



# BUSHFIRE HAZARD ASSESSMENT (BHA)

## Property

100-148 Loganview Road, Logan Reserve

Lots 4, 5, 7 and 8 on RP105335 and Lots 101 and 102 on RP868235

QM Properties

December 2021

- + Bushfire assessments
- + Property vegetation assessments
- + Site planning for bushfire
- + Property management for bushfire
- + Bushfire management plans

[qldbushfireplanning.com.au](http://qldbushfireplanning.com.au)

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It is acknowledged and agreed that the site may be subject to a degree of bushfire hazard. The client acknowledges and agrees that QBP has not created or contributed to the creation of this hazard and the client indemnifies QBP for claims arising out of or result from a bushfire event except to the extent attributable to the negligence of QBP.

The client agrees that QBP shall have no liability in respect of any damage or loss incurred as a result of bushfire. Compliance with this report shall be the responsibility of the client and/or the land-owners. This disclaimer shall apply notwithstanding the report may be made available to the relevant Local Government Authority and other persons for an application for permission or approval to fulfill a legal requirement.

## EXECUTIVE SUMMARY

A 233 residential lots has been proposed at 100-148 Loganview Road, Logan Reserve, Lots 4, 5, 7 and 8 on RP105335 and Lots 101 and 102 on RP868235. The site is captured by the State Planning Policy Natural Hazards and Resilience - *Bushfire Prone Area* mapping and in accordance with the provisions of the Logan City Council Bushfire Hazard Overlay Code, a detailed Bushfire Hazard Assessment has been prepared.

The subject site has been identified in the Queensland State Planning Policy (2017) as being within a potential bushfire impact zone. This report includes a number of recommendations regarding bushfire risk mitigation in accordance with AS3959-2018 and Logan Planning Scheme 2015 V6.0.

| Recommendation |  |
|----------------|--|
| 1              | Proposed buildings will be constructed to meet the requirements of the Australian Standard AS3959- 2018 - <i>Construction of buildings in bushfire prone areas.</i>                                      |
| 2              | Fencing on 100-148 Loganview Road, Logan Reserve will be constructed of non – combustible materials.   |
| 3              | Ingress and egress for residents and emergency services will be from Loganview Road via constructed internal roads   |
| 4              | Reticulated water will be provided to the reconfiguration.   |
| 5              | A bushfire information kit will be provided to affected residents to inform them of the bushfire risks and their roles and responsibilities for prevention, preparedness and response to any fire event. |

## INTRODUCTION

Queensland Bushfire Planning has been engaged on behalf of QM Properties to conduct a site-based Bushfire Hazard Assessment in relation to a 233 residential lots development at 100-148 Loganview Road, Logan Reserve. This Report has been prepared in accordance with the Logan Planning Scheme 2015 V6.0. The aim of this report is to demonstrate the level of bushfire hazard, utilising the methodology as required by that policy.

The focus of this Report refers to the statutory planning and building requirements as they may apply, pursuant to all relevant policies, standards and regulation, along with end-user consideration. In addition, this report seeks to ensure fire risk and evacuation for adjoining and nearby properties is not inadvertently adversely impacted. This assessment report aims to mitigate the risk to life and property from bushfire threat and the impact of bushfire attack which includes:

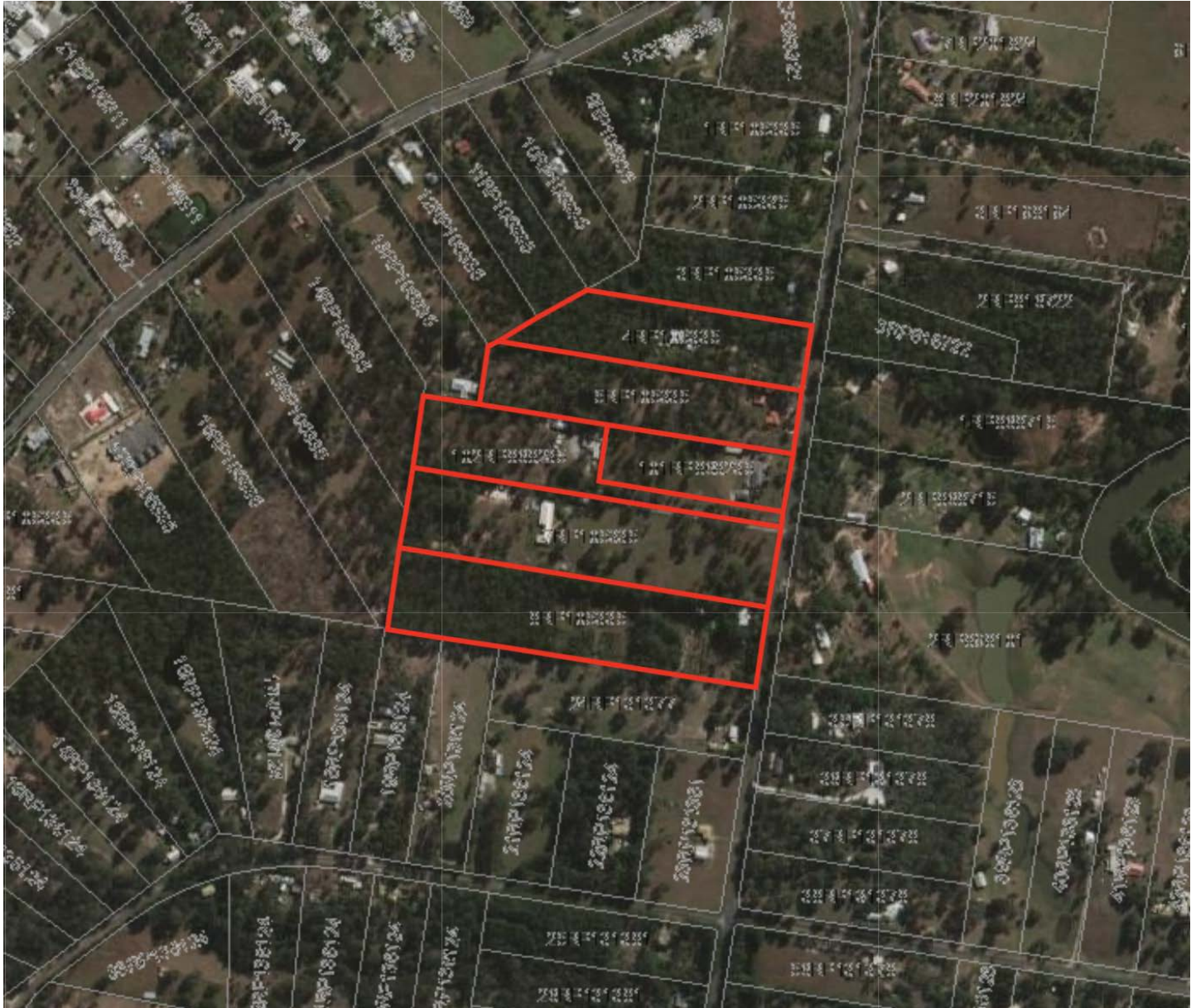
- Direct flame contact;
- Ember and firebrand attack;
- Radiant heat; and
- Fire-driven wind.

