

Queensland Bushfire Risk Assessments
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BUSHFIRE RISK ASSESSMENT AND RISK MITIGATION COMPLIANCE REPORT

Prepared in accordance with:

State Planning Policy Guideline - 2017
Queensland Development Code - 2009
Australian Standard AS3959 - 2018
Construction of Buildings in Bushfire Prone Areas
The Gold Coast City Council Planning Scheme - 2016

PLANS AND DOCUMENTS referred to in the DEVELOPMENT APPROVAL

Application No: COM/2026/92

Dated: 21 August 2026

Development shall comply with the conditions of approval as detailed in the Decision Notice and Council's Planning Scheme, Local Laws and Planning Policies

Report prepared for:

Bosform Pty Ltd
c/ Michel Group Services

For property:

(Lot 19) 2 Karingal Drive,
Pimpama. 4209

Prepared by:

Queensland Bushfire Risk Assessments
Ray Cavanough and Max Gray

Date: 09/03/2026

Valid for adoption for 36 months from date of site inspection

Note: Whilst every care has been taken in the preparation of this report, it has been drawn up within the guidelines provided, and is a risk assessment only, recommending risk reduction measures, and should the recommendations be adopted fully, neither implies nor guarantees any warranty of any kind in respect to life, property, or any other matter.

Document Control:

Date	Rev	Comment	Prepared By	Checked By	Authorised by
09/03/26	1	First version.	Max Gray	Max Gray	Max Gray and Ray Cavanough

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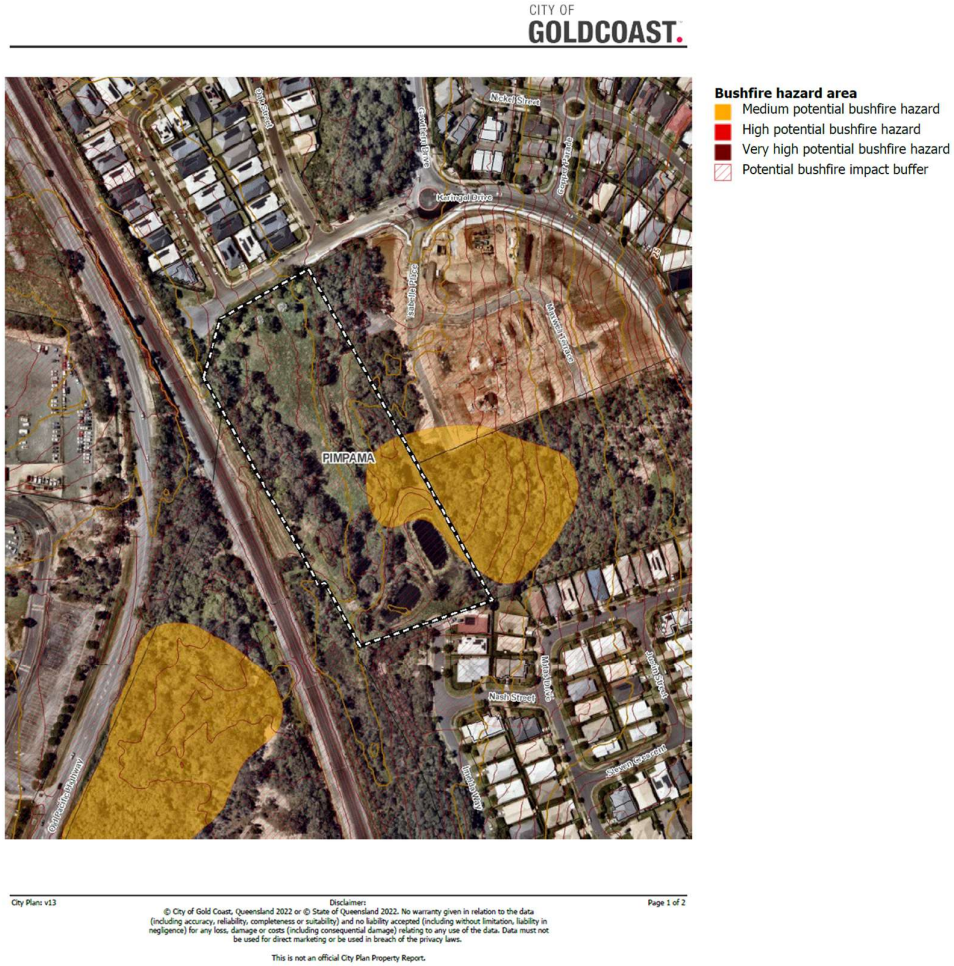
Property: Location and Details

A site inspection was conducted on the 02/02/2026.

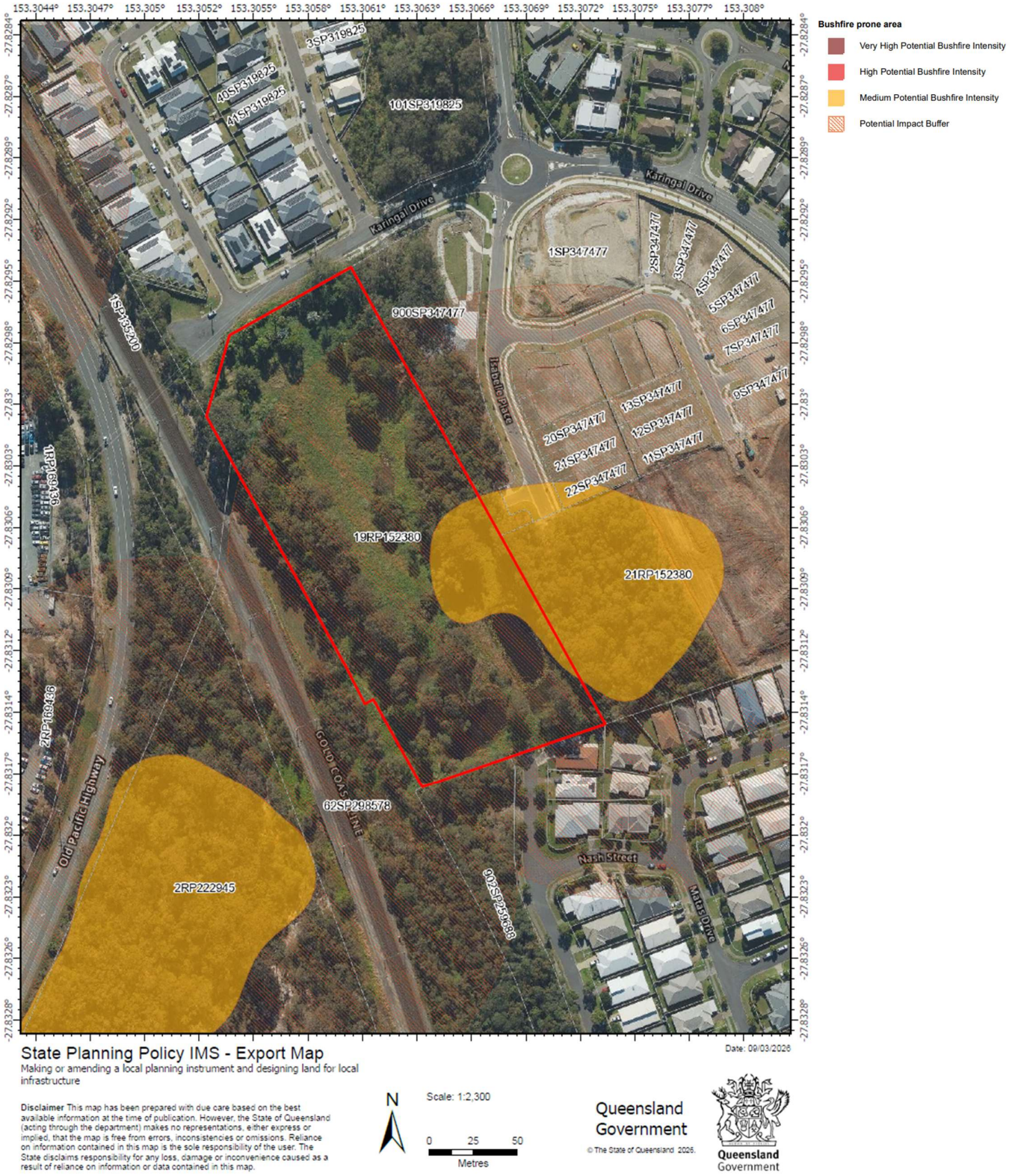
Local Government Authority: City of Gold Coast Council
Street Address: 2 Karingal Drive, Pimpama. 4209
Real Property Description: Lot 19 – RP 152380
Site Area: 24,590m^2

Proposal:

The proposal involves a material change of use for multiple dwellings, reconfiguring a lot into two management lots and a park lot, and operational works including ground level modifications and vegetation clearing. It features a new townhouse development with 16 units accessible via Imelda Way and 41 units accessible from Karingal Drive. The reconfiguration creates management lots for these townhouse complexes and a park lot to be transferred to the Council, designated for a drainage reserve that crosses the site, as per the site plan under appendix 1. Base plans outlining the development, and any other documentation have been supplied by Michel Group Services.



Site Overview (Fig. 1)
CGCC Interactive Mapping System 2016 Overlay Map, indicating Potential Bushfire Impact Buffer Zone, Medium, High, Very High Bushfire Hazard areas and slope contour.



Site Overview (Fig. 2)

The State Planning Policy interactive mapping system indicating bushfire hazard areas.

CITY OF GOLDCOAST.



Regulated vegetation
Regulated vegetation

Vegetation management
High priority vegetation
Medium priority vegetation
General priority vegetation

Koala habitat areas

Waterways
Major waterway
Waterway

City Plan: v13

Disclaimer:
© City of Gold Coast, Queensland 2022 or © State of Queensland 2022. No warranty given in relation to the data (including accuracy, reliability, completeness or suitability) and no liability accepted (including without limitation, liability in negligence) for any loss, damage or costs (including consequential damage) relating to any use of the data. Data must not be used for direct marketing or be used in breach of the privacy laws.

This is not an official City Plan Property Report.

Page 1 of 2

Site Overview (Fig. 3)
CGCC Interactive Mapping System 2016 Overlay Map, indicating Environmental significance overlays.

2 Karingal Drive

Regional Ecosystems

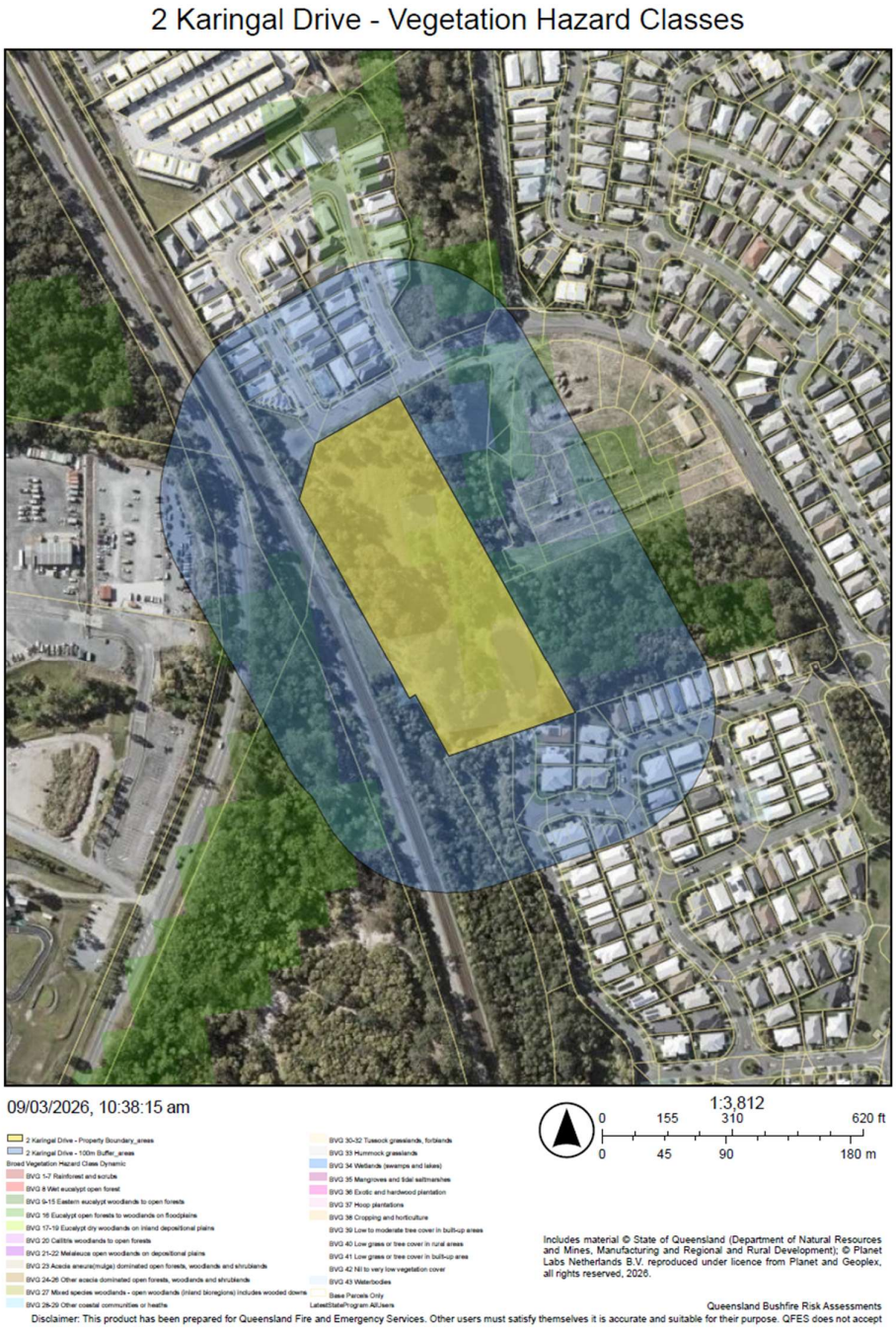


	Short Description	Full Description	Common Names	Fire Guidelines
Regional Ecosystem 12.11.24	Eucalyptus carnea or E. tindaliae, Corymbia intermedia +/- E. siderophloia or E. crebra woodland on metamorphics +/- interbedded volcanics	Eucalyptus carnea or E. tindaliae, Corymbia intermedia woodland +/- E. crebra or E. siderophloia, Eucalyptus resinifera, Eucalyptus major, E. helidonica, Angophora woodsiana, C. trachyphloia, E. microcorys, Corymbia citriodora subsp. Variegata, C. henryi. Occurs on Palaeozoic and older moderately to strongly deformed and metamorphosed sediments and interbedded volcanics usually at altitudes <300 metres. (BVG1M: 9g)	**Woodland** • Thick leaved mahogany • Tindal's stringybark • Pink bloodwood • Northern grey ironbark • Narrow leaved ironbark	**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.

Regional Ecosystem 12.3.11	Eucalyptus tereticornis +/- Eucalyptus siderophloia, Corymbia intermedia open forest on alluvial plains usually near coast	Eucalyptus tereticornis +/- E. siderophloia and Corymbia intermedia open forest to woodland. Corymbia tessellaris, Lophostemon suaveolens and Melaleuca quinquenervia frequently occur and often form a low tree layer. Other species present in scattered patches or low densities include Angophora leiocarpa, E. exserta, E. grandis, E. latisinensis, E. tindaliae, E. racemosa and Melaleuca sieberi. Corymbia trachyphloia and/or C. citriodora subsp. Variegata may dominate on areas of Pleistocene alluvia. Eucalyptus seeana may be present south of Landsborough and Livistona decora may occur in scattered patches or low densities in the Glenbar SF and Wongi SF areas. Occurs on Quaternary alluvial plains and drainage lines along coastal lowlands. Rainfall usually exceeds 1000mm/y. (BVG1M: 16c)	**Open Forest** • Blue gum • Northern grey ironbark • Pink bloodwood	**SEASON:** Summer to late-autumn. **INTENSITY:** Low. **INTERVAL:** 3-6 years. **STRATEGY:** Aim to burn 40-60% of any given area. Spot ignition in cooler or moister periods encourages mosaics. **ISSUES:** Control of weeds is a major focus of planned burning in most areas. Maintain ground litter and fallen timber habitats by burning only with sufficient soil moisture. Burning should aim to produce fine scale mosaics of unburnt areas.

