# BUSHFIRE MANAGEMENT STATEMENT– 210 JAROSITE RD, BELLS BEACH

20th December 2016

South Coast Bushfire Consultants

**South Coast Bushfire Consultants**

P.O. Box 721, Torquay, Vic 3228

Phone: 0401 328 757 Email: mksteel@bigpond.com

Principal Consultant – Kylie Steel

Qualifications / Accreditations:

- Accredited Bushfire Consultant (BPAD level 2) with the Fire Protection Association Australia (FPA) (2014)
- Preparing and assessing an application under the Bushfire Management Overlay – Planet (Department of Planning and Community Development) (2013)
- Postgraduate Certificate in Bushfire Planning and Management – The University of Melbourne (2013)
- Postgraduate Certificate in Business – The University of Notre Dame, Broome (2002)
- Bachelor of Science, Honours – The University of Melbourne (1998)
- Native Vegetation Planning Permit Applications – Planet (Department of Planning and Community Development) Training Seminar (2013)

## Disclaimer

This report has been made with careful consideration and with the best information available to South Coast Bushfire Consultants at the time of writing. Before relying on information in this report, users should evaluate the accuracy, completeness and relevance of the information provided for their purposes. South Coast Bushfire Consultants do not guarantee that it is without flaw or omission of any kind and therefore disclaim all liability for any error, loss or other consequence that may arise from you relying on any information in this report.

Requirements detailed in this document do not guarantee survival of the buildings or the occupants. The owner of the dwelling is strongly encouraged to develop and practice a bushfire survival plan.

## Version Control

| | Name | Date Completed | Comments |
|---|---|---|---|
| Report Version | Kylie Steel | 20/12/16 | Version 4 |
| Field Assessment | Kylie Steel | April & September 2015 | |
| Report | Kylie Steel | 12/09/15 | |
| Mapping | Kylie Steel | 13/09/15 | |

# Definitions, Abbreviations and Acronyms

AS 3959-2009 – Australian Standard AS 3959 -2009 Construction of buildings in bushfire-prone areas.

CFA – Country Fire Authority

Clause – A clause relates to a specific piece within the planning scheme.

Clause 44.06 – Bushfire Management Overlay

Clause 52.47 – Planning for Bushfire

DEPI – Department of Environment Planning and Infrastructure (now DELWP)

DELWP – Department of Environment, Land, Water and Planning

BAL – Bushfire Attack Level

BPA – Bushfire Prone Area

BMO – Bushfire Management Overlay

BMS – Bushfire Management Statement

Method 1 – refers to methodology in AS 3959-2009 for determining a BAL with a number of predetermined inputs.

Method 2 – refers to methodology in AS 3959-2009 for determining a site specific BAL

Pathway 1 – refers to an application pathway in Clause 52.47 of the planning scheme.

Pathway 2 – refers to an application pathway in Clause 52.47 of the planning scheme.

Planning Practice Note – a guide for using various sections of the planning scheme prepared by DTPI

RA – Responsible Authority

SCBC – South Coast Bushfire Consultants

Total Fire Ban Day – is declared by CFA on days when fires are likely to spread rapidly and could be difficult to control.

# Bushfire Management Statement– 210 Jarosite Rd, Bells Beach

## 1 SUMMARY

This document analyses the bushfire hazards to a proposed dwelling at 210 Jarosite Rd, Bells Beach.

The site is within the Bushfire Management Overlay (BMO) and as such any development must meet the objectives of the overlay. This document interprets how the proposed dwelling can meet the objectives and approval measures of *Clause 52.47 – Planning for Bushfire* and *44.06 - Bushfire Management Overlay*.

This document includes a; Bushfire Landscape Assessment, Bushfire Hazard Site assessment, Bushfire Attack Level (BAL) assessment and a Bushfire Management Plan. This information is presented to provide a response to the legislative requirements of the Bushfire Management Overlay (Clause 44.06 and 52.47).

The site is in the Rural Conservation Zone (RCZ) and requires a pathway 2 application. The property is surrounded by hobby farms and areas of coastal heathland vegetation. Neighbouring properties have a mixture of grasslands, woodland, heathland and low threat vegetation.

