BUSHFIRE THREAT ASSESSMENT

FOR
A PROPOSED
1 INTO 2 LOT SUBDIVISION

AT

698 RED HILLS ROAD,

MARULAN NSW 2579

Prepared by:

Firebird ecoSultants Pty Ltd
ABN – 16 105 985 993

PO Box 354
Newcastle NSW 2300

Mob: 0414 465 990
Ph: 02 4910 3939
Fax: 02 4929 2727
Email: sarah@firebirdeco.com.au

Site Details:	698 Red Hills Road, Marulan NSW 2579
Prepared by:	***Sarah Jones B.Env.Sc., G.Dip.DBPA (Design in Bushfire Prone Areas)*** ***Firebird ecoSultants Pty Ltd*** **A**BN – 16 105 985 993 PO Box 354, Newcastle NSW 2300 M: 0414 465 990 Email: sarah@firebirdeco.com.au T: 02 4910 3939 Fax: 02 4929 2727
Prepared for:	Fides Environmental
Reference No.	Marulan – Fides Environmental – November 2024
Document Status & Date:	15th November 2024
Author:	Azmina Shafie
Reviewer 1:	Liv Page
Reviewer 2:	Sarah Jones

Disclaimer

Notwithstanding the precautions adopted within this report, it should always be remembered that bushfires burn under a wide range of conditions. An element of risk, no matter how small always remains, and although the standard is designed to improve the performance of such buildings, there can be no guarantee, because of the variable nature of bushfires, that any one building will withstand bushfire attack on every occasion.

Executive Summary

A Bushfire Threat Assessment Report (BTA) has been prepared by Firebird ecoSultants Pty Ltd at the request of Fides Environmental for a proposed 1 into 2 lot subdivision at 698 Red Hills Road, Marulan NSW 2579. The report forms part of the supporting documentation for a DA to be submitted to Goulburn Mulwaree Council (GMC) because the site is mapped as Bushfire Prone Land (BPL) under the Environmental Planning & Assessment Act 1979 (s10.3 – Bush fire prone land).

The development is required to satisfy EP&A Act 1979 (Section 4.46 – What is Integrated Development) for the residential subdivision. Council will refer the BAR to the NSW RFS to satisfy the Rural Fire Act 1997 (s100B) for the subdivision.

This Report demonstrates how the development conforms with the document titled 'Planning for Bushfire Protection' (PBP). The aim of PBP is to provide for the protection of human life and minimise the impacts on property from the threat of bush fire, while having due regard to development potential, site characteristics and protection of the environment (p.10).

This assessment aims to consider and assess the bushfire hazard and associated potential threats relevant to the proposal. Recommendations are provided with regard to fuel management, access, provision of emergency services, building protection and construction standards to facilitate an acceptable level of bushfire protection.

In summary, the following is recommended to enable the proposal to meet the relevant legislative requirements:

1. **Asset Protection Zone (APZ) - The APZ provides space and reduced fuel loads to ensure radiant heat levels at the buildings are below critical limits and to prevent direct flame contact.**

    - The proposal is for a subdivision of 1 into 2 lots only, however the intent of the subdivision is to provide for a future habitable dwelling on proposed lot 1.

    - The existing dwelling on proposed lot 2 has an established defendable space that is well maintained to the standard of an Inner Protection Area in accordance with Planning for Bushfire Protection 2019. No further APZ measures are required.

    - In order for any future dwelling on proposed lot 1 to achieve a Bushfire Attack Level (BAL) of BAL-29 or less, the following land is to be managed as an APZ:

        - Minimum of 45m to the Northwest;
        - Minimum of 11m to the North;
        - Minimum of 15m to the East;
        - Minimum of 23m to the South; and
        - Minimum of 13m to the West.

    - These distances are to be managed as described under 'Planning for Bushfire

Protection (Appendix 4 – Asset Protect Zone Requirements)' and the document titled 'Standards for Asset Protection Zones'.

2. Access - Access standards provide for emergency evacuation and firefighting operations

- The proposal is for a 1 into 2 lot subdivision, therefore the construction of perimeter roads is not required.

- The existing property access road to service access proposed lot 1 and new property access road to service access to proposed lot 2 complies/will comply with the following requirements from Table 5.3b in PBP 2019:

    - Minimum 4m carriageway width;
    - In forest, woodland and heath situations, rural property access 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;
    - 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; and
    - The crossfall is not more than 10 degrees.

3. Construction Standards – Construction standards seek to increase the protection of the habitable buildings from bushfire. The shorter the APZ (distance between the external wall of the habitable building and the unmanaged vegetation), then the higher the construction standard, which is referred to as the BAL

- The existing dwelling on proposed lot 2 is to be upgraded for ember protection with the minimum recommended construction upgrades as follows:

    - Openable and non-openable portions of existing windows and doors to be covered with screens of steel, bronze, or aluminium to maximum allowable aperture of 2mm, and frames supporting mesh must be made of steel and attached with metal fitting;
    - All gaps, vents, weepholes (except for weepholes to sills of windows and doors), and the like must be screened with steel, bronze or aluminium to maximum allowable aperture of 2mm;
    - All decorative softwood removed from construction and replaced with non-combustible or hardwoods from Appendix F of AS3959-2018;
    - All verandas, decks, steps, ramps, landings, balustrades and handrails to be replaced to minimum BAL-29 construction standards.

- Any future dwelling in the proposed building envelope will be assessed as BAL-29 based on the abovementioned APZs.

4. Water supply – water supply is provided for firefighting purposes

- Water tanks are existing on site to service the existing dwelling on proposed lot 2. They occur within the defendable space and have sufficient capacity for firefighting. It is recommended they are fitting appropriately with installation of 65mm Storz outlet with a ball valve for easy access in the event of firefighting activity.

