

BUSHFIRE RISK ASSESSMENT - RESPONSE TO CLAUSE 13.02-1S – 5, 20, 25 AND 30 ORMOND ST, BANNOCKBURN

REF: 2021-280

12 May 2022

South Coast Bushfire Consultants

SCBC DRAFT CLAUSE 13.02-1S

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Version Control

	Name	Date Completed	Comments
Report Version	Kylie Steel	02/12/21	Version 1
		12/05/22	Version 2
Field Assessment	Kylie Steel	02/12/21	
Report	Kylie Steel	02/12/21	
Mapping	Kylie Steel	02/12/21	

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Requirements detailed in this document do not guarantee survival of the buildings or the occupants. The client is strongly encouraged to develop and practice a bushfire survival plan.

Information and assistance including a template for a Bushfire Survival Plan is provided as part of the 'Fire Ready Kit' available through the CFA website at <http://www.cfa.vic.gov.au> or through your local CFA Regional office.

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DEFINITIONS, ABBREVIATIONS AND ACRONYMS

AS 3959-2018	Australian Standard AS 3959 -2018 Construction of buildings in bushfire-prone areas
CFA	Country Fire Authority
Clause	A clause is a provision in the planning scheme
Clause 44.06	Bushfire Management Overlay
Clause 53.02	Planning for Bushfire
Clause 13.02	Environmental Risk – Bushfire
DELWP	Department of Environment, Land, Water and Planning
BAL	Bushfire Attack Level
BPA	Bushfire Prone Area
BMO	Bushfire Management Overlay
BMS	Bushfire Management Statement
Method 1	refers to methodology in AS 3959-2018 for determining a BAL with a number of predetermined inputs
Method 2	refers to methodology in AS 3959-2018 for determining a site specific BAL
Pathway 1	refers to an application pathway in Clause 53.02 of the planning scheme
Pathway 2	refers to an application pathway in Clause 53.02 of the planning scheme
Planning Practice Note	a guide for using various sections of the planning scheme prepared by DELWP
RA	Responsible Authority
SCBC	South Coast Bushfire Consultants
Total Fire Ban Day	is declared by CFA on days when fires are likely to spread rapidly and could be difficult to control

Bushfire Risk Assessment - Response to Clause 13.02-1S – 5, 20, 25 and 30 Ormond St, Bannockburn

1. EXECUTIVE SUMMARY

This report has been prepared to accompany a planning permit application at 5, 20, 25 and 30 Ormond St, Bannockburn (referred to as 'the site' in this report). The proposal seeks to re-zone and subdivide the site for residential lots.

The site is within a Bushfire Prone Area (BPA) of the state and as such all development needs to demonstrate that it meets the objective of *Clause 13.02-1S Bushfire Planning*. The objective of *Clause 13.02-1S* is 'to strengthen the resilience of settlements and communities to bushfire through risk-based planning that prioritises the protection of human life'.

The proposed development is not within the Bushfire Management Overlay (BMO).

The site within the township boundary of

The development site is surrounded by grassland hazards to the west and south. These hazards can be mitigated through ensuring appropriate setback through subdivision design.

East of the development is Bruce Creek that supports small narrow areas of unmanaged vegetation.

Clause 13.02-1S requires a subdivision (settlement development) to enable setbacks to ensure future residential development is not exposed to radiant heat loads greater than $12.5\text{kW}/\text{m}^2$. This is achieved through the management of defendable space, perimeter roads and staging the subdivision.

A BAL-Low can be achieved where development has a 50m setback from grassland hazards. A BAL-Low can be achieved within internal areas of the subdivision.

A staged development of the site at proposed development can mitigate the bushfire hazards and provide adequate separation from the surrounding hazards, meeting the life safety objectives detailed in Clause 13.02-1S with appropriate subdivision design.

2. SUMMARY

The following details the proposed development, the assessment methodology and the proposed bushfire mitigation measures.

Application	To rezone and subdivide land at 5, 20, 25 and 30 Ormond St, Bannockburn for a residential subdivision.
Construction Standard	The National Construction Code (NCC) requires all dwellings within the Bushfire Prone Area (BPA) to be constructed in accordance with AS 3959-2018.
Bushfire Landscape Risk	The broader landscape shows the dominant hazard in the surrounding landscape is grassland vegetation.
Assumptions	<p>In undertaking the assessment, the following assumptions have been made:</p> <ol style="list-style-type: none"> 1. It is assumed that all vegetation within the street scape and open space areas will be managed to a low threat condition in accordance with AS 3959-2018 (see appendix 11.1). 2. The <i>Bannockburn Urban Design Framework Overall Principles Plan</i> shows a perimeter access road to the south of the development, and it shows the surrounding land to the south and east as 'Future Low Density Residential Development'. For the purposes of this assessment it is determined that this development will occur at some time in the future. 3. A distance of 39m of defendable space is proposed to the west along Bruce Creek. This defendable space distance will reduce the radiant heat exposure to a BAL of 12.5 based on the creek line vegetation remaining as a scrub fuel load.
Staging	<ol style="list-style-type: none"> 1. It is proposed that that development will occur in stages. The land within 50m of the southern boundary and eastern boundary (abutting the farmland) must not be developed until the grassland is adequately mitigated. This could be achieved by undertaking the one of the following options: <ol style="list-style-type: none"> A. Future development includes a perimeter road to the township to the south and the east. In the interim the land to the south and east must manage the 50m buffer to a low threat condition. B. A steel fence with steel uprights and supports is installed along the southern and eastern perimeters of the subdivision to mitigate the grassland hazards. This will be appropriate where the development in the growth areas to the south and east area being undertaken.
Perimeter Roads	<ol style="list-style-type: none"> 1. There are perimeter roads to the north and west that provide access and egress. 2. There is a road reserve to the east between the proposed development and the farmland to the east. It is proposed that this road reserve would be developed as a road or managed to a low threat condition.