To maintain the ecological values associated with development in the Rural Conservation Zone (RCZ) a BAL of 40 has been determined to enable a greater amount of vegetation to be retained. The defendable space can be contained wholly within the property boundary.

The construction requirements in AS 3959-2009 associated with a BAL of 40significantly enhance a dwellings ability to mitigate against the mechanisms associated with a bushfire attack on a dwelling.

There are a number of Stringybark eucalypts in the surrounding vegetation particularly in the Jarosite Basin to the south west and this will significantly increase the short distance ember production in the event of a landscape bushfire.

# 2 INTRODUCTION

This document has been prepared for the property owner to respond to the requirements of Clause 44.06 *Bushfire Management Overlay* (known from this point on as Clause 44.06), and associated Clause 52.47 *Bushfire Protection: Planning Requirements* (known from this point on as Clause 52.47) for a dwelling at 210 Jarosite Rd, Bells Beach.

The site is located in the Bushfire Management Overlay (BMO) and requires a bushfire management statement to accompany the planning permit application.

# 3 METHODOLOGY

The methodology used to prepare a holistic approach to assessing and mitigation the bushfire risk to the development includes the following:

- Bushfire Hazard Landscape Assessment
- Bushfire Hazard Site Assessment
- A method 1 BAL Assessment
- Bushfire Management Plan
- Bushfire Management Statement (Clause 52.47)

# 4 PLANNING AND BUILDING CONTROLS

## 4.1 Planning and building controls

| Clause Number | Name |
|---|---|
| 35.06 | Rural Conservation Zone (RCZ) |
| | Schedule 1 |
| 44.06 | Bushfire Management Overlay |
| 52.17 | Native Vegetation |
| 52.47 | Planning for Bushfire |
| 52.48 | Bushfire Protection: Exemptions |
| 42.02 | Vegetation Protection Overlay (VPO) |
| | Schedule 1 |

# 5 BUSHFIRE HAZARD LANDSCAPE ASSESSMENT

The Bushfire Hazard Landscape Assessment includes a plan that describes the bushfire hazard of the general locality surrounding the site (Map 1).

## 5.1 Vegetation extent in the broader landscape

The vegetation in the broader landscape is varied in its composition and thus its bushfire risk. The vegetation that surrounds the property in 1km radium is hobby farms to the north and large areas of coastal heath vegetation to the south. The Jarosite basin is to the south west of the property and has high fuel loads is about 300 hectares in size and would allow a significant fire front to develop under extreme bushfire weather conditions.

## 5.2 Surrounding Road Network

The surrounding road network is excellent and provides easy access to the Township of Torquay. The central township zone of Torquay is located approximately 5km from the proposed development.

The roads that lead to the township of Torquay are lined heavily with vegetation and early evacuation on high bushfire risk days is recommended.

## 5.3 Bushfire History of the Area

The Barwon South West Regional Strategic Fire Management Plan: Environmental Scan lists bushfire events in the Otway Ranges. The 1939 Black Friday Fires and the 1983 Ash Wednesday fires were the most significant bushfire events in the South West region of Victoria in recent history.

The Ash Wednesday fires started in Deans Marsh and were pushed south under a northerly wind before the introduction of the cold change or low pressure system which then forced the fire in a southwesterly direction along the coast and through the Great Otway National Park.

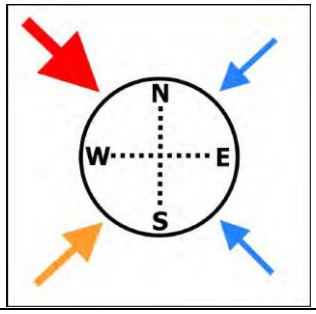
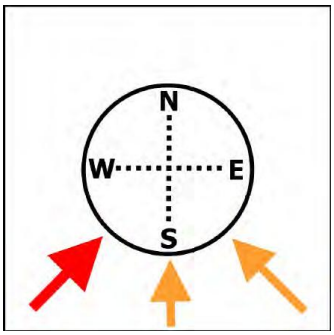
The events of 1983 show how devastating a bushfire within the Otway Ranges can be. The township of Anglesea was significantly affected by these bushfires. The Ash Wednesday bushfire footprint can be seed in Appendix 2 of this document. The 1983 Ash Wednesday bushfire did impact the proposed development site and were on the edge of the containment line.