Site Overview (Fig. 4)

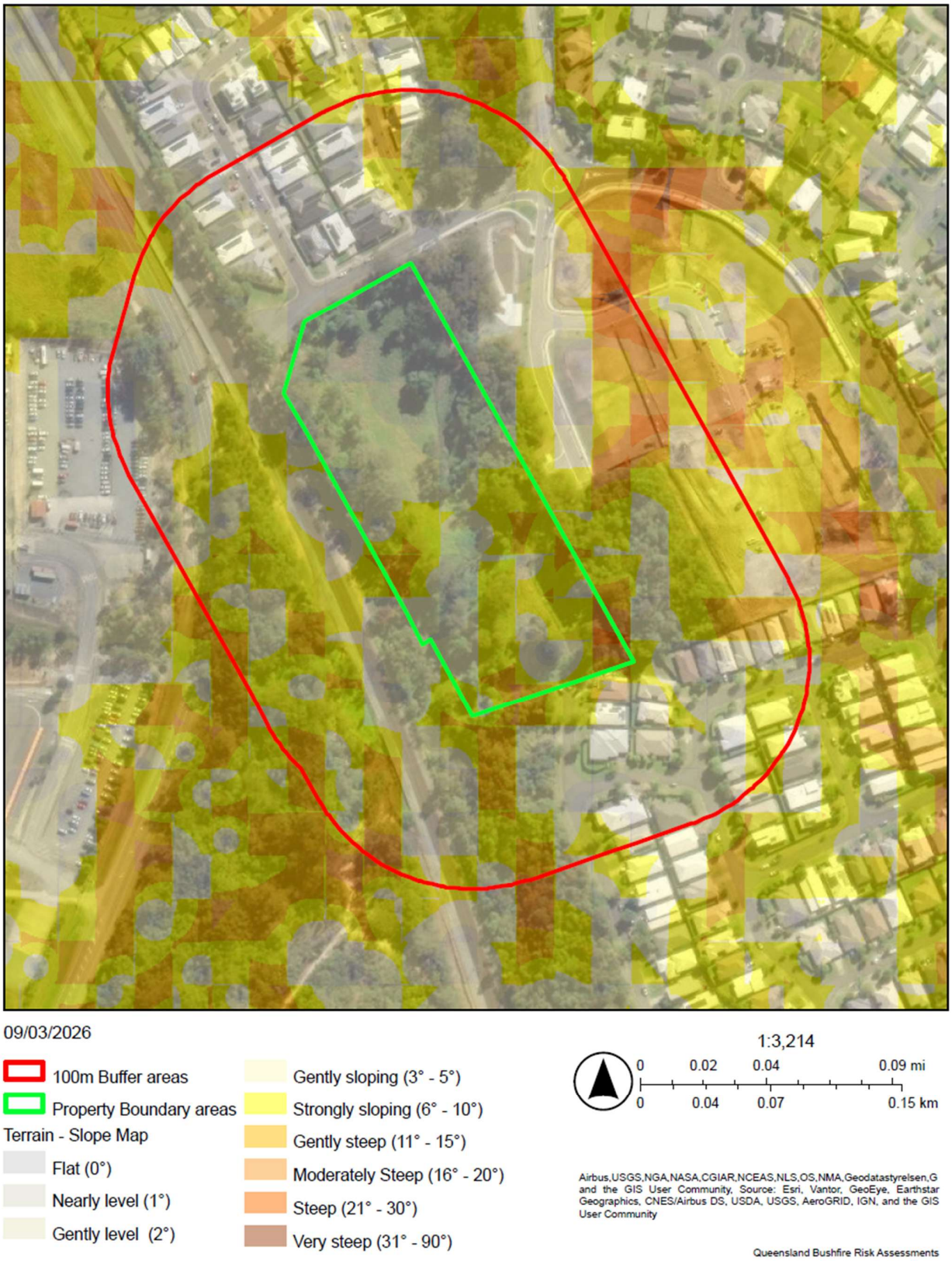
Queensland Globe indicating regional ecosystems within 100 metres of the proposed development.



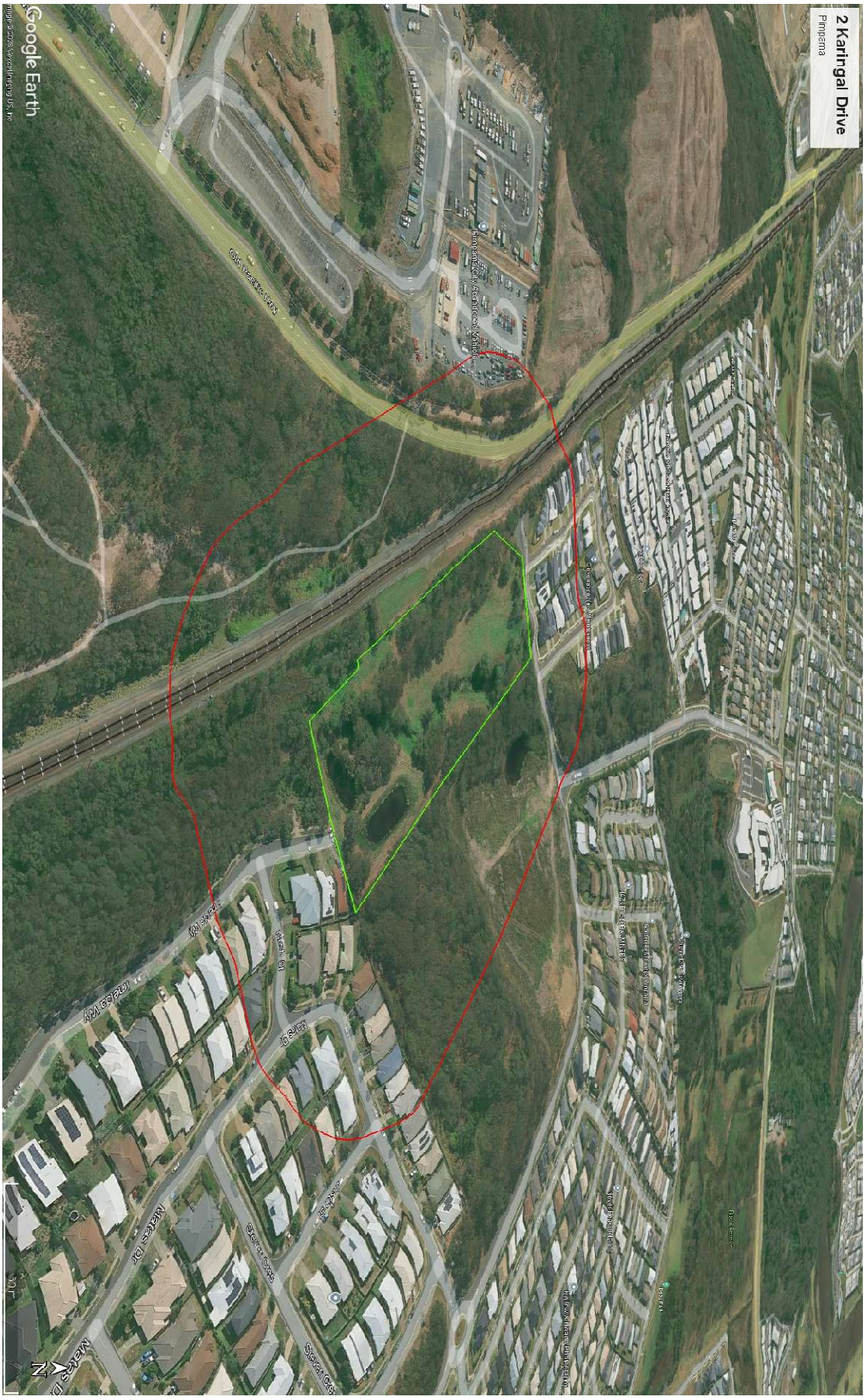
Vegetation Hazard Class	Description
9.2	Moist to dry eucalypt woodland on coastal lowlands and ranges
16.1	Eucalyptus dominated forest on drainage lines and alluvial plains
40.4	Continuous low grass or tree cover
41.4	Discontinuous low grass or tree cover
42.6	Nil to very low vegetation cover
43.6	Water bodies or very low vegetation cover

Site Overview (Fig. 5)
BRC MapViewer online mapping system indicating vegetation hazard classes.

2 Karingal Drive - Terrain Slope Map



Site Overview (Fig. 6)
Terrain slope map detailing surrounding landscape slopes.



Site Overview (Fig. 7)
Google Earth illustrating a 3D visual of the property.



Legend

100m Buffer
100m Buffer

BAL Map
A. Forest

B. Woodland
Excluded

BAL Map (Fig. 8)

Aerial image showing classifiable vegetation within a 100-metre radius of development.

General Description:

The property number 2 is located on the southern side of Karingal Drive in a medium density residential zoned area. The property currently has pre-existing infrastructure located onsite in the way of two dams that are to be filled as a part of the project. The proposed development will implement 57 new townhouses at the site. The property is generally flat with a southerly aspect but has some small slope runs into a wet gulley in the centre of the block (this wet gulley is proposed to be rehabilitated as a part of the proposed development).

The Queensland Globe state mapping system shows the regional ecosystems 12.11.24 and 12.3.11 to be located within 100 metres of the property. The BRC MapViewer online mapping system shows the vegetation hazard classes 9.2, 16.1, 40.4, 41.4, 42.6 and 43.6 to be located within 100 metres of the property.

Upon the conduction of a site inspection, five plots of classifiable vegetation were found within 100 metres of the property.

Plot 1:
Classifiable vegetation classed as (VHC 16.1) eucalyptus dominated forest on drainage lines and alluvial plains consisting of grey gum, iron bark, bloodwood and paperbark top storey, regrowth eucalyptus species, wattle and escaped garden ornamentals mid storey, with a leaf litter and grass ground cover. This plot of vegetation is located to the north across Karingal Drive and is located along a mapped council waterway.

Plot 2:
Classifiable vegetation classed as (VHC 16.1) eucalyptus dominated forest on drainage lines and alluvial plains consisting of grey gum, iron bark, bloodwood and paperbark top storey, regrowth eucalyptus species, wattle and escaped garden ornamentals mid storey, with a predominantly managed grass ground cover. This plot of vegetation is located along the mapped waterway within the property and is proposed to be rehabilitated with species present in the regional ecosystems 12.3.11 and 12.3.6. Details regarding the rehabilitation area and planting palette can be found under appendix 2 of this report.

Plot 3:
Classifiable vegetation classed as (VHC 9.2) moist to dry eucalypt woodland on coastal lowlands and ranges consisting of bloodwood, grey gum and paperbark top storey, wattle, paperbark and regrowth eucalyptus species mid storey, with a grass ground cover. This plot of vegetation is located to the west of the property across the Gold Coast train line.

Plot 4:
Classifiable vegetation classed as (VHC 9.2) moist to dry eucalypt woodland on coastal lowlands and ranges consisting of predominantly wattle and paperbark top and mid storey, with a leaf litter ground cover. This plot of vegetation is located to the south of the property beyond a bio basin implemented as a part of the neighbouring residential development.

Plot 5:
Classifiable vegetation classed as (VHC 9.2) moist to dry eucalypt woodland on coastal lowlands and ranges consisting of flooded gum and bloodwood top storey, wattle, paperbark and escaped garden ornamentals mid storey, with a grass ground cover. This plot of vegetation is located to the east of the site being a small patch that will connect with the proposed rehabilitation area in the centre of the property.

Vegetation within the property consists of scattered grey gum, bloodwood, wattle, escaped garden ornamentals, paperbark weeds and managed grass. Much of the

vegetation within the site is proposed to be removed to make way for the new townhouse development.

Excluded areas within 100 metres of the property consist of roads and dwellings or areas with a managed ground cover deemed to be low threat.

Adjoining properties are of similar size and are developed. Access to the site will be via a new driveway network from both Karingal Drive and Imelda Way. Reticulated water is available to the site, therefore, water storage for firefighting purposes will not be a requirement for this proposal.

AS3959-2018 BAL Calculations Method 2 – Minimum Setback Distances

2.2.2	Fire Danger Index – QLD	**53** *Variable FDI retrieved from the QFES Catalyst online mapping system.*
2.2.3	Classified Vegetation Types	**VHC 9.2 – moist to dry eucalypt woodland on coastal lowlands and ranges** Understorey Fuel Load: 14.9 t/ha Total Fuel Load: 17.2 t/ha
		VHC 16.1 – Eucalyptus dominated forest on drainage lines and alluvial plains Understorey Fuel Load: 13.8 t/ha Total Fuel Load: 16 t/ha
		Exclusion Clause – 2.2.3.2 *e) Non-vegetated areas, that is, areas permanently cleared of vegetation, including waterways, exposed beaches, roads, footpaths, buildings and rocky outcrops.* *f) Vegetation regarded as low threat due to factors such as flammability, moisture content or fuel load. This includes grassland managed in a minimal fuel condition, mangroves and other saline wetlands, maintained lawns, golf courses (such as playing areas and fairways), maintained public reserves and parklands, sporting fields, vineyards, orchards, banana plantations, market gardens (and other non-curing crops), cultivated gardens, commercial nurseries, nature strips and windbreaks.*
		National Construction Code Queensland Variation Clause H7D4 *The requirements of (a) do not apply when, in accordance with AS 3959, the classified vegetation is Group F rainforest (excluding wet sclerophyll forest types), mangrove communities and grasslands under 300mm high.*
2.2.4	Distance From Classified Vegetation	**Plot 1: VHC 16.1**
		Plot 2: VHC 16.1
		Plot 3: VHC 9.2
		Plot 4: VHC 9.2
		Plot 5: VHC 9.2
2.2.5	Effective Slopes	**Plot 1: VHC 16.1** – Flat
		Plot 2: VHC 16.1 – Flat (short downslopes on either side of waterway)
		Plot 3: VHC 9.2 – Flat
		Plot 4: VHC 9.2 – Flat
		Plot 5: VHC 9.2 – Flat
2.2.6	Bushfire Attack Level	**Minimum setbacks for Bushfire Attack Levels shown below.**
2.2.7	Construction Requirements	**Dependent on Bushfire Attack Level.**

Plot 1:

FLAMESOL
FPA AUSTRALIA

Calculated February 13, 2026, 3:41 pm (MDc v.4.9)

Plot 1: VHC 16.1

Minimum Distance Calculator - AS3959-2018 (Method 2)			
Inputs		Outputs	
Fire Danger Index	53	Rate of spread	0.87 km/h
Vegetation Classification	Forest	Flame length	7.62 m
Understorey fuel load	13.8 t/ha	Flame angle	54 °, 64 °, 73 °, 78 °, 80 ° & 85 °
Total fuel load	16 t/ha	Elevation of receiver	3.08 m, 3.42 m, 3.64 m, 3.72 m, 3.75 m & 3.79 m
Vegetation height	n/a	Fire intensity	7,255 kW/m
Effective slope	0 °	Transmissivity	0.886, 0.874, 0.856, 0.836, 0.823 & 0.751
Site slope	0 °	Viewfactor	0.5863, 0.4326, 0.2893, 0.1959, 0.1591 & 0.0437
Flame width	100 m	Minimum distance to < 40 kW/m²	6.4 m
Windspeed	n/a	Minimum distance to < 29 kW/m²	8.699999999999999 m
Heat of combustion	18,600 kJ/kg	Minimum distance to < 19 kW/m²	13 m
Flame temperature	1,090 K	Minimum distance to < 12.5 kW/m²	19.1 m
		Minimum distance to < 10 kW/m²	23.2 m

Rate of Spread - Mcarthur, 1973 & Noble et al., 1980

Flame length - NSW Rural Fire Service, 2001 & Noble et al., 1980

Elevation of receiver - Douglas & Tan, 2005

Flame angle - Douglas & Tan, 2005

Radiant heat flux - Drysdale, 1999, Sullivan et al., 2003, Douglas & Tan, 2005

Bushfire Attack Level	Separation Required
BAL – FZ	0 Metres
BAL – 40	7 Metres
BAL – 29	9 Metres
BAL – 19	14 Metres
BAL – 12.5	20 Metres
BAL – Low	>100 Metres

Plot 2:

FLAMESOL
FPA AUSTRALIA

Calculated February 13, 2026, 3:17 pm (MDc v.4.9)

Plot 2: VHC 16.1

Minimum Distance Calculator - AS3959-2018 (Method 2)			
Inputs		Outputs	
Fire Danger Index	53	Rate of spread	0.87 km/h
Vegetation Classification	Forest	Flame length	7.62 m
Understorey fuel load	13.8 t/ha	Flame angle	54 °, 64 °, 73 °, 78 °, 80 ° & 85 °
Total fuel load	16 t/ha	Elevation of receiver	3.08 m, 3.42 m, 3.64 m, 3.72 m, 3.75 m & 3.79 m
Vegetation height	n/a	Fire intensity	7,255 kW/m
Effective slope	0 °	Transmissivity	0.886, 0.874, 0.856, 0.836, 0.823 & 0.751
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		Minimum distance to < 10 kW/m²	23.2 m

Rate of Spread - Mcarthur, 1973 & Noble et al., 1980

Flame length - NSW Rural Fire Service, 2001 & Noble et al., 1980

Elevation of receiver - Douglas & Tan, 2005

Flame angle - Douglas & Tan, 2005

Radiant heat flux - Drysdale, 1999, Sullivan et al., 2003, Douglas & Tan, 2005

Bushfire Attack Level	Separation Required
BAL – FZ	0 Metres
BAL – 40	7 Metres
BAL – 29	9 Metres
BAL – 19	14 Metres
BAL – 12.5	20 Metres
BAL – Low	>100 Metres

Plot 3:

FLAMESOL
FPA AUSTRALIA

Calculated February 13, 2026, 3:18 pm (MDc v.4.9)

