

BUSHFIRE HAZARD MANAGEMENT PLAN

Spring Mountain Estate Stage 13

BELLBIRD DRIVE AND WEDGEBILL COURT, GREENBANK



Prepared for:

MTAA Superannuation Fund (Flagstone Creek and Spring Mountain Park)

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DISCLAIMER

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

This assessment is prepared based upon local, State and Federal legislative provisions relating to bushfire protection, as relevant at the time of production. Jensen Bowers Group Consultants Pty Ltd maintains relevant knowledge with regard to planning and development in bushfire prone areas. However, it is important to note that whilst bushfires generally maintain certain scientific attributes, bushfire events vary in intensity, duration, location and 'typical' behavioural characteristics. Bushfires do not always conform to scientific and widely-understood predictabilities and remain subject to variation across fire seasons by virtue of changes in ground fuel loads and vegetation, prevailing weather and wind conditions and topography.

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

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

Jensen Bowers Group Consultants Pty Ltd accepts no responsibility for any damage or loss of life or property as a result of bushfire or any other cause which may in any way be taken to be the subject of this report. This report and the information within it is provided on the understanding that reasonable care will be taken when using it. If there remains any uncertainty regarding the application of the information within the report in a specified circumstance, further professional advice should be sought. Jensen Bowers Group Consultants Pty Ltd does not accept responsibility for how the information within this report is applied or relied upon.

1

INTRODUCTION

Jensen Bowers Group Consultants Pty Ltd has been engaged on behalf of MTAA Superannuation Fund (Flagstone Creek and Spring Mountain Park) to undertake a site-based bushfire hazard management plan as an update to the original report prepared by Bushland Protection Systems Pty Ltd (BPS) dated 2007 and as approved by Council. This report is prepared pursuant to the constructed subdivision approvals in place and carried out relating to Stage 13 of the Spring Mountain Estate.

It is understood Stage 13 of the Spring Mountain Estate was approved by Council in 2008. At the time of production of this report, the construction of the subdivision relating specifically to Stage 13 had been carried out in full. The original bushfire management plan approved by Council carried a 5 year currency period. As not all of the constructed allotments accommodate a dwelling at this time, a revised bushfire hazard management plan is required as per the provisions of the original report prepared by BPS.

The focus of this assessment report remains two-fold, both with respect to the satisfaction of revision requirements set out in the BPS report and also end-user consideration, being the purchasers of the constructed allotments.

At the time this report was prepared, five of the constructed vacant allotments within Stage 13 were on the market, whilst a small number of other allotments had been purchased but not yet built upon. The remainder of allotments within Stage 13 accommodated detached dwellings on rural residential sized allotments.

Stage 13 of Spring Mountain Estate is subject to the Bushfire Hazard Overlay of the Beaudesert Planning Scheme which remains the applicable local planning instrument for this area following the 2008 Local Government amalgamations. The site is also identified on the State Planning Policy (SPP) bushfire hazard mapping recently released by the Queensland Government.

This assessment report aims to mitigate the risk to life and property from bushfire threat and the impact of bushfire attack which includes:

- direct flame contact
- ember and firebrand attack
- radiant heat
- fire-driven wind.

Building loss is typically associated with one or more forms of bushfire attack, the most common being the combined effects of radiant heat and ember attack. Danger to human life is also associated with these forms of bushfire attack in addition to smoke emission.

This assessment does not seek to remove the threat of bushfire risk, but provide relevant siting, layout, building and / or servicing information to assist the ability of land-owners to manage the threat of this risk. This assessment report is prepared in accordance with best practice industry

standards as applicable in Queensland and pursuant to both State and local government bushfire hazard policies and guidelines.

1.1 Impetus for Updated Bushfire Hazard Assessment

Approval for the Stage 13 allotment reconfiguration was issued by Council in 2008. Pursuant to these approvals, conditions of development were imposed requiring the preparation of a Bushfire Management Plan. In accordance with these conditions a Bushfire Risk Assessment and Mitigation Plan was prepared by BPS, but is now in excess of 5 years old. Pursuant with the advice set out in that report, a review after 5 years is recommended should the development not be completed in that time. As such, this report has been subsequently prepared and draws upon advice provided by the previous report in order to ensure ongoing consistency but also takes into account amendments to local, State and national bushfire policies and guidelines since this time.

1.2 Site Details

Site address	Bellbird Drive and Wedgebill Court, GREENBANK
Local Government	Logan City Council (Beaudesert Planning Scheme)
Real property description	Formerly described as Lots 1301 to Lot 1336 on SP227174 and Lots 998 and 999 on SP227174
Area of Site	Approximately 19.7 hectares
Tenure	Freehold
Applicant's name	MTAA Superannuation Fund (Flagstone Creek and Spring Mountain Park)
Fire Authority	Rural Fire Service Queensland (RFSQ) RFSQ South Eastern Region (Greenbank RFS Brigade)
Current Land Use	Approved rural residential subdivision
Proposed Land Use	Approved rural residential subdivision
Adjoining Properties	Freehold and Council-owned reserve / park

1.3 Site Locality



Figure 1: Site locality (Source: NeapMap, 2014)

1.4 Understanding Fire Weather Characteristics

It remains important to understand the influence of fire weather with regard to how it can affect bushfire risk levels on a daily, weekly or seasonal basis.

In South East Queensland, hot-air fire wind is typically generated by north-west and south-westerlies and cool-air fire wind is generated by south-westerlies which are prevalent during Southern Queensland's fire season which extends from August to March, annually. In some situations however, south-easterlies can also drive bushfire behaviour.

Notwithstanding the above, it is noted bushfires do not always conform to widely-accepted characteristics. Other fire weather conditions must also be contemplated such as preceding weather conditions (such as low rainfall or drought), air temperature and relative humidity. If the area has been subject to drought or low rainfall for a period of time, vegetation health tends to deteriorate with increased leaf drop, curing and drying. This contributes to increased ground fuel loads and general ignition susceptibility. Prolonged dry periods also reduce soil moisture content.

Air temperatures of above 30 degrees Celsius are typically conducive to increased fire weather, as are extended periods of higher than average air temperatures. In conjunction, low relative humidity (i.e low air moisture content) is also a contributing factor to increased fire weather.

In concert, all of the above factors can impact on the ability for fire to propagate, and alter behaviour and intensity characteristics and as such, fire weather is a significant component of bushfire hazard. Whilst an assessment of vegetation types, fuel loads, effective slope and other factors can be readily undertaken, fire weather can fluctuate across days, weeks and seasons and can have a significant impact on the potential for bushfire threat as well as influence bushfire behaviour and intensity.

The Fire Danger Index (FDI) is a commonly used method to readily advise the community of the likely ability of fire suppression based on fire weather, which is used to inform the Fire Danger Rating (FDR) System at Figure 2. It is important to maintain awareness as to the level of local fire danger during the fire season.

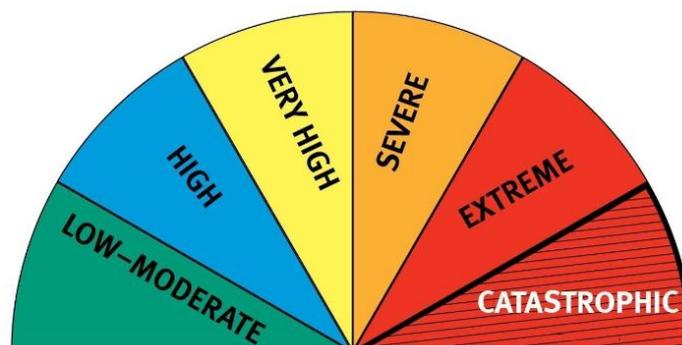


Figure 2: Fire Danger Ratings (Source: RFSQ, 2013)

2 APPROVED DEVELOPMENT

The development relates to a previously approved rural residential subdivision, specifically Stage 13 of the Spring Mountain Estate. It is noted at the time of production of this report the subdivision had been completed with dwellings already constructed on a number of allotments.

Stage 13 is currently accessed via two road connections from Parrot Street and Thornbill Drive. Parrot Street provides a connection to Spring Mountain Drive which remains the primary point of access for the Estate and links to the Mount Lindesay Highway to the east. The rural residential sized allotments created between 4,000m² and 8,851m². Two parks have been retained in their natural state, comprising bushland areas which surround the rural residential development. It is understood the bushland parks surrounding Stage 13 remain in Council ownership, identified in green at Figure 3 below. Refer to **Attachment A** for the approved reconfiguration plan for Stage 13.

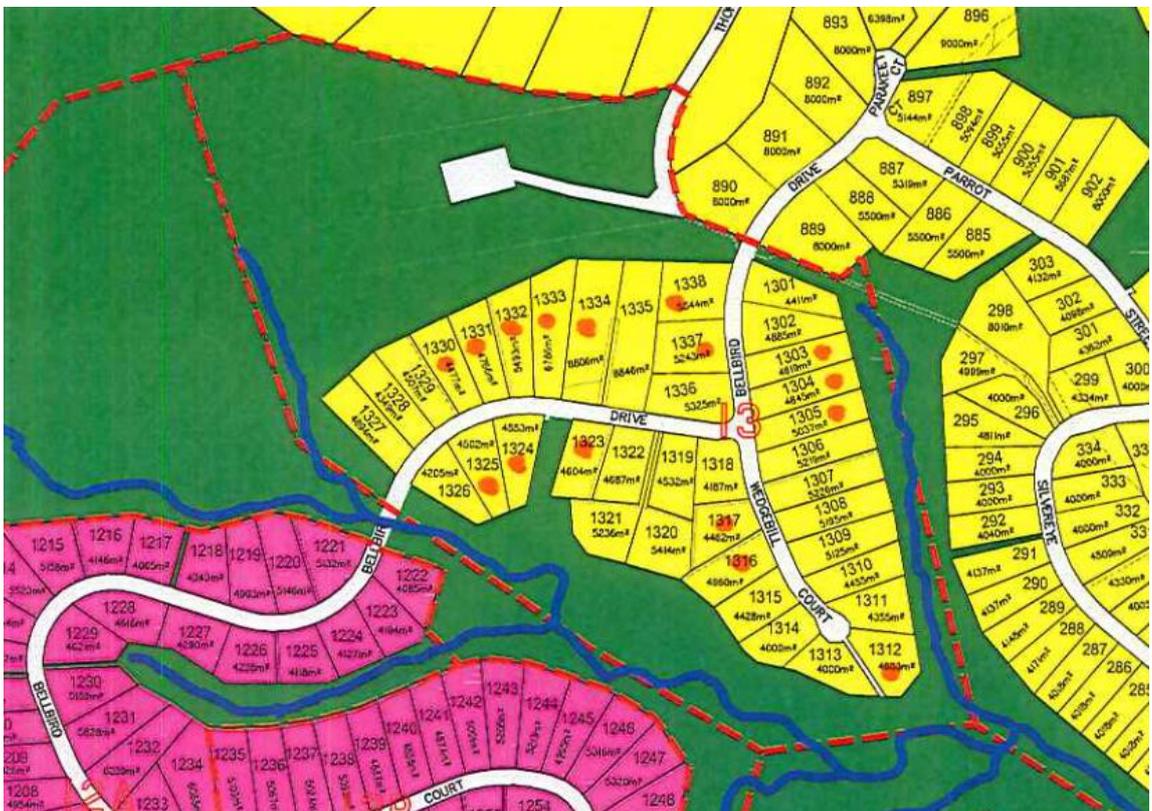


Figure 3: Stage 13 as currently approved by Council (red dots denote vacant allotments as at time of report preparation)
(Source: Schlencker Surveying (Qld), 2014)

3

SITE CONTEXT AND LOCALITY

The approved rural residential subdivision is located at the periphery of a previously-developed low density residential community which forms part of the Spring Mountain Estate in the south-western area of Greenbank. Stage 13 is currently constructed and comprises a number of detached dwellings on individual allotments, with a small number of lots yet to accommodate dwelling development. Stage 13 is enveloped by bushland parks which are owned by Council, and further adjoins a larger area of bush landscape to the west, north-west and south-west. It is noted that future rural residential development, being Stages 11 and 12, may occur to the south-west of Stage 13. The site also adjoins creeks and overland flow paths to the immediate west, south-west and east which are partially incorporated within the bushland parks in the ownership of the Council.

The wider Spring Mountain Estate is located to the north, south and east of Stage 13. A water pump station is located to the immediate north of the site within the Council-owned parkland on Lot 999.



Figure 4: Stage 13 of Spring Mountain Estate (Source: Jensen Bowers, 2014)

An established fire trail network also exists, surrounding the constructed allotments along the eastern, south-western and northern boundaries of Stage 13. Various access points to the network are currently available.



Figure 5: Stage 13 of Spring Mountain Estate (Source: Jensen Bowers, 2014)



Figure 6: Bushland corridor at the southern boundary of Stage 13 (Source: Jensen Bowers, 2014)



Figure 7: Bushland corridor at the eastern boundary of Stage 13 (Source: Jensen Bowers, 2014)



Figure 8: Fire trail and bushland south-western boundary of Stage 13 (Source: Jensen Bowers, 2014)

4

STATUTORY BUSHFIRE HAZARD ASSESSMENT

4.1 State Planning Policy

The single State Planning Policy (SPP) was released by the State Government in December 2013 and amended in July 2014 which comprises a range of State-interest requirements for planning scheme preparation and interim development assessment provisions. Whilst this assessment does not relate to development assessment, as this process has been previously undertaken, for the purposes of this report the extent of the SPP mapping is considered relevant.

The SPP mapping identifies areas of medium, high and very high hazard, along with an associated potential impact area, with respect to the subject sites pursuant to the new bushfire hazard mapping methodology developed by the CSIRO in partnership with the Queensland Government. The new mapping methodology yields an estimated 85% level of accuracy based upon recent innovation in fire science and is considered a substantial advancement in bushfire hazard mapping in Queensland. The new mapping methodology is based upon potential fire line intensity using the MacArthur Mk 5 Forest Fire Danger Meter and inputs of total fuel load and effective slope to derive a potential rate of fire spread. A 100m 'buffer' area is also applicable being the zone in which ember attack and radiant heat remain relevant adjacent to the actual hazard. Patch and corridor filtering are also introduced on the premise that certain areas of vegetation are likely to prevent a running fire front from reaching its full potential.