This assessment does not seek to remove the threat of any bushfire risk, but provide detailed siting, layout, building and/or servicing information to assist the ability of the owner(s) to manage the potential threat of this risk. This assessment report is prepared in accordance with best practice industry standards as applicable in Queensland and pursuant to both State and local government bushfire hazard policies and guidelines.

## SITE DESCRIPTION AND DETAILS

|                           |   |
|---------------------------|---|
| Site Address              | 100-148 Loganview Road, Logan Reserve                           |
| Local Government          | Logan City Council  |
| Real Property Description | Lots 4, 5, 7 and 8 on RP105335 and Lots 101 and 102 on RP868235 |
| Zoning                    | Emerging Community  |
| Area of Site              | 192970 (total)  |
| Applicant                 | QM Properties   |
| Current Land Use          | Residential   |
| Proposed Land Use         | Low Density Residential   |

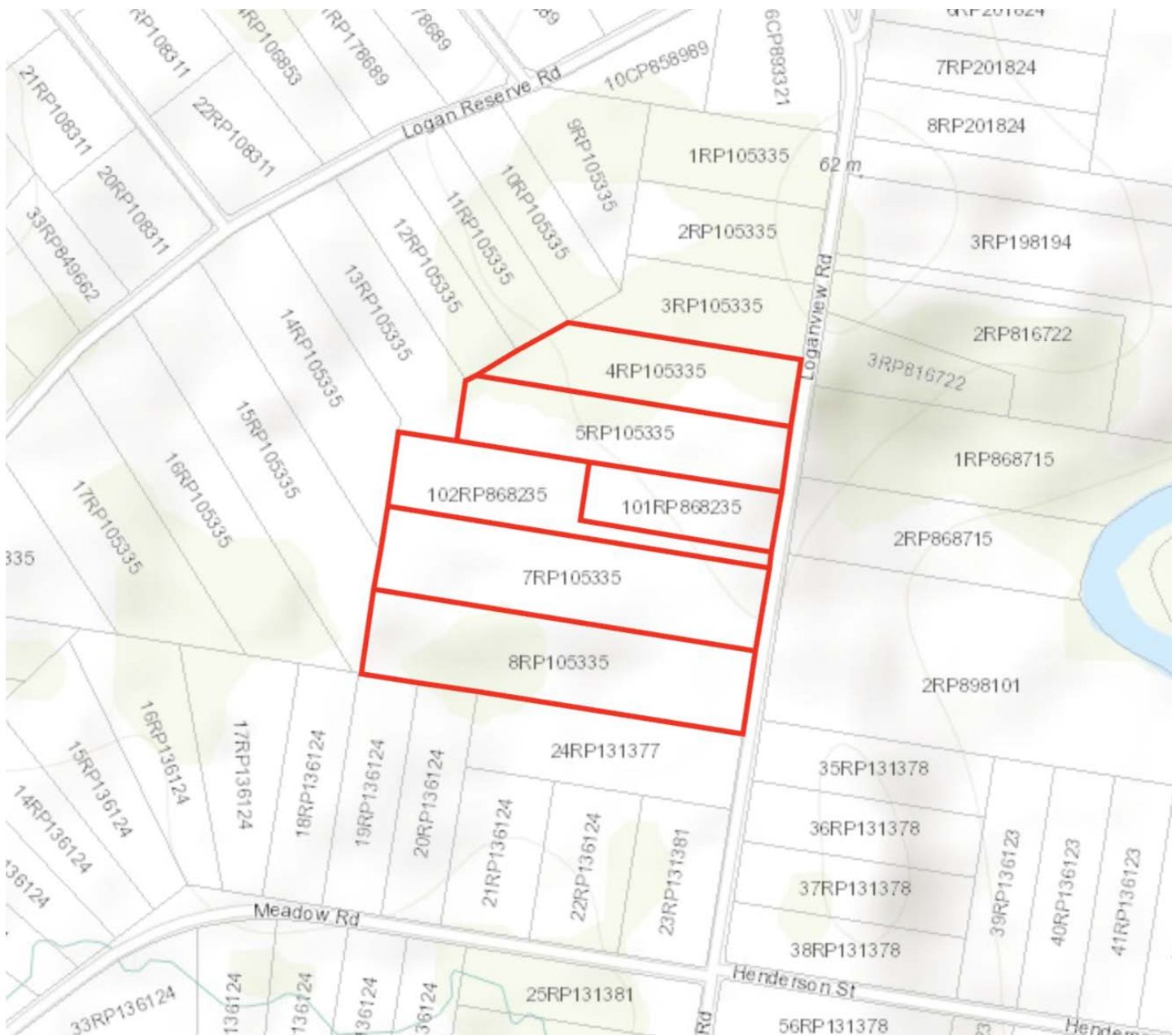
The site is located at 100-148 Loganview Road, Logan Reserve and is described as Lots 4, 5, 7 and 8 on RP105335 and Lots 101 and 102 on RP868235 within Logan City Council (Figure 1).



**Figure 1**

- + Bushfire assessments
- + Property vegetation assessments
- + Site planning for bushfire
- + Property management for bushfire
- + Bushfire management plans

Lots 4, 5, 7 and 8 on RP105335 and Lots 101 and 102 on RP868235 has an area of 192970 (total) square metres and is aligned east - west with a southwesterly aspect (Figure 2). Lots 4, 5, 7 and 8 on RP105335 and Lots 101 and 102 on RP868235 are currently zoned Emerging Community.



**Figure 2**

- + Bushfire assessments
- + Property vegetation assessments
- + Site planning for bushfire
- + Property management for bushfire
- + Bushfire management plans

# PROPOSED DEVELOPMENT

The proposed development consists of 233 residential lots (Figure 4).

## PROPOSAL PLAN



### NOT TO BE USED FOR ENGINEERING DESIGN OR CONSTRUCTION

**NOTES**

This plan was prepared as a provisional layout to accompany a development application. The information on this plan is not suitable for any other purpose.

Property dimensions, areas, numbers of lots and contours and other physical features shown have been compiled from existing information and may not have been verified by field survey. These may need confirmation if the development application is approved and development proceeds, with any change when a full survey is undertaken or in order to comply with development approval conditions.

No reliance should be placed on the information on this plan for detailed subdivision design or for any technical design involving the site.

Boundaries and setbacks shown are indicative only and are subject to Engineering Design.

Saunders Havill Group therefore disclaims any liability for any loss or damage whatsoever or howsoever incurred, arising from any such design or reliance upon this plan for any purpose other than as a document prepared for the sole purpose of accompanying a development application which may be subject to alteration beyond the control of the Saunders Havill Group. Unless a development approval states otherwise, this is not an approved plan.

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Lands Data © State of Queensland Department of Natural Resources and Mines (2016).

\* This note is an integral part of the proposal. Reproduction of this plan or any part of it without the note being included in full will render the information shown on such reproduction invalid and not suitable for use.