Plot 3: VHC 9.2

Minimum Distance Calculator - AS3959-2018 (Method 2)			
Inputs		Outputs	
Fire Danger Index	53	Rate of spread	0.9399999999999999 km/h
Vegetation Classification	Woodland	Flame length	8.220000000000001 m
Understorey fuel load	14.9 t/ha	Flame angle	54 °, 64 °, 73 °, 78 °, 79 ° & 85 °
Total fuel load	17.2 t/ha	Elevation of receiver	3.32 m, 3.69 m, 3.93 m, 4.02 m, 4.03 m & 4.09 m
Vegetation height	n/a	Fire intensity	8,421 kW/m
Effective slope	0 °	Transmissivity	0.885, 0.873, 0.853, 0.832, 0.82 & 0.748
Site slope	0 °	Viewfactor	0.5871, 0.4367, 0.2916, 0.1971, 0.1603 & 0.0438
Flame width	100 m	Minimum distance to < 40 kW/m²	6.9 m
Windspeed	n/a	Minimum distance to < 29 kW/m²	9.300000000000001 m
Heat of combustion	18,600 kJ/kg	Minimum distance to < 19 kW/m²	13.9 m
Flame temperature	1,090 K	Minimum distance to < 12.5 kW/m²	20.4 m
		Minimum distance to < 10 kW/m²	24.7 m

Rate of Spread - Mcarthur, 1973 & Noble et al., 1980

Flame length - NSW Rural Fire Service, 2001 & Noble et al., 1980

Elevation of receiver - Douglas & Tan, 2005

Flame angle - Douglas & Tan, 2005

Radiant heat flux - Drysdale, 1999, Sullivan et al., 2003, Douglas & Tan, 2005

Bushfire Attack Level	Separation Required
BAL – FZ	0 Metres
BAL – 40	8 Metres
BAL – 29	10 Metres
BAL – 19	15 Metres
BAL – 12.5	21 Metres
BAL – Low	>100 Metres

Plot 4:

FLAMESOL
FPA AUSTRALIA

Calculated February 13, 2026, 3:43 pm (MDc v.4.9)

Plot 4: VHC 9.2

Minimum Distance Calculator - AS3959-2018 (Method 2)			
Inputs		Outputs	
Fire Danger Index	53	Rate of spread	0.9399999999999999 km/h
Vegetation Classification	Woodland	Flame length	8.220000000000001 m
Understorey fuel load	14.9 t/ha	Flame angle	54 °, 64 °, 73 °, 78 °, 79 ° & 85 °
Total fuel load	17.2 t/ha	Elevation of receiver	3.32 m, 3.69 m, 3.93 m, 4.02 m, 4.03 m & 4.09 m
Vegetation height	n/a	Fire intensity	8,421 kW/m
Effective slope	0 °	Transmissivity	0.885, 0.873, 0.853, 0.832, 0.82 & 0.748
Site slope	0 °	Viewfactor	0.5871, 0.4367, 0.2916, 0.1971, 0.1603 & 0.0438
Flame width	100 m	Minimum distance to < 40 kW/m²	6.9 m
Windspeed	n/a	Minimum distance to < 29 kW/m²	9.300000000000001 m
Heat of combustion	18,600 kJ/kg	Minimum distance to < 19 kW/m²	13.9 m
Flame temperature	1,090 K	Minimum distance to < 12.5 kW/m²	20.4 m
		Minimum distance to < 10 kW/m²	24.7 m

Rate of Spread - Mcarthur, 1973 & Noble et al., 1980

Flame length - NSW Rural Fire Service, 2001 & Noble et al., 1980

Elevation of receiver - Douglas & Tan, 2005

Flame angle - Douglas & Tan, 2005

Radiant heat flux - Drysdale, 1999, Sullivan et al., 2003, Douglas & Tan, 2005

Bushfire Attack Level	Separation Required
BAL – FZ	0 Metres
BAL – 40	8 Metres
BAL – 29	10 Metres
BAL – 19	15 Metres
BAL – 12.5	21 Metres
BAL – Low	>100 Metres

Plot 5:

FLAMESOL
FPA AUSTRALIA

Calculated February 13, 2026, 3:19 pm (MDc v.4.9)

Plot 5: VHC 9.2

Minimum Distance Calculator - AS3959-2018 (Method 2)			
Inputs		Outputs	
Fire Danger Index	53	Rate of spread	0.9399999999999999 km/h
Vegetation Classification	Woodland	Flame length	8.220000000000001 m
Understorey fuel load	14.9 t/ha	Flame angle	54 °, 64 °, 73 °, 78 °, 79 ° & 85 °
Total fuel load	17.2 t/ha	Elevation of receiver	3.32 m, 3.69 m, 3.93 m, 4.02 m, 4.03 m & 4.09 m
Vegetation height	n/a	Fire intensity	8,421 kW/m
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Windspeed	n/a	Minimum distance to < 29 kW/m²	9.300000000000001 m
Heat of combustion	18,600 kJ/kg	Minimum distance to < 19 kW/m²	13.9 m
Flame temperature	1,090 K	Minimum distance to < 12.5 kW/m²	20.4 m
		Minimum distance to < 10 kW/m²	24.7 m

Rate of Spread - Mcarthur, 1973 & Noble et al., 1980

Flame length - NSW Rural Fire Service, 2001 & Noble et al., 1980

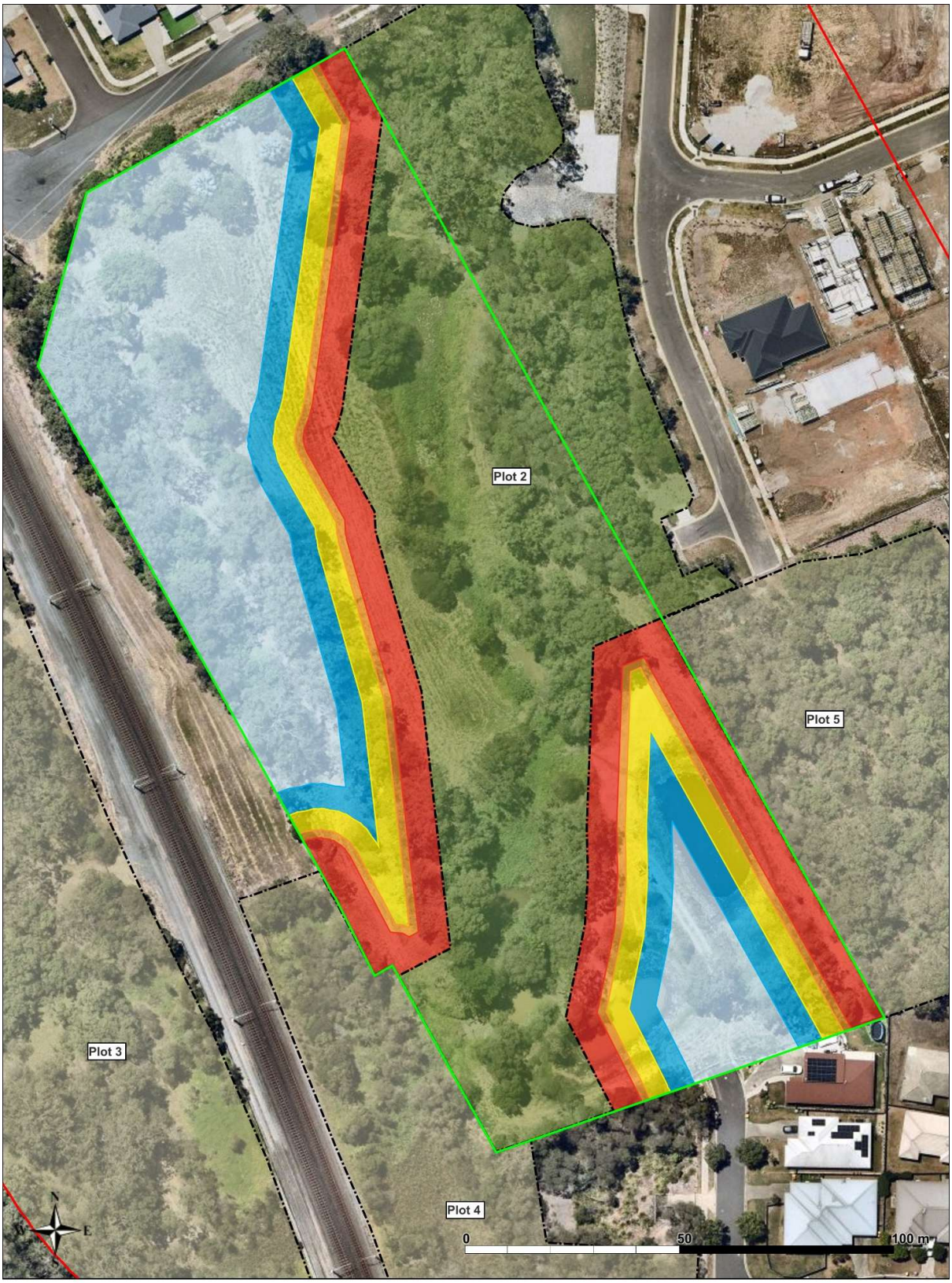
Elevation of receiver - Douglas & Tan, 2005

Flame angle - Douglas & Tan, 2005

Radiant heat flux - Drysdale, 1999, Sullivan et al., 2003, Douglas & Tan, 2005

Bushfire Attack Level	Separation Required
BAL – FZ	0 Metres
BAL – 40	8 Metres
BAL – 29	10 Metres
BAL – 19	15 Metres
BAL – 12.5	21 Metres
BAL – Low	>100 Metres

BAL Contours:



For setback distances from classifiable vegetation, refer to the minimum setbacks section above for the applicable plot.

BAL Contours (Development Overlay):



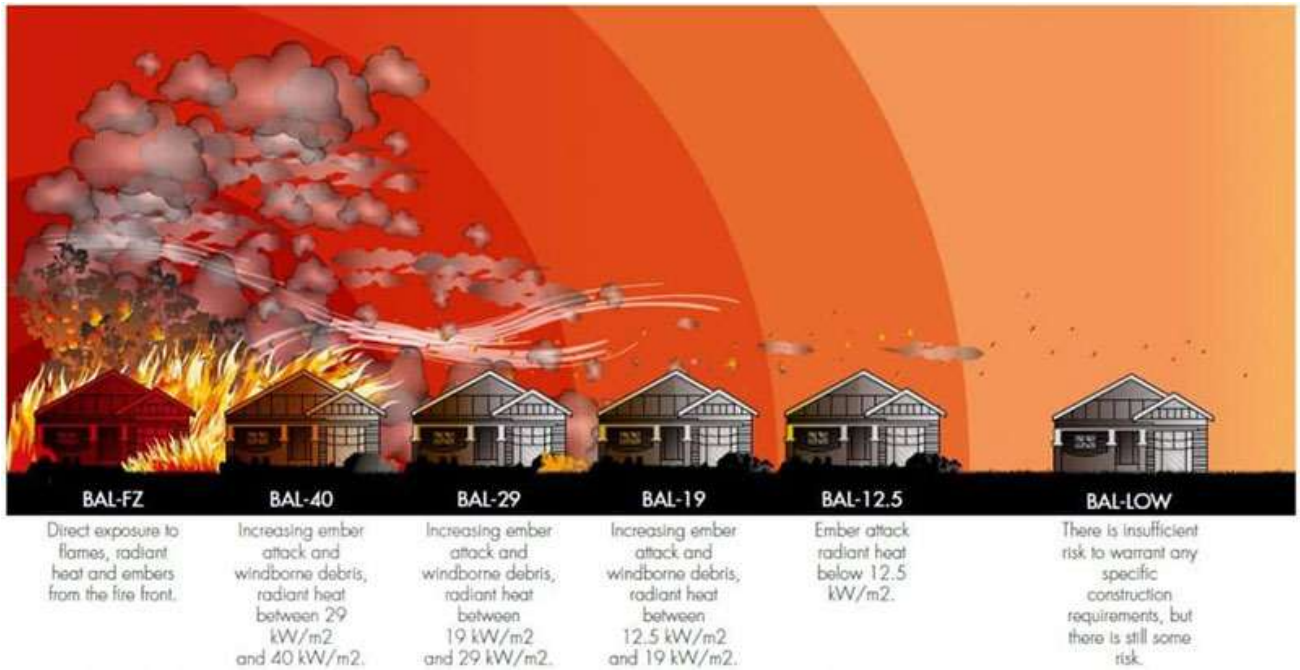
Legend

100m Buffer	BAL Map for Contours		BAL Contours		
100m Buffer	A. Forest	B. Woodland	BAL-12.5	BAL-19	BAL-40
				BAL-29	BAL-FZ

Bushfire Attack Levels and Corresponding Sections for Specific Construction Requirements

Bushfire Attack Level (BAL)	Classified vegetation within 100m of the site and heat flux exposure thresholds	Description of predicted bushfire attach and levels of exposure	Construction Section
BAL – Low	See clause 2.2.3.2	There is insufficient risk to warrant specific construction requirements	4
BAL – 12.5	≤12.5 kW/m^2	Ember attack	3 and 5
BAL – 19	>12.5 kW/m^2 ≤19 k W/m^2	Increasing levels of ember attack and burning debris ignited by windborne embers together with increasing heat flux	3 and 6
BAL – 29	>19 kW/m^2 ≤29 kW/m^2	Increasing levels of ember attack and burning debris ignited by windborne embers together with increasing heat flux	3 and 7
BAL – 40	>29 kW/m^2 ≤40 kW/m^2	Increasing levels of ember attack and burning debris ignited by windborne embers together with increasing heat flux with increased likelihood of direct contact with flames	3 and 8
BAL – Flame Zone	> 40 kW/m^2	Direct exposure to flames from fire front in addition to heat flux and ember attack	3 and 9

Table 3.1, AS3959-2018.



AS3959 Shielding Principle

Section 3.5 of AS3959 states the following:

Where an elevation is not exposed to the source of bushfire attack, then the construction requirements for that elevation can reduce to the next BAL. However, it shall not reduce to below BAL-12.5.

An elevation is deemed to be not exposed to the source of bushfire if all of the straight lines between that elevation and the source of bushfire attach are obstructed by another part of the same building. However, it shall not reduce to below BAL-12.5.

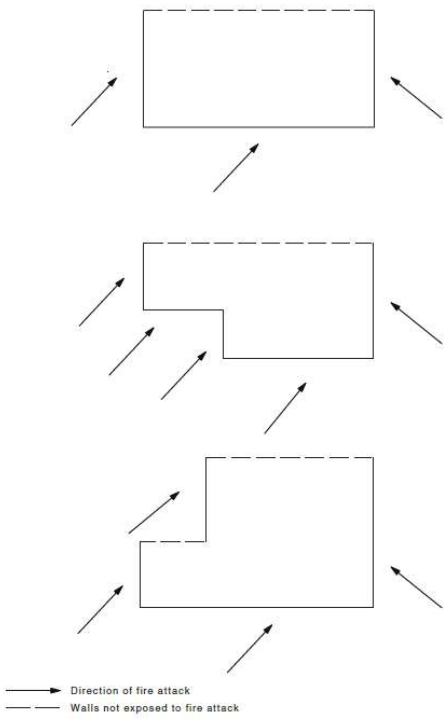


FIGURE 3.1 EXAMPLES OF WALLS SUBJECT TO SHIELDING

© Standards Australia www.standards.org.au

The shielding of an elevation shall apply to all elements of the wall, including openings, but shall not apply to subfloors or roofs.

The above shielding principle cannot be applied to the proposed townhouses as they are exposed to multiple potential fire fronts.

Radiant Heat Barrier:

To reduce the potential radiant heat flux exposure to proposed townhouses number 5 through 16, a radiant heat barrier will be implemented along the eastern property boundary for the extent of plot 5 classifiable vegetation and for a small portion of plot 2 classifiable vegetation. The radiant heat barrier will provide a radiant heat flux reduction for classifiable vegetation plot 5 only due to its length and location. The radiant heat barrier will be located as shown below.



Legend

100m Buffer
100m Buffer

Radiant Heat Barrier
Radiant Heat Barrier (Colourbond Fence 1.8m Tall)

BAL Map for Contours
A. Forest
B. Woodland

There are limitations to the implementation of a radiant heat barrier that need to be considered. These limitations are as follows:

- The barrier is the same width as the emitter itself (the barrier width is the same as the flame width, the barrier must provide protection for the entire front of the plot of vegetation it is shielding from),
- The barrier is uniform in height (for example, 1.8m in height for its full length) and
- The barrier is constructed to be able to withstand the amount and duration of bushfire attack expected and will not become an emitter of radiant heat itself (concrete or masonry radiant heat barriers are best suited, but Colourbond steel is also an acceptable solution).

With regard to the above limitations, the radiant heat barrier must be implemented as described below:

- **Implemented for the full length of the shielded vegetation plots (plot 5),**
- **Be a uniform height of 1.8 metres for its full length,**
- **Be constructed out of concrete, masonry or Colourbond steel, and**
- **be located along the edge of classifiable vegetation plot 5, not at a midway point between the vegetation edge and the shielded structures.**

If the radiant heat barrier is not designed and implemented as described above, it will not adequately provide shielding to the affected structures and the below adjusted radiant heat calculations will be considered inaccurate.

