

# **APPENDIX D      BUSHFIRE REPORT**

# Bushfire Hazard Assessment Report

***Proposed:***  
**Commercial  
Development**

***At:***  
**20 Pacific Highway,  
Bennetts Green NSW**

*Reference Number:* 120423B

*Prepared For:*  
SPG Investments P/L  
C/- Blueprint Group Australia P/L

**6<sup>th</sup> June 2017**



*Prepared By:*  
**Building Code & Bushfire  
Hazard Solutions Pty Limited**

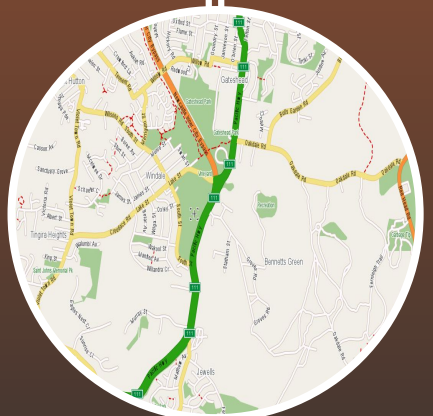
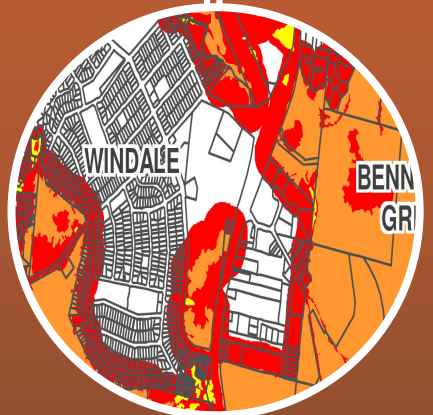
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## List of Abbreviations:

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APZ	Asset Protection Zone
AS3959	Australian Standard 3959 – 2009 as amended.
BAL	Bushfire Attack Level
BCA	Building Code of Australia
BPMs	Bushfire Protection Measures
BPLM	Bushfire Prone Land Map
Council	Lake Macquarie Council
DA	Development Application
EP&A Act	<i>Environmental Planning and Assessment Act - 1979</i>
ESD	Ecologically Sustainable Development
FRNSW	Fire and Rescue NSW
IPA	Inner Protection Area
NCC	National Construction Codes
NP	National Park
NSP	Neighbourhood Safer Place
OPA	Outer Protection Area
PBP	<i>Planning for Bush Fire Protection – 2006</i>
ROW	Right of Way
RF Act	<i>Rural Fires Act - 1997</i>
RFS	NSW Rural Fire Service
SEPP	State Environmental Planning Policy
SFPP	Special Fire Protection Purpose
SWS	Static Water Supply

## 1.0 Introduction

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The development proposal relates to a s96 application amending an approved commercial development, primarily consisting of bulky goods stores, a service station, retail / commercial outlets, two restaurants (fast food outlets) and associated infrastructure, within a large property known as 20 Pacific Highway, Bennetts Green (Lot 1 DP 1214343). The overall property is currently vacant consisting of unmanaged and semi managed vegetation. This report is intended to address three applications being a s96 for lots 1 and 2, a DA for fuel and fast food (lot 3) and a DA for the balance of lot 3 which are being lodged concurrently.

The subject site has street frontage to Pacific Highway to the east, Lake Street to the north, a vegetated reserve to the south and South Street and playing fields to the west. The vegetation identified as being the potential bushfire hazard is located to the north (associated with Scrubby Creek), northeast within a large vegetated allotment, west within Michael Bird Oval and south within the vegetated reserve.

Lake Macquarie Council's Bushfire Prone Land Map identifies the subject property as containing Category 1 Vegetation and its associated 100 metre buffer zone and therefore the application of *Planning for Bush Fire Protection - 2006* (PBP) must apply in this instance.

## 2.0 Purpose of Report

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The purpose of this Bushfire Assessment Report is to provide the owners, The Rural Fire Service and Council with an independent bushfire hazard determination together with appropriate recommendations for both new building construction and bushfire mitigation measures considered necessary having regard to construction within a designated 'bushfire prone' area.

The recommendations contained within this report may assist in forming the basis of any specific construction conditions and/or bushfire mitigation measures that Council and/or the NSW Rural Fire Service may elect to place within any consent conditions issued for the subject Development Application.

## 3.0 Scope of this Report

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The scope of this report is limited to providing a bushfire hazard assessment and recommendations for the subject property. Where reference has been made to the surrounding lands, this report does not purport to directly assess those lands; rather it may discuss bushfire impact and/or progression through those lands and possible bushfire impact to the subject property.

## 4.0 Referenced Documents and Persons

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Comments provided are based on the requirements of the *Environmental Planning and Assessment Act 1979* (EP&A Act), the *Rural Fires Act 1997*, the *Rural Fires Regulation 2013*, the RFS document known as '*Planning for Bush Fire Protection 2006*' for the purposes of bushfire hazard determination and Australian Standard 3959 2009 titled 'Construction of buildings in bushfire-prone areas' as amended for building/structural provisions.

A company representative has made a site inspection of the subject property and the surrounding area. The Overall Site Plan prepared by The Buchan Group, Project No. 316137, Drawing No. ATP - 200 has been relied upon for this assessment.

## 5.0 Compliance Tables & Notes

The following table sets out the projects compliance with *Planning for Bush Fire Protection – 2006*.

### Lot 1 Bunnings Warehouse

	North (across Lake Street)	North (within Michael Bird Oval)	Northeast	South
<b>Vegetation Structure</b>	Riparian (Rainforest)	Scrub	Scrub	Forest
<b>Slope</b>	0 degrees and up	0 degrees and upslope	0 – 5 degrees down	0 - 5 degrees down
<b>Proposed asset protection zone</b>	>140 metres	>140 metres	>140 metres	≥6.5 metres
<b>Significant Environmental Features</b>	Sports Oval / Lots 2 & 3 / Lake Street	Sports Ovals	Pacific Highway	Vegetated reserve
<b>Threatened Species</b>	Not Known By Others	Not Known By Others	Not Known By Others	Not Known By Others
<b>Aboriginal Relics</b>	Not Known By Others	Not Known By Others	Not Known By Others	Not Known By Others
<b>Bushfire Attack Level</b>	BAL Low	BAL 12.5	BAL Low	BAL Flame Zone

### Asset Protection Zones Compliance

The development proposal relates to a commercial development and as such there are no minimum required Asset Protection Zones, rather a defensible space should be provided. The northern and north-eastern hazards are separated from the subject site by existing formed public roads, providing direct access for fire services and a suitable defensible space.

The southern hazard consists of a newly created 2.5 Ha vegetated reserve. This vegetation is an isolated pocket surrounded by existing public roads and the proposed service lane within the development site. These surrounding roads provide attending fire services direct vehicle access to all interfaces of the hazard. This subsequently facilitates expedited suppression by Fire & Rescue NSW appliances located within the neighbouring suburbs of Tingira Heights, Charlestown or Belmont should a bushfire occur within this hazard.

