BUSHFIRE THREAT ASSESSMENT REPORT

Subject Property: Lot 1, 2 and 3 DP 29748 & Lot 4 Section 1 DP 31209, Tweed Coast Road and Cypress Crescent CABARITA
Client: Lance Hansen

Peter Thornton
BPAD – A Certified Practitioner
MFireSafeEng
BCA Check Pty Ltd

September 2009
Our Ref: 91940

1.0 EXECUTIVE SUMMARY

The following report has been prepared at the request of Lance Hansen to provide supporting information to enable the NSW Department of Planning and NSW Rural Fire Service to assess the proposal against the requirements of Planning for Bushfire Protection 2006 as directed by the Director Generals Environmental Assessment Requirements.

Although the application does not require a Bush Fire Safety Authority (s75U EP&A Act 1979) an assessment will be undertaken against the heads of consideration of clause 44 of the *Rural Fires Regulation* for format purposes and will demonstrate compliance with the Performance Criteria of Planning for Bushfire Protection 2006.

The following points highlight compliance with the exceptional circumstances of Section 3.3 of PBP2006 and the intent of Section 4.2.3 and Section 4.2.7 of Planning for Bushfire Protection 2006.

- The existing development will have a better bush fire risk outcome than if the development did not proceed as proposed, it being noted that the current unprotected domiciles are within 8m of the northern boundary.
- The construction methods recommended will demonstrate that the buildings will be provided with measures to reduce the risk of ignition and comply with the required asset protection zones pursuant to Table A2.6 of Planning for Bushfire Protection 2006.
- The building lines proposed are not closer to the hazard than neighbouring properties.
- Water supply will be compliant with Planning for Bushfire Protection 2006.
- Evacuation procedures and plans are to be prepared and submitted to the RFS for approval as a condition of the Bush Fire Safety Authority or approval.

The following recommendations are made to the Rural Fire Service to be included with the issue of a Bush Fire Safety Authority.

1. The building is to be constructed in accordance with Level 1 construction standards pursuant to AS 3959-1999 and garage door openings in accordance with s4.3.5 and Figure 4.9 of Planning for Bushfire Protection 2006.

2. Should a gas service be installed the following aspects will require consideration:

    - Reticulated or bottled gas installed and maintained in accordance with AS 1596 with metal piping used.

    - Fixed gas cylinders to be kept clear of flammable material by a distance of 10m and shielded on the hazard side of the installation

    - Gas cylinders close to the dwelling are to have the release valves directed away from the building and at least 2m from flammable material with connections to and from the gas cylinder being of metal.

- Polymer sheathed flexible gas supply lines to gas meters adjacent to the buildings are not used.

3. Landscaping is to be undertaken in accordance with A5.3 of Planning for Bushfire Protection 2006.

4. Vegetation management is to be undertaken in accordance with A5.4 of Planning for Bushfire Protection 2006.

5. Maintenance of the property is to be undertaken in accordance with A5.5 of Planning for Bushfire Protection 2006.

6. The design principles of s4.3.5 of Planning for Bushfire Protection 2006 are to be complied with.

7. A hydrant and hose reel system is to be provided in accordance with Part E of the Building Code of Australia. It is assumed that the system is compliant with 2419.1 and AS 2441 and in this regard it is recommended that certification be obtained from the Principal Certifying Authority.

8. An emergency evacuation procedure and detailed plans of all Emergency Assembly Areas (onsite and offsite) are to be prepared in accordance with the RFS Guidelines for the Preparation of Emergency/Evacuation Plan and AS 3745-2002. The emergency evacuation plan is to be submitted to the Rural Fire Service for approval prior to the occupation certificate being issued. The developer is to provide a copy of the above document to the local Bush Fire Management Committee and DECC for their information prior to the occupation of any accommodation of a SFPP.

9. Electrical supply is to be placed underground.

10. The entire property is to be an Inner Protection Areas monitored and management in accordance with the 'Standards for Asset Protection Zones' (RFS 2005) and Appendix 5 of PBP2006.

11. Units denoted 6, 7, 8, 14, 15 and 16 are capable of being used as Class 3 tourist facility use pursuant the Building Code of Australia provided they are located 25m from the north boundary.

2.0 INTRODUCTION

The site is classified by Planning for Bushfire Protection 2006 as an Infill Special Fire Protection Purpose (SFPP) given that the site has a current caravan park use and will require removal of structures to accommodate the proposed development.

Although the application does not require a Bush Fire Safety Authority (s75U EP&A Act 1979) an assessment will be undertaken against the heads of consideration of clause 44 of the *Rural Fires Regulation* for format purposes and will demonstrate compliance with the Performance Criteria of Planning for Bushfire Protection 2006.

The report has been prepared to address the requirements of clause 44 of the *Rural Fires Regulation* as highlighted below.

- description (including the address) of the property on which the development the subject of the application is to be carried out,
- classification of the vegetation on and surrounding the property (out to a distance of 140 metres from the boundaries of the property) in accordance with the system for classification of vegetation contained in *Planning for Bush Fire Protection*,
- an assessment of the slope of the land on and surrounding the property (out to a distance of 100 metres from the boundaries of the property),
- identification of any significant environmental features on the property,
- the details of any threatened species, population or ecological community identified under the *Threatened Species Conservation Act 1995* that is known to the applicant to exist on the property,
- the details and location of any Aboriginal relic (being a relic within the meaning of the *National Parks and Wildlife Act 1974*) or Aboriginal place (within the meaning of that Act) that is known to the applicant to be situated on the property,
- a bush fire assessment for the proposed development (including the methodology used in the assessment) that addresses the following matters:
- the extent to which the development is to provide for setbacks, including asset protection zones,
- the siting and adequacy of water supplies for fire fighting,
- the capacity of public roads in the vicinity to handle increased volumes of traffic in the event of a bush fire emergency,
- whether or not public roads in the vicinity that link with the fire trail network have two-way access,
- the adequacy of arrangements for access to and egress from the development site for the purposes of an emergency response,
- the adequacy of bush fire maintenance plans and fire emergency procedures for the development site,
- the construction standards to be used for building elements in the development,
- the adequacy of sprinkler systems and other fire protection measures to be incorporated into the development,

- an assessment of the extent to which the proposed development conforms with or deviates from the standards, specific objectives and performance criteria set out in Chapter 4 (Performance Based Controls) of *Planning for Bush Fire Protection*.

Section 4.2.5 of Planning for Bushfire Protection 2006 requires that SFPPs that are classified as infill development have *"an appropriate combination of bush fire protection measures and compliance with the intent and performance criteria of each measure within Section 4.3.5."* Section 4.2.5 acknowledges that in some existing circumstances the preferred standards are difficult to achieve and in these circumstances the specific objectives in Section 4.2.3 are to be followed.

The proposal is to comply with the asset protection zone requirements of Table 2.6 of Planning for Bushfire Protection 2006 by locating the units used for the tourist accommodation i.e. units 6, 7, 8, 14, 15 and 16 to meet these requirements. This is due to the intent of Section 3.2 which requires a target level not exceeding 10kW/m^2 to all sides of the building. The report will address the requirements of 'exceptional circumstances' to allow a major part of the asset protection zone to be located on crown land that is maintained by Department of Environment and Climate Change (DECC) and is specifically identified in the Cudgen Reserve Fire Management Strategy.