Since the devastating bushfires on Black Saturday in 2009 the number of prescribed burns or fuel reduction burns across the state has increased. The fuel reduction burns surrounding Anglesea can be seen in Appendix 1, most of these burns have occurred in the last 5-6 years. These offer some protection for the time being; however, it is uncertain if these practices will be ongoing.

## 5.4 Bushfire Risk

The site is at an increased risk from bushfire due to its vulnerability from all directions and the distance required traveling to a safer place.

Table 1 – Bushfire Scenarios

| Scenario | Description | Site Response |
|---|---|---|
| 1 – North   | North of the site areas of highly modified vegetation with residential development built throughout areas of remnant woodland vegetation.<br><br>The dominant tree species is *Eucalyptus obliqua* (Messmate stringybark) and the ember attack mechanism of a landscape bushfire would be significant. | The property is able to provide defendable space for a BAL of 40 to the north. |
| 2 - East | East of the site is an property with areas of modified and managed gardens. Extreme bushfire behaviour is not associated with an approach from the east.<br><br>The most likely scenario from the east is from a spot fire that has been created by a much larger landscape bushfire to the south west. These spot fires can be erratic and create strong winds as they are sucked into the main front. | The proposed building foot prints are able to provide defendable space for a BAL of 40 to the east. |
| 3 – South   | Directly south of the site are large areas of unmanaged vegetation. The vegetation is in close proximity to the ocean and is classified as coastal heath at the tops of the wind affected ridges and can be classified as forest in more protected areas down within the basin. | Defendable space for a BAL of 40 is able to be achieved to the south. |
| 4- West | The greatest fire run potential and the path of the Ash Wednesday bushfire came from the south west.<br><br>There is the potential for a fire run over 50km from the south west through the Great Otway National Park.<br><br>Extreme fire weather can approach from the west on the | West of the site are managed properties and these would influence a fire front impacting on the proposed development. |

| | | |
|---|---|---|
| | south westerly wind change when a low pressure system is introduced. | |