This mapping supports the implementation of the SPP only and is not a trigger for AS3959-2009 – Construction of Buildings in Bushfire Prone Areas pursuant to the Building Code of Australia.

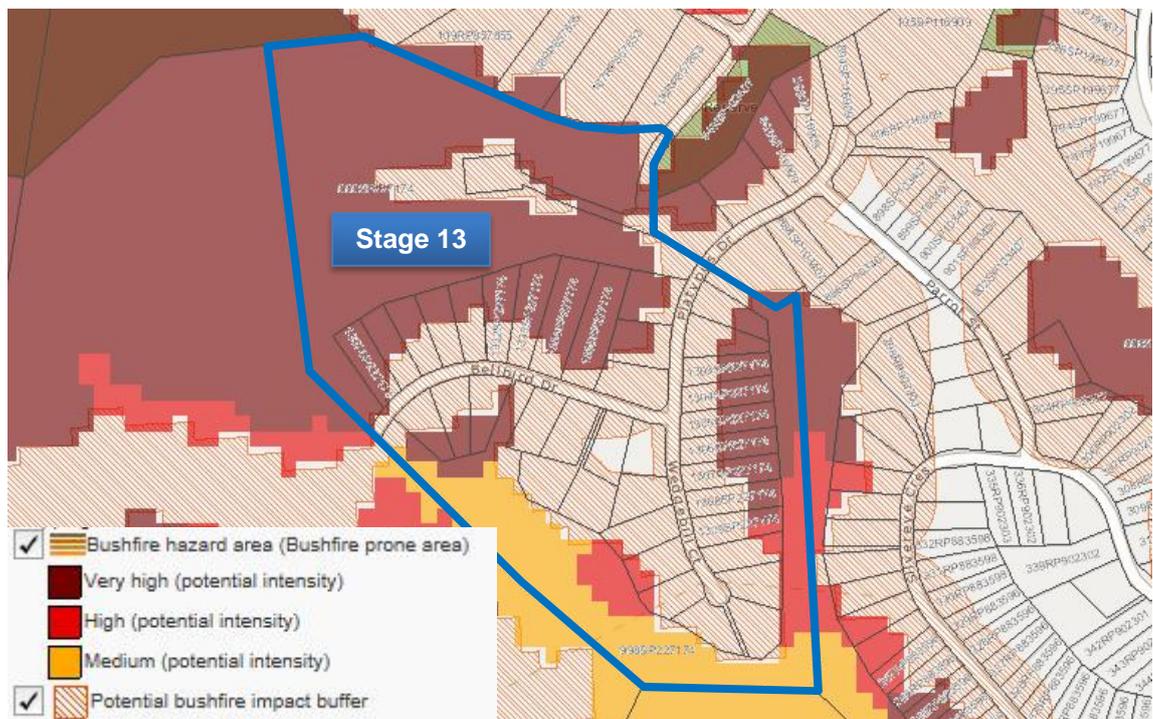


Figure 9: SPP Bushfire Hazard Development Assessment mapping (Source: Queensland Government, 2014)

As identified by the above mapping the majority of hazard is located to the north-west of the site, which is also upslope from the site. The creek and overland flow path corridors to the south-west and east also subject to varying levels of bushfire hazard.

The following requirements relate to all types of development subject to natural hazards, assessed pursuant to the SPP:

Table 1: SPP Natural Hazards Interim Development Provisions

For all natural hazards, development:	Assessment
1. Avoids natural hazard areas or mitigates the risks of the natural hazard; and	It is understood the development has been previously assessed by Council pursuant to the previous SPP1/03 – Mitigating the Adverse Impacts of Flood, Bushfire and Landslide via the existing reconfiguration approvals.
2. Supports and does not unduly burden disaster management response or recovery capacity and capabilities; and	
3. Directly, indirectly and cumulatively avoids an increase in the severity of the natural hazard and the potential for damage on the site or to other properties; and	
4. Avoids risks to public safety and the environment from the location of hazardous materials and the release of these materials as a result of the natural hazard; and	
5. Maintains or enhances natural processes and the protective function of landforms and vegetation that can mitigate risks associated with the natural hazard	

4.2 Local Government Provisions

The Beaudesert Planning Scheme remains the applicable local planning instrument, noting that planning approval was obtained in 2008. Thus, assessment against the Bushfire Hazard Overlay Code is not applicable.

Notwithstanding the above, the Bushfire Hazard Overlay mapping under the Beaudesert Planning Scheme remains relevant pursuant to the provisions of the Building Code of Australia (BCA). The BCA nominates local government planning scheme hazard overlay mapping as the relevant trigger for the applicability of AS3959-2009 – Construction of Buildings in Bushfire Prone Areas. On this basis, the overlay mapping is relevant in terms of dwelling construction.

Figure 10 provides an excerpt of the current Bushfire Hazard Overlay map under the Beaudesert Planning Scheme, identifying areas within Stage 13 as subject to bushfire hazard.

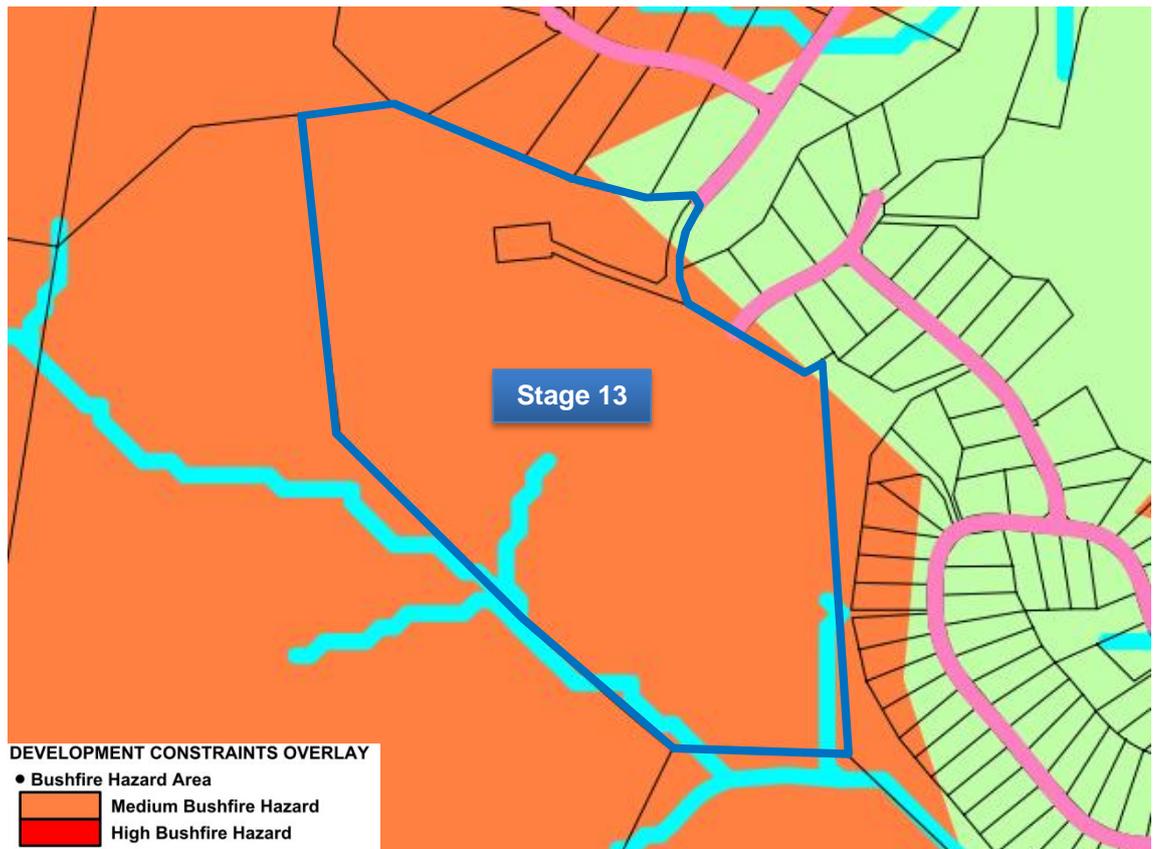


Figure 10: Excerpt from Beaudesert Planning Scheme Bushfire Hazard Overlay (Source: Scenic Rim Regional Council, 2014)

4.2.1 Draft Logan Planning Scheme 2014

At the time this report was produced, the public display of the Draft Logan Planning Scheme had closed. It is understood that the Draft Planning Scheme Bushfire Hazard Overlay mapping was not based upon the new mapping methodology developed by the CSIRO and adopted by the State Government and to this end, the Draft Overlay mapping requires revision in accordance with the new SPP mapping methodology requirements. It is noted that the Draft Bushfire Hazard Overlay expands upon that area currently identified under the Beaudesert Planning Scheme Bushfire Hazard Overlay and is also more substantial in area than that identified by the State Government's SPP bushfire hazard mapping. In addition, the Draft Overlay mapping does not differentiate between low, medium or high hazard areas as required by the SPP mapping methodology, refer to Figure 11.

To this end, it is understood the Draft Bushfire Hazard Overlay mapping will be amended in accordance with the SPP mapping methodology. However, it is noted Local Government retains the ability to complete its own assessment in accordance with the mapping methodology which may derive different or additional hazard areas than identified by the State Government.

It is possible that not all dwellings yet to be constructed on established allotments will be complete in advance of the adoption of the new Planning Scheme. Should this be the case, dwellings requiring building approval following the adoption of the new planning scheme will likely trigger assessment against AS3959-2009 pursuant to the new Bushfire Hazard Overlay mapping which will be adopted under the forthcoming Local Planning Scheme. Figure 11 below

illustrates the Draft Bushfire Hazard Overlay mapping which was on public display however, it cannot be ascertained at this stage whether this mapping will change or to what degree.

At present, it is considered that the Draft Bushfire Hazard Overlay mapping does not entirely reflect potential bushfire behaviour by virtue of how the mapping is presented. Whilst the Draft Overlay mapping identifies vegetation which may present a risk, when combined with typical fire weather conditions which are conducive to bushfire in South East Queensland, it is unlikely that fire would propagate to its maximum rate of spread in some locations, such as the eastern corridor area, on prevailing wind conditions. As previously identified, fire-driven wind in Queensland is typically associated with North-Westerlies, South-Westerlies and less commonly on South-Easterlies.



Figure 11: Excerpt from Draft Logan Planning Scheme Bushfire Hazard Overlay (Source: Logan City Council, 2014)

5

BUSHFIRE SITE ASSESSMENT

5.1 Introduction

The following assessment was carried out in accordance with the provisions of the State Planning Policy, Beaudesert Shire Planning Scheme and in a preliminary context with regard to AS3959-2009. It is noted this assessment is undertaken pursuant to existing reconfiguration approvals from Council and for the purposes of updating the original BPS bushfire management report which has expired.

In terms of assessment methodology, it is noted that the Fire Danger Index (FDI) is calculated at 40 with a flame temperature of 1,090k, as per the provisions of the Australian Standard as relevant to Queensland. On this basis and as required by both the SPP Bushfire Hazard mapping and AS3959-2009, the site assessment area encompasses that area within 100m of the identified hazard contained within and adjacent to the development sites.

It is critical to note the FDI provisions pursuant to AS3959-2009 for Queensland provide design parameters which equate to Very High (FDI 25-49) in terms of the Fire Danger Rating (FDR). Thus, fire days in excess of this (Severe, Extreme and Catastrophic) are not accommodated by existing statutory building instruments and are therefore beyond design parameters.

5.2 Vegetation Classification

Vegetation classification is important for a number of reasons, namely it indicates the level of fire intensity and fire behaviour associated with specific stands of vegetation and it also indicates the fuel loads which may exist in certain locations.

It is noted Stage 13 has been cleared of areas of vegetation to accommodate constructed development and house pads for future dwellings. Vegetation relevant in this case is located both internal and external to the existing house lots. The creek and overland flow paths which adjoin the site also provide small areas of riparian vegetation or individual species which are located within the eastern vegetated corridor and in areas to the south-west, but external to any house sites. These generally represent the more dense areas of vegetation with a largely continuous ground to canopy fuel arrangement.

The majority of the area comprises grassy eucalypt environments as well as dense eucalypt forest with a shrub understorey. Vegetation to the north is considerably more open in terms of canopy cover and general accessibility than areas to the south.

Based upon the vegetation description provided in BPS' original report, the species composition of the area appears to remain largely similar. However, it is important to note some significant changes in species classification in terms of bushfire behaviour have occurred since the preparation of the original bushfire hazard management report. Figure 12 sets out the current vegetation classifications as relevant to the site in terms of bushfire hazard, consistent with classifications identified by AS3959-2009.

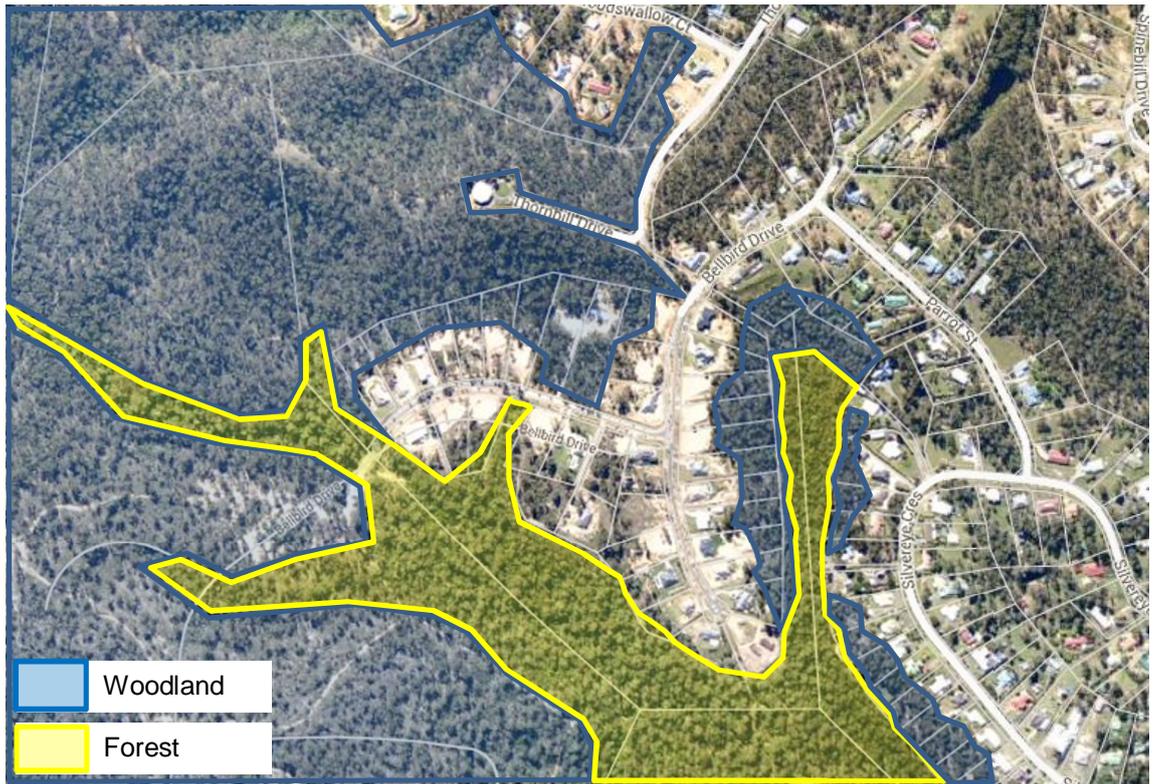


Figure 12: Vegetation Classification for Stage 13 (areas are approximate only)
 (Source: As adapted from NearMap, 2014)

5.3 Effective Slope

Effective slope relates to the topography beneath classified vegetation, as this influences fire speed and fire spread - namely, that the speed of fire doubles for every 10 degrees incline. An on-site effective slope assessment has been conducted via clinometer and rangefinder readings. Figure 13 below illustrates the maximum effective slope relevant to this assessment.

