

BUSHFIRE MANAGEMENT PLAN



Lot 123 on SP311786

633, 695 and 787 – 815 Ripley Road, Ripley

Client Reference: 012.03.21



Bushfire Risk Reducers
ABN 28 355 366 321

PO Box 4645 Toowoomba East 4350
T] 07 46366367 F] 07 46366383 M] 0438 994465



BPAD
Bushfire
Planning & Design
Accredited Practitioner
Level 3

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REPORT AUTHOR

Alistair Hill

Director - Bushfire Risk Reducers

FPAA BPAD - Level 3 Certified Practitioner

Certification Number: BPD-PA-19034

M] 0438 994465

T] 07 46366367

F] 07 46366383

W] www.bushfire.biz

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DOCUMENT CONTROL**Bushfire Management Plan****Client:** SIG Group**Client Reference:** 012.03.21**Project:** RoL and MCU**Site Location:** 633, 695 and 787 – 815 Ripley Road, Ripley

Version	Date	Status	Changes	Author	Approver
Rev 0	21.03.2021	First Draft		AH	AH
Rev 1	29.03.21	Final Report		AH	AH
Rev 2	23.02.2022	Final Report	Layout changes	AH	AH
Rev 3	18.10.2022	Final Report	Confirm planting detail in retention basins. Layout changes.	AH	AH
Rev 4	19.10.2023	Final Report	Layout change and IR response	AH	AH
Rev 5	19.11.2023	Final Report	Address IR relating to recreated waterway. DA Conditions of Approval dated 18 September 2023. (Item 37).	AH	AH
Rev 6	1.12.2023	Final Report	Waterway rehabilitation right up to roadway	AH	AH

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1.0 Introduction

This report has been commissioned by Sekisui House in order to support a Development Application for the subdivision of Lot 123 on SP311786 (the “Subject Lot”) into approximately 680 Residential Lots, a Linear Park and Drainage Reserve, and 2 Local Parks; and also in compliance with the Building Code of Australia (BCA), in respect of future buildings on each of the residential Lots.

Ipswich City Council (ICC) bushfire hazard overlay mapping classifies the majority of the area as “transitional bushfire risk area”, and consequently as “bushfire prone area” (BPA). The hazard mapping is created from data that is collected remotely to combine vegetation data with slope and aspect data, and arrive at a hazard rating based on a model specified in State Planning Policy (SPP) 01/03 (*Mitigating the adverse impacts of flood, bushfire and landslide*).

SPP 01/03 was replaced by State Planning Policy— Natural Hazards, Risk & Resilience (October 2019) accompanied by *A new methodology for State-wide mapping of bushfire prone areas in Queensland* (CSIRO 2014) with bushfire hazard mapping which designates most of the site as BPA.

Council is required to give regard to State mapping, and in regarding land as being BPA there are two main implications:

1. It requires the production of a Bushfire Management Plan which complies with the Ipswich Planning Scheme (in this case Part 11, Division 4 (Bushfire Overlay Code).
2. It invokes the Building Code of Australia (BCA), requiring compliance with its bushfire related function performance objectives and with AS3959-2018 *Construction of buildings in bushfire prone areas*.

This Bushfire Management Plan objectively determines the nature and severity of potential worst case wildfire in the area, and develops risk mitigation measures to be used in combination with established construction needs in accordance with AS3959-2018. It is the implementation of all these protection measures in combination, that will demonstrate the viability and conformance of the proposed development in the development application process.

2.0 Site and Development Description

2.1 Property Description

Site ID:	Lot 123 of SP311786
	Parish of Ipswich, County of Stanley.
Current address of property:	633, 695 and 787 – 815 Ripley Road, Ripley, QLD 4306.
Local Government Area:	Ipswich City Council.
Total Area:	N/A
Zoning:	Future Urban

2.2 Proposed Development

The proposed development is planned to create approximately 680 Residential Lots, a Linear Park and Drainage Reserve, and two Local Parks.

2.3 Site Location and Layout

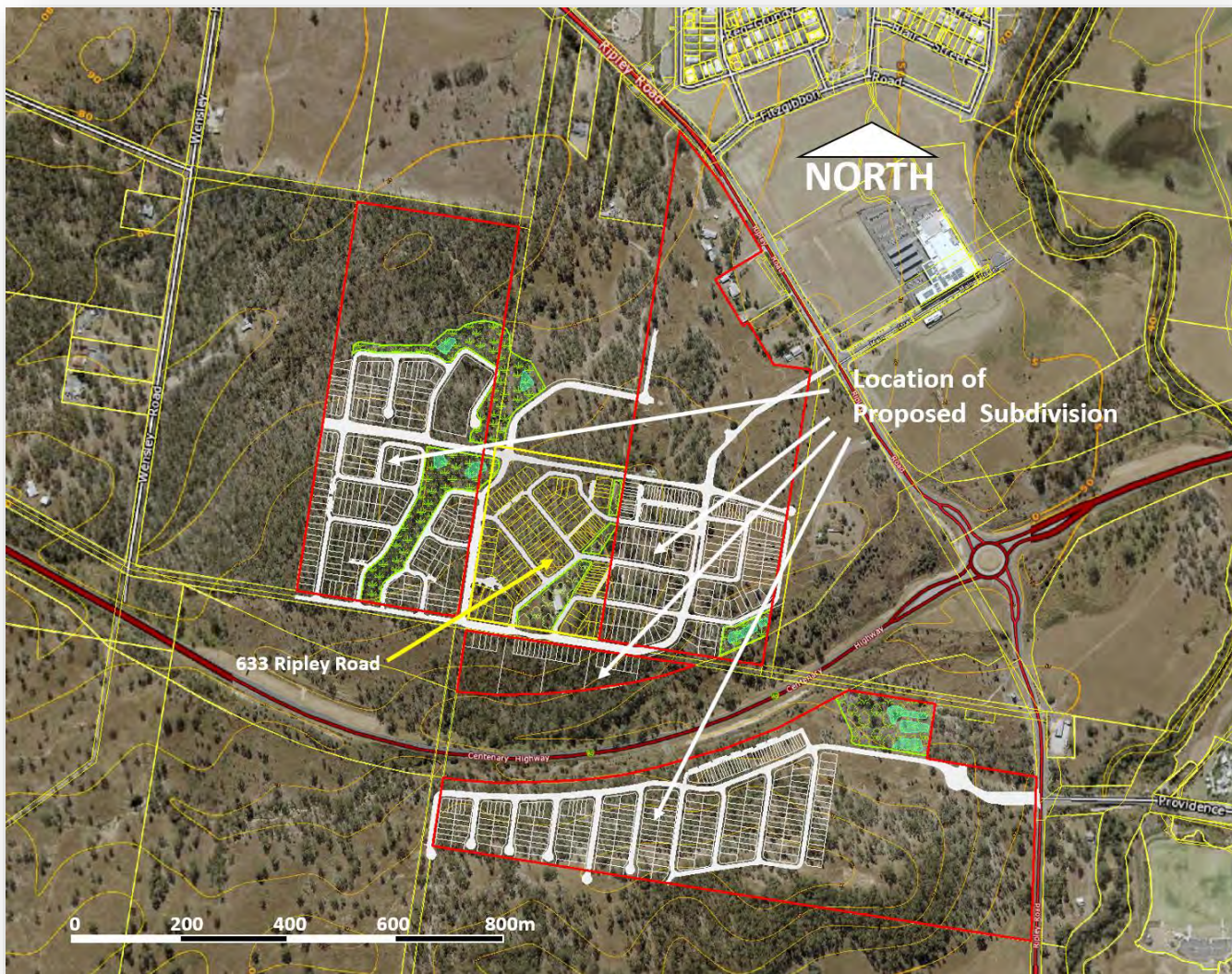


Figure 1. Broader area showing the location of the proposed development.

Located on the western side of Ripley Road, and either side of the Centenary Highway, the site interfaces with open forest and woodland, generally on a slight downslope. Relatively poor soil fertility and water holding capacity limits biomass (vegetative fuel) production, and light grazing pressure (cattle) combines with additional grazing by macropods and hares, so that available fuel loads are below the default values attributed by State Government to the mapped Regional Ecosystem present.

The proposed subdivision of 633 Ripley Road is subject to a separate Development Application 17/2013/PDA, however the developments are integrally linked, and operational works, including clearing for development being timed together.

Access and egress will be via Ripley Road along a safe route.

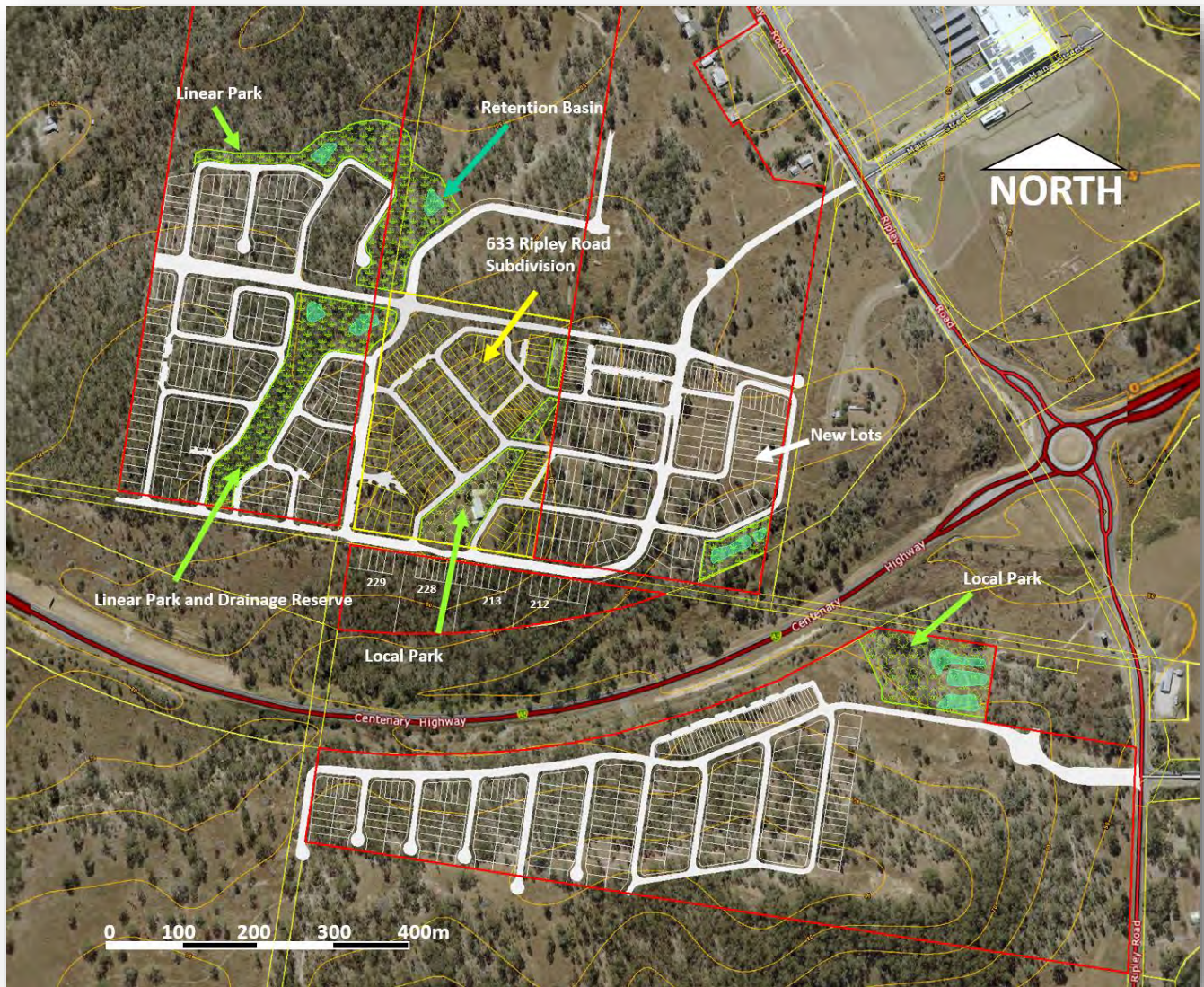


Figure 2. Proposed Subdivision

The site is located within 1 km of the nearest Queensland Fire and Emergency Services (Ripley Rural Fire Station).

3.0 Bushfire Hazard Assessment

3.1 Bushfire hazard classification

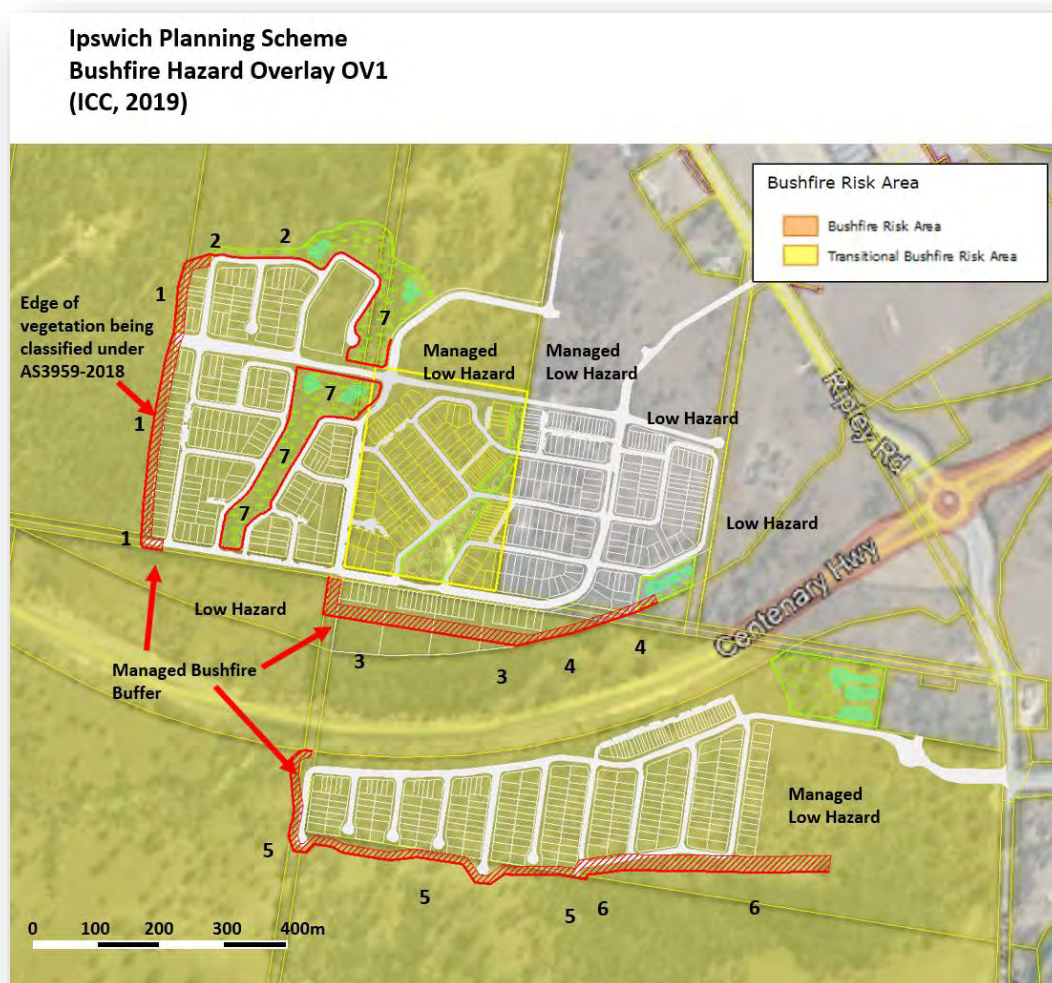


Figure 3. Council bushfire hazard mapping

“Bushfire Prone Land” is defined under the BCA and SPP01/03 as an area **identified as such by Local Government** (using the methodology specified in Appendix 3 of SPP01/03); and using “medium and high hazard” as indicators of bushfire prone land. Table 1 validates the site as “medium” hazard (and hence BPA) according to this methodology. Neither State nor Council hazard overlay claim to be perfect, and both are subject to ground validation.

Bushfire hazard assessment SPP01/03 Methodology		
Date: 3rd September 2020		
Characteristic	Description	Hazard score #
Vegetation	Eucalypt forest with dry shrub ladder fuels	6
Slope	Undulating > 5 – 10%	2
Aspect	Various, generally northerly to westerly	3
Total hazard score	Medium	11

Table 1. SPP01/03 Methodology applied to retained vegetation areas abutting the development.

A Total hazard score of 13 or greater rates as “High”, a score of 6 to 12.5 rates as “Medium” and a score 1 to 5.5 rates as “Low”.

AS3959-2018 specifies building implications within 100m of designated bushfire prone land, or more strictly speaking, within 100m of intact, classified vegetation (50m in the case of grassland). This BMP establishes Bushfire Attack Levels (BALs) for affected Lots, using a combination of Methods 1 and 2 approach under AS3959-2018.

SPP 01/03 was replaced by State Planning Policy – Natural hazards, risk and resilience (December 2013, latest version December 2019) accompanied by *A new methodology for State-wide mapping of bushfire prone areas in Queensland* (CSIRO 2014) with bushfire hazard mapping shown in Figure 4 which designates several interfaces with the proposed development as “bushfire prone area” (BPA). This is validated in Section 6.3 of this Plan. The retained hazard interfaces are numbered 1 to 7 in Figures 3, 4 and 5.

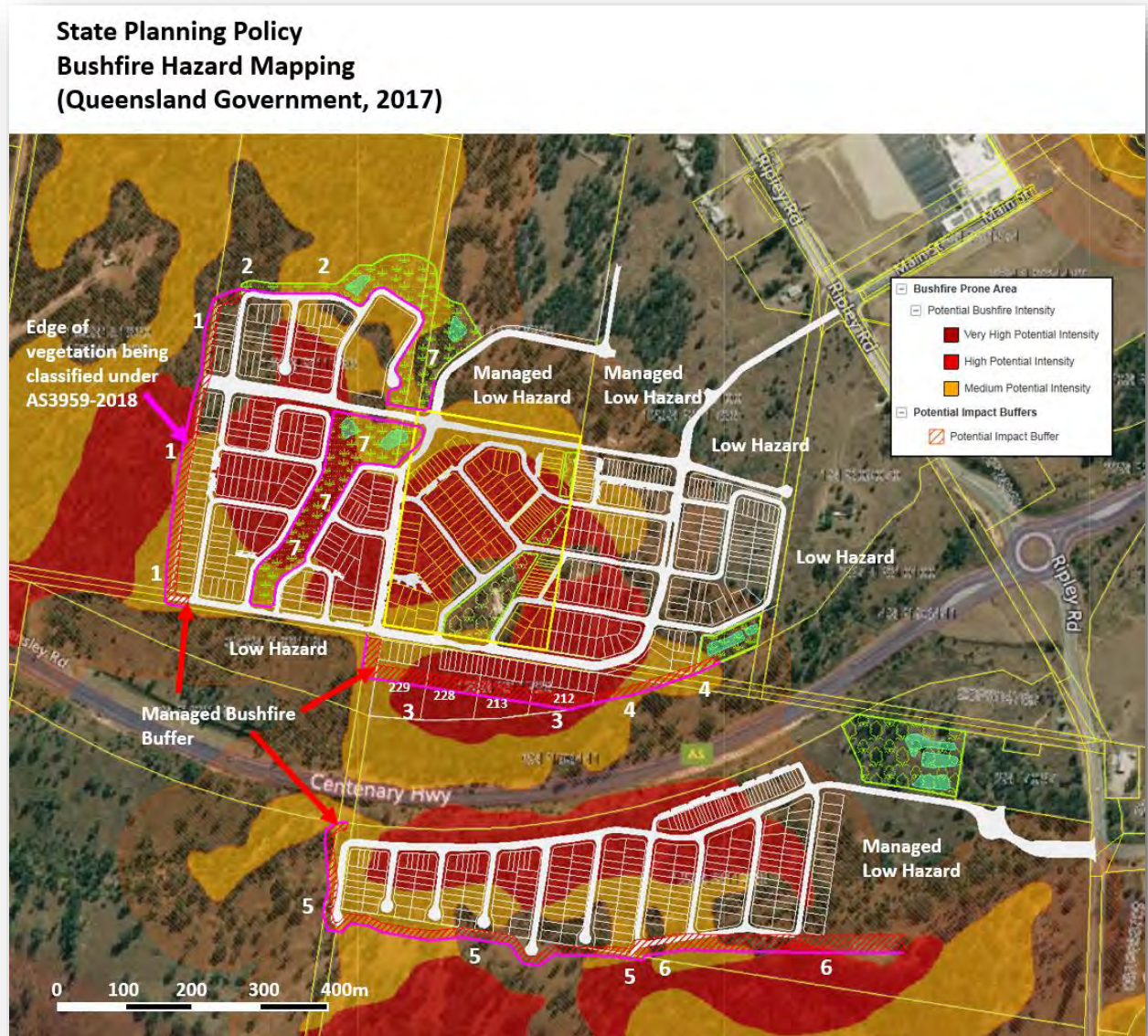


Figure 4. State bushfire hazard mapping

Figure 4 shows a “Managed Bushfire Buffer” to be managed by the Developer and owners of Lots 212, 213, 228 and 229, in order to avoid the need to construct future dwellings above BAL 29 under AS3959-2018.