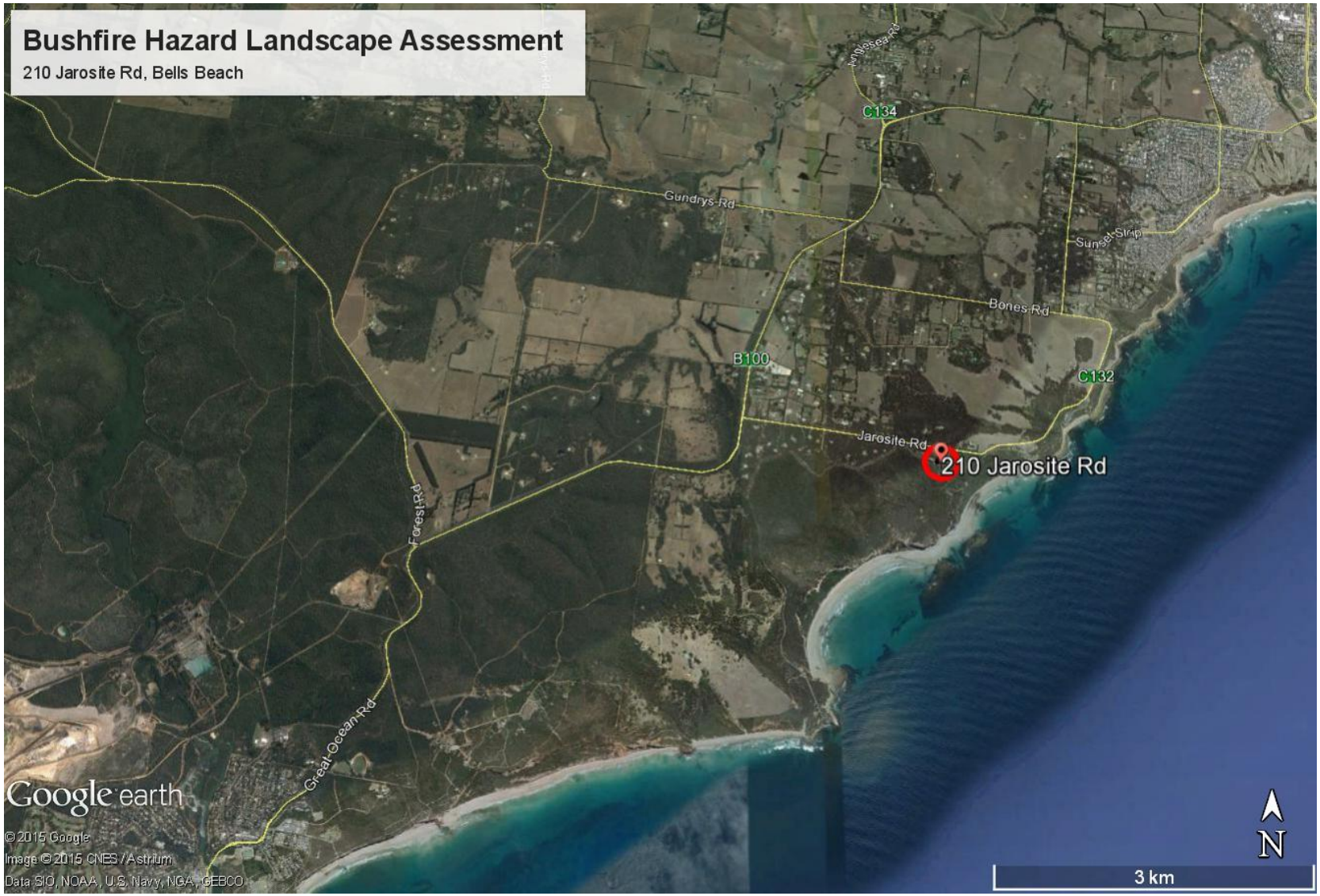
## 5.5 Landscape Type

The determination of landscape type is a requirement of Clause 52.47 as a simplified method to establish landscape context.

The surrounding landscape is characteristic of the 'Broader Landscape Type Four' as per *Planning Practice Note 65* (DTPLI 2014).

Table 2 – Broader Landscape Type Justification

| Broader Landscape Type Three Description | Sites Response |
|---|---|
| The type and extent of vegetation located more than 150m from the site may result in neighbourhood-scale destruction as it interacts with the bushfire hazard on and close to a site. | There are significant areas of unmanaged vegetation surrounding the site in the form of coastal heath and forest vegetation with the dominant eucalypt species being Stringybark's. |
| Bushfire can approach from more than one aspect. | A bushfire can approach from all aspects. |
| The site is located in an area that is not managed in a minimum fuel condition. | The area surrounding the site is a mosaic of managed gardens, grassland, coastal heath and areas of forest. |
| Access to an appropriate place that provides shelter from bushfire is not certain. | The nearest built up residential area away from the bushfire hazard of the The Great Otway Nation Park is the township of Torquay. The central area of the township is located approximately 5km from the site and requires travel through unmanaged vegetation. |