	<p>3. A perimeter road to the south has not been proposed as part of this subdivision. The land to the south is included in the South West Growth Precinct and it is likely this land will be developed in the future and a formalized township boundary road will be part of this development. In the interim a number of grassfire mitigation measures are proposed that include staging, management of buffers and a steel perimeter fence to the south and east.</p>
<p>Bushfire Site Assessment (Bushfire Attack Level) BAL</p>	<p>The development can meet setbacks for a BAL of 12.5 in accordance with AS 3959-2021.</p> <p>The setbacks require the following:</p> <ol style="list-style-type: none"> 1. The western interface has the separation of Harvey Road. Development will need to ensure a 19m setback from the grassland hazards. The setback can include Harvey Road. 2. North of the site is the high-density residential area and setbacks are not required. 3. The section to the east of the site adjoining Bruce Creek requires a 39m setback around the creek interface. 4. A section to the east adjoining the road reserve and grassland must manage defendable space or a distance of 22m. The road reserve would be managed as part of this development and it has a width of 20m. A dwelling setback of 2m will then achieve the 22m setback. 5. South of the site is farmland that supports grassland. A setback of 19m is required within the property boundary to achieve a BAL of 12.5. Based on a precautionary measure and to be compliant with Clause 13.02-1S it is proposed that the subdivision is undertaken in stages and no development will occur within 50m of the southern boundary until such time as a perimeter road is established in future development to the south (as per the Bannockburn Growth Plan May 2021).
<p>Protection of Human Life</p>	<p>The site can meet the objectives of Clause 13.02-1S relating to the protection of human life. Ensuring no development is exposed to radiant heat loads greater than 12.5kW/m² and that central areas within the subdivision ensure areas considered a BAL of Low.</p> <p>The proposed development is adjoining the existing residential areas of Bannockburn.</p>
<p>Vegetation Management within the site</p>	<p>It is recommended that all landscaping within the site is managed as 'low threat vegetation' in accordance with AS 3959-2018 (see Appendix 11.1 for definition).</p>
<p>Access</p>	<p>In accordance with the CFA recommendations the following access requirements can be met:</p> <ul style="list-style-type: none"> • Roads must be constructed to a standard so that they are accessible in all weather conditions and capable of accommodating a vehicle of 15 tonnes for the trafficable road width. • The average grade must be no more than 1 in 7 (14.4%) (8.1 degrees) with a maximum of no more than 1 in 5 (20%) (11.3 degrees) for no more than 50 meters. Dips must have no more than a 1 in 8 (12%) (7.1 degree) entry and exit angle.

	<ul style="list-style-type: none"> • Curves must have a minimum inner radius of 10 metres. Have a minimum trafficable width of 3.5 metres and be clear of encroachments for at least 0.5 metres on each side and 4 metres above the access way. • Roads more than 60m in length from the nearest intersection must have a turning circle with a minimum radius of 8m (including roll-over kerbs if they are provided) T or Y heads of dimensions specified by CFA may be used as alternatives.
Hydrant	<p>In accordance with the CFA the site must have Hydrants installed within the site that meet the following requirements:</p> <ul style="list-style-type: none"> • Above or below ground operable hydrants must be provided. The maximum distance between these hydrants and the rear of all building envelopes (or in the absence of building envelopes, the rear of the lots) must be 90 metres and the hydrants must be no more than 120 metres apart. These distances must be measured around lot boundaries. • The hydrants must be identified with marker posts and road reflectors as applicable to the satisfaction of the Country Fire Authority.

3. SCOPE OF THE REPORT

This assessment has been prepared to demonstrate that the proposed development has regard for the surrounding bushfire hazards. The associated legislative requirements affecting the site have been identified and address.

The report considers how the proposed subdivision can demonstrate compliance with the objectives of Clause 13.02-1S.

4. METHODOLOGY

The methodology used to prepare a holistic approach to assessing and mitigation the bushfire risk to the development includes the following:

- Legislative Controls Affecting the Development
- Bushfire Hazard Landscape Assessment
- Bushfire Hazard Site Assessment
- A Bushfire Attack Level (BAL) Assessment
- Vegetation Management within the site
- Response to Clause 13.02-1S

5. LEGISLATIVE CONTROLS AFFECTING THE DEVELOPMENT

The site is affected by planning, building and legislative controls.