### LEGEND

- Major Contour (1.0m Interval)
- Minor Contour (0.25m Interval)
- Stage Boundary
- DA 1 Boundary
- DA 2 Boundary

| STAGE No     | No of Residential Lots |
|--------------|------------------------|
| STAGE 1      | 40                     |
| STAGE 2      | 28                     |
| STAGE 3      | 35                     |
| STAGE 4      | 31                     |
| STAGE 5      | 22                     |
| STAGE 6      | 45                     |
| STAGE 7      | 32                     |
| <b>TOTAL</b> | <b>233</b>             |

| DEVELOPMENT STATISTICS                  | Lots       | %           |
|---|------------|-------------|
| 500m <sup>2</sup> - < 600m <sup>2</sup> | 121        | 52.0%       |
| 600m <sup>2</sup> - < 800m <sup>2</sup> | 32         | 13.7%       |
| 800m <sup>2</sup> +                     | 80         | 34.3%       |
| <b>Total Residential Allowments</b>     | <b>233</b> | <b>100%</b> |
| Site Area                               | 19,307 ha  |             |
| Net Residential Land Area               | 12,961 ha  | 67.0 %      |
| Average Lot Size (556m <sup>2</sup> )   | 1,462 ha   | 7.7%        |
| Road                                    | 4,914 ha   | 25.4%       |

RP DESCRIPTION: Lots 4, 5, 7, 8 on RP105335 & Lots 101 & 102 on RP868235



Q M PROP CO No.2 PTY LTD

100,110,120,128, 130 & 140 LOGANVIEW ROAD , LOGAN RESERVE ● 09/12/2021 ● 10642 P 03 Rev C

Figure 4

# SCOPE OF BUSHFIRE HAZARD ASSESSMENT

A reconfiguration of a lot has been proposed at 100-148 Loganview Road, Logan Reserve, Lots 4, 5, 7 and 8 on RP105335 and Lots 101 and 102 on RP868235. The site is captured by the State Planning Policy Natural Hazards and Resilience - *Bushfire Prone Area* mapping and in accordance with the provisions of the Logan City Council Bushfire Hazard Overlay Code, a detailed Bushfire Hazard Assessment has been prepared.

- + Bushfire assessments
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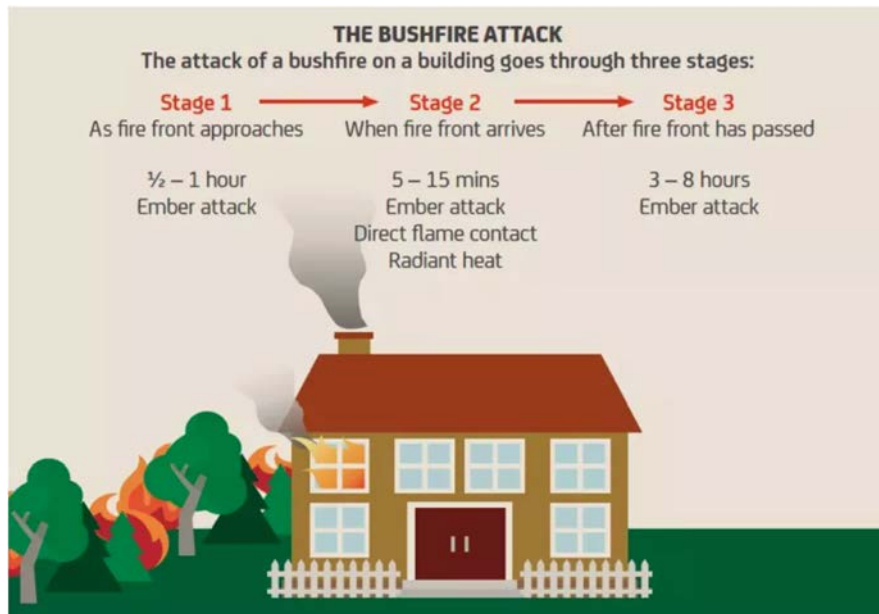
## UNDERSTANDING BUSHFIRE HAZARD

Bushfires are an intrinsic part of Australia's environment. Natural ecosystems have evolved with fire and the landscape, along with its biological diversity, has been shaped by both historic and recent fires. Many of Australia's native plants are fire prone and very combustible, while numerous species depend on fire to regenerate. Indigenous Australians have long used fire as a land management tool and it continues to be used to clear land for agricultural purposes and to protect properties from intense, uncontrolled fires. Historically, bushfires have caused loss of life and significant damage to property. While naturally occurring bushfires cannot be averted, their consequences can be minimised by implementing mitigation strategies and reducing the potential impact to areas which are most vulnerable.

### Bushfire Attack

Bushfire attack refers to the various methods in which bushfire may impact upon life and property and principally encompass:

- Direct flame contact;
- Ember and firebrand attack;
- Radiant heat; and
- Fire-driven wind (Figure 5).



**Figure 5**



## Direct Flame Contact

Direct flame attack refers to flame contact from the main fire front, the flame that engulfs burning vegetation is the same flame that contacts the building. It is estimated that only 10 to 20 per cent of buildings lost to bushfire occur as a direct result of flame attack.

## Ember and Firebrand Attack

CSIRO research has shown that ember attack is the cause of up to 80% of house loss in Australia. The convective forces of bushfire raise burning embers into the atmosphere on prevailing winds and deposit them to the ground ahead of the fire front. Typically, ember attack occurs approximately 30 minutes prior to the arrival of the fire front and continues during the impact of the fire front and for several hours afterwards. Building loss via ember attack relates largely to the vulnerabilities and peculiarities of each building, its distance from the classifiable vegetation and whether someone is present to actively defend the building.

## Radiant Heat

Measured in kilowatts per m<sup>2</sup>, radiant heat is the heat energy released from the fire front which radiates to the surrounding environment, deteriorating rapidly over distance. In terms of impacts on buildings, radiant heat can pre-heat materials making them more susceptible to ignition. Radiant heat can also damage building materials such as window glazing, allowing openings into a building through which embers may enter.

## Fire Driven Wind

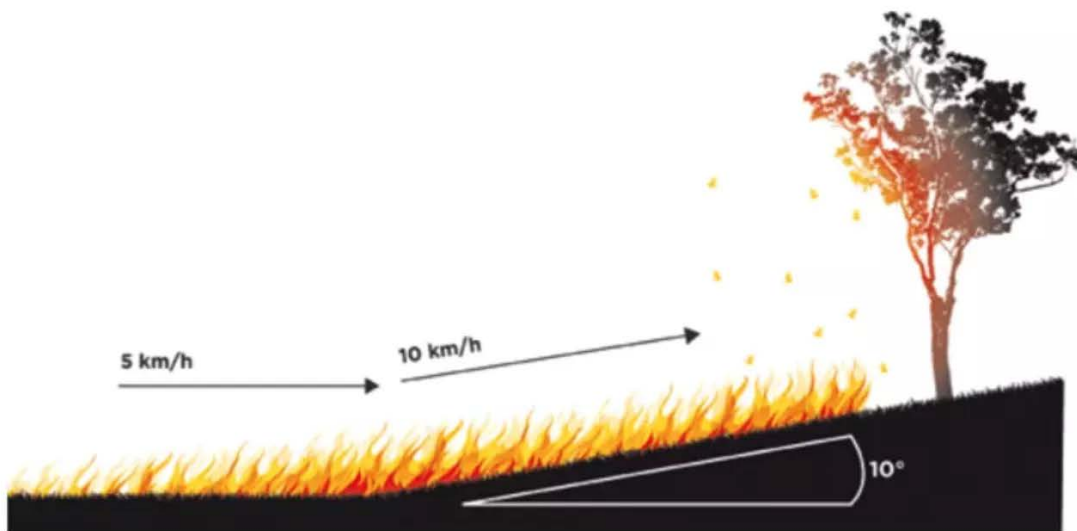
The convective forces of a bushfire typically result in strong fire-driven winds, which can lead to building damage. The typical effects of fire driven wind include conveyance of embers, damage from branches and debris hitting the building, as well as direct damage to vulnerable building components, such as lifting roofs and the breakage of windows.