Map 1 – Bushfire Hazard Landscape Assessment

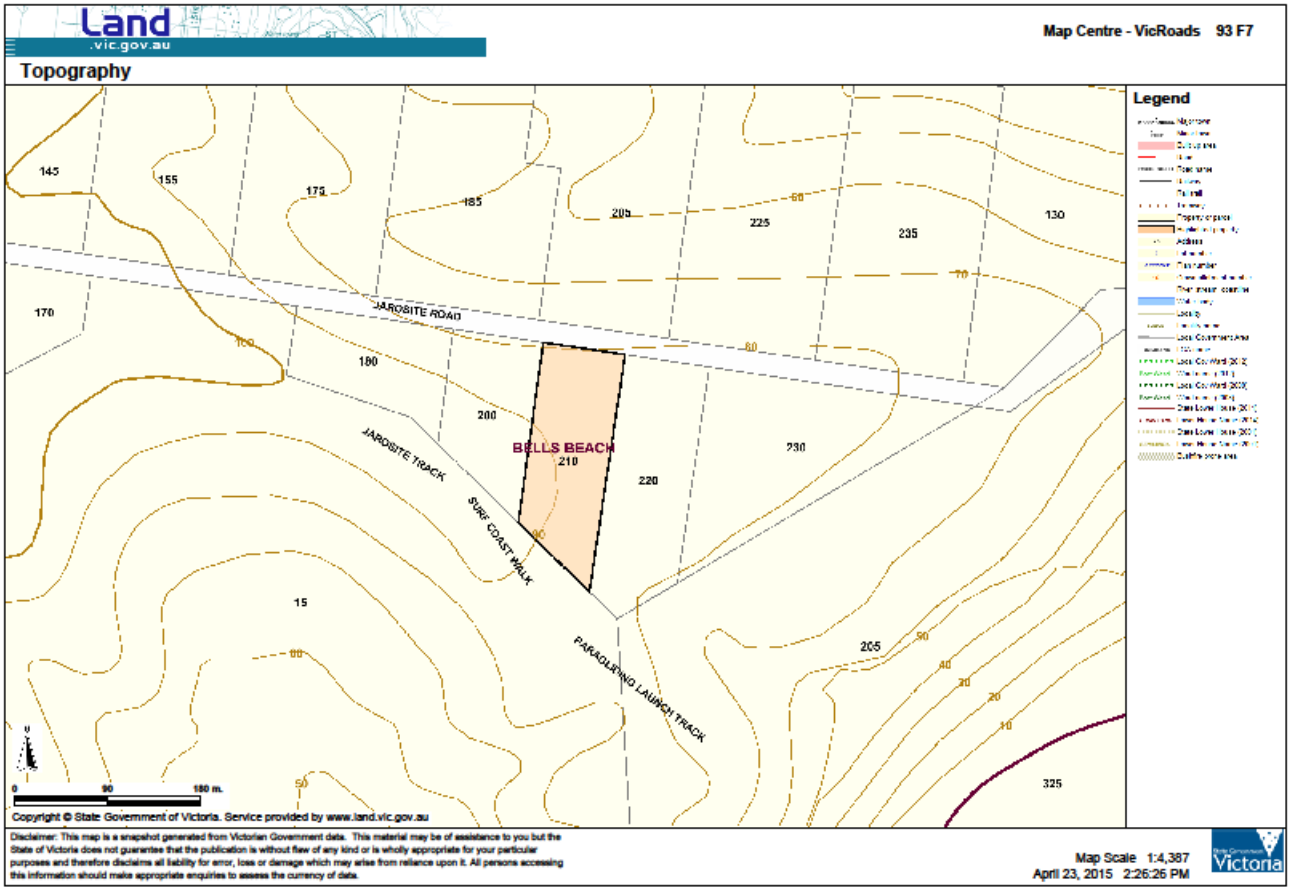
# 6 BUSHFIRE HAZARD SITE ASSESSMENT

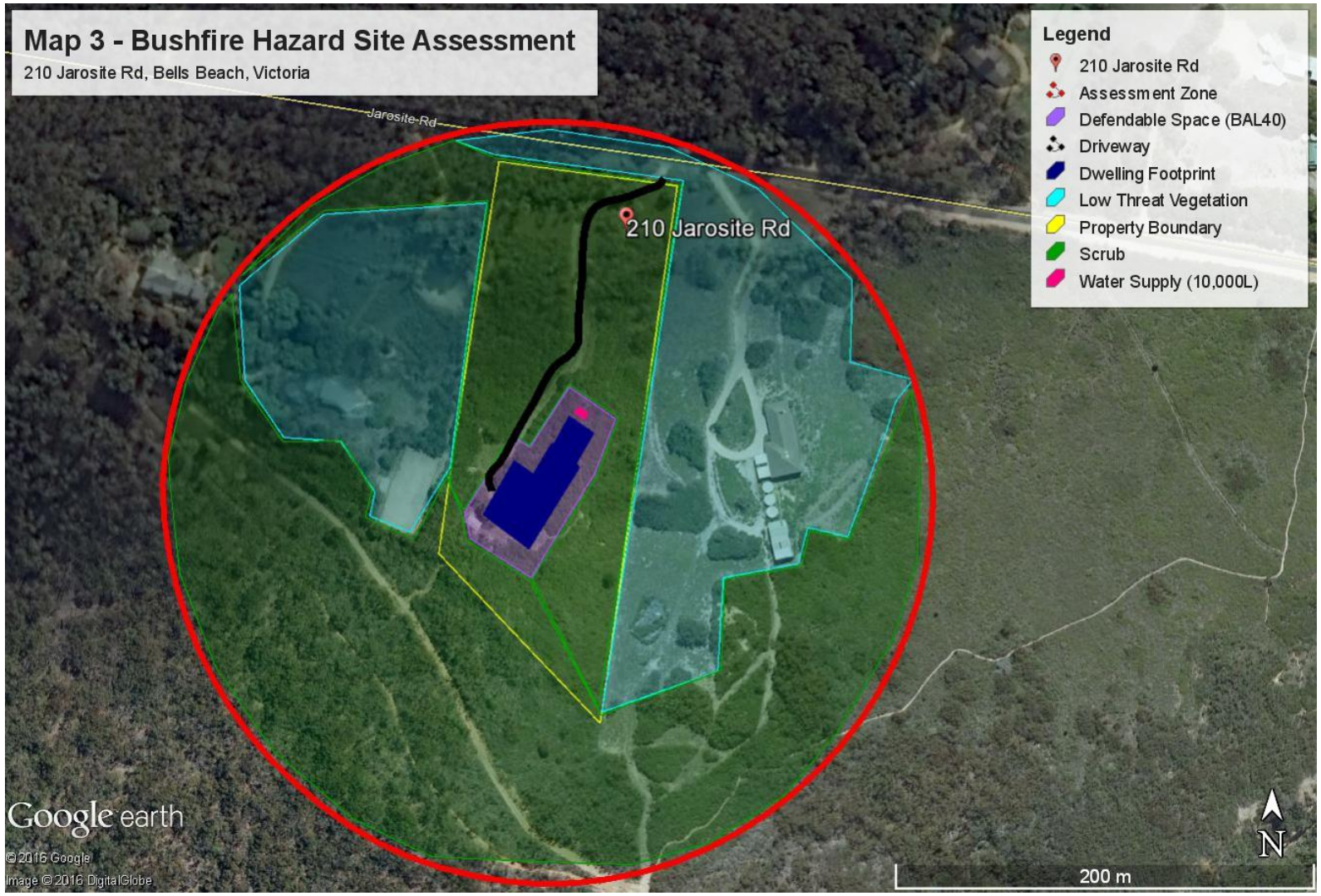
The Bushfire Hazard Site Assessment includes a plan that describes the bushfire hazard within 150 meters of the proposed development. The description of the hazard is prepared in accordance with AS 3959-2009 Construction of buildings in bushfire prone areas (Standards Australia) excluding paragraph (a) of section 2.2.3.2 (Vegetation Exclusions).

## 6.1 Site Details

| | |
|---|---|
| Address: | 210 Jarosite Rd, Bells Beach (Lot 40 LP 136440) |
| Municipality: | Surfcoast Shire |
| Existing Dwellings: | Vacant Land |
| Private Bushfire Shelter: | N/A |
| Application Pathway: | Clause 52.47-2 |

Map 2 Current Layout of the site






Map 3 – Bushfire Hazard Site Assessment

## 6.2 Vegetation

The vegetation within the 150 meter assessment area was classified according to AS 3959-2009, 'Practice note 65 (DTPLI 2014) and the 'Overall fuel hazard assessment guide' (DSE 2010).

The AS 3959-2009 approach uses a generalised description of vegetation based on the AUSLIG (Australian Natural Resources Atlas: No.7 Native Vegetation) classification system. According to this method, vegetation can be classified into seven categories. Each category indicates a particular type of fire behavior and these categories or classifications are then used to determine bushfire intensity.

The vegetation identified within the 150 meter assessment zone is detailed in table 3 and the locations of these vegetation types are evident in Map 3.