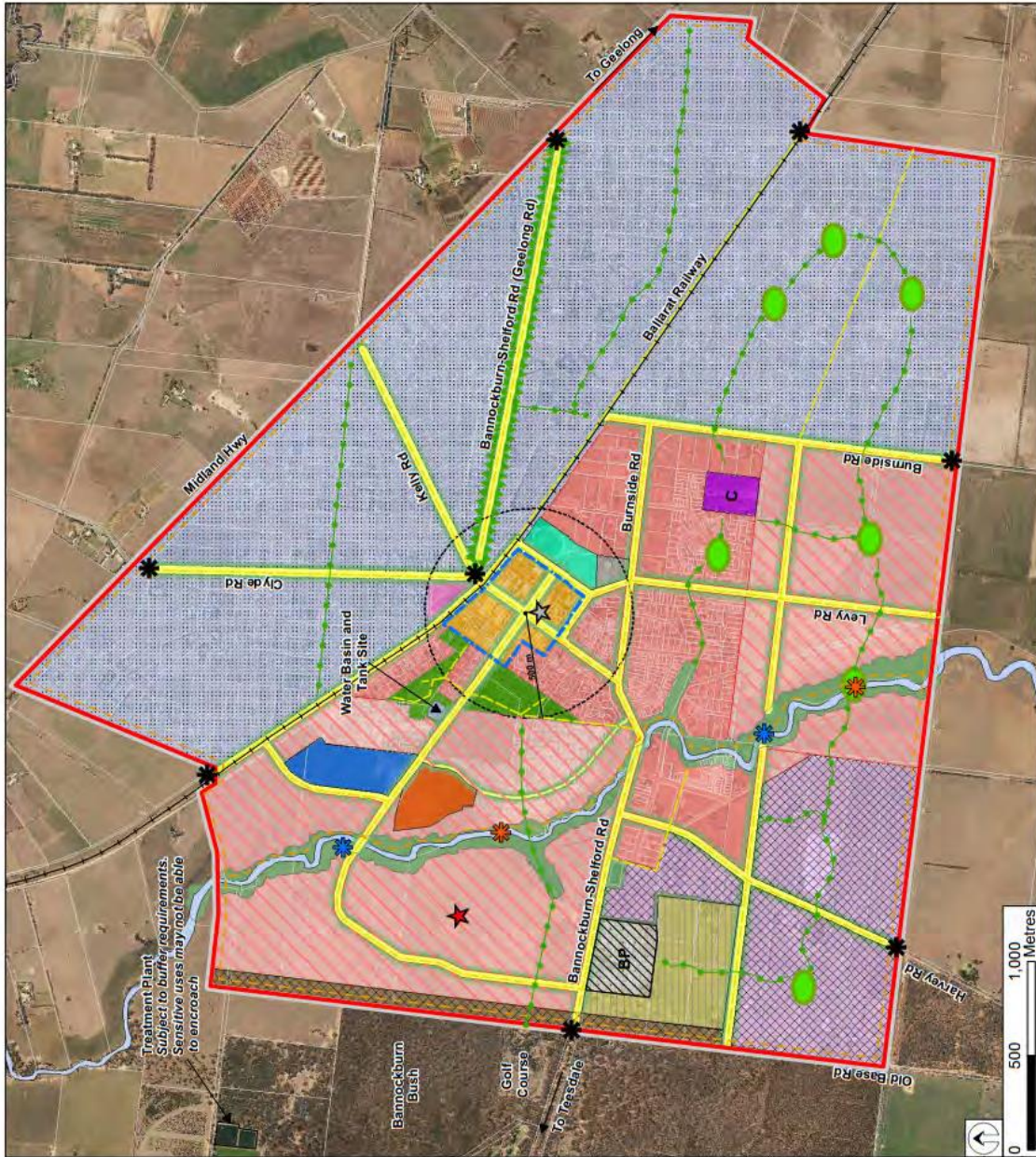
5.1 Planning controls

Table 1 – Planning Clauses affecting the site

Clause Number	Name	Detail
State Planning Policy Framework		
13.02-1S	Bushfire planning	<p><i>Objective - To strengthen the resilience of settlements and communities to bushfire through risk-based planning that prioritises the protection of human life.</i></p> <p><i>This policy must be applied to all planning and decision making relating to land which is:</i></p> <ul style="list-style-type: none"> • <i>Within a designated bushfire prone area;</i> • <i>Subject to a Bushfire Management Overlay; or</i> • <i>Proposed to be used or developed in a way that may create a bushfire hazard.</i> <p><i>The subject site is within a designated Bushfire Prone Area and therefore the policy applies.</i></p>
Planning Zone:		
	Farming Zone	To implement the Municipal Planning Strategy and the Planning Policy Framework. To provide for the use of land for agriculture. To encourage the retention of productive agricultural land. To ensure that non-agricultural uses, including dwellings, do not adversely affect the use of land for agriculture. To encourage the retention of employment and population to support rural communities. To encourage use and development of land based on comprehensive and sustainable land management practices and infrastructure provision.
Planning Overlays:		
Applies only to 25 Ormond St, Bannockburn	Environmental Significance Overlay – Schedule 2	To implement the Municipal Planning Strategy and the Planning Policy Framework. To identify areas where the development of land may be affected by environmental constraints. To ensure that development is compatible with identified environmental values.
Applies only to 25 Ormond St, Bannockburn	Land Subject to Inundation Overlay	To implement the Municipal Planning Strategy and the Planning Policy Framework. To identify flood prone land in a riverine or coastal area affected by the 1 in 100 (1 per cent Annual Exceedance

		<p>Probability) year flood or any other area determined by the floodplain management authority. To ensure that development maintains the free passage and temporary storage of floodwaters, minimises flood damage, responds to the flood hazard and local drainage conditions and will not cause any significant rise in flood level or flow velocity. To minimise the potential flood risk to life, health and safety associated with development. To reflect a declaration under Division 4 of Part 10 of the Water Act, 1989. To protect water quality and waterways as natural resources by managing urban stormwater, protecting water supply catchment areas, and managing saline discharges to minimise the risks to the environmental quality of water and groundwater. To ensure that development maintains or improves river, marine, coastal and wetland health, waterway protection and floodplain health.</p>
<p>Local Planning Policy Framework – Golden Plains Shire Council Planning Scheme</p>		
<p>11.03-6L</p>	<p>Bannockburn Strategy</p>	<p><i>Settlement Strategies:</i></p> <ul style="list-style-type: none"> • <i>Avoid out of sequence residential subdivision and development.</i> • <i>Maintain a fire buffer area at the urban growth boundary of Bannockburn.</i> • <i>Avoid commercial development that is separated from the defined town centre.</i> • <i>Develop Milton Street to provide a future road link across Bruce’s Creek to serve future residential areas to the west of Bannockburn.</i> • <i>Support medium density housing within a general 500 metre radius of the Bannockburn Town Centre.</i>