## Vegetation

The Australian bush varies greatly around the country. There are regions of open woodlands, grassland savannas, dense rainforest. Different types of vegetation burn differently. Generally, fuel is classified as being fine (grasses and twigs that are less than 6 millimetres in diameter) or heavy (branches, logs or stumps). Finer fuels burn more easily, increasing the spread of the fire. Another key factor is fuel moisture content, or how dry the fuel is. The drier the fuel, the more easily it will burn. The dryness of the fuel depends on seasonal rainfall and temperatures.

## Topography

Fires burn faster uphill. This is due to the radiation and convection a fire creates preheating the fuel. A 10-degree increase in slope results in a doubling of the speed of the fire. Fire will spread up a 10-degree slope two times as fast as it will along flat ground (Figure 6). The aspect of a slope (direction that a sloping piece of land is facing) influences a fire's behaviour. Northern and western aspects receive more direct heat from the sun, drying both the soil and the vegetation more than on southern or eastern slopes. The fuels on northern and western aspects are often drier and less dense than fuels on slopes with a different aspect.

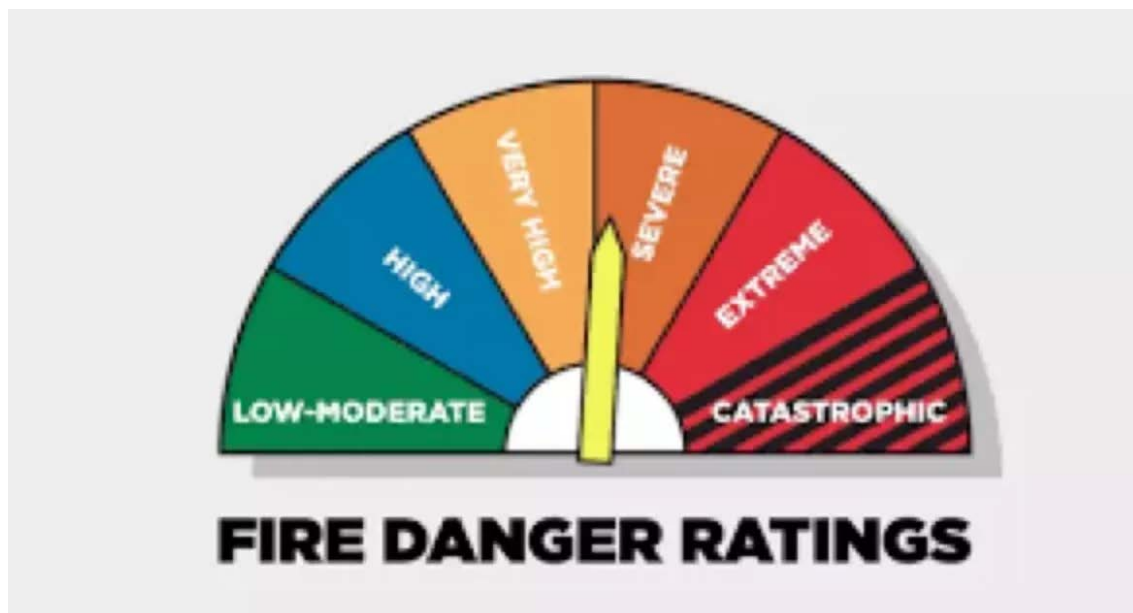


**Figure 6**

## Fire Weather

Fire weather affects bushfire risk levels on a daily, weekly or seasonal basis. The South-east Queensland weather pattern is dominated by a maritime effect. The most common winds are southeast and northeast, the latter being very common during the summer months as an afternoon sea breeze. The most severe fire weather in the area is associated with a northwest wind generated on the back of a high pressure system moving slowly from west to east or from a situation where there is intense low pressure activity in the southeast of Australia extending a trough into southern Queensland (Just, 1978). However, the frequency of these situations in the region is low, being generally of the order of one to two days or fewer per year. The exception can occur in bad fire seasons when fuel conditions are very dry as a result of prolonged dry periods. In Queensland, these bad fire seasons occur about once a decade and are infrequent when compared with the fire situation that prevails frequently in southern Australia.

Whilst an assessment of vegetation types, fuel loads, effective slope and other factors can be readily undertaken, fire weather can fluctuate across days, weeks and seasons and can have a significant impact on the potential for bushfire threat, as well as influence bushfire behaviour and intensity. The Forest Fire Danger Index (FFDI) is a commonly used method to readily advise the community of the likely ability of fire suppression based on fire weather, which is used to inform the Fire Danger Rating (FDR) System (Figure 7). It is important to maintain awareness as to the level of local fire danger during the fire season.



**Figure 7**

## BUSHFIRE HAZARD ASSESSMENT

The State Government Single State Planning Policy (SPP) released in 2017, includes mapping that is an outcome of the new bushfire hazard mapping methodology, developed by the CSIRO and the Queensland Government. The new Bushfire Prone Area mapping was found to have an average reliability of 85%. The new methodology provides a major improvement in bushfire hazard mapping. The new modified approach calculates potential fire line intensity using total fuel loads, landscape slope and fire weather severity. A default 100-metre buffer was determined from analysis of heat and radiation decay curves and research that indicates 80% of housing loss and 80% of life loss occurred within 100 metres of bushland.

The subject site is identified on the State Planning Policy Natural Hazards Risk and Resilience mapping as being within potential bushfire impact zone, requiring the bushfire hazard impacts be addressed (Figure 8).