- Reticulated water supply and associated fire hydrants are not provided for proposed lot 2 therefore a 20,000L static water supply must be provided on site for each occupied building and in accordance with the following requirements from Table 7.4a:

    - a connection for firefighting purposes is located within the IPA or non-hazard side and away from the structure; a 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;
    - a hardened ground surface for truck access is supplied within 4m of the access hole;
    - above-ground tanks are manufactured from concrete or metal;
    - raised tanks have their stands constructed from non-combustible material or bushfire resisting timber (see Appendix F AS3959);
    - unobstructed access is provided at all times;
    - tanks on the hazard side of a building are provided with adequate shielding for the protection of firefighters; and
    - underground tanks are clearly marked;
    - all exposed water pipes external to the building are metal, including any fittings;
    - where pumps are provided, they are a minimum 5hp or 3kW petrol or diesel-powered pump, and are shielded against bushfire attack; any hose and reel for firefighting connected to the pump shall be 19mm internal diameter; and
    - fire hose reels are constructed in accordance with AS/NZS 1221:1991 fire hose reels, and installed in accordance with the relevant clauses of AS2441:2005 installation of fire hose reels.

5. Landscaping – The type, location and ongoing maintenance of landscaping is considered a necessary BPM

- The identified APZs are to be managed in accordance with accordance with PBP (Appendix 4);
- A clear area of low-cut lawn or pavement is maintained adjacent to the dwellings; and
- Fencing details in accordance with PBP (7.6 – Fences and gates)

This report provides the above required information to assist Council and the RFS in determining compliance in accordance with the PBP 2019 and AS 3959-2018.

Sarah Jones
B.Env.Sc., G.Dip.DBPA (Design for Bushfire Prone Areas)
FPA BPAD-A Certified Practitioner (Certification Number BPD-26512)
Ecologist / Bushfire Planner

Terms & Abbreviations

Abbreviation	Meaning
APZ	Asset Protection Zone
AS2419 -2017	Australian Standard – Fire Hydrant Installations
AS3959-2018	Australian Standard – Construction of Buildings in Bush Fire Prone Areas
BCA	Building Code of Australia
BPA	Bush Fire Prone Area (Also Bushfire Prone Land)
BFPL Map	Bush Fire Prone Land Map
BPMs	Bush Fire Protection Measures
BFSA	Bush Fire Safety Authority
CC	Construction Certificate
EPA Act	*NSW Environmental Planning and Assessment Act 1979*
FFDI	Forest Fire Danger Index
FMP	Fuel Management Plan
GMC	Goulburn Mulwaree Council
ha	hectare
IPA	Inner Protection Area
LGA	Local Government Area
OPA	Outer Protection Area
PBP	Planning for Bushfire Protection 2019
PoM	Plan of Management
RF Act	Rural Fires Act 1997
RF Regulation	Rural Fires Regulation

CONTENTS

1 INTRODUCTION 1

1.1 Site Particulars 1
1.2 Description of the Proposal 3
1.3 Legislative Requirements 3
1.4 Objectives of Assessment 3

2 METHODOLOGY 5

2.1 Vegetation Assessment 5
2.2 Slope Assessment 5

3 SITE ASSESSMENT 6

3.1 Vegetation & Slope Assessment 6

4 BUSHFIRE PROTECTION ASSESSMENT 8

4.1 Asset Protection Zones (APZ) 8

5 DWELLING DESIGN & CONSTRUCTION 10

5.1 Determination of Bushfire Attack Levels 11

6 COMPLIANCE 12

7 CONCLUSION & RECOMMENDATIONS 21

8 BIBLIOGRAPHY 24

APPENDIX A PROPOSED SITE PLANS A-1

APPENDIX B ASSET PROTECTION ZONES B-1

TABLES

Table 3-1: Vegetation Classification for Proposed Lot 1 6

Table 4-1: Recommended APZs for Proposed Future Dwelling within proposed lot 1 8

Table 5-1: Determination of Required BALs for Future Dwelling within proposed lot 1 11

Table 6-1: Proposed Subdivision Compliance with Development Standards 12

FIGURES

Figure 1-1: Site Location 2

Figure 1-2 Bushfire Prone Land Map 4

Figure 3-1: Vegetation Map 7

Figure 4-1: APZ Map 9

1 INTRODUCTION

A Bushfire Threat Assessment Report (BTA) has been prepared by Firebird ecoSultants Pty Ltd at the request of Fides Environmental for a proposed 1 into 2 lot subdivision at 698 Red Hills Road, Marulan NSW 2579, hereafter referred to as the "site" (refer to Figure 1-1 for site locality). Refer to Appendix A for Proposed Site Plans.

This BTA is suitable for submission with a Development Application (DA) and provides information on measures that will enable the development to comply with 'Planning for Bushfire Protection' (NSW RFS, 2019), hereafter referred to as PBP (RFS, 2019).

This assessment aims to consider and assess the bushfire hazard and associated potential threats relevant to such a proposal, and to outline the minimum mitigative measures which would be required in accordance with the provisions of the Environmental Planning and Assessment Amendment (Planning for Bushfire Protection) Regulation 2007 and the Rural Fires Amendment Regulation 2007 (RF Amendment Regulation 2007).

1.1 Site Particulars

Locality:	698 Red Hills Road, Marulan NSW 2579
LGA:	Goulburn Mulwaree Council
Current Land Use:	Existing dwelling to remain
Forest Danger Index:	100 FFDI

Note:
Boundaries are not survey accurate.
Although all reasonable care has been taken to ensure the information shown on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. Please verify the accuracy of all information prior to use.