Table 3 – Vegetation Assessment

| | |
|---|---|
| Scrub | AS 3959-2009 Definition<br><br>*Found in wet areas and / or areas affected by poor soil fertility or shallow soils; >30% foliage cover. Dry heaths occur in rocky areas. Shrubs >2m high. Typically of coastal wetlands and tall heaths.*<br><br>Site Description<br><br>The vegetation surrounding the site is largely stunted due to the coastal proximity and the stunting effects the coastal winds have on vegetation. The heath is very dense and largely dominated by *Acacia* and *Leptospernum* (tea tree) species with some stunted *Eucalypts*.<br><br>The ecological vegetation classes (DELWP) for the surrounding vegetation were identified and are detailed in appendix 1 of this document. They confirm the classification of Scrub vegetation. |

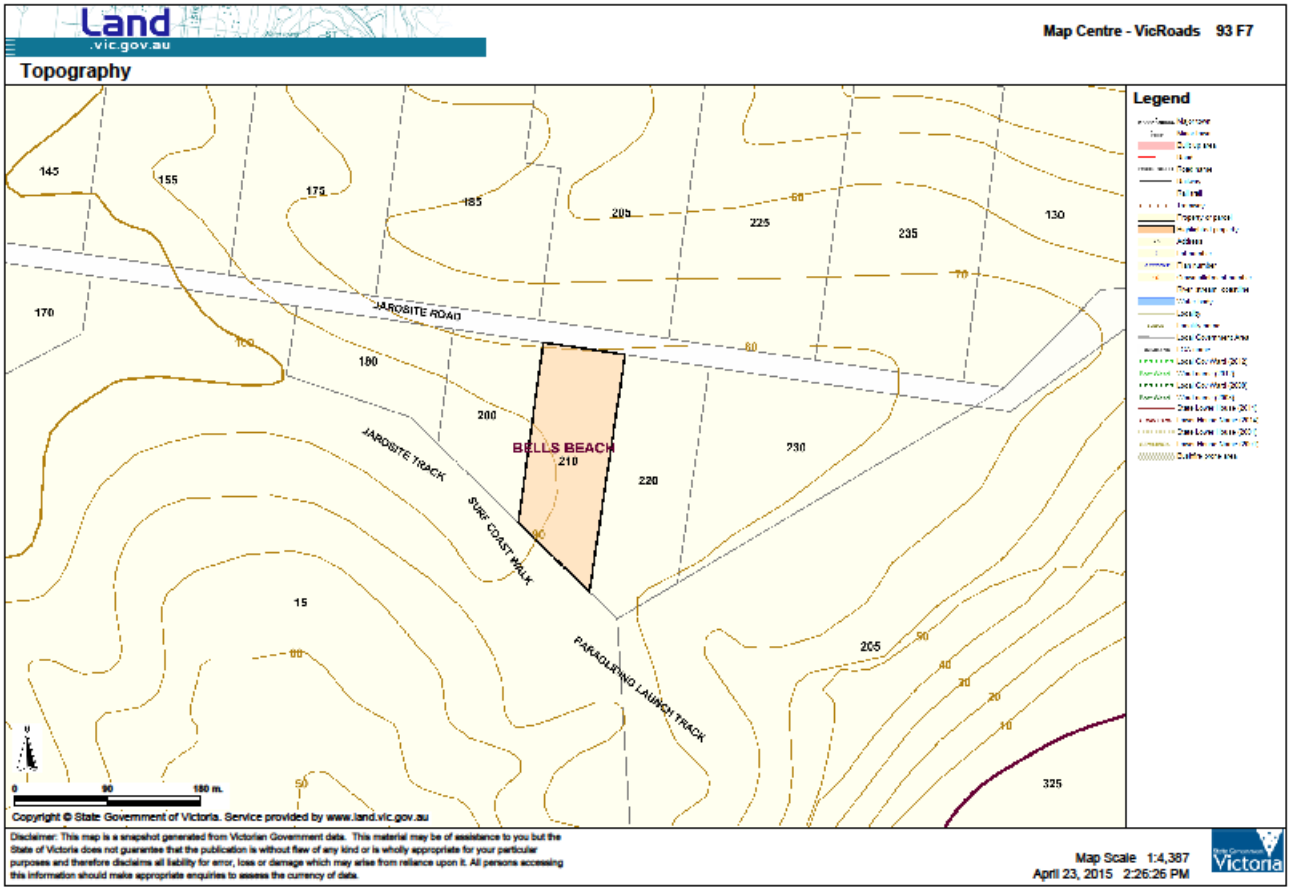
| | |
|---|---|
| |  <br>Figure 1 – Vegetation within the site looking south. |
| Low Threat Vegetation and Non-Vegetated Areas | <u>AS 3959-2009 Definition</u><br><br>e*) Non-vegetated areas, including waterways, roads, footpaths, buildings and rocky outcrops.*<br><br>*f) Low threat vegetation, including grassland managed in a minimal fuel condition, maintained lawns, golf courses, maintained public reserves and parklands, vineyards, orchards, cultivated gardens, commercial nurseries, nature strips and windbreaks.*<br><br><u>Site Description</u><br><br>There are areas on adjoining properties to the east and west that appear to have managed vegetation surrounding their homes. Due to the density of vegetation within the site at 210 Jarosite rd it was difficult to establish the condition of these gardens. Assessments were made in accordance with Google earth images as per Map 1 in this document. |