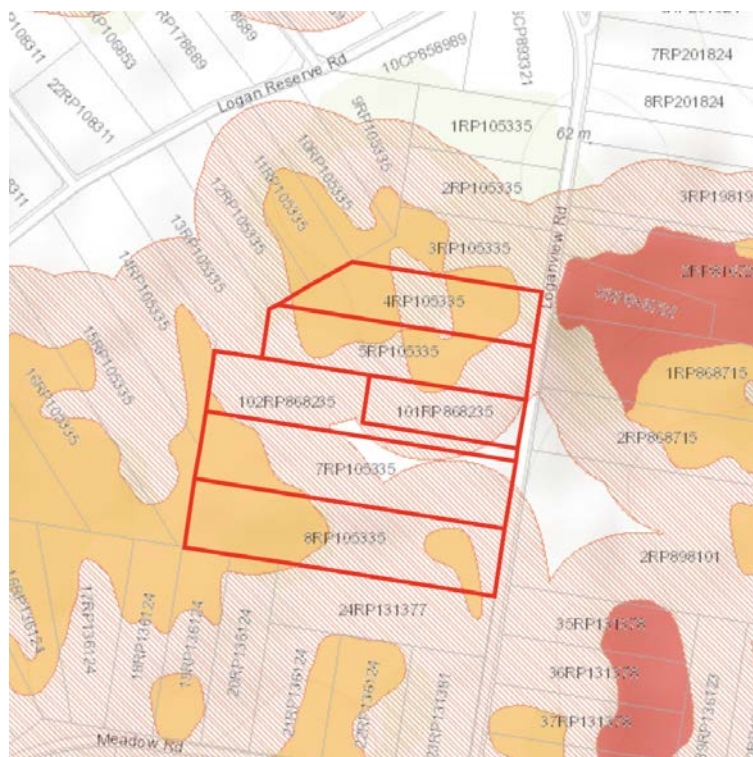


Figure 8



- + Bushfire assessments
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## LOCAL GOVERNMENT PROVISIONS

The Logan Planning Scheme 2015 V6.0 incorporates Bushfire Hazard Overlay Mapping, Overlay Code and Bushfire Hazard Planning Scheme Policy. An Assessment has also been conducted against the applicable Overlay Code.

## SITE ASSESSMENT

An onsite inspection and assessment were conducted at 100-148 Loganview Road, Logan Reserve on 8 December, 2021 to observe and record the relevant information to determine the bushfire hazard in accordance with the requirements of the Logan Planning Scheme 2015 V6.0.

### Vegetation

The *Public Safety Business Agency (PSBA) State-wide Bushfire Hazard (Bushfire Prone Area)* mapping identifies the original vegetation on and about this site as Regional Ecosystem (RE) 12.9 - 10.4 *Eucalyptus racemosa* subsp. *racemosa* woodland on sedimentary rocks. Vegetation hazard Class 9.2 (Photo 1).



**Photo 1**

## Classified Vegetation

Australian Standard, *Construction of Buildings in Bushfire Prone Areas* (AS 3959–2018) requires any classified vegetation within 100 metres of the proposed works must be assessed. The vegetation on Lots 4, 5, 7 and 8 on RP105335 and Lots 101 and 102 on RP868235 and surrounding properties has been identified as a mix of managed and Low hazard and remnant vegetation (RE) 12.9 - 10.4 - Moist to dry eucalypt woodland on coastal lowlands (Photo 2, Photo 3)



**Photo 2**



**Photo 3**

## Risk Analysis

The potential for an unplanned vegetation fire to occur within retained vegetation is a function of the level of hazard and the opportunity for ignition and fire development. The risk can be quantified in two parts:

- Internal
- External

### Internal

No identified classified vegetation will remain on the proposed development. The established vegetation within Lot 900 (detention basin) will be managed to ensure the designed purpose of the basin is maintained.

## External

The current management of the adjoining lands has reduced or mitigated the bushfire hazard as shown on the State and LCC mapping. The field observations have confirmed the actual hazard now impacting the proposed development. No classified vegetation has been identified to the south, west and east of the proposal. *AS3959 - 2018 Section 2, 2.2.3.2 (f)*

*:Vegetation considered as low threat due to factors such as flammability, moisture content or fuel load. This includes grassland managed in minimal fuel condition (Figure 9)*



**Figure 9**

Classified Vegetation has been identified on the adjoining lots to the north:

- Lot 1 RP105335
- Lot 3 RP105335
- Lot 2 RP816722
- Lot 3 RP816772

The vegetation has been identified as Non - remnant RE 12.9 - 10.4, Moist to dry eucalypt woodland on coastal lowlands and ranges. The Fuel load for this vegetation type is 17.2 tonnes/ha.

## ASSESSMENT OF BUSHFIRE HAZARD

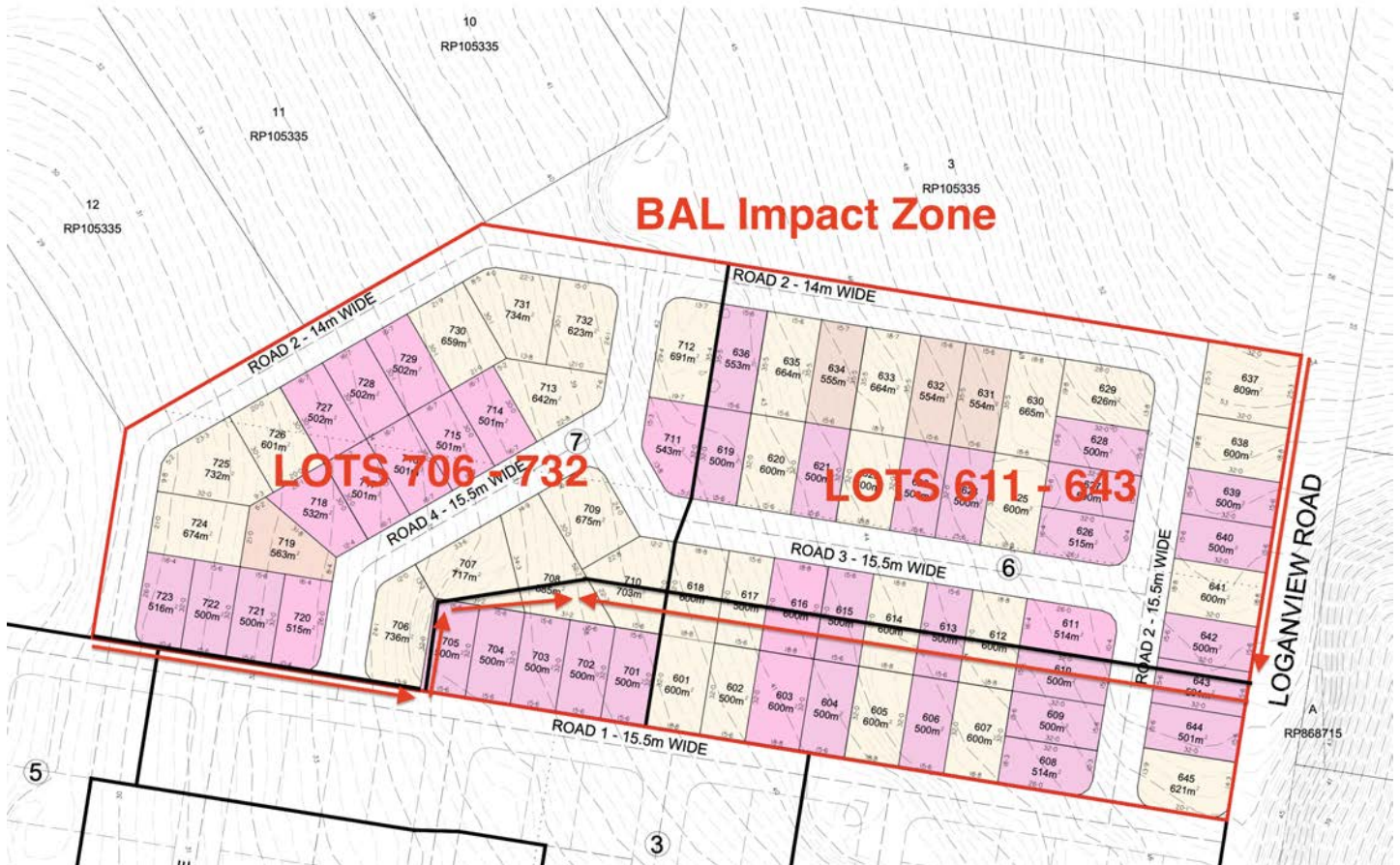
Australian Standard - *Construction of Buildings in Bushfire Prone Areas (AS 3959-2018)* requires that any classified vegetation within 100 metres of the proposed works must be assessed. Figure 9 shows the extent of the Bushfire Attack Level (BAL Impact Zone).