Agreements are in place between the Developer and these Lot owners to enable such management until such time as development occurs on adjacent land.

3.2 Vegetation Assessment, Slope and Separation Distances from Proposed Development

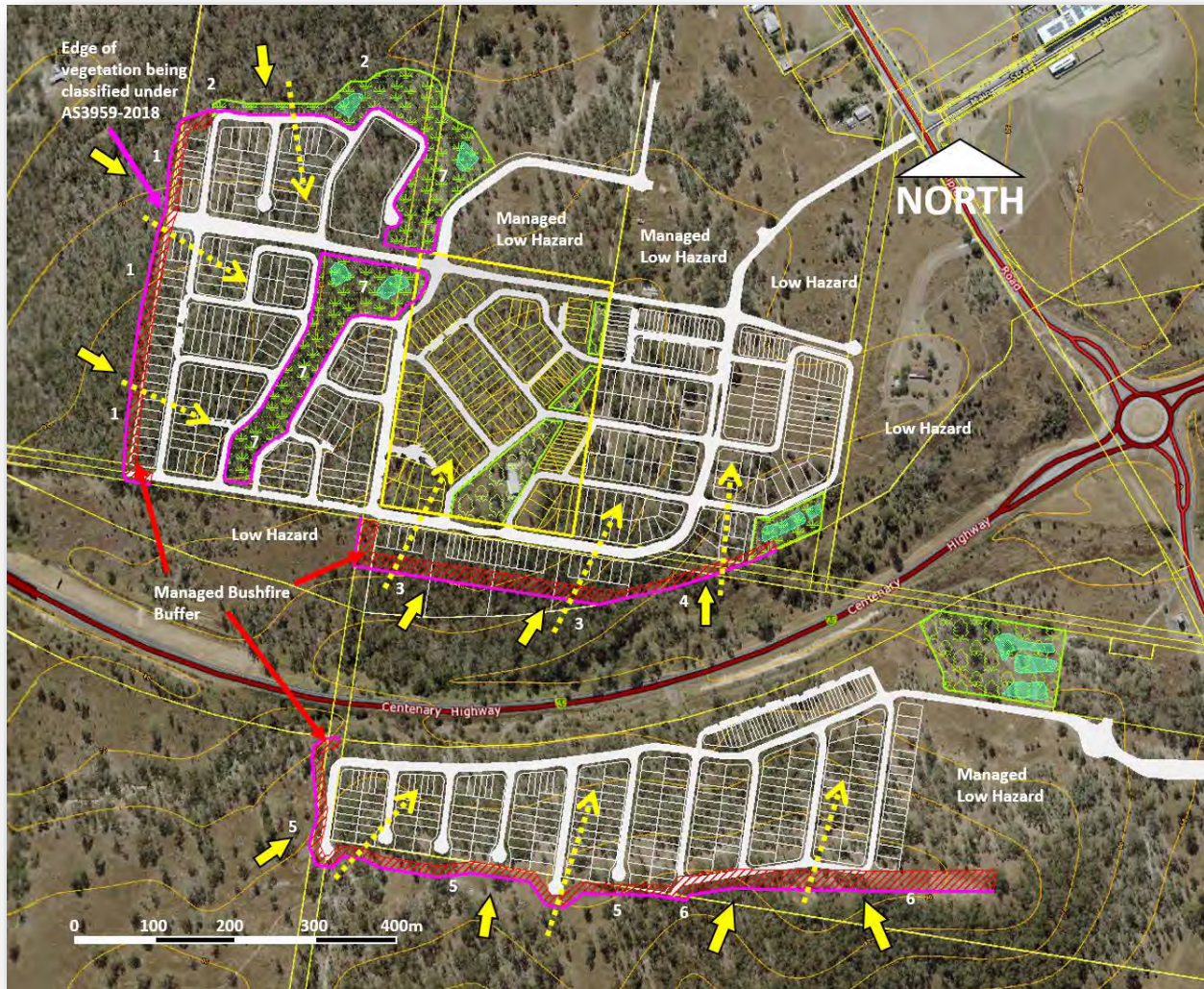


Figure 5. Fuel Zones Assessed Solid yellow arrows indicate most likely direction of bushfire attack, dotted arrows in the form of embers. Contours shown are 10m.

Figure 5 shows the six interfaces assessed. The effective slope is taken as 5° downslope for Forest Interface 1, Flat for Forest Interface 2, 10° downslope for Forest Interface 3, 7° downslope for Woodland Interfaces 4 and 5, 14° downslope for Forest Interface 6 and 3° downslope for Interface 7. Section 6.3 established the width of a “Bushfire Buffer” for Lots exposed to these interfaces, such that the Bushfire Attack Level (BAL) for future dwellings does not exceed BAL 29 under AS3959-2018. The Bushfire Buffer will be maintained in a low hazard state by the Developer until future realignment of that part of the site. Lot owners of Lots 212, 213, 228 and 229 will be required by a Bushfire Covenant placed on these Lots, to maintain their sections of bushfire buffer in perpetuity.

Section 6 objectively calculates and determines the potential nature and severity of bushfire attack more thoroughly. This serves as a basis for determining the construction and other bushfire protection measures outlined in this BAL Assessment.

Fuel assessments were of limited value due to the short time since fire and the fact that current fuel values are not representative of their long term stable state. The fuel values applied to fire modelling in Section 6.3 are taken from the Queensland Government (QFES) dataset, as required under AS3959-2018.

3.3 Fuel Interfaces 1 and 2



Figure 6. Fuel Interfaces 1 and 2

Fuel hazard estimate		Assessment according to Hines et al 2010	
Date: 8 th January 2021			
Layer	Rating	Description / Comments	Equivalent fuel load t/ha
Surface and near surface	Moderate	Moderate litter bed 10 mm with High NS fuels, <i>Aristida sp</i> , <i>Heteropogon sp</i> , <i>Themeda sp</i> , <i>Rhyncheletrum sp</i> , and broadleaved weeds	8 - 10
Elevated	Moderate	Canopy recruiters, with <i>Acacia spp</i> , <i>Lantana sp</i> . Easy to choose a path through but brush against vegetation occasionally.	2
Bark	Low	Predominance of low bark hazard - <i>C.citriodora</i> , <i>E.crebra</i> , <i>Angophora sp</i>).	0
Overall rating	Moderate		10 - 12t/ha

Table 2. Fuel Assessment Fuel Interfaces 1 and 2.

Site assessment identified the developing vegetation community most closely resembling RE12.9 – 10.2, for which State Government attributes a default Total Available Fuel Load of 20.8t/ha (Vegetation Hazard Class 10.1). Applying this default value (as required under AS3959-2018) clearly provides considerable redundancy in planning. In Section 6.3 a Total available fuel load of 20.8t/ha is applied, 19.3t/ha of which is Surface and Near surface fuel.

3.4 Fuel Interface 3



Figure 7. Fuel Interface 3

Fuel hazard estimate	Assessment according to Hines et al 2010		
Date: 8 th January 2021			
Layer	Rating	Description / Comments	Equivalent fuel load t/ha
Surface and near surface	Moderate	Moderate litter bed 10 mm with High NS fuels, <i>Aristida sp</i> , <i>Cymbopogon sp</i> , and broadleafed weeds	8 - 10
Elevated	Moderate	Canopy recruiters, with <i>Acacia spp</i> , <i>Lantana sp</i> . Easy to choose a path through but brush against vegetation occasionally.	2
Bark	Low	Predominance of low bark hazard - <i>C.citriodora</i> , <i>E.crebra</i> , <i>Angophora sp</i>).	0
Overall rating	Moderate		10 - 12t/ha

Table 3. Fuel Assessment Fuel Interface 3.

Site assessment identified the developing vegetation community most closely resembling RE12.9 – 10.2, for which State Government attributes a default Total Available Fuel Load of 20.8t/ha (Vegetation Hazard Class 10.1). Applying this default value (as required under AS3959-2018) clearly provides considerable redundancy in planning. In Section 6.3 a Total available fuel load of 20.8t/ha is applied, 19.3t/ha of which is Surface and Near surface fuel.

3.5 Fuel Interface 4



Figure 8. Fuel Interface 4

Fuel hazard estimate	Assessment according to Hines et al 2010		
Date: 8 th January 2021			
Layer	Rating	Description / Comments	Equivalent fuel load t/ha
Surface and near surface	Moderate	Moderate litter bed 10 mm with Moderate NS fuels, <i>Aristida sp</i> , <i>Cymbopogon sp</i> , and broadleaved weeds	6 - 8
Elevated	Moderate	Canopy recruiters, with <i>Acacia spp</i> , <i>Lantana sp</i> . Easy to choose a path through but brush against vegetation occasionally.	2
Bark	Low	Predominance of low bark hazard - <i>C.citriodora</i> , <i>E.crebra</i> , <i>Angophora sp</i> .	0
Overall rating	Moderate		8 - 10t/ha

Table 4. Fuel Assessment Fuel Interface 4.

Site assessment identified the developing vegetation community most closely resembling RE12.9 – 10.2, in a woodland form, for which State Government attributes a default Total Available Fuel Load of 18t/ha (Vegetation Hazard Class 10.2). Applying this default value (as required under AS3959-2018) clearly provides considerable redundancy in planning. In Section 6.3 a Total available fuel load of 18t/ha is applied, 17t/ha of which is Surface and Near surface fuel.

3.6 Fuel Interface 5



Figure 9. Fuel Interface 5

Fuel hazard estimate	Assessment according to Hines et al 2010		
Date: 8 th January 2021			
Layer	Rating	Description / Comments	Equivalent fuel load t/ha
Surface and near surface	Moderate	Moderate litter bed 10 mm with Moderate NS fuels, <i>Aristida sp</i> , <i>Cymbopogon sp</i> , and broadleaved weeds	6 - 8
Elevated	Moderate	Canopy recruiters, with <i>Acacia spp</i> , <i>Lantana sp</i> . Easy to choose a path through but brush against vegetation occasionally.	2
Bark	Low	Predominance of low bark hazard - <i>C.citriodora</i> , <i>E.crebra</i> , <i>Angophora sp</i>).	0
Overall rating	Moderate		8 - 10t/ha

Table 5. Fuel Assessment Fuel Interface 5.

Site assessment identified the developing vegetation community most closely resembling RE12.9 – 10.2, in a woodland form, for which State Government attributes a default Total Available Fuel Load of 18t/ha (Vegetation Hazard Class 10.2). Applying this default value (as required under AS3959-2018) clearly provides considerable redundancy in planning. In Section 6.3 a Total available fuel load of 18t/ha is applied, 17t/ha of which is Surface and Near surface fuel.

3.7 Fuel Interface 6



Figure 10. Fuel Interface 6

Fuel hazard estimate		Assessment according to Hines et al 2010	
Date: 8 th January 2021			
Layer	Rating	Description / Comments	Equivalent fuel load t/ha
Surface and near surface	Moderate	Moderate litter bed 10 mm with High NS fuels, <i>Aristida sp</i> , <i>Cymbopogon sp</i> , <i>Lomandra sp</i> , <i>Rhyncheletrum sp</i> , and broadleaved weeds	8 - 10
Elevated	Moderate	Canopy recruiters, with <i>Acacia spp</i> , <i>Lantana sp</i> . Easy to choose a path through but brush against vegetation occasionally.	2
Bark	Low	Predominance of low bark hazard - <i>C.citriodora</i> , <i>E.crebra</i> , <i>Angophora sp</i>).	0
Overall rating	Moderate		10 - 12t/ha

Table 6. Fuel Assessment Fuel Interface 6.

Site assessment identified the developing vegetation community most closely resembling RE12.9 – 10.2, for which State Government attributes a default Total Available Fuel Load of 20.8t/ha (Vegetation Hazard Class 10.1). Applying this default value (as required under AS3959-2018) clearly provides considerable redundancy in planning. In Section 6.3 a Total available fuel load of 20.8t/ha is applied, 19.3t/ha of which is Surface and Near surface fuel.

3.8 Fuel Interface 7

The recreated waterway potentially represents a corridor of future hazard for which Vegetation Hazard Class 16.1 can be anticipated (*Eucalyptus dominated forest on drainage lines and alluvial plains*).

State Government attributes a default Total Available Fuel Load of 16t/ha to VHC 16.1, of which 13.8t/ha is Surface and Near surface fuel. These values are applied to fuel Area 7 in Section 6.3.

Council has indicated that it is not supportive of maintaining a mown interface as a transition between the perimeter roadway and the revegetated drainage corridor.

As a consequence this Plan assumes future hazard developing right up to the edge of the roadway, and reflects the “worst case scenario” for exposure of closest buildings.

Ultimate design of the recreated waterway may enable a reassessment of its future hazard status, due to factors such as linear fragmentation, narrow width of intact fuel corridor and the consequential effect of “patch and corridor filtering” as outlined in State Government’s *Bushfire Resilient Communities Technical Reference Guide* (BRC)(October 2019).

4.0 Site constraints and environmental values which may limit mitigation options

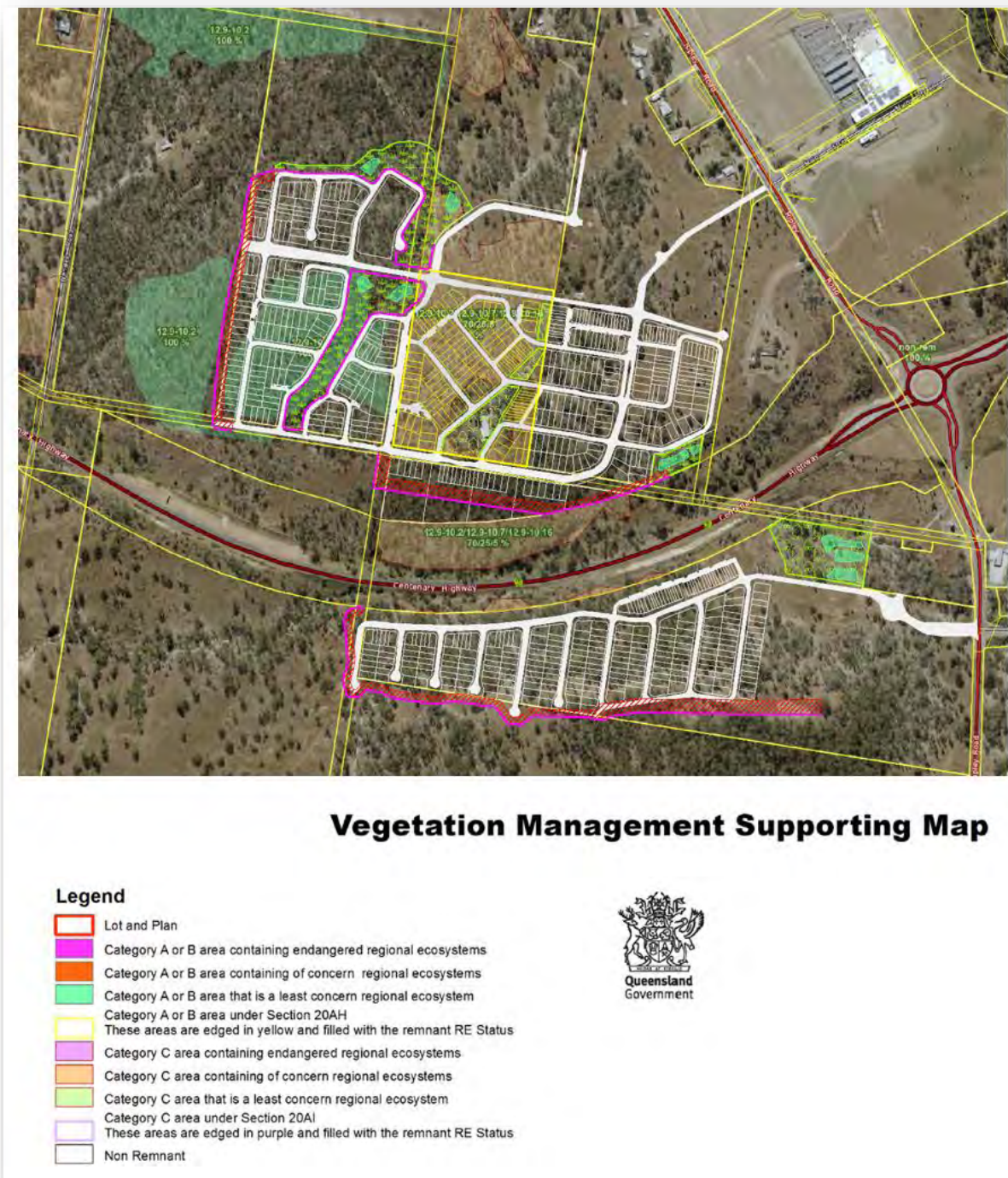


Figure 11. Regional Ecosystem (RE) Mapping

Figure 11 shows the proposed development location in relation to vegetation mapped by the Queensland Department of Natural Resources, Mines and Energy as comprising remnant “Of Concern” RE 12.9-10.7, and “Of Least Concern” RE12.9 – 10.2. Site assessment indicates that vegetation is most consistent with RE 12.9 – 10.2, although actual fuel values are considerably lower, and more like RE12.9-10.7.

DNRME provides the following Description and recommended fire guidelines for the vegetation communities mapped.

Regional Ecosystem	Description	Fire Guidelines
RE 12.9-10.7 Of Concern	<i>Eucalyptus crebra</i> +/- <i>E. tereticornis</i>, <i>Corymbia tessellaris</i>, <i>Angophora leiocarpa</i>, <i>E. melanophloia</i> woodland. Occurs on Cainozoic and Mesozoic sediments. (BVG1M: 13c) Vegetation Hazard Class (VHC) 13.2 14.4t/ha Total Available Fuel Load (State Default Value)	OPTIMAL SEASON: Summer to winter. INTENSITY: Low to moderate. INTERVAL: 4-25 years. STRATEGY: Aim for 40-60% mosaic burn. Burn with soil moisture and with a spot ignition strategy so that a patchwork of burnt/unburnt country is achieved. ISSUES: The fire regime should maintain a mosaic of grassy and shrubby understoreys. Control of weeds is a major focus of planned burning in most areas. Careful thought should be given to maintaining ground litter and fallen timber habitats by burning only with sufficient soil moisture. Burning should aim to produce fine scale mosaics of unburnt areas. Variability in season and fire intensity is important, as well as spot ignition in cooler or moister periods to encourage mosaics.
RE 12.9 – 10.2 Of Least Concern	Open-forest or woodland of <i>Corymbia citriodora</i>, usually with <i>Eucalyptus crebra</i>. Other species such as <i>Eucalyptus tereticornis</i> and <i>Corymbia intermedia</i> may be present in scattered patches or in low densities. Understorey can be grassy or shrubby. Shrubby understorey of <i>Lophostemon confertus</i> (whipstick form) often present in northern parts of bioregion. Occurs on Cainozoic and Mesozoic sediments. (BVG1M: 10b) Vegetation Hazard Class (VHC) 10.1 20.8t/ha Total Available Fuel Load (State Default Value) Woodland Form (VHC) 10.2 18t/ha Total Available Fuel Load (State Default Value)	As above.