FIGURE 1-1: LOCALITY MAP

Ref No 3403

CLIENT	Client
SITE DETAILS	No.698 Red Hills Road Marulan
DATE	21 November 2024

NORTH

0 20 40 60

SCALE 1200 @ A3

PIXELDRAFTING

Firebird ecoSultants Pty Ltd
ABN - 16 105 985 993
Level 1, 146 Hunter Street, Newcastle NSW 2300
P O Box 354 Newcastle NSW 2300

firebird

FIGURE 1-1: LOCALITY MAP

Ref No 3403

CLIENT	Client
SITE DETAILS	No.698 Red Hills Road Marulan
DATE	21 November 2024

NORTH

0 20 40 60

SCALE 1200 @ A3

PIXELDRAFTING

Firebird ecoSultants Pty Ltd
ABN - 16 105 985 993
Level 1, 146 Hunter Street, Newcastle NSW 2300
P O Box 354 Newcastle NSW 2300

firebird

1.2 Description of the Proposal

This DA relates to the proposal for a 1 into 2 lot subdivision. Refer to Appendix A for proposed plans.

1.3 Legislative Requirements

The Site has been mapped as Bush Fire Prone Land Map (BFPLM) by GMC.

This report forms part of the supporting documentation for a Development Application (DA) to be submitted to GMC.

This BTA has been prepared using current legislative requirements and associated guidelines for assessment of bushfire protection, these being:

- PBP (RFS, 2019); and
- AS3959-2018 Construction of Buildings in Bushfire Prone Area.

1.4 Objectives of Assessment

This report has been prepared to address the requirements of Clause 44 of the Rural Fires Regulation. This BTA also addresses the six key Bush Fire Protection Measures (BFRMs) in a development assessment context being:

- The provision of clear separation of buildings and bush fire hazards, in the form of fuel-reduced APZ (and their components being Inner Protection Areas (IPA's) and Outer Protection Areas (OPA's);
- Sitting and design of the proposal;
- Construction standards;
- Appropriate access standards for residents, fire-fighters, emergency workers and those involved in evacuation;
- Adequate water supply and pressure, and utility services; and
- Suitable landscaping, to limit fire spreading to a building.

Figure 1-2 Bushfire Prone Land Map

2 METHODOLOGY

2.1 Vegetation Assessment

Vegetation surveys and vegetation mapping carried out on the site has been undertaken as follows:

- Aerial Photograph Interpretation to map vegetation cover and extent
- Confirmation of the vegetation assemblage typology present.

2.2 Slope Assessment

Slope assessment has been undertaken as follows:

- Aerial Photograph Interpretation in conjunction with analysis of electronic contour maps with a contour interval of 2m.

3 SITE ASSESSMENT

The following assessment has been undertaken in accordance with the requirements of PBP (RFS, 2019).

3.1 Vegetation & Slope Assessment

In accordance with PBP (RFS 2019), an assessment of the vegetation over a distance of 140m in all directions from the site was undertaken. Vegetation that may be considered a bushfire hazard was identified in all directions from the site. This assessment is depicted in Table 3-1.

In accordance with PBP (RFS 2019), an assessment of the slope beneath the vegetation considered a bushfire hazard was undertaken and the results are presented in Table 3-1 below.

Table 3-1: Vegetation Classification for Proposed Lot 1

Direction	Vegetation Type	Distance from Site Boundary	Slope Vegetation occurs on
North	Remnant vegetation*	>11m	Cross slope
Northwest	Forest vegetation	>45m	Downslope 10-15°
East	Grasslands	>15m	Downslope 10-15°
South	Remnant vegetation* and grasslands	>23m	Downslope 10-15°
West	Grasslands	>13m	Downslope 5-10°

*Vegetation has been assessed as remnant in accordance with Section A1.11 in PBP 2019 as it provides a parcel <1ha in size.

Legend

- Building Outline
- APZ
- Subject Land

Assessment Area

- 100m
- 140m

Classified Vegetation

- Rainforest
- Forest (wet and dry sclerophyll) ect.
- Grassy and Semi-Arid Woodland (including Mallee)
- Grassland

- Elevation Contours
- Cadastre

Scale 1:1,300

0 40 80 m

firebird

Client: Fides Environmental

Project: 698 Red Hills Road, Marulan NSW 2579

Figure 3-1: Vegetation Map

4 BUSHFIRE PROTECTION ASSESSMENT

4.1 Asset Protection Zones (APZ)

The PBP (RFS, 2019) guidelines have been used to determine the widths of the APZs required for habitable buildings within the site using the vegetation and slope data identified in Section 3-1 of this report.

The site lies within Goulburn Mulwaree Local Government Area and therefore is assessed under an FDI rating of 100. Using the results from the Site Assessment (section 3.1 of this report) the deemed to satisfy APZ requirements for the proposed buildings within the site were determined using Table A1.12.2 in PBP (RFS, 2019). Refer to Table 4-1 for the required APZs for the proposed habitable buildings.

Table 4-1: Recommended APZs for Proposed Future Dwelling within proposed lot 1

Direction from Development	Vegetation classified within 140m	Effective Slope (within 100m)	APZ to be provided
North	Remnant vegetation	Cross slope	An APZ of 11m is to be provided.
Northwest	Forest vegetation	Downslope 10-15°	An APZ of 45m is to be provided.
East	Grasslands	Downslope 10-15°	An APZ of 15m is to be provided.
South	Remnant vegetation and grasslands	Downslope 10-15°	An APZ of 23m is to be provided.
West	Grasslands	Downslope 5-10°	An APZ of 13m is to be provided.