The downslope areas illustrate the approximate location of the creek gullies which adjoin the site. Land to the north of the site is upslope, as is land further to west on the other side of the creek.

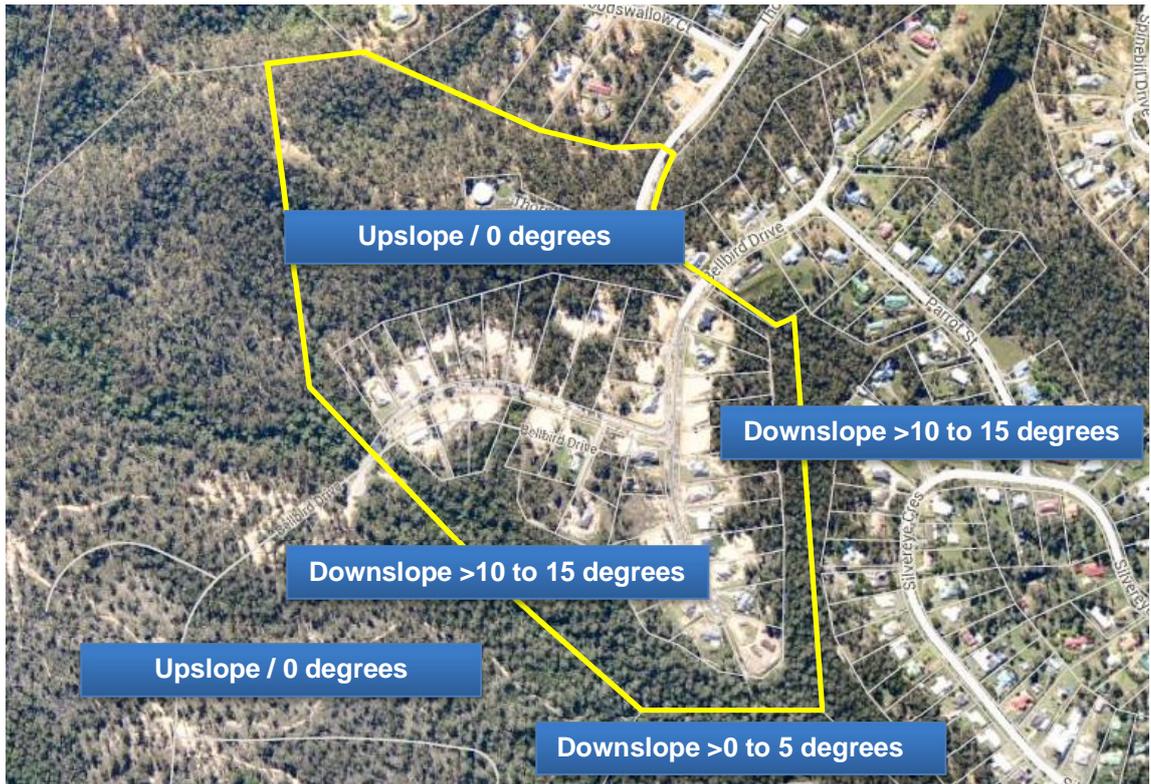


Figure 13: Effective slope relating to Stage 13 (Source: NearMap, 2014)

5.4 Bushfire Behaviour

As outlined in the original BPS report, the predominant form of bushfire hazard relevant to Stage 13 is from the north-west, west and possibly from the south-west in areas between Stage 13 and Spring Mountain.

Bushfire hazard to the immediate south and east is more likely associated with point ignition (i.e. via ember) rather than an intensive fire run by virtue of its location and constrained size which for the most part would limit any potential fire activity from reaching maximum rate of spread. This remains consistent with the assessment contained within the BPS report.

5.5 Landscape and Local Bushfire Hazard

Two types of risk are relevant in terms of bushfire hazard including landscape risk where large expanses of bushland over tens to hundreds of hectares are located in immediate proximity to, and may traverse, urban periphery townships, and local bushfire hazard risk which is most commonly presented by fragmented areas of vegetation larger than 1 hectare in size.

Based on the characteristics of the locality landscape bushfire risk is present. Access to land to the west of Stage 13 is available via Bellbird Drive. A large dam is also located to the south-west of the site, providing suitable water supply for draughting by the rural fire service for fire suppression if required.

The topography immediately adjoin the site is also relevant from this perspective. Potential bushfire from the north-west or west of the site is likely to slow considerably immediately prior to

reaching the site, given its location on a downward slope where fire will descend down the hillside terrain. Generally, a slowing of speed and rate of spread also gives rise to more calm conditions and may assist in fire suppression activities and active defence.

Potential bushfire moving from the south-west will experience a general slowing of speed and rate of spread before speeding up marginally as it crosses the creek in this location and up the eastern bank. Given the significance of the downward slope immediately before reaching the creek's banks it is possible such fire would slow substantially so as to moderate the impact of its transition up the eastern bank of the creek. Additionally, it is likely fire services would mobilise to prevent any fire reaching this location via defensive firefighting techniques such as strategic back burning.

It is important to note however, that bushfire behaviour can fluctuate on any given day, remaining a direct function of fire weather conditions which can change rapidly between hours.

6

BUSHFIRE MANAGEMENT AND MITIGATION MEASURES

6.1 Road Network

Road design is significant in terms of a range of aspects of bushfire prevention and ability for bushfire fighting. Road design must cater for emergency access and egress in times of potential bushfire events. Based on existing Council approvals, the road design and general subdivision layout has been previously assessed and approved as acceptable by Council pursuant to the former SPP 1/03 – Mitigating the Adverse Impacts of Flood, Bushfire and Landslide.

The approved internal road network maintains connectivity to Parrot Street and Silvereye Crescent which connects with Spinebill Drive, a local connector road, and then to Spring Mountain Drive, a district connector road. This remains the most direct route out of the Estate, noting Silvereye Crescent provides two access points to Spinebill Drive. A secondary access from Bellbird Drive to Thornbill Drive is also available however Thornbill Drive is located to the north whereas Parrot Street and Silvereye Crescent are located to the east moving away from the prominent hazard source.

Into the future and depending on the construction of further stages of the Spring Mountain Estate, additional road access via Bellbird Drive to the south may be available through Stages 11 and 12, linking back again to Spring Mountain Drive to the south-east.

Residents are encouraged to consider their evacuation route and evacuation destination prior to any specific bushfire event and at what stage they will evacuate ensuring it is early enough to ensure safe evacuation. Residents are strongly discouraged from adopting a 'wait and see' approach and should prepare a personal / household bushfire survival plan and ideally, speak with officers of the local rural fire brigade for advice in advance of any particular bushfire event.

6.2 Fire Trails

It is noted that fire trails have been established at the outer boundary of the allotments contained within Stage 13, refer to **Attachment B**. These trails connect with a wider network of trails to the south (to Stage 10) and to the north and west which must continue to be maintained by the relevant authorities. A range of access easements are also located on individual allotments to allow for periodic access and egress along the trail. The purposes of these trails specifically seek to aid in the management of the parkland areas surrounding Stage 13 as well as fire management (hazard reduction) and fire appliance access (if so required) in the event of bushfire. It is noted these trails are located on Council-owned land, unless for the purposes of access easements.

These trails are to be maintained to the following standards as per the recommendations of the original BPS report:

- Where within vegetated corridors (south and east):

4m wide slashed grass trail with an overall managed fuel width of 6m. Mature and semi-mature tree species may be maintained provided 4x4 fire appliance access is not detrimentally affected.

- To the west, south-west and north-west:
10m wide managed fuel width with regular access to the road network and land to the west of Stage 13.

In terms of design specifications, all fire trails must comply with the following:

- access to all formalised fire trails must be available at all times
- signage at all access and egress points where trails join with the formal road network which read 'Fire Trail Access' to be maintained
- suitable fire trail gate systems currently installed are to be appropriately maintained and accessible by both Council and the local rural fire brigade
- fire trails are to provide a 4m wide carriageway with additional fuel management for 1m either side (6m in total) and regularly maintained in a low ground fuel condition. A minimum 4m overhead clearance to branches must be achieved, however it is recommended that overhanging branches are avoided where possible. If slashed, all debris and cuttings must be removed from the fire trail. Trees immediately alongside the fire trails should have branches lopped to a height of 2m to prevent fire propagation within the tree canopy
- fire trails are a maximum grade of 15 degrees if sealed and 10 degrees if unsealed
- the crossfall of any fire trail is not more than 10 degrees
- unsealed fire trails should comprise a regularly mowed grass cover
- appropriate drainage and erosion controls are provided
- all fire trails are to be regularly inspected and maintained, particularly in the lead up to annual fire seasons. On-going vegetation management along all fire trails is required to mitigate opportunity for vegetation encroachment.

6.3 Building Envelopes

Building envelopes are provided over each allotment which identify the building and conservation envelopes which apply, refer to **Attachment B**. The building envelopes identified are quite large in size and may amply provide for dwelling construction within a number of locations and formats within each allotment. It is understood a minimum frontage setback of 10m and rear and side boundary setbacks of 6m remain applicable. It is noted that a number of allotments include vegetated areas which must be retained in an unmanaged state (i.e. no clearing is permitted).

6.4 Accessibility

It is noted the approved development comprises rural residential sized allotments at a very low-density. Driveway access, length and siting are largely dictated by the size of the allotments, the majority of lots will maintain relatively short driveways. Where future dwellings may be located toward the centre or rear of lot, thereby requiring a longer driveway access, it is recommended the driveway be suitably sealed to support a tanker appliance up to 25 tonnes with a width of a minimum of 4m and height clearance of 4m from overhanging branches. Any bends in the driveway should provide a turning area equivalent to a 20m diameter. If the

driveway is relatively straight, sufficient space should be available to allow a fire appliance to manoeuvre on site and leave the property in a forward gear.

Any driveways over an easement providing access to a fire trail are required to permit 24 hour access to the easement as required.

6.5 Vegetation Management

The bushland areas and corridors which adjoin the development sites must be managed so as to reduce the build-up of unacceptable fuel loads. Regular inspections by the Council and local rural fire brigade are required to limit the opportunity for increased fire intensity by virtue of ground fuel load build-up and the propagation of weeds or swathes of long grass where in proximity to the site.

Management processes should ideally be undertaken prior to and during summer. Prescribed burning should only occur during winter months when the FFDI is low and weather conditions permit. The management of bushland surrounding the site should be included in Council's bushfire management plan and undertaken in accordance with Council policy.

6.5.1 Clearing

It is noted the conservation envelopes on each property include sensitive ecosystem values and cannot be cleared or otherwise impacted without first seeking approval from both Council and the State Government, as required. Purchasers should contact Council to discuss the best approach with regard to the ongoing care for and management of these areas within individual allotments.

Clearing outside of the conservation envelopes is permitted and is recommended. Individual tree species may be retained provided vertical and horizontal fuel connectivity is removed (i.e ensure tree canopies are separated and understorey is thinned or removed to prevent fire moving between species and from ground and surface fuels in a ladder effect to the tree canopy).

The BPS report issued in 2007 identified a minimum 10m inner zone (excluding non 'firewise' trees and shrubs) and a 10m outer zone (understorey removed and ground fuels area managed). In addition, it recommends an additional 1m of managed or cleared vegetation per degree of downslope to provide for added mitigation.

6.5.2 Landscaping

All approved allotments must be landscaped within the building envelope areas so as to reduce opportunity for spot fires via ember attack and so as to maintain adequate defendable space / separation distance around each dwelling.

Fire authorities in other jurisdictions which experience a higher level of bushfire risk have completed significant work in the area of landscaping for bushfire hazard. The CFA has produced a 'Plant Selection Key' to assist in the identification of suitable 'fire-wise' plantings.

The Country Fire Service of South Australia, New South Wales Fire Service and the Tasmania Fire Service have all prepared lists of less flammable species which are suitable for landscaping purposes relevant to their respective jurisdictions. The CFA in particular has done much work focusing on the characteristics of 'fire-wise' plants as opposed to specific species. It is recommended a copy of the CFA's 'Landscaping for Bushfire' Guideline be provided to all property purchasers, a copy of this document is included at **Attachment C**.

'Fire-wise' species maintain a number of characteristics which reduce their propensity for ignition. In detail:

- any trees or shrubs must comprise smoother bark or attached tightly on trunks as opposed to loose, stringy or ribbon bark. Avoid species which shed bark on an annual basis
- chose species with a high moisture content, with coarse and broad leaves which are thinly spread such as succulents
- select species with foliage which is less dense and open and loosely branching.

Notwithstanding the above and irrespective of the characteristics of such species, certain weather conditions can impact upon the propensity for ignition and propagation of fire within any vegetation. It must be noted that no vegetation can be considered 'fire proof'.