## 6.3 Topography

The site was close to the top of a ridge that looks down towards the South Side beach break. The terrain to the north, east and south falls away to varying degrees.

The topography of the surrounding landscape would influence the intensity and severity of a landscape bushfire.

Map 4 – Topography of the site and surrounds.



## 6.4 Bushfire Attack Level (BAL) for the proposed development

The bushfire attack level (BAL) is a means of measuring the severity of a building's potential exposure to ember attack, radiant heat and direct flame contact, using increments of radiant heat expressed in kilowatts per meter squared. The BAL is also the basis for establishing the requirements for construction to improve protection of building elements from attack by bushfire.

The highest BAL determines the construction requirements for the dwelling.

The BAL for this site has been calculated using a 'Forest Fire Danger Index' (FFDI) of 100 and a Flame Temperature of 1090K. The FFDI and flame temperature are in accordance with parameters that have been set as the appropriate risk parameters by the Minster for Planning.

Table 4 – BAL calculations for the proposed dwelling

| Orientation | Highest threat vegetation | Slope under classifiable vegetation | Defendable Space Requirement | Bushfire Attack Level (BAL) |
|---|---|---|---|---|
| North | Scrub | 0-5˚Downslope | 11m | 40 |
| East | Scrub | Flat | 7m | 40 |
| South | Scrub | 5-10˚Downslope | 12m | 40 |
| West | Scrub | Upslope | 7m | 40 |

# 7 BUSHFIRE MANAGEMENT PLAN AND STANDARD PERMIT CONDITIONS

This section of the report details the site layout including access, water supply, building footprint and defendable space.

Table 3 – Planning permit conditions to accompany the Bushfire Management Plan.

| |
|---|
| Preamble<br><br>Before development start, a Bushfire Management Plan (BMP) must be submitted to and endorsed by the Responsible Authority. The plan must show the following bushfire mitigation measures, unless otherwise agreed in writing by the CFA and the Responsible Authority. |
| Defendable Space<br><br>An area of defendable space for the designated BAL around the proposed building / or to the property boundary where vegetation (and other flammable materials) will be modified and managed in accordance with the following requirements:<br><br>• Grass must be short cropped and maintained during the declared fire danger period.<br>• All leaves and vegetation debris must be removed at regular intervals during the declared fire danger period.<br>• Within 10 meters of a building, flammable objects must not be located close to the vulnerable parts of the building.<br>• Plants greater than 10 cm in height must not be placed within 3m of a window or glass feature of the building.<br>• Shrubs must not be located under the canopy of trees.<br>• Individual and clumps of shrubs must not exceed 5sq. metres in area and must be separated by at least 5 metres.<br>• Trees must not overhang or touch any elements of the building.<br>• The canopy of trees must be separated by at least 5 meters.<br>• There must be a clearance of at least 2 