Bannockburn Urban Design Framework Overall Principles Plan

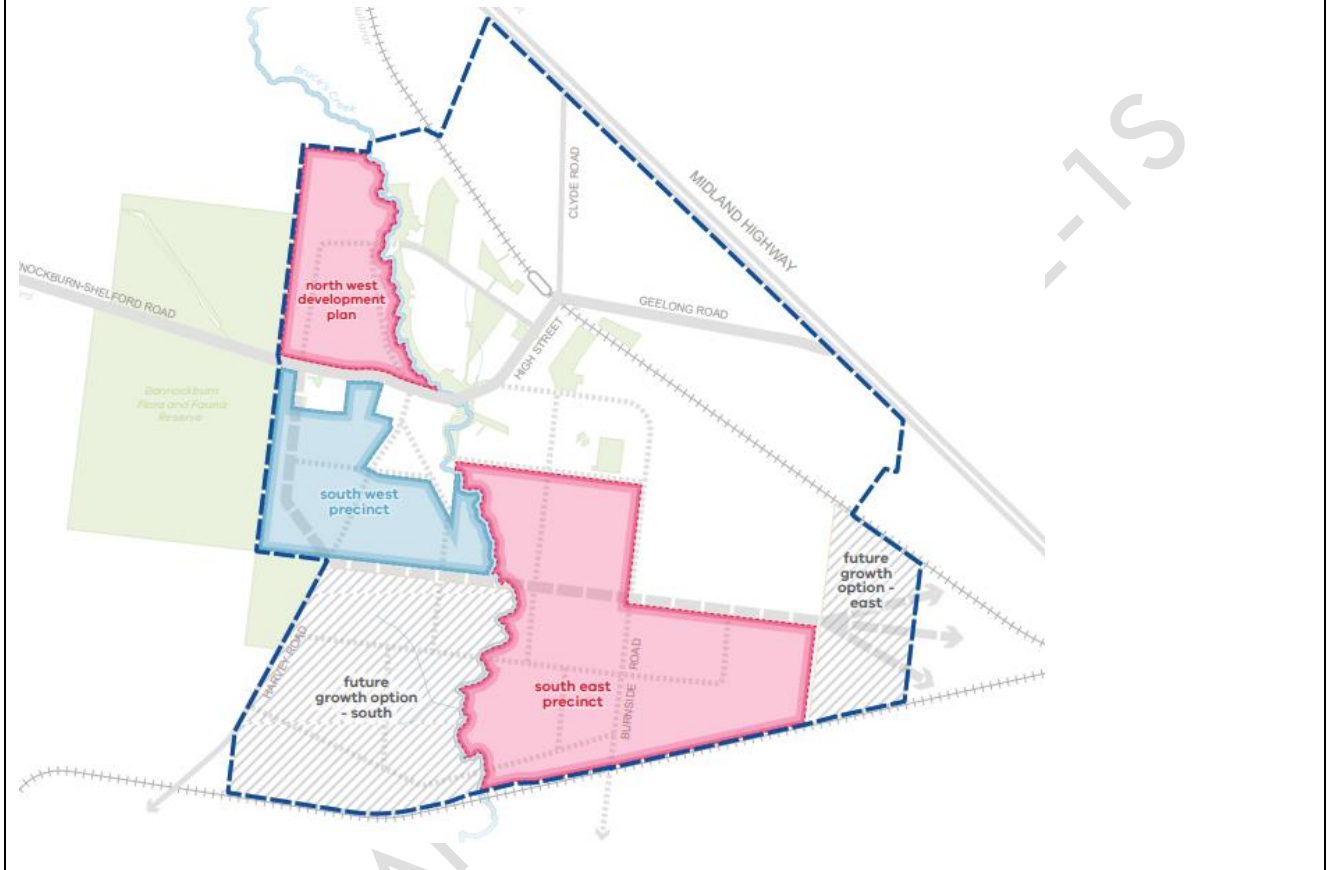


Bannockburn Urban Design Framework
Figure 2: Overall Principles

Bannockburn Growth Plan – May 2021

The Bannockburn Growth Plan (May 2021) was prepared by the Victorian Planning Authority in partnership with Golden Plains Shire Council to guide the sustainable development of Bannockburn to the year 2050.

The proposed development is within the proposed growth boundary and adjoined by the south west precinct (shown in blue) and the south east precinct (shown in pink).



5.2 Building Controls

All building work must comply with the Building Act 1993, Building Regulations 2006 and the National Construction Code (the NCC) unless specifically exempted.

The development site is within the Bushfire Prone Area of the state and as such construction is required to address bushfire risk.

The NCC is a performance-based document and it sets out the minimum criteria which defines how buildings must perform to meet the objectives and functional statements. The NCC calls upon the *Australian Standard AS 3959–2018 Construction of Buildings in Bushfire Prone Areas* for Class 1, 2 and 3 buildings and associated Class 10a (e.g. deck) building works.

Section 3.7.4 of the BCA – Acceptable Construction, Part 3.7.4 Bushfire Prone Areas calls upon AS 3959-2018, if all the criteria in Method 1 or 2 of this document are met a building is deemed to satisfy the requirements of the VCC.

The Standard AS 3959-2018 specifies the requirements for the construction of buildings in bushfire prone areas in order to improve their resistance to bushfire attack from burning embers, radiant heat, flame contact and combinations of the three attack forms.

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6. BUSHFIRE HAZARD IDENTIFICATION AND ASSESSMENT

The landscape assessment is important to consider as it defines the context of site assessment. The Bushfire Hazard Landscape Assessment has identified risks in the surrounding landscape and has considered the assessment of bushfire hazards on the basis of:

- Landscape conditions – meaning conditions in the landscape up to 75 kilometers from a site;
- Local conditions – meaning conditions in the area within approximately 1 km of a site;
- Neighbourhood conditions – meaning conditions in the area within 400m of a site; and
- The site for the development.

6.1 Vegetation in the Surrounding Landscape

The development site is located to the southwest of the of the existing township area of Bannockburn. The site will be bordered by residential development to the north and in some areas to the east.

West and south of the site are areas of open grassland used for a variety of farming practices. The grasslands extend for significant distances.

East of the site is the Bruce Creek which supports a narrow band of shrubs and some scattered trees.

The township of Bannockburn is surrounded by grassland to all aspects and a grassland fire is the only form of landscape bushfire that would impact the township.

The Bannockburn Nature Reserve is located to the west of the existing township and is over 1 km from the proposed development.

Long fire runs through grassland are unlikely due to the extent of the surrounding residential and agricultural development.

6.2 Mitigating Features within the surrounding landscape

There are a number of features within the surrounding landscape that would aid in the suppression of a landscape grassfire, including:

1. The Midland Highway to the east.
2. Residential development to the north.
3. Intensive Agriculture to the south.
4. Low density residential properties to the west.

6.3 Potential Fire Behavior

Bushfire behavior is influenced by three key factors; climate, topography and fuel availability. The landscape surrounding the site is dominated by grassland fuel loads and the topography of the landscape is undulating.

Table 3 – Bushfire attack mechanisms and appropriate inputs for models.

	Standard Assessment Inputs and Considerations	Risk Based Assessment Inputs and Considerations
Consideration of all bushfire mechanisms:	<p>The AS 3959-2018 methodology assumes that distance to classification determines the radiant heat exposure and associated BAL. The BAL determines the construction standard. The higher the BAL the greater a developments resilience to bushfire.</p> <p>AS 3959-2018 does not have any regard for convective heat or bushfire induced winds.</p>	<p>Consider and assess each bushfire attack mechanism independently considering the unique specifics of the site. The bushfire attack mechanisms to be assessed include:</p> <ul style="list-style-type: none"> ● Radiant Heat Exposure ● Convective Heat Exposure ● Ember Attack ● Bushfire Induced Winds.
Analysis of the bushfire model inputs:	<p>Forest Fire Danger Index (FFDI)</p> <p>The FFDI is used nationally as a measure for fire weather. It uses the drought factor (seasonal dryness), relative humidity, temperature and wind speed to establish the fire weather severity.</p> <p>The BMO and AS 3959-2018 assumes an FFDI of 100.</p>	<p>The assessment has assumed an FFDI of 100 as it is the state based assumption.</p>
	<p>Flame Temperature</p> <p>The BMO and AS 3959-2018 assumes a flame temperature of 1090K.</p>	<p>Use the state-based assumption.</p>
	<p>Fuel Loads</p> <p>In AS 3959-2018 assumes fuel loads within grasslands.</p>	<p>The assumed fuel loads within AS 3959-2018 for grassland are deemed appropriate.</p>