Adjusted Radiant Heat Flux Calculations for Classifiable Vegetation Plot 5:

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Calculated March 8, 2026, 11:30 pm (RHBc v.1.4)

BAL-40

Radiant Heat Barrier calculator - AS3959-2018			
Inputs		Outputs	
Fire Danger Index	53	Rate of spread	0.94 km/h
Vegetation Classification	Woodland	Flame length	8.22 m
Understorey fuel load	14.9 t/ha	Flame angle	44 °
Total fuel load	17.2 t/ha	Panel height	5.71 m
Vegetation height	n/a	Elevation of receiver	2.85 m
Effective slope	0 °	Effective barrier height	1.8 m
Site slope	0 °	Fire intensity	8,421 kW/m
Distance to vegetation	5.7 m	Transmissivity	0.892
Flame width	100 m	Viewfactor	0.7212
Windspeed	n/a	Radiant heat flux	48.96 kW/m²
Heat of combustion	18,600 kJ/kg	Viewfactor of barrier	0.1327
Flame temperature	1,090 K	Adjusted viewfactor	0.5885
Actual barrier height	1.8 m	Adjusted radiant heat flux	39.95 kW/m²
		Bushfire Attack Level	BAL-40

Rate of Spread - Mcarthur, 1973 & Noble et al., 1980

Flame length - NSW Rural Fire Service, 2001 & Noble et al., 1980

Elevation of receiver - Douglas & Tan, 2005

Flame angle - Douglas & Tan, 2005

Radiant heat flux - Drysdale, 1999, Sullivan et al., 2003, Douglas & Tan, 2005

FLAMESOL
FPA AUSTRALIA

Calculated March 8, 2026, 11:32 pm (RHBc v.1.4)

BAL-29

Radiant Heat Barrier calculator - AS3959-2018			
Inputs		Outputs	
Fire Danger Index	53	Rate of spread	0.94 km/h
Vegetation Classification	Woodland	Flame length	8.22 m
Understorey fuel load	14.9 t/ha	Flame angle	58 °
Total fuel load	17.2 t/ha	Panel height	6.97 m
Vegetation height	n/a	Elevation of receiver	3.48 m
Effective slope	0 °	Effective barrier height	1.8 m
Site slope	0 °	Fire intensity	8,421 kW/m
Distance to vegetation	7.8 m	Transmissivity	0.88
Flame width	100 m	Viewfactor	0.5267
Windspeed	n/a	Radiant heat flux	35.28 kW/m²
Heat of combustion	18,600 kJ/kg	Viewfactor of barrier	0.0981
Flame temperature	1,090 K	Adjusted viewfactor	0.4286
Actual barrier height	1.8 m	Adjusted radiant heat flux	28.7 kW/m²
		Bushfire Attack Level	BAL-29

Rate of Spread - Mcarthur, 1973 & Noble et al., 1980

Flame length - NSW Rural Fire Service, 2001 & Noble et al., 1980

Elevation of receiver - Douglas & Tan, 2005

Flame angle - Douglas & Tan, 2005

Radiant heat flux - Drysdale, 1999, Sullivan et al., 2003, Douglas & Tan, 2005

FLAMESOL
FPA AUSTRALIA

Calculated March 8, 2026, 11:34 pm (RHBc v.1.4)

BAL-19

Radiant Heat Barrier calculator - AS3959-2018			
Inputs		Outputs	
Fire Danger Index	53	Rate of spread	0.94 km/h
Vegetation Classification	Woodland	Flame length	8.22 m
Understorey fuel load	14.9 t/ha	Flame angle	69 °
Total fuel load	17.2 t/ha	Panel height	7.67 m
Vegetation height	n/a	Elevation of receiver	3.83 m
Effective slope	0 °	Effective barrier height	1.8 m
Site slope	0 °	Fire intensity	8,421 kW/m
Distance to vegetation	11.4 m	Transmissivity	0.864
Flame width	100 m	Viewfactor	0.3594
Windspeed	n/a	Radiant heat flux	23.62 kW/m²
Heat of combustion	18,600 kJ/kg	Viewfactor of barrier	0.0711
Flame temperature	1,090 K	Adjusted viewfactor	0.2882
Actual barrier height	1.8 m	Adjusted radiant heat flux	18.94 kW/m²
		Bushfire Attack Level	BAL-19

Rate of Spread - Mcarthur, 1973 & Noble et al., 1980

Flame length - NSW Rural Fire Service, 2001 & Noble et al., 1980

Elevation of receiver - Douglas & Tan, 2005

Flame angle - Douglas & Tan, 2005

Radiant heat flux - Drysdale, 1999, Sullivan et al., 2003, Douglas & Tan, 2005

FLAMESOL
FPA AUSTRALIA

Calculated March 8, 2026, 11:38 pm (RHBc v.1.4)

BAL-12.5

Radiant Heat Barrier calculator - AS3959-2018			
Inputs		Outputs	
Fire Danger Index	53	Rate of spread	0.94 km/h
Vegetation Classification	Woodland	Flame length	8.22 m
Understorey fuel load	14.9 t/ha	Flame angle	75 °
Total fuel load	17.2 t/ha	Panel height	7.94 m
Vegetation height	n/a	Elevation of receiver	3.97 m
Effective slope	0 °	Effective barrier height	1.8 m
Site slope	0 °	Fire intensity	8,421 kW/m
Distance to vegetation	16.7 m	Transmissivity	0.844
Flame width	100 m	Viewfactor	0.2432
Windspeed	n/a	Radiant heat flux	15.61 kW/m²
Heat of combustion	18,600 kJ/kg	Viewfactor of barrier	0.0504
Flame temperature	1,090 K	Adjusted viewfactor	0.1927
Actual barrier height	1.8 m	Adjusted radiant heat flux	12.37 kW/m²
		Bushfire Attack Level	BAL-12.5

Rate of Spread - Mcarthur, 1973 & Noble et al., 1980

Flame length - NSW Rural Fire Service, 2001 & Noble et al., 1980

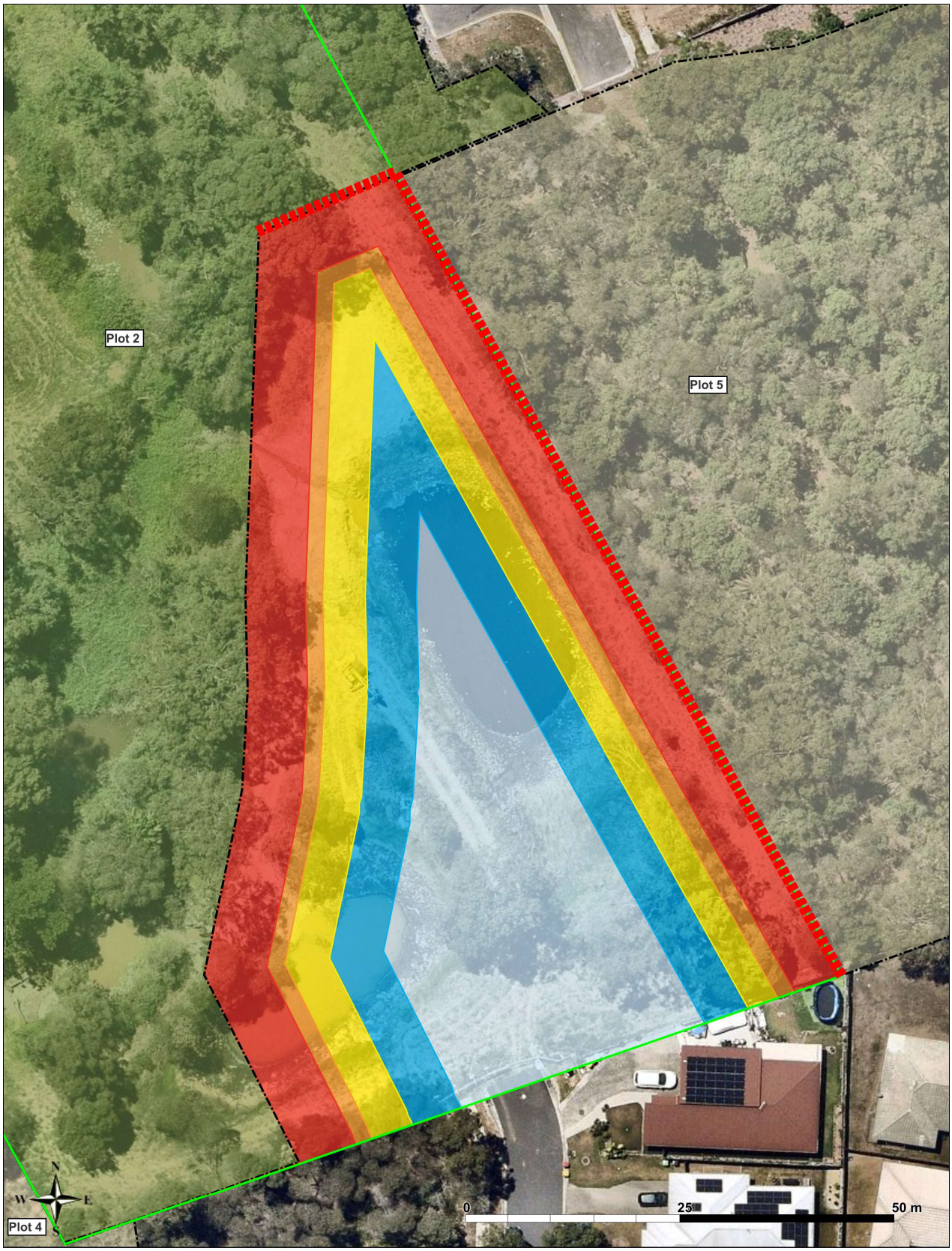
Elevation of receiver - Douglas & Tan, 2005

Flame angle - Douglas & Tan, 2005

Radiant heat flux - Drysdale, 1999, Sullivan et al., 2003, Douglas & Tan, 2005

Bushfire Attack Level	Separation Required
BAL – FZ	0 Metres
BAL – 40	5.7 Metres
BAL – 29	7.8 Metres
BAL – 19	11.4 Metres
BAL – 12.5	16.7 Metres
BAL – Low	>100 Metres

Adjusted BAL Contours After Radiant Heat Barrier:



Legend

100m Buffer
100m Buffer

Radiant Heat Barrier
Radiant Heat Barrier (Colourbond Fence 1.8m Tall)

BAL Map for Contours (Radiant Heat Barrier)
A. Forest
B. Woodland

BAL Contours (Radiant Heat Barrier)
BAL-12.5
BAL-19
BAL-29
BAL-40
BAL-FZ

Recommendations:

1. **Access to Water for Firefighting Purposes:**

   Reticulated water is available to the site and will be extended throughout the property as a part of the proposed development; therefore, providing a static water storage supply for firefighting purposes is not a requirement from this proposal.

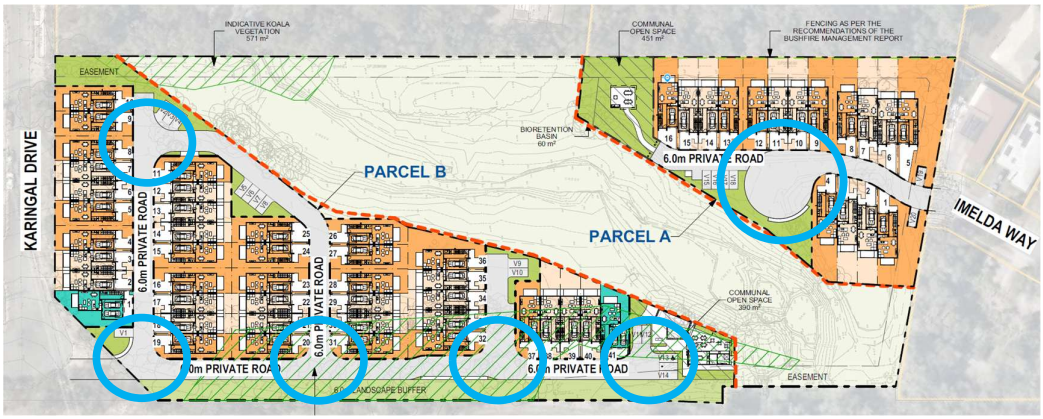
2. **Vehicular Access:**

   The proposed internal road network is considered compliant and can adequately provide access for firefighting and emergency appliances. The minimum criterion for these internal roads is shown below.

   a. a minimum cleared width of 6m and a height of 4.8m;
   b. a minimum formed width of 4m;
   c. a maximum gradient of 12.5% constructed to an all-weather standard; and
   d. culverts and/or bridges with a minimum load bearing of 15 tonnes (if applicable).

   Passing bays will not be required along the proposed internal road network as there are many areas for vehicles to simultaneously pass within the property.

   Hard stand turning areas will be made available throughout the property as circled in the below site plan.



3. **Open Space:**

   The proposed development proposes small areas of communal open space located close to the northern and southern property boundaries. The proposed open space area can include mature canopy trees but must have a ground cover managed to a maximum height of 150mm at all times. The mature canopy trees within the open space area should be located where the canopies do not overlap.

4. **Vegetation Management:**

Due to the nature of the proposed development and proposed rehabilitation areas, landscape buffers and dedicated koala habitat areas, conditioned radiation zones are not a requirement for this proposal. Setbacks for BAL contours are taken from the edges of the rehabilitation area along the gulley, classifiable vegetation outside the property boundaries and any other dedicated green space areas. Some reductions in the proposed rehabilitation area have been proposed in order for particular structures to achieve ≤29kW/m^2 of potential radiant heat flux as described under recommendation five below.

5. **Acceptable Bushfire Risk (≤29kW/m^2 of Potential Radiant Heat Flux)**

All habitable structures within the proposed development must meet a maximum radiant heat flux exposure of ≤29kW/m^2. Class 10 or other non-habitable structures can be erected with a radiant heat flux exposure greater than 29kW/m^2 but must be individually assessed for Bushfire Attack Level. The proposed townhouses number 1, 4, 9-16, 10, 11, 25, 26, 27, 35, 36 and 38-41 currently do not meet ≤29kW/m^2 of potential radiant heat flux (without consideration to the radiant heat barrier along plot 5 classifiable vegetation).

All below required setback distances are measured to the wall line of the proposed townhouse structure, not to the support of the proposed awnings which are considered to be class 10 and can be exposed to >29kW/m^2 of potential radiant heat flux.

Proposed townhouses 5-16 on parcel A must be setback at least 7.8 metres (after the implementation of the radiant heat barrier) from the eastern property boundary (classifiable vegetation plot 5) to achieve ≤29kW/m^2 of potential radiant heat flux. Proposed townhouses 1 and 4 on parcel A and 10, 11, 25, 26, 27, 35, 36 and 38-41 on parcel B are all exposed to >29kW/m^2 of potential radiant heat flux from the proposed rehabilitation area (classifiable vegetation plot 2). A reduction to the rehabilitation area of 9 metres from the structures exposed to >29kW/m^2 of potential radiant heat flux as noted above will allow these structures to be considered an acceptable level of bushfire risk. These reduced threat zones of the proposed rehabilitation area can consist of canopy trees with a mown grass ground cover. A map illustrating this reduction is shown below.

Amended in red by council-

It is noted that class 10 structures are not set back to hazardous vegetation to achieve a radiant heat flux of 29kW/m2. The Bushfire consultant and building certifier are to liaise to ensure adequate ratings.



Legend

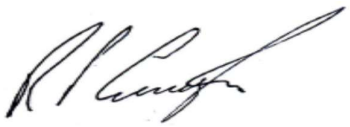
100m Buffer
100m Buffer

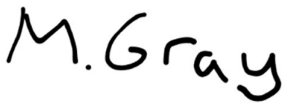
BAL Map for Contours (Post Rehab Reduction and After RHB)
A. Forest
B. Woodland

BAL Contours (Post Rehab Reduction and RHB)
BAL-12.5
BAL-19
BAL-29
BAL-40
BAL-FZ

6. Where possible and ecologically viable, non-combustible high moisture content species should be utilised when planting within the property.