Legend

- Line Distance
- Building Outline
- APZ
- Subject Land

Assessment Area

- 100m
- 140m

Classified Vegetation

- Rainforest
- Forest (wet and dry sclerophyll) ect.
- Grassy and Semi-Arid Woodland (including Mallee)
- Grassland
- Elevation Contours
- Cadastre

Scale 1:600

0 20 40 m

firebird

Client: Fides Environmental

Project: 698 Red Hills Road, Marulan NSW 2579

Figure 4-1: APZ Map

5 DWELLING DESIGN & CONSTRUCTION

Building design and the materials used for construction of future dwellings should be chosen based on the information contained within AS3959-2018, and accordingly the designer / architect should be made aware of this recommendation. It may be necessary to have dwelling plans checked by the architect involved to ensure that the proposed dwellings meet the relevant Bushfire Attack Level (BAL) as detailed in AS3959-2018.

The determinations of the appropriate BAL are based upon parameters such as weather modelling, fire-line intensity, flame length calculations, as well as vegetation and fuel load analysis. The determination of the construction level is derived by assessing the:

- Relevant FFDI = 100
- Flame temperature
- Slope
- Vegetation classification; and
- Building location.

The following BAL, based on heat flux exposure thresholds, are used in the standard:

(a) **BAL – LOW** The risk is considered to be **VERY LOW**

There is insufficient risk to warrant any specific construction requirements but there are still some risks.

(b) **BAL – 12.5** The risk is considered to be **LOW**

There is a risk of ember attack.

The construction elements are expected to be exposed to a heat flux not greater than 12.5 k/m^2.

(c) **BAL – 19** The risk is considered to be **MODERATE**

There is a risk of ember attack and burning debris ignited by wind borne embers and a likelihood of exposure to radiant heat.

The construction elements are expected to be exposed to a heat flux not greater than 19 kW/m^2.

(d) **BAL-29** The risk is considered to be **HIGH**

There is an increased risk of ember attack and burning debris ignited by windborne embers and a likelihood of exposure to an increased level of radiant heat.

The construction elements are expected to be exposed to a heat flux no greater than 29 kW/m^2.

(e) **BAL-40** The risk is considered to be **VERY HIGH**

There is much increased risk of ember attack and burning debris ignited by windborne embers, a likelihood of exposure to a high level of radiant heat and some likelihood of direct exposure to flames from the fire front.

The construction elements are expected to be exposed to a heat flux no greater than 40 kW/m^2.

(f) **BAL-FZ** The risk is considered to be **EXTREME**

There is an extremely high risk of ember attack and burning debris ignited by windborne embers, a likelihood of exposure to an extreme level of radiant heat and direct exposure to flames from the fire front.

The construction elements are expected to be exposed to a heat flux greater than 40 kW/m^2.

5.1 Determination of Bushfire Attack Levels

Using a FFDI of 100, the information relating to vegetation and slope was applied to Table A1.12.5 of PBP 2019 to determine the appropriate BAL ratings. The results from this bush fire risk assessment are detailed below in Table 5-1–Bush Fire Attack Assessment.

Table 5-1: Determination of Required BALs for Future Dwelling within proposed lot 1

Vegetation Type & Direction	Separation Distance from vegetation	Bushfire Attack Level (BAL)	Construction Section
Remnant to the North	>11m	BAL-29	Sect 3 & 7 of AS3959
Forest to the Northwest	>45m	BAL-29	
Grassland to the East	>15m	BAL-29	
Remnant to the South	>23m	BAL-29	
Grassland to the West	>13m	BAL-29	

Given the information in Table 5-1 above any future dwelling within the proposed lot 1 will be able to comply with AS3959-2018 and is able to achieve a BAL-29 or less, given the implementation of an appropriate APZ as provided in Chapter 4 of this report and maintained in perpetuity in accordance with PBP 2019.

6 COMPLIANCE

The proposal is for a rural residential subdivision and therefore development standards apply. Table 6-1 details compliance with Development Standards for Residential and Rural Residential Subdivisions.

Table 6-1: Proposed Subdivision Compliance with Development Standards

Acceptable Solutions	Performance Criteria	Compliance
Asset Protection Zones		
〉 APZs are provided in accordance with Tables A1.12.2 and A1.12.3 based on the FFDI.	potential building footprints must not be exposed to radiant heat levels exceeding 29 kW/m² on each proposed lot.	**Complies with Acceptable Solution –** APZs for the site has been provided in accordance with Table A1.12.2 of PBP 2019.
〉 APZs are managed in accordance with the requirements of Appendix 4.	APZs are managed and maintained to prevent the spread of a fire towards the building.	**Complies with Acceptable Solution –** APZs on site are to be managed in accordance with Appendix 4 of PBP 2019.
〉 APZs are wholly within the boundaries of the development site	the APZs is provided in perpetuity	**Complies with Acceptable Solution –** APZs are wholly within the boundaries of the development site.
〉 APZs are located on lands with a slope less than 18 degrees.	APZ maintenance is practical, soil stability is not compromised and the potential for crown fires is minimised.	**Complies with Acceptable Solution –** APZs on site occur over land with slope <18°.
Landscaping		
〉 landscaping is in accordance with Appendix 4; and fencing is constructed in accordance with section 7.6.	landscaping is designed and managed to minimise flame contact and radiant heat to buildings, and the potential for wind-driven embers to cause ignitions.	**Complies with Acceptable Solution –** All landscaping within the site will meet the requirements of the acceptable solution.