### Construction Level Compliance

*Quote from PBP 2006*

*The BCA does not provide for any bush fire specific performance requirements and as such AS 3959 does not apply as a set of 'deemed to satisfy' provisions. The general fire safety construction provisions are taken as acceptable solutions, but the aim and objectives of PBP apply in relation to other matters such as access, water and services, emergency planning and landscaping/vegetation management.*

*In circumstances where the aim and objectives of PBP (section 1.1) are not met, then the construction requirements for bush fire protection will need to be considered on a case-by-case basis.*



The proposed Bunnings Warehouse will comprise of tilt slab walls, colorbond roofing (fully sarked) with poly carbonate light strips and is slab on ground. Furthermore an internal sprinkler system will be provided along with other essential fire safety equipment (e.g. fire hose reels and fire extinguishers). It should be noted that there is no glazing proposed on the southern elevation of the building, being the Flame Zone aspect. It will be recommended as part of this assessment that all doors within the 24 metre flame length have a minimum FRL of -/30/- (this includes the doors to the main warehouse and bagged goods area). The roller door to the timber trade sales is in an area determined to be BAL 40. It will also be recommended that the remainder of the building provide measures to mitigate smoke and ember attack, including screening or enclosing all gaps >3mm in size, installing draught excluders on external side-hung doors, fitting external roller doors with relevant seals and added protection on any ducted air ventilation systems. Any polycarbonate roof sheeting shall use a material with a flammability index of less than 5 and have steel, bronze or aluminium mesh screens with a maximum aperture of 2 mm fitted immediately above or below the roof sheeting. Any shade sails in the outdoor area (approx. 74 metres from the hazard interface) shall be of a material having a flammability index of less than 5.

#### Lot 2 Tenancies 1 - 5 (including Anaconda and fast food outlet)

	North	North (within Michael Bird Oval)	South	Northeast
<b>Vegetation Structure</b>	Riparian (Rainforest)	Scrub	Forest	Scrub
<b>Slope</b>	0 degrees and up	0 degrees level	0 - 5 degrees down	0 – 5 degrees down
<b>Proposed asset protection zone</b>	>140 metres	>140 metres	>140 metres	>140 metres
<b>Significant Environmental Features</b>	Lot 3 / Lake Street	Sports Ovals	Lot 1 Bunnings / Vegetated reserve	Pacific Highway
<b>Threatened Species</b>	Not Known By Others	Not Known By Others	Not Known By Others	Not Known By Others
<b>Aboriginal Relics</b>	Not Known By Others	Not Known By Others	Not Known By Others	Not Known By Others
<b>Bushfire Attack Level</b>	BAL Low	BAL Low	BAL Low	BAL Low

### Asset Protection Zones Compliance

The development proposal relates to a commercial development and as such there are no minimum required Asset Protection Zones, rather a defensible space should be provided. Lot 2 is separated from the hazard interface by > 140 metres and would, post development, not be considered bushfire prone land.

### Construction Level Compliance

AS3959 – 2009 *This Standard does not provide construction requirements for buildings assessed in bushfire-prone areas in accordance with Section 2 as being BAL—LOW.*

AS3959 – 2009 *The Bushfire Attack Level BAL—LOW is based on insufficient risk to warrant specific bushfire construction requirements.*

No construction recommendations are required for any works within Lot 2.



**Lot 3 Service station**

	<b>North</b>	<b>East</b>	<b>South</b>	<b>Northwest</b>
<b>Vegetation Structure</b>	Riparian (Rainforest)	Scrub	Forest	Scrub
<b>Slope</b>	0 degrees and up	0 – 5 degrees down	0 - 5 degrees down	0 degrees
<b>Proposed asset protection zone</b>	>255 metres	>140 metres	>140 metres	>74 metres
<b>Significant Environmental Features</b>	Spotlight / Lake Street	Pacific Highway	Lot 1 & 2 / Vegetated reserve	Sports Ovals
<b>Threatened Species</b>	Not Known By Others	Not Known By Others	Not Known By Others	Not Known By Others
<b>Aboriginal Relics</b>	Not Known By Others	Not Known By Others	Not Known By Others	Not Known By Others
<b>Radiant heat impact</b>	n/a	n/a	n/a	2.66 kWm <sup>2</sup>
<b>Bushfire Attack Level</b>	BAL Low	BAL Low	BAL Low	BAL 12.5

**Asset Protection Zones Compliance**

The service station is separated from the hazard interface by 74 metres and complies with (exceeds) the APZ requirements as if it was a residential subdivision and / or a Special Fire Protection Purpose Development.

**Construction Level Compliance**

The proposed location of the service station complies with the aims and objectives of PBP 2006 including siting, access and services.

It will be recommended that the service station is constructed to comply with section 3 and BAL 12.5 under section 5 of AS 3959 – 2009 and Appendix 3 under PBP 2006 and added protection on any ducted air ventilation systems.

**Lot 3 Tenancies 3 - 7 and fast food outlet**

	<b>North</b>	<b>East</b>	<b>South</b>	<b>West</b>
<b>Vegetation Structure</b>	Riparian (Rainforest)	Scrub	Forest	Scrub
<b>Slope</b>	0 degrees and up	0 – 5 degrees down	0 - 5 degrees down	0 degrees
<b>Proposed asset protection zone</b>	>140 metres	>140 metres	>140 metres	>11 metres
<b>Significant Environmental Features</b>	Spotlight / Tenancy 8	Pacific Highway	Vegetated reserve	Access road
<b>Threatened Species</b>	Not Known By Others	Not Known By Others	Not Known By Others	Not Known By Others
<b>Aboriginal Relics</b>	Not Known By Others	Not Known By Others	Not Known By Others	Not Known By Others
<b>Bushfire Attack Level</b>	BAL Low	BAL Low	BAL Low	BAL Flame Zone

**Asset Protection Zones Compliance**

The development proposal relates to a commercial development and as such there are no minimum required Asset Protection Zones, rather a defensible space should be provided. The southern, northern and north-eastern hazards are separated from the subject site by existing formed public roads, providing direct access for fire services and a suitable defensible space.

The western hazard consists of an unmanaged area of vegetation within Michael Bird Oval. This vegetation is an isolated pocket surrounded by existing playing fields and the proposed service road within the development site. The service road provides attending fire services direct vehicle access to the hazard. This subsequently facilitates expedited suppression by Fire & Rescue NSW appliances located within the neighbouring suburbs of Tingira Heights, Charlestown or Belmont should a bushfire occur within this hazard.

**Construction Level Compliance**

The proposed Tenancies 3 - 7 will comprise of tilt slab walls, colorbond roofing (fully sarked) and is slab on ground, with essential fire safety equipment (e.g. fire hose reels and fire extinguishers). It will be recommended that the buildings provide measures to mitigate smoke and ember attack, including screening or enclosing all gaps >3mm in size, installing draught excluders on external side-hung doors, fitting external roller doors with relevant seals and added protection on any ducted air ventilation systems. As far as screening openings any drive through server window on a fast food outlet shall be treated as if it was a door and ensure there are no gaps greater than 3 mm when the server window is closed. Any polycarbonate roof sheeting shall use a material with a flammability index of less than 5 and have steel, bronze or aluminium mesh screens with a maximum aperture of 2 mm fitted immediately above or below the roof sheeting.