Table 4 – Bushfire Attack Mechanisms

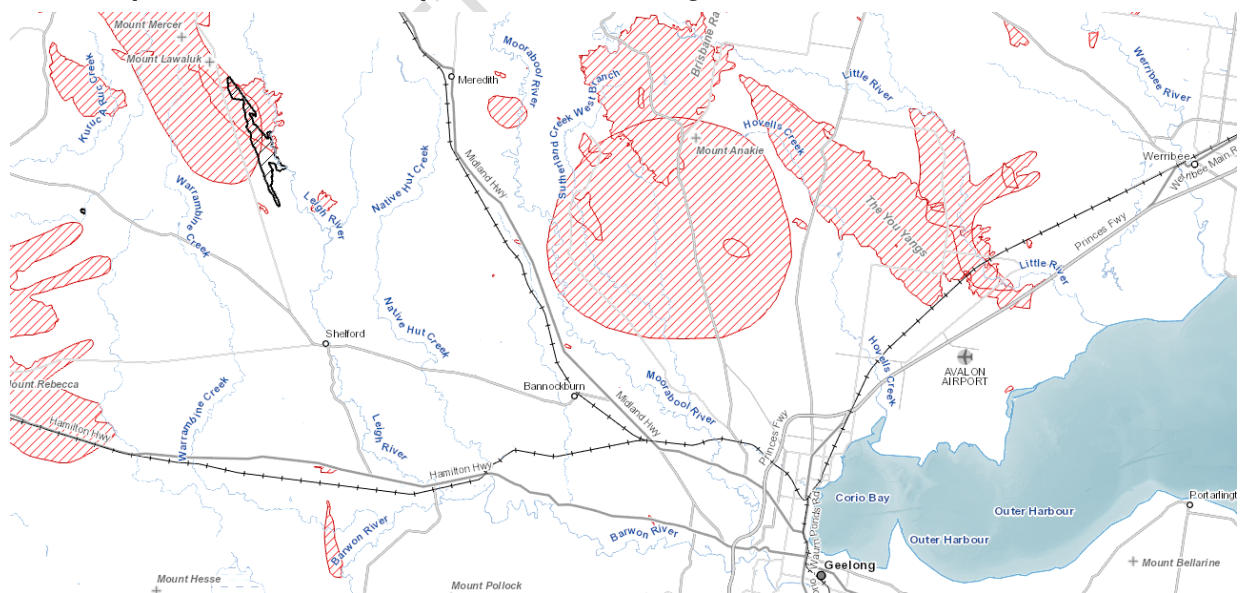
Attack Mechanism	Sites Risk and Response
Radiant Heat Exposure	<p>Low exposure to radiant heat as the site is able to meet a BAL of Low and BAL of 12. due to the low threat vegetation within the surrounding landscape.</p> <p>All construction will be in accordance with a BAL of 12.5 to mitigate the impacts of low radiant heat exposures.</p>
Convective Heat Exposure	The site will not be affected by convective heat as the topography surrounding the site is largely flat.
Ember Attack	Ember attack will be limited due to the lack of eucalypt species within the surrounding landscape.
Bushfire Induced Winds	Bushfire induced winds are not expected to be extreme in this location due to the benign topography of the surrounding landscape.

6.4 Bushfire History of the Area

The map below (Map 3) sourced from NatureKit shows bushfires within the surrounding landscape since 1970. This map shows a historical fire in the surrounding landscape.

The map shows historical grassfires around Lara and the You Yangs. The map also shows a number of historical fires to the west.

6.4.1 Map 1 – Bushfire History of the surrounding area



6.5 Map 2 – Bushfire Hazard Landscape Assessment



The broader landscape shows the dominant hazard in the surrounding landscape is grassland vegetation. The Bannockburn nature reserve and golf course is located approximately 1km to the west of the proposed development.

6.6 Map 3 - Bushfire Hazard Site Assessment – 1km Assessment Zone



The 1km assessment zone shows the extent of development in the surrounding landscape. The proposed development site is surrounded by grassland hazards, low density residential development to the south and west and high density residential development to the north and north east.

6.7 Map 4 – Bushfire Hazard Site Assessment – 400m Assessment Zone



The 400m assessment zone shows the established development to the north, east and west.

6.8 Map 5 – Bushfire Attack Level (BAL) Assessment – 100m Assessment Zone



The 100m assessment zone shows the proposed development and the hazards within 100m of the perimeter of the site that dictate the BAL assessment.

7. BUSHFIRE HAZARD SITE ASSESSMENT

The Bushfire Hazard Site Assessment includes a plan that describes the bushfire hazard within 150 meters of proposed development. The description of the hazard is prepared in accordance with AS 3959-2018 Construction of buildings in bushfire prone areas (Standards Australia) excluding paragraph (a) of section 2.2.3.2 (Vegetation Exclusions).

7.1 Site Details

Address:	2, 20, 25 and 30 Ormond Road, Bannockburn
Parcel	The property has 4 Parcels: <ol style="list-style-type: none">1. Allotment 12 Sec. 22B Township of South Bannockburn.2. Allotment 11 Sec. 22B Township of South Bannockburn.3. Allotment 10 Sec. 22B Township of South Bannockburn.4. Lot 1 TP174543
Municipality:	Golden Plains
BMO Schedule:	N/A
Melways Reference:	Melway 488 A9

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7.2 Vegetation


The vegetation within the 100 metre assessment area was classified according to method 1 in AS 3959-2018 for the purposes of this assessment.

The method 1 assessment in AS 3959-2018 uses a generalised description of vegetation based on the AUSLIG (Australian Natural Resources Atlas: No.7 Native Vegetation) classification system. According to this method, vegetation can be classified into seven categories. Each category indicates a particular type of fire behavior and these categories or classifications are then used to determine bushfire intensity.