Access (General Requirements)		
〉 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 and out of the development; 〉 traffic management devices are constructed to not prohibit access by emergency services 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, 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;	firefighting vehicles are provided with safe, all-weather access to structures.	**Complies with Acceptable Solution –** The existing property access is to service access to proposed lot 1 and the proposed property access road will service the existing dwelling on proposed lot 2. These property access roads comply/will comply with the following requirements from Table 5.3b in PBP 2019: 〉 Minimum 4m carriageway width; 〉 In forest, woodland and heath situations, rural property access 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; 〉 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; and 〉 The crossfall is not more than 10 degrees.

〉 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 〉 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.		
〉 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.	the capacity of access roads is adequate for firefighting vehicles.	**Complies with Acceptable Solution –** The public road network is existing and proposed/existing property access roads will comply with the requirements of the acceptable solution.
〉 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 the relevant clauses of AS 2419.1:2017 - 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.	there is appropriate access to water supply.	**Complies with acceptable solution** – Static water supply will be accessible by a Category 1 fire appliance for both the existing dwelling and any future dwelling.

Perimeter Roads		
〉 are two-way sealed roads; 〉 minimum 8m carriageway width kerb to kerb; 〉 parking is provided outside of the carriageway width; 〉 hydrants are located clear of parking areas; 〉 are through roads, and these are linked to the internal road system at an interval of no greater than 500m; 〉 curves of roads have a minimum inner radius of 6m; 〉 the maximum grade road is 15 degrees and average grade of not more than 10 degrees; 〉 the road crossfall does not exceed 3 degrees; and 〉 a minimum vertical clearance of 4m to any overhanging obstructions, including tree branches, is provided.	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.	**N/A –** perimeter roads are not required.
Non-Perimeter Roads		
〉 minimum 5.5m carriageway width kerb to kerb;	access roads are designed to allow safe access and egress for firefighting vehicles while residents are evacuating.	**N/A –** non-perimeter roads are not proposed. Property access roads are to service access to the proposed lots.

〉 parking is provided outside of the carriageway width; 〉 hydrants are located clear of parking areas; 〉 roads are through roads, and these are linked to the internal road system at an interval of no greater than 500m; 〉 curves of roads have a minimum inner radius of 6m; 〉 the road crossfall does not exceed 3 degrees; and 〉 a minimum vertical clearance of 4m to any overhanging obstructions, including tree branches, is provided.		
Property Access		
〉 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:**	firefighting vehicles can access the dwelling and exit the property safely.	**Complies with Acceptable Solution –** The existing property access is to service access to proposed lot 1 and the proposed property access road will service the existing dwelling on proposed lot 2. These property access roads comply/will comply with the following requirements from Table 5.3b in PBP 2019: 〉 Minimum 4m carriageway width; 〉 In forest, woodland and heath situations, rural property access roads have passing bays every 200m that are 20m long by 2m

〉 minimum 4m carriageway width; 〉 in forest, woodland and heath situations, rural property access 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; 〉 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 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**		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; 〉 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; and 〉 The crossfall is not more than 10 degrees.

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.		
Water Supplies		
〉 reticulated water is to be provided to the development where available; 〉 a static water and hydrant supply is provided for non-reticulated developments or where reticulated water supply cannot be guaranteed; and 〉 static water supplies shall comply with Table 5.3d.	adequate water supplies are provided for firefighting purposes.	**Complies with Acceptable Solution –** Static water supply is compliant with the acceptable solution requirements.
〉 fire hydrant, spacing, design and sizing complies with the relevant clauses of Australian Standard AS 2419.1:2017; 〉 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.	Water supplies are located at regular intervals; and the water supply is accessible and reliable for firefighting operations.	**Complies with Acceptable Solution –** Static water supply is compliant with the acceptable solution requirements.
〉 fire hydrant flows and pressures comply with the relevant clauses of AS 2419.1:2017.	flows and pressure are appropriate.	**Complies with Acceptable Solution –** Static water supply is compliant with the acceptable solution requirements.

〉 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.	the integrity of the water supply is maintained.	**Complies with Acceptable Solution –** All above ground water service pipes will meet the requirements.
Electricity Services		
〉 where practicable, electrical transmission lines are underground; 〉 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 Vegetation Near Power Lines.	location of electricity services limits the possibility of ignition of surrounding bush land or the fabric of buildings.	**Complies with Acceptable Solution –** All future dwellings are able to meet the requirements for electricity services.
Gas Services		
〉 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;	location and design of gas services will not lead to ignition of surrounding bushland or the fabric of buildings.	**Can Complies with Acceptable Solution –** All future dwellings are able to meet the requirements for gas services.

〉 all fixed gas cylinders are kept clear of all flammable materials to a distance of 10m and shielded on the hazard side; 〉 connections to and from gas cylinders are metal; 〉 polymer-sheathed flexible gas supply lines are not used; and 〉 above-ground gas service pipes are metal, including and up to any outlets.		

7 CONCLUSION & RECOMMENDATIONS

In summary, a Bushfire Risk Assessment has been undertaken for a proposed 1 into 2 lot subdivision at 698 Red Hills Road, Marulan NSW 2579. The report forms part of the supporting documentation for a Development Application (DA) to be submitted to GMC.

If the recommendations contained within this report are duly considered and incorporated, it is considered that the fire hazard present is containable to a level necessary to provide an adequate level of protection to life and property on the subdivision. In summary, the following is recommended to enable the proposal to meet the relevant legislative requirements:

1. Asset Protection Zone (APZ) - The APZ provides space and reduced fuel loads to ensure radiant heat levels at the buildings are below critical limits and to prevent direct flame contact.