The specific objectives for the SFPP developments are to be complied with given the special characteristic and needs of the occupants. The design ensures that exits are located away from the hazard side of the building and emergency evacuation procedures are to be prepared for approval by the Rural Fire Service.

The recommendations within this report will detail compliance with Section 3.3, Section 4.2.7 and the aim and objectives of Planning for Bushfire Protection 2006 to reduce the risk of ignition to the buildings in a bushfire event. It is noted however that bushfire is a natural phenomenon and there can never be any guarantee that a building will not be adversely affect by bushfire especially given the exceptional circumstance relating to this site and use.

3.0 REPORT IDENTIFICATION

Report Ref No.: 91940

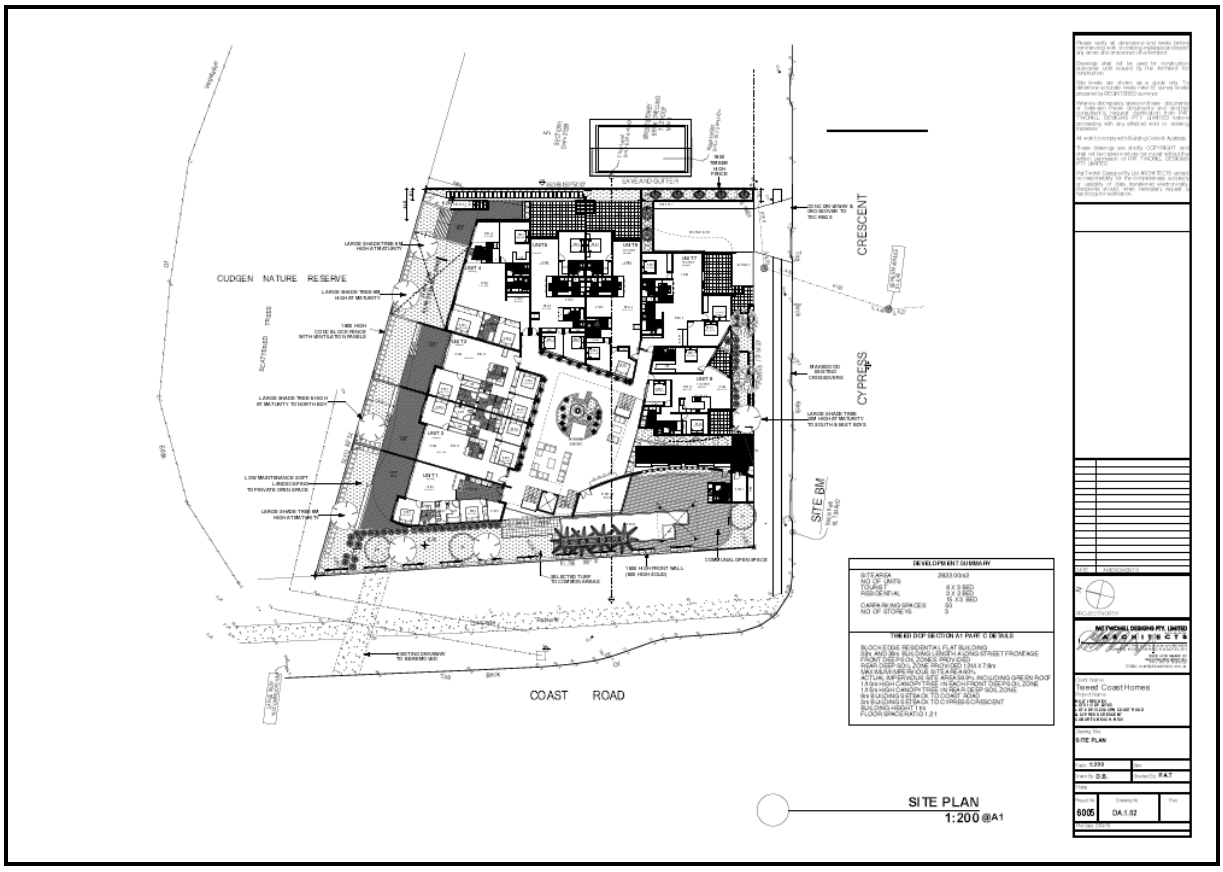
Property Address: Lot 1, 2 and 3 DP 29748 & Lot 4 Section 1 DP 31209, Tweed Coast Road and Cypress Crescent CABARITA

Local Government Area: Tweed Shire Council

Proposal: Proposed unit development consisting of a combination of permanent residential use and tourist accommodation.

Drawings prepared by: Pat Twohill Designs Pty Ltd Architects

Drawing ID: Pre DA 1.01 – 1.09 dated 21/4/09.


CUDGEN NATURE RESERVE
CRESCENT
CYPRESS
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SITE BM
SITE PLAN
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UNIT 1
UNIT 2
UNIT 3
UNIT 4
UNIT 5
UNIT 6
UNIT 7
UNIT 8
LEVEL ONE PLAN
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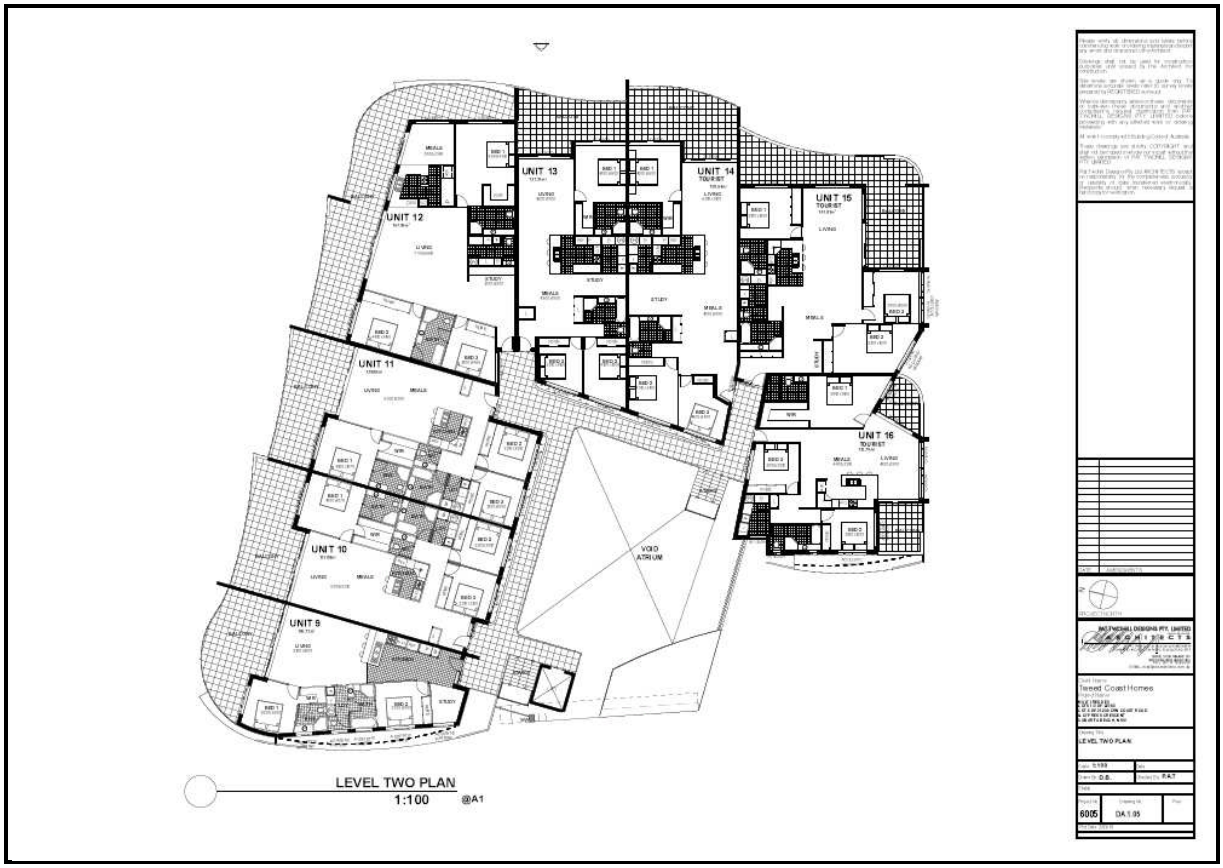