Table 7. Regional Ecosystem Descriptions and Fire Guidelines

The adjacent areas of open forest vegetation are unlikely to be provided with managed fire, along with the temporary hazard reduction benefits this brings. Planning is not based on any assumptions regarding hazard reduction; and has to be based on fuel levels reaching a long term maximum stable state, coinciding with ignition under worst case foreseeable fire weather conditions.

4.1 Fire History and Frequency

This study found multiple indicators of prior fire, in the past 10 years. Recurrence of fire at some time is regarded as possible, potentially coinciding with maximum fuel accumulation and worst case fire weather conditions.

5.0 Specific risk factors associated with the development proposal

5.1 Nature of activities anticipated on site

Normal residential activities are anticipated to occur in the area, which includes the potential inclination of juveniles and others to make temporary “camps” in bushland, and others to undertake illegal dumping or torching of vehicles. The number of fire incidents expected by QFES varies in direct proportion to the numbers of people present. The proposed development adds significantly to the number of people living in the area or likely to cause ignition or likely to be exposed to bushfire. However only a limited number of new Lots are directly exposed, and in most cases future development will remove the present hazard.

5.2 Numbers of people likely to be present

2 - 4 residents could be expected to be present on each of the approximately 680 Lots. The proposed development adds significantly to the number of people living in the area or potentially exposed to the possibility of unplanned fire, however the design of the development and road layout, together with the mitigation measures required under this Plan serve to reduce risk to a level that can be deemed acceptable.

6.0 Nature and Severity of Potential Bushfire Attack

6.1 Bushfire season and Fire Weather

The “typical fire season” in this area peaks between September and November. The predominant winds in the area are south easterly, however during the fire season, hot gusty westerlies of over 30 kph can be expected, with Relative Humidity falling to 10% and less. Temperatures on these days can climb over 35°C , and for two or three days a year, fire weather conditions equivalent to FDI levels of around 60 can be anticipated. (Note that this is in contrast to the value of 40 which Queensland is currently using in the recently revised AS3959 - 2018).

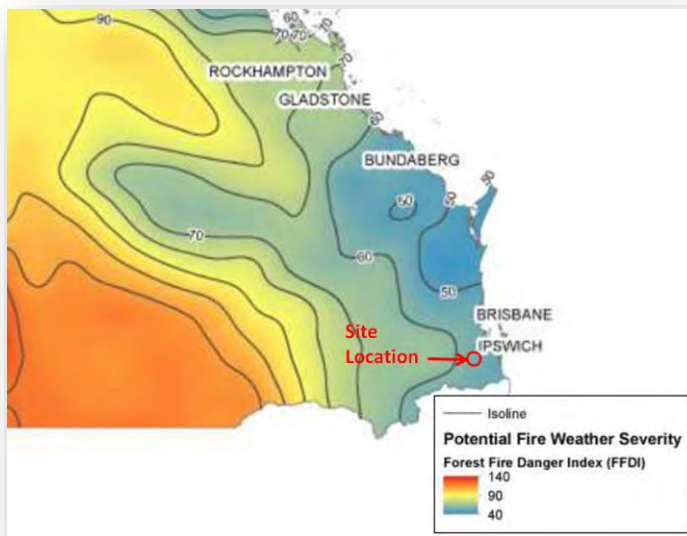


Figure 13. State Government revised FDI values to FDI 60 for the area involved. (CSIRO, 2014).

6.2 Anticipated direction of bushfire attack

The probability of unplanned “wildfire” attack is currently regarded as possible, or even likely. The potential directions of attack are from all points of the compass as indicated in Figure 4. The direction of worst case fire weather is generally westerly to north westerly.

Bushfire attack comes in a number of forms: direct flame, radiant heat, embers, smoke and wind. Research shows that over 80% of houses lost to bushfire in Australia can be attributed to ember attack, within 100m of bushland.

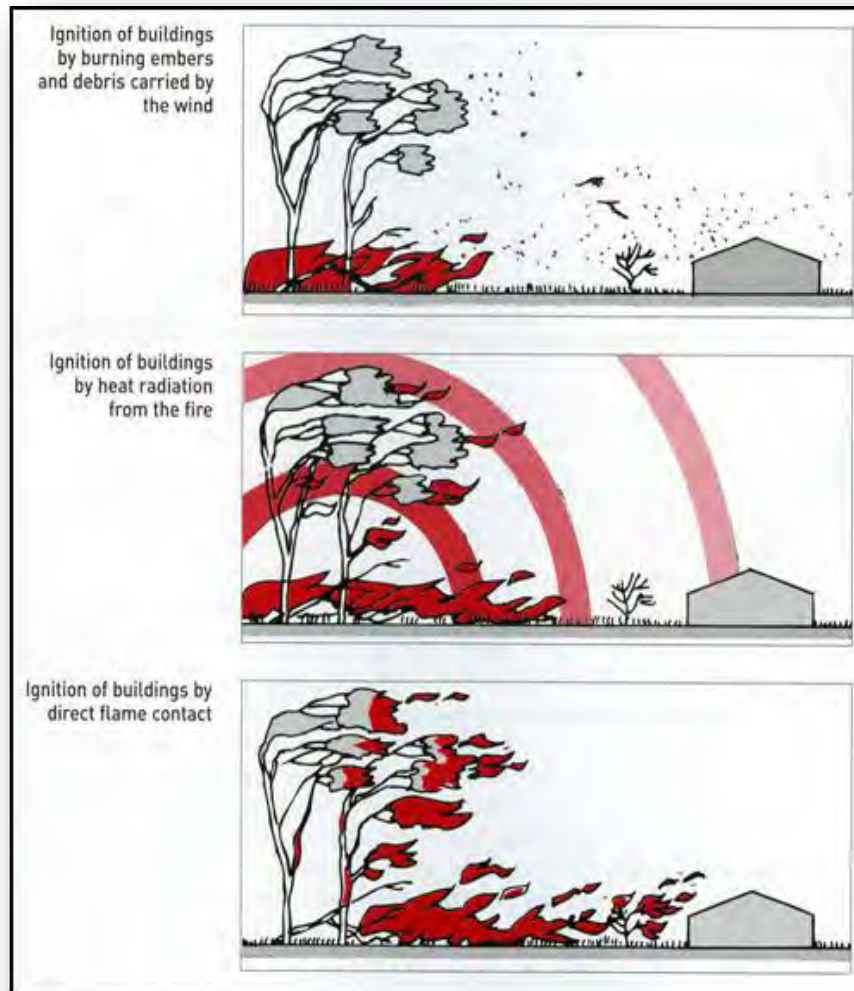


Figure 14. Main Bushfire Attack mechanisms (Image courtesy of Ramsay & Rudolf, 2003)

6.3 Anticipated severity of bushfire attack

Values for vegetation type, fuel load and slope are carried forward to Tables 8 and 9, to predict the key fire parameters for the potential worst case fire scenarios. (Interfaces are identified in Figures 3, 4 and 5).

Fire Scenario – Interface 1	Fire Scenario – Interface 1	Fire Scenario – Interface 2	Fire Scenario – Interface 2	Fire Scenario – Interface 3	Fire Scenario – Interface 3
Method 2 AS3959-2018 FDI 60 Forest @ 19.3/20.8t/ha. Effective Slope under vegetation 5° Downslope	Method 1 AS3959 – 2018 FDI 40 Forest Effective Slope under vegetation > 0 - 5° Downslope	Method 2 AS3959-2018 FDI 60 Forest @ 19.3/20.8t/ha. Effective Slope under vegetation 0° / Flat	Method 1 AS3959 – 2018 FDI 40 Forest Effective Slope under vegetation 0° / Flat	Method 2 AS3959-2018 FDI 60 Forest @ 19.3/20.8t/ha. Effective Slope under vegetation 10° Downslope	Method 1 AS3959 – 2018 FDI 40 Forest Effective Slope under vegetation >5 - 10° Downslope
Fire Intensity (Byram, 1959) 21 086W/m ("HIGH")		Fire Intensity (Byram, 1959) 14 934W/m ("MEDIUM")		Fire Intensity (Byram, 1959) 29 773W/m ("HIGH")	
Rate of Spread (Noble et al, 1980) 1.96kph		Rate of Spread (Noble et al, 1980) 1.39kph		Rate of Spread (Noble et al, 1980) 2.77kph	
Flame Height (modified Mc Arthur V equation, NSW RFS 2001) 15.25m		Flame Height (modified Mc Arthur V equation, NSW RFS 2001) 11.53m		Flame Height (modified Mc Arthur V equation, NSW RFS 2001) 20.5m	
Flame Width 100m		Flame Width 100m		Flame Width 50m	
Elevation of Receiver 2.4m		Elevation of Receiver 2.4m		Elevation of Receiver 2.4m	
BAL FZ within <13m of intact unmanaged vegetation BAL 40 from 13 - <17m BAL 29 from 17 - <25m BAL 19 from 25 - <34m BAL 12.5 from 34 – 100m	BAL FZ within <12m of intact unmanaged vegetation BAL 40 from 12 - <16m BAL 29 from 16 - <24m BAL 19 from 24 - <34m BAL 12.5 from 34 – 100m	BAL FZ within <10m of intact unmanaged vegetation BAL 40 from 10 - <13m BAL 29 from 13 - <20m BAL 19 from 20 - <28m BAL 12.5 from 28 – 100m	BAL FZ within <10m of intact unmanaged vegetation BAL 40 from 10 - <13m BAL 29 from 13 - <20m BAL 19 from 20 - <28m BAL 12.5 from 28 – 100m	BAL FZ within <17m of intact unmanaged vegetation BAL 40 from 17 - <22m BAL 29 from 22 - <29m BAL 19 from 28 - <37m BAL 12.5 from 37 – 100m	BAL FZ within <15m of intact unmanaged vegetation BAL 40 from 15 - <20m BAL 29 from 20 - <29m BAL 19 from 29 - <41m BAL 12.5 from 41 – 100m

Table 8. Calculated values for potential bushfire characteristics, and methods used.

The radiant heat flux values for Methods 1 and 2 are compared as Bushfire Attack Levels (BALs) in Table 8 and 9 and Figure 14. The predicted fireline intensity for unmanaged vegetation interfaces is in the “Medium” and “High” range, validating classification as BPA. Application of Method 2 under AS3959-2018 has derived higher BAL ratings, however as State fuel values are so much higher than those assessed (exaggerating the design fire parameters), and because Method 1 is also a ‘deemed to satisfy’ methodology, Method 1 setback distances have generally been selected (highlighted in bold in the bottom row of both tables).

Fire Scenario – Interface 4	Fire Scenario – Interface 4 and 5	Fire Scenario – Interface 5	Fire Scenario – Interface 6	Fire Scenario – Interface 6	Fire Scenario – Interface 7
Method 2 AS3959-2018 FDI 60 Woodland @ 17/18t/ha. Effective Slope under vegetation 7° Downslope	Method 1 AS3959 – 2018 FDI 40 Woodland Effective Slope under vegetation > 5 - 10° Downslope	Method 2 AS3959-2018 FDI 60 Woodland @ 17/18t/ha. Effective Slope under vegetation 6° Downslope	Method 2 AS3959-2018 FDI 60 Forest @ 19.3/20.8t/ha. Effective Slope under vegetation 14° Downslope	Method 1 AS3959 – 2018 FDI 40 Forest Effective Slope under vegetation >10 - 15° Downslope	Method 2 AS3959-2018 FDI 60 Forest @ 13.8/16t/ha. Effective Slope under vegetation 3° Downslope
Fire Intensity (Byram, 1959) 18 451W/m ("MEDIUM")		Fire Intensity (Byram, 1959) 17 221W/m ("MEDIUM")	Fire Intensity (Byram, 1959) 39 237W/m ("MEDIUM")		Fire Intensity (Byram, 1959) 10 103W/m ("MEDIUM")
Rate of Spread (Noble et al, 1980) 1.98kph		Rate of Spread (Noble et al, 1980) 1.85kph	Rate of Spread (Noble et al, 1980) 3.65kph		Rate of Spread (Noble et al, 1980) 1.22kph
Flame Height (modified Mc Arthur V equation, NSW RFS 2001) 15.06m		Flame Height (modified Mc Arthur V equation, NSW RFS 2001) 14.2m	Flame Height (modified Mc Arthur V equation, NSW RFS 2001) 26.23m		Flame Height (modified Mc Arthur V equation, NSW RFS 2001) 9.85m
Flame Width 100m		Flame Width 100m	Flame Width 100m		Flame Width 100m
Elevation of Receiver 2.4m		Elevation of Receiver 2.4m	Elevation of Receiver 2.4m		Elevation of Receiver 2.4m
BAL FZ within <13m of intact unmanaged vegetation BAL 40 from 13 - <17m BAL 29 from 17 - <25m BAL 19 from 25 - <28m BAL 12.5 from 28 – 100m	BAL FZ within <9m of intact unmanaged vegetation BAL 40 from 9 - <13m BAL 29 from 13 - <19m BAL 19 from 19 - <28m BAL 12.5 from 28 – 100m	BAL FZ within <12m of intact unmanaged vegetation BAL 40 from 12 - <16m BAL 29 from 16 - <23m BAL 19 from 23 - <33m BAL 12.5 from 33 – 100m	BAL FZ within <22m of intact unmanaged vegetation BAL 40 from 22 - <28m BAL 29 from 28 - <39m BAL 19 from 39 - <52m BAL 12.5 from 52 – 100m	BAL FZ within <19m of intact unmanaged vegetation BAL 40 from 19 - <25m BAL 29 from 25 - <36m BAL 19 from 36 - <49m BAL 12.5 from 49 – 100m	BAL FZ within <9m of intact unmanaged vegetation BAL 40 from 9 - <12m BAL 29 from 12 - <17m BAL 19 from 17 - <24m BAL 12.5 from 24 – 100m

Table 9. Calculated values for potential bushfire characteristics, and methods used.

The Radiant Heat Flux Curves are compared in Figures 15 and 16 below.

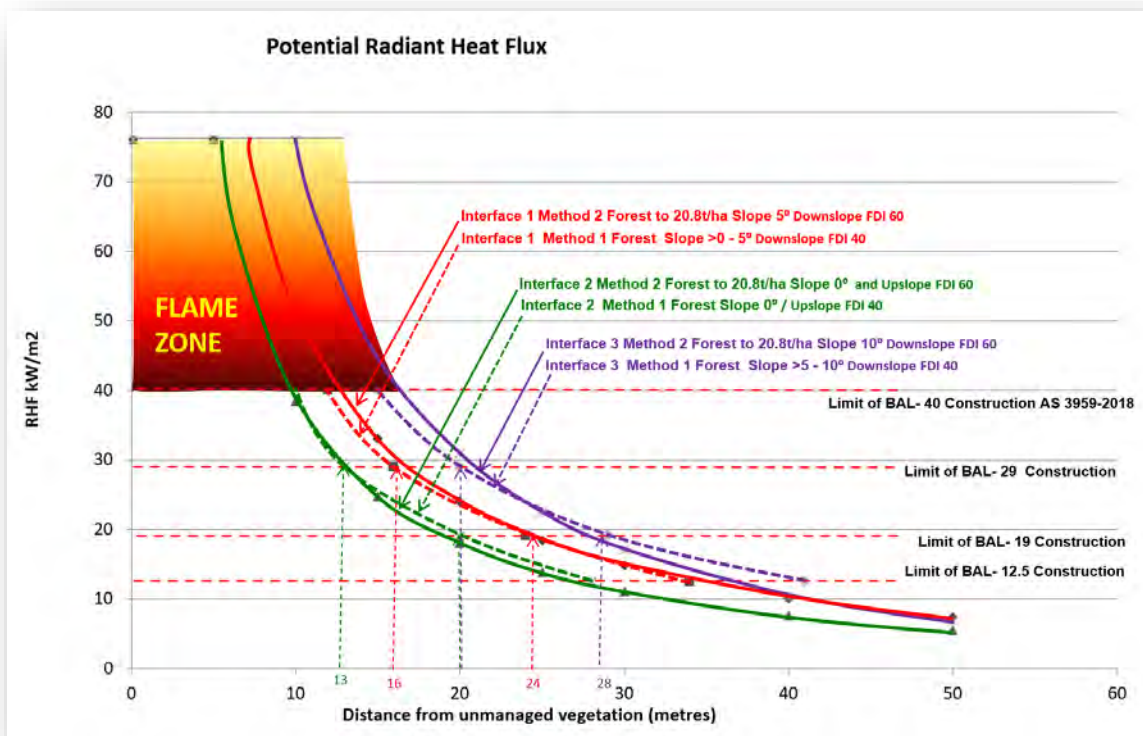


Figure 15. Radiant Heat Flux Predicted by Methods 1 and 2.

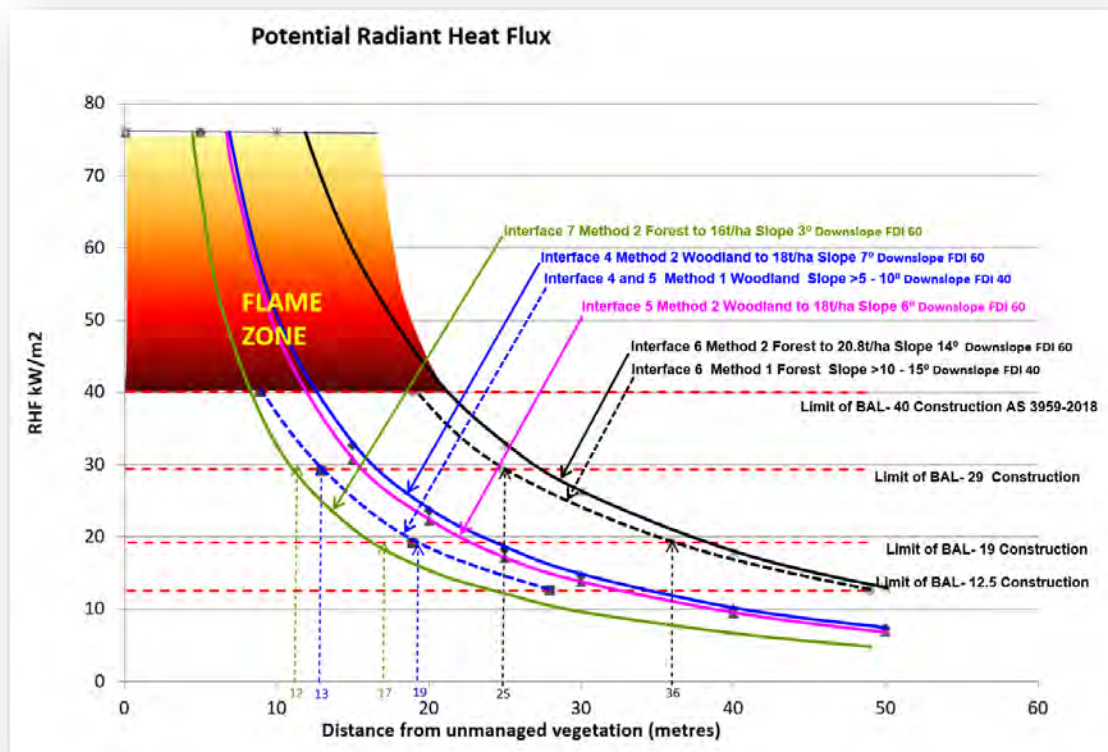


Figure 16. Radiant Heat Flux Predicted by Methods 1 and 2.

The radiant heat flux values are represented as BAL contours in Figure 18 and 19.

The significance of the radiant heat flux levels discussed is shown below in Table 10.

Radiant Heat Flux (kW/m ²)	Likely Effects
> 40 - 110	Flame Zone. Even the strongest toughened glass fails.
29 - 40	Latest technology in toughened glass may survive. Most will not. Timber ignites without pilot flame. Limit of BAL-40 Construction AS3959 - 2009.
29	Ignition of timbers without piloted ignition (3 minutes exposure) during the passage of a bushfire. Most types of toughened glass could fail. Limit of BAL-29 Construction AS3959 - 2009.
19	Screened float glass could fail during the passage of a bushfire. Limit of BAL-19 Construction AS3959 - 2009.
12.5	Standard float glass could fail during the passage of a bushfire. Limit of BAL-12.5 Construction AS3959 - 2009. Some timbers can ignite with prolonged exposure and with pilot ignition sources (eg embers)
10	Critical conditions. Firefighters not expected to operate in these conditions. Considered life threatening in under a minute in protective equipment. Fabrics inside a building could ignite spontaneously with long exposures.
7	Likely fatal to unprotected persons after exposure of several minutes.
4.7	Extreme conditions. Firefighter in protective clothing will feel pain after 60 seconds exposure.
3	Hazardous conditions. Firefighters expected to operate for a short period (10 minutes).
2.1	Unprotected person will feel pain after 1 minute exposure - non fatal.