- The proposal is for a subdivision of 1 into 2 lots only, however the intent of the subdivision is to provide for a future habitable dwelling on proposed lot 1.
- The existing dwelling on proposed lot 2 has an established defendable space that is well maintained to the standard of an Inner Protection Area in accordance with Planning for Bushfire Protection 2019. No further APZ measures are required.
- In order for any future dwelling on proposed lot 1 to achieve a Bushfire Attack Level (BAL) of BAL-29 or less, the following land is to be managed as an APZ:
  - Minimum of 45m to the Northwest;
  - Minimum of 11m to the North;
  - Minimum of 15m to the East;
  - Minimum of 23m to the South; and
  - Minimum of 13m to the West.
- These distances are to be managed as described under ‘Planning for Bushfire Protection (Appendix 4 – Asset Protect Zone Requirements)’ and the document titled ‘Standards for Asset Protection Zones’.

2. Access - Access standards provide for emergency evacuation and firefighting operations

- The proposal is for a 1 into 2 lot subdivision, therefore the construction of perimeter roads is not required.
- The existing property access road to service access proposed lot 1 and new property access road to service access to proposed lot 2 complies/will comply with the following requirements from Table 5.3b in PBP 2019:
  - Minimum 4m carriageway width;
  - In forest, woodland and heath situations, rural property access 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;
- 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; and
- The crossfall is not more than 10 degrees.

3. Construction Standards – Construction standards seek to increase the protection of the habitable buildings from bushfire. The shorter the APZ (distance between the external wall of the habitable building and the unmanaged vegetation), then the higher the construction standard, which is referred to as the BAL

- The existing dwelling on proposed lot 2 is to be upgraded for ember protection with the minimum recommended construction upgrades as follows:

  - Openable and non-openable portions of existing windows and doors to be covered with screens of steel, bronze, or aluminium to maximum allowable aperture of 2mm, and frames supporting mesh must be made of steel and attached with metal fitting;
  - All gaps, vents, weepholes (except for weepholes to sills of windows and doors), and the like must be screened with steel, bronze or aluminium to maximum allowable aperture of 2mm;
  - All decorative softwood removed from construction and replaced with non-combustible or hardwoods from Appendix F of AS3959-2018;
  - All verandas, decks, steps, ramps, landings, balustrades and handrails to be replaced to minimum BAL-29 construction standards.

- Any future dwelling in the proposed building envelope will be assessed as BAL-29 based on the abovementioned APZs.

4. Water supply – water supply is provided for firefighting purposes

- Water tanks are existing on site to service the existing dwelling on proposed lot 2. They occur within the defendable space and have sufficient capacity for firefighting. It is recommended they are fitting appropriately with installation of 65mm Storz outlet with a ball valve for easy access in the event of firefighting activity.

- Reticulated water supply and associated fire hydrants are not provided for proposed lot 2 therefore a 20,000L static water supply must be provided on site for each occupied building and in accordance with the following requirements from Table 7.4a:

  - a connection for firefighting purposes is located within the IPA or non-hazard side and away from the structure; a 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;
- a hardened ground surface for truck access is supplied within 4m of the access hole;
- above-ground tanks are manufactured from concrete or metal;
- raised tanks have their stands constructed from non-combustible material or bushfire resisting timber (see Appendix F AS3959);
- unobstructed access is provided at all times;
- tanks on the hazard side of a building are provided with adequate shielding for the protection of firefighters; and
- underground tanks are clearly marked;
- all exposed water pipes external to the building are metal, including any fittings;
- where pumps are provided, they are a minimum 5hp or 3kW petrol or diesel-powered pump, and are shielded against bushfire attack; any hose and reel for firefighting connected to the pump shall be 19mm internal diameter; and
- fire hose reels are constructed in accordance with AS/NZS 1221:1991 fire hose reels, and installed in accordance with the relevant clauses of AS2441:2005 installation of fire hose reels.

5. Landscaping – The type, location and ongoing maintenance of landscaping is considered a necessary BPM

- The identified APZs are to be managed in accordance with accordance with PBP (Appendix 4);
- A clear area of low-cut lawn or pavement is maintained adjacent to the dwellings; and
- Fencing details in accordance with PBP (7.6 – Fences and gates)

This report provides the above required information to assist Council and the RFS in determining compliance in accordance with the PBP 2019 and AS 3959-2018.

8 BIBLIOGRAPHY

Department of Bush Fire Services (undated). *Bush Fire Readiness Checklist.*

NSWFB (1988). *Hazard Reduction for the Protection of Buildings in Bushland Areas.* New South Wales Fire Brigades.

NSW Rural Fire Service (1997). *Bush Fire Protection for New and Existing Rural Properties.* September 1997, NSW Government.

NSW Rural Fire Service (2006). *Planning for Bushfire Protection – A Guide for Councils, Planners, Fire Authorities, Developers and Home Owners.*

NSW Rural Fire Service (2019). *Planning for Bushfire Protection – A Guide for Councils, Planners, Fire Authorities, Developers and Home Owners.*

NSW Rural Fire Service (2005). Standards for Asset Protection Zones. NSW Rural Fire Service.

NSW Rural Fire Service (2002). *Circular 16/2002: Amendments to the Rural Fires Act 1997 – hazard reduction and planning requirements.*

Planning NSW & NSW Rural Fire Service (2001). *Planning for Bushfire Protection – A Guide for Councils, Planners, Fire Authorities, Developers and Home Owners.*

Ramsay, GC and Dawkins, D (1993). *Building in Bushfire-prone Areas – Information and Advice.* CSIRO and Standards Australia.

Rural Fires and Environmental Assessment Legislation Amendment Act 2002.