4.0 PROPOSED DEVELOPMENT

The proposed development is described in the Statement of Environmental Effects (SEE) prepared by Darryl Anderson Consulting Pty Ltd. The site currently has an approved caravan park use comprising 24 sites and an amenities block. The development proposed the demolition of the permanent structures to be replaced with a three storey, mixed use, multi dwelling housing and tourist accommodation consisting of 23 units and basement parking for 49 vehicles.

To ensure compliance with the acceptable solutions of Planning for Bushfire Protection 2006 having regard to the required width of asset protection zones for the Special Fire Protection Proposed unit numbers 6, 7, 8, 14, 15 and 16 are nominated as tourist accommodation.

5.0 DETERMINATION OF CATEGORY OF BUSHFIRE ATTACK

The primary hazard is located within Cudgen Reserve to the north of the subject site. The vegetation is identified as tall heath when assessed against the classifications provided in Planning for Bushfire Protection 2006.

Currently the Cudgen Reserve Fire Management Strategy administered by Department of Environment and Climate Change (DECC) identifies a 30m asset protection zone located on crown land adjacent to the northern boundary of the subject property. Recent discussions

with Josh Maden (DECC) established that although a 30m APZ is current DECC reserves the right to reduce this APZ in the future to a width of 20m.

Table 1

ASSESSMENT STEPS	RESPONSE
Step A – Vegetation distance, type and class	
Identify all of the vegetation in each direction of the site using figure A2.3 for a distance of 140m – consider both under storey and canopy	**East-** Residential development **South** – Residential development **North** – Tall Heath – Cudgen Reserve **West** – Residential development
Classify the vegetation groups as set out in PBP 2006 Table A2.1.	**Tall Heath**
Step B & C – distance between vegetation groups	
Determine the distance between each vegetation group and the development. **North**	**28m – Class 2 (residential)** **45m – Class 3 (tourist occupation)**
Step D – average slope of the ground for each vegetation group	
Determine the average slope of the ground for each vegetation group using the defined classes: **North**	**The vegetation is located on flat 0^0 ground**
Step E – determination of bushfire attack	
Consult PBP 2006 Table 2.6 & A3.4 to match vegetation distance and slope class to determine category of bushfire attack 1. apply highest category attack if more than one obtained 2. if the nearest vegetation is 100m or more away the level of bushfire attack is categorized as low	**Medium - Level 1 construction**

Aerial photograph showing the location of the existing caravan park in relation to the hazard.

6.0 ASSET PROTECTION ZONES

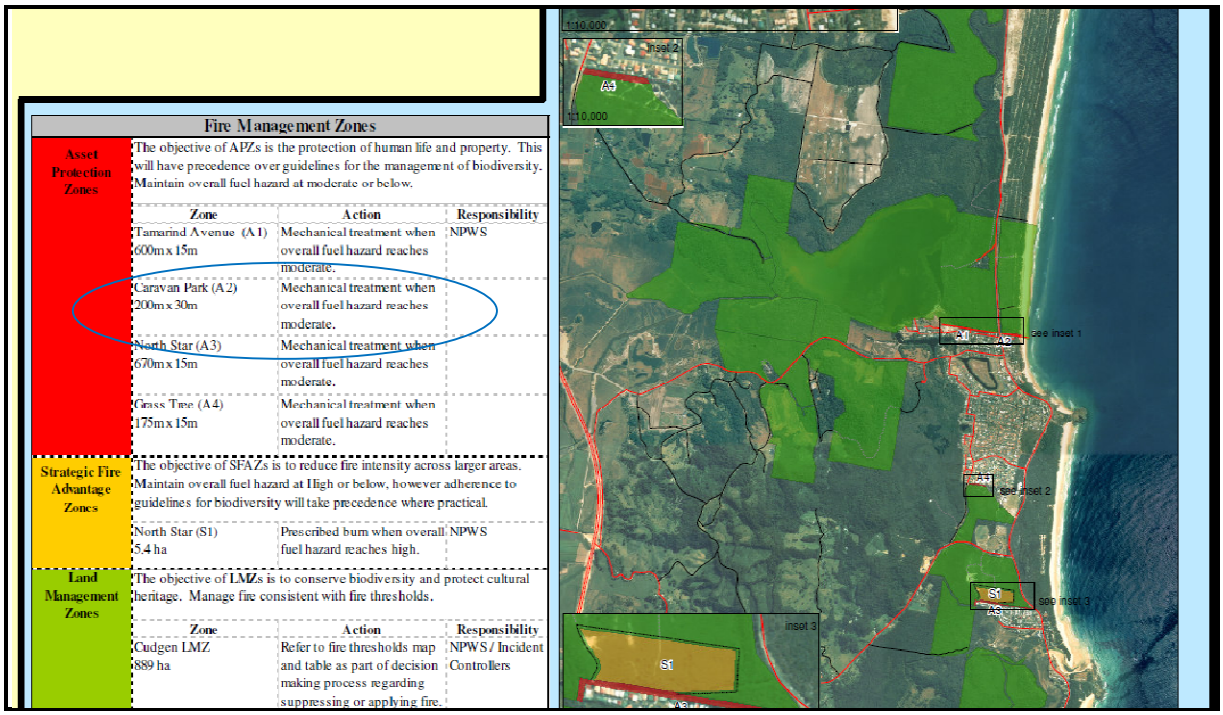
Performance Criteria	Acceptable Solutions	Comment
The intent may be achieved where:		
Radiant heat levels of greater than 10kW/m^2 will not be experienced by occupants or emergency services workers entering or exiting a building	An APZ is provided in accordance with the relevant tables and figures in Appendix 2 of PBP2006. Exits are located away from the hazard side of the building. The APZ is wholly within the boundaries of the development site. Exceptional circumstances may apply (see section 3.3)	Complies – 45m Class 3 and 28m Class 2 use. Complies Exceptional circumstances. Part of the APZ is provided in the Cudgen Fire Management Strategy.
Applicants demonstrate that issues relating to slope are addressed: maintenance is practical, soil stability is not compromised and the potential for crown fires is negated.	Mechanisms are in place to provide for the maintenance of the APZ over the life of the development. The APZ is not located on lands with a slope exceeding 18 degrees	Complies Complies

APZs are managed and maintained to prevent the spread of a fire towards the building.	In accordance with the requirements of 'Standards for Asset Protection Zones (RFS 2005). NB – a monitoring and fuel management program should be required as a condition of development consent	Complies – provided the appropriate condition is included in the approval for the entire property to be an Inner Protection Area.
Vegetation is managed to prevent flame contact and reduce radiant heat to buildings, minimise the potential for wind driven embers to cause ignition and reduce the effects of smoke on residents and fire fighters.	Compliance with Appendix 5 of PBP2006	Complies - provided the appropriate condition is included on the approval for fuel management and monitoring.