Table 6 – Vegetation Assessment

Vegetation Classification	Vegetation Type (AS 3959-2018 Description)	Site Description
<p>Grassland</p>	<p><u>Open Woodland/Low Open Woodland/Open Shrubland/Low Open Shrubland/Hummock Grassland/Closed Tussock Grassland/Tussock Grassland/Open Tussock/Sparse Open Tussock/Dense Sown Pasture/Sown Pasture/Open Herbfield/Spare Open Herbfield:</u> All forms (except tussock, moorlands), including situations with shrubs and trees, if the overstorey foliage cover is less than 10%. Includes pasture and cropland.</p>	<p>The surrounding landscape is dominated by grazed grasslands. The grasslands have a mixed use including grazing and cropping.</p>

		<p>Figure 1 –Grassland along Bruce Creek.</p> 
<p>Scrub</p>	<p><u>Closed Scrub:</u> Found in wet areas and / or areas affected by poor soil fertility or shallow soils; >30% foliage cover. Dry heaths occur in rocky areas. Shrubs >2m high. Typical of coastal wetlands and tall heaths up to 6m in height. May be dominated by Banksia, Melaleuca or Leptospermum with heights of up to 6m.</p> <p><u>Open Scrub:</u> Shrubs greater than 2m high; 10%-30% foliage cover with a mixed species composition.</p>	<p>The vegetation within the 100m assessment area to the west along Bruce Creek is classified as scrub. There are trees located further to the north and south, however, this area of Bruce Creek is dominated by grassland and scrub.</p> <p>The creek line is a narrow band of vegetation that meanders along the creek line.</p>

		<p>Figure 2 – Scrub along Bruce Creek.</p> 
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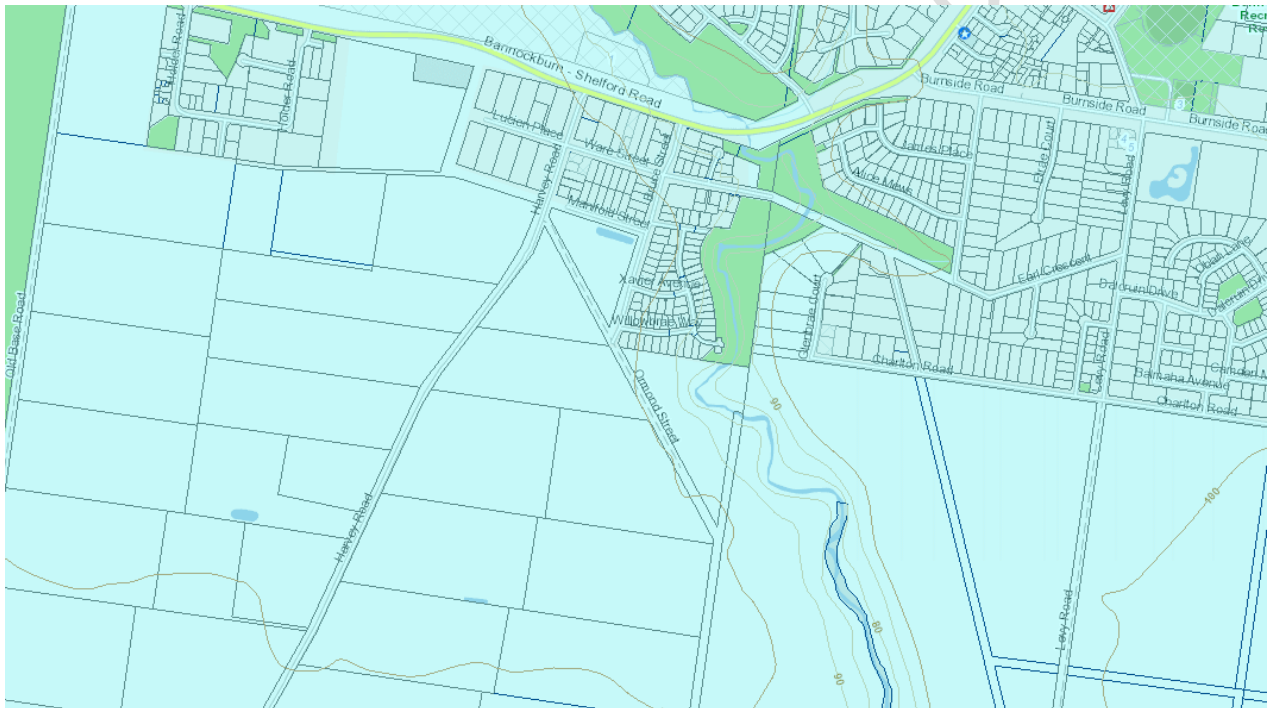
7.3 Topography

Topography of the land surrounding a site is particularly important as the topography influences the rate of spread and intensity of a fire. Fire burns faster uphill, as the slope increases so does the speed of the fire and its intensity. As a general rule for every increase 10° up a slope, the fire will double its speed and conversely down a slope. Fires tend to move more slowly as the slope decreases.

The topography of the surrounding landscape is largely flat with small depressions into dams and a deep depression along Bruce Creek as can be seen in Figure 1 and 2.

Grassland fires are predominantly influenced by wind speed and the cured (dryness) nature of the grassland rather than topography.

Map 6 – Topography of the site.



7.4 Bushfire Attack Level (BAL) for the proposed developments

The bushfire attack level (BAL) is a means of measuring the severity of a building's potential exposure to ember attack, radiant heat and direct flame contact, using increments of radiant heat expressed in kilowatts per meter squared, and the basis for establishing the requirements for construction to improve protection of building elements from attack by bushfire.

The BAL for this site has been calculated to assess the radiant heat exposure to the site. The BAL inputs include a 'Forest Fire Danger Index' (FFDI) of 100 and a Flame Temperature of 1090K.

The minimum construction standard in a Bushfire Prone Area is a BAL of 12.5 from AS 3959-2018.

The BAL assessment assumes that vegetation within the site will be managed to a low threat condition in accordance with AS 3959-2018. The definition of low threat vegetation is detailed in Appendix 1 of this document.

Table 7 – BAL for the development.

Orientation	Highest threat vegetation	Slope under classifiable vegetation	Distance to the unmanaged bushfire hazard.	Bushfire Attack Level (BAL)
North	Low-Threat	Flat	>100m	BAL - Low
East	Scrub	Downslope 10-15°	39m	BAL - 12.5
East	Grassland	Downslope 0-5°	22m	BAL - 12.5
South	Grassland	Flat	19m	BAL - 12.5
West	Grassland	Flat	19m	BAL - 12.5

8. BUSHFIRE MANAGEMENT PLAN

Bushfire Management Plan – 5, 20, 25 & 30 Ormond Road, Bannockburn (Prepared By SCBC – 12/05/22)



Access Requirements

- Roads must be constructed to a standard so that they are accessible in all weather conditions and capable of accommodating a vehicle of 15 tonnes for the trafficable road width.
- The average grade must be no more than 1 in 7 (14.4%) (8.1 degrees) with a maximum of no more than 1 in 5 (20%) (11.3 degrees) for no more than 50 meters. Dips must have no more than a 1 in 8 (12%) (7.1 degree) entry and exit angle.
- Curves must have a minimum inner radius of 10 metres. Have a minimum trafficable width of 3.5 metres and be clear of encroachments for at least 0.5 metres on each side and 4 metres above the access way.
- Roads more than 60m in length from the nearest intersection must have a turning circle with a minimum radius of 8m (including roll-over kerbs if they are provided) T or Y heads of dimensions specified by CFA may be used as alternatives.