**Figure 9**

Figure 10 shows the Lots that will be impacted by the classified vegetation identified on the adjoining lands, as Lots 612 to 643 and Lots 706 to 732.

**PROPOSAL PLAN**



**Figure 10**

- + Bushfire assessments
- + Property vegetation assessments
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The BAL impacts as calculated using Method 2 of the Australian standard for the construction of buildings in bushfire prone areas - AS3959 -2018 is a measure of the severity of a building or buildings potential exposure to ember attack, radiant heat and direct flame contact, using increments of radiant heat expressed in kilowatts per metre squared and is the basis for establishing the requirements for construction to improve protection of building elements from attack by bushfire. Figure 11 shows the actual BAL impacts on the Lots 611 to 643 & Lots 706 to 732.

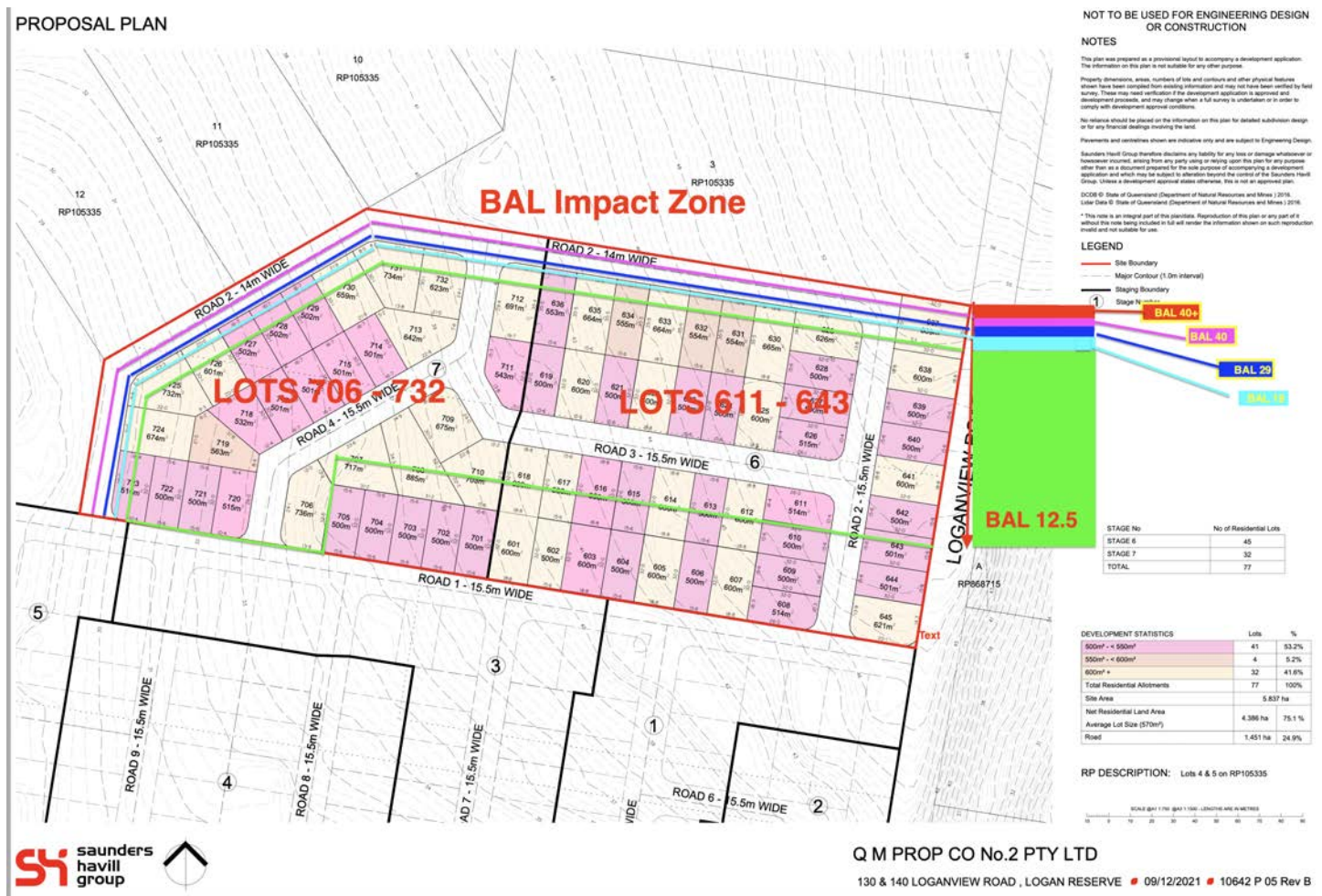


Figure 11

- + Bushfire assessments
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## Potential Radiant Heat Flux

The Australian Standard, Construction of Buildings in Bushfire Prone Areas (AS 3959-2018), provides a suitable methodology for identifying assessable vegetation and determining the requirements for the construction of buildings in order to improve their resistance to bushfire attack from burning embers, radiant heat, flame contact and a combination of the three attack forms.

Calculations using AS 3959-2018, in accordance with Appendix B - *Detailed Method for Determining the Bushfire Attack Level (BAL) – Method 2 (Normative)*, indicate that at a separation distance of see Appendix 1 metres a building located on the proposed site will be exposed to a radiant heat flux of see Appendix 1 kW/M<sup>2</sup> equating to a Bushfire Attack Level (BAL) of see Appendix 1.

## Bushfire Protection Measures in Combination

Figure 12 illustrates that effective protection against bushfire can only be achieved by the integration of multiple measures. Removing the bushland (hazard) will remove the risk but this option is neither necessarily possible nor desirable. An acceptable level of protection of life and property can be achieved while still retaining and protecting biodiversity and the natural values of the bushland.



**Figure 12**

## BUSHFIRE RISK MITIGATION

A range of strategies can be applied to mitigate the potential impacts of bushfire:

- Vegetation management
- Access and egress
- Fencing
- Water supply
- Awareness and education
- Building construction.

### Vegetation Management

Onsite vegetation and landscape management are important to maintaining low hazard conditions by:

- Limiting fuel accumulation;
- Reducing connectivity of fuels;
- Establishing and maintaining defensible space;
- Appropriate landscaping; and
- The proposed lot size of the development and Low density configuration will constrain the development of any additional bushfire hazard.

### Clearing

The site will be cleared to facilitate the proposed development.

### Landscaping

No landscaping of a hazardous nature will be established within the development.