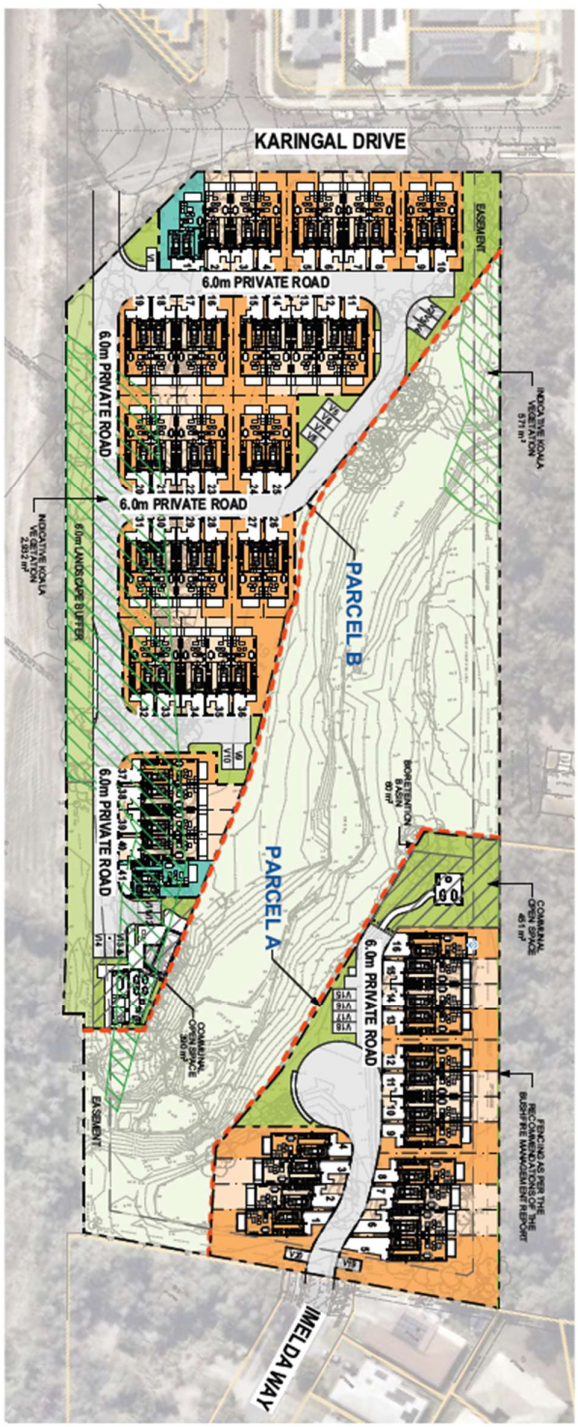
7. It is recommended that an alert be placed on the Title or Council Rate searches noting that an approved Bushfire Risk Assessment is in existence, is made available to ensuing owners, and must be complied with by ensuing owners.





Ray Cavanough and Max Gray

Appendix 1 – Site Plan



PARCEL A - THE FERNHURST
60 IMELDA WAY

SITE SUMMARY
APPROX. NET SITE AREA 0.491 ha
APPROX. NET DENSITY 32.59 du/ha

DEVELOPMENT SUMMARY

SPECIAL A 3 BEDROOM 1+1 CAR 2 STOREY	8
SPECIAL A END 3 BEDROOM 1+1 CAR 2 STOREY	8
TOTAL	16

PARCEL B - THE BROOKFIELD
2 KARINGAL DRIVE

SITE SUMMARY
APPROX. NET SITE AREA 1.073 ha
APPROX. NET DENSITY 38.21 du/ha

DEVELOPMENT SUMMARY

SPECIAL A 3 BEDROOM 1+1 CAR 2 STOREY	19
SPECIAL A END 3 BEDROOM 1+1 CAR 2 STOREY	20
SPECIAL B 3 BEDROOM 1+1 CAR 2 STOREY	2
TOTAL	41

NOTE: GCCC

LOT DIMENSIONS AND AREAS ARE BASED ON SURVEY PLAN AND ARE INDICATIVE ONLY. SIZES TO BE CONFIRMED

INDICATIVE KOALA VEGETATION AREA

INDICATIVE BUILDABLE PAD AREA (BATTER)

PRODUCT TO BE MODIFIED: TERRACE IN BASEMENT

SITED STRUCTURE PLAN

Scale 1:1000 @ A3

0 10 20 30 40 50m

2 KARINGAL DRIVE & 60 IMELDA WAY

PIMPAMA

BOS PROPERTY

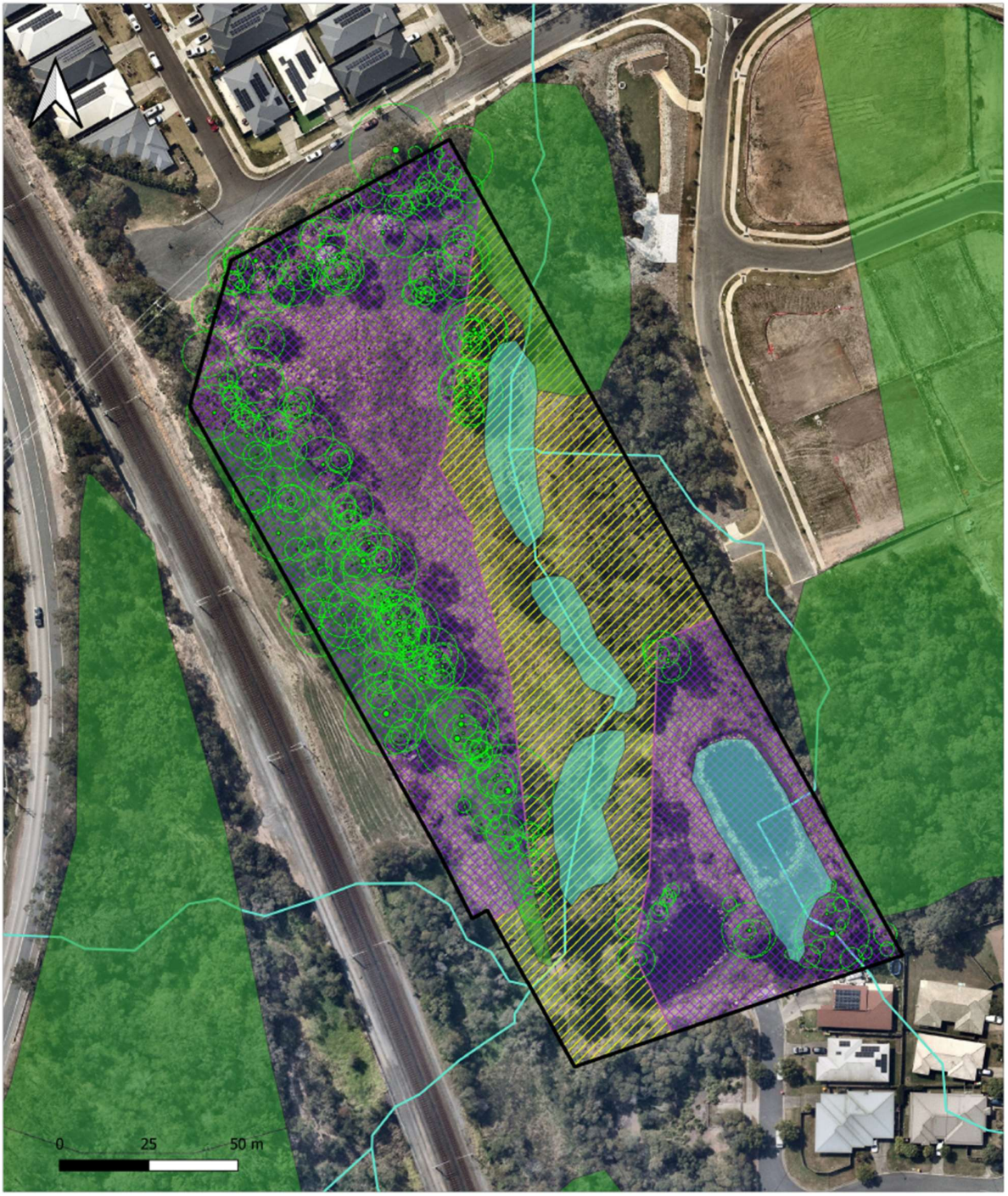
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Appendix 2 – Rehabilitation Management Plan and Planting Palette



2 Karingal Cres, Coomera

Restoration Area

Project: BE200223	Date:
Scale: 1:1000 at A3	Projection:
Data Sources:	



Location of site within City of Gold Coast

Legend

- Site [1]
- Tree Trunk [282]
- Tree NRZ [282]
- Restoration (0.9ha)
- Development footprint
- City Plan Waterway
- Core Koala Habitat Areas (DETSI v4)

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BOSFORM 30 YEARS

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Appendix C – Planting Palette – RE 12.3.11 / 12.3.6

Notes:

1. Local provenance tubestock only and no cultivars.
2. Not all species will be available at the time of planting however at least 50% of the species specified should be utilised. Alternative substitutions are to be approved by Council.
3. This palette reflects species typically occurring in the following preclearing regional ecosystems:
   a. Of concern RE 12.3.11: *Eucalyptus tereticornis* +/- *Eucalyptus siderophloia*, *Corymbia intermedia* open forest on alluvial plains usually near coast (outer riparian zone)
   b. Least concern RE 12.3.6: *Melaleuca quinquenervia* +/- *Eucalyptus tereticornis*, *Lophostemon suaveolens*, *Corymbia intermedia* open forest to woodland on coastal alluvial plains (inner riparian zone – 5m from top of bank to bed).
4. Generally palustrine wetlands in floodplains, fringing drainage lines, swales and depressions, but can include lacustrine water bodies associated with the construction of bunding and levees.
5. This ecosystem is also known to provide suitable habitat for the Vulnerable koala *Phascolarctos cinereus*.

Scientific Name	Common Name	Stratum/Zone
Angophora leiocarpa	Smooth Barked Apple	Canopy
Corymbia intermedia[k]	**Pink Bloodwood**	**Canopy**
Corymbia tesselaris[k]	**Moreton Bay Ash**	**Canopy**
Elaeocarpus obovatus	Hard quandong	Canopy
Eucalyptus robusta[k]	**Swamp mahogany**	**Canopy**
Endiandra sieberi	Hard Corkwood	Canopy
Eucalyptus seeana[k]	Narrow leaved redgum	Canopy
Eucalyptus siderophloia[k]	**Grey Ironbark**	**Canopy**
Eucalyptus tereticornis[k]	**Forest Red Gum**	**Canopy**
Lophostemon suaveolens[k]	**Swamp Mahogany**	**Canopy**
Melaleuca quinquenervia[k]	**Broad Leaved Paperbark**	**Canopy**
Melaleuca salicina[k]	**White bottlebrush**	**Canopy**
Acacia disparrima subsp. disparrima	**Brush ironbark wattle**	**Understorey**
Acmena smithii	Lily Pilli	Understorey
Allocasuarina littoralis	**Black She-Oak**	**Understorey**
Alphitonia excelsa	Red Ash	Understorey
Banksia integrifolia subsp. integrifolia	Coastal Banksia	Understorey
Commersonia bartramia	Brown kurrajong	Understorey
Cupaniopsis anacardioides	**Tuckeroo**	**Understorey**
Elaeocarpus reticulatus	Blueberry Ash	Understorey
Ficus coronata	Sandpaper fig	Understorey
Glochidion ferdinandi	**Cheese Tree**	**Understorey**
Glochidion sumatranum	Umbrella cheese tree	Understorey
Melaleuca sieberi	Sieber's paperbark	Understorey
Acacia leiocalyx	Black Wattle	Shrub
Alpinia caerulea	Native ginger	Shrub
Austromyrtus dulcis	Midgen Berry	Shrub

Scientific Name	Common Name	Stratum/Zone
Banksia robur	Swamp banksia	Shrub
Breynia oblongifolia	Coffee Bush	Shrub
Clerodendrum floribundum	Lolly Bush	Shrub
Dodonaea triquetra	Large-leaf Hop-bush	Shrub
Hakea florulenta	Willow hakea	Shrub
Hibiscus heterophyllus	Rosella	Shrub
Hovea acutifolia	Pointed-leaved Hovea	Shrub
Leptospermum polygalifolium	A Teatree	Shrub
Melastoma malabathricum	Blue tongue	Shrub
Myoporum acuminatum	Boobialla	Shrub
Persoonia adenantha	A Geebung	Shrub
Persoonia stradbrokensis	A Geebung	Shrub
Pittosporum revolutum	Rough Fruit Pittosporum	Shrub
Pultenaea villosa	Hairy Bush-pea	Shrub
Sannantha similis	Twiggy heath myrtle	Shrub
Maclura cochinchinensis	Cockspur Thorn	Shrub
Alloteropsis semialata	Cockatoo grass	Groundcover
Cymbopogon refractus	Barbed Wire Grass	Groundcover
Dianella caerulea	Blue Flax-lily	Groundcover
Dianella revoluta	Blueberry Lily	Groundcover
Digitaria didactyla	Queensland Blue Couch	Groundcover
Gahnia aspera	Rough Saw-sedge	Groundcover
Gahnia clarkei	Tall saw-sedge	Groundcover
Gahnia sieberiana	Red-fruit saw-sedge	Groundcover
Imperata cylindrica	blady grass	Groundcover
Lepidosperma laterale	Variable Swordsedge	Groundcover
Lomandra longifolia	Spiny-headed Mat-rush	Groundcover
Lomandra multiflora	Many flowered matrush	Groundcover
Ottochloa gracillima	Pademelon grass	Groundcover
Pimelea linifolia	Rice flower	Groundcover
Themeda triandra	Kangaroo Grass	Groundcover
Viola banksii	Wild Violet	Groundcover
Viola hederacea	Ivy-leaved Violet	Groundcover
Xanthorrhoea fulva	Swamp grasstree	Groundcover
Bolboschoenus fluviatilis	marsh clubrush	Riparian
Carex appressa	Tall sedge	Riparian
Carex fascicularis	Tassel sedge	Riparian
Crinum pendunculatum	River lily	Riparian
Cyperus exaltatus	Giant sedge	Riparian
Eleocharis cylindrostachys	Spikerush	Riparian
Eleocharis philippinensis	Spikerush	Riparian
Eleocharis sphacelata	Tall spikerush	Riparian

Appendix 3 – Photos of Main Aspects



1. Classifiable vegetation plot 1 (VHC 16.1).



2. Classifiable vegetation plot 1 (VHC 16.1).



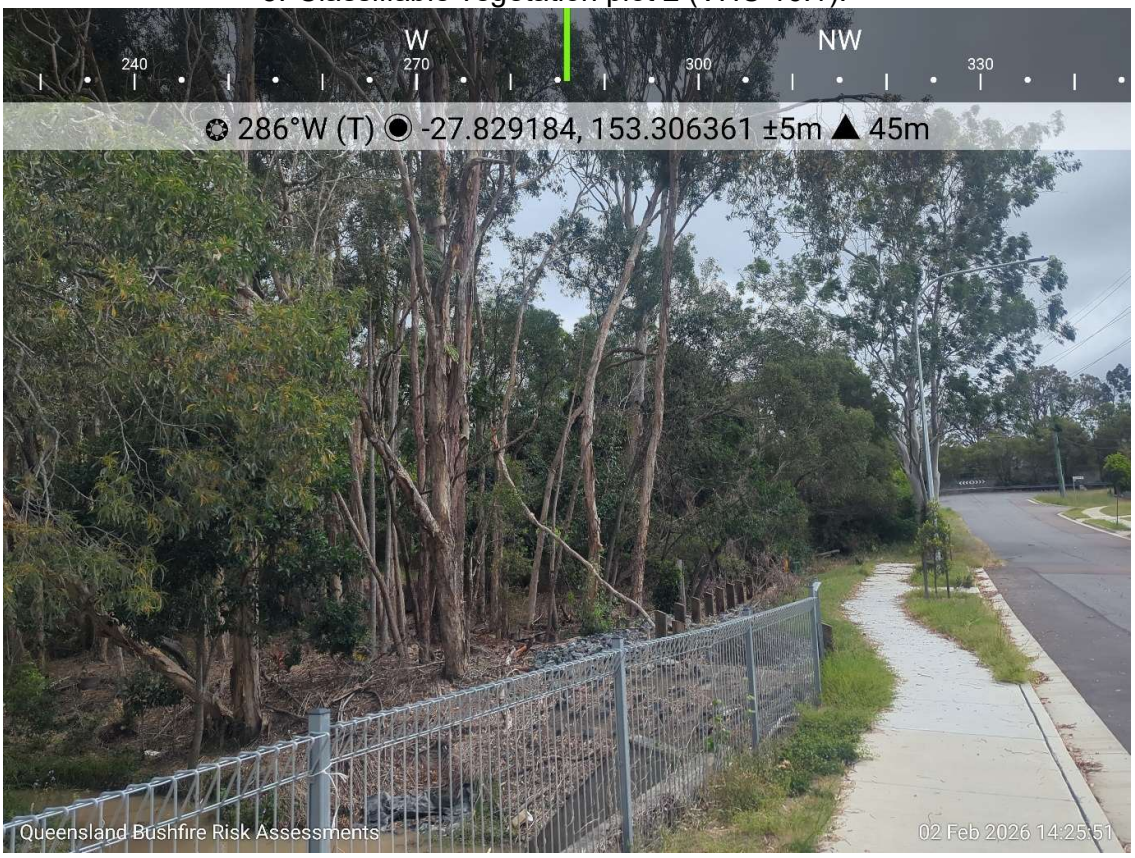
3. Classifiable vegetation plot 1 (VHC 16.1).