Construction Standards

All future construction works will comply with a **BAL 12.5** compliant with AS 3959-2018.

Defendable space will be managed for the following distances:

- North – Property Boundary
- East – 39m (around the Bruce Creek)
- East – 22m (to the farmland and existing road reserve)
- South – 19m
- West – 19m (can include Harvey Street and Ormond Road in the defendable space).

Vegetation Management requirements within the street scape and the open space areas of the subdivision include:

- Grass must be short cropped and maintained during the declared fire danger period.
- All leaves and vegetation debris must be removed at regular intervals during the declared fire danger period.
- Within 10 metres of a building, flammable objects must not be located close to the vulnerable parts of the building.
- Plants greater than 10 centimetres in height must not be placed within 3 metres of a window or glass feature of the building.
- Shrubs must not be located under the canopy of trees.
- Individual and clumps of shrubs must not exceed 5 square metres in area and must be separated by at least 5 metres.
- Trees must not overhang or touch any elements of the building.
- The canopy of trees must be separated by at least 5 metres.
- There must be a clearance of at least 2 metres between the lowest tree branches and ground level.

Hydrant Requirements

Above or below ground operable hydrants must be provided. The maximum distance between these hydrants and the rear of all building envelopes (or in the absence of building envelopes, the rear of the lots) must be 90 metres and the hydrants must be no more than 120 metres apart. These distances must be measured around lot boundaries.

The hydrants must be identified with marker posts and road reflectors as applicable to the satisfaction of the Country Fire Authority.

9. RESPONSE TO CLAUSE 13.02 – BUSHFIRE PLANNING

9.1 Policy Application

Clause 13.02 must be applied to all planning and decision making under the Planning and Environment Act 1987 relating to land that is:

- Within a designated bushfire prone area,
- Subject to a Bushfire Management Overlay, or
- Proposed to be used or developed in a way that may create a bushfire hazard.

9.2 Objective

To strengthen the resilience of settlements and communities to bushfire through risk-based planning that prioritises the protection of human life.

9.3 Strategies: Protection of human life

Give priority to the protection of human life by:

Strategy	Consideration
Prioritising the protection of human life over all other policy considerations.	<p>There are no conflicting policy considerations identified during the assessment of this development.</p> <p>The site is not in a landscape at a high risk from bushfire and the site can provide areas exposed to low levels of radiant heat.</p>
Directing population growth and development to low risk locations and ensuring the availability of, and safe access to, areas where human life can be better protected from the effects of bushfire.	<p>The development site is identified in the Bannockburn Urban Design Framework as being a location for 'Consolidated Residential Development' and for 'Priority Residential Development Zone'.</p> <p>The proposed development can adequately mitigate the surrounding hazards to protect human life. Central areas of the subdivision will be exposed to a BAL Low.</p>
Reducing the vulnerability of communities to bushfire through the consideration of bushfire risk in decision making at all stages of the planning process.	<p>The bushfire risk of the proposed site is being considered at the permit stage.</p> <p>The development of this site will reduce the grassland hazards western interface of the existing township.</p> <p>The site is on the edge of a number of future growth zones including the north west development plan, the south west precinct and the south east precinct.</p>

9.4 Strategies: Bushfire Hazard Identification and Assessment

Identify bushfire hazard and undertake appropriate risk assessment by:

Strategy	Consideration
Applying the best available science to identify vegetation, topographic and climatic conditions that create a bushfire hazard	The best available science has been applied to this application.
Considering the best available information about bushfire hazard including the map of designated bushfire prone areas prepared under the Building Act 1993 or regulations made under that Act	The site is within the Bushfire Prone Area of the state.
Applying the Bushfire Management Overlay in planning schemes to areas where the extent of vegetation can create an extreme bushfire hazard	The BMO is not applied to the site.
<p>Considering and assessing the bushfire hazard on the basis of:</p> <ul style="list-style-type: none"> • Landscape conditions – meaning conditions in the landscape within 20 km (and potentially up to 75km) of a site. • Local conditions – meaning conditions in the area within approximately 1km of a site. • Neighbourhood conditions – meaning conditions in the area within 400m of a site. • The site for the development. 	Section 5, 6 and 7 of this report address the landscape, local and neighborhood conditions.
Consulting with emergency management agencies and the relevant fire authority early in the process to receive their recommendations and implement appropriate bushfire protection measures.	<p>Emergency services have provided an Response to Version 1 of this report.</p> <p>This Version (2) provides some enhanced mitigation measures to the area's of concern raised by the CFA.</p> <p>Emergency services would have been consulted in the development of the <i>Bannockburn Urban Design Framework Overall Principles Plan</i>.</p>
Ensuring that strategic planning documents, planning scheme amendments, planning permit applications and development plan approvals properly assess bushfire risk and include	The application includes appropriate bushfire protection measures, including: staging of the subdivision to mitigate the grassland impacts from the south and east, proposed perimeter fencing as n interim mitigation measure whilst the growth areas to