## Site Access and Egress

The intent of design requirements for roads is to provide safe egress for residents and access for attending firefighting vehicles. A road system that is compliant with guideline measures provides fire services with easier access to buildings, a safe retreat for firefighters and residents, and can provide a fire control line where hazard reduction and back burning can take place. In determining safe access to a site, consideration is given to the fire brigade vehicles which are required to access public and private roads. Given the size of these vehicles and the poor visibility in which they often operate, roads need to be designed to specific requirements, including road width, grade, cross-fall, weight capacity, passing bays and turnaround areas, all of which may vary depending on whether it is a perimeter, access, cul-de-sac or battle-axe road type. Constructed roads to meet LCC Logan Planning Scheme 2015 V6.0. standards will provide ingress and egress for residents and emergency services.

## Fencing

Fencing materials have the capacity to contribute to fire spread and intensity. It is recommended that non-combustible fencing materials should be used where required.

## Water Supply

Providing a sufficient water supply provides firefighters and residents with the appropriate levels of water to undertake building defense. There are two options in which a house site can be supplied with a sufficient water supply; from either reticulated water accessible via a hydrant, or a dedicated static water supply. Reticulated water will be supplied to the development meeting the required statutory standards.



## Community Awareness

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

The warning systems now implemented by Emergency Services and Local Authorities provide timely information and advice to occupants. Understanding what to do in the event of bushfire emergency is critical. Prior knowledge as to the steps to take during the lead up to a fire event, during the passage of bushfire, and what to do immediately after the fire front has passed is critical.

The Rural Fire Service Queensland (RFSQ) 'Bushfire Survival Plan' provides detailed information on how to prepare for the bushfire season and how to take action to survive in the event of bushfire. A copy of this publication can be obtained from the RFSQ website. ([https://ruralfire.qld.gov.au/Fire\\_Safety\\_and\\_You/Bushfire\\_Survival\\_Plan/](https://ruralfire.qld.gov.au/Fire_Safety_and_You/Bushfire_Survival_Plan/))

## SUMMARY OF RECOMMENDATIONS

This report includes a number of recommendations regarding bushfire risk mitigation in accordance with AS3959-2018 and Logan Planning Scheme 2015 V6.0. A summary of recommendations made by this report is included below.

| RECOMMENDATIONS  |
|--|
| 1. Proposed buildings will be constructed to meet the requirements of the Australian Standard AS3959- 2018 - <i>Construction of buildings in bushfire prone areas.</i>                             |
| 2. Fencing on Lots 4, 5 , 7 and 8 on RP105335 and Lots 101 and 102 on RP868235 will be constructed of non – combustible materials where required   |
| 3. Ingress and egress for residents and emergency services will be from Loganview Road via constructed internal roads.   |
| 4. Reticulated water will be provided to the reconfiguration.  |
| 5. A bushfire information kit will be provided to residents to inform them of the bushfire risks and their roles and responsibilities for prevention, preparedness and response to any fire event. |

## CONCLUSIONS

This report considers the bushfire mitigation measures required for 100-148 Loganview Road, Logan Reserve, Lots 4, 5 , 7 and 8 on RP105335 and Lots 101 and 102 on RP868235. Based on this assessment, a range of recommendations has been derived. In addition, it is significant to note that bushfire remains a natural process which is endemic to the Australian bush and it remains subject to a range of contributing factors which are variable on a daily and hourly basis. It is extremely difficult to predict the behaviour and intensity of a fire event at any given time. Therefore, it remains of the utmost importance that residents within identified bushfire prone areas obtain knowledge and remain aware of their options in the event of a bushfire to ensure the preservation of both life and property.



# Appendices

## APPENDIX 1

# POTENTIAL BUSHFIRE ATTACK LEVEL

The Australian Standard, Construction of Buildings in Bushfire Prone Areas (AS 3959-2018) provides a suitable methodology for identifying assessable vegetation and determining the requirements for the construction of buildings in order to improve their resistance to bushfire attack from burning embers, radiant heat, flame contact and a combination of the three attack forms.

## Method for Determination of BAL

The BAL was determined in accordance with Appendix B of *AS 3959-2018, Detailed Method for Determining the Bushfire Attack Level (BAL) – Method 2 (Normative)*:

**Step 1:** Determine the relevant FDI.

**Step 2:** Determine the vegetation classification, fuel loads.

**Step 3:** Determine the effective slope in degrees under the classified vegetation.

**Step 4:** Determine the slope in degrees of the land between the site and the classified vegetation.

**Step 5:** Determine the distance of the site from classified vegetation.

**Step 6:** Calculations.

## Determination of BAL

### Step 1. Relevant Fire Danger Index

The PSBA bushfire hazard mapping identifies the FFDI as 54.

### Step 2. Vegetation Classification - Fuel Loads

The vegetation type was classified as remnant vegetation (RE) 12.9 - 10.4 - Moist to dry eucalypt woodland on coastal lowlands. Available fuel weights were derived from *PSBA State – Wide Bushfire Hazard (Bushfire Prone Area) Mapping. Fuel weight was determined as: 17.2 tonne/hectare*. Fuel weights were determined as:

- 11.4 tonne/hectare surface fuels
- 3.5 tonne/hectare near surface fuels
- 1.3 tonne/hectare elevated fuels
- 1.0 tonne/hectare bark fuels
- Total fuel weight = 17.2 tonne/hectare.

**Step 3. Determine the effective slope in degrees under the classified vegetation**

The classified vegetation is upslope : AS3959 - 2018 upslope vegetation will assume a value of 0 degrees,

**Step 4. Determine the slope in degrees of the land between the site and the classified vegetation**

The slope between the site and the classified vegetation is with an average slope of 0 degrees.

**Step 5. Determine the distance of the site from classified vegetation**

Distance is calculated from the closest edge of the classified vegetation. Classified vegetation under AS 3959-2018 does not include low threat vegetation. The distance to the classified vegetation was calculated using a Nikon Forestry Pro Range Finder and Inclinometer at See table 1.

**Step 6. Calculations**

Effective slope (°) - AS3959 - 2018 upslope vegetation will assume a value of 0

Site slope (°) - 0

Distance (m) - See table 1

Vegetation classification — remnant vegetation (RE) 12.9 - 10.4 - Moist to dry eucalypt woodland on coastal lowlands

Forest Fire Danger Index (FFDI) – 54

Surface fuel load (t/ha) – 11.4

Overall fuel load (t/ha) – 17.2

Heat of combustion (kJ/kg) – 18 600

Flame temperature (K) – 1 090

**Outcomes**

Intensity (kW/m<sup>2</sup>) – 9 328

Radiant heat flux (kW/m<sup>2</sup>) – see Table below

**Bushfire Attack Level (BAL) - see Table below**

|  |        |
|--|--------|
| Minimum distance to < 40 kW/m <sup>2</sup>   | 7.4 m  |
| Minimum distance to < 29 kW/m <sup>2</sup>   | 10.1 m |
| Minimum distance to < 19 kW/m <sup>2</sup>   | 15 m   |
| Minimum distance to < 12.5 kW/m <sup>2</sup> | 21.9 m |