**Lot 3 Tenancy 8 / Spotlight**

	North	East	South	West
<b>Vegetation Structure</b>	Riparian (Rainforest)	Scrub	Forest	Scrub
<b>Slope</b>	0 degrees and up	0 – 5 degrees down	0 - 5 degrees down	0 degrees
<b>Proposed asset protection zone</b>	>52 metres	>140 metres	>140 metres	>40 metres
<b>Significant Environmental Features</b>	Car parking / Lake Street	Pacific Highway	Lots 1 & 3 / Vegetated reserve	PCYC Building
<b>Threatened Species</b>	Not Known By Others	Not Known By Others	Not Known By Others	Not Known By Others
<b>Aboriginal Relics</b>	Not Known By Others	Not Known By Others	Not Known By Others	Not Known By Others
<b>Bushfire Attack Level</b>	BAL 12.5	BAL Low	BAL Low	BAL 12.5

## Asset Protection Zones Compliance

The development proposal relates to a commercial development and as such there are no minimum required Asset Protection Zones, rather a defensible space should be provided. Spotlight tenancy is separated from the hazard interfaces by 52 metres and >40 metres and complies with (exceeds) the APZ requirements as if it was a residential subdivision.

## Construction Level Compliance

The proposed location of the Spotlight tenancy complies with the aims and objectives of PBP 2006 including siting, access and services. PBP 2006 states *“The BCA does not provide for any bush fire specific performance requirements and as such AS 3959 does not apply as a set of ‘deemed to satisfy’ provisions. The general fire safety construction provisions are taken as acceptable solutions”*.

It will be recommended that the building provide measures to mitigate smoke and ember attack, including screening or enclosing all gaps >3mm in size, installing draught excluders on external side-hung doors, fitting external roller doors with relevant seals and added protection on any ducted air ventilation systems.

## Access and Services

Guideline Ref.	Proposed Development Determinations
Internal Roads	The proposed service road interfacing the southern hazard within Lot 1 is 6.5 metres wide and provides access along the hazard interface and the proposed service road interfacing the western hazard within Lot 3 is 11 metres wide and also provides access along the hazard interface. The remainder of the site is separated from the northern and eastern hazards by existing public roads. The southern hazard is also surrounded by existing public roads (Pacific Hwy and South Street).
Water Supply	It is understood that an internal hydrant system will be installed throughout the subject site. The sizing, pressure and spacing of this internal hydrant system must be installed in accordance with AS2419.1-2005.
Evacuation	Evacuation is possible by utilising proposed and existing road infrastructure. It will be recommended that a Bush Fire Evacuation Plan for the Bunnings Warehouse and Service Station (Lot 3) be prepared in accordance with section 4.2.7 of Planning for Bush Fire Protection 2006 prior to occupancy of the buildings.

### 6.0 Aerial view of the subject allotment

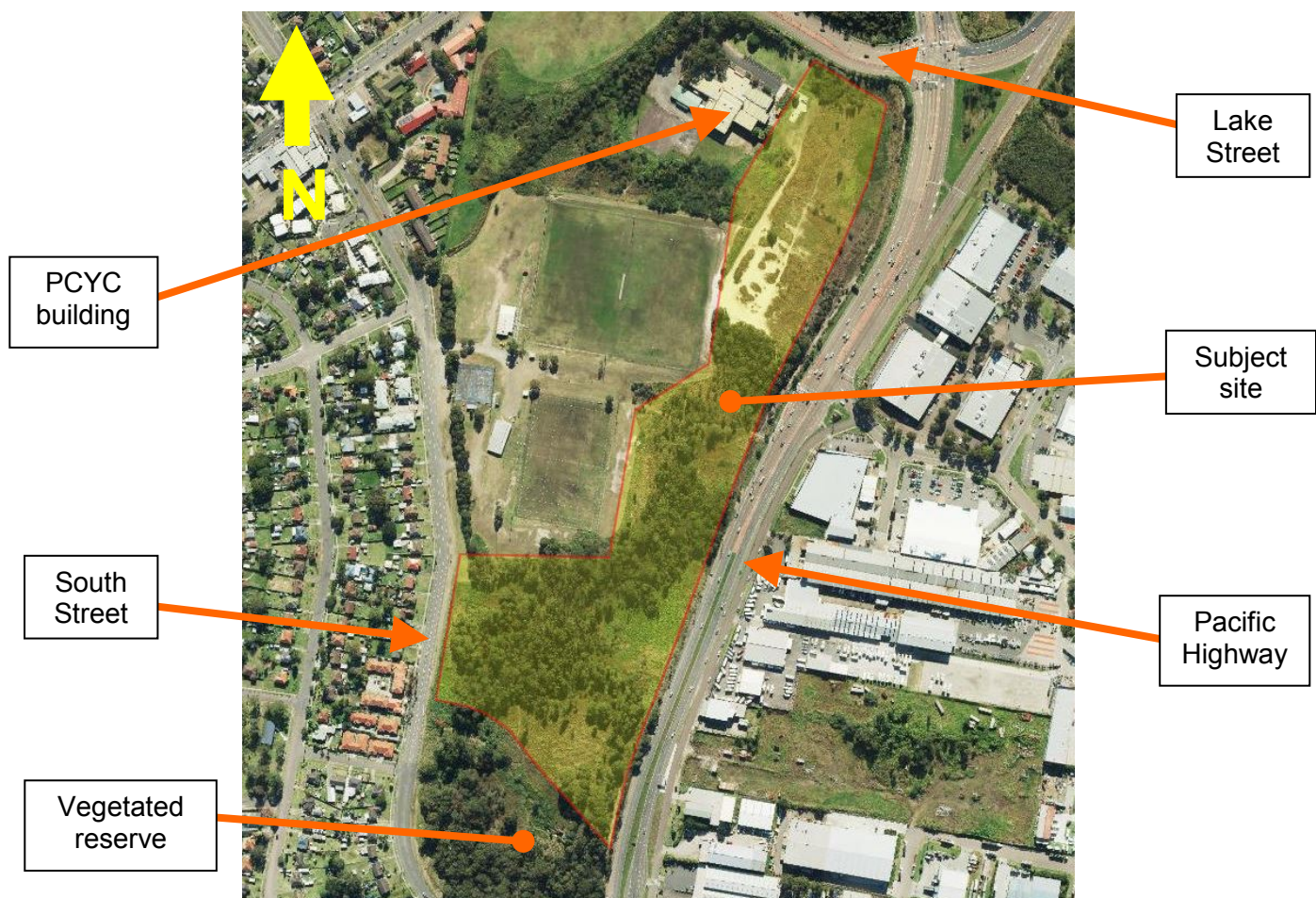


Image 01: Aerial view of the subject area from Six Maps



## 7.0 Bushfire Hazard Assessment

### 7.01 Preface

Properties considered to be affected by possible bushfire impact are determined from the local Bushfire Prone Land Map as prepared by Council and or the Rural Fire Service. All property development within affected areas is subject to the conditions detailed in the document '*Planning for Bush Fire Protection 2006*' (PBP). Set back distances for the purpose of creating Asset Protection Zones (APZ's) must be applied and any buildings must then conform to corresponding regulations detailed in Australian Standard 3959 'Construction of buildings in bushfire prone areas' 2009.

*Planning for Bush Fire Protection 2006*, (PBP) formally adopted on the 1<sup>st</sup> March 2007 and amended 3<sup>rd</sup> May 2010 (Appendix 3) provides for the protection of property and life (including fire-fighters and emergency service personnel) from bushfire impact.