Asset Protection Zones are areas established and maintained to ensure that bushfire fuels are progressively reduced between the development and the bushfire hazard. The Asset Protection Zone incorporates an Inner Protection Area (IPA). The Inner Protection Area is located adjacent to the development and becomes an area with significantly reduced fuel loadings. These areas are to be monitored and management in accordance with the 'Standards for Asset Protection Zones' (RFS 2005) and Appendix 5 of PBP2006.

Current 30m APZ maintained as identified in the Cudgen Reserve Fire Management Strategy.

A minimum 20m of the asset protection zone is provided as part of the Cudgen Reserve Fire Management Strategy and in this regard 'Exceptional Circumstances' must be demonstrated in order to permit the use of this area.



Fire Management Zones

Asset Protection Zones	The objective of APZs is the protection of human life and property. This will have precedence over guidelines for the management of biodiversity. Maintain overall fuel hazard at moderate or below.		
	Zone	**Action**	**Responsibility**
	Tamarind Avenue (A1) 600m x 15m	Mechanical treatment when overall fuel hazard reaches moderate.	NPWS
	Caravan Park (A2) 200m x 30m	Mechanical treatment when overall fuel hazard reaches moderate.	
	North Star (A3) 670m x 15m	Mechanical treatment when overall fuel hazard reaches moderate.	
	Grass Tree (A4) 175m x 15m	Mechanical treatment when overall fuel hazard reaches moderate.	
Strategic Fire Advantage Zones	The objective of SFAZs is to reduce fire intensity across larger areas. Maintain overall fuel hazard at High or below, however adherence to guidelines for biodiversity will take precedence where practical.		
	North Star (S1) 5.4 ha	Prescribed burn when overall fuel hazard reaches high.	NPWS
Land Management Zones	The objective of LMZs is to conserve biodiversity and protect cultural heritage. Manage fire consistent with fire thresholds.		
	Zone	**Action**	**Responsibility**
	Cudgen LMZ 889 ha	Refer to fire thresholds map and table as part of decision making process regarding suppressing or applying fire.	NPWS / Incident Controllers

Cudgen Reserve Fire Management Strategy.

PRINCIPLES FOR EXCEPTIONAL CIRCUMSTANCES

In order to further demonstrate exceptional circumstances the following principles of s3.3 PBP2006 are considered.

"The existing form of development will obtain a better bush fire risk outcome than if the development did not proceed (e.g. through increased construction standards)"

As identified in s3.3 of Planning for Bushfire Protection 2006, it is not possible to be definitive about the full range of exceptional circumstances and in turn each development should be assessed on its own merits. In this regard it is considered that given the site has 24 current tourist facility sites that do not have any specific bushfire mitigation measures exception circumstance can be applied to ensure that a better outcome is achieved if the development proceeds in that the number of tourist sites is reduced and compliance with Planning for Bushfire Protection 2006 is achieved.

Structures currently adjacent to the northern boundary are potentially susceptible in a bushfire event.

The proposed tourist accommodation is located in the southern section of the proposed building and each unit is completely shielded from the hazard by the Class 2 residential units in the northern section. In turn negligible radiant heat flux would be received by the tourist units and the occupants or fire fighting personnel in access to or egress from the units.

The development will have emergency evacuation procedures, compliant APZ width and water supply with access provided between the hazard and the development by way of the managed area identified in the Cudgen Reserve Fire Management Strategy.

"The building line should be no closer to the hazard than neighbouring properties"
The proposed development is not closer to the hazard than adjoining properties it being noted that residential development to the northwest is closer to the hazard that the development proposed.

"The extensions should be no closer to the hazard than the existing building footprint"
The existing caravan sites are in close proximity to the northern boundary with the development proposing an 8m setback from the north boundary. In turn the development will be no closer that the existing footprint of the caravan sites.

"An upgrade of existing facilities may be required"
The new building will be fully compliant with the construction standards pursuant to Level 1 construction of AS 3959-1999.

"The proposal is an infill arrangement and site constraints do not allow APZ requirements to be met"

The asset protection zone required by Planning for Bushfire Protection 2006 will be met however the asset protection zone will be located partly within a 20m wide area on crown land adjacent to the northern boundary which is identified in the Cudgen Reserve Fire Management Strategy and is currently adequately maintained.

The proposal is considered an infill arrangement although it may be suggested that given all existing structures will be demolished that the development is not infill however the proposal holds the same intention. The positives created by the proposed development is a reduction of the impact of RFS resources in a bushfire event, significantly reducing the risk of ignition, reducing the potential number of occupants on the site, improving life safety over that currently approved and a Fire Safety Schedule being established as mechanism to enforce maintenance is considered to be meritorious.

7.0 ACCESS

Internal roads within the development are 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. The existing development is accessed by a sealed driveway on flat ground from the non-hazard (south) side of the property.

Access between the development and the bushfire hazard to the north currently exists and is used by DECC as access to maintain the 30m wide asset protection zone as identified in the Cudgen Reserve Fire Management Strategy.

Access is provided between the development and the bushfire hazard to the north

8.0 WATER, GAS AND ELECTRICITY

Adequate water supply is a critical requirement for fire-fighting purposes in the event of a bushfire. In rural areas not having a reticulated water supply, a dedicated static supply will be required in an appropriate location and with suitable fittings included.

A hydrant and hose reel system will be provided on site in accordance with Part E of the Building Code of Australia 2009. In this regard the Building Code of Australia will require the systems to be compliant with 2419.1 and AS 2441 and certification be obtained from the Principal Certifying Authority and included on the Fire Safety Schedule.

Electrical and gas supply can also have an impact in a bushfire event by increase the risk of ignition to a building and to personal safety during suppression or evacuation stages. Electrical supply is therefore to be placed underground.

Should a gas service be installed the following aspects will require consideration:

- Reticulated or bottled gas installed and maintained in accordance with AS 1596 with metal piping used.
- Fixed gas cylinders to be kept clear of flammable material by a distance of 10m and shielded on the hazard side of the installation
- Gas cylinders close to the building are to have the release valves directed away from the building and at least 2m from flammable material with connections to and from the gas cylinder being of metal.
- Polymer sheathed flexible gas supply lines to gas meters adjacent to the buildings are not used.

9.0 EMERGENCY AND EVACUATION PLANNING

Performance Criteria	Acceptable Solutions	Comment
The intent may be achieved where:		
An Emergency and Evacuation Management Plan is approved by the relevant fire authority for the area	An emergency/evacuation plan is prepared consistent with the RFS Guidelines for the Preparation of Emergency/Evacuation Plan. Compliance with AS 3745-2002 'Emergency control organization and procedures for buildings, structures and workplaces' for residential accommodation'.	To comply and included as a condition of approval for submission. To comply and included as a condition of approval for submission.