Table 10. Significance of various RHF levels (Source: NSW RFS, 2006)

7.0 Bushfire Protection Measures in Combination



Figure 17. Bushfire Planning Measures in Combination (Source: NSW RFS, 2006)

Figure 17, taken from *Planning for Bushfire Protection* (NSW Rural Fire Service, 2006) illustrates that there are other factors and measures which need to be integrated to mutually support one another to provide protection against bushfire.

Simply removing the hazard (bushland) is one possible way of removing risk to life and property, but this approach is not always desirable. The safety of life and property can be achieved whilst retaining the natural amenity and value of bushland areas, provided these integrated bushfire protection measures are applied.

7.1 Building Construction and Design

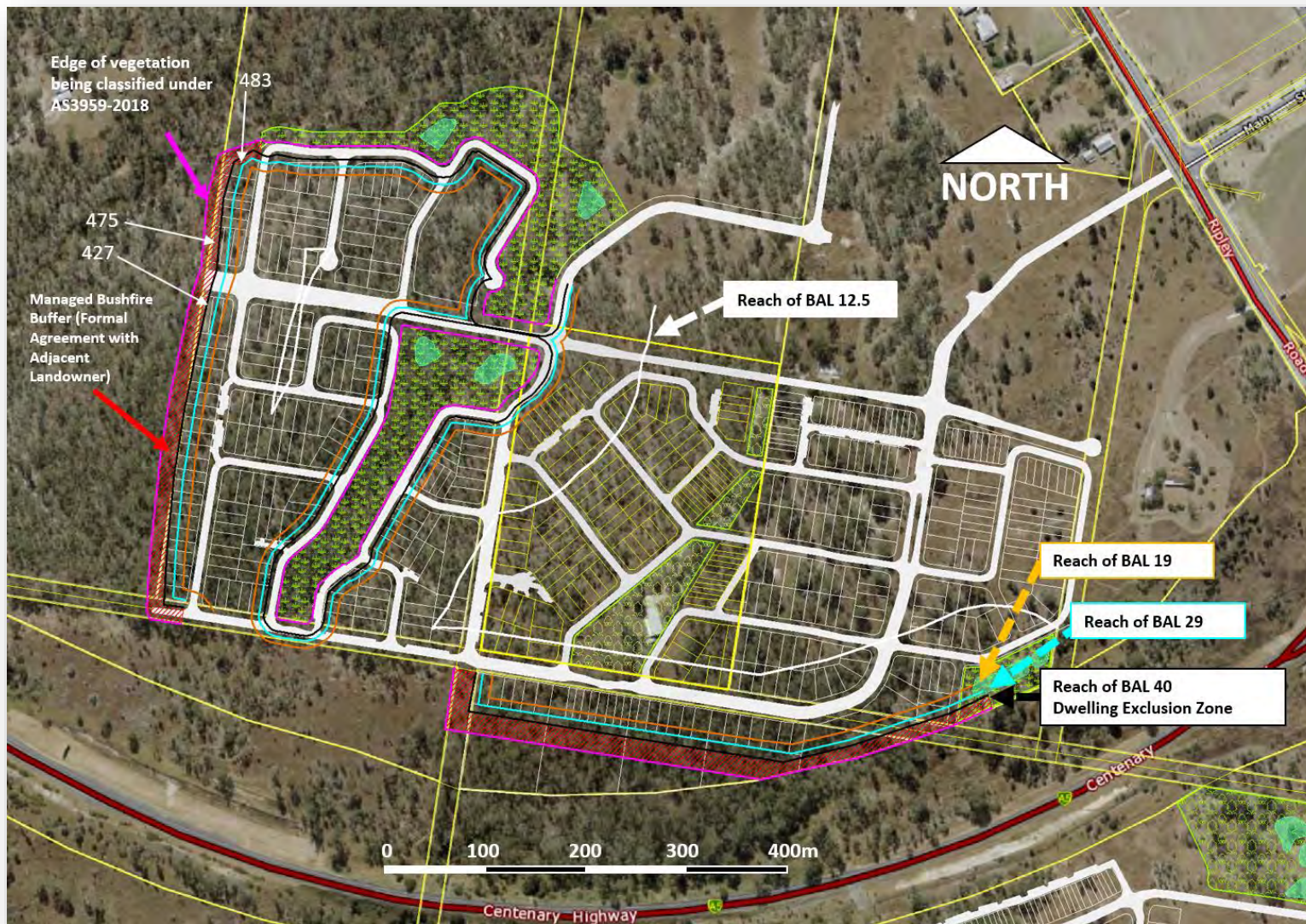


Figure 18. BAL contours for northern part of subdivision. Note the mown buffer access abutting Lot 483 to the north.

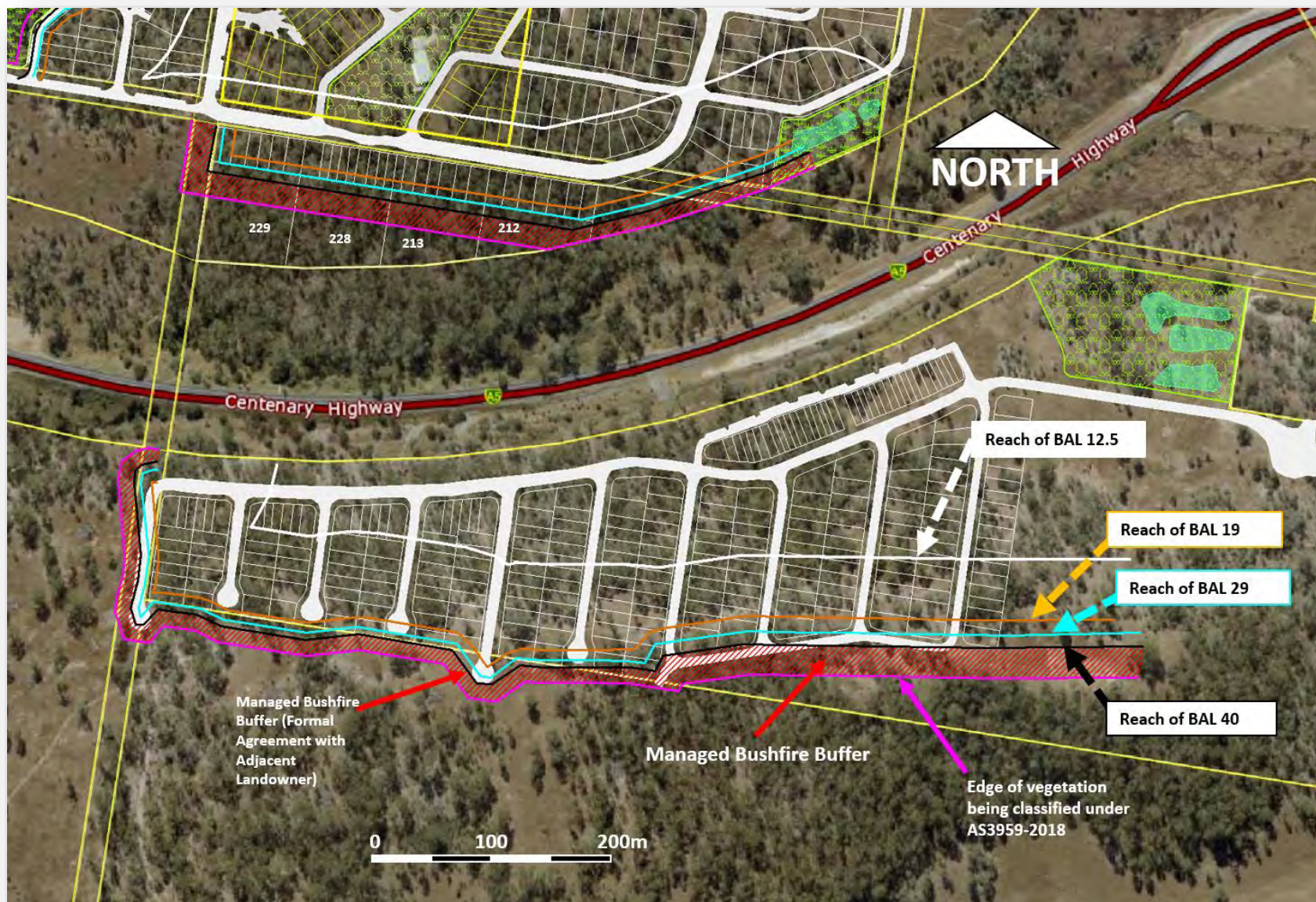


Figure 19. BAL contours for southern part of subdivision.

The proposed design serves to avoid construction to greater than BAL 29 under AS3959-2018. Lots 427 and 475 (noted in Figure 17) will not be sold until either the adjacent Lot is cleared for development, or until an alternate design is approved for this part of the subdivision.

Within the reach of BAL 12.5 shown in Figure 15, any Class 10a structure (such as sheds, garages, gazebos, fences) built within 6m of any dwelling will also need to be constructed in accordance with AS3959-2018.

7.2 Asset Protection Zones and Landscaping

Asset protection zones are the most strategically valuable defense against radiant heat and flame, and to a lesser extent embers.

The landscaping plan shall maintain an “Inner Protection Area” (IPA) for the entire unbuilt area of all Lots within the reach of BAL 12.5, effectively free of available fuel.

- Plants retained in or introduced into the IPA should be selected based on low combustibility, by virtue of high moisture content, low volatile oil content, high leaf mineral levels, large fleshy leaves, absence of shedding bark.
- Plant arrangement is just as important as low combustibility. Plants should be placed so as to minimize either vertical or horizontal connectedness of plant material. Appendix 1 provides examples of less hazardous native plant species.
- Combustible vegetation shall not be allowed to come into contact with combustible parts of buildings.
- Trees should not be allowed to directly overhang roof lines.
- Regular yard maintenance should be undertaken to remove available fine fuels and debris, particularly throughout the fire season.

An Outer Protection Area involves removal of the understorey so as to deprive an advancing fire front of its fuel continuity, and thereby collapsing the fire front. In this case the APZ recommended for the new lots shall be constructed and maintained as IPA.

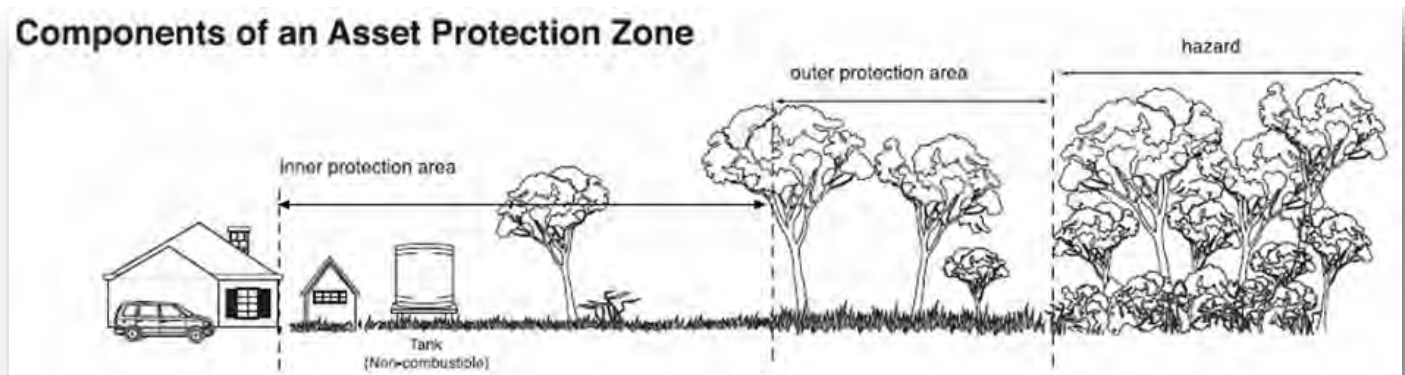


Figure 20. Components of an Asset Protection Zone (APZ)

Specific Bushfire Buffers are proposed to ensure that future dwellings do not require construction above BAL 29 under AS3959-2018.

Managed Bushfire Buffers will be the responsibility of the Developer and the owners of Lots 212, 213, 228 and 229, via a Covenant that will be placed on the Title. In steeper/battered sections they will be planted out with low combustibility vegetation comprised of *Patersonia spp* (native iris) , *Lomandra spp* with any invasive species or regrowth removed so that the buffer remains in a low hazard state (akin to a modified grass community). In flat sections they will be routinely slashed or mown.

Where the buffer is located on adjoining lots, and the Developer chooses to develop lots adjacent to the buffer, the Developer will enter into a formal and binding agreement that they will manage the buffer in a low hazard state in perpetuity, or until the development of the land concerned occurs, at which point the agreement will self extinguish. An alternative option is for the affected Lots to remain unsold and undeveloped until the neighbouring properties have been cleared/developed.

A Bushfire Covenant will be placed upon the title of Lots 212, 213, 228 and 229, requiring the owners of these larger lots to manage this section of buffer in a low hazard state in perpetuity, by slashing or mowing.

As a precaution, the Drainage Reserve/recreated waterway has been treated (Section 3.8) as potential future hazard. Ultimate design may enable a reassessment of future hazard status, due to factors such as linear fragmentation, narrow width of intact fuel corridor and the consequential effect of “patch and corridor filtering” as outlined in State Government’s *Bushfire Resilient Communities Technical Reference Guide* (BRC)(October 2019).

The drainage corridor could be designed and planted to achieve a low hazard state for the long term. This could involve species selection which provides waterway filtration function whilst being of low combustibility.

Other design features include options such as:

- Clumped plantings within “islands” between which a grassed surface is routinely mown.
- Narrow linear strips with low combustibility vegetation being linearly fragmented eg. By rocky waterway centre, pedestrian pathways beside the drainage line etc.

7.3 Access and Egress Management

The site is within approximately 1km by road of the nearest Queensland Fire and Emergency Services (Ripley Rural Fire Station).

Access and egress is via Ripley Road, in two directions, and the route is a safe one.

Access and egress for fire fighters will be provided in accordance with the Queensland Fire and Emergency Services Guideline (*Fire Hydrant and Vehicle Access Guidelines for Residential, Commercial and Industrial Lots, 2015*). The guideline is attached as Appendix 2.

The proposed internal road system provides for continuous traffic flow and for through roads. Ample turning opportunities are also available for large urban fire fighting appliances (a minimum inside radius of 6m and minimum outside radius of 12m).

7.4 Water Supplies and Utilities

Water supply for the development will be connected to Council mains reticulated supply, with hydrants installed in accordance with AS2419.1-2005 and with volumes and pressure under the control of Council water utilities provider. Fire fighting water supply and fire hydrants will be provided in accordance with the Queensland Fire and Emergency Services Guideline (*Fire Hydrant and Vehicle Access Guidelines for Residential, Commercial and Industrial Lots, 2015*).

Electricity supply to the site will be supplied underground.

Any reticulated or bottled gas shall be installed and maintained in accordance with AS1596 – 2002. Metal piping is to be used. Any fixed LPG tanks shall be kept clear of flammable materials, and located on the non hazard side of the building. Any gas cylinders which need to be kept close to a building shall have release valves directed away from the building. Polymer sheathed flexible gas supply lines to gas meters adjacent to buildings are not to be used.

7.5 Fire Fighting and Emergency Management Arrangements

The development is serviced by the proposed road and driveways for Emergency Services use. The maintenance of a mown or slashed grass surface of all Lots provides safe defensible space around key assets in the unlikely event of bush fire.

Obstructions to access onto individual Lots and the rear of buildings should be avoided.

Residents shall be made aware of the existence of this Plan, and their need to comply with the relevant provisions, in particular building construction, APZ maintenance, optimizing access around buildings and emergency response preparations.

Residents shall decide on their Stay and Defend / or Go Early strategy before each fire season so as to ensure this decision is not made too late, when smoke and emergency vehicles prevent an orderly evacuation. Staying to defend is a viable and preferable option for the proposed development.

Residents staying to defend should ensure that they have adequate protective clothing, including full length cotton or denim garments, sturdy boots, gloves, smoke mask (minimum P2 with valves) and smoke goggles.

Appendix 2 provides guidance for Residents' Emergency Management Planning in relation to bushfire.

8.0 Assessment of proposal against Ipswich Planning Scheme 2006

Part 11, Division 4 – Bushfire Hazard Areas Overlay Code

All lots inside the BAL 12.5 contour (white line) in Figures 17 and 18 will conform to the above code.

Specific Outcomes	Probable Solutions
8.1 (SO1) Design, Siting and Construction (1) Uses and works in bushfire risk areas are designed, sited, and constructed to— (a) minimise the number of people and properties subject to bushfire risk; (b) improve the survivability of buildings and the protection of life during the passage of a firefront; (c) minimise costs and threats to emergency services; and (d) facilitate evacuation in the event of a bushfire	PS1 is applied in that: (1) (a) Uses and works are sited— (i) in existing cleared areas able to accommodate the use within an adequate fire protection buffer generally as identified in (iii) below, and this Plan demonstrates the setbacks available to be adequate to avoid exceeding BAL 29; and (ii) on land and parts of a site which are least prone to bushfire risk with regard to aspect, slope, elevation and vegetation type— (A) away from the tops of ridgelines and with the flatter portion of the lot being used as building sites; and (B) on land with a slope gradient less than 15%, and generally on level ground; and (iii) generally with a minimum 20 metre wide area (measured from the horizontal from the building) serving as a fire protection buffer around the building of which at least the first 10 metres from the building is a cleared area (fuel free inner zone), while the outer 10 metres (fuel reduced outer zone) may be planted with fire retardant vegetation species or grassed; and (iv) to ensure that any outbuilding (such as garages and carports) is built as part of the main building or located at least 5 metres from the main building. (b) If trees are planted they— (i) are of a species that grow to over 2 metres in height to maintain separation between lower canopy and the ground; (ii) have vertical and horizontal separation between each plant to ensure the canopy is not continuous; and (iii) do not grow closer to the building than a distance equivalent to the tree's expected mature height so that branches do not overhang the eaves of the building. (c) Buildings— (i) have a continuous roof line avoiding roof valleys, multiple hips and a combination of pitched and flat roofs on the same building – as these provide catchment areas for debris; and (ii) have low pitched roofs between 12 and 21 degrees to reduce radiation pick up; and (iii) are of slab-on-ground construction where this is responsive to the site; or

	(iv) “pole based structures” with floors elevated off the ground with all external openings (between the floor and the ground) sealed to prevent the entry of burning debris; and (v) minimise large expansive walls as these expose a greater surface area to a bushfire; and (vi) shall be constructed in accordance with AS3959-2018.
8.2 (SO2) Uses and works avoid a high concentration of people living or congregating in a high bushfire risk area.	PS2 is applied in that: The proposed development does not involve uses where people are likely to congregate, including a caravan park, camping ground, or other high concentration uses.
8.3 (SO3) Water Storage and Supply Uses and works provide sufficient and accessible water storage and supply for firefighting purposes by— (a) connection to a reticulated water supply, if available to the site, having sufficient pressure and flow for firefighting purposes; or (b) where reticulated water supply is not available to the site, a dam, lake, water tank or swimming pool are provided with sufficient capacity for water pumping in times of bushfire.	PS3 is applied in that: Where reticulated water supply is available— Water supply outlet pipes are located within 40m of dwellings.
8.4 (SO4) Vehicular Access and Fire Trails Fire trails or perimeter roads are provided to mitigate against bushfire risk by— (a) separating uses and works from surrounding vegetated areas; and (b) being of sufficient width to serve as an effective fire trail which allows continuous access for firefighting vehicles; and (c) being in secure tenure and maintained.	PS5 is applied in that: Uses and works (including where reconfiguring a lot) incorporate— (a) a perimeter road— (i) located between the majority of proposed Lots and adjacent vegetated lands; and (ii) with a minimum cleared width of more than 10 metres; and (iii) with a constructed road width of 6 metres; and (iv) constructed to an all weather standard.
8.5 (SO5) Residential uses and works (including reconfiguring a lot) are designed to mitigate potential bushfire risk and provide safe sites for dwellings.	PS6 is applied in that: Wherever possible the road layout provides through roads and avoids the use of culs de-sac and dead end roads. PS1 is applied utilising the areas of lowest risk on the site; and the use will adhere to the requirements specified by this Plan.
8.6 (SO6) Where the use involves the reconfiguring a Lot and the opening of a new road, the road layout provides vehicular access which is designed to—	PS5 is applied to the extent outlined above. PS6 is applied in that: Wherever possible the road layout provides through roads and avoids the use of culs de-sac and dead end roads.