The thrust of the document is to ensure that developers of new properties or sub-divisions include the constraints associated with the construction of buildings in bushfire prone areas within their proposed development sites. PBP is applicable to proposed development inside a determined Category 1 or 2 areas and also inside a buffer zone radius of 100m from a Category 1 bushfire area or 30m from a Category 2 bushfire area.

The document also acknowledges 'infill' developments associated with re-development of existing properties and allows some higher levels of building safety where the increased 'set backs' (APZ's) may not be achievable.

The subject development relates to a s96 application for an approved commercial development comprising of the establishment of a number of bulky goods stores, service station, a restaurant, a fast food outlet and associated infrastructure and is assessed as a 79BA application under the Environmental Planning and Assessment Act 1979.

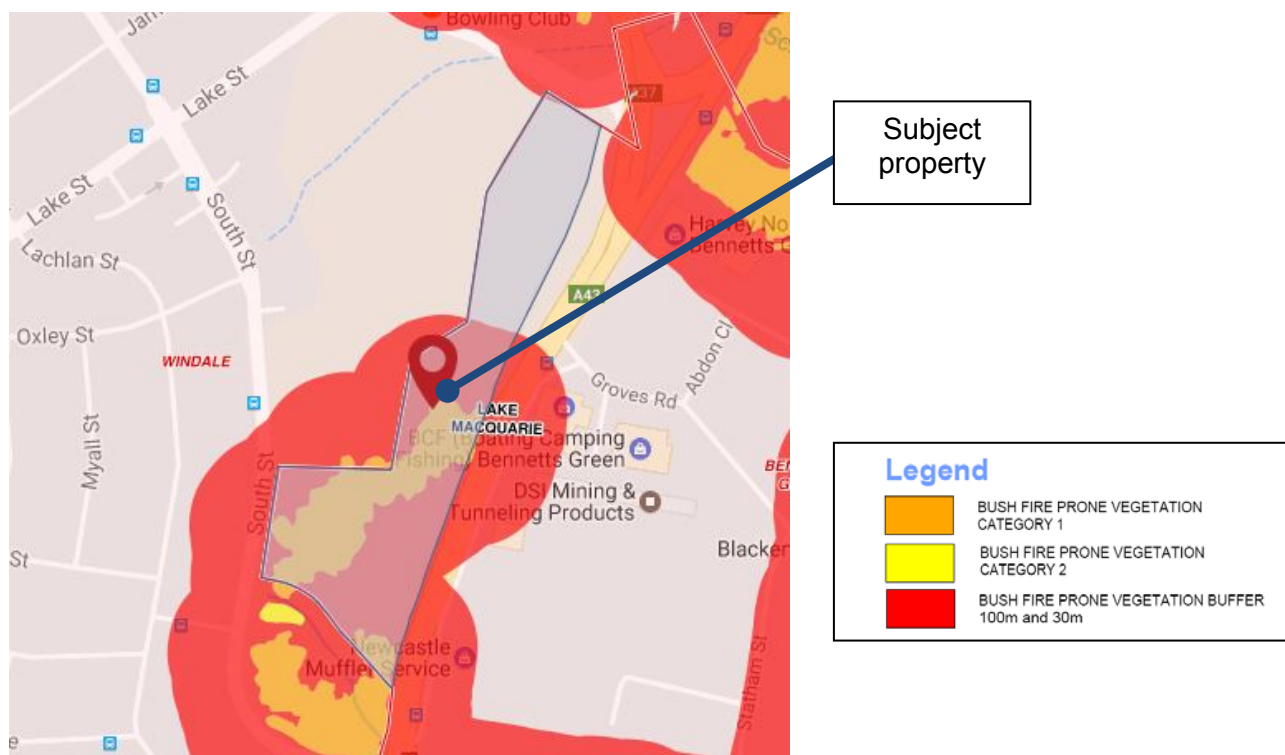


Image 02: Extract from Lake Macquarie Council's Bushfire Prone Land Map

## 7.02 Location

The subject site is known as 20 Pacific Highway, Bennetts Green (Lot 1 DP 1214343) located within Lake Macquarie Councils Local Government Area. The subject site has street frontage to Pacific Highway to the east, Lake Street to the north, a vegetated reserve to the south and South Street and playing fields to the west.

The vegetation identified as being the potential bushfire hazard is located to the north (associated with Scrubby Creek), northeast within a large vegetated allotment, west within Michael Bird Oval and south within the vegetated reserve.



Photograph 01: View northeast along the Pacific Highway

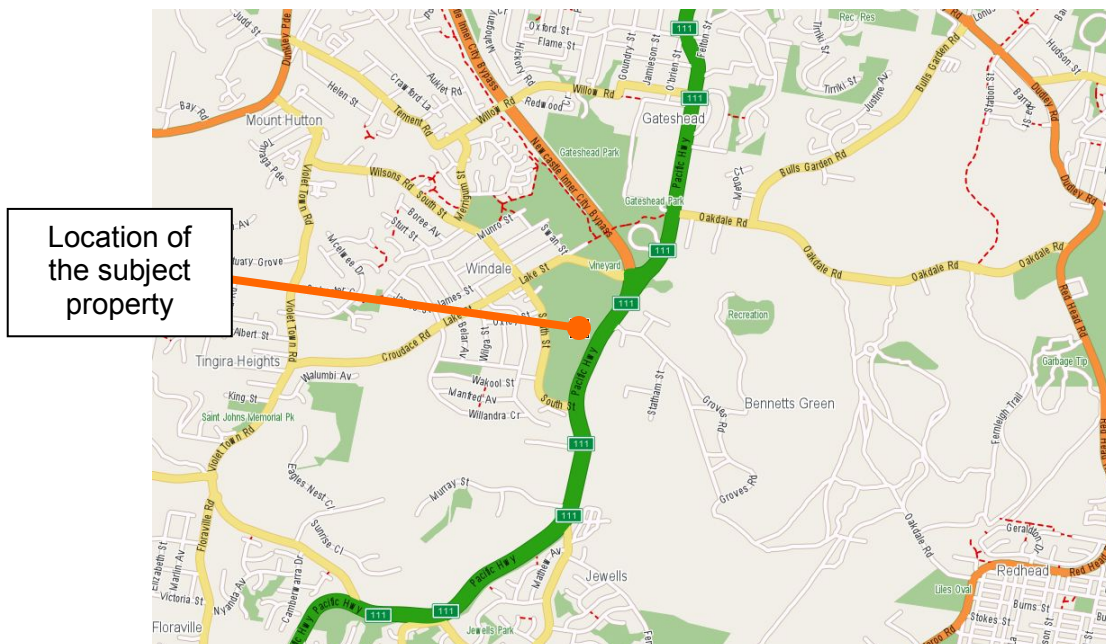


Image 03: Extract from street-directory.com.au



## 7.03 Vegetation

The vegetation that is posing a threat to the proposed development site is located to the north associated with an existing watercourse, northeast within a large vegetated allotment, west within Michael Bird Oval and south within the vegetated reserve.

The vegetation posing a hazard to the north was found to be located along an existing watercourse, generally not exceeding 20 metres on either bank. The vegetation within the adjacent bowling club allotment was found to be well managed, comprising of predominately mown lawns.