	NB: The developer should provide a copy of the above document to the local Bush Fire Management Committee for their information prior to the occupation of any accommodation of a SFPP.	
Suitable management arrangements are established for consultation and implementation of the emergency and evacuation plan	An Emergency Planning Committee is established to consult with residents (and their families in the case of aged care accommodation and schools) and staff in developing and implementing an Emergency Procedures Manual. Detailed plans of all Emergency Assembly Areas including "onsite" and "offsite" arrangements as stated in AS 3745-2002 are clearly displayed, and an annual (as a minimum) trial emergency evacuation is conducted.	This not relevant to the existing use. To comply and included as a condition of consent for submission.

Compliance with the acceptable solutions is capable of being achieved and in this regard an emergency evacuation procedure is to be prepared and submitted to the Rural Fire Service for approval.

An emergency evacuation procedure and detailed plans of all Emergency Assembly Areas (onsite and offsite) are to be prepared in accordance with the RFS Guidelines for the Preparation of Emergency/Evacuation Plan and AS 3745-2002. The emergency evacuation plan is to be submitted to the Rural Fire Service for approval prior to the occupation certificate being issued. The developer is to provide a copy of the above document to the local Bush Fire Management Committee and Department of Environmental Climate Change for their information prior to the occupation of any accommodation of a SFPP.

10. SPECIAL CONSIDERATIONS

This report does not comment on the following legislation and in this regard the report is to be assessed with the Statement Environmental Effect submitted with the development application.

- State Environmental Planning Policy No. 44 (Koala Habitat Protection).
- Threatened Species Conservation Act (1995).
- Environmental Protection and Biodiversity Conservation Act (1999).
- Rural Fires and Environmental Legislation Amendment Act 2002.
- National Parks and Wild Life Act, 1974 (Wildlife Atlas)

11. CONCLUSION

This report has addressed all matters required by clause 44 of the *Rural Fires Regulation* for an application for a Bush Fire Safety Authority or consideration of the bushfire threat. The report has established that:

- The proposed development satisfies the heads of consideration to be assessed with 'exceptional circumstances'
- The recommended future construction will reduce the risk of ignition to the building.
- The intent of Planning for Bushfire Protection is satisfied.

The following recommendations are made to the Rural Fire Service to be included with the issue of a Bush Fire Safety Authority.

1. The building is to be constructed in accordance with Level 1 construction standards pursuant to AS 3959-1999 and garage door openings in accordance with s4.3.5 and Figure 4.9 of Planning for Bushfire Protection 2006.

2. Should a gas service be installed the following aspects will require consideration:

    - Reticulated or bottled gas installed and maintained in accordance with AS 1596 with metal piping used.

    - Fixed gas cylinders to be kept clear of flammable material by a distance of 10m and shielded on the hazard side of the installation

    - Gas cylinders close to the dwelling are to have the release valves directed away from the building and at least 2m from flammable material with connections to and from the gas cylinder being of metal.

    - Polymer sheathed flexible gas supply lines to gas meters adjacent to the buildings are not used.

3. Landscaping is to be undertaken in accordance with A5.3 of Planning for Bushfire Protection 2006.

4. Vegetation management is to be undertaken in accordance with A5.4 of Planning for Bushfire Protection 2006.

5. Maintenance of the property is to be undertaken in accordance with A5.5 of Planning for Bushfire Protection 2006.

6. The design principles of s4.3.5 of Planning for Bushfire Protection 2006 are to be complied with.

7. A hydrant and hose reel system is to be provided in accordance with Part E of the Building Code of Australia. It is assumed that the system is compliant with 2419.1 and AS 2441 and in this regard it is recommended that certification be obtained from the Principal Certifying Authority.

8. An emergency evacuation procedure and detailed plans of all Emergency Assembly Areas (onsite and offsite) are to be prepared in accordance with the RFS Guidelines for the Preparation of Emergency/Evacuation Plan and AS 3745-2002. The emergency evacuation plan is to be submitted to the Rural Fire Service for approval prior to the occupation certificate being issued. The developer is to provide a copy of the above document to the local Bush Fire Management Committee and DECC for their information prior to the occupation of any accommodation of a SFPP.

9. Electrical supply is to be placed underground.

10. The entire property is to be an Inner Protection Areas monitored and management in accordance with the 'Standards for Asset Protection Zones' (RFS 2005) and Appendix 5 of PBP2006.

11. Units denoted 6, 7, 8, 14, 15 and 16 are capable of being used as Class 3 tourist facility use pursuant the Building Code of Australia provided they are located 25m from the north boundary.

References:

NSW Rural Fire Service and Planning NSW (2006), *Planning for bushfire protection, A guide for councils planners fire authorities developers and homeowners.* Rural Fire Service NSW Australia.

Standards Australia, (1999), AS3959 *Construction of buildings in bushfire prone areas,* Australian Standards, Sydney.

Legislation.

Environmental Planning and Assessment Act 1979 and Regulations 2000. *New South Wales.* Parliamentary Counsel's Office, NSW Government Information Service.

Rural Fires Act 1997. *New South Wales.* Parliamentary Counsel's Office, NSW Government Information Service.

Rural Fires Regulation. *New South Wales.* Parliamentary Counsel's Office, NSW Government Information Service.

Disclaimer

This report was prepared for the purposes and exclusive use of the stated client to accompany an application to the Department of Planning and referred to the Rural Fire Service for the specific application for development to the existing Special Fire Protection Purpose, and is not to be used for any other purpose or by any other person or Corporation. BCA Check Pty Ltd accepts no responsibility for any loss or damage suffered howsoever arising to any person or Corporation who may use or rely on this report in contravention of the terms of this clause.

Reporting has been based on the relevant Council and Rural Fire Service Guidelines, however, recommendations given in this report are based on our site investigation at the time of reporting. In some cases site conditions may change dramatically within a few years due to rapid vegetation re-growth and invading weed species.

APPENDIX A

Standards for Asset Protection Zones (RFS 2005)

standards

for asset protection zones

protection

NSW RURAL FIRE SERVICE

STANDARDS FOR ASSET PROTECTION ZONES

INTRODUCTION

For thousands of years bush fires have been a natural part of the Australian landscape. They are inevitable and essential, as many Australian plants and animals have adapted to fire as part of their life cycle.

In recent years developments in bushland areas have increased the risk of bush fires harming people and their homes and property. But landowners can significantly reduce the impact of bush fires on their property by identifying and minimising bush fire hazards. There are a number of ways to reduce the level of hazard to your property, but one of the most important is the creation and maintenance of an Asset Protection Zone (APZ).

A well located and maintained APZ should be used in conjunction with other preparations such as good property maintenance, appropriate building materials and developing a family action plan.

WHAT IS AN ASSET PROTECTION ZONE?

An Asset Protection Zone (APZ) is a fuel reduced area surrounding a built asset or structure. This can include any residential building or major building such as farm and machinery sheds, or industrial, commercial or heritage buildings.

An APZ provides:

- a buffer zone between a bush fire hazard and an asset;
- an area of reduced bush fire fuel that allows suppression of fire;
- an area from which backburning may 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.

Potential bush fire fuels should be minimised within an APZ. This is so that the vegetation within the planned zone does not provide a path for the transfer of fire to the asset either from the ground level or through the tree canopy.