(a) mitigate against bushfire risk by ensuring adequate access for firefighting and other emergency vehicles; and (b) allow for evacuation in the event of a bushfire; and (c) provide for the safe and effective operation of water supply and equipment for fire fighting vehicles	PS7 is applied in that: Road gradients are generally no more than 12.5%, or are from 12.5% to not more than 20% over a maximum distance of 50 metres.
8.7 (SO7) The size and shape of residential Lots and the design and location of access paths facilitate emergency access to buildings and firefighting infrastructure, and the incorporation of suitable on-site bushfire mitigation measures.	PS 1, 5, 6 and 7 are applied.
8.8 (SO8) New residents are informed about the nature of the bushfire hazard and mitigation measures.	Lot Buyers shall be made aware of this Plan at the point of purchase, including a property note attached to land title.

9.0 Assessment of proposal against State Planning Policy 2019

State Planning Policy – Natural hazards, risk and resilience (SPP, December 2013, latest version December 2019) replaces State Planning Policy 1/03 *Mitigating the Adverse Impacts of Flood, Bushfire and Landslide*. The SPP Guideline – Natural hazards, risk and resilience provides a methodology for determining Bushfire Hazard based on Potential Fireline Intensity. The methodology and hazard mapping has been included in Section 3.1 of this Plan in establishing the adjacent area as potentially hazardous and as a bushfire prone area.

The SPP guideline provides development assessment benchmarks to ensure that State interests are appropriately considered in relation to natural hazards, including bushfire hazard areas. These provisions serve as general guidelines to either avoid or otherwise adequately mitigate bushfire risk. Specific guidelines for bushfire hazard overlay codes are yet to be provided, and this detail is addressed by this Plan in terms of meeting the current requirements of Local Government in Section 8 above.

Interim Development Assessment Benchmarks – SPP Part 4	Solutions Provided
(3) Development avoids natural hazard areas or where it is not possible to avoid the natural hazard area, development mitigates the risks to people and property to an acceptable or tolerable level, and	This Plan establishes the nature and potential severity of the adjacent hazard and provides a combination of bushfire protection measures to mitigate risk including park management, building construction, asset protection zones, access, water supplies and utilities, and emergency management arrangements.
(4) Development supports, and does not unduly burden, disaster management response or recovery capacity and capabilities, and	The combined effect of the bushfire protection measures specified by this Plan serves to reduce risk to a low level and ensure resilience and preparedness for unplanned fire so that the response or recovery capacity and capability of emergency services is not unduly burdened or impeded. This Plan serves to protect life and property from bushfire without depending on emergency services for protection.
(5) Development 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	The development decreases the nature of the existing hazard, and site layout and landscaping on the site is designed to moderate the exposure of buildings. The potential for damage to other properties is not increased as a consequence of the proposed development.
(6) Risks to public safety and the environment from the location of hazardous materials and the release of these materials is avoided, and	Hazardous materials are not stored in quantities or locations on the site which would pose a risk to the public or the environment.
(7) The natural processes and the protective function of landforms and the vegetation that can mitigate risks associated with the natural hazard are maintained or enhanced.	The development maintains the natural processes and protective function of vegetation that previously existed for the site.

10.0 Recommendations

1. That future dwellings shall be constructed in accordance with AS3959-2018, as summarised in Tables 8 and 9 and Figures 17 and 18 of this Plan. Lots 427 and 475 (noted in Figure 17) will not be sold until either the adjacent Lot is cleared for development, or until an alternate design is approved for this part of the subdivision.

Any other Class 10a structure built within 6m of any residence within the reach of BAL 12.5 (in Figure 15) shall be constructed in accordance with this Standard.

Builders should warrant that they have a copy of this Standard, and that it shall be used consistently throughout the design and construction of dwellings and other structures located within 6m of them.

2. Asset Protection Zones and Managed Bushfire Buffers, as described in Section 7.2 of this Plan shall be maintained on a low hazard state by the Developer and Lot owners of Lots 212, 213, 228 and 229 (under a Covenant placed on the land Title). Where the buffer is located on adjoining lots, and the Developer chooses to develop lots adjacent to the buffer, the Developer will enter into a formal and binding agreement that they will manage the buffer in a low hazard state in perpetuity, or until the development of the land concerned occurs, at which point the agreement will self-extinguish. An alternative option is for the affected Lots to remain unsold and undeveloped until the neighbouring properties have been cleared/developed.
3. Fire fighting water supply and fire hydrants will be provided in accordance with the Queensland Fire and Emergency Services Guideline (*Fire Hydrant and Vehicle Access Guidelines for Residential, Commercial and Industrial Lots, 2015*).
4. Lot buyers shall be made aware of the existence of this Plan and their responsibilities outlined within it, in particular construction, asset protection zone and emergency management.

11.0 Summary

The area of “hazard” faced by the proposed development is significant, but relatively low available fuel loads reduce the potential nature and severity of unplanned fire. Nevertheless, the likelihood of wildfire at some time is regarded as likely, warranting protection measures to be taken, as outlined in this Plan. This Plan demonstrates compliance with legislative requirements of State and Local Government, and the BCA.

Along with adequate water supply and emergency management arrangements, compliant construction under AS3959-2018 and APZs to reduce the exposure of life and property to bushfire, these combined measures assist to prepare residents for the possibility of fire in the area.

12.0 References

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- Sustainable Planning Act (2009), Queensland Government, Queensland.
- Vegetation Management Act (1999), Queensland Government, Queensland.
- Webster, J. (2000), *The Complete Bushfire Safety Book*, Random House Australia, NSW.

Appendix 1

Less combustible native plants list

Source: Bowden, J (1999)

10

APPENDIX

Fire Retardant Native Plants

Form: S = Shrub; T = Tree; V = Vine; H = Herb; Gc = Ground cover; eO = epiphytic Orchid; eF = epiphytic Fern; tF = terrestrial Fern.

Fire-retardance: Lm = due to leaf water contents; St = due to salt content; Sl = succulent leaves

Comments: Wb = suitable for windbreak/fire barrier; Ad = suitable as addition to windbreak/fire barrier but not as main species; Us = suitable for understory of windbreak/fire barrier; Oa = suitable for open areas near house; Sa = suitable for sheltered areas near house; Pf = suitable if protected from direct flames; De = Deciduous in winter, in flower or in dry periods

(-) = may not occur naturally in Pine Rivers Valley but has not proved invasive.

Fire-Retardant Plants for Small Gardens

Scientific Name	Common Name	Form	Fire Retardance	Comments
GYMNOSPERMS				
Zamaceae				
<i>Lepidozamia peroffskyana</i>	Shining Burrawang	S	Lm	Us Sa
<i>Macrozamia lucida</i>	Pineapple Zamia	S	Lm	Us Sa
<i>Macrozamia miquelii</i>	Wild Pineapple	S	Lm	Us Oa Sa
Agavaceae				
<i>Cordyline petiolaris</i>	Broad-leaf Palm Lily	S	Lm	Us Sa
<i>Cordyline rubra</i>	Red-fruit Palm Lily	S	Lm	Us Sa
<i>Cordyline stricta</i>	Slender Palm Lily	S	Lm	Us Sa
MONOCOTYLEDONS				
Amaryllidaceae				
<i>Crinum pedunculatum</i>	River Lily	H	Lm Sl	Us Oa Sa
<i>Doranthus palmeri</i> (-)	Spear Lily	H	Lm Sl	Us Oa Sa
<i>Proiphys cunninghamii</i>	Brisbane Lily	H	Lm Sl	Us Sa
Araceae				
<i>Alocasia brisbanensis</i>	Conjevoi	H	Lm	Us Sa
<i>Gymnostachys anceps</i>	Settlers Flax	H	Lm	Us Sa
<i>Pothos longipes</i>	Pothos	V	Lm	Us Sa
<i>Typhonium brownii</i>	Stinking Lily	H	Lm	Us Sa
Arecaceae				
<i>Livistona monostachya</i>	Walking Stick Palm	P	Lm	Us Sa

Scientific Name	Common Name	Form	Fire Retardance	Comments
Commelinaceae				
<i>Aneilema acuminatum</i>	Aneilema	H Gc	Lm	Us Sa
<i>Aneilema biflorum</i> (-)	Aneilema	H Gc	Lm	Us Sa
<i>Commelina cyanea</i>	Scurvy Plant	H Gc	Lm	Us Op Sa
<i>Politia crispata</i>	Snake Weed	H Gc	Lm	Us Sa
<i>Politia macrophylla</i>	Large Snake Weed	H Gc	Lm	Us Sa
Dioscoreaceae				
<i>Dioscorea transversa</i>	Native Yam	V	Lm	Us Sa
Liliaceae				
<i>Bulbine bulbosa</i> (-)	Bulbine Lily	H	Lm Sl	Oa
<i>Dianella brevipedunculata</i>	Blue Flax Lily	H	Lm	Us Oa Sa
<i>Dianella caerulea</i>	Blue Flax Lily	H	Lm	Us Oa Sa
<i>Dianella revoluta</i>	Flax Lily	H	Lm	Us Oa Sa
<i>Drynophila moorei</i> (-)	Orange Berry	H	Lm	Us Sa
<i>Tripladenia cunninghamii</i>	Bush Lily	H	Lm	Us Sa
Orchidaceae				
<i>Dendrobium gracilicaule</i>	Spotted Orchid	eO	Lm	Sa
<i>Dendrobium X gracillimum</i>	Natural Hybrid	eO	Lm	Sa
<i>Dendrobium monophyllum</i>	Lily of the Valley			
	Orchid	eO	Lm	Sa
<i>Dendrobium schoenitum</i>				
(<i>D. beckeri</i>)				
<i>Dendrobium speciosum</i>	Pencil Orchid	eO	Lm	Sa
<i>Dendrobium teretifolium</i>	King Orchid	eO	Lm	Sa
	Bridal Veil Orchid	eO	Lm	Sa
<i>Dendrobium tetragonum</i>	Spider Orchid	eO	Lm	Sa
Philisaceae				
<i>Eustrephus latifolius</i>	Wombat Berry	V	Lm	Us Oa Sa
<i>Geitonoplesium cymosum</i>	Scrambling Lily	V	Lm	Us Sa
Philydraceae				
<i>Philydrium lanuginosum</i>	Frogsmouth	aH	Lm Sl	Oa Wet areas
Smilacaceae				
<i>Smilax glycyphylla</i>	Sweet Sarsparilla	V	Lm	Us Sa
Xanthorrhoeaceae				
<i>Lomandra confertifolia</i>	Mat Rush	H	Lm	Oa
<i>Lomandra hystrix</i>	Creek Mat Rush	H	Lm	Us Sa
<i>Lomandra longifolia</i>	Long-leaf Mat Rush	H	Lm	Us Oa Sa
<i>Lomandra filiformis</i>	Fine-leaf Mat Rush	H	Lm	Oa
<i>Lomandra multiflora</i>	Many-flower Mat Rush	H	Lm	Oa
<i>Lomandra spicata</i>	Mountain Mat Rush	H	Lm	Us Oa Sa
Zingiberaceae				
<i>Alpinia arundinacea</i>	Wild Ginger	H	Lm	Us Sa
<i>Alpinia coerulea</i>	Native Ginger	H	Lm	Us Sa

Scientific Name	Common Name	Form	Fire Retardance	Comments
DICOTYLEDONS				
Aizoaceae				
<i>Carpobrotus glaucescens</i>	Pig Face	H Gc	Lm SI	Oa
Acanthaceae				
<i>Graptophyllum excelsum</i> (-)	Scarlet Fuchsia	S	Lm	Us Sa
<i>Graptophyllum spinigerum</i>	Samford Holly	S	Lm	Us Sa
<i>Pseuderanthemum tenellum</i>	Pseuderanthemum	H	Lm	Us Sa
<i>Pseuderanthemum variable</i>	Love Flower	H	Lm	Us Sa
Apiaceae				
<i>Centella australis</i>	Pennywort	H Gc	Lm	Oa
<i>Hydrocotyle acutiloba</i>	Pennywort	H Gc	Lm	Us Sa
<i>Hydrocotyle pedicellosa</i>	Pennywort	H Gc	Lm	Us Sa
Apocynaceae				
<i>Alyxia ruscifolia</i>	Chain fruit	S	Lm	Us Sa
<i>Carissa ovata</i>	Current Bush	S	Lm	Us Oa Sa
<i>Neisosperma poweri</i> (-)	Milkbush	S	Lm	Us Sa
<i>Ochrosia moorei</i> (-)	Southern Ochrosia	S	Lm	Us Sa
<i>Parsonsia lenticellata</i>	Narrow-leaf Silkpod	V	Lm	Us Sa
<i>Parsonsia lilacina</i>	Delicate Silkpod	V	Lm	Us Sa
<i>Tabernaemontana pandacacui</i>	Banana Bush	S	Lm	Us Sa
Aristolochiaceae				
<i>Aristolochia</i> sp. aff. <i>pubera</i>	Pipe Vine	V	Lm	Us Sa
<i>Aristolochia praevanosa</i>	Richmond Birdwing Vine	V	Lm	Us Sa
Asclepiadaceae				
<i>Hoya australis</i>	Wax Flower	V	Lm	Us Sa
<i>Marsdenia longiloba</i>	Slender Milk Vine	V	Lm	Us Sa
<i>Secamone elliptica</i>	Corky Milk Vine	V	Lm	Us Sa
<i>Tylophora paniculata</i>	Thin-leaf Tylophora	V	Lm	Us Sa
Bignoniaceae				
<i>Pandorea floribunda</i>	New sp. Pine R	V	Lm	Us Oa Sa
<i>Pandorea jasminoides</i>	Bower of Beauty	V	Lm	Us Oa Sa
Caesalpiniaceae				
<i>Cassia artemisioides</i> (-)	Silver Cassia	S		Oa
Campanulaceae				
<i>Lobelia trigonocalis</i>	Forest Lobelia	H Gc	Lm	Us Oa
<i>Wahlenbergia gracilis</i>	Bluebells	H		Oa
Capparidaceae				
<i>Capparis arborea</i>	Native Caper	S/T	Lm	Us Sa
<i>Capparis sarmentosa</i>	Scrambling Caper	V	Lm	Us Sa

Scientific Name	Common Name	Form	Fire Retardance	Comments
Celastraceae				
<i>Cassine australis</i>	Red Olive Berry	S/T	Lm	Us Sa
<i>Denhamia celastroides</i>	Orange Boxwood	S/T	Lm	Us Sa
<i>Denhamia pittosporoides</i>	Orange Boxwood	S/T	Lm	Us Sa
<i>Maytenus bilocularis</i>	Orangebark	S/T	Lm	Us Sa
Chenopodiaceae				
<i>Einadia hastata</i>	Berry Salt Bush	S Gc	St	Oa
<i>Enchylaena tomentosa</i>	Ruby Salt Bush	S Gc	St SI	Oa
<i>Halosarcia indica</i>	Samphire	S Gc	St SI	Oa Salty soil
<i>Sarcocornia quinqueflora</i>	Samphire	S Gc	St SI	Oa Salty soil
<i>Suaeda australis</i>	Seablite	S Gc	St SI	Oa Salty soil
<i>Suaeda arbusculoides</i>	Jellybean Plant	S Gc	St SI	Oa Salty soil
Convolvulaceae				
<i>Convolvulus erubescens</i>	Australian Bindweed	V	Lm	Oa
<i>Dichondra repens</i>	Kidney Weed	H Gc	Lm	Us Sa
<i>Polymeria calycina</i>	Swamp Bindweed	V	Lm	Oa
Cunoniaceae				
<i>Aphanopetalum resinosum</i>	Gum Vine	V Gc	Lm	Us Sa
<i>Vesselowskyia rubifolia</i> (-)	Southern Marara	S/T	Lm	Us Sa
Davidsoniaceae				
<i>Davidsonia pruriens</i> (-)	Davidson's Plum	T	Lm	Us Sa
Dilleniaceae				
<i>Hibbertia aspera</i>	Rough Guinea Flower	S	Lm	Oa
<i>Hibbertia dentata</i>	Toothed Guinea Flower	V	Lm	Us Oa Sa
<i>Hibbertia linearis</i>	Showy Guinea Flower	S	Lm	Oa
<i>Hibbertia obtusifolia</i>	Hoary Guinea Flower	S	Lm	Oa
<i>Hibbertia stricta</i>	Erect Guinea Flower	S	Lm	Oa
<i>Hibbertia scandens</i>	Twining Guinea Flower	V	Lm	Us Oa Sa
Elaeocarpaceae				
<i>Elaeocarpus reticulatus</i>	Blueberry Ash	S/T	Lm	Us Oa Sa
Epacridaceae				
<i>Trochocarpa laurina</i>	Tree Heath	S/T	Lm	Us Sa
Escalloniaceae				
<i>Abrophyllum ornans</i>	Native Hydrangea	S	Lm	Us Sa
<i>Polyosma cunninghamii</i>	Featherwood	S/T	Lm	Us Sa
Euphorbiaceae				
<i>Acalypha capillipes</i>	Small-leaf Acalypha	S	Lm	Us Sa
<i>Acalypha eremorum</i>	Native Acalypha	S	Lm	Us Sa
<i>Acalypha nemorum</i>	Southern Acalypha	S	Lm	Us Sa
<i>Actephila lindleyi</i>	Actephila	S/T	Lm	Us Sa
<i>Alchornea ilicifolia</i>	Native Holly	S	Lm	Us Sa
<i>Breynia oblongifolia</i>	Native Coffee Bush	S	Lm	Us Oa Sa
<i>Cleistanthes cunninghamii</i>	Cleistanthes	S/T	Lm	Us Sa

Scientific Name	Common Name	Form	Fire Retardance	Comments
Croton phlebalioides	Narrow-leaf Croton	S	Lm	Us Sa
Croton verrucosus	Native Cascarilla	S/T	Lm	Us Sa
Macaranga tanarius	Macaranga	S/T	Lm	Us
Mallotus laevis	Scrub Odour Bush	S/T	Lm	Us Sa
Oncocarpus natus	Old Bleeding Heart	S/T	Lm	Us Sa
(O. populifolius)				
Eupomatiaceae				
Eupomatia bennettii	Small Bolwarra	S	Lm	Us Sa
Eupomatia laurina	Bolwarra	S	Lm	Us Sa
Escaloniaceae				
Cuttisia viburnea (-)	Native Elderberry	T	Lm	Us Sa
Fabaceae				
Abrus precatorius	Crabs Eye Vine	V	Lm	Us Oa Sa
Aotus lanigera	Pointed Aotis	S	Lm	Oa Sa
Glycine clandestina	Twining Glycine	V	Lm	Oa
Glycine tonnetella	Woolly Glycine	V	Lm	Oa
Hardenbergia violacea	False Sarsparilla	V	Lm	Oa
Hovea linearis	Common Hovea	S	Lm	Oa
Hovea longipes (-)	Brush Hovea	S	Lm	Oa
Indigophora australis	Australian Indigo	S	Lm	Oa
Kennedia rubicunda	Dusky Coral Pea	V	Lm	Oa
Oxylobium ilicifolium (-)	Holly Pea	S	Lm	Oa
Oxylobium scandens (-)	Netted Shaggy Pea	S	Lm	Oa
Pultenaea retusa	Blunt-leaf Bush Pea	S	Lm	Oa
Pultenaea spinulosa (-)	Prickly Pea	S	Lm	Oa
Pultenaea villosa (-)	Hairy Bush Pea	S	Lm	Oa
Swainsona galegifolia	Darling Pea	S	Lm	Oa
Goodeniaceae				
Goodenia rotundifolia	Star Goodenia	H Gc	Lm	Oa
Scaevola aemula (-)	Fairy Fan Flower	H Gc	Lm	Oa
Scaevola albida (-)	Fan Flower	H	Lm	Oa
Scaevola calendulacea (-)	Scented Fan Flower	H Gc	Lm	Oa
Scaevola ramosissima (-)	A Fan Flower	H Gc	Lm	Oa
Lamiaceae				
Ajuga australis	Southern Bugle	H	Lm	Oa
Plectranthus argenteus (-)	Silver Native Coleus	H	Lm	Us Sa
Plectranthus graveolens	Native Coleus	H	Lm	Us Sa
Plectranthus parviflorus	Cockspur Flower	H	Lm	Us Sa
Prostanthera ovalifolia	Oval-leaf Mint Bush	S	Lm	Os Sa
Lauraceae				
Cryptocarya laevigata	Glossy Laurel	S/T	Lm	Us Sa
Cryptocarya meisneriana	Thick-leaf Laurel	S/T	Lm	Us Sa
Leeaceae				
Leea indica (-)	Bandicoot Berry	S	Lm	Us Sa