## APPENDIX 2

# CODE COMPLIANCE ASSESSMENT

## Bushfire Hazard Overlay Code - Logan Planning Scheme 2015 V6.0 (Section 8.2.3)

| Performance Outcomes   | Acceptable Outcomes   | Compliance  |
|--|---|---|
| <p><b>PO1</b></p> <p>Development is designed to:</p> <p>(a) minimise risk of bushfire hazard;</p> <p>(b) provide safe premises;</p> <p>(c) create efficient emergency access for fire-fighting and other emergency vehicles.</p> | <p><b>AO1</b></p> <p>Development:</p> <p>(a) does not increase the number of persons living in, or lots in, the Bushfire hazard area identified on Bushfire hazard overlay map—OM—03.00; or</p> <p>(b) is on a site that a bushfire hazard assessment prepared in accordance with the methodology in planning scheme policy 6—Management of bushfire hazard determines is of low bushfire hazard.</p> | <p>Bushfire Hazard Assessment (BHA) prepared by Queensland Bushfire Planning (QBP)</p>  |
| <p><b>PO2</b></p> <p>Development is sited and constructed to minimise the bushfire hazard and maximise the protection of life and property from bushfire.</p>  | <p><b>AO2</b></p> <p>Development is located and constructed:</p> <p>(a) where there is no bushfire management plan approved by an existing development approval:</p> <p>i. such that the bushfire attack level is less than or equal to BAL—29;</p> <p>ii. away from the most likely direction of a fire front;</p>   | <p>Lot 637 will be partially impacted by a BAL &lt; 29. The impact can be mitigated by the location of an appropriate BLE and compliance with Building codes and standards.</p> |

| Performance Outcomes  | Acceptable Outcomes   | Compliance   |
|---|---|--|
|   | <p>iii. so that elements of the development least susceptible to fire are sited closest to the bushfire hazard;</p> <p>iv. such that asset protection zones are sited on land with a slope less than 18 degrees;</p> <p>v. such that asset protection zones are entirely within the boundaries of the private property of the development site; or</p> <p>vi. where an approved bushfire management plan directs development to be located.</p> |  |
| <p><b>PO3</b><br/>Reconfiguring a lot ensures that lots are designed to minimise bushfire hazard and provide safe sites for people, property and buildings.</p> | <p><b>AO3</b><br/>Lots:<br/>(a) are suitable for people, property and buildings by:<br/>i. having a bushfire attack level less than or equal to BAL-29; or<br/>ii. containing a development envelope area that has a bushfire attack level less than or equal to BAL-29;<br/>(b) provide asset protection zones that:<br/>i. are located on land with a slope less than 18 degrees;<br/>ii. are located on the same lot.</p>                    | <p>All Lots have BAL of &lt; 29.<br/>Lot 637 will have a BLE to mitigate the risk.</p>                             |
| <p><b>PO4</b><br/>Access for fire management and evacuation is provided by access that:<br/>(a) separates premises from adjoining vegetation;</p>               | <p><b>AO4</b><br/>Access for fire management and evacuation is provided by vehicular access in the form of a perimeter road:</p>  | <p>A perimeter road at the western and northern boundaries will provide separation from the identified hazard.</p> |

| Performance Outcomes  | Acceptable Outcomes  | Compliance  |
|---|--|---|
| <p>(b) is safely accessible by fire fighting vehicles;</p> <p>(c) has regular vehicular access points for bushfire management, response and evacuation;</p> <p>(d) has regular vehicle passing and turning areas for bushfire management, response and evacuation;</p> <p>(e) allows access at all times for fire fighting vehicles;</p> <p>(f) allows for maintenance, burning off and bushfire response;</p> <p>(g) has vehicular links to an alternative through road;</p> <p>(h) is readily maintained.</p> | <p>(a) with a minimum reserve width of 20 metres;</p> <p>(b) located between the premises and adjoining vegetation;</p> <p>(c) with a maximum gradient of 12.5 percent;</p> <p>(d) constructed to otherwise comply with <u>section 3.4–Movement</u> infrastructure standards of planning scheme policy 5 –Infrastructure;</p> <p>(e) that has a layout that does not include a cul-de-sac</p>  | <p>Roads will meet LCC Requirements</p>   |
| <p><b>PO5</b></p> <p>Development has access to adequate water supply for fire fighting purposes.</p>  | <p><b>AO5</b></p> <p>Development:</p> <p>(a) is connected to a reticulated water supply scheme that has sufficient flow and pressure characteristics for fire fighting purposes at all times with a minimum pressure and flow of 10 litres per second at 200kPa; or</p> <p>(b) has an on-site water storage in accordance with <u>Table 8.2.3.3.2–Water storage for fire fighting</u>, dedicated or retained for fire fighting purposes that is made of fire resistant materials and is:</p> <ol style="list-style-type: none"> <li>i. a separate tank; or</li> <li>ii. a reserve section in the bottom part of the main water supply tank.</li> </ol> | <p>Reticulated water will be connected to all Lots to meet the LCC requirements</p> |

| Performance Outcomes   | Acceptable Outcomes  | Compliance                         |
|--|--|------------------------------------|
| <p><b>PO6</b><br/>Community infrastructure is not located in a bushfire hazard area or is able to function effectively during and immediately after a bushfire event.</p>  | <p><b>AO6</b><br/>(a) Community infrastructure is:<br/>(a) not located in a Bushfire hazard area identified on Bushfire hazard overlay map—OM—03.00; or<br/>(b) located to ensure that:<br/>i. the core services provided by the community infrastructure is able to function effectively during bushfire events;<br/>ii. access to the community infrastructure is not compromised by bushfire events;<br/>iii. the safe storage of valuable records, public records and items of cultural or historic significance is able to be maintained during a bushfire event.</p> | <p>No community infrastructure</p> |
| <p><b>PO7</b><br/>Public safety and the environment are not adversely affected by the adverse impacts of bushfire on hazardous materials including fuels, explosives and flammable chemicals manufactured or stored in bulk on premises.</p> | <p><b>AO7</b><br/>Hazardous materials:<br/>(a) storage is in compliance with AS1940—The storage and handling of flammable and combustible liquids; manufacturing does not occur in a Bushfire hazard area on Bushfire hazard overlay map—OM—03.00.</p>   | <p>Not Applicable</p>              |

## Appendix 3

### About the Report Author



This Report was prepared by Bushfire Specialist Bernard Trembath. Bernard has extensive practical knowledge and experience in bushfire planning and management and an intimate working knowledge of Queensland vegetation and climate, particularly in relation to fire prediction and behaviour.

Prior to establishing Queensland Bushfire Planning in 2014, Bernard was the Regional Manager Rural Operations, Brisbane Region, for Queensland Fire and Emergency Services (QFES). As Regional Manager, Bernard was responsible for bushfire mitigation within the Brisbane Region, working with Local Governments and many other organisations to help reduce the impacts of bushfires. Bernard was also the QFES bushfire planning specialist, providing specialist bushfire planning and management advice on behalf of QFES.

Since 2014, Bernard has provided his specialist bushfire planning knowledge to advise and assist a large number of individuals, companies and government agencies. His happy clients include:



- + Bushfire assessments
- + Property vegetation assessments
- + Site planning for bushfire
- + Property management for bushfire
- + Bushfire management plans