4. Classifiable vegetation plot 2 (VHC 16.1).



5. Classifiable vegetation plot 2 (VHC 16.1).



6. Classifiable vegetation plot 2 (VHC 16.1).



7. Vegetation currently present onsite.



8. Vegetation currently present onsite.



9. Vegetation currently present onsite.



10. Vegetation currently present onsite.



11. Vegetation currently present onsite.



12. Vegetation currently present onsite.



13. Vegetation currently present onsite.



14. Vegetation currently present onsite.



15. Vegetation currently present onsite.



16. Vegetation currently present onsite.



17. Vegetation currently present onsite.



18. Classifiable vegetation plot 3 (VHC 9.2).



19. Classifiable vegetation plot 3 (VHC 9.2).



20. Classifiable vegetation plot 4 (VHC 9.2) beyond a bio basin.



21. Classifiable vegetation plot 4 (VHC 9.2) beyond a bio basin.



22. Classifiable vegetation plot 4 (VHC 9.2).



23. Classifiable vegetation plot 4 (VHC 9.2).



24. Classifiable vegetation plot 4 (VHC 9.2).



25. Classifiable vegetation plot 5 (VHC 9.2).



26. Classifiable vegetation plot 5 (VHC 9.2).



27. Classifiable vegetation plot 5 (VHC 9.2).

Photo Points



Legend

Photopoints

Appendix 4 – Bushfire Hazard Overlay Code

8.2.3.3 Specific benchmarks for assessment

Table 8.2.3-2: Bushfire hazard overlay code – for assessable development

Performance outcomes	Acceptable outcomes	Does the proposal meet the acceptable outcome? if not, justify how the proposal meets either the performance outcome or overall outcome
PO1 In a bushfire hazard area, the fire mitigation methods used at the site are adequate for the bushfire hazard of the individual site, having regard to: (a) vegetation type; (b) slope; (c) aspect; (d) bushfire history; (e) conservation values of the site; (f) ecological restoration, including forest succession; (g) ongoing maintenance; (h) climate change; and (i) on site and off-site[1] fire hazard implications. [1]**Note: This includes potential hazard from land up to 10kms away from the site. For example, how might large tracts of forest away from the site impact on the bushland that surrounds the site.**	**AO1** A written assessment by a suitably qualified and experienced bushfire management consultant confirms that the site is not in a bushfire hazard area. OR The development complies with an approved Bushfire management plan prepared in accordance with **SC6.3 City Plan policy – Bushfire management plans**. OR The development complies with an existing approved Bushfire management plan as referenced within the approved reconfiguration of a lot. **Note: Prior to:** **(a) plan sealing for a Reconfiguration of a lot; or** **(b) the issue of a Building final or Certificate of classification for Building work; or** **(c) the commencement of use where building work is not proposed.** **Whichever comes first, the applicant must submit to Council, certification from an appropriately qualified and experienced person that the development has been completed in accordance with, and complies with the approved Bushfire management plan and that all risk treatments are functioning in accordance with the approved plan.**	**The proposed development is accompanied by a bushfire management plan prepared by Queensland Bushfire Risk Assessments dated the 09/03/26.**

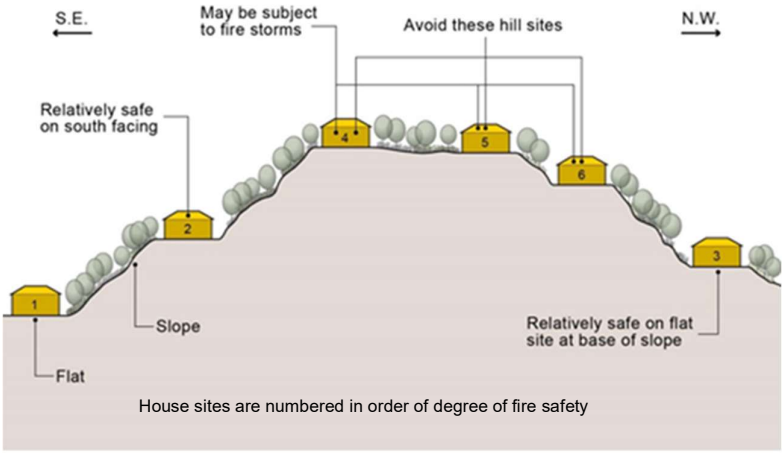
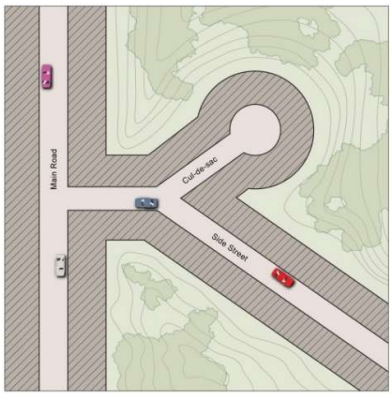
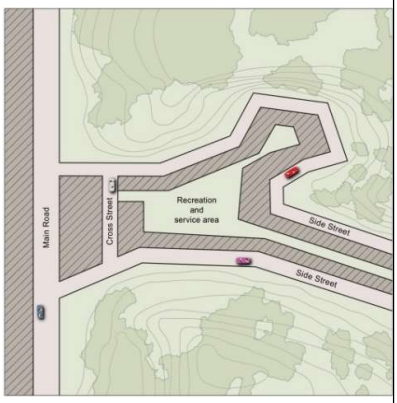


Figure 8.2.3-1
Bushfire hazard overlay – Preferred house site location in bushfire hazard areas. Image adapted from QDHLGP (1993) Bushfire Hazard Planning in Queensland.

PO2 In a bushfire hazard area, development: (a) does not result in a high concentration of people living, working or congregating in a bushfire hazard area; (b) does not result in the bulk manufacture or storage of hazardous materials; and (c) 'essential' community infrastructure is able to function effectively during and immediately after a bushfire event.	**AO2** The following land uses are not located in a bushfire hazard area: (a) Child care centre; (b) Community care centre; (c) Community use; (d) Development involving the manufacture or storage of hazardous material in bulk; (e) Educational establishment; (f) Hospital; (g) Residential care facility; (h) Retirement facility; (i) Rooming accommodation; (j) Sport and recreation uses; (k) Tourist attraction; (l) Tourist park; and (m) Utility installation (waste management facilities). AND In a bushfire hazard area permitted essential community infrastructure is designed to function effectively during and immediately after bushfire events, as demonstrated in a Bushfire management plan. **Note: A Bushfire management plan prepared by a suitably qualified person and in accordance with SC6.3 City Plan policy – Bushfire management plans is Council's preferred method for addressing this acceptable outcome.**	**Compliant** The proposed development does not fall under a use detailed in A02; however, the proposed development will result in a higher concentration of residents at the property. The accompanying bushfire risk assessment has demonstrated that the proposed development meets an acceptable bushfire risk and can effectively function in the event of a bushfire.
PO3 In a bushfire hazard area, developments, including lot layout are designed to avoid bushfire hazard and provide safe sites for people, property and buildings. Editor's note – The development should be located: (a) away from the most likely direction of a fire front (refer Figure 8.2.3-1: Preferred house site location in bushfire hazard areas); and (b) so that elements of the development least susceptible to fire are sited closest to the bushfire hazard.	**AO3** Development, Lots and/or building envelopes are not located within bushfire hazard areas. OR The development is located in accordance with the approved Bushfire management plan as referenced within the approved reconfiguration of a lot. OR The development is designed to adequately demonstrate that the risk to life and property is minimised to achieve acceptable levels and ensure ongoing site management.	**Compliant** All of the proposed new townhouse buildings can adequately meet 29kW/m^2 of potential radiant heat flux or less with the implementation of a radiant heat barrier and a reduction in the proposed rehabilitation area. Details regarding these requirements are located under the recommendations section of this report.

	AO3.2 The development design incorporates bushfire radiation zone/s that: (a) use existing or natural fire breaks & minimise the need to clear native vegetation; (b) do not impact matters of environmental significance; (c) are located entirely within the boundaries of the private property of the development site; and (d) incorporates landscaping species that are less likely to exacerbate a bushfire event.	**Compliant** The proposed development does not rely on radiation zones in order to mitigate against potential bushfire risk.
PO4 In a bushfire hazard area, when designing for bushfire hazard mitigation the lot layout must avoid impacts on matters of environmental significance.	**AO4** Development design, Lot size, and layout avoids impact on matters of environmental significance and minimises impacts such as fragmentation, habitat loss and edge effects for any matters of environmental significance.	**Compliant** The proposed development does not have impacts on matters of environmental significance due to a lack of conditioned vegetation management for bushfire mitigation.

PO5 Development uses fencing that: (a) does not contribute to the spread of bushfire; (b) facilitates the safe movement of fauna; and (c) provides access for fire-fighting purposes.	**AO5** Fences are constructed: (a) using non-combustible or fire retardant materials within 20m of any building used for accommodation; (b) that do not impede the safe movement of fauna (where applicable); and (c) has gates that can be freely accessed for fire-fighting purposes (if applicable).	**Compliant** A radiant heat barrier has been conditioned as a part of this proposal which must consist of steel, concrete or masonry. Any other fencing constructed within the property is recommended to consist of a non-combustible material such as concrete, masonry or Colourbond steel.
PO6 In a bushfire hazard area, vehicular access (including internal roads) is designed to mitigate against bushfire hazard by ensuring adequate access for: (a) fire-fighting and other emergency vehicles, and (b) the evacuation of residents and emergency personnel, during a bushfire event.	**AO6.1** The development design incorporates a perimeter road that: (a) is located between the boundary of the lots and/or buildings and the adjacent natural area and/or bushfire hazard area; (b) has a minimum cleared width of 20m; (c) has a constructed minimum road width of 6m; (d) has a maximum gradient of 12.5%; (e) is constructed to an all-weather standard; and (f) is constructed to ensure all culverts and bridges have a minimum load bearing of 15 tonnes (if applicable). (refer **Figure 8.2.3-2b**).	**Compliant** The proposed internal driveway design is considered adequate for providing access for firefighting and other emergency vehicles. The proposed driveway also provides efficient evacuation to Karingal Drive and Imelda Way for all onsite structures.
	AO6.2 The road design is capable of providing access for fire-fighting and other emergency vehicles, in accordance with **SC6.11 City Plan policy – Land development guidelines, Section 2 – Transport network standards**.	**Compliant** The proposed driveway design is capable of providing access for firefighting appliances and other emergency vehicles.
	AO6.3 The road design does not include dead end roads (refer **Figure 8.2.3-2a**).	**Compliant** The proposed internal driveway design includes a dead end in parcel A but provides a turning circle in the way of a cul-de-sac. Other 'T' shaped areas are readily available within proposed parcel B.

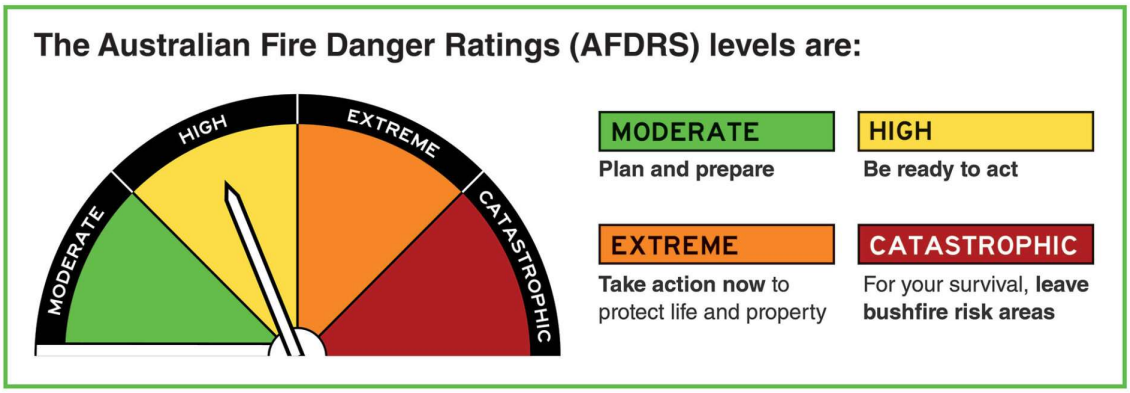
Figures 8.2.3-2a and 8.2.3-2b: Examples of acceptable and unacceptable road layout designs in bushfire hazard areas  **Figure 8.2.3-2a** Unacceptable design – along a ridge top in a bushfire hazard area – the ridge top development has no fire control lines and obstructs fire fighters.  **Figure 8.2.3-2b** Acceptable design – Ring road system provides a fire control line and access for fire fighters with all lots located on the inside of the ring-road.		
PO7 In a bushfire hazard area, the development layout is designed to avoid the requirement to clear vegetation to achieve risk reduction.		**AO7** The Bushfire management plan details the required extent of vegetation clearing and landscaping and where required modify development design and/or lot layout to minimise clearing of vegetation. **Note:** **For guidance on how to prepare a Bushfire management plan refer to SC6.3 City Plan Policy – Bushfire management plans.**	**Compliant** No vegetation is required to be removed for bushfire mitigation purposes.
PO8 For areas to be dedicated to Council as open space, management strategies to mitigate bushfire risk must be identified.		**AO8** The Bushfire management plan contains a separate section detailing management strategies for areas to be dedicated to Council that can be included within the Open space management plan. **Note:** **For guidance on how to prepare a Bushfire management plan refer to SC6.3 City Plan Policy – Bushfire management plans.**	**Compliant** There are two small sections of open space dedicated to council as a part of this proposal. Management conditions of the open space area are located under the recommendations section of this report.
PO9 In a bushfire hazard area, fire trails must be provided to: (a) enable access for fire fighters, residents and equipment; (b) contribute to (where required) bushfire radiation zone(s); (c) mitigate against bushfire hazard; and (d) allow access for hazard reduction management programs. **Note: fire trails should be located, constructed and maintained with due regard for landscape and ecological values and should not result in soil disturbance or erosion.**		**AO9.1** Fire trails are located on public land (including public open space areas) to facilitate access for fire brigades. OR Fire trails located on private property are located as close as possible to the property boundaries and the adjoining bushfire hazard area, and an access easement is granted in favour of City of Gold Coast and Queensland Fire and Emergency Services. **Note:** **Design and construction of all fire trails located on land to be**	**Compliant** Due to the proposed driveway network, fire trails have not been recommended as a part of this proposal.

	dedicated to the City as Conservation Estate are in accordance with SC6.3 City Plan policy – Bushfire management plans, Section 3.5(f). For other fire trails, AO9.2 – AO9.6 apply.	
	AO9.2 The fire trail has: (a) a minimum cleared width of 6m; (b) a minimum of 4.8m vertical clearance; (c) a cross fall of no greater than 10 degrees; (d) a minimum formed width of 4m; (e) a maximum gradient of 12.5%, with adequate drainage to prevent soil erosion and minimise ongoing trail maintenance; and (f) culverts and/or bridges with a minimum load bearing of 8 tonnes (if applicable).	**Not applicable**
	AO9.3 Vehicular links are provided along the fire trail either to existing fire trails or roads, and these links are designed having regard to the topography of the site, fire fighter safety and the need to regularly access water supplies. **Note: where possible, these links should be at intervals of approximately 200m**	**Not applicable**
	AO9.4 The fire trail has vehicular access at each end, and links either to existing fire trails or public roads.	**Not applicable**
	AO9.5 The fire trail provides turning areas for fire-fighting appliances. The turning bay can be either: (a) a turning circle; (b) a 'T' shaped turning bay; or (c) a 'Y' shaped turning bay.	**Not applicable**
	AO9.6 The fire trail provides areas for vehicles to pass or turn at intervals of not more than 200m and with a maximum grade of 5% (1 in 20).	**Not applicable**
PO10 In a bushfire hazard area, the development maintains the safety of people and property by ensuring that the water supply is reliable and has sufficient flow and pressure	**AO10.1** The development is proposed in a bushfire hazard area, and reticulated water is supplied in accordance with **SC6.11 City Plan policy – Land**	**Compliant** The property has access to reticulated water and fire hydrants along Karingal Drive and Imelda Way. The reticulated water access will be further implemented throughout the site including the installation of fire

requirements for fire-fighting purposes at all times.	**development guidelines, Section 6 – Water supply and sewerage reticulation standards**.	hydrants. Therefore, water storage for firefighting purposes will not be a requirement for this proposal.
	AO10.2 Development involving new or existing buildings with a gross floor area of greater than 50m^2, each lot has a reliable reticulated water supply that has sufficient flow and pressure characteristics for fire-fighting purposes at all times. It must have a minimum pressure and flow of 10 litres a second at 200 kPa.	**Compliant** The proposed development will have access to an adequate reticulated water supply.
PO11 In a bushfire hazard area, the development maintains the safety of people and property by ensuring that an adequate water supply for fire-fighting purposes is provided.	**AO11.1** For development with a combined GFA less than 500m^2 where one or more buildings are proposed, dedicated fire-fighting water storage is provided to protect each individual building. Each dedicated fire-fighting water storage must have a volume of water not less than 10,000 litres for each building, be provided within 10m of each building and be: (a) a separate tank that is either below ground level or of non -flammable construction; or (b) a reserve section in the bottom part of the main water supply tank that is either below ground level or of non -flammable construction. **Note: dedicated fire-fighting water storage is in addition to water supply for household use and does not include swimming pools, creeks and dams.**	**Not applicable**
	AO11.2 For development that proposes one or more buildings with a combined GFA greater than 500m^2 there is no acceptable outcome provided.	**Not applicable**
PO12 In a bushfire hazard area, all fire-fighting water storage tanks, including domestic water supply tanks, are fitted with the standard rural fire brigade fittings.	**AO12** The outlet pipe is 50mm in diameter, fitted with a 50mm male camlock (standard rural fire brigade fitting) and an isolating valve.	**Not applicable**
PO13 In a bushfire hazard area, water storage provided for fire-fighting purposes is safely located and accessible at all times.	**AO13.1** The water supply outlet is located at least 9m from any potential fire hazards, such as venting gas bottles and combustible structures.	**Not applicable**
	AO13.2 A safe and accessible hard stand area capable of	**Not applicable**