Scientific Name	Common Name	Form	Fire Retardance	Comments
Lythraceae				
Lagerstroemia archeriana (-)	Native Crepe Myrtle	S/T	Lm	Us Oa Sa De
Malvaceae				
Pavonia hastata (-)	Pavonia	S	Lm	Oa Sa
Hibiscus heterophyllus	Native Rosella	S/T	Lm	Us Sa
Hibiscus geranioides (-)		S	Lm	Oa
Melastomaceae				
Melastoma affine	Pink Lasiandra	S	Lm	Us Sa Oa
Meliaceae				
Turtacea pubescens (brownii)	Native Witch-Hazel	S/T	Lm	Us Sa
Menispermaceae				
Pleogyne australis	Pleogyne	V	Lm	Us Sa
Mimosaceae				
Acacia complanata	Flat-stem Wattle	S		Oa Pf
Acacia hubbardiana	Yellow Prickly Moses	S		Oa Pf
Acacia irrorata	Blue Skin	S		Oa Pf
Acacia myrtifolia	Myrtle Wattle	S		Oa Pf
Acacia suaveolens	Sweet Wattle	S		Oa Pf
Acacia ulicifolia	Prickly Moses	S		Oa Pf
Archidendron lovelliae (-)	Baconwood	S/T	Lm	Us Sa
Monimiaceae				
Wilkiea huegeliana	Tetra Beech	S/T	Lm	Us Sa
Wilkiea macrophylla	Large-leaf Wilkiea	S/T	Lm	Us Sa
Myoporaceae				
Erenophila debilis	Winter Apple	S Gc	Lm	Os
Myoporum boninense				
(M. ellipticum)	Boobialla	S Gc	Lm	Os
Myoporum montanum	Mountain Boobialla	S	Lm	Os
Myrsinaceae				
Aegiceras corniculatum	Milky Mangrove	S/T	Lm St	Oa Coastal
Rapanea howittiana	Scrub Muttonwood	S/T	Lm	Us Sa
Rapanea subsessilis	Red Muttonwood	S/T	Lm	Us Sa
Myrtaceae				
Archirhodomyrtus beckeri (-)	Rose Myrtle	S	Lm	Us Sa
Austrorhynchus fragrantissima (-)	Sweet Myrtle	T	Lm	Us Sa
Austrorhynchus hillii	Scaly Myrtle	S/T	Lm	Us Sa
Austrorhynchus inophloia	Thread-bark Myrtle	S/T	Lm	Us Sa
Austrorhynchus aff. lasioclada (-)	Velvet Myrtle	T	Lm	Us Sa
Austrorhynchus metrosideros (-)		S	Lm	Us Sa
Ptilidostigma glabrum (-)	Plum Myrtle	S	Lm	Us Sa
Ptilidostigma rhytidisperma	Small-leaf Plum Myrtle	S	Lm	Us Sa
Rhodamnia acuminata (-)	Cooloola Ironwood	S	Lm	Us Sa

Scientific Name	Common Name	Form	Fire Retardance	Comments
<i>Rhodamnia dumicola</i>	Rib-fruit Malletwood	S/T	Im	Us Sa
<i>Rhodamnia maidenii</i> (-)	Smooth Scrub Turpentine	S	Im	Us Sa
<i>Rhodomyrtus psidioides</i>	Native Guava	S	Im	Us Sa
<i>Syzygium wilsoni</i> (-)	Powder-puff Lilly Pilly	S	Im	Us Sa
Nyctaginaceae				
<i>Pisonia aculeata</i>	Native Bougainvillea	V	Im	Us Sa
Oleaceae				
<i>Jasminum simplicifolium</i>	Slender Jasmine	V	Im	Us Sa
<i>Notelaea ovata</i>	Netted Mock Olive	S	Im	Us Sa
<i>Notelaea venosa</i>	Veined Mock Olive	S	Im	Us Sa
Passifloraceae				
<i>Passiflora aurantia</i>	Red Passion Flower	V	Im	Us Oa Sa
<i>Passiflora herbertiana</i>	Yellow Passion Flower	V	Im	Us Oa Sa
Peperoniaceae				
<i>Peperomia blanda</i>	Native Peperomia	H	Im	Us Sa
<i>(leptostachya)</i>	Native Peperomia	H	Im	Us Sa
<i>Peperomia tetraphylla</i>				
Pittosporaceae				
<i>Citriobatus linearis</i>	Black-fruit Thornbush	S	Im	Us Sa
<i>Citriobatus paucifloris</i>	Orange Thornbush	S	Im	Us Sa
<i>Pittosporum revolutum</i>	Brisbane Laurel	S	Im	Us/Wb Sa/Oa
Proteaceae				
<i>Banksia oblongifolia</i>	Dwarf Banksia	S		Oa Pf
<i>Banksia robur</i>	Swamp Banksia	S		Oa Pf
<i>Grevillea leiophylla</i>	Wallum Grevillea	S		Oa Pf
<i>Grevillea 'Robyn Gordon'</i>	G. 'Robyn Gordon'	S		Oa Pf
<i>Grevillea sericea</i>	Pink Spider Flower	S		Oa Pf
<i>Grevillea 'Shirley Howie'</i>	G. 'Shirley Howie'	S		Oa Pf
<i>Grevillea 'Superb'</i>	G. 'Superb'	S		Oa Pf
<i>Hakea florulenta</i>	Hakea	S		Oa Pf
<i>Hakea purpurea</i>	Purple Hakea	S		Oa Pf
<i>Lambertia formosa</i> (-)	Mountain Devil	S		Oa Pf
<i>Lomatia silaifolia</i>	Crinkle Bush	S		Oa Pf
<i>Stenocarpus angustifolia</i> (-)		S		Oa Pf
Rhizophoraceae				
<i>Bruguiera gymnorhiza</i>	Orange Mangrove	S/T	Lm St	Oa Coastal
<i>Ceriops tagal</i>	Yellow Mangrove	S/T	Lm St	Oa Coastal
<i>Rhizophora stylosa</i>	Stilted Mangrove	S/T	Lm St	Oa Coastal
Rosaceae				
<i>Rubus parvifolia</i>	Pink Raspberry	S	Im	Oa
<i>Rubus rostratus</i>	Native Raspberry	S	Im	Us Sa
Rubiaceae				
<i>Canthium coprosmoides</i>	Coast Canthium	S/T	Im	Us Oa Sa
<i>Canthium lamprophyllum</i>	Large-leaf Canthium	S/T	Im	Us Sa

Scientific Name	Common Name	Form	Fire Retardance	Comments
<i>Canthium microphyllum</i>	Small-leaf Canthium	S	Im	Us Sa
<i>Ixora bleckleri</i>	Brown Coffeeewood	S/T	Im	Us Sa
<i>Morinda acutifolia</i>	Veiny Morinda	V	Im	Us Sa
<i>Morinda jasminoides</i>	Sweet Morinda	V	Im	Us Sa
<i>Pavetta australiensis</i>	Pavetta	S	Im	Us Sa
<i>Psychotria daphnoides</i>	Smooth Psychotria	S	Im	Us Sa
<i>Psychotria loniceroides</i>	Hairy Psychotria	S	Im	Us Sa
<i>Psychotria simmondsiana</i>	Small Psychotria	S	Im	Us Sa
<i>Randia benthamiana</i>	Native Gardenia	S	Im	Us Sa
<i>Randia chartacea</i>	Narrow-leaf Gardenia	S	Im	Us Sa
Rutaceae				
<i>Clausena brevistyla</i> (-)	Clausena	S	Im	Us Sa
<i>Microcitrus australasica</i> (-)	Finger Lime	S	Im	Us Sa
<i>Murraya ovatifoliolata</i> (-)	Native Murraya	S/T	Im	Us Sa
<i>Phebalium woombye</i> (-)	Phebalium	S	Im	Oa
Sambucaceae				
<i>Sambucus australasica</i>	Yellow Elderberry	S	Im	Us Sa
Sapindaceae				
<i>Alecryon coriaceus</i> (-)	Beach Bird's Eye	S/T	Im	Wb Oa
<i>Arytera microphylla</i> (-)	Dwarf Coogara	S	Im	Us Sa
<i>Cupaniopsis newmanii</i> (-)	Long-leaf Tuckeroo	T	Im	Us Sa Oa
<i>Cupaniopsis serrata</i>	Rusty Tuckeroo	S/T	Im	Us Sa Oa
<i>Cupaniopsis wadsworthii</i> (-)	Dwarf Tuckeroo	S	Im	Us Sa
<i>Harpullia alata</i> (-)	Wing-leaf Tulip	S	Im	Us Sa
<i>Mischocarpus undatus</i>	Red Pear-fruit	T	Im	Us Sa
Sapotaceae				
<i>Planchonella myrsinoides</i>	Yellow Plumwood	S/T	Im	Us Sa
Scrophulariaceae				
<i>Artenema fimbriatum</i>	Koala bells	H	Im	Oa
Tetragoniaceae				
<i>Tetragonia tetragonioides</i>	Native Spinach	H Gc	St Sc	Oa
Solanaceae				
<i>Duboisia myoporoides</i>	Corkwood	S/T	Im	Us Sa
<i>Solanum aviculare</i>	Kangaroo Apple	S	Im	Us Sa Oa
<i>Solanum densevestitum</i> (-)	Furry Nightshade	S	Im	Us Sa
<i>Solanum stelligerum</i> (-)	Star Nightshade	S	Im	Us Sa
Sterculiaceae				
<i>Brachychiton bidwillii</i>	Little Kurrajong	S	Im	Us Sa Oa
<i>Commersonia fraserii</i>	Scrub Kurrajong	S	Im	Us Sa Oa
Symplocaceae				
<i>Symplocos baeuerlenii</i> (-)	Shrubby Hazelwood	S	Im	Us Sa

Fire-Retardant Plants for Medium Gardens

The following plants can be used in addition to the list of plants for small gardens.

Scientific Name	Common Name	Form	Fire Retardance	Comments
MONOCOTYLEDONS				
Arecaceae				
<i>Archontophoenix cunninghamii</i>	Picabeen Palm	P	Lm	Ad
<i>Calamus muelleri</i>	Lawyer Cane Vine	P	Lm	Ad
<i>Livistona australis</i>	Cabbage Palm	P	Lm	Ad
Smilacaceae				
<i>Ripogonum fawcettianum</i>	Small Supplejack	V	Lm	Sa
<i>Smilax australis</i>	Barb-wire Vine	V	Lm	Sa Oa
DICOTYLEDONS				
Akaniaceae				
<i>Akania lucens</i>	Turnipwood	T	Lm	Us
Alangiaceae				
<i>Alangium villosum</i>	Muskwood	T	Lm	Us
<i>polyosmoides</i>				
<i>Alangium villosum tomentosum</i>	Muskwood	T	Lm	Us
Annonaceae				
<i>Polyalthia nitidissima</i>	Canary Beech	T	Lm	Us
Apocynaceae				
<i>Alstonia constricta</i>	Quinine Tree	T	Lm	Us
<i>Melodinus acutiflorus</i>	Merangarra	V	Lm	Sa
<i>Melodinus australis</i>	Southern Melodinus	V	Lm	Sa
Araliaceae				
<i>Cephalorhiza cephalobotrys</i>	Climbing Panax	V	Lm	Sa
Bignoniaceae				
<i>Pandorea pandorana</i>	Wonga Vine	V	Lm	Oa Sa
Caesalpiniaceae				
<i>Barklya syringifolia</i>	Crown of Gold Tree	T	Lm	Us Sa Oa
<i>Cassia tomentella</i> (-)	Velvet Bean	S/T	Lm	Us Oa
Cunoniaceae				
<i>Callicoma serratifolia</i> (-)	White Alder	S/T	Lm	Us
Dilleniaceae				
<i>Tecomnanthe hillii</i> (-)	Fraser Island Climber	V	Lm	Sa

Scientific Name	Common Name	Form	Fire Retardance	Comments
Thymeliaceae				
<i>Phaleria clerodendron</i> (-)	Scrub Daphne Slender Rice Flower Tie Bush	S	Lm	Us Sa
<i>Phaleria chermisideana</i>		S/T	Lm	Us Sa
<i>Pimelea linifolia</i>		S	Lm	Oa
<i>Wikstroemia indica</i>		S	Lm	Us Oa Sa
Tiliaceae				
<i>Corchorus cunninghamii</i>	Corchorus	S	Lm	Us Sa
Urticaceae				
<i>Elatostema reticulatum</i>	Rainforest Spinach	H	Lm	Us Sa
<i>Elatostema stipitatum</i> (-)	Small Soft Nettle	H	Lm	Us Sa
<i>Pipturus argenteus</i>	Native Mulberry	S/T	Lm	Us Sa
Verbenaceae				
<i>Callicarpa pedunculata</i>	Velvet-leaf	S	Lm	Us Sa
<i>Clerodendrum floribundum</i>	Lolly Bush	S/T	Lm	Us Oa Sa
<i>Clerodendrum tomentosum</i>	Hairy Lolly Bush	S/T	Lm	Us Oa Sa
<i>Phyla nodiflora</i> (-)	Condamine Couch	H Gc	Lm	Oa
<i>Vitex ovata</i> (-)	Vitex	S Gc	Lm	Oa
Violaceae				
<i>Viola betonicifolia</i>	Purple Violet	H	Lm	Us Sa
<i>Viola hederacea</i>	Native Violet	H	Lm	Us Sa
Vitaceae				
<i>Cayratia acris</i>	Hairy Water Vine	V	Lm	Us Sa
<i>Cayratia clematidea</i>	Slender Grape	V	Lm	Us Oa Sa
<i>Cayratia euryneura</i>	Soft Water Vine	V	Lm	Us Sa
<i>Cissus opaca</i>	Small-leaf Water Vine	V	Lm	Us Oa Sa
Winteraceae				
<i>Tasmannia insipida</i>	Pepper Bush	S	Lm	Us Sa
PTERIDOPHYTES				
Aspleniaceae				
<i>Asplenium attenuatum</i>	A Spleenwort	F	Lm	Sa
<i>Asplenium australasicum</i>	Crow's Nest Fern	eF	Lm	Sa
Osmundaceae				
<i>Todea barbara</i>	King Fern	tF	Lm	Us Sa
Polypodiaceae				
<i>Drynaria rigidula</i>	Basket Fern	eF	Lm	Sa
<i>Phymatodes scandens</i>	Scented Climbing Fern	tF	Lm	Sa
<i>Platynerium bifurcatum</i>	Elkhorn	eF	Lm	Sa
<i>Platynerium superbum</i>	Staghorn	F	Lm	Sa
<i>Pyrosia confluenta</i>	Felt Fern	eF	Lm	Sa
<i>Pyrosia rupestris</i>	Rock Felt Fern	eF	Lm	Sa

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Ebenaceae				
<i>Diospyros australis</i>	Black Plum	T	Lm	Us/Wb
<i>Diospyros geminata</i>	Scaly Ebony	T	Lm	Us/Wb
<i>Diospyros mabacea</i> (-)	Red-fruited Ebony	T	Lm	Us
Escalloniaceae				
<i>Anopterus macleayanus</i> (-)	Queensland Laurel	T	Lm	Us
<i>Polyalthia nitidissima</i>	Canary Beech	T	Lm	Us
Euphorbiaceae				
<i>Claoxylon australe</i>	Brittlewood	S/T	Lm	Us
<i>Croton achroynchioides</i>	Thick-leaved Croton	S/T	Lm	Us
<i>Croton insularis</i>	Queensland Cascarilla	S/T	Lm	Us
<i>Croton stigmatus</i>	White Croton	T	Lm	Us
Fabaceae				
<i>Erythrina vespertilio</i>	Bat's Wing Coral Tree	T	Lm	Ad De
Hernandiaceae				
<i>Hernandia bivalvis</i>	Cudgerie	T	Lm	Wb
Lauraceae				
<i>Cryptocarya bidwillii</i>	Yellow Laurel	T	Lm	Wb
<i>Cryptocarya meisneriana</i>	Thick-leaf Laurel	T	Lm	Wb
<i>Cryptocarya sclerophylla</i>	Boonah Laurel	T	Lm	Wb
<i>Cryptocarya triplinervis</i>	Brown Laurel	T	Lm	Wb
<i>Cryptocarya triplinervis</i> var. <i>pubens</i>	Hairy Brown Laurel	T	Lm	Wb
Meliaceae				
<i>Owenia venosa</i>	Crow's Apple	T	Lm	Us/Wb
<i>Synoum glandulosum</i>	Scentless Rosewood	S/T	Lm	Us
<i>Turraea pubescens</i> (T. brownii)	Native Witch-Hazel	T	Lm	Us
Menispermaceae				
<i>Stephania japonica</i> var. <i>discolor</i>	Tape Vine	V	Lm	Sa Oa
Mimosaceae				
<i>Acacia aulacocarpa</i>	Hickory Wattle	T	Lm	Wb/Pf
<i>Acacia implexa</i>	Light Wood	T	Lm	Wb/Pf
<i>Acacia melanoxylon</i>	Blackwood	T	Lm	Wb/Pf
<i>Acacia cincinnata</i>	Wattle	S/T	Lm	Wb/Pf
<i>Pararchidendron pruinosum</i>	Snowwood	T	Lm	Us/Wb
Moraceae				
<i>Ficus coronata</i>	Creek Sandpaper Fig	T	Lm	Us/Wb
<i>Ficus fraseri</i>	A Sandpaper Fig	T	Lm	Us/Wb
<i>Ficus opposita</i>	A Sandpaper Fig	T	Lm	Us/Wb
<i>Streblus brunonianus</i> (S. pendulinus)	Whalebone Tree	T	Lm	Us/Wb