WHAT WILL THE APZ DO?

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

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

WHERE SHOULD I PUT AN APZ?

An APZ is located between an asset and a bush fire hazard.

The APZ should be located wholly within your land. You cannot undertake any clearing of vegetation on a neighbour's property, including National Park estate, Crown land or land under the management of your local council, unless you have written approval.

If you believe that the land adjacent to your property is a bush fire hazard and should be part of an APZ, you can have the matter investigated by contacting the NSW Rural Fire Service (RFS).

There are six steps to creating and maintaining an APZ. These are:

1. Determine if an APZ is required;
2. Determine what approvals are required for constructing your APZ;
3. Determine the APZ width required;
4. Determine what hazard reduction method is required to reduce bush fire fuel in your APZ;
5. Take measures to prevent soil erosion in your APZ; and
6. Landscape and regularly monitor in your APZ for fuel regrowth.

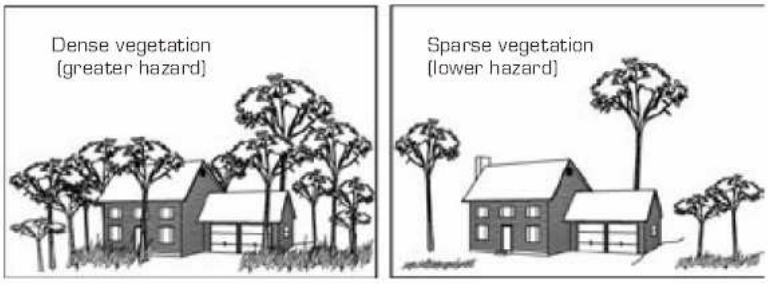
STEP 1. DETERMINE IF AN APZ IS REQUIRED

Recognising that a bush fire hazard exists is the first step in developing an APZ for your property.

If you have vegetation close to your asset and you live in a bush fire prone or high risk area, you should consider creating and maintaining an APZ.

Generally, the more flammable and dense the vegetation, the greater the hazard will be. However, the hazard potential is also influenced by factors such as slope.

- A large area of continuous vegetation on sloping land may increase the potential bush fire hazard.
- The amount of vegetation around a house will influence the intensity and severity of a bush fire.
- The higher the available fuel the more intense a fire will be.



Isolated areas of vegetation are generally not a bush fire hazard, as they are not large enough to produce fire of an intensity that will threaten dwellings.

This includes:

- bushland areas of less than one hectare that are isolated from large bushland areas; and
- narrow strips of vegetation along road and river corridors.

If you are not sure if there is a bush fire hazard in or around your property, contact your local NSW Rural Fire Service Fire Control Centre or your local council for advice.

STEP 2. DETERMINE WHAT APPROVALS ARE REQUIRED FOR CONSTRUCTING YOUR APZ

If you intend to undertake bush fire hazard reduction works to create or maintain an APZ you must gain the written consent of the landowner.

Subdivided land or construction of a new dwelling
If you are constructing an APZ for a new dwelling you will need to comply with the requirements in *Planning for Bushfire Protection*. Any approvals required will have to be obtained as part of the Development Application process.

Existing asset
If you wish to create or maintain an APZ for an existing structure you may need to obtain an environmental approval. The RFS offers a free environmental assessment and certificate issuing service for essential hazard reduction works. For more information see the RFS document *Application Instructions for a Bush Fire Hazard Reduction Certificate* or contact your local RFS Fire Control Centre to determine if you can use this approval process.

Bear in mind that all work undertaken must be consistent with any existing land management agreements (e.g. a conservation agreement, or property vegetation plan) entered into by the property owner.

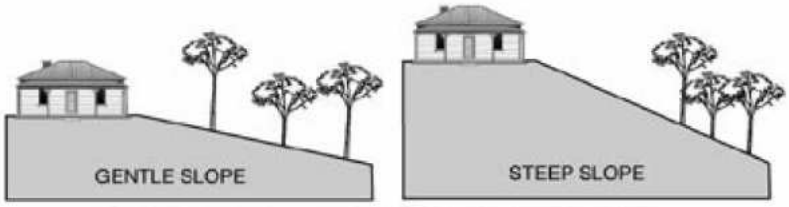
If your current development consent provides for an APZ, you do not need further approvals for works that are consistent with this consent.

If you intend to burn off to reduce fuel levels on your property you may also need to obtain a Fire Permit through the RFS or NSW Fire Brigades. See the RFS document *Before You Light That Fire* for an explanation of when a permit is required.

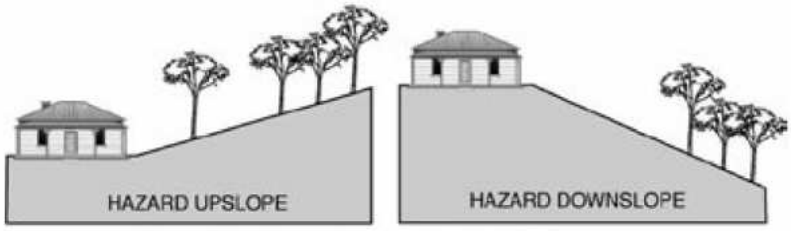
STEP 3. DETERMINE THE APZ WIDTH

The size of the APZ required around your asset depends on the nature of the asset, the slope of the area, the type and structure of nearby vegetation and whether the vegetation is managed.

Fires burn faster uphill than downhill, so the APZ will need to be larger if the hazard is downslope of the asset.



Gentle slopes require a smaller APZ distance than steep slopes



A hazard downslope will require a greater APZ distance then a hazard upslope of the asset

Different types of vegetation (for example, forests, rainforests, woodlands, grasslands) behave differently during a bush fire. For example, a forest with shrubby understorey is likely to result in a higher intensity fire than a woodland with a grassy understorey and would therefore require a greater APZ width.

A key benefit of an APZ is that it reduces radiant heat and the potential for direct flame contact on homes and other buildings. Residential dwellings require a wider APZ than sheds or stockyards because the dwelling is more likely to be used as a refuge during bush fire.

Subdivided land or construction of a new dwelling
If you are constructing a new asset, the principles of *Planning for Bushfire Protection* should be applied. Your Development Application approval will detail the exact APZ distance required.

Existing asset
If you wish to create an APZ around an existing asset and you require environmental approval, the Bush Fire Environmental Assessment Code provides a streamlined assessment process. Your Bush Fire Hazard Reduction Certificate (or alternate environmental approval) will specify the maximum APZ width allowed.

For further information on APZ widths see *Planning for Bushfire Protection* or the *Bush Fire Environmental Assessment Code* (available on the RFS website), or contact your local RFS Fire Control Centre.

STEP 4. DETERMINE WHAT HAZARD REDUCTION METHOD IS REQUIRED TO REDUCE BUSH FIRE FUEL IN YOUR APZ

The intensity of bush fires can be greatly reduced where there is little to no available fuel for burning. In order to control bush fire fuels you can reduce, remove or change the state of the fuel through several means.

Reduction of fuel does not require removal of all vegetation, which would cause environmental damage. Also, trees and plants can provide you with some bush fire protection from strong winds, intense heat and flying embers (by filtering embers) and changing wind patterns. Some ground cover is also needed to prevent soil erosion.