	accommodating a fire fighting vehicle is provided not more than 3m from the water supply outlet.	
PO14 Development in a bushfire hazard area must provide adequate fire-fighting water storage. This infrastructure must be provided on public land so as to be readily accessible to fire brigades for hazard reduction and fire-fighting purposes.	**AO14.1** Where public water supplies (e.g. fire hydrants or public water storage) do not exist, water supply tanks are provided for fire-fighting purposes on public land within the development. The water tanks must: (a) Be installed on land dedicated to Council; (b) hold a volume of at least 22,500 litres per every 20 dwellings; (c) be of concrete construction; and (d) have an outlet pipe of 50mm in diameter, fitted with a 50mm male camlock (standard rural fire brigade fitting) and an isolating valve.	**Not applicable**
	AO14.2 Development on public land provides a safe and accessible hardstand area capable of accommodating a fire fighting vehicle not more than 3m from the water supply outlet.	**Compliant** The proposed internal driveway design is wide enough to accommodate the three-point turn of firefighting appliances. Multiple 'T' shaped turning bays also facilitate the movement of vehicles within the property.
PO15 Development does not cause: (a) an unacceptable risk to people, property and the environment due to the impact of bushfire on hazardous chemicals; (b) excess danger or difficulty to emergency services for emergency response or evacuation.	**AO15** Development involving the storage, handling or manufacture of hazardous chemicals is not located within a Bushfire hazard area.	**Compliant (with conditions)** The proposed development is not permitted to store or manufacture hazardous chemicals within the site.
PO16 In a bushfire hazard area, new residents/occupants of a development in a bushfire hazard area are informed about: (a) the potential bushfire hazard on their site; (b) their responsibility for fire management; (c) the measures required for ongoing fire hazard mitigation; and (d) emergency procedures during a bushfire or on bad fire weather days. **Editor's note - Further information on bushfire preparation can be found at www.ruralfire.qld.gov.au**	**AO16** A copy of the Bushfire management plan, complete with the Queensland Fire and Emergency Services cover sheet and any other addendums is provided to each resident/occupant for their information. **Note: the QFES cover sheet is attached to the approved Bushfire management plan and a notification will be placed on the property's rates notice.**	**Compliant (with conditions)** The bushfire management plan must be made available to all residents of the site and a notice must be placed on the Council rate search.

Appendix 5 – The Australian Fire Danger Rating System (AFDRS)



The Australian Fire Danger Rating System is a simplified way for members of the public to understand the potential day-to-day bushfire risk based on many factors including up-to-date state fuel data, spatial and satellite data and weather data. The four levels as shown above are:

- Moderate,
- High,
- Extreme and
- Catastrophic.

Each danger level should be treated differently and requires homeowners to be actively aware of each level day to day.

MODERATE	HIGH	EXTREME	CATASTROPHIC
Plan and prepare. Most fires can be controlled.	Be ready to act. Fires can be dangerous.	Take action now to protect your life and property. Fires will spread quickly and be extremely dangerous.	For your survival, leave bushfire risk areas If a fire starts and takes hold, lives are likely to be lost.
Stay up to date and be ready to act if there is a fire	There's a heightened risk. Be alert for fires in your area. Decide what you will do if a fire starts. If a fire starts, your life and property may be at risk. The safest option is to avoid bushfire risk areas.	These are dangerous fire conditions. Check your bushfire plan and ensure that your property is fire ready. If a fire starts, take immediate action. If you and your property are not prepared to the highest level, go to a safer location well before the fire impacts. Reconsider travel through bushfire risk areas.	These are the most dangerous conditions for a fire. Your life may depend on the decisions you make, even before there is a fire. Stay safe by going to a safer location early in the morning or the night before. Homes cannot withstand fires in these conditions. You may not be able to leave, and help may not be available.

Shown above is a breakdown of each risk level from the Australian Fire Danger Rating System website (https://afdrs.com.au/). It's important to understand that as the levels rise, there is a requirement for fire wardens and employees to heighten their bushfire awareness and prepare adequately.

Updated fire danger ratings can be found at the below websites and should be checked every four days at a minimum to stay aware of what potential fire weather is ahead.

Bureau of Meteorology – Queensland Fire Danger Ratings
http://www.bom.gov.au/qld/forecasts/fire-danger-ratings.shtml

The above website provided by the Bureau of Meteorology breaks down Queensland into 15 sections and provides an FBI (Fire Behaviour Index) rating of which each danger rating has a range. The ranges are as follows.

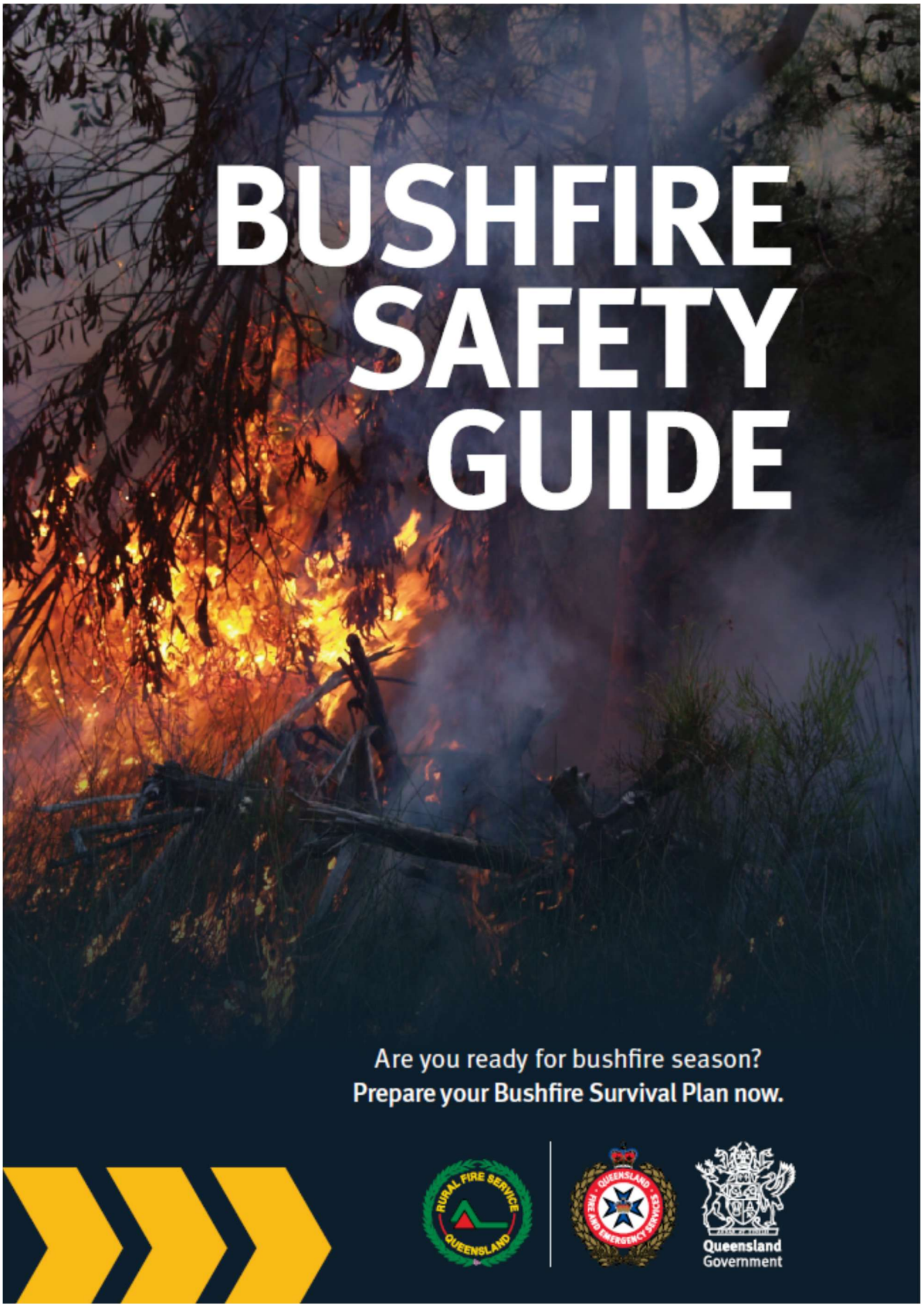
- No Rating (<12)
- Moderate (12-23)
- High (24-49)
- Extreme (50-99)
- Catastrophic (>=100)

Queensland Fire and Emergency Services – Fire Danger Ratings
https://www.qfes.qld.gov.au/prepare/bushfire/fire-danger-ratings

The above QFES website provides some more information on the fire danger ratings as well as an interactive map for each section of Queensland. This can act as a great visual alternative to the Bureau of Meteorology which is presented as a table of figures.

Overall, homeowners, fire wardens and community members should pay special attention to the current fire danger ratings in order to be readily prepared for bushfire weather. Correspondence with the local rural fire brigade may be helpful in order to stay ready and prepared for potential bushfires.

Appendix 6 – Queensland Fire and Emergency Services Bushfire Safety Guide





Bushfires can affect you no matter where you live in Queensland.

Bushfires move fast, can be highly destructive and pose a serious threat to life, property, and the environment.

Queensland Fire and Emergency Services (QFES) are committed to protecting lives and properties, however in a state as big as Queensland, a fire crew may not be available to assist every home.

It's important you have a plan in place and know exactly what you can do to protect yourself, your family, and your property.

During a bushfire, your safety depends on your preparations and the decisions you make.

The first step is to understand your level of risk to help you make informed decisions that are right for you and your family.

When is bushfire season?

Fire season in Queensland often begins in July and runs through until October, but can extend into February. However, bushfires in Queensland can occur at any time.

These times can vary each year depending on the condition of local bushland, long-term climate conditions, and short-term weather events. The impacts of climate change are creating extended fire seasons that include higher temperatures with more frequent hot days, and increased fire danger across the state.

KNOW YOUR RISK

Is your property at risk?

All Queenslanders need to be prepared for bushfire. You don't have to live in the bush to be threatened by bushfires, just close enough to be affected by burning material, embers, and smoke.

If you answer yes to any of the questions below you are at a heightened risk of bushfire.

- Do you live within a few kilometres of bushland?
- Does your local area have a history of bushfire?
- Do you have trees and shrubs within 20 metres of your home?
- Do you live along the coast near scrub?
- Do you live on a farm or near paddocks?

Visit the QFES website at www.qfes.qld.gov.au and use the post code checker to see the bushfire potential in your neighbourhood.

It's not just fire

Bushfires can lead to loss of life and cause serious damage to property and infrastructure, but the fire itself is only one part of the danger.

- Fire embers (small pieces of burning bark, leaves and twigs) can be caught in the wind and travel many kilometres from where the bushfire is burning and cause spot fires to start.
- The radiant heat from a large bushfire can be felt more than 100 metres away and can melt or crack objects such as glass windows, allowing embers into buildings and vehicles.
- Radiant heat can also be deadly to people and animals, causing dehydration and even heatstroke.
- Toxic fumes and heavy smoke from bushfires can make seeing and breathing difficult.



Is your home at risk?

Use the risk factors checklist to assess the vulnerability to your home in the event of a bushfire. Consider what changes you could make to your home to reduce your risk. The more boxes you tick, the more prepared your home may be.

Does your home have:

- ☐ Non-combustible exterior walls.
- ☐ Sealed roof ridge capping.
- ☐ Enclosed eaves.
- ☐ An enclosed underfloor.
- ☐ Metal screened vents.
- ☐ Non-combustible window trimmings.
- ☐ Non-combustible deck or verandah.

If firefighters need to access your property, does it have:

- ☐ Access route clear of overhanging trees.
- ☐ Access route clear of overhead powerlines.
- ☐ Unrestricted driveway access (gates can be opened without restriction).
- ☐ Room for large vehicles to reverse in (Approximately four metres wide).
- ☐ Turning or passing areas for large vehicles.
- ☐ Heavy vehicle access on cattle grids and bridges.
- ☐ Two-wheel drive vehicle access.
- ☐ An alternative way out for vehicles.

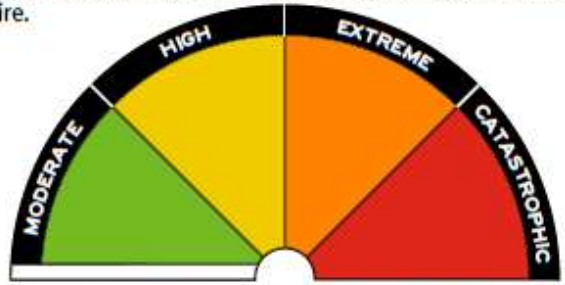
Do you have accessible water supply:

- ☐ Reticulated water supply.
- ☐ Tank supply suitable for firefighter access - 50mm male camlock fitting with shut-off valve.
- ☐ Accessible open water supply such as a dam or pool.
- ☐ Firefighting pump and hose connected to a water supply.

Know your Fire Danger Ratings

A Fire Danger Rating (FDR) describes the potential level of danger should a bushfire start. They are important because they provide you with information so you can take action to protect yourself, your family, and your home from the potentially dangerous impacts of bushfire.

They do not indicate the chance of a fire occurring, although this is a common misconception. Ratings are calculated using a combination of weather forecasting and information about vegetation that could fuel a fire.



Find your local FDR forecast by visiting the QFES website at www.qfes.qld.gov.au.

Moderate — PLAN AND PREPARE

Plan and prepare.
Most fire can be controlled.

High — BE READY TO ACT

Be ready to act.
Fires can be dangerous.

Extreme — TAKE ACTION NOW

Take action now to protect your life and property.
Fires will spread quickly and be extremely dangerous.

Catastrophic — LEAVE BUSHFIRE RISK AREA

For your survival, leave bushfire risk areas.
If a fire starts and takes hold, lives are likely to be lost.



WILL YOU LEAVE EARLY?

One of the most important things to do before bushfire season is to decide what you will do if a bushfire threatens your home or property.

Leave early? Or stay and defend?

Discuss with your family if you are capable and prepared to stay and defend your home or if leaving is the best choice for your family.

You need to consider:

- **Your health.**
  Fire conditions may aggravate conditions, such as breathing conditions that may make it difficult to defend your property for an extended period of time.
- **Your physical abilities.**
  You may need to defend your home for several hours in extreme heat and smoke which may require intense physical activity.
- **Your mobility.**
  You will need to move around your property with ease, potentially in dark, windy, and noisy conditions.
- **Your mental health.**
  The impact of bushfire can be traumatic and you will need to be mentally prepared.
- **Your ability** to make critical and informed decisions under stressful conditions.

Your decisions

You have decided to leave early. You need to prepare for the season ahead and make your Bushfire Survival Plan with your family. The decisions you make now will help you be prepared in the event your home and family are impacted by bushfire.

- What will be your trigger to leave? This could be a Fire Danger Rating. Don't rely on an official warning to leave. Bushfires can start quickly and threaten lives and homes within minutes.
- Do you or your family members have any disabilities or medical conditions that you need to take into consideration?
- Will you leave early that morning or the night before?
- Where will you go? Can you stay with family and friends or at a hotel in a safe location?
- Who will you tell? You should let your family, friends, and neighbours know where you have relocated to in case you need to be contacted.
- What route will you take and what is your back up route if a fire is already in the area?
- What will you take with you?
- What are you going to do with your pets or livestock?
- Who else do you need to talk to about where you are going?
- How will you stay informed about warnings and updates?
- What do you need to do to prepare your home before you leave?
- What will you do if there is a fire in the area and you cannot leave? Make sure you have a contingency plan.

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

YOUR BUSHFIRE EVACUATION KIT

You must prepare a Bushfire Evacuation Kit to ensure you and your family have important items and equipment ready to relocate until you can return to your home.

Include items such as:

- Hat
- Long sleeve shirt (natural fibres)
- Jeans or long pants (natural fibres)
- Drinking water
- Medication and prescriptions
- Boots
- Radio (battery operated)
- Batteries
- Important documents (e.g. insurance papers)
- Safety glasses
- Wallets and purses
- Passports and birth certificates
- Torch (battery operated)
- Children's toys
- Blankets (natural fibres)
- Family photos and valuables
- Pet supplies
- Mobile phone and charger

LEAVE EARLY



If you decide to stay at your home during a fire, you need to be well prepared.