Notwithstanding, it is noted the easiest and most effective way of managing bushfire threat on rural properties is to manage ground fuel loads and regrowth in a minimal fuel condition. Year-round property maintenance is required to ensure excess or build-up of ground fuels (dead plant material) is removed prior to and during each annual fire season.

6.6 Building Construction Requirements

Bushfire attack levels (BAL) are derived from AS3959-2009 to distinguish the level of attack buildings may experience based on a range of factors, being those addressed in Section 5 of this report. Vegetation typologies, effective slope and separation distances maintain a significant bearing on the likely behaviour and intensity of a bushfire and how these factors may combine to impact upon nearby buildings. In essence, the further away a building is constructed from classifiable vegetation, the lower the bushfire construction level.

The Australian Standard adopts six distinct BAL categories including a 'low' category for areas where bushfire risk is limited, these categories are outlined below. The categories themselves are based upon the level of radiant heat flux which may be experienced during a bushfire event. These BAL levels are translated to specific construction requirements to enhance the ability of buildings to withstand bushfire attack.

**BUSHFIRE ATTACK LEVELS AND CORRESPONDING SECTIONS FOR
SPECIFIC CONSTRUCTION REQUIREMENTS**

Bushfire Attack Level (BAL)	Classified vegetation within 100 m of the site and heat flux exposure thresholds	Description of predicted bushfire attack and levels of exposure
BAL—LOW	See Clause 2.2.3.2	There is insufficient risk to warrant specific construction requirements
BAL—12.5	$\leq 12.5 \text{ kW/m}^2$	Ember attack
BAL—19	$> 12.5 \text{ kW/m}^2$ $\leq 19 \text{ kW/m}^2$	Increasing levels of ember attack and burning debris ignited by windborne embers together with increasing heat flux
BAL—29	$> 19 \text{ kW/m}^2$ $\leq 29 \text{ kW/m}^2$	Increasing levels of ember attack and burning debris ignited by windborne embers together with increasing heat flux
BAL—40	$> 29 \text{ kW/m}^2$ $\leq 40 \text{ kW/m}^2$	Increasing levels of ember attack and burning debris ignited by windborne embers together with increasing heat flux with the increased likelihood of exposure to flames
BAL—FZ	$> 40 \text{ kW/m}^2$	Direct exposure to flames from fire front in addition to heat flux and ember attack

Figure 16: Excerpt from AS3959-2009 (Source: Standards Australia, 2011)

As BAL categories for building construction are based upon distance from classifiable vegetation, dwelling siting is particularly important to accurately identify the appropriate building measures required.

The BPS report issued in 2007 identified a minimum 10m inner zone (excluding non 'firewise' trees and shrubs) and a 10m outer zone (understorey removed and ground fuels area managed). In addition, it recommends an additional 1m per degree of downslope to provide for added mitigation.

The BAL categories identified for particular sites at **Attachment B** contemplates the clearing rationale as identified in the original BPS report however, it also considers the building construction provisions as per AS3959-2009. This being the case, a range of BAL categories is identified over certain properties depending on where a dwelling may locate. Where a dwelling is located across two or more categories, the highest BAL category will apply to that dwelling. Alternatively, purchasers may engage a suitable qualified specialist to undertake a more tailored BAL assessment based on building and siting plans. As this information is not currently available, the BAL provisions as set out at **Attachment B** remain applicable.

In addition, the BAL categories identified are based upon site clearing / vegetation management (understorey thinned or removed) within the building envelope. If such activities are not undertaken as recommended by this report, higher BAL categories for dwelling construction will prevail and a tailored BAL assessment specific to the proposal will be required, prepared by a suitably qualified specialist. As noted, no clearing is permitted within the conservation envelopes on relevant properties which thus requires separation distance from vegetation located on-site with respect a small number of allotments.

Based on the separation distance provisions as per the original BPS report, the current version of AS3959-2009 as it applied at the time this report was prepared and the clearing and vegetation management provisions set out in section 6.5.1, provisional BAL categories are provided for those allotments which remained vacant at the time this report was prepared, refer to **Attachment B**. Where a building is sited outside of the provisions identified at **Attachment B**, a property-based BAL assessment will be required to contemplate the alterations and resultant BAL category.

6.6.1 Limitations of AS3959-2009

The Australian Standard provides that although its provisions are:

'designed to improve the performance of buildings when subjected to bushfire attack in designated bushfire-prone areas there can be no guarantee that a building will survive a bushfire event on every occasion. This is substantially due to the unpredictable nature and behaviour of fire and extreme weather conditions.'

It is significant to also understand the objective of AS3959-2009, which is to *'prescribe particular construction details for buildings to reduce the risk of ignition from a bushfire, appropriate to the:*

- a) *potential for ignition caused by burning embers, radiant heat or flame generated by a bushfire; and*
- b) *intensity of the bushfire attack on the building.'*

Further and as set out previously in this report, the FFDI provisions pursuant to AS3959-2009 adopted for Queensland is 40 and as such the design parameters in this context are designed to a maximum of Very High (FDI 25-49). Thus, fire days in excess of this (Severe, Extreme and Catastrophic days) are not accommodated by existing statutory building instruments and is beyond design parameters. As advised by the RFSQ at **Attachment D**, early evacuation on fire danger days above Very High is recommended, even if properties are well-prepared.

Importantly, the enhancement of survival of life and property relies upon a range of mitigation measures, including regular and on-going property and vegetation management as well as BAL construction requirements. Again, whilst all reasonable care and diligence has been applied throughout the preparation of this assessment and the identification of BAL provisions, these provisions in no way form a guarantee against the loss of life or property as a result of bushfire and it remains the responsibility of property owners to investigate, self-educate and understand how best to protect their property and lives in the event of bushfire. A range of helpful resources are listed in Section 9 of this report.

6.7 Fencing

Fencing materials can have a considerable impact on the propagation of fire. Likewise, some fencing materials can alleviate exposure to radiant heat which can assist life and property survival.

Upon inspection of the site is noted that rural style fencing is currently provided with timber-framed mesh fencing along property frontages and rural mesh fencing to side and rear boundaries.

Where purchasers undertake fencing it is recommended that styles which limit the use of timber (i.e. are 75% open style / transparent or use fire resistant and fire retardant materials) is recommended. Colorbond, masonry or rock fencing is acceptable however, traditional timber paling fences are not recommended.

6.8 Water Supply and Fire-Fighting Infrastructure

It is understood the site is connected to reticulated water. As per any new residential subdivision the reticulated water network must comply with Council's Subdivision Design and Construction Manual, which includes specific provisions for fire-fighting requirements. It is understood the site is serviced by a low pressure reticulated water supply with fire hydrants.

In some circumstances, reticulated water (pressure or supply) may not be guaranteed in the event of bushfire. This can be for a number of reasons including power outages to pump stations or damage to pump stations via bushfire or large amounts of water being drawn from the mains by fire services and the wider community. On this basis, it is strongly recommended that all dwellings are supplemented by a minimum 10,000 litre water tank or pool capable of draughting water for personal firefighting use in the event of ember attack. Ember attack can occur several kilometres ahead of a fire front.

Water tanks are not to be constructed of any material which may fail when exposed to excessive heat and must be located on that side of the building which is furthest away from any nearby bushland vegetation. Access around the entire perimeter of each dwelling should be maintained and any hoses and equipment should likewise be capable of reaching all external areas of the dwelling, including roof valleys.

Water tanks should also include a 50mm male camlock fitting for emergency fire service use (or as otherwise instructed by the local rural fire brigade). External hose connections both to reticulated water supplies and directly to the storage tank are recommended. The location of these on each property relative to the siting of the dwelling should ideally be discussed with the local rural fire brigade.

External fire-fighting systems for dwellings, such as 30m fire hoses and roof and gutter-mounted sprinkler systems, may be contemplated by prospective owners to enhance fire-fighting ability however this is not specifically required. It is noted that such systems do have certain limitations which should be considered prior to installation, if so desired. Such systems cannot guarantee the preservation of life or property in the event of a bushfire.

Plastic gas fittings are not acceptable.

6.9 Bushfire Awareness

Landowners are responsible for developing their own knowledge and understanding of the level of bushfire risk specific to their respective properties. A household bushfire plan is required and must take account of matters such as where occupants are during the day (at home, work or school), if any occupants require special assistance (i.e infants, the elderly or the ill), evacuation routes available, evacuation destinations, property maintenance and preparation and arrangements for pets. Planning ahead of any perceived bushfire event is essential.

Understanding what to do in the event of bushfire emergency is critical, residents may not always receive an extended warning or warning to evacuate and fire appliances may not always be available to render assistance. Thus, prior knowledge as to the steps to take during the lead up to a fire event, during the passage of bushfire and what to do immediately after the fire front has passed is critical.

The RFSQ's 'Bushfire Survival Plan' provides detailed information on how to prepare for the bushfire season and how to take action to survive in the event of bushfire. A copy of this publication is enclosed at **Attachment D**.

7

SUMMARY OF RECOMMENDATIONS

This report contains a number of recommendations relating to specific bushfire mitigation measures. These recommendations are summarised below and must be implemented by the purchasers and / or Logan City Council.

1. Provide a copy of this report to Logan City Council, the local rural fire brigade and all current and potential purchasers for review
2. Establish and maintain a 10m wide low / no fuel zone around the external perimeter of the dwelling
3. Clear ground and surface (understorey) vegetation on the property where outside of the conservation covenant areas and ensure all trees retained are isolated individuals with separated canopies
4. Continue to provide rural mesh fencing. If rural mesh fencing is not preferred, provide masonry or colorbond fencing as an alternative to traditional timber paling fencing. Timber paling fencing is not recommended
5. Maintain the established fire trail network and its points of access as identified at **Attachment B** and pursuant to design specifications set out in Section 6.2 where required
6. Ensure property setbacks and BAL provisions comply as per the requirements set out at **Attachment B**, or unless otherwise assessed by a qualified specialist or building certifier where a property-specific assessment is undertaken pursuant to AS3959-2009
7. Potential purchasers seek advice from a qualified and registered builder, suitably qualified bushfire specialist and / or building certifier with regard to the construction requirements identified for respective properties set out in **Attachment B**
8. Ensure the collective range of bushfire mitigation measures as identified within this report and illustrated at **Attachment B** are implemented to ensure the bushfire attack levels identified can be achieved
9. Where dwellings are located toward the centre or rear of lot, thereby requiring a longer driveway access, it is recommended the driveway be suitably sealed to support a tanker appliance up to 25 tonnes with a width of a minimum of 4m and height clearance of 4m from overhanging branches. Any bends in the driveway should provide a turning area equivalent to a 20m diameter
10. If a driveway is relatively straight, sufficient space should be available to allow a fire appliance to manoeuvre on site and leave the property in a forward gear
11. Any driveways over an easement providing access to a fire trail are required to permit 24 hour access to the easement as required. No fencing or gates or obstructive structures or landscaping should be provided across or within these easements
12. Council and / or the local rural fire brigade are required to undertake regular inspections and maintenance of all Council-owned land adjoining the subject site. Removal of ground fuel matter and management of vegetation (mowing, pruning, thinning, etc) is required prior to every fire season

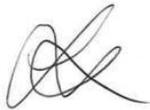
13. The CFA's 'Landscaping for Bushfire' guide is utilised in garden design and plant selection process for all properties. Purchasers should be aware of how to create and maintain a 'fire-wise' garden so as to limit fuels surrounding dwellings
14. Purchasers are strongly recommended to consider the installation of a 10,000l water tank (and stand-alone pump) with necessary emergency firefighting attachments for personal fire-fighting purposes. This may assist to provide additional capacity to protect against ember attack should the need arise
15. Land-owners ensure water tanks are always full prior to each bushfire season
16. Plastic gas fittings for individual dwellings are not acceptable and should not to be used
17. Purchasers should consider additional fire preparedness at the dwelling design stage. This may be in the form of:
 - a. limiting the number of roof valleys and wall articulations so as to reduce the number of points around the dwelling where embers may lodge
 - b. include window and door sills of 18 degrees or higher to allow embers to easily roll off or blow away
 - c. incorporate laminated glass such that, in the event of fracturing from radiant heat, the possibility of ember entry is reduced
 - d. provide gutter guards to keep leaf litter and vegetation debris out of gutters, which may catch alight via ember attack
 - e. consider roof tie-down to protect against fire-driven wind
 - f. consider the use of mounted sprinklers and / or hoses for additional fire-fighting protection external to the house
 - g. design dwellings to accommodate higher BAL construction requirements than required under the Australian Standard
18. Land-owners seek to educate and inform themselves and their family members on how to appropriately manage bushfire risk, how to prepare themselves and their properties for a bushfire event and what to do in the event of a bushfire.

8

CONCLUSIONS

This report considers the bushfire mitigation measures required for Stage 13) as part of the Spring Mountain Estate. Based upon on-site inspections and analysis, a range of mitigation measures are identified to aid in the defence against bushfire with respect to areas of classifiable vegetation which surround the development site.

Based on this assessment, a range of recommendations has been derived. In addition, it is significant to note that bushfire remains a natural process which is endemic to the Australian bush and it remains subject to a range of contributing factors which are variable almost on a daily basis. As such, it is extremely difficult to predict the behaviour and intensity of a fire event at any given time. On this basis, it remains of the utmost importance that residents within identified bushfire prone areas obtain knowledge and remain aware of their options in the event of a bushfire to ensure the preservation of both life and property.



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AUTHOR'S PROFILE

Laura is a qualified specialist in the area of bushfire planning and management, with extensive knowledge and experience with regard to bushfire hazard planning policy, bushfire responsive strategic planning and planning for development in bushfire hazard areas. Laura maintains nationally accredited training in the area of risk based land use planning with the Australian Emergency Management Institute as well as development and building in bushfire prone areas with the University of Technology, Sydney in partnership with the Country Fire Authority of Victoria.

Laura is a member of the State Government's Bushfire Risk Advisory Group. Laura is also a Member of the Fire Protection Association of Australia, the Australian Institute of Emergency Services and the Planning Institute of Australia. Laura maintains an honours degree in Regional and Town Planning from the University of Queensland and a Graduate Certificate in Project Management from the University of South Australia.