Fuels can be controlled by:

1. raking or manual removal of fine fuels
Ground fuels such as fallen leaves, twigs (less than 6 mm in diameter) and bark should be removed on a regular basis. This is fuel that burns quickly and increases the intensity of a fire.

Fine fuels can be removed by hand or with tools such as rakes, hoes and shovels.

2. mowing or grazing of grass
Grass needs to be kept short and, where possible, green.

3. removal or pruning of trees, shrubs and understorey
The control of existing vegetation involves both selective fuel reduction (removal, thinning and pruning) and the retention of vegetation.

Prune or remove trees so that you do not have a continuous tree canopy leading from the hazard to the asset. Separate tree crowns by two to five metres. A canopy should not overhang within two to five metres of a dwelling.

Native trees and shrubs should be retained as clumps or islands and should maintain a covering of no more than 20% of the area.

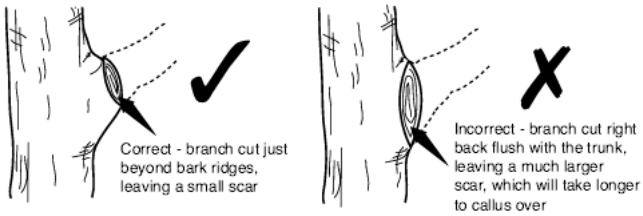
When choosing plants for removal, the following basic rules should be followed:

1. Remove noxious and environmental weeds first. Your local council can provide you with a list of environmental weeds or 'undesirable species'. Alternatively, a list of noxious weeds can be obtained at **www.agric.nsw.gov.au/noxweed/;**
2. Remove more flammable species such as those with rough, flaky or stringy bark; and
3. Remove or thin understorey plants, trees and shrubs less than three metres in height

The removal of significant native species should be avoided.

Prune in acordance with the following standards:

- Use sharp tools. These will enable clean cuts and will minimise damage to the tree.
- Decide which branches are to be removed before commencing work. Ensure that you maintain a balanced, natural distribution of foliage and branches.
- Remove only what is necessary.
- Cut branches just beyond bark ridges, leaving a small scar.
- Remove smaller branches and deadwood first.



There are three primary methods of pruning trees in APZs:

1. Crown lifting (skirting)
Remove the lowest branches (up to two metres from the ground). Crown lifting may inhibit the transfer of fire between the ground fuel and the tree canopy.

2. Thinning
Remove smaller secondary branches whilst retaining the main structural branches of the tree. Thinning may minimise the intensity of a fire.

3. Selective pruning
Remove branches that are specifically identified as creating a bush fire hazard (such as those overhanging assets or those which create a continuous tree canopy). Selective pruning can be used to prevent direct flame contact between trees and assets.

Your Bush Fire Hazard Reduction Certificate or local council may restrict the amount or method of pruning allowed in your APZ.

See the *Australian Standard 4373 (Pruning of Amenity Trees)* for more information on tree pruning.

4. Slashing and trittering
Slashing and trittering are economical methods of fuel reduction for large APZs that have good access. However, these methods may leave large amounts of slashed fuels (grass clippings etc) which, when dry, may become a fire hazard. For slashing or trittering to be effective, the cut material must be removed or allowed to decompose well before summer starts.

If clippings are removed, dispose of them in a green waste bin if available or compost on site (dumping clippings in the bush is illegal and it increases the bush fire hazard on your or your neighbour's property).

Although slashing and trittering are effective in inhibiting the growth of weeds, it is preferable that weeds are completely removed.

Care must be taken not to leave sharp stakes and stumps that may be a safety hazard.

5. Ploughing and grading
Ploughing and grading can produce effective firebreaks. However, in areas where this method is applied, frequent maintenance may be required to minimise the potential for erosion. Loose soil from ploughed or graded ground may erode in steep areas, particularly where there is high rainfall and strong winds.

6. Burning (hazard reduction burning)
Hazard reduction burning is a method of removing ground litter and fine fuels by fire. Hazard reduction burning of vegetation is often used by land management agencies for broad area bush fire control, or to provide a fuel reduced buffer around urban areas.

Any hazard reduction burning, including pile burns, must be planned carefully and carried out with extreme caution under correct weather conditions. Otherwise there is a real danger that the fire will become out of control. More bush fires result from escaped burning off work than from any other single cause.

It is YOUR responsibility to contain any fire lit on your property. If the fire escapes your property boundaries you may be liable for the damage it causes.

Hazard reduction burns must therefore be carefully planned to ensure that they are safe, controlled, effective and environmentally sound. There are many factors that need to be considered in a burn plan. These include smoke control, scorch height, frequency of burning and cut off points (or control lines) for the fire. For further information see the RFS document *Standards for Low Intensity Bush Fire Hazard Reduction Burning*, or contact your local RFS for advice.

7. Burning (pile burning)
In some cases, where fuel removal is impractical due to the terrain, or where material cannot be disposed of by the normal garbage collection or composted on site, you may use pile burning to dispose of material that has been removed in creating or maintaining an APZ.

For further information on pile burning, see the RFS document *Standards for Pile Burning*.

In areas where smoke regulations control burning in the open, you will need to obtain a Bush Fire Hazard Reduction Certificate or written approval from Council for burning. During the bush fire danger period a Fire Permit will also be required. See the RFS document *Before You Light that Fire* for further details.

STEP 5. TAKE MEASURES TO PREVENT SOIL EROSION

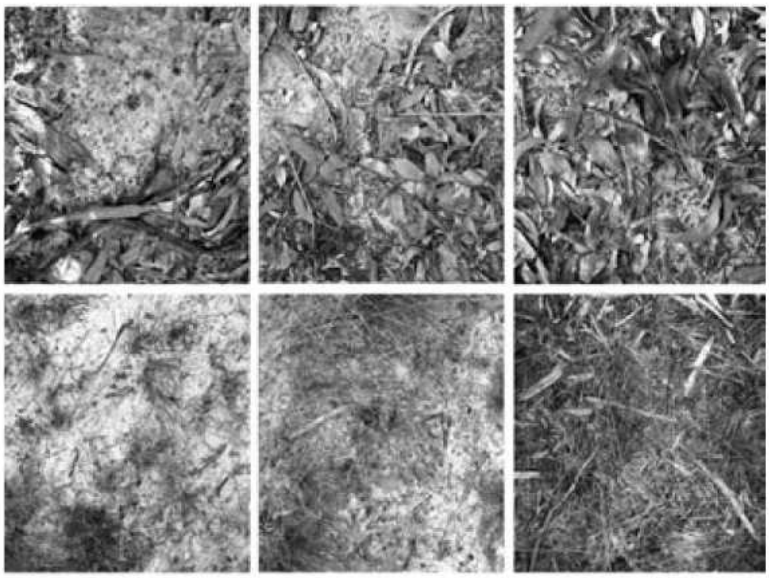
While the removal of fuel is necessary to reduce a bush fire hazard, you also need to consider soil stability, particularly on sloping areas.

Soil erosion can greatly reduce the quality of your land through:

- loss of top soil, nutrients, vegetation and seeds
- reduced soil structure, stability and quality
- blocking and polluting water courses and drainage lines

A small amount of ground cover can greatly improve soil stability and does not constitute a significant bush fire hazard. Ground cover includes any material which directly covers the soil surface such as vegetation, twigs, leaf litter, clippings or rocks. A permanent ground cover should be established (for example, short grass). This will provide an area that is easy to maintain and prevent soil erosion.