Scientific Name	Common Name	Form	Fire Retardance	Comments
Myoporaceae				
<i>Myoporum acuminatum</i>	Coast Boobialla	S/T	Lm	Wb Oa
Myrsinaceae				
<i>Rapanea variabilis</i>	Muttonwood	T	Lm	Us
Myrtaceae				
<i>Acmena smithii</i> (small varieties)	Creek Lilly Pilly	T	Lm	Us/Wb
<i>Decaspermum humile</i>	Silky Myrtle	S/T	Lm	Us
<i>Metrosideros queenslandica</i> (-)Pink Myrtle		T	Lm	Us
<i>Rhodamnia rubescens</i>	Brown Malletwood	T	Lm	Us/Wb
<i>Syzygium hodgkinsonia</i> (-)	Smooth-bark Rose Apple	T	Lm	Us
Oleaceae				
<i>Notelaea johnsonii</i>	Veinless Mock Olive	S/T	Lm	Us
<i>Notelaea longifolia</i>	Large Mock Olive	S/T	Lm	Us/Wb
<i>Notelaea microcarpa</i>	Velvet Mock Olive	S/T	Lm	Us/Wb
Pittosporaceae				
<i>Hymenosporum flavum</i>	Native Frangipani	T	Lm	Us Ad
<i>Pittosporum undulatum</i>	Mock Orange	T	Lm	Us/Wb
Proteaceae				
<i>Buckinghamia celsissima</i> (-)	Ivory Curl Flower	T	Lm	Wb
<i>Grevillea helmsiae</i> (-)	Red Boppel Nut	T	Lm	Us Pf
<i>Hicksbeachia pinnatifolia</i> (-)	Tree Lomatia	T	Lm	Us Ad Pf
<i>Lomatia arborescens</i> (-)	Queensland Nut	S/T	Lm	Us Pf
<i>Macadamia integrifolia</i>	Maroochy Nut	T	Lm	Wb
<i>Macadamia ternifolia</i>	Rough Shell Bush Nut	T	Lm	Wb
<i>Macadamia tetraphylla</i>	Spice Bush	T	Lm	Us
<i>Triunia youngiana</i>		T	Lm	
Rubiaceae				
<i>Coelospermum paniculatum</i>	Coelospermum	V	Lm	Sa
<i>Hodgkinsonia ovatiflora</i>	Golden Ash	T	Lm	Us/Wb
Rununculaceae				
<i>Clematis glycinoides</i>	Headache Vine	V	Lm	Sa
Rutaceae				
<i>Acronychia imperforata</i>	Coast Aspen	S/T	Lm	Us/Wb
<i>Acronychia pauciflora</i>	Soft Acronychia	S/T	Lm	Us
<i>Microcitrus australis</i>	Round Lime	S	Lm	Us
Sapindaceae				
<i>Alectryon connatus</i>	Alectryon	T	Lm	Wb Slow at first
<i>Alectryon subcinerus</i>	Wild Quince	T	Lm	Wb
<i>Alectryon subdentatus</i>	Holly-leaf Bird's Eye	T	Lm	Wb
<i>Alectryon tomentosus</i>	Hairy Bird's Eye	T	Lm	Wb
<i>Arytera distylos</i>	Twin-leaf Coogera	T	Lm	Wb

Scientific Name	Common Name	Form	Fire Retardance	Comments
<i>Arytera divaricata</i>	Rose Tamarind	T	Lm	Wb
<i>Arytera foveolata</i>	Pitted Coogera	T	Lm	Wb
<i>Cupaniopsis parvifolia</i>	Small-leaf Tuckeroo	T	Lm	Wb
<i>Cupaniopsis shirleyana</i> (-)	Wedge-leaf Tuckeroo	T	Lm	Us/Wb
<i>Cupaniopsis tomentella</i> (-)	Boonah Tuckeroo	T	Lm	Wb
<i>Elattostachys nervosa</i>	Beetroot	T	Lm	Us/Wb
<i>Elattostachys xylocarpa</i>	White Tamarind	T	Lm	Wb
<i>Guioa semiglauc</i>	Wild Quince	T	Lm	Wb
<i>Lepiderema pulchella</i> (-)	Fine-leaf Tuckeroo	T	Lm	Wb
<i>Mischocarpus australis</i>	Red Pear-fruit	T	Lm	Wb
<i>Toechima tenax</i>	Scrub Teak	T	Lm	Wb
Sapotaceae				
<i>Planchonella chartacea</i>	Thin-leaf Plum	S/T	Lm	Us Sa
<i>Planchonella cotinifolia</i>	Small-leaf Plum	S/T	Lm	Us Sa
Simaroubaceae				
<i>Gulfoylia monostylis</i>	Native Plum	T	Lm	Us
Symplocaceae				
<i>Symplocos thwaitesii</i>	Buff Hazelwood	S/T	Lm	Us

PTERIDOPHYTES

Cyatheaceae

<i>Cyathea australis</i>	Rough Tree Fern	tF	Lm	Us
<i>Cyathea cooperi</i>	Common Tree Fern	tF	Lm	Us
<i>Cyathea leichhardtiana</i>	Prickly Tree Fern	tF	Lm	Us

Fire-Retardant Plants for Large Gardens, Acreage Blocks, Parks and Farms

The following plants can be used in addition to the lists of plants for small and medium gardens.

Scientific Name	Common Name	Form	Fire Retardance	Comments
GYMNOSPERMS				
Araucariaceae				
<i>Agathis robusta</i> (-)	Qld Kauri	T	Lm	Pf - resin
<i>Araucaria bidwillii</i> (-)	Bunya Pine	T	Lm	Pf - resin
<i>Araucaria cunninghamii</i>	Hoop Pine	T	Lm	Pf - resin
Podocarpaceae				
<i>Podocarpus elatus</i>	Brown or Plum Pine	T	Lm	Pf - resin
MONOCOTYLEDONS				
Arecaceae (Palmae)				
<i>Calamus muelleri</i>	Lawyer Cane Vine	V	Lm	Sa Oa

Scientific Name	Common Name	Form	Fire Retardance	Comments
Flagellariaceae				
<i>Flagellaria indica</i>	Supplejack	V	Lm	Sa
Pandanaceae				
<i>Freyinetia excelsa</i>	Climbing Pandanus	V	Lm	Sa
<i>Freyinetia scandens</i>	Climbing Pandanus	V	Lm	Sa
Smilacaceae				
<i>Ripogonum album</i>	White Supplejack	V	Lm	Sa
<i>Ripogonum brevifolium</i>	Supplejack	V	Lm	Sa
<i>Ripogonum discolor</i>	Prickly Supplejack	V	Lm	Sa
<i>Ripogonum elseyanum</i>	Hairy Supplejack	V	Lm	Sa
DICOTYLEDONS				
Anacardiaceae				
<i>Euroschinus falcata</i>	Ribbonwood	T	Lm	Wb
<i>Rhodospaera rhodanthema</i>	Deep Yellowwood	T	Lm	Wb
Annonaceae				
<i>Melodorum leichhardtii</i> (Rauwenhoffia l.)	Zig-Zag Vine	V	Lm	Sa
Apocynaceae				
<i>Alstonia constricta</i>	Quinine Tree	T	Lm	Wb
<i>Melodinus acutiflorus</i>	Merangarra	V	Lm	Sa
<i>Melodinus australis</i>	Southern Melodinus	V	Lm	Sa
<i>Parsonsia eucalyptophylla</i>	Gargaloo	V	Lm	Sa Oa
<i>Parsonsia fulva</i>	Furry Silkpod	V	Lm	Sa
<i>Parsonsia lanceolata</i>	Northern Silkpod	V	Lm	Sa
<i>Parsonsia latifolia</i>	Monkey Vine	V	Lm	Sa
<i>Parsonsia straminea</i>	Monkey Rope	V	Lm	Sa Oa
<i>Parsonsia velutina</i>	Velvet Silkwood	V	Lm	Sa Oa
<i>Parsonsia ventricosa</i>	Pointed Silkpod	V	Lm	Sa
Arecaceae				
<i>Calamus muelleri</i>	Lawyer Cane	V	Lm	Sa
Araliaceae				
<i>Cephalalaria cephalobotrys</i>	Climbing Panax	V	Lm	Sa
<i>Polyscias elegans</i>	Celerywood	T	Lm	Wb/Ad Oa
<i>Polyscias murrayi</i>	Pencil Cedar	T	Lm	Sa
Asclepiadaceae				
<i>Marsdenia rostrata</i>	Common Milk Vine	V	Lm	Sa
Atherospermataceae				
<i>Daphandra micrantha</i>	Socketwood	T	Lm	Wb

Scientific Name	Common Name	Form	Fire Retardance	Comments
Avicenniaceae				
<i>Avicennia marina</i>	Grey Mangrove	T	Lm St	Oa Coastal
Burseraceae				
<i>Canarium australasicum</i>	Carrotwood	T	Lm	Wb
Caesalpinhiaceae				
<i>Cassia markisiana</i> (-)	Native Laburnum	T	Lm	Wb
<i>Caesalpinia bonduc</i>	Caesalpinia	V	Lm	Sa
<i>Caesalpinia scortechinii</i>	Large Prickle Vine	V	Lm	Sa
<i>Caesalpinia subtropica</i>	Corky Prickle Vine	V	Lm	Sa
Celastraceae				
<i>Celastrus australis</i>	Staff Climber	V	Lm	Sa
<i>Celastrus subspicatus</i>	Large Staff Vine	V	Lm	Sa
<i>Loeseneriella barbata</i> (<i>Hippocratea</i> b.)	Knot Vine	V	Lm	Sa
Cunoniaceae				
<i>Caldcluvia paniculosa</i>	Rose-leaf Marara	T	Lm	Wb
<i>Ceratopetalum apetalum</i> (-)	Coachwood	T	Lm	Wb
<i>Geissois benthamii</i>	Red Carabeen	T	Lm	Wb
<i>Pseudoweinmannia</i>				
<i>lachnocarpa</i>	Marara	T	Lm	Wb
<i>Schizomeria ovata</i>	White Birch	T	Lm	Us/Wb
Ebenaceae				
<i>Diospyros fasciculosa</i>	Grey Ebony	T	Lm	Wb
<i>Diospyros pentamera</i>	Myrtle Ebony	T	Lm	Wb
Ehretiaceae				
<i>Cordia dichotoma</i> (-)	Cordia	T	Lm	Wb
<i>Ehretia acuminata</i>	Koda	T	Lm	Ad De
Elaeocarpaceae				
<i>Elaeocarpus eumundi</i>	Eumundi Quandong	T	Lm	Wb
<i>Elaeocarpus grandis</i>	Blue Quandong	T	Lm	Wb
<i>Elaeocarpus kirtonii</i>	White Quandong	T	Lm	Wb
<i>Elaeocarpus obovatus</i>	Hard Quandong	T	Lm	Wb
<i>Sloanea australis</i>	Maiden's Blush	T	Lm	Wb
<i>Sloanea woollsi</i>	Yellow Carabeen	T	Lm	Wb
Escalloniaceae				
<i>Quintinia verdonii</i>	Grey Possumwood	T	Lm	Wb
Euphorbiaceae				
<i>Austrobauxus swainii</i> (-)	Pink Cherry	T	Lm	Wb
<i>Baloghia inophylla</i> (<i>B. lucida</i>)	Scrub Bloodwood	T	Lm	Wb
<i>Bridelia exaltata</i>	Scrub Ironbark	T	Lm	Wb
<i>Bridelia leichhardtii</i>	Leichhardt's Ironbark	T	Lm	Wb
<i>Claoxylon australe</i>	Brittlewood	T	Lm	Wb

Scientific Name	Common Name	Form	Fire Retardance	Comments
<i>Dissiliaria baloghoides</i>	Lancewood	T	Lm	Wb
<i>Drypetes australasica</i>	Yellow Tulip	T	Lm	Wb
<i>Excoecaria agallocha</i>	Milky Mangrove	T	Lm St	Ad Coastal
<i>Excoecaria dallachyana</i>	Scrub Poison Tree	T	Lm	Wb
<i>Glochidion ferdinandi</i>	Cheese Tree	T	Lm	Wb
<i>Glochidion sumatranum</i>	Buttonwood	T	Lm	Wb
<i>Mallotus discolor</i>	Yellow Kamala	T	Lm	Wb
<i>Mallotus philippensis</i>	Red Kamala	T	Lm	Wb
Fabaceae				
<i>Austrosteenisia blackii</i>	Blood Vine	V	Lm	Sa Oa
<i>Castanospermum australe</i>	Black Bean	T	Lm	Wb
<i>Derris involuta</i>	Native Derris	V	Lm	Sa
<i>Erythrina sp. Lacey's Creek</i>	Corkwood	T	Lm	Ad De
<i>Erythrina vesperitilo</i>	Batswing Coral Tree	T	Lm	Ad De
<i>Mucuna gigantea</i>	Bumy Bean	V	Lm	Sa
Flacourtiaceae				
<i>Scolopia braunii</i>	Flintwood	T	Lm	Wb
Flindersiaceae				
<i>Flindersia australis</i>	Crows Ash	T	Lm	Wb
<i>Flindersia bennettiana</i>	Bennett's Ash	T	Lm	Wb
<i>Flindersia collina</i>	Leopard Ash	T	Lm	Wb
<i>Flindersia schottiana</i>	Cudgerie or Bumpy Ash	T	Lm	Wb
<i>Flindersia xanthoxyla</i>	Yellowwood	T	Lm	Wb
Icacinaceae				
<i>Citronella moorei</i>	Churnwood	T	Lm	Wb
<i>Pennantia cunninghamii</i>	Brown Beech	T	Lm	Wb
Lauraceae				
<i>Cryptocarya erythroxylon</i>	Pigeonberry Ash	T	Lm	Wb
<i>Cryptocarya hypospodia</i>	Rib-fruit Pepperberry	T	Lm	Wb
<i>Cryptocarya macdonaldii</i>	Cooloola Laurel	T	Lm	Wb
<i>Cryptocarya microneura</i>	Murrogon	T	Lm	Wb
<i>Cryptocarya obovata</i>	Pepperberry Tree	T	Lm	Wb
<i>Endiandra muelleri</i>	Mueller's Walnut	T	Lm	Wb
<i>Endiandra pubens</i>	Hairy Walnut	T	Lm	Wb
<i>Endiandra sieberi</i> (-)	Hard Corkwood	T	Lm	Wb
<i>Neolitsea australiensis</i>	Grey Bolly Gum	T	Lm	Wb
<i>Neolitsea dealbata</i>	White Bolly Gum	T	Lm	Us/Wb
Malvaceae				
<i>Hibiscus tiliaceus</i>	Cotton Tree	T	Lm	Wb
<i>Lagunaria patersonii</i> (-)	Norfolk Is Hibiscus	T	Lm	Wb
Meliaceae				
<i>Anthocarapa nitidula</i> (<i>Pseudocarapa nitidula</i>)	Incense Cedar	T	Lm	Wb
<i>Dysoxylum fraserianum</i>	Rosewood	T	Lm	Wb

Scientific Name	Common Name	Form	Fire Retardance	Comments
<i>Dysoxylum mollissimum</i> <i>ssp. molle</i> (<i>D. muelleri</i>)	Red Bean	T	Lm	Wb
<i>Dysoxylum rufum</i>	Hairy Rosewood	T	Lm	Wb
<i>Melia azedarach</i>	White Cedar	T	Lm	Wb/Ad Dv
<i>Owenia cepiodora</i>	Onion Cedar	T	Lm	Wb
<i>Toona australis</i>	Red Cedar	T	Lm	Wb/Ad Dv
Menispermaceae				
<i>Legnephora moorei</i>	Wild Grape	V	Lm	Sa
<i>Sarcopetalum harveyanum</i>	Pearl Vine	V	Lm	Sa
<i>Stephania aculeata</i>	Prickly Snake Vine	V	Lm	Sa
<i>Tinospora smilacina</i>	Snake Vine	V	Lm	Sa
<i>Tinospora tinisporoides</i>	Arrow-head Vine	V	Lm	Sa
Mimosaceae				
<i>Acacia aulacocarpa</i> var.				
<i>Acacia aulacocarpa</i>	Hickory Wattle	T	Lm	Wb Pf
<i>Acacia bakeri</i>	Marblewood	T	Lm	Wb Pf
<i>Acacia harpophylla</i> (-)	Brigalow Wattle	T	Lm	Wb
<i>Acacia melanoxylon</i>	Blackwood	T	Lm	Wb Pf
<i>Archidendron grandiflorum</i>	Lace Flower	T	Lm	Wb
Monimiaceae				
<i>Palmeria scandens</i>	Anchor Vine	V	Lm	Sa
Moraceae				
<i>Ficus macrophylla</i>	Moreton Bay Fig	T	Lm	Wb
<i>Ficus obliqua</i>	Small-leafed Fig	T	Lm	Wb
<i>Ficus platypoda</i>	Rock Fig	T	Lm	Wb
<i>Ficus superba</i> var. <i>henniana</i>	Deciduous Fig	T	Lm	Ad De
<i>Ficus virens</i> var. <i>sublaeolata</i>	White Fig	T	Lm	Wb
<i>Ficus watkinsiana</i>	Nipple Fig	T	Lm	Wb
<i>Maclura cochinchinensis</i> (<i>Cudrania</i> c.)	Cockspur Thorn	V	Lm	Oa Sa
<i>Malaisia scandens</i>	Burny Vine	V	Lm	Sa
Myrtaceae				
<i>Acmena hemilampra</i>	Blush Satinash	V	Lm	Wb
<i>Acmena ingens</i> (<i>A. brachyandra</i>)	Red Apple	V	Lm	Wb
<i>Acmena smithii</i>	Creek Lilly Pilly	T	Lm	Wb
<i>Lophostemon confertus</i>	Brush Box	T	Lm	Wb
<i>Syncarpia glomulifera</i>	Turpentine	T	Lm	Wb
<i>Syzygium australe</i>	Scrub Cherry	T	Lm	Wb
<i>Syzygium corynanthum</i>	Sour cherry	T	Lm	Wb
<i>Syzygium crebrinerve</i>	Purple Cherry	T	Lm	Wb
<i>Syzygium moorei</i> (-)	Durobby	T	Lm	Wb
Nyctaginaceae				
<i>Pisonia aculeata</i>	Native Bougainvillea	V	Lm	Sa