9

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Attachment A

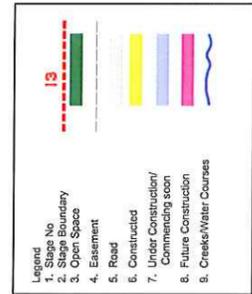
STAGE 13 APPROVED PLAN OF RECONFIGURATION

CFA'S LANDSCAPING FOR BUSHFIRE GUIDELINE



STAGE	ALLOTMENT YIELD					TOTAL	MINIMUM	MAXIMUM	AVERAGE	TOTAL (LOTS)
	COMPACT <3999 m	STANDARD 4000-4999m	CHOICE 5000-5999 m	PREMIUM 6000-6999m	SUPERIOR 7000-7999m					
11A	-	15	-	1	-	16	4000	6551	4248	6,7965
11B	-	11	6	4	5	26	4069	7892	5687	14,7860
12A	-	21	11	3	-	35	4065	8620	4897	17,1408
12B	-	9	16	3	-	28	4151	6420	5208	14,5822
13	-	24	11	1	-	2	4000	8651	4805	19,0762
15	4	45	5	2	7	62	3500	9472	4147	23,7929
16	7	54	3	2	-	68	3500	2,9001ha	5224	35,5353
17	5	47	7	2	2	5	4000	1,4193ha	5297	35,4878
18	-	42	12	4	4	67	4000	4006	4002	2,4001
SMD (RESIDENTIAL)	-	6	-	-	-	1	4005	4005	4005	0,4005
SMD (COMMERCIAL)	-	1	-	-	-	-	-	-	-	-
TOTAL	No OF LOTS					408	TOTAL AREA OF LOTS			203,3697ha

PEET SPRING MOUNTAIN



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DATE: 15/09/03
 CHECKED: BJD
 DATE: 25.2.2014
 DRAWN: BJD
 DATE: 15.9.2003
 SCALE: 1:5000
 DWG. NO.: 14/03/03-03

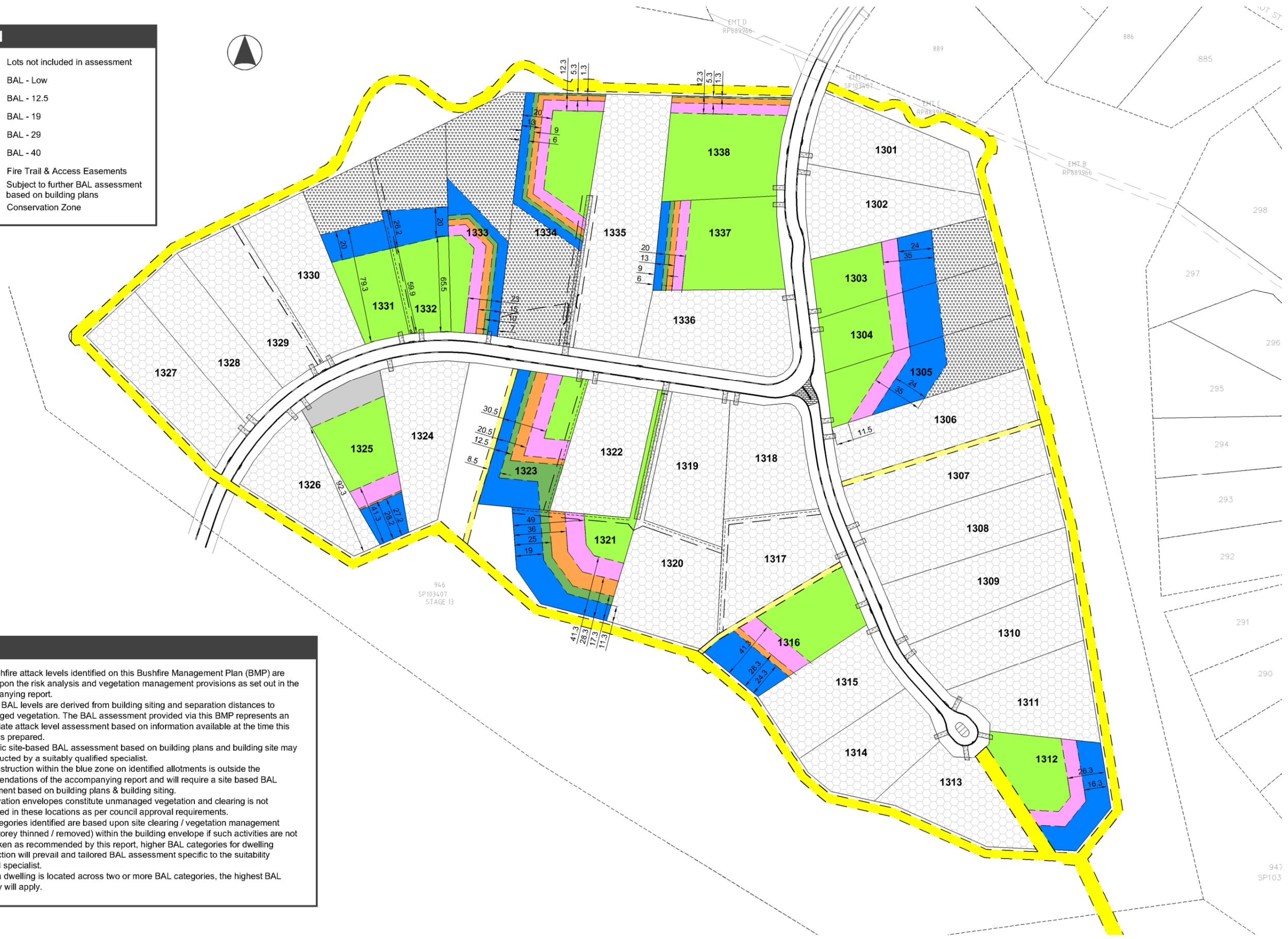
1: VADAP/PEET - Spring Mountain 2014 (2014) 14/03/03-03 (PEET) 14/03/03-03

General Notes
 This Plan has been prepared for discussion purposes only, and is subject to the following:
 1. The boundaries shown herein have been determined from plan information & DCD30 2013. No search has been undertaken for Easements or other encumbrances on this site or any other parcels. The dimensions, areas and total number of lots shown herein are based on the information on this plan for any financial dealings involving the land. The information on this plan is for general guidance only and should not be relied upon for any financial dealings involving the land. The information on this plan is for general guidance only and should not be relied upon for any financial dealings involving the land. The information on this plan is for general guidance only and should not be relied upon for any financial dealings involving the land.

Scale 1:5000 @ A1 paper size - Lengths are in Metres.
 50 0 50 100 150 200 250 300 350 400 450 500 550 600 650 700

Legend

-  Lots not included in assessment
-  BAL - Low
-  BAL - 12.5
-  BAL - 19
-  BAL - 29
-  BAL - 40
-  Fire Trail & Access Easements
-  Subject to further BAL assessment based on building plans
-  Conservation Zone



- Notes**
1. The bushfire attack levels identified on this Bushfire Management Plan (BMP) are based upon the risk analysis and vegetation management provisions as set out in the accompanying report.
 2. Specific BAL levels are derived from building siting and separation distances to unmanaged vegetation. The BAL assessment provided via this BMP represents an appropriate attack level assessment based on information available at the time this BMP was prepared.
 3. A specific site-based BAL assessment based on building plans and building site may be conducted by a suitably qualified specialist.
 4. Any construction within the blue zone on identified allotments is outside the recommendations of the accompanying report and will require a site based BAL assessment based on building plans & building siting.
 5. Conservation envelopes constitute unmanaged vegetation and clearing is not authorised in these locations as per council approval requirements.
 6. BAL categories identified are based upon site clearing / vegetation management (understorey thinned / removed) within the building envelope if such activities are not undertaken as recommended by this report, higher BAL categories for dwelling construction will prevail and tailored BAL assessment specific to the suitability qualified specialist.
 7. Where a dwelling is located across two or more BAL categories, the highest BAL category will apply.



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Drawing Ref: BMP-7763-002-B
 Date: 11/08/14
 Scale: 1:2,500 @ A3


Bushfire Management Plan
Stage 13 - Spring Mountain Estate
 for MTA Superannuating Fund (Flagstone Creek & Spring Mountain Park)

PLANT SELECTION KEY

About the key

The Plant Selection Key is a practical tool developed to guide you in choosing plants suitable for use in a garden in a high bushfire risk area.

The key comprises a series of questions and information about plant characteristics and their relative flammability. The key provides:

- › an overall flammability rating
- › a firewise rating
- › advice about maintenance
- › advice about whether the plant is appropriate for a garden.

An interactive version of this key is available online at cfa.vic.gov.au/plants

This Plant Selection Key is based on Behm AL, Long AJ, Monroe MC, Randall CK, Zipperer WC, Hermansen-Baez LA (2004) *Fire in the Wildland-Urban Interface: Preparing a Firewise Plant List for WUI Residents*. Circular 1453, School of Forest Resources and Conservation, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida.

Address: Southern Center for Wildland-Urban Interface Research and Information,
408 W. University Ave., Suite 306, USDA Forest Service, Gainesville, FL 32601.
Email (ahermansen@fs.fed.us) or fax (1-352-376-4536).

The Plant Selection Key has been customised to better suit Australian conditions and is intended to provide an indication of plant flammability. The flammability of plants is highly variable and in periods of drought or in the path of an oncoming bushfire, plants will dry out and become highly flammable. If there is uncertainty about the results this key produces, seek professional advice from a plant specialist.

PLANT SELECTION KEY

USING THE KEY: A THREE STEP PROCESS

1. Make a list of plants to be used in the garden

As a starting point, make an initial list of plants you want to plant in a garden. In doing this, it is important to:

- Choose plants that are suited to the local growing conditions.
- Check with your local council about legislative controls that may apply to your property. These may influence what and where you can plant.
- Check for characteristics that influence flammability. These are outlined in Section 5.
- Identify the plant species, including both the common name and the scientific name. This is important as even closely related plants in the same genus can vary greatly in their flammability.
- Take note of the size and form of the plant at maturity. Plant labels often focus on plant size within five to ten years of planting and may not be reliable for this assessment.
- Note how the plant will look in summer and whether it is susceptible to disease, insects or pests. This information can be obtained from plant websites, books, the local nursery or council.

2. Work through the key

- Begin at 1. *What type of plant is it?* and follow the prompts to the next number.
- Record how many 'Less Firewise' or 'Not Firewise' results the plant receives in the record sheet on page 62 at the end of the key.
- Collate the results in the record sheet.

3. Rate each plant for its suitability in the garden

The table on page 45 outlines four firewise ratings – Not Firewise, At-Risk Firewise, Moderately Firewise and Firewise – and a corresponding flammability rating. The flammability rating of individual plants depends on the number of 'Less' or 'Not Firewise' results you record.

Once you have established the firewise and flammability rating for each plant, you can determine the plant's suitability for use within a garden, where it should be planted (presuming it is suitable) as well as maintenance requirements.

FIREWISE AND FLAMMABILITY RATINGS

NOT FIREWISE

If you record any **NOT FIREWISE** results, regardless of any **LESS FIREWISE** results, then that plant is **NOT FIREWISE**.

- **Flammability = Extreme**
- **Where to plant:** These plants should not be planted in a garden or used when landscaping for bushfire.

AT-RISK FIREWISE

If you recorded three or more **LESS FIREWISE** results, then that plant is **AT-RISK FIREWISE**.

- **Flammability = High**
- **Where to plant:** Avoid using these plants in a garden. If you are on a large property, they may be planted outside the defensible space.

MODERATELY FIREWISE

If you recorded one or two **LESS FIREWISE** results, then that plant is **MODERATELY FIREWISE**.

- **Flammability = Moderate**
- **Where to plant:** These plants can be used in a garden but they need regular maintenance to keep them in a less flammable condition.

FIREWISE

If after finishing the key you had no **LESS FIREWISE** results, then that plant is **FIREWISE**.

- **Flammability = Low**
- **Where to plant:** These plants can be used in a garden as they are not known to be particularly flammable.

**BEGIN
PLANT
SELECTION KEY**



PLANT SELECTION KEY

1. What type of plant is it?



Tree

- Has single or multiple woody trunks and grows from 5-30 metres or over at maturity.
- Single-stem trees typically branch well above the ground, while multiple-stemmed trees typically branch close to the ground.
- Foliage is concentrated in the canopy allowing other vegetation to grow underneath.
- Has highly variable leaf and bark types.

Go to 2



Palm or palm-like

- Vary greatly in height.
- Generally have a single woody trunk topped by fronds.
- Many species retain dead fronds which can be flammable.
- Australian palm-like plants include tree-ferns, screw-palms, cycads and grass-trees. They can grow several metres tall and also have a 'skirt' of dead fronds or leaves close to the ground. This is an important flammability characteristic as it can act as a ladder fuel.

Go to 9



Shrubs

- Are shorter and generally more compact than trees, typically 3-4 metres in height with branching close to the ground.
- Have dense, bushy foliage and woody stems.
- Because of this structure, shrubs can carry fire from the ground to the tree canopy.

Go to 13



Vines and climbers

- Have soft or woody stems and are climbing or scrambling plants. Are often grown over fences, pergolas or trellises and can grow over other plants.
- Can be deciduous or evergreen. Some accumulate large amounts of dead leaves.
- Can act as ladder fuel and carry flames up into shrubs, trees or supporting structures.
- Examples include grapes, Virginia Creeper, Coral pea, Running Postman or Happy Wanderer.

Go to 17



Herbaceous plants

- Have soft and fleshy leaves with non-woody stems.
- Are low-growing, often less than 50 centimetres tall.
- Include most smaller flowering plants grown in gardens. Can look 'shrubby', form clumps or grow as groundcovers.
- Moisture content is usually higher than most woody shrubs. Often droop when dry.
- Examples include violets and pansies.

Groundcovers

- Are woody or herbaceous. Woody groundcovers spread without climbing.
- Are generally less than 50 centimetres tall.