<p>appropriate bushfire protection measures.</p>	<p>the south and east are under development, vegetation management within the subdivision in the public open space areas and road reserves, access and egress for emergency services and hydrant requirements.</p>
<p>Not approving development where a landowner or proponent has not satisfactorily demonstrated that the relevant policies have been addressed, performance measures satisfied or bushfire protection measures can be adequately implemented.</p>	<p>The site is surrounded by grassland vegetation and the hazards can be appropriately managed.</p> <p>The bushfire risk to the site will be addressed through vegetation management.</p>
<p>9.5 Strategies: Settlement Planning</p> <p><i>Plan to strengthen the resilience of settlements and communities and prioritise protection of human life by:</i></p>	
<p>Strategy</p>	<p>Consideration</p>
<p>Directing population growth and development to low risk locations, being those locations assessed as having a radiant heat flux of less than 12.5 kilowatts/square metre under AS 3959-2018 Construction of Buildings in Bushfire-prone Areas (Standards Australia, 2018).</p>	<p>The development will not be exposed to radiant heat levels that exceed 12.5kW/m² as demonstrated in the BAL assessment in section of this report.</p> <p>A number of mitigation measures associated with staging and perimeter steel fences are proposed as an interim solution whilst the abutting growth areas are being developed.</p>
<p>Ensuring the availability of, and safe access to, areas assessed as a BAL-LOW rating under AS 3959-2018 Construction of Buildings in Bushfire-prone Areas (Standards Australia, 2009) where human life can be better protected from the effects of bushfire.</p>	<p>The central areas of the site greater than 50m from the grassland hazards and 100m from all other hazards are exposed to a BAL Low in accordance with AS 3959-2018.</p>
<p>Ensuring the bushfire risk to existing and future residents, property and community infrastructure will not increase as a result of future land use and development.</p>	<p>The proposed development will not increase the risk to future residence, property, or community infrastructure.</p>
<p>Achieving no net increase in risk to existing and future residents, property and community infrastructure, through the implementation of bushfire protection Measures and where possible reducing bushfire risk overall.</p>	<p>There is a net decrease in risk associated with this development as the management of the grassland within the property will further protect the properties that border the proposed development.</p>
<p>Assessing and addressing the bushfire hazard posed to the settlement and the</p>	<p>The bushfire hazards have been assessed in sections 6 and 7 of this report.</p>

<p>likely bushfire behavior it will produce at a landscape, settlement, local, neighbourhood and site scale, including the potential for neighbourhood-scale destruction.</p>	<p>The hazards to the proposed site have been addressed through, staging of the development, potential steel fencing to the south and east, management of vegetation within the site, construction requirements and setback distances associated with AS 3959-2018.</p>
<p>Assessing alternative low risk locations for settlement growth on a regional, municipal, settlement, local and neighbourhood basis.</p>	<p>The site is identified in the Bannockburn Urban Design Framework as a site for future residential development and thus an alternative low risk location for settlement growth is not considered.</p>
<p>Not approving any strategic planning document, local planning policy, or planning scheme amendment that will result in the introduction or intensification of development in an area that has, or will on completion have, more than a BAL 12.5 rating under AS 3959-2018 Construction of Buildings in Bushfire-prone Areas (Standards Australia, 2018).</p>	<p>The buildings within the site will not be exposed to radiant heat loads greater than 12.5kW/m².</p>

9.6 Strategies: Areas of biodiversity conservation value

Strategy	Consideration
<p>Ensure settlement growth and development approvals can implement bushfire protection measures without unacceptable biodiversity impacts by discouraging settlement growth and development in bushfire affected areas that are important areas of biodiversity.</p>	<p>The biodiversity impacts have not been considered as part of this report.</p>

9.7 Use and development control in a Bushfire Prone Area

In a bushfire prone area designated in accordance with regulations made under the Building Act 1993, bushfire risk should be considered when assessing planning applications for the following uses and development:

- Subdivisions of more than 10 lots.
- Accommodation.
- Child care centre.
- Education centre.
- Emergency services facility.
- Hospital.
- Indoor recreation facility.

- Major sports and recreation facility.
- Place of assembly.

Any application for development that will result in people congregating in large numbers.
When assessing a planning permit application for the above uses and development:

Strategy	Consideration
Consider the risk of bushfire to people, property and community infrastructure.	The bushfire risk to people and property has been addressed as part of this application.
Require the implementation of appropriate bushfire protection measures to address the identified bushfire risk.	The proposal includes appropriate bushfire protection from the surrounding hazards.
Ensure new development can implement bushfire protection measures without unacceptable biodiversity impacts.	The biodiversity impacts have not been considered as part of this report.

9.8 Policy Guidelines

Consider as relevant:

- Any applicable approved state, regional and municipal fire prevention plan.

9.9 Policy Documents

Consider as relevant:

- AS 3959-2018 Construction of Buildings in Bushfire-prone Areas (Standards Australia, 2018).
- Building in bushfire-prone areas – CSIRO and Standards Australia (SAA HB36-1993, 1993)
- An bushfire prone area map prepared under the Building Act 1993 or regulations made under the Act.

10. REFERENCES

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11. APPENDICES

11.1 Appendix 1 – The definition of ‘Low Threat Vegetation’.

There are two different definitions of ‘Low Threat’ vegetation. One is detailed within the planning scheme (Clause 53.02 Bushfire Planning) and another in AS 3959-2018.

Within the body of this report the existing fuel is assessed in accordance with AS 3959-2018 and the recommended low threat vegetation management within the road reserves and public open space within the subdivision is managed in accordance with the definition from Clause 53.02 for defensible space.

Low threat vegetation – AS 3959-2018

The definition in AS 3959-2018 includes the following:

- (a) *Multiple areas of vegetation less than 0.25ha in area and not within 20m of the site, or each other of other areas of vegetation being classified vegetation.*
- (b) *Strips of vegetation less than 20m in width (measured perpendicular to the evaluation exposed to the strip of vegetation) regardless of length and not within 20m of the site or each other, or other areas of vegetation being classified.*
- (c) *Non-vegetated areas, including waterways, roads, footpaths, buildings and rocky outcrops.*

Vegetation regarded as low threat due to factors such as flammability, moisture content or fuel load. This includes grassland managed in a minimal fuel condition, mangroves and other saline wetlands, maintained lawns, golf courses (such as playing areas and fairways), maintained public reserves and parklands, sporting fields, vineyards, orchards, market gardens (and other non-curing crops), cultivated gardens, commercial nurseries, nature strips and windbreaks.

Low threat vegetation (Defensible Space) – Clause 53.02

The definition of ‘Low Threat’ vegetation is detailed in Clause 53.02 for sites within the Bushfire Management Overlay (BMO). Clause 53.02 refers to areas of low fuel loads around buildings as areas of Defensible Space. The vegetation management criteria of defensible space include the following:

- Grass must be short cropped and maintained during the declared fire danger period.
- All leaves and vegetation debris must be removed at regular intervals during the declared fire danger period.
- Within 10 metres of a building, flammable objects must not be located close to the vulnerable parts of the building.
- Plants greater than 10 centimetres in height must not be placed within 3 metres of a window or glass feature of the building.
- Shrubs must not be located under the canopy of trees.
- Individual and clumps of shrubs must not exceed 5 square metres in area and must be separated by at least 5 metres.
- Trees must not overhang or touch any elements of the building.
- The canopy of trees must be separated by at least 5 metres.
- There must be a clearance of at least 2 metres between the lowest tree branches and ground level.