The vegetation posing a hazard to the northeast and west was found to consist of shrubs >2 metres in height with some scattered overstorey trees. The vegetation posing a hazard to the south was found to consist of trees 10-30 metres in height with a 30-70% foliage cover and an understorey of low trees, shrubs and grasses.

For the purpose of assessment under PBP the vegetation posing a hazard to the north was determined to be a riparian area (Rainforest A2.3 of PBP), Scrub to the northeast and west and Forest to the south.



Riparian  
hazard

Photograph 02: View east from Lake Street toward the northern hazard



Forest

Photograph 03: View north from South Street toward the southern hazard



## 7.04 Slope and Topography

The slope that would most significantly affect bushfire behaviour must be assessed for at least 100 metres from the closest proposed building footprint within the subject site.

The most significant bushfire impact from the north and west is expected to be a bushfire travelling across slope toward the subject site. The most significant bushfire impact from the northeast and south is expected to be a bushfire travelling upslope toward the subject site.

The slope that would **most significantly** influence bushfire impact was determined from topographic imagery to be:

- 0 degrees and up slope within the hazard to the north and west
- 0 – 5 degrees down slope within the hazard to the northeast and south



0 - 5 degrees  
down

Photograph 04: View north from within an adjoining commercial allotment

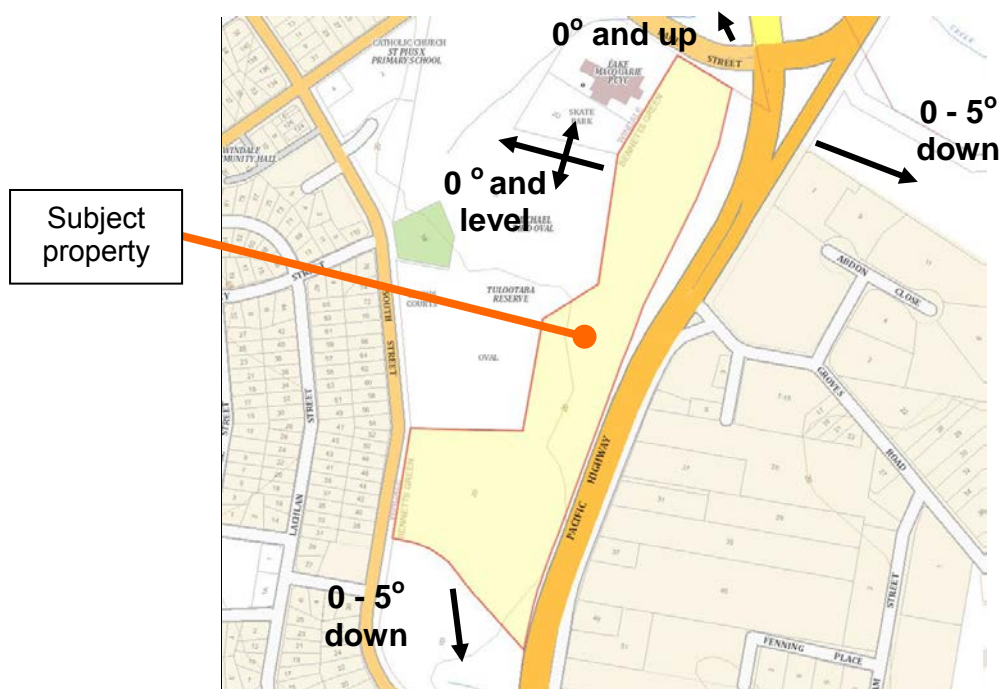


Image 04: Extract from Land and Property Management Authority Spatial Information Exchange

## 7.05 Asset Protection Zones

The proposed application relates to a commercial development and as such there are no minimum required Asset Protection Zones under Planning for Bush Fire Protection 2006.

The northern and north-eastern hazards are separated from the subject site by existing formed public roads, providing direct access for fire services and a suitable defensible space.

The southern and western hazard will be separated from the built form by internal service roads providing a formed defensible space between any building and the bushland interface.

The proposed building in Lot 1 was found to be located 6.5 metres from the closest hazard interface to the south. And Tenancies 4, 5 and 6 within Lot 3 are 11 metres from the hazard interface.

The service station is separated from the closest hazard interface by 74 metres which complies with (exceeds) the APZ requirements as if it was a residential subdivision and / or a Special Fire Protection Purpose Development.

In consideration of the type of development, limited fire development period in the closest hazards, building construction, comprehensive access, new water supply and recommended emergency planning the proposed separation distances from the hazard interface is considered acceptable.

All grounds within the subject site will be maintained in accordance with an Asset Protection Zone as detailed in Appendix 2 of Planning for Bush Fire Protection 2006 and the NSW Rural Fire Service publication 'Standards for Asset Protection Zones'.

## 7.06 Fire Fighting Water Supply

In ground hydrants are available along the Pacific Highway, South Street and Lake Street for the replenishment of attending fire services.

It is understood that a hydrant system will be installed throughout the subject site. The sizing, pressure and spacing of this internal hydrant system must be installed in accordance with AS2419.1-2005.

The proposed building within Lot 1 will also be fitted with an internal sprinkler system. All proposed buildings will be fitted with relevant essential fire services (i.e. fire hose reels and fire extinguishers).

The existing and proposed water supply is considered adequate for the replenishment of attending fire services.

## 7.07 Property Access – Fire Services & Evacuation

The subject site has street frontage to Lake Street to the north, Pacific Highway to the east and South Street to the south and west. The proposed internal road system will provide access/egress points to Lake Street (service access only), Pacific Highway and South Street.

The northern and north-eastern hazards are separated from the subject site by existing formed public roads, providing direct access for fire services and a suitable defensible space.

The southern hazard consists of a newly created vegetated reserve. This vegetation is an isolated pocket surrounded by existing public roads and the proposed service road within the development. These surrounding roads provide attending fire services direct vehicle access to all interfaces of this hazard.

Should a bushfire occur within the immediately adjoining hazards to the west and south suitable access for swift suppression by Fire & Rescue NSW appliances from within the neighbouring suburbs of Tingira Heights, Charlestown or Belmont is available.

Persons seeking to egress the proposed development will be able to do so via the proposed internal road system and existing road infrastructure.

The proposed access arrangements in conjunction with the existing access provisions are considered acceptable for occupant evacuation and fire-fighter access.

It is recommended that an Emergency / Evacuation Plan be prepared for the Bunnings Warehouse in Lot 1 and the Service Station in Lot 3 which is consistent with the NSW Rural Fire Service document Guidelines for the Preparation of Emergency/Evacuation Plan. The EMP for the service station is to include a trigger to stop pumping when;

- Significant smoke and ember impact is occurring within the sites grounds, or
- When alerts or instruction from a reliable source have been received (e.g. Police, RFS, Fire & Rescue NSW, SES). Alerts can be monitored using the Fires Near Me APP or the NSW Rural Fire Services website. Alerts may also come via the media, telephone alert or SMS system for the local area, or
- When it is considered necessary due to bushfires in the local vicinity but not necessarily due to actual bushfire impact within the site. Pumping should cease on Catastrophic fire danger days or TOBAN days where bushfires are already present within approx. 1.5 km of the site. Fires can be monitored using the Fires Near Me APP.