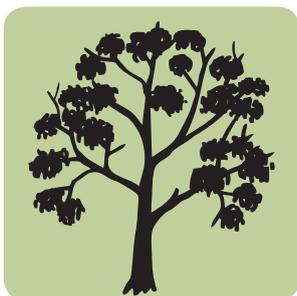
Grasses or grass-like

- Leaves are usually long, fine or strappy.
- Vary from a few centimetres to over 2 metres tall. Clump size can be up to 1 metre in diameter.
- Most grasses grown in gardens are perennial rather than annual. Many of these form clumps called tussocks. Examples include Wallaby Grass and Canary Grass.
- Perennial tussock grasses accumulate dead material mixed with the living leaves and are quite flammable, although they usually only burn for a short time.
- Other grasses grow as a continuous mat, such as lawn grasses.
- Leaves of grass-like plants are often coarse and thick and may accumulate dead leaves in the living clump. Examples include Mat rush, New Zealand Flax, Iris and Gladioli.

Go to 18



2. What type of tree is it?



Eucalypts

- Can have woolly fibrous bark (stringy bark), deeply corrugated and dense bark (iron bark), 'chippy' or platy bark (box bark) or smooth (gum bark).
- All flower and have leaves that hang vertically.
- Their bark can be extremely flammable.
- Examples include trees from the genera *Eucalyptus*, *Corymbia* (includes Flowering Gums) and *Angophora* (includes Smooth Barked Apple and Dwarf Apple that are similar in appearance to smooth barked gums).

Go to 3



Conifer or conifer-like

- Develop woody cones and have needle-like or scale-like leaves.
- Examples include pines, hemlocks, spruces, junipers, cedars and cypress.
- Native Australian examples include Cypress Pine, Cherry Ballart and she-oaks.

Go to 7



Other tree types

- This category contains all trees that are not eucalypts, conifers or conifer-like.
- Leaf type can vary greatly. For example:
 - the small leaves and phyllodes (lea-like structures) of wattles such as Blackwood and Silver Wattle
 - the medium-sized leaves of Lilly Pilly and Southern Sassafras
 - the deeply lobed leaves of Silky Oak
 - the wider, broad leaves of Kurrajong and non-native species such as maples, oaks and elms.

Go to 11

3. What type of bark does the tree have?



Stringybark eucalypt with coarse, loose fibrous bark

- Examples include Messmate and Red Stringybark.

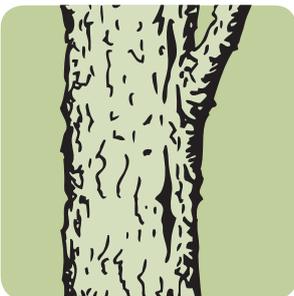
Go to 4



Sheds large ribbons or sheets of bark annually

- Strips or ribbons of bark are caught and held in the tree.
- Examples include many smooth or gum-barked eucalypts such as Manna Gum and Mountain Grey Gum.

Go to 8



Does not have stringy bark or ribbons of bark

- Examples include iron bark, some gum-bark species, box bark and peppermint bark eucalypts.

Go to 5

4. NOT FIREWISE



- Trees with this type of bark are extremely flammable.
- This type of bark acts as a ladder carrying fire into the canopy of the tree and produces masses of embers.

For more information, see *Section 3: Rules for vegetation clearance around existing houses* or *Section 5: Choosing suitable plants*.

Go to 29 (END)

5. What is the height of the lowest branch?



Low Branches are less than 2 metres above the ground.

Go to 6



Good separation At least 2 metres between ground and branches.

Go to 20

6. LESS FIREWISE



- Trees must be under-pruned up to 2 metres if possible and dead branches and fronds removed to ensure a more firewise characteristic.

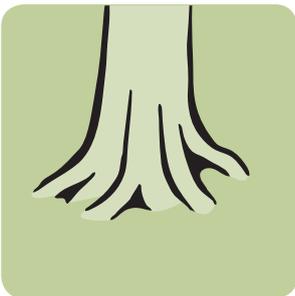
Go to 11

7. Does it shed large amounts of leaves or needles?



Yes The conifer sheds large amounts of leaves or needles. For example, Monterey Pine.

Go to 8



No The conifer or conifer-like tree does not shed large quantities of leaves or needles. Examples may include native Cypress Pine, she-oak and Cherry Ballart.

Go to 9

8. LESS FIREWISE



- Pine needles need to be periodically removed from roofs, other plants and the ground near structures.
- Eucalypt bark and foliage should also be routinely removed from the tree and the ground.

Go to 9

9. What is the height of the lowest branch or frond?



Low Branches or fronds are less than 2 metres above the ground.

Go to 10



Good separation At least 2 metres between ground and branches.

Go to 11

10. LESS FIREWISE



- Trees must be under-pruned to a height of 2 metres if possible and dead branches and fronds removed to ensure a more firewise characteristic.

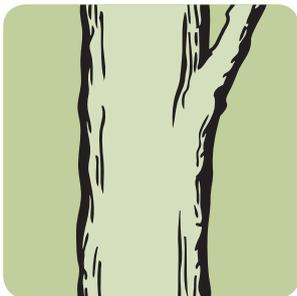
Go to 11

11. Does it have papery or loose bark?



Yes Trunk has papery bark or loose fibrous bark.
For example tea-trees and most paper barks.

Go to 12



No Trunk does not have papery bark or loose fibrous bark.

Go to 20

12. LESS FIREWISE



- Papery bark and fibres may act as ladder fuels.
- Requires appropriate placement in your garden.

Go to 20

13. What is the plant's texture?



Fine texture

- Texture is used to describe the overall appearance of the plant from a distance.
- From a distance of about 3 metres it is not easy to distinguish individual leaves or branches on plants with a fine texture.
- Examples include diosma and some paper barks with thin, narrow leaves. The fineness of foliage (the surface area-to-volume-ratio) is a very important determinant of flammability.

Go to 14



Medium texture

- This category includes many azalea and holly species as well as the natives Sarsaparilla and Hairpin Banksia.

Go to 15



Coarse texture

- It is easy to distinguish each individual leaf or branch from a distance of about 3 metres.
- Examples include hydrangea, cotoneaster, hazel pomaderris and blanket leaf.

Go to 15

14. LESS FIREWISE



- Plants with a fine texture have a higher surface-area-to-volume ratio and tend to dry out more readily than medium- and coarse-textured plants. This makes them generally more flammable.
- Require appropriate placement and routine pruning.

Go to 15

15. How dense is the plant?



Very dense

- So dense that it is very difficult to place a hand in the plant and touch the main stem. These plants have dense branches.
- Examples include shrubby grevilleas and junipers.

Go to 16



Moderately dense

- Sufficiently dense to not be able to see through the plant, but reasonably easy to place a hand into the plant and touch the main stem.
- Examples include some lavenders, rosemary and some correas.

Go to 20



Sparsely dense

- May have open branching patterns, making it easy to see through the plant.
- Examples include many wattles, rhododendrons and some hydrangeas.

Go to 20

16. LESS FIREWISE



- Dense plants have a larger amount of fuel packed closely together, which encourages the spread of flames within the plant.
- Require appropriate placement and routine pruning.

Go to 20

17. NOT FIREWISE

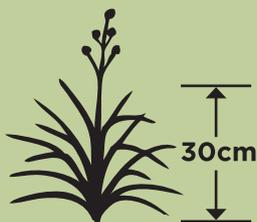


- Vines are extremely flammable as they typically add fuel directly to a structure. As such, they act as ladder fuels bridging gaps between surface fuels and canopy fuels.

For more information, see *Section 3: Rules for vegetation clearance around existing houses* or *Section 5: Choosing suitable plants*.

Go to 29 (END)

18. Is it a grass greater than 30 centimetres tall?



Yes Grass is greater than 30 centimetres tall (for example grass in the Family Poaceae or Gramineae).

Go to 19

No Short grasses and all other herbaceous plants or grass-like plants.

Go to 20



19. NOT FIREWISE



- Regardless of how many **LESS FIREWISE** results you may get, tall grasses are extremely flammable because they readily dry out and rapidly carry fire.

For more information, see *Section 3: Rules for vegetation clearance around existing houses* or *Section 5: Choosing suitable plants*.

Go to 29 (END)

20. Does the plant retain dead leaves or twigs?



Yes Plant retains dead leaves or twigs mixed with the living leaves.

- Retention of dead leaves or twigs increases the flammability of a plant. Fine fuels readily dry out and increase the fuel available within the plant for fire.

Go to 21



No Plant does not usually retain dead leaves or twigs, except when shedding leaves.

Go to 22

21. NOT FIREWISE



- Regardless of how many **LESS FIREWISE** results you receive for this plant, plants that retain dead foliage throughout the year are extremely flammable.
- Dead foliage has very low leaf moisture content and is therefore highly susceptible to ignition.

For more information: see *Section 3: Rules for vegetation clearance around existing houses* or *Section 5: Choosing suitable plants*.

Go to 29 (END)

22. Are the leaves waxy or oily?



Yes Leaves have a waxy coating or numerous oil glands dotted on the leaves.

- The leaves of plants containing significant amounts of oils and waxes will often have a strong scent when crushed. The presence of these chemicals often contributes to plant flammability.
- Plants with waxy leaves are often grey, silver or whitish and the waxy 'bloom' can be scraped off the leaf with a fingernail. For example, Wax Myrtle and gallberry.
- Plants in the families Myrtaceae, Rutaceae, Lamiaceae and Pinaceae are examples of plants with numerous oil glands. [Go to 23](#)



No Leaves do not have a waxy coating or numerous oil glands.

[Go to 24](#)

23. LESS FIREWISE



- Plants with large amounts of oils and waxes are more flammable than those without these chemicals.
- Require appropriate placement and routine pruning.

[Go to 24](#)

24. Is the species seriously susceptible to disease, insects or pests?



Yes Species is known to be seriously susceptible to disease or insect pests.

- Plants seriously susceptible to disease are likely to become stressed and have less vigorous growth.
- When this happens, there is a lower foliage moisture content and a greater number of dead leaves are retained. This in turn makes the plant more flammable. For example, elm trees.

Go to 25



No Species is not known to be particularly susceptible to disease or insect pests.

Go to 26

25. LESS FIREWISE



- Routine monitoring and appropriate treatment for the disease or pest is recommended.

Go to 26

26. Is the plant deciduous or evergreen?



Deciduous Plants drop all leaves once a year and the new leaves usually have higher moisture content than evergreen plants.

Go to 29



Evergreen Plants retain leaves for several years.

Go to 27

27. Are the leaves soft, thick or fleshy?



Yes Plant leaves are soft, thick, succulent or fleshy.

- These types of leaves often have a higher moisture content than hard, thin and needle-like leaves, making them less flammable.
- Moisture can often be seen on the exposed edge of torn leaves. Examples include cactus, agave, some myoporums such as Creeping Myoporum, many Lilies, some saltbush species and geraniums.

Go to 29



No Plant leaves are not obviously succulent; they may have various shapes and vary in thickness.

Go to 28

28. LESS FIREWISE



- Require appropriate placement and routine pruning.

Go to 29

29. END

How many LESS FIREWISE ratings did your plant score?	Then your plant is:	What does this mean?
None	FIREWISE	<ul style="list-style-type: none"> ➤ Flammability = Low ➤ Where to plant: These plants can be used in a garden as they are not known to be particularly flammable.
 or 	MODERATELY FIREWISE	<ul style="list-style-type: none"> ➤ Flammability = Moderate ➤ Where to plant: These plants can be used in a garden but they need regular maintenance to keep them in a less flammable condition.
 or more	AT-RISK FIREWISE	<ul style="list-style-type: none"> ➤ Flammability = High ➤ Where to plant: Avoid using these plants in a garden. If you are on a large property, they may be planted outside the defensible space.
Was your plant NOT FIREWISE?	NOT FIREWISE	<ul style="list-style-type: none"> ➤ Flammability = Extreme ➤ Where to plant: These plants should not be planted in a garden or used when landscaping for bushfire.

WHAT TO DO NEXT

- It is important to consider the role that plant selection plays in enhancing defensible space.
- If the plant is 'Firewise' or 'Moderately Firewise', locate it according to the design principles as outlined in Section 4. Remember, the location and arrangement of plants has a significant effect on reducing the bushfire risk within your garden, but during summer as soil dries out, the moisture content of plants will decrease and their flammability will increase.
- If the plant is 'At Risk' or 'Not Firewise' it should not be planted within the defensible space. For further information, see *Section 3: Rules for vegetation clearance around existing homes* or *Section 5: Choosing suitable plants*.
- You can also book a free Home Bushfire Advice Service visit where a member of CFA will assess your property and provide a range of options to assist you to develop your Bushfire Survival Plan. Go to cfa.vic.gov.au/hbas for information and bookings.

RECORD SHEET

➤ Use this sheet to record the plant name and how many 'Less Firewise' or 'Not Firewise' results the plant receives as you work through the Plant Selection Key.

Plant name	NOT FIREWISE Circle the questions that had a Not Firewise outcome	LESS FIREWISE Circle the questions that had a Less Firewise outcome	Firewise Rating	Flammability
			NOT FIREWISE (any Not Firewise results)	Extreme
			AT-RISK FIREWISE (3 or more Less Firewise results)	High
			MODERATELY FIREWISE (1 or 2 Less Firewise results)	Moderate
			FIREWISE (no Less Firewise results)	Low
	4. 17. 19. 21.	6. 8. 10. 12. 14. 16. 23. 25. 28.		
	4. 17. 19. 21.	6. 8. 10. 12. 14. 16. 23. 25. 28.		
	4. 17. 19. 21.	6. 8. 10. 12. 14. 16. 23. 25. 28.		
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	4. 17. 19. 21.	6. 8. 10. 12. 14. 16. 23. 25. 28.		
	4. 17. 19. 21.	6. 8. 10. 12. 14. 16. 23. 25. 28.		
	4. 17. 19. 21.	6. 8. 10. 12. 14. 16. 23. 25. 28.		
	4. 17. 19. 21.	6. 8. 10. 12. 14. 16. 23. 25. 28.		
	4. 17. 19. 21.	6. 8. 10. 12. 14. 16. 23. 25. 28.		
	4. 17. 19. 21.	6. 8. 10. 12. 14. 16. 23. 25. 28.		
	4. 17. 19. 21.	6. 8. 10. 12. 14. 16. 23. 25. 28.		