Standards Australia (2018). *AS 3959 – 2018: Construction of Buildings in Bushfire-prone Areas.*

APPENDIX A PROPOSED SITE PLANS

(A) EASEMENT FOR PIPELINE & WATER SUPPLY 6 WIDE (IN DP 1171367)(AH699797)
(B) PROPOSED EASEMENT FOR PIPELINE & WATER SUPPLY 20 WIDE & 5.175 WIDE IN (DP 1159329)
(C) EASEMENT FOR PIPELINE 24.385 WIDE (DP 499002)

2

DP 1236943

187°11'20"
71.730

92°27'50"
1377.72

(608)

(B)

(A)(B)

(C)

(B)

(A)

(135)

PROPOSED NEW DRIVEWAY

57.300
22°56'20"

57.300
36°56'40"

(PROPOSED LOT 1)
(10ha)

40
DP 882293

(286)

(213)

(159)

332.43
43°56'40"

ROAD

(B)

(A)(B)

290.66
144°17'40"

201.90
110°51'55"

155.38
91°23'45"

43

DP 882293

376.18
125°34'25"

(PROPOSED LOT 2)
(40.05ha)

PROPOSED NEW DRIVEWAY

31°56'30"
52.570

19°56'20"
52.570

17°16'40"
30.610

4°04'10"
26.550

351°19'00"
49.355

343°55'40"
26.225

EASEMENT FOR ELECTRICITY PURPOSES 20 WIDE
DP 882293

RED HILLS (Variable Width)

126.89
106°18'55"

115.76
81°48'15"

NOTES:
1. BOUNDARIES HAVE NOT BEEN VERIFIED BY SURVEY.
2. DIMENSIONS AND AREAS ARE SUBJECT TO FINAL DESIGN, SURVEY & COUNCIL APPROVAL.
3. THIS SUBDIVISION LAYOUT IS A CONCEPT ONLY AND IS SUBJECT TO COUNCIL APPROVAL.
4. THIS SUBDIVISION LAYOUT SHOULD NOT BE USED FOR FINANCIAL PLANNING PRIOR TO COUNCIL APPROVAL.
5. THE LOT YIELD ON THIS PLAN MAY CHANGE TO REFLECT COUNCIL REQUIREMENTS.
6. THIS PLAN IS TO ACCOMPANY AN APPLICATION TO COUNCIL AND SHOULD NOT BE USED FOR ANY OTHER PURPOSE.
7. EASEMENTS MAY BE CREATED ON THE FINAL SUBDIVISION PLAN.
8. RESTRICTION ON THE USE OF LAND MAY BE CREATED ON THE FINAL SUBDIVISION PLAN.
9. THESE NOTES ARE AN INTEGRAL PART OF THIS PLAN & SHOULD NOT BE REMOVED.
10. THIS DRAFT PLAN HAS BEEN PREPARED FROM INFORMATION ISSUED BY FIDES ENVIRONMENTAL WITH DRAWING REF: Deboke 20240210-DA-CIV-DWG-01.DWG DATED 17-10-2024

REVISIONS

No.	DATE	REVISION DETAILS	DRAWN	CHK	APP
A	22-10-2024	INITIAL VERSION	LAS	KP	KP

HORIZ. SCALE: 1:2500 @ A2
VERT. SCALE: N/A @ A2
COORDINATES: N/A
DATUM: N/A
ORIGIN:
ORIGIN:

NOTES

LGA: GOLUBURN MULWAREE

CLIENT: FIDES ENVIRONMENTAL

SURVEY: KP
DRAWN: LS
CHECKED: KP
APPROVED: KP

DATE OF SURVEY: OCT 2024
DATE OF PLAN: 22-10-2024
DATE LAST SAVED: 22.10.2024
DATE APPROVED: 22-10-2024

TITLE: Plan showing proposed subdivision of Part Lot 40 DP 882293 698 Red Hills Road, Marulan

DRAWING No: AU213017274-DA01a.dwg

JOB No: AU213017274
ISSUE: A
SHEET 1 OF 1 SHEETS
SIZE: A2

RPS AAP Consulting Pty Ltd (ABN 97 117 883 173)
UNIT 1.16, LEVEL 1, 4 COLUMBIA COURT, NORWEST NSW 2153
www.rpsgroup.com.au

THIS IS A COLOURED PLAN.
REPRODUCTION IN COLOUR ONLY.

N:\Projects\D365 AU Projects\AU213017274 - 698 Red Hills Road Marulan\05 Drafting\Survey\08 DA\AU213017274-DA01a.dwg 22.10.2024

APPENDIX B ASSET PROTECTION ZONES

APPENDIX 4

ASSET PROTECTION ZONE REQUIREMENTS

In combination with other BPMs, a bush fire hazard can be reduced by implementing simple steps to reduce vegetation levels. This can be done by designing and managing landscaping to implement an APZ around the property.

Careful attention should be paid to species selection, their location relative to their flammability, minimising continuity of vegetation (horizontally and vertically), and ongoing maintenance to remove flammable fuels (leaf litter, twigs and debris).

This Appendix sets the standards which need to be met within an APZ.

A4.1 Asset Protection Zones

An APZ is a fuel-reduced area surrounding a building or structure. It is located between the building or structure and the bush fire hazard.

For a complete guide to APZs and landscaping, download the NSW RFS document *Standards for Asset Protection Zones* at the NSW RFS Website www.rfs.nsw.gov.au.

An APZ provides:

- a buffer zone between a bush fire hazard and an asset;
- an area of reduced bush fire fuel that allows for suppression of fire;
- an area from which backburning or hazard reduction can be conducted; and
- an area which allows emergency services access and provides a relatively safe area for firefighters and home owners to defend their property.