WILL YOU STAY?

Defending your home through a bushfire is a demanding task. You need to be mentally and physically ready and you need to have a plan.

What to expect

A bushfire is a terrifying and stressful experience. Understanding what to expect and planning what you will do will help you cope.

- It will be hot and dark. The sky may turn orange.
- Strong gusty winds and intense heat will make you tired quickly.
- Thick, heavy smoke will sting your eyes.
- Smoke will make it hard to breathe easily.
- Strong winds will push you around.
- The roaring sound of the wind and fire approaching will make it hard to hear.
- Embers will rain down causing spot fires all around you.
- Power, water and internet may be cut off.
- You may be isolated.
- The fire could impact you very fast, so you need to remain calm and stay focused.
- You may hear explosions nearby.
- While the fire front may pass quite quickly, it could be hours before the danger is over and you can rest.

Your decisions

You need to discuss your options with your family and prepare your Bushfire Survival Plan so that your whole household knows their roles. Some things that you need to consider are:

- How will you stay informed about warnings and updates?
- Is your property able to withstand the impact of a bushfire? What can you do to better prepare you home?
- Do you have any experience with or knowledge of defending a property during a bushfire?
- Do you have the supplies you need to defend your home, and know how to use them?
- Do you have an independent water supply or will you rely on water mains?
- How many people will be defending the property in the event of a bushfire? It is unsafe to defend a property on your own - if you are injured you may not be able to seek medical assistance and there may be too many locations that need attention for just one person.
- Do you or your family members have any disabilities or medical conditions that you need to take into consideration?
- Will someone else be responsible for looking after others (young, elderly, or disabled)? If you are defending the property, it is preferable that someone else is available to provide supervision or assistance to dependents.
- Is there anyone outside your neighbourhood that you need to help or check up on?
- What are you going to do with your pets or livestock? Will you have someone dedicated to looking after your animals so that you can focus on defending your property?
- What will you do if it's too dangerous to stay? Where will you go? Do you have any family or friends you can stay with? What will you take? Make sure you have a contingency plan.



If you choose to or are forced to stay at your property it is essential you are prepared for the oncoming bushfire.

Before the fire front arrives:

- ☐ Ensure vehicles have sufficient fuel and move them to a safe location.
- ☐ Relocate garden furniture, door mats and other outdoor items indoors.
- ☐ Block downpipes at the top and fill gutters with water if possible.
- ☐ Wet down the sides of buildings, decks and plants close to your home in the likely path of the bushfire.
- ☐ Move animals and livestock to a well-grazed or ploughed area.
- ☐ Turn on garden sprinklers for 30 minutes to soak the ground.
- ☐ Close windows, doors, and vents. Shut blinds.
- ☐ Take down curtains and move furniture away from windows.
- ☐ Seal gaps under doors and windows with wet towels.
- ☐ Fill containers with water, e.g. sinks, bathtub, buckets, bins.
- ☐ Bring pets inside, contain them in one room and provide them with plenty of water.
- ☐ Tune in to warnings to monitor local radio, websites or social media for updates.
- ☐ Put on protective clothing.
- ☐ Drink lots of water.
- ☐ Notify friends and family of your intent to stay.

As the fire front arrives:

- ☐ Disconnect hose and fittings and bring inside.
- ☐ Go inside for shelter.
- ☐ Drink lots of water.
- ☐ Shelter in your house on the opposite side from the approaching fire, in a room with multiple escape points.
- ☐ Patrol and check for embers inside, particularly in the roof space.
- ☐ Check on family and pets.
- ☐ Maintain a means of escape.
- ☐ Continually monitor conditions.
- ☐ Stay tuned to information channels.



After the fire front passes:

- ☐ Stay tuned to information channels.
- ☐ Contact friends and family to tell them you are safe.
- ☐ Continue to check for small spot fires and burning embers:
  - » Inside your roof space.
  - » Under the house.
  - » On verandahs and decks.
  - » In roof lines and gutters.
  - » Under floorboards.
  - » In wood piles.
  - » In garden beds.



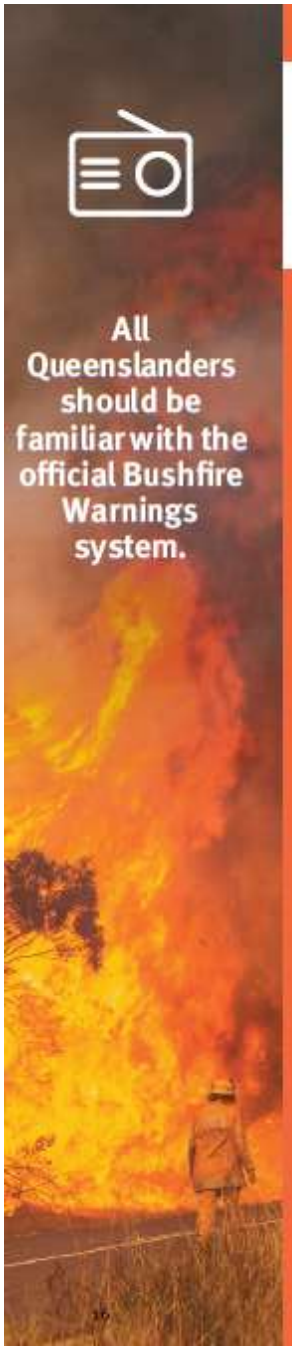
YOUR BUSHFIRE EMERGENCY KIT

If you choose or are forced to stay at your home, a Bushfire Emergency Kit will equip you to extinguish small fires and provide you with basic protection from heat, smoke, and flames. Make sure you have enough supplies for everyone staying.

 Hat	 Safety glasses
 Smoke mask	 Long sleeve shirt (natural fibres)
 Water bottle	 Gloves
 Jeans or long pants (natural fibres)	 Boots

- Batteries
- Blankets (natural fibres)
- Bucket
- Drinking water
- Fire extinguisher
- First aid kit
- Hoses
- Knapsack sprayer
- Ladder
- Medication and prescriptions
- Mop
- Mobile phone and charger
- Radio (battery operated)
- Shovel
- Torch
- Towels





All Queenslanders should be familiar with the official Bushfire Warnings system.

TUNE IN TO WARNINGS

When there's a bushfire in your area, it's up to you to take notice, stay informed, make decisions, and act. Tune into local media including radio, official social media feeds and websites. Don't assume you will receive an official warning as a fire approaches.

- Current Bushfires Map
  www.qfes.qld.gov.au/Current_Incidents
- Find your local ABC radio station
  www.abc.net.au/newsradio
- Find your local commercial radio
  www.commercialradio.com.au
- QFES Facebook
  @QldFireandEmergencyServices
- QFES Twitter
  @QldFES
- QFES website
  www.qfes.qld.gov.au

Call Triple Zero (000) if your life or property is under threat.

ADVICE

If you get an Advice warning, you'll be asked to **STAY INFORMED** or **AVOID SMOKE**. You should:

- Stay inside and close windows and doors.
- Keep respiratory medication close by.
- Follow your bushfire survival plan now or learn how to make one on the QFES website.
- Stay informed and decide what you will do if the bushfire gets closer.

WATCH and ACT

A Watch and Act warning will advise you to **PREPARE TO LEAVE** or **NOT SAFE TO RETURN**. You should:

- Follow your bushfire survival plan now.
- Prepare now so you can leave quickly if the bushfire gets close.
- If you find it hard to move quickly, leaving now is your safest option.
- Keep medications close by.
- Move flammable items away from your house if you can.
- Do not fly drones near the fire or in the warning area.
- Help others if it's safe to do so.
- If you left the area, it is not safe to return.
- Stay informed by listening to warnings.

EMERGENCY WARNING

An Emergency warning will prompt you to **LEAVE IMMEDIATELY** or **SEEK SHELTER IMMEDIATELY**. You should:

- Wear protective clothing and stay hydrated.
- Keep medications close by.
- Listen to warnings.
- If you can't leave safely or a SEEK SHELTER warning is issued for your area:
  - Seek shelter inside a brick building in a room with multiple escape points on the opposite side from the approaching fire.
  - As the fire approaches and passes, the safest place will change, so be ready to move quickly.
  - Close windows and doors. Seal any gaps with wet towels.
  - Check for embers inside, particularly in the roof space. Put them out quickly.
  - Keep pets inside with you.



PREPARE

Preparation is the key to survival.

Use this checklist as a guide to start preparing your home before the start of bushfire season.

Structure:

- ☐ Clear gutters and roof of leaves, twigs, bark and other debris. Consider installing gutter guards.
- ☐ Enclose open areas under decks and floors.
- ☐ Install steel wire mesh screens on windows, doors, vents, and weep holes.
- ☐ Point LPG cylinder relief valves away from your house.
- ☐ Check and maintain firefighting pumps, generators, and water systems.
- ☐ Seal gaps in external roof and cladding.
- ☐ Remove flammable items away from your home (such as woodpiles, mulch, boxes, hanging baskets, and outdoor furniture).

Vegetation:

- ☐ Reduce vegetation along access paths.
- ☐ Mow your lawn regularly.
- ☐ Remove excess flammable materials such as long dry grass, dead leaves, and branches.
- ☐ Trim low-lying branches around your home to a height of two metres from the ground.

Access:

- ☐ Display house number at road.
- ☐ Ensure adequate space for fire trucks to access your home (at least four metres wide and high with turn-around area).

Personal:

- ☐ Gather sufficient personal protective clothing and equipment for all persons and store so that they are readily accessible.
- ☐ Prepare your evacuation kit or emergency kit.
- ☐ Stock your first aid kit.
- ☐ Check insurance policies are adequate for home and vehicles.
- ☐ Review and update your Bushfire Survival Plan as a family each year.
- ☐ Make a contingency plan.
- ☐ Note your Neighbourhood Safer Place, if available.

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





CREATE YOUR BUSHFIRE SURVIVAL PLAN TODAY

Make your Bushfire Survival Plan together as a family, tear out and display it for everyone to note. Share your plan with your family and friends.

Bushfire is a very real risk across Queensland, so make sure you are prepared now.

Don't wait until it's too late.

Include a contingency plan

Bushfires are unpredictable and plans can fail. A contingency plan that identifies your alternate options may save your life if you are caught in a fire. You need to consider:

- What will you do if you are away from home (work, school, shopping)?
- What if your pet is scared and you cannot find them?
- What if you are home alone?
- What if you have guests staying with you?
- What will you do if your travel route is cut off?
- What will you do if you are trapped in your home?
- Where will you go if you had planned to stay but it is now unsafe and you need to leave?

OUR BUSHFIRE SURVIVAL PLAN

Date: _____

OUR DETAILS

Names: Contact Number:

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

Address: _____

_____

Lot / Plan No. _____

EMERGENCY DETAILS *(name / phone / policy / account)*

Fire, Police, Ambulance: 000

Insurance Provider: _____

Local Council: _____

Electricity Provider: _____

Gas Provider: _____

Water Supplier: _____

Phone Company: _____

Internet Provider: _____

Bank: _____

Doctor: _____

Vet: _____

Work: _____

School: _____

Neighbours: _____

_____

_____

Other: _____

_____

LEAVING

Who will leave early?

What will be your trigger to leave?

Where will you go?

How will you get there?

☐ Do you have your evacuation kit ready?

What else will you take?

What is your plan for your pets or livestock?

STAYING

Who will stay?

What is the plan for livestock and pets?

Before there is a fire, how will you get yourself and your property ready?

As the fire approaches, what steps will you take so you and your home can withstand the fire?

As the fire front arrives, where will you safely monitor the fire from inside your home?

After the fire has passed, what areas of your property will you check for spot fires and burning embers?

CONTINGENCY PLAN

What will you do if things don't go to plan?

Neighbourhood Safer Place - a last resort

A Neighbourhood Safer Place (NSP) is a last resort option. It is an identified local open space or building where people may gather to seek shelter from a bushfire. Before bushfire season, you should:

- Make sure you know if a NSP is available in your local government area. NSPs are not available in every area.
- Note the travel time and distance to your local NSP.
- Include your NSP details in your Bushfire Survival Plan contingency plan.

The main purpose of a NSP is to provide some level of protection to communities from the effects of a bushfire. Your NSP will not guarantee safety in all circumstances, and the following limitations need to be considered if you plan to use one as a last resort:

- Firefighters may not be present if they are involved in the operational response at other locations.
- Support personnel may not be present at the NSP.
- NSPs do not cater for animals or pets.
- NSPs do not provide meals or amenities.
- NSPs may not provide shelter from the elements, particularly flying embers.

If you have special needs you should think about what assistance you may require. A NSP may not be a suitable location for your evacuation. You will need to make appropriate arrangements with friends, family, or carers.

Visit the QFES website at www.qfes.qld.gov.au to find out about NSPs in your local government area.

If you're unsure about your level of risk or require assistance, call 13 QGOV (13 74 68) to book a Property Advice Visit.

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Some Fire Resistant Native Trees and Shrubs

(www.bushfire.nsw.gov.au)

Scientific Name:	Common Name:
Acacia Cyclops	West Australian Coastal Wattle
Acacia Glandulicarpa	Hairy Pod Wattle
Acacia Howittii	Sticky Wattle
Acacia Iteaphyla	Gawler Range Wattle
Acacia Melanoxyion	Blackwood
Acacia Pravissima	Ovens Wattle
Acacia Prominens	Golden Rain Wattle
Acacia Vestita	Cedar Wattle
Acacia Terminalis	Hairy Wattle
Acmena Smithii	Lilly Pilly
Agonis Juniperina	Juniper Myrtle
Angophora Costata	Apple Jack
Atriplex Spp	Saltbush
Brachychiton Populneus	Kurrajong
Casuarina Cristata	Belah
Casuarina Cunninghamiana	River She Oak
Eucalyptus Maculata	Spotted Gum
Ficus Macrophylla	Moreton Bay Fig
Hakea Salicifolia	Willow Hakea
Hakea Suaveolens	Sweet Hakea
Heterogeneric Oleifolium	Cattlebush
Lagunaria Patersonii	Pyramid Tree
Melaleuca Lanceolata	Moonah
Melia Azedarach	White Cedar
Myoporum Insulare	Boobialla
Pittosporum Undulatum	Sweet Pittosporum
Tristania Conferta	Brush Box

It should be noted that there are a large variety of non-native or introduced plants available that are also hard to burn. When using non-native plants care must be taken that they are not introduced into situations where they may become an environmental weed therefore these plants are not listed here.



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Ray: 0407 652 899
Max: 0458 250 661
Email: qldbushfire.ra@yahoo.com

Bushfire Compliance Reports for South East Queensland

Statement of Competency for Ray Cavanough and Max Gray

Queensland Bushfire Risk Assessments has been operating for 20 years**,** carrying out assessments across the Gold Coast, Logan, Beaudesert, Brisbane, Redlands, and Pine Rivers areas. The business has also worked in collaboration with local government authorities on a range of fire management and planning projects**,** contributing to community safety and the effective implementation of bushfire mitigation strategies.

Ray Cavanough

Ray Cavanough has been involved with bushfire management and control for 39 years, including 6 years as a rural fire brigade member in western Queensland before joining the Springbrook Rural Fire Brigade in 1981. From 1981 to the present, Ray has spent 6 years as First Officer (Officer in Charge) of the Springbrook Rural Fire Brigade, 7 years as Logistics and Training Officer, and is currently President of the brigade.

Ray is a Level 2 Firefighter and a Specialist Instructor, with extensive experience as Incident Controller for several major fires during 1994, 1996, 2000, and 2002. He has completed numerous courses on bushfire management and behaviour, weather influences, structural fires, breathing apparatus, vegetation fuel loadings, fire control, and backburning operations.

He has also contributed to the Gold Coast City Council Bushfire Management Strategy, hazard reduction programs, and community awareness initiatives. Ray's risk assessments and bushfire plans include Camping and Motocross recreational parks, small subdivisions, and numerous dwelling sites.

Ray is a member of the Rural Fires Association Queensland, a professional group that regularly consults and provides submissions to state and local government on bushfire management planning schemes.

Max Gray

Max Gray has worked under the direct supervision and mentorship of Ray Cavanough for the past 7 years, assisting in the preparation of bushfire management plans in accordance with *AS3959–2018*. His experience spans data collection, site inspections, assessment of vegetation types, slope analysis, and separation distances for residential and subdivision developments across South East Queensland.

Max is currently completing a Bachelor of Building Surveying (Honours), equipping him with a strong understanding of the interaction between planning, construction standards, and bushfire resilience.

In addition to his technical and academic experience, Max serves as the Secretary for the Rural Fires Association Queensland (RFAQ), contributing to the coordination of consultant engagement, policy review, and communication between members and government agencies on bushfire management and planning matters.

Through his ongoing professional, academic, and association involvement, Max has developed strong technical competency in applying bushfire assessment methodologies, interpreting planning and building legislation, and preparing clear, compliant bushfire reports. His combination of hands-on experience and formal education supports a high standard of professional practice within Queensland Bushfire Risk Assessments.