FURTHER RESOURCES

CFA

cfa.vic.gov.au

Fire Ready Kit

On the Land: Agricultural Fire Management Guidelines

A guide to retrofit your home for better protection from a bushfire

Fire Service Guidelines:

- *Land Use Planning 0002: Requirements for Water Supply and Access in a Bushfire Management Overlay*
- *Land Use Planning 0003: Assessing Vegetation in a Bushfire Management Overlay*

OTHER

dpcd.vic.gov.au/planning/bushfire

Fact Sheet: Planning and Building for Bushfire Protection

Advisory Note 39: Amendment VC83 Bushfire Protection Vegetation Exemptions

Advisory Note 40: Amendment VC83 Bushfire Protection Bushfire Planning Provisions

Practice Note 64: Local Planning for Bushfire Protection

Practice Note 65: Bushfire Management Overlay and Bushfire Protection: Planning Requirements

planningschemes.dpcd.vic.gov.au

Clause 13.05 Bushfire

Clause 44.06 Bushfire Management Overlay

Clause 52.17 Native vegetation

Clause 52.43 Interim Measures for Bushfire Protection

Clause 52.47 Bushfire Protection: Planning Requirements

Clause 52.48 Bushfire Protection: Exemptions

Planning for Bushfire in Victoria (CFA and DPCD, forthcoming)

Department of Sustainability and Environment

dse.vic.gov.au

land.vic.gov.au

Department of Primary Industries

dpi.vic.gov.au

Municipal Association of Victoria

Council details can be found at mav.asn.au/about-local-government/council-details

Ramsay, C and Rudolph, L, 2003 *Landscape and Building Design for Bushfire Areas*, CSIRO, Melbourne.

Standards Australia AS 3959-2009: Construction of Buildings in Bushfire-prone Areas

Bushfire Survival Plan

PREPARE. ACT. SURVIVE.

Tomorrow's Queensland: strong, green, smart, healthy and fair



You must **PREPARE**. **ACT**. **SURVIVE**.

Your main priority is to ensure that you and your family are safe. During a bushfire you and your family's survival and safety depend on your preparations, and the decisions you make.

The lives of you and your family are more important than any building.

Whether your plan is to leave early or stay, you must prepare your home and property to increase their level of resilience and your chances of survival.

Bushfires in Queensland

The fire season in Queensland normally commences in the far north of the state in July and progresses through to southern areas as spring approaches. The fire season can extend through to February in southern and far south-western Queensland. These time frames can vary significantly from year to year, depending on the fuel loads, long-term climate and short-term weather conditions in each area.

There are four key considerations for dealing with bushfire:

- The safety of you and your family.
- The resilience of your property.
- The protection of irreplaceable valuables and important documents.
- The maintenance of adequate levels of insurance.

This document will provide you with information about the things you need to consider to prepare yourself and your home for the bushfire season, and how to make your own personal Bushfire Survival Plan.

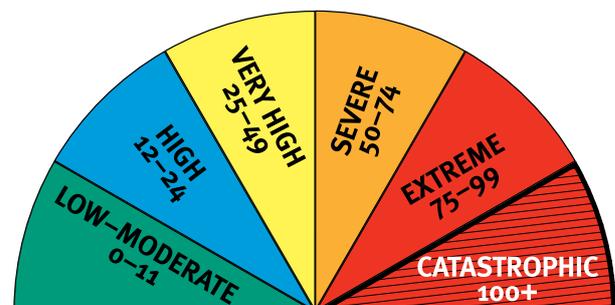
It is your responsibility to prepare yourself, your family and your home for the threat of bushfire.

Understand your risk

The first step in planning to survive a bushfire is to understand your own level of risk. By understanding your own level of risk you will be able to make informed decisions that are right for you and your family. Included with this Bushfire Survival Plan is a self-assessment tool that will enable you to assess the risk level associated with your property. If you are still unsure of your level of risk or require assistance contact your local fire station for more information. To book a Bushfire Safety presentation call 1300 369 003.

Fire danger ratings

The increased frequency of extreme bushfires in Australia in the last 10 years and the recent experience of the Black Saturday fires in Victoria have encouraged fire services throughout Australia to introduce new levels of Fire Danger Rating (FDR). A lift-out chart of the FDR system is contained within this document. Display it in a prominent place in your home or keep it with your Bushfire Survival Plan.



Catastrophic fire danger rating

The highest level is catastrophic. On a day of catastrophic FDR leaving early is the only option to ensure your survival. You must relocate early to a safer location, hours or the day before a fire occurs. Under no circumstances will it be safe to stay with your property.

Extreme fire danger rating

The second highest level is extreme. Should a fire occur in your area on a day of extreme FDR leaving early will always be the only option. Staying can only be considered for homes that:

- Have been designed and constructed specifically to address the threat of bushfire.
- Have been maintained to those levels and are currently well prepared.
- Can be actively defended by people with the skills, knowledge and confidence to implement a well-rehearsed Bushfire Survival Plan.

On days of catastrophic or extreme FDR:

- Fires are likely to be uncontrollable, unpredictable and very fast moving with highly aggressive flames extending high above tree tops and buildings.
- Thousands of embers may be violently blown into and around homes causing other fires to start rapidly and spread quickly up to 20 kilometres ahead of the main fire.
- Fire can threaten suddenly, without warning, and the heat and wind will make it difficult to see, hear and breathe as the fire approaches.
- People in the path of such fires will almost certainly be injured or die and a significant number of homes and businesses will be destroyed or damaged.
- Even well-prepared and constructed homes will not be safe.
- Expect power, water and phone networks to fail as severe winds bring down trees, power lines and blow roofs off buildings well ahead of the fire.

It is vital that you understand on these days that your survival will depend solely on how well you have prepared and how decisively you act.

Leaving late can be
a deadly option.
If you are in any doubt,
make the decision to
LEAVE EARLY.

What will you do?

At all times you need to **PREPARE.ACT.SURVIVE.**

When the fire danger rating is '**catastrophic**' leaving early is the safest option.

When the fire danger rating is lower than '**catastrophic**', one of the most important decisions you need to make is whether you will leave early or stay with a well prepared property. This decision is the basis of your Bushfire Survival Plan.

The following questions may help you make the right decision for whether you will leave early or stay:

- Do you need to consider family members who are young, elderly or infirm?
- Are you physically and emotionally prepared to stay with your property?
- Do you have the knowledge, skills, and confidence to stay with your property?
- Is your home adequately constructed, maintained and prepared to withstand the impact of a fire? In other words, is your home prepared to withstand the impact of a bushfire?
- Do you have well-maintained resources and equipment to fight fire, and do you know how to use them?
- Do you have appropriate protective clothing to fight a fire?
- What will you do if a rapid onset fire leaves you with no time to leave? Where will you shelter?



Leave early

If you plan to leave early then you must leave your home well before a bushfire threatens and travelling by road becomes hazardous. Your leave early preparations include:

Step 1: Preparation – your property should be well prepared for bushfire even if you intend to leave early.

Step 2: What you will do – make your Bushfire Survival Plan in accordance with your decision to leave early.

Step 3: Make a contingency plan – the FDR, the preparedness of your home, a change in household circumstances, a change in your physical preparedness or unexpected visitors are some things that may require you to reconsider your Bushfire Survival Plan.

Planning to stay

Planning is critical to successfully staying with your home may involve the risk of psychological trauma, injury or death.

Step 1: Preparation – your property must be able to withstand the impact of bushfire and well prepared to shelter you and your family.

Step 2: What you will do – make your Bushfire Survival Plan in accordance with your decision to stay.

Step 3: Make a contingency plan – the FDR, the preparedness of your home, a change in household circumstances, a change in your physical preparedness or unexpected visitors are some things that may require you to reconsider your Bushfire Survival Plan.

In making your decision to stay, here are a few things you need to consider.

- Is your property able to withstand the impact of a bushfire?
- Are you physically and emotionally prepared to stay with your property?
- Do you have well-maintained resources and equipment and do you know how to use them?
- Do you have appropriate protective clothing?
- Will your bushfire survival plan need to be different for weekdays, weekends or if someone is sick at home?
- Do you have a contingency plan?

Preparing your Bushfire Survival Plan

Preparation is the key to survival. Being involved in a fire will be one of the most traumatic experiences of your life.

- Prepare yourself – you need to be both mentally and physically prepared to carry out your Bushfire Survival Plan.
- Prepare your Bushfire Survival Plan.
- Prepare your Bushfire Survival Kit.
- Prepare your Bushfire Relocation Kit.
- Prepare your property.

When writing your plan you need to consider:

- Have you made the right choice: to leave early or stay?
- Have you discussed your choice with your family, friends and neighbours?
- Who will take charge and lead other family members by carefully communicating the various tasks set out in the plan?
- If you have chosen to stay what will you do to protect your property when the fire arrives?
- What will you put in your Bushfire Survival Kit and where will you store it?
- Do your friends, family and neighbours know the details of your plan?

- What will you do if your Bushfire Survival Plan fails?
- Do you have an alternative option or contingency plan if your plan fails?
- Do you have a Neighbourhood Safer Place (NSP) you can go to as a last resort? For more information on NSPs see www.ruralfire.qld.gov.au.
- Is it safe to travel there?

If your decision is to leave early, you must include the following information or action items in your Bushfire Survival Plan:

- Monitor media outlets – radio, TV, mobile phone and internet for bushfire alerts.
- When will you leave?
- What will be your trigger for action?
- Will your plan be different for weekdays, weekends, or if someone is at home sick or injured?
- What will you take with you (Relocation Kit)?
- Where will you and your family go when you leave early?
- What route will you take to get there?
- What will you do with your pets?
- What will you do if there are consecutive or multiple **'catastrophic'** or extreme fire danger days?
- Will you go into work on days when the FDR is in the upper levels?
- Will you send your children to school when the FDR is in the upper levels?
- Will all members of your household leave early?
- What will you do to prepare your property?
- What is your contingency plan in the event that it is unsafe to leave?

If your decision is to stay you must include the following information or actions items in your Bushfire Survival Plan:

- Monitor media outlets – Radio, TV, mobile phone and internet.
- Locate your Bushfire Survival Kit.
- Put on protective clothing.
- Remain hydrated by drinking lots of water.

- Move any stock to fully grazed paddocks.
- Move cars to a safe location.
- Remove garden furniture, doormats and other items.
- Close windows and doors and shut blinds.
- Take down curtains and move furniture away from windows.
- Seal gaps under doors and window screens with wet towels.
- Place pets inside, restrain them, and provide water.
- Block downpipes and fill gutters with water.
- Wet down the sides of buildings facing the approaching fire front.
- Wet down decks and verandas.
- Wet down fine fuels close to buildings.
- Turn on sprinklers in garden before bushfire arrives.
- Fill containers with water; bath, sinks, buckets, wheelie bins, etc.
- Have ladders ready for roof space access (inside) and against roof (outside).
- Have generator or petrol pump ready.
- Start checking and patrolling for embers outside.

When the fire front arrives:

- Take all fire fighting equipment inside such as hoses and pumps as they may melt during the fire.
- Go inside and shelter away from the fire front.
- Patrol the inside of your home, including the ceiling space, for embers or small fires that may start.
- Drink lots of water.
- Check family and pets.

After the fire front has passed:

- Wear protective equipment.
- Go outside once it is safe.
- Check for small spot fires and burning embers:
 - inside roof space
 - under floor boards
 - under house space
 - on veranda and decks

- on window ledges and door sills
- in roof lines and gutters
- garden beds and mulch
- wood heaps
- outdoor furniture
- sheds and carports
- Continue to drink lots of water.
- Stay at your property until the surrounding area is clear of fire.
- Monitor media outlets – radio, TV, mobile phone and internet.

You need to be both mentally and physically prepared to carry out your Bushfire Survival Plan

There may be other actions to include, depending on your individual property and the level of bushfire risk you are exposed to.

Include the whole family in creating your Bushfire Survival Plan. You and your family should be aware of the actions you will take at the various FDR levels and it is important to ensure this is incorporated into your Bushfire Survival Plan. The FDR for your area can be found on roadside signs and by visiting www.ruralfire.qld.gov.au and following the FDR link.

It is important that your Bushfire Survival Plan does not rely solely on receiving an alert.

Once you have completed your Bushfire Survival Plan, practise it regularly to ensure everyone involved knows exactly what to do in the event of a fire.

Preparing your Bushfire Survival Kit

It is essential that you have a Bushfire Survival Kit if your choice is to stay with your property. This kit will ensure you and your family have the important equipment you need to stay. For a comprehensive list of equipment needed in a Bushfire Survival Kit see page 14.

Preparing your Bushfire Relocation Kit

It is equally important to have a relocation kit if your choice is to leave early. This kit will ensure you and your family have important items and equipment required to relocate for the time needed. For a comprehensive list of items and equipment needed in a Bushfire Relocation Kit see page 15.

Making a contingency plan

No matter whether your decision is to leave early, well before a bush fire threatens or to stay you should still have a contingency plan as part of your Bushfire Survival Plan. There are many scenarios to consider, such as what you will do if a rapid onset fire starts in your local area making roads impassable or travel particularly dangerous. You should have other options if road travel is not safe.

- Is your house well prepared?
- Can it provide you with protection from radiant heat?
- Have you identified a safer location such as an NSP?

Sheltering in a well-prepared property is far safer than being out in the open or in a vehicle

Preparing your property

An unprepared property is not only at risk itself, but may also present an increased danger for your neighbours and their homes.

Planning is absolutely critical to safely staying with your home. Staying home involves the risk of psychological trauma, injury and death.

There are a number of measures you can take to prepare your home and property for bushfire. These include several preparations you must take annually prior to the bushfire season.

Your pre-season property preparations should include:

- Displaying a prominent house number.
- Ensuring there is adequate access for fire trucks to your property – 4 metres wide by 4 metres high with a turn-around area. Reduce vegetation loads along the access path.
- Mowing your grass regularly.
- Removing excess ground fuels and combustible material (long dry grass, dead leaves and branches).
- Clearing of leaves, twigs, bark and other debris from the roof and gutters.
- Purchasing and testing the effectiveness of gutter plugs.
- Trimming low-lying branches 2 metres from the ground surrounding your home.
- Enclosing open areas under your decks and floors.
- Installing fine steel wire mesh screens on all windows, doors, vents and weep holes.
- Pointing LPG cylinder relief valves away from the house.
- Conducting maintenance checks on pumps, generators and water systems.
- Checking that you have sufficient personal protective clothing and equipment.
- Relocating flammable items away from your home including woodpiles, paper, boxes, crates, hanging baskets and garden furniture.
- Sealing all gaps in external roof and wall cladding.
- Checking that the first aid kit is fully stocked.