## 7.08 Risk Rating

In assessing the bushfire threat to the site and its structures it is important to have a holistic approach and assess the risk of a bushfire occurring in the area and impacting the subject site. It is also important to include the risk the site poses to neighbouring properties.

This section specifically addresses the potential bushfire impact from the southern and western hazard (being the highest identified threats) to the proposed service station.

Bushfires can be ignited by many causes including spotting from larger fires or lightning strikes. Ignition may also be caused by human activities from within the site or adjacent public roads. In short anything that can generate sufficient heat, sparks or flame to ignite a combustible material.

It has been identified that due to the high exposure to public access provided by the playing fields, existing public roads and proposed perimeter service road there may be a higher likelihood of ignition from human sources (i.e. discarded cigarette butts, arson etc.).

Traditional significant fire weather is typically from the north, northwest or west as prevailing weather conditions bring hot dry winds from central NSW. These winds increase temperature, lower relative humidity and decreases fuel moisture content allowing more available fuels to readily burn. Any bushfire burning within the southern hazard under these traditional fire weather conditions will be burning parallel and past or away from the subservice centre.

Significant bushfire impact from the east toward the subject property is considered unlikely due to cooler winds and higher relative humidity expected during prevailing southerly and south easterly weather influences due to the coastal influences.

Where bushfires are occurring under the prescribed 1:50 year fire weather parameters the maximum radiant heat impact is 2.66 kWm<sup>2</sup> only marginally above the threshold that is considered acceptable for an outdoor neighbourhood safer place. Where unplanned fires (wildfires) occur

within the western hazard outside optimum bushfire weather conditions they would generally be limited to ground fires due to the grassy and weedy nature of the hazard and the lack of any real fully structure and continuous forest vegetation.

Fire & Rescue NSW have stations located with the neighbouring suburbs of Tingira Heights, Charlestown or Belmont. Should a campaign fire occur within the local government area additional resources would be 'moved-up' from other areas and staged nearby.

As previously stated the presence of the public roads and proposed perimeter service road provide attending fire services direct vehicle access to the entire perimeter of the southern hazard. This subsequently facilitates swift suppression of any unplanned fire.

Table 03 is an overview of risk matrix to the service station. This model takes a holistic approach and assesses the risk of a bushfire occurring and impacting the site. This risk level can be reduced by either an increase in preparedness by the owners/occupants of the dwelling (e.g. good house keeping, maintained lawns & bushfire awareness) and/or hazard reduction activities by local fire agencies. Alternatively this risk level can increase if the preparedness level decreases and/or hazard reduction activities are neglected for the area.

The matrix is for risk only, it does not reflect the Bushfire Attack Level determined within PBP 2006.

#### **Likelihood:**

There are four possible likelihood ratings: unlikely, possible, likely and almost certain. The following Table 01 outlines the process for determining likelihood:

	<b>Fires are expected to spread and reach the asset</b>	<b>Fires are not expected to spread and reach the asset</b>
<b>Fires occur frequently</b>	Almost certain	Possible
<b>Fires occur infrequently</b>	Likely	Unlikely

Table 01: Likelihood Table

In consideration of the information provided by the NSW Rural Fire Service and local knowledge of the area the Likelihood of a bushfire igniting and spreading toward the subject site and impacting the asset has been determined to be '**Unlikely**'.

#### **Consequence:**

Consequence is the outcome or impact of a bush fire event. The assessment process for consequence is different for each asset type; human settlement, economic, environmental and cultural. There are four possible consequence ratings: minor, moderate, major and catastrophic. The following Table 02 outlines the process for determining consequence. This has been sourced from the Bush Fire Risk Management Planning Guidelines for Bush Fire Management Committees (policy no 1/2008, annex B) and adapted to the subject site;

Consequence rating	Descriptions
<b>Minor</b>	<ul style="list-style-type: none"> <li>• No fatalities.</li> <li>• Some minor injuries with first aid treatment possibly required.</li> <li>• No persons are displaced.</li> <li>• Little or no personal support (physical, mental, emotional) required.</li> <li>• Inconsequential or no damage to asset.</li> <li>• Little or no financial loss.</li> </ul>
<b>Moderate</b>	<ul style="list-style-type: none"> <li>• Medical treatment required but no fatalities. Some hospitalisation.</li> <li>• Localised displacement of persons who return within 24 hours.</li> <li>• Personal support satisfied through local arrangements.</li> <li>• Localised damage to asset that is rectified by routine arrangements.</li> </ul>
<b>Major</b>	<ul style="list-style-type: none"> <li>• Possible fatalities.</li> <li>• Extensive injuries, significant hospitalisation.</li> <li>• Large number of persons displaced (more than 24 hours duration).</li> <li>• Significant resources required for personal support.</li> <li>• Significant damage to asset that requires external resources.</li> </ul>
<b>Catastrophic</b>	<ul style="list-style-type: none"> <li>• Significant fatalities.</li> <li>• Large number of severe injuries.</li> <li>• Extended and large number requiring hospitalisation.</li> <li>• General and widespread displacement of persons for extended duration.</li> <li>• Extensive resources required for personal support.</li> <li>• Extensive damage to asset.</li> </ul>

Table 02: Consequence Table

In consideration of the site specific circumstances including existing ground maintenance, building construction, and proximity to the bushfire hazards, the subject site has been determined to have a consequence rating of '**Minor**'.



		CONSEQUENCE			
		Minor	Moderate	Major	Catastrophic
L I K E L I H O O D	Almost Certain	High	Very High	Extreme	Extreme
	Likely	Medium	High	Very High	Extreme
	Possible	Low	Medium	High	Very High
	Unlikely	Low	Low	Medium	High

Table 03: Risk Matrix

## 8.0 Site & Bushfire Hazard Determination

### 8.01 Planning for Bush Fire Protection - 2006

'Planning for Bush Fire Protection – 2006' (PBP) is applicable to those lands determined as being within a 'bushfire prone area' in accordance with a local Bushfire Prone Land Map as provided by the Rural Fire Service and Council. The most appropriate method of determining site bushfire hazard under the terms of PBP is to consider the site in a singular form.

*Bushfire prone areas are defined as those areas;*

- *within or within 100m of high or medium bushfire hazards; or*
- *within or within 30m of low bushfire hazards.*

In this instance the subject property has been identified as being bushfire prone land therefore it is appropriate to apply PBP 2006.

### 8.02 Australian Standard AS 3959 – 2009 'Construction of buildings in bushfire –prone areas'

Australian Standard 3959 – 2009 'Construction of buildings in bushfire-prone areas' provides for six (6) levels of building construction these being BAL - Low, BAL - 12.5, BAL - 19, BAL - 29, BAL - 40 and BAL - FZ. The Australian Standard 3959 specifies construction standards for buildings within various Bushfire Attack Levels as determined by the *Planning for Bush Fire Protection – 2006* document. The NSW Rural Fire Service will not accept deemed to satisfy provisions for BAL Flame Zone and therefore have a NSW variation to the listed standard provisions of BAL FZ under AS3959 - 2009.