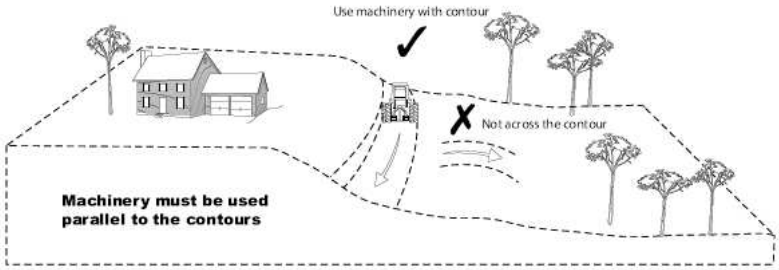
When using mechanical hazard reduction methods, you should retain a ground cover of at least 75% to prevent soil erosion. However, if your area is particularly susceptible to soil erosion, your Hazard Reduction Certificate may require that 90% ground cover be retained.



50% **75%** **100%**

Ground Cover

To reduce the incidence of soil erosion caused by the use of heavy machinery such as ploughs, dozers and graders, machinery must be used parallel to the contours. Vegetation should be allowed to regenerate, but be managed to maintain a low fuel load.

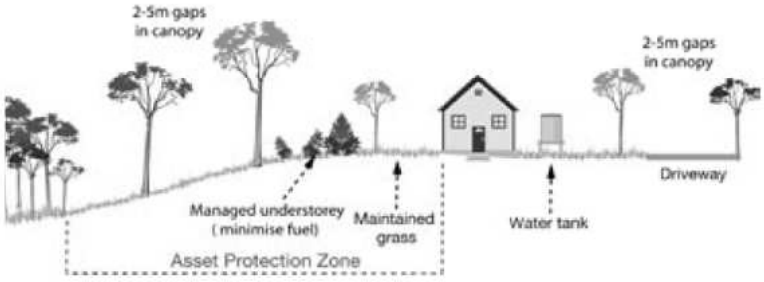


STEP 6. ONGOING MANAGEMENT AND LANDSCAPING

Your home and garden can blend with the natural environment and be landscaped to minimise the impact of fire at the same time. To provide an effective APZ, you need to plan the layout of your garden to include features such as fire resistant plants, radiant heat barriers and windbreaks.

Layout of gardens in an APZ
When creating and maintaining a garden that is part of an APZ you should:

- ensure that vegetation does not provide a continuous path to the house;
- remove all noxious and environmental weeds;
- plant or clear vegetation into clumps rather than continuous rows;
- prune low branches two metres from the ground to prevent a ground fire from spreading into trees;
- locate vegetation far enough away from the asset so that plants will not ignite the asset by direct flame contact or radiant heat emission;
- plant and maintain short green grass around the house as this will slow the fire and reduce fire intensity. Alternatively, provide non-flammable pathways directly around the dwelling;
- ensure that shrubs and other plants do not directly abut the dwelling. Where this does occur, gardens should contain low-flammability plants and non flammable ground cover such as pebbles and crush tile; and
- avoid erecting brush type fencing and planting "pencil pine" type trees next to buildings, as these are highly flammable.



Removal of other materials
Woodpiles, wooden sheds, combustible material, storage areas, large quantities of garden mulch, stacked flammable building materials etc. should be located away from the house. These items should preferably be located in a designated cleared location with no direct contact with bush fire hazard vegetation.

Other protective features
You can also take advantage of existing or proposed protective features such as fire trails, gravel paths, rows of trees, dams, creeks, swimming pools, tennis courts and vegetable gardens as part of the property's APZ.

PLANTS FOR BUSH FIRE PRONE GARDENS

When designing your garden it is important to consider the type of plant species and their flammability as well as their placement and arrangement.

Given the right conditions, all plants will burn. However, some plants are less flammable than others.

Trees with loose, fibrous or stringy bark should be avoided. These trees can easily ignite and encourage the ground fire to spread up to, and then through, the crown of the trees.

Plants that are less flammable, have the following features:

- high moisture content
- high levels of salt
- low volatile oil content of leaves
- smooth barks without "ribbons" hanging from branches or trunks; and
- dense crown and elevated branches.

When choosing less flammable plants, be sure not to introduce noxious or environmental weed species into your garden that can cause greater long-term environmental damage.

For further information on appropriate plant species for your locality, contact your local council, plant nurseries or plant society.

If you require information on how to care for fire damaged trees, refer to the Firewise brochure *Trees and Fire Resistance; Regeneration and care of fire damaged trees.*

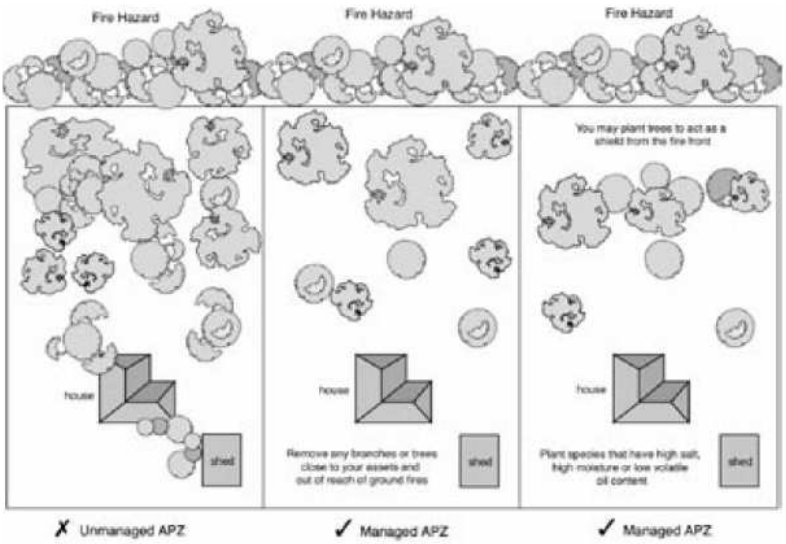
WIND BREAKS

Rows of trees can provide a wind break to trap embers and flying debris that could otherwise reach the house or asset.

You need to be aware of local wind conditions associated with bush fires and position the wind break accordingly. Your local RFS Fire Control Centre can provide you with further advice.

When choosing trees and shrubs, make sure you seek advice as to their maximum height. Their height may vary depending on location of planting and local conditions. As a general rule, plant trees at the same distance away from the asset as their maximum height.

When creating a wind break, remember that the object is to slow the wind and to catch embers rather than trying to block the wind. In trying to block the wind, turbulence is created on both sides of the wind break making fire behaviour erratic.



HOW CAN I FIND OUT MORE?

The following documents are available from your local Fire Control Centre and from the NSW RFS website at **www.rfs.nsw.gov.au.**

- Before You Light That Fire
- Standards for Low Intensity Bush Fire Hazard Reduction Burning
- Standards for Pile Burning
- Application Instructions for a Bush Fire Hazard Reduction Certificate

If you require any further information please contact:

- your local NSW Rural Fire Service Fire Control Centre. Location details are available on the RFS website or
- call the NSW RFS Enquiry Line 1800 679 737 (Monday to Friday, 9am to 5pm), or
- the NSW RFS website at **www.rfs.nsw.gov.au.**

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