Bushfire Alerts

If you receive an emergency warning about a bushfire or other emergency, take notice as it could save your life.

There are three types of alert messages to help you make the right safety choices:

Bushfire Advice Message – a fire has started – general information to keep you up to date.

Bushfire Watch and Act Message – represents a heightened level of threat. Conditions are changing, a fire is approaching; lives may come under threat. Take appropriate action.

Bushfire Emergency Warning – is the highest level message advising of impending danger. It may be preceded with the Standard Emergency Warning Signal (SEWS).

An Emergency Warning
means there is a threat
to lives and protective
action is required
immediately.

When a bushfire strikes

You have made your decision to **PREPARE.ACT.SURVIVE**. You have prepared your property before the fire season. You have made your Bushfire Survival Plan. You have practised your Bushfire Survival Plan.

A bushfire is threatening? What do you do?

- Know the FDR for any given day.
- Regularly check the FDR on the Rural Fire Services website at www.ruralfire.qld.gov.au.
- Monitor your media outlets for warnings on bushfire activity.
- Seek out information if you have to, and do not assume that you will receive a warning.
- Leave early or stay according to your Bushfire Survival Plan.
- Act decisively in accordance with your Bushfire Survival Plan.
- Do not adopt the 'wait and see' option.

Travelling in your vehicle near a bushfire

Sheltering inside a vehicle is a high-risk strategy that can result in death. Whilst sheltering inside a vehicle offers you a slightly higher chance of survival than being caught in the open, having a leave early or stay strategy is a much safer option.

You should never take a journey into areas where the fire danger is catastrophic or extreme. You should consider postponing or finding alternative routes if necessary. If you can smell or see smoke in the distance it is best to u-turn and drive away from the danger.

If you are caught in smoke or flames while on the road:

- Turn on the vehicle's headlights and hazard warning lights.
- If you need to shelter in your vehicle drive your car into a bare, clear area well away from surrounding trees, leaving lights on. Position vehicle to prevent side impact from advancing fire front.
- Close all windows and vents.
- Leave the engine running and turn off the air conditioning system.
- Cover your entire body with woollen or cotton blankets to protect from radiant heat.
- Take shelter below the window level.
- Drink water frequently and stay in the vehicle until the fire front has passed.
- Once the fire front has passed exit the vehicle to inspect the damage and ensure other passengers are safe.

Neighbourhood Safer Places

A Neighbourhood Safer Place (NSP) is a place of last resort for people during a bushfire. An NSP may form part of a back-up plan when:

- Your Bushfire Survival Plan has failed.
- Your plan was to stay but the extent of the fire means that your home cannot withstand the impact of the fire and therefore your home is not a safe place to shelter.
- The fire has escalated to an extreme or catastrophic level and relocation is the safest option.

An NSP is an identified building or open space within the community that can provide a level of protection from the immediate life-threatening effects of a bushfire. NSPs still entail some risk, both in moving to them and while sheltering in them and cannot be considered completely safe.

They are a place of *last resort* in bushfire emergencies only. The following limitations of NSPs need to be considered within your Bushfire Survival Plan:

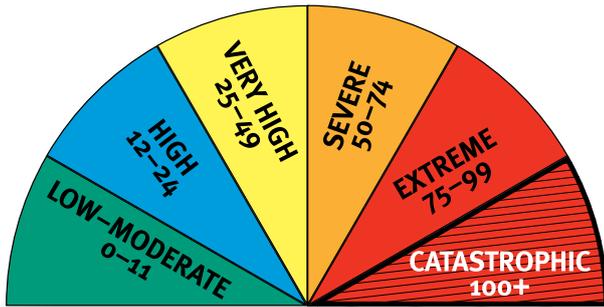
- NSPs do not cater for pets.
- Firefighters may not be present as they will be fighting the main fire front elsewhere.
- NSPs do not provide meals or amenities.
- They may not provide shelter from the elements, particularly flying embers.

If you are a person with special needs you should give consideration to what assistance you may require at an NSP.

Although QFRS cannot guarantee an immediate presence during a bushfire, every effort will be made to provide support as soon as resources are available.

If an NSP is part of your contingency plan it should not require extended travel through fire-affected areas to get there.

FIRE DANGER RATING



The Fire Danger Rating (FDR) is an early indicator of potential danger and should act as your first trigger for action. The higher the rating the greater the need for you to act.

The FDR is an assessment of the potential fire behaviour, the difficulty of suppressing a fire, and the potential impact on the community should a bushfire occur on a given day.

A Fire Danger Index (FDI) of 'low-moderate' means that fire will burn slowly and that it will be easily controlled, whereas a FDI in excess of 'catastrophic 100+' means that fire will burn so fast and so hot that it will be uncontrollable.

CATASTROPHIC 100+

A fire with a rating of 'catastrophic' may be uncontrollable, unpredictable and fast moving. The flames will be higher than roof tops. Many people will be injured and many homes and businesses will be destroyed.

During a 'catastrophic' fire, well-prepared and constructed homes will not be safe. Leaving is the only option for your survival.

EXTREME 75-99

A fire with an 'extreme' rating may be uncontrollable, unpredictable and fast moving. The flames will be higher than roof tops. During an 'extreme' fire, people will be injured and homes and businesses will be destroyed.

During an 'extreme' fire, well-prepared and well-constructed homes may not be safe. Leaving is the only option for your survival.

SEVERE 50-74

A fire with a 'severe' rating may be uncontrollable and move quickly, with flames that may be higher than roof tops. A 'severe' fire may cause injuries and some homes or businesses will be destroyed.

During a fire with a 'severe' rating, leaving is the safest option for your survival. Use your home as a place of safety only if it is well-prepared and well-constructed.

VERY HIGH 25-49

A fire with a 'very high' danger rating is a fire that can be difficult to control with flames that may burn into the tree tops. During a fire of this type some homes and businesses may be damaged or destroyed.

During a fire with a 'very high' danger rating, you should use your home as a place of safety only if it is well prepared and well-constructed.

HIGH 12-24

A fire with a 'high' danger rating is a fire that can be controlled where loss of life is unlikely and damage to property will be limited.

During a fire with a 'high' danger rating, you should know where to get more information and monitor the situation for any changes.

LOW-MODERATE 0-11

A fire with a 'low to moderate' rating can be easily controlled and pose little/or no risk to life or property.

During a fire with a 'low to moderate' rating, you should know where to get more information and monitor the situation for any changes.

BUSHFIRE SURVIVAL PLAN

Complete your personalised Bushfire Survival Plan lift-out.

Personal details:

Important phone numbers: **000** (Fire, Police and Ambulance)

Family: _____ Family: _____ Family: _____

Work: _____ Friends: _____ Friends: _____

School: _____

Important contact details – name and phone number:

Insurer: _____ Policy Number: _____ Phone: _____

Electricity: _____ Phone: _____

Water: _____ Phone: _____

Gas: _____ Phone: _____

Phone Company: _____ Phone: _____

Council: _____ Phone: _____

Leave early:

List all names and contact phone numbers of household members who have decided to leave early then complete Section 1.

Names: _____

Phone: _____

Stay:

List all names and contact phone numbers of household members who have decided to stay, then complete Section 2.

Names: _____

Phone: _____

Leave early – Section 1

Pull this Bushfire Survival Plan lift-out from this document and keep in a safe place.

Leaving early will always be the safest option for you and your family. It is extremely important for you to prepare a detailed leave early plan to ensure everyone understands what to do and when. Use the boxes below to list tasks to do.

When to go – Think of different triggers that will cause you and your family to leave early. Think about what you will do if you have sent the children to school that day. Think about whether or not you will have to travel from work into the fire zone.

Where to go – Identify one or more safer locations. Consider putting on personal protective clothing before you leave home.

How to get there – What roads will you take to your destination? Have an alternative route if your first choice is impassable.

What to take – Make a list of your most valuable items (e.g. insurance papers, electronic records, photo albums, passports, birth certificates and other important documents).

Stay – Section 2

Anyone who is not going to leave early must be involved in completing this stay and defend plan to ensure they know what to do. Every stay plan will be different depending on your circumstances. Use the boxes below to list tasks to do.

Before the fire approaches – Start getting yourself and your property ready for a bushfire.

As the fire approaches – Prepare for ember attack on or near your home.
Remember to put on personal protective clothing.

As the fire front arrives – Stay safe by monitoring the fire from inside your home.

After the fire has passed – Patrol your property and extinguish any spot fires or burning embers.
You may need to keep this up for several hours.

Everyone must have a contingency plan

Have a contingency plan – what will you do if you can't activate your Bushfire Survival Plan? Remember that leaving late can lead to loss of lives.

Know where your nearest NSP is and how to get there.

ACTIVATING YOUR BUSHFIRE SURVIVAL PLAN

Once you have prepared your Bushfire Survival Plan and completed your preparations, it is absolutely essential that you regularly practise and review your plan. This will make sure you and your family are well organised in the event of a bushfire. If a bushfire threatens the health and safety of you, your family, home or property, you should follow these steps:

Step 1 – Activate your Bushfire Survival Plan

Someone must take charge and lead other family members through this emotional experience by carefully communicating the various tasks set out in the plan. Know who is going to leave early and who is going to stay.

Step 2 – Put on your personal protective clothing

Every member of the family must change into their personal protective clothing, including long pants, long-sleeve-shirt and closed-in shoes.

Step 3A – Pack your vehicle and leave early

If your plan is to leave early, pack all valuables in your vehicle (see Relocation Kit) and relocate to your designated safer location. Give yourself enough time to get you and your family to safety. Don't return home until it is safe to do so.

OR

Step 3B – Implement your strategy to stay and defend

If your plan is to stay ensure you have all the items in the Bushfire Survival Kit ready to go. This can be a dangerous option and you should be physically and mentally prepared.

Step 4 – Keep informed of bushfire activity

Listen to the radio, television, internet, firefighters and/or police for information on the fire in your local area. Bushfire is dynamic and unpredictable so you need to be prepared for the unexpected. Warnings are not guaranteed so do whatever is necessary to ensure you remain safe.

BUSHFIRE SURVIVAL KIT

You need to have a Bushfire Survival Kit stored in an area of the house that is safe and easy to access. It should contain:

- protective clothing
- mop
- gloves
- torch
- hoses
- shovel
- towels
- buckets
- safety goggles
- ladder
- medications
- bottled drinking water
- fire extinguishers
- battery operated radio
- spare batteries
- smoke mask
- woollen blankets
- first aid kit
- knapsack sprayer
- protective clothing for the whole family.



RELOCATION KIT

Write a list of all items your family will need before, during and after your relocation. The list below shows items that you might like to put in your relocation kit.

- protective clothing for the whole family
- battery operated radio and spare batteries
- safety goggles
- mobile phone and battery charger
- medications
- wallet or purse and money
- clothing (two sets of clothes for each family member)
- identity information (passports, birth certificates)
- bottled water (enough for each relocated family member)
- family and friends' phone numbers
- items of high importance (e.g. family photos, valuables, important documents)
- blankets (natural fibres)
- children's toys



BUSHFIRE RISK SELF-ASSESSMENT CHECKLIST



This basic self-assessment checklist is designed to give you a greater understanding of the bushfire risk level relevant to your property. Information provided in this assessment will assist you when completing your Bushfire Survival Plan.

Address:

Postcode:

Property Owner/Property Name:

ACCESS/EGRESS

Road/Street/Driveway PLEASE ✓ APPROPRIATE BOX

Clear of overhanging vegetation	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Unrestricted gate access	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Clear of overhead power lines	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Able to reverse in	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Turning/passing areas	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Heavy vehicle access on cattle grid/bridge	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Alternative way out	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Two wheel drive access	Yes <input type="checkbox"/>	No <input type="checkbox"/>

STRUCTURE/S

Exterior walls – non-combustible	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Roof ridge capping sealed	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Eaves enclosed	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Roofing gutters and valleys clear of leaf litter and fine fuels	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Underfloor enclosed	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Vents screened	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Windows – non-combustible finishing	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Deck/veranda non-combustible	Yes <input type="checkbox"/>	No <input type="checkbox"/>

WATER SUPPLY

Reticulated water supply	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Tank supply with QFRS access – 50mm male camlock fitting so fire fighters can use water if needed	Yes <input type="checkbox"/>	No <input type="checkbox"/>
QFRS accessible external open water supply (dam/pool)	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Firefighting pump and hose connected to water supply	Yes <input type="checkbox"/>	No <input type="checkbox"/>

Other considerations

There are a range of other things to be considered regardless of your decision to leave early or stay:

- Firefighting equipment such as pumps, hoses and sprinkler systems should be tested regularly and maintained in maximum operational working condition.
- Firefighters may need access to your property during a bushfire so it is in your best interests to allow enough space for fire trucks (4 metres wide by 4 metres high).
- Your pets, livestock and other animals require proper care and attention during fires. Consider food, medication, transportation and sleeping arrangements for your animals.

Myths versus Reality

Myths	Reality
There will always be a fire truck available to fight a bushfire threatening my home.	Firefighters may be required to fight many fronts of a large fire. Fire trucks and firefighters are finite resources so it is important they are deployed in an appropriate manner to best manage the fire.
I know the back streets in town like the back of my hand so it is OK for me to leave at the last minute.	If your decision in your Bushfire Survival Plan is to leave early, then you should leave well before the fire front reaches your property. Irrespective of your local area knowledge you must stick to your plan and leave early. Leaving late can be fatal.
Someone from an emergency service will knock on my door when it is time to leave.	Emergency services personnel may not be available to alert the community by door-knocking and encouraging you to leave. You need to monitor the bushfire alerts by listening to the radio, watching TV or checking the rural fire website. You need to be ready to leave early if your life or the people in your care are at risk.
My house will not burn down because there is more than 50 metres between my home and nearby bushland.	Most houses which burn down during bushfires have been attacked by flying embers. Under certain conditions embers can cause ignitions up to 20kms in front of the main fire. A combination of your level of preparation and your home's construction will determine the survivability of your home.
I only have to clean my gutters and mow my lawns to prepare my property for bushfire.	Fire requires fuel, heat and oxygen to occur. This means that flames or embers do not necessarily rely solely on your gutters and lawns for fuel. They might utilise overhanging trees, woodpiles, old building materials under the deck or chemicals in the garden shed to sustain them. Take the time to properly prepare your whole property, which includes yourself, your house and your land.