### 8.03 Correlation between bushfire impact and AS3959

Bushfire Attack Level	Maximum radiant heat impact (kW/m <sup>2</sup> )	Level of construction under AS3959-2009
Low		No special construction requirements
12.5	≤12.5	BAL - 12.5
19	12.6 to 19.0	BAL - 19
29	19.1 to 29.0	BAL - 29
40	29.1 to 40.0	BAL - 40
Flame Zone	>40.0	BAL FZ No deemed to satisfy provisions

### 8.04 Site Specific Bushfire Hazard Determination

All property development must be assessed on an individual basis as broad-brush approaches of documents such as PBP may not be applicable in every instance. The proposed development located at 20 Pacific Highway, Bennetts Green was assessed against the requirements of *Planning for Bush Fire Protection 2006* noting the following:

- a) Access to the subject site is available from Lake Street, Pacific Highway or South Street.
- b) Direct vehicle access is available to all identified bushfire hazards via existing public roads and internal service roads.
- c) Recommendations to maintain a defensible space within the subject property will be included.



## 8.05 Viable Construction Method

The objectives of *Planning for Bush Fire Protection* – 2006 are for the protection of life including fire fighters. Provided these objectives can be met the construction of buildings is feasible and both the Rural Fire Service and Council should be in a position to consider such applications.

The proposed building within Lot 1 will comprise of tilt slab walls, colorbond roofing (fully sarked) and is slab on ground. Furthermore an internal sprinkler system will be provided along with other essential fire safety equipment (e.g. fire hose reels and fire extinguishers).

It should be noted that there is no glazing proposed on the southern elevation of the main building, being the Flame Zone aspect. Additionally it is recommended that the doors are fire rated (min - /30/-) on those parts of this facade closer than 24 metre from the hazard interface (see image 05 over page).

It will also be recommended as part of this assessment that all buildings on Lot 1 and 3 provide measures to mitigate smoke and ember attack, including screening or enclosing all gaps >3mm in size with steel, bronze or aluminium mesh having a maximum aperture of 2 mm, installing draught excluders on external side-hung doors and fitting external roller doors with relevant seals. All doors to be ember proof in the closed position. This may require draught excluders on the stiles, head, sill or threshold and rebated or planted jambs & centre stiles.

Mechanical ducted ventilation will also need to ensure that the units remain ember proof. This can be achieved by providing screens over air intake vents and ensuring that exhaust vents are either screened or fitted with dampers that close when positive outward air pressure is lost. This does not apply to split system air-conditioning units.

Any polycarbonate roof sheeting shall use a material with a flammability index of less than 5 and have steel, bronze or aluminium mesh screens with a maximum aperture of 2 mm fitted immediately above or below the roof sheeting. Any shade sails in the outdoor area of the Bunnings building (approx. 74 metres from the hazard interface) shall be of a material having a flammability index of less than 5.

The highest Bushfire Attack Level to the proposed Service Station was determined from Table 2.4.2 of AS3959 - 2009 to be to be 'BAL 12.5'. The proposed Service Station is required to comply with section 3 and BAL 12.5 under section 5 of AS 3959 – 2009 and Appendix 3 under PBP 2006.

## 9.0 Recommendations

The following recommendations are provided as the minimum necessary for compliance with *Planning for Bush Fire Protection* 2006 and Australian Standard 3959 'Construction of buildings in bushfire-prone areas' 2009. Additional recommendations are provided to supplement these minimum requirements where considered necessary.

### General

2. That the proposed development be in accordance with the Overall Site Plan prepared by The Buchan Group, Project No. 316137, Drawing No. ATP 200.

### Construction

3. That the openable windows on the proposed buildings in Lot 1 and Lot 3 (not including servery windows on fast food outlets) be screened within aluminium, steel or bronze metal mesh having an aperture size of  $\leq 2\text{mm}$  in such a way that the entire opening remains screened when the window is in the opened position.
4. That all gaps  $> 3\text{mm}$  on the proposed buildings in Lot 1 and Lot 3 be either screened within aluminium, steel or bronze metal mesh having an aperture size of  $\leq 2\text{mm}$  or enclosed.
5. That the external side-hung doors and any servery window (fast food outlet) on the proposed buildings in Lot 1 and Lot 3 be tight fitting and fitted with a draft excluder. This may require draft excluders on the stiles, head, sill or threshold and rebated or planted jambs & centre stiles.
6. That any external roller doors on the proposed buildings in Lot 1 and Lot 3 have tight fitting guide tracks and are sealed at the head and sides so that there are no gaps  $> 3\text{mm}$ .
7. That the doors into the main warehouse within Lot 1 within 24 metres of the southern boundary are fire rated (min -/30/-).
8. That mechanical ducted ventilation on the proposed buildings in Lot 1 and Lot 3 provides screens over air intake vents and ensure that exhaust vents are either screened or fitted with dampers that close when positive outward air pressure is lost to ensure they maintain ember protection to the inside of the building.
9. That any polycarbonate roof sheeting on buildings in Lot 1 and 3 shall use a material with a flammability index of less than 5 and have steel, bronze or aluminium mesh screens with a maximum aperture of 2 mm fitted immediately above or below the roof sheeting.
10. That any shade sails in the outdoor areas of the building on Lot 1 shall be of a material having a flammability index of less than 5.
11. That any roof sheeting on buildings in Lot 1 and 3 shall be fully sarked with a sarking having a flammability index of less than 5.
12. That the proposed Service Station is constructed to comply with section 3 and BAL 12.5 under section 5 of AS 3959 – 2009 and Appendix 3 under PBP 2006.

### Asset Protection Zones

13. That all grounds within the subject site be maintained in accordance with an Asset Protection Zone as detailed in Appendix 2 of *Planning for Bush Fire Protection* 2006 and the NSW Rural Fire Service publication 'Standards for Asset Protection Zones'.

## Landscaping

14. That all new landscaping within the subject site is to comply with Appendix 5 'Landscaping and Property Maintenance' of *Planning for Bush Fire Protection* 2006.

## Water

15. The sizing, pressure and spacing of the hydrant system be installed in accordance with AS2419.1-2005.

## Emergency Management

16. That an Emergency / Evacuation Plan be prepared for the Bunnings Warehouse in Lot 1 and the Service Station in Lot 3 which is consistent with the NSW Rural Fire Service document Guidelines for the Preparation of Emergency/Evacuation Plan. The EMP for the service station is to include a trigger to stop pumping when;

- Significant smoke and ember impact is occurring within the sites grounds,

Or

- When alerts or instruction from a reliable source have been received (e.g. Police, RFS, Fire & Rescue NSW, SES). Alerts can be monitored using the Fires Near Me APP or the NSW Rural Fire Services website. Alerts may also come via the media, telephone alert or SMS system for the local area,

Or

- When it is considered necessary due to bushfires in the local vicinity but not necessarily due to actual bushfire impact within the site. Pumping should cease on Catastrophic fire danger days or TOBAN days where bushfires are already present within approx. 1.5 km of the site. Fires can be monitored using the Fires Near Me APP.

## 10.0 Conclusion

Given that the property is deemed bushfire prone under Lake Macquarie Council's Bushfire Prone Land Map any development would need to meet the requirements of *Planning for Bush Fire Protection* 2006 and of the construction requirements of Australian Standard 3959 'Construction of buildings in bushfire-prone areas' 2009. The determination of any bushfire hazard must be made on a site-specific basis that includes an assessment of the local bushland area and its possible impact to the subject property.