Bush fire fuels should be minimised within an APZ. This is so that the vegetation within the zone does not provide a path for the spread of fire to the building, either from the ground level or through the tree canopy.

An APZ, if designed correctly and maintained regularly, will reduce the risk of:

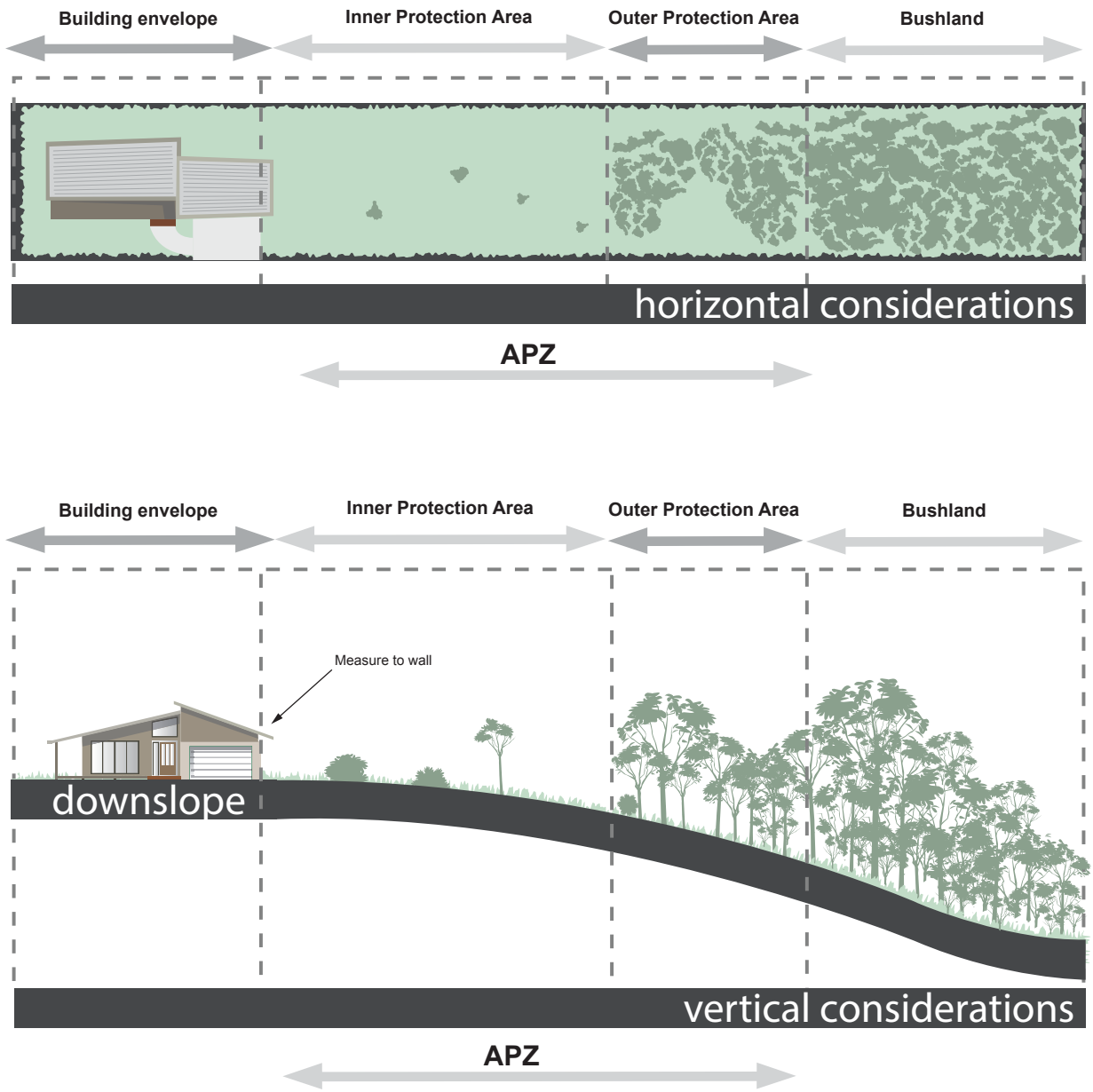
- direct flame contact on the building;
- damage to the building asset from intense radiant heat; and
- ember attack.

The methodology for calculating the required APZ distance is contained within Appendix 1. The width of the APZ required will depend upon the development type and bush fire threat. APZs for new development are set out within Chapters 5, 6 and 7 of this document.

In forest vegetation, the APZ can be made up of an Inner Protection Area (IPA) and an Outer Protection Area (OPA).

Figure A4.1

Typical Inner and Outer Protection Areas.



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.

A4.1.2 Outer Protection Areas (OPAs)

An OPA is located between the IPA and the unmanaged vegetation. It is an area where there is maintenance of the understorey and some separation in the canopy. The reduction of fuel in this area aims to decrease the intensity of an approaching fire and restricts the potential for fire spread from crowns; reducing the level of direct flame, radiant heat and ember attack on the IPA.

Because of the nature of an OPA, they are only applicable in forest vegetation.

When establishing and maintaining an OPA the following requirements apply:

Trees

- tree canopy cover should be less than 30%; and
- canopies should be separated by 2 to 5m.

Shrubs

- shrubs should not form a continuous canopy; and
- shrubs should form no more than 20% of ground cover.

Grass

- grass should be kept mown to a height of less than 100mm; and
- leaf and other debris should be removed.

An APZ should be maintained in perpetuity to ensure ongoing protection from the impact of bush fires. Maintenance of the IPA and OPA as described above should be undertaken regularly, particularly in advance of the bush fire season.