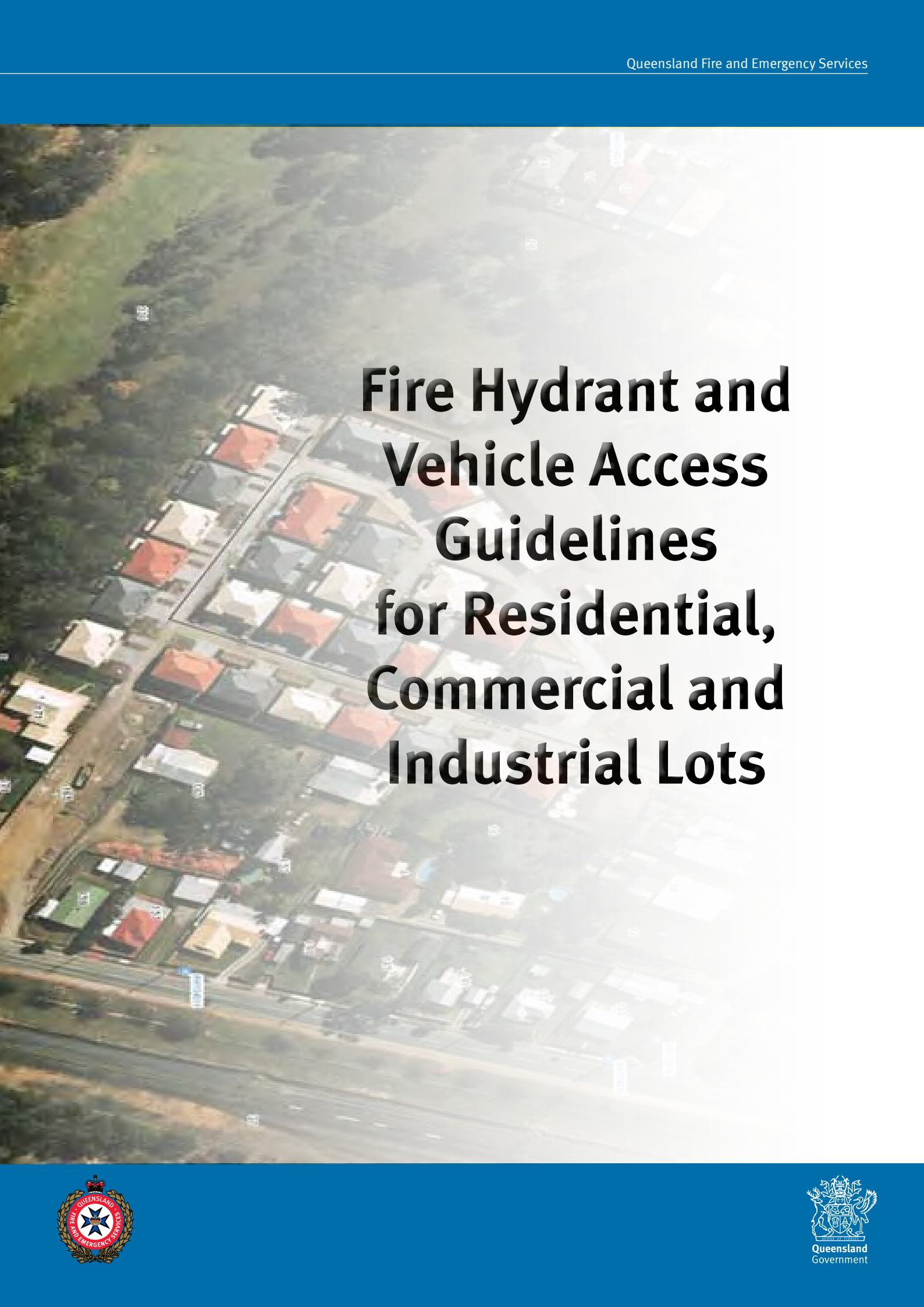
Scientific Name	Common Name	Form	Fire Retardance	Comments
Oleaceae				
<i>Olea paniculata</i>	Native Olive	T	Lm	Wb
Piperaceae				
<i>Piper novae-hollandiae</i>	Native Pepper Vine	V	Lm	Sa
Pittosporaceae				
<i>Pittosporum rhombifolium</i>	Hollywood	T	Lm	Wb
Proteaceae				
<i>Floydia praealta</i>	Ball Nut	T	Lm	Wb
<i>Grevillea hilliana</i> (-)	Hill's Silky Oak	T	Lm	Pf
<i>Grevillea robusta</i>	Silky Oak	T	Lm	Pf
<i>Helicia glabriflora</i>	Smooth Helicia	T	Lm	Pf
<i>Macadamia integrifolia</i>	Queensland Nut	T	Lm	Wb
<i>Macadamia ternifolia</i>	Maroochy Nut	T	Lm	Wb
<i>Macadamia tetraphylla</i> (-)	Rough-shell Bush Nut	T	Lm	Wb
<i>Oriocallis pinnata</i> (-)	Pink Silky Oak	T	Lm	Pf
<i>Oriocallis wickhamii</i> (-)	Satin Oak	T	Lm	Pf
(<i>Alloxylon flammeum</i>)				
<i>Stenocarpus salignus</i> (-)	Scrub Beefwood	T	Lm	Pf
<i>Stenocarpus sinuatus</i>	Wheel of Fire Tree	T	Lm	Wb
Ranunculaceae				
<i>Clematis aristata</i>	Old Man's Beard	V	Lm	Sa
Rhamnaceae				
<i>Alphitonia excelsa</i>	Red Ash	T	Lm	Wb
<i>Alphitonia petrei</i>	Pink Ash	T	Lm	Wb
<i>Emmenosperma</i> <i>alphitonioides</i>	Yellow Ash	T	Lm	Wb
Rosaceae				
<i>Rubus moluccanus</i>	Molucca Bramble	V	Lm	Sa
Rutaceae				
<i>Acronychia oblongifolia</i>	White Lilly Pilly	ST	Lm	Wb
<i>Acronychia suberosa</i>	Corky Acronychia	T	Lm	Wb
<i>Sarcamelicope simplicifolia</i>	Bauerella	T	Lm	Wb
Sapindaceae				
<i>Alectryon reticulatus</i>	Alectryon	T	Lm	Wb
<i>Arytera lautererana</i>	Corduroy Tamarind	T	Lm	Wb
<i>Atalaya multiflora</i>	Broad-leaf Whitewood	T	Lm	Wb
<i>Atalaya salicifolia</i> (<i>A. virens</i>)	Scrub Whitewood	T	Lm	Wb
<i>Castanospora aphanandi</i> (-)	Brown Tamarind	T	Lm	Wb
<i>Cupaniopsis anacardioides</i>	Tuckeroo	T	Lm	Wb
<i>Cupaniopsis flagelliformis</i> (-)	Brown Tuckeroo	ST	Lm	Wb
<i>Diploglottis campbellii</i> (-)	Small-leaf Tamarind	T	Lm	Wb
<i>Diploglottis cunninghamii</i>	Native Tamarind	T	Lm	Wb/Ad
<i>Harpullia hillei</i>	Blunt-leaf Tulip	T	Lm	Wb
<i>Harpullia pendula</i>	Tulipwood	T	Lm	Wb

Scientific Name	Common Name	Form	Fire Retardance	Comments
<i>Jagera pseudorhus</i>	Foam Bark Tree	T	Lm	Wb
<i>Mischocarpus anodontus</i>	Veiny Pear-fruit	T	Lm	Wb
<i>Mischocarpus pyrifolius</i>	Yellow Pear-fruit	T	Lm	Wb
<i>Rhysotoechia bifoliolata</i> (-)	Twin-leaf Tuckeroo	T	Lm	Wb
<i>Sarcopteryx stipata</i>	Corduroy	T	Lm	Wb
<i>Toechima dasyrrhache</i>	Blunt-leaf Steelwood	T	Lm	Wb
Sapotaceae				
<i>Amorphospermum antilogum</i>	Brown Pearwood	T	Lm	Wb
<i>Amorphospermum whitei</i> (-)	Rusty Plum	T	Lm	Wb
<i>Planchonella australis</i>	Black Apple	T	Lm	Wb
<i>Planchonella laurifolia</i> (-)	Blush Coondoo	T	Lm	Wb
<i>Planchonella pohlaniana</i>	Yellow Boxwood	T	Lm	Wb
Simaroubaceae				
<i>Ailanthus triphyssa</i>	White Siris	T	Lm	Wb
<i>Guilfoylia monostylis</i>	Native Plum	T	Lm	Wb
Siphonodontaceae				
<i>Siphonodon australis</i>	Ivorywood	T	Lm	Wb
Sterculiaceae				
<i>Argyrodendron actinophyllum</i>	Black Booyong	T	Lm	Wb
<i>Argyrodendron trifoliolatum</i>	Brown Tulip Oak	T	Lm	Wb
<i>Brachychiton acerifolius</i>	Flame Tree	T	Lm	Ad De
<i>Brachychiton discolor</i>	Lace Bark	T	Lm	Ad De
<i>Brachychiton populneus</i>	Kurrajong	T	Lm	Wb
<i>Brachychiton rupestris</i> (-)	Qld Bottle tree	T	Lm	Ad De
<i>Brachychiton</i> sp. (-)	Ormeau Bottle tree	T	Lm	Ad De
<i>Commersonia bartramia</i>	Brown Kurrajong	T	Lm	Us/Wb
<i>Sterculia quadrifida</i>	Peanut Tree	T	Lm	Ad De
Symplocaceae				
<i>Symplocos stawelli</i>	White Hazelwood	T	Lm	Wb
Ulmaceae				
<i>Aphananthe philippinensis</i>	Native Elm	T	Lm	Wb
<i>Celtis paniculata</i>	Investigator Tree	T	Lm	Wb
Urticaceae				
<i>Dendrocnide excelsa</i>	Giant Stinging Tree	T	Lm	Wb
<i>Dendrocnide photinophylla</i>	Mulberry Stinger	T	Lm	Wb
Verbenaceae				
<i>Gmelina leichhardtii</i>	White Beech	T	Lm	Wb
<i>Premna lignum-vitae</i>	Lignum-vitae	T	Lm	Wb
Vitaceae				
<i>Cissus antarctica</i>	Kangaroo Vine	V	Lm	Wb
<i>Cissus hypoglauca</i>	Five-leaf Watervine	V	Lm	Wb
<i>Cissus sterculiifolia</i>	Long-leaf Watervine	V	Lm	Wb
<i>Tetrastigma nitens</i>	Shining Grape	V	Lm	Wb

Appendix 2

Fire Hydrant and Vehicle Access Guidelines for Residential, Commercial and Industrial Lots

Source: Queensland Fire and Emergency Services (2015)



Fire Hydrant and Vehicle Access Guidelines for Residential, Commercial and Industrial Lots



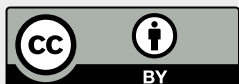
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Glossary of Terms

In this document, the terms are limited to the meanings described below.

Building:	A building is a fixed structure that is wholly or partly enclosed by walls or is roofed.
Structure:	For this document refer to definition of a Building.
Fire Appliance:	A vehicle used to combat a fire. A typical fire appliance (a pumper) is approximately 2.5m wide, 7.7m long and it is typically used in urban residential areas. Further specifications of fire appliances and larger appliances are available from the QFES if design solutions are required for specific situations.
Hydrant:	An assembly installed on a branch from a water pipeline, which provides a valved outlet to permit a supply of water to be taken from the pipeline for fire fighting. These include above and below ground hydrants.
QFES:	Queensland Fire and Emergency Services.
Material Change of Use:	As per the <i>Sustainable Planning Act 2009</i>
Reconfiguration of a Lot:	As per the <i>Sustainable Planning Act 2009</i>
Reticulated Water Supply:	Is a permanent infrastructure provided to deliver treated water to lots from an Urban Utility Authority through a system of pipes, mains, control valves etc. for household or industrial use. It will supply uninterrupted water at a positive pressure for fire fighting purposes.
Road or Carriageway:	Construction which is specifically designed for all vehicle travel (may or may not include a sealed top surface layer).
A Constructed Road:	For the purpose of defining widths, includes the part of the road reserve set aside for traffic and also includes roll-over kerbs but does not include the remaining part of the road reserve.
Trafficable Width:	Refers to that width of the constructed road that is unimpeded by encroachments such as street furniture or landscaping, and is available for free movement of fire appliances.



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Public Safety Business Agency working in partnership with the Queensland Fire and Emergency Services.

1. Scope

For applications seeking development approval for material change of use or reconfiguring a lot for the purpose of building, where streets and common access ways are proposed regardless of building classification.

Where reticulated hydrant systems and vehicle access are not currently required under the *Sustainable Planning Act 2009* (SPA), the *Building Act 1975* or Building Code of Australia (BCA) the measures in this document should be adopted.

Australian Standard (AS) 2419.1 2005 Appendix B is a minimum standard of design and performance for the State of Queensland. In a Local Government Authority where a local Water Authority specifies a design and performance criteria above the requirements of AS 2419.1 2005 Appendix B, the Local Water Authority requirements will be adopted.

For the installed reticulated hydrant systems the minimum water flow rate and pressure is to be 10 L/S @ 200 Kpa as per AS 2419.1 2005 Table 2.2. In a Local Government Authority where a local Water Authority specifies a flow rate and pressure above the requirements of AS 2419.1 2005 Table 2.2, the Local Water Authority requirements will be adopted.

For fire appliance access, a minimum width and height clearance for roadways is required. Constructed roads must comply with Government legislation such as the “Road Planning and Design Manual”.

2. Introduction

The Queensland Fire and Emergency Services (QFES) is the primary provider of fire and rescue services throughout Queensland. The QFES is responsible for community safety, the protection of people, property and the environment from fire and chemical incidents and, in conjunction with other agencies, the rescue of people trapped in vehicles, buildings and other emergency situations.

The loss of life and property damage by fire in residential, commercial and industrial premises is a major concern to the QFES, and for this reason, these lot reconfigurations need to be designed to provide ready access for fire appliances, whilst providing a fire fighting water supply from a Hydrant System.

Water supply and access requirements for material change of use or reconfiguring a lot within this document are a planning tool and advice for building and developer applicants, it is not the intent of this document for land development applications to be referred to the QFES. They outline fire safety requirements to enable the QFES to efficiently manage fire incidents.

This document reflects Queensland Government policy of promoting sustainable development that achieves economic, social and environmental objectives, including safety. The provisions are flexible allowing planners and designers to economically achieve safety objectives without compromising aesthetics or amenity.

3. Where Do These Guidelines Apply?

These guidelines apply to all material change of use or reconfiguration of a lot that will include streets and common access ways within a common private title in areas serviced by reticulated water within Queensland, for residential buildings, both attached and detached commercial or industrial buildings that are not covered in other legislation or planning provisions.

For example, this would apply to planned townships or reconfigurations regardless of current fire service intervention.

4. Water Supply Specification

Installed reticulated hydrant systems are to be located on roadways or access ways for all material change of use and reconfigured lots for fire fighting purposes as per AS 2419.1 2005 Appendix B that provides a minimum standard for hydrant intervals. In a Local Government Authority where a Local Water Authority specifies a design and performance criteria above the requirements of AS 2419.1 2005 Appendix B, the Local Water Authority requirements will be adopted.

For the installed reticulated hydrant systems the minimum water flow rate and pressure is to be 10 L/S @ 200 Kpa as per AS 2419.1 2005 Table 2.2. In a Local Government Authority where a local Water Authority specifies a flow rate and pressure above the requirements of AS 2419.1 2005 Table 2.2, the Local Water Authority requirements will be adopted.

4.1 Hydrant Provision:

Hydrant Provision	
Expectation	Acceptable Outcomes
Where reticulated water is available, operable hydrants are to be provided.	Hydrants above or below ground should be provided and maintained to the minimum required performance standard as per AS 2419.1 2005.

Rationale:

Firefighters use water as a prime extinguishing medium for structure fires. Reticulated water mains have hydrants placed at regular intervals to enable firefighters to connect into the reticulated system. The water is pressurised by pumps in the fire appliance and delivered via hoses to the fire.

Figure 1 illustrates hydrant locations on reticulated water mains.



Figure 1 – Reticulated Hydrant System

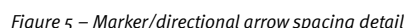


Figure 2 – Use of Hydrant System

4.2 Hydrant Markers

Hydrant Markers	
Expectation	Acceptable Outcomes
Hydrants are suitably identified so that firefighters can locate them at all hours.	Blue cats eyes are preferred for sealed roads. Marker posts at the fence line should be used to identify hydrants where there is an unsealed road as road (HR) or path (HP) hydrants. The Figures 3-6 are examples of marker locations.

Firefighters need to quickly locate water supplies in emergencies. Hydrant indicators need to be visually identifiable from both directions by the approaching fire appliance crews and must identify the location of the hydrant.



Hydrant Location	
Expectation	Acceptable Outcomes
Hydrants are located in positions that will enable firefighters to access water safely, effectively and efficiently.	Residential Streets and Accessways Above or below ground fire hydrants should be provided at not more than 120m intervals along residential streets and at each street intersection. Above ground fire hydrants may be single outlet.
	Commercial and Industrial Streets and Accessways Within streets serving commercial properties such as factories, warehouses and offices, above or below ground fire hydrants should be provided at not more than 90 m intervals and at each street intersection. Above ground fire hydrants should have dual valved outlets.

Upon arriving at a structure fire, firefighters site the fire appliance with considerations to safety, access to the fire, other responding appliances and accessible water supply for fire fighting purposes. Firefighters have an expectation that fire hydrants will be located on reticulated water systems no more than 120 metres apart as per AS 2419.1 2005, Appendix B. QFES equipment, procedures and the training of personnel is based on this preferred standard of fire hydrant placement and associated access requirements.



Note: Hydrants should be located at each intersection. With this in mind hydrant interval distances should not exceed 120 metres.

Figure 6 – Hydrant System design to minimum standards

5. Vehicle Access Requirements

Fire service vehicular access is to enable the service to intervene to fight the fire, assist with evacuation and stop the spread of fire to another building.

A minimum roadway clearance of 3.5m wide by 4.8m high is required for a fire appliance. Constructed roads must comply with Government legislation as specified in the “Road Planning and Design Manual”.

5.1 Road Width and Height

Road Width and Height	
Performance Outcomes	QFES Acceptable Outcomes
Roads are wide enough for fire appliances to gain access to a safe working area close to dwellings and water supplies whether or not on-street parking spaces are occupied.	Constructed roads must be as specified in the “Road Planning and Design Manual”.

Rationale:

Fire appliances often used in residential areas are typically 2.5 m wide and 7.7m long. The road width must allow room for safe passage of a fire appliance with additional margins for human error and safe clearances.

5.2 Road Construction

Road Construction	
Performance Outcomes	QFES Acceptable Outcomes
Roads must be constructed to facilitate the safe passage of a laden fire appliance in all weather conditions.	Roads must be constructed to a standard so that they are accessible in all weather conditions and capable of accommodating a vehicle of 15 tonnes for the trafficable road width as specified in the “Road Planning and Design Manual”.

Rationale:

Roads must be trafficable in all weather conditions. Most appliances in residential areas currently weigh less than 13 tonnes.

5.3 Road Grades

Road Grades	
Performance Outcomes	QFES Acceptable Outcomes
Grades of roads must facilitate the safe passage of fire appliances.	The average grades, dips, and exit angles must be addressed as specified in the “Road Planning and Design Manual”.

Rationale:

Steep slopes affect the free movement of appliances and hinder safe fire fighting. Severe short dips may limit access due to the overhang of the body from the wheels.

5.4 Turning Bays

Turning Bays	
Performance Outcomes	QFES Acceptable Outcomes
Provision is made for fire appliances to turn at the end of dead end roads.	Constructed roads more than 60m in length from the nearest intersection must have a turning circle with a minimum radius of 8m (including roll-over kerbs if they are provided). Other solutions using T or Y heads of specified dimensions are also appropriate. See figure 2 in the “Road Planning and Design Manual” .

Rationale:

It is dangerous for emergency vehicles to be required to reverse along roads for excessive distances in urban areas. Turning is normally carried out after the incident is under control when emergency movement is not required. Even then, large appliances reversing in residential areas create safety concerns. Fire appliances occasionally need to seek an alternative route necessitating a 180 degree turn in emergency conditions. Using a three point turn, fire appliances require a turning circle radius of 8m to turn safely. Alternative designs using specified T or Y heads are also appropriate. This area needs to be clear of obstructions.

Turning Examples

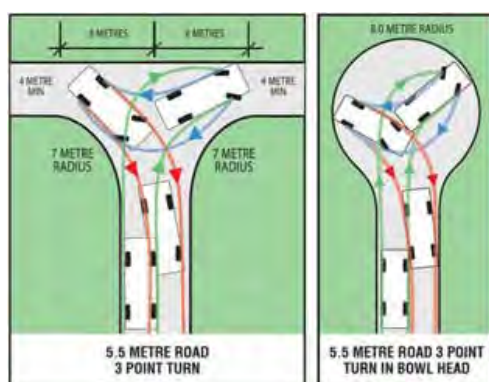


Figure 7 – Vehicle Turning Provisions

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Appendix 3

Bushfire Survival Plan Guideline / Template

Source: Queensland Fire and Emergency Services

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.

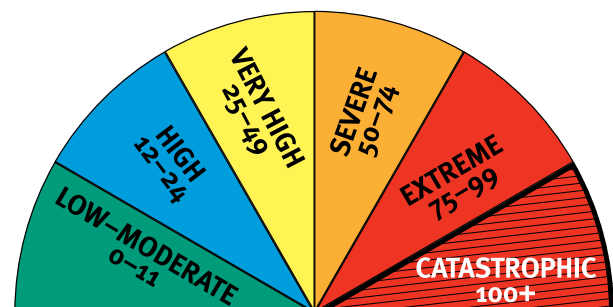
It is your responsibility
to prepare yourself, your
family and your
home for the threat
of bushfire.

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:

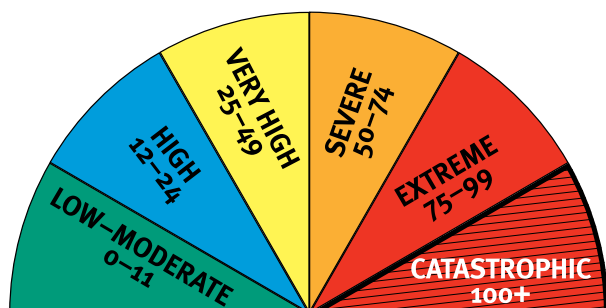
- NSPs do not cater for pets.
- Firefighters may not be present as they will be fighting the main fire front elsewhere.
- NSPs do not provide meals or amenities.
- They may not provide shelter from the elements, particularly flying embers.

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 a '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

Step3B – 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 ☐	No ☐
Unrestricted gate access	Yes ☐	No ☐
Clear of overhead power lines	Yes ☐	No ☐
Able to reverse in	Yes ☐	No ☐
Turning/passing areas	Yes ☐	No ☐
Heavy vehicle access on cattle grid/bridge	Yes ☐	No ☐
Alternative way out	Yes ☐	No ☐
Two wheel drive access	Yes ☐	No ☐

STRUCTURE/S

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

WATER SUPPLY

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

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.