The subject site comprises a newly created allotment known as 20 Pacific Highway, Bennetts Green (Lot 1 DP 1214343). The hazard was identified as being located to the north, northeast, west and south of the proposed development site. The vegetation posing a hazard was determined to be rainforest (riparian area) to the north, scrub to the northeast and west and forest to the south.

The proposed application relates to a commercial development and as such there are no minimum required Asset Protection Zones under Planning for Bush Fire Protection 2006. PBP 2006 states *"The BCA does not provide for any bush fire specific performance requirements and as such AS 3959 does not apply as a set of 'deemed to satisfy' provisions. The general fire safety construction provisions are taken as acceptable solutions, but the aim and objectives of PBP apply in relation to other matters such as access, water and services, emergency planning and landscaping/vegetation management. In circumstances where the aim and objectives of PBP (section 1.1) are not met, then the construction requirements for bush fire protection will need to be considered on a case-by-case basis."*

Specific recommendations on construction have been included here which are considered acceptable measures to comply with the aims and objectives of PBP 2006. Other recommendations on asset protection zones, emergency management and service supply have also been included where considered necessary.

In accordance with the bushfire safety measures contained in this report, and consideration of the site specific bushfire risk assessment it is our opinion that when combined, they will provide a reasonable and satisfactory level of bushfire protection to the subject development and also satisfy both the Rural Fire Service's concerns and those of Council in this area.

We are therefore in support of the development application.

Should you have any enquiries regarding this project please contact me at our office.

Prepared by  
Building Code & Bushfire Hazard Solutions



**Duncan Armour**

Reviewed by  
Building Code & Bushfire Hazard Solutions P/L



**Wayne Tucker**

G. D. Design in Bushfire Prone Areas.  
Certificate IV Fire Technology  
Ass Dip Applied Science  
Manager - Bushfire Section  
Fire Protection Association of Australia BPAD – Level 3 Certified  
Practitioner Accreditation number – BPD – PA-09399



## 11.0 Annexure 01

### List of Referenced Documents

- a) *Environmental Planning and Assessment Act 1979*
- b) *'Planning for Bush Fire Protection' 2006* - NSW Rural Fire Services & Planning NSW
- c) *'Construction of buildings in bushfire-prone areas'* - AS 3959 – 2009 (as - amended) – Standards Australia
- d) *'Lake Macquarie Council's Bushfire Prone Land Map'*
- e) Acknowledgements to:  
  
NSW Department of Lands – SixMaps  
Street-directory.com.au
- g) Overall Site Plan prepared by The Buchan Group, Project No. 316137, Drawing No. ATP 200.

### Attachments

- Attachment 01: Bushfire Design Fire Modelling Report
- Attachment 02: 79BA Compliance Certificate



# Building Code & Bushfire Hazard Solutions

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## BUSHFIRE RISK ASSESSMENT CERTIFICATE UNDER s79BA OF THE EP&A Act 1979

<b>PROPERTY ADDRESS:</b>	20 Pacific Highway Bennetts Green
<b>DESCRIPTION OF PROPOSAL:</b>	Commercial development
<b>PLAN REFERENCE:</b> (relied upon in report preparation)	Overall Site Plan by Buchan Group, Project No. 316137, Dated Drawing No. ATP - 200
<b>BAL RATING:</b>	BAL FZ <small>(If the BAL rating is FZ the application is to be referred to NSW RFS for assessment)</small>
<b>DOES THE PROPOSAL RELY ON ALTERNATE SOLUTIONS:</b>	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; border-radius: 50%; padding: 2px 10px;">YES</div> <div>NO</div> </div> <small>(Circle the relevant response)</small> <small>(If YES the application is to be referred to NSW RFS for assessment)</small>
<b>BUSHFIRE ASSESSMENT REPORT REFERENCE:</b>	120423B
<b>REPORT DATE:</b>	6th June 2017
<b>CERTIFICATION NO/ACCREDITED SCHEME</b>	BPAD9399

I Wayne Tucker of Building Code and Bushfire Hazard Solutions Pty Ltd hereby certify, in accordance with Section 79BA of the *Environmental Planning and Assessment Act 1979 No 203*:

- That I am a person recognised by the *NSW Rural Fire Service* as a qualified consultant in bushfire risk assessment; and
- That subject to the recommendations contained in the Bushfire Risk Assessment Report the proposed development conforms specifications and requirements of the documents entitled *Planning for Bush Fire Protection* prepared by the NSW Rural Fire Service in co-operation with the Department of Planning and any other documents as prescribed by Section 79BA 1 (a) of the *Environmental Planning and Assessment Act 1979 No 203*.

I am aware that the Bushfire Assessment Report, prepared for the above mentioned site is to be submitted in support of a development application for this site and will be relied upon by Council as the basis for ensuring that the bushfire risk management aspects of the proposed development have been addressed in accordance with *Planning for Bushfire Protection 2006*.

Signature:  Date: 6th June 2017





# Bushfire Attack Assessment Report

AS3959 (2009) Version 1.4.2

Print Date: 18/05/2017

Assessment Date: 4/05/2017

**Site Street Address:** Service Station, Windale  
**Assessor:** Mr Admin; admin  
**Fire Danger Index:** 100 (Fire Weather Area: Greater Sydney Region)  
**Local Government Area:** Wyong **Alpine Area:** No

## Equations Used

Transmissivity: Fuss and Hammins, 2002  
 Flame Length: RFS PBP, 2001  
 Rate of Fire Spread: Noble et al., 1980  
 Radiant Heat: Drysdale, 1985; Sullivan et al., 2003; Tan et al., 2005  
 Peak Elevation of Receiver: Tan et al., 2005  
 Peak Flame Angle: Tan et al., 2005

**Run Description:** SouthNorthwest

## Vegetation Information

<b>Vegetation Type:</b>	Scrub/Tall Heath	<b>Vegetation Group:</b>	Shrub & Heath
<b>Vegetation Slope:</b>	0 Degrees	<b>Vegetation Slope Type:</b>	Downslope
<b>Surface Fuel Load(t/ha):</b>	25	<b>Overall Fuel Load(t/ha):</b>	25

## Site Information

<b>Site Slope</b>	0 Degrees	<b>Site Slope Type:</b>	Downslope
<b>Elevation of Receiver(m)</b>	5	<b>APZ/Separation(m):</b>	74

## Fire Inputs

<b>Veg./Flame Width(m):</b>	50	<b>Flame Temp(K)</b>	1200
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## Calculation Parameters

<b>Flame Emissivity:</b>	95	<b>Relative Humidity(%):</b>	25
<b>Heat of Combustion(kJ/kg)</b>	18600	<b>Ambient Temp(K):</b>	308
<b>Moisture Factor:</b>	5		

## Program Outputs

<b>Category of Attack:</b>	LOW	<b>Peak Elevation of Receiver(m):</b>	5.76
<b>Level of Construction:</b>	BAL 12.5	<b>Fire Intensity(kW/m):</b>	53816
<b>Radiant Heat(kW/m2):</b>	2.66	<b>Flame Angle (degrees):</b>	82
<b>Flame Length(m):</b>	11.63	<b>Maximum View Factor:</b>	0.032
<b>Rate Of Spread (km/h):</b>	4.17	<b>Inner Protection Area(m):</b>	74
<b>Transmissivity:</b>	0.753	<b>Outer Protection Area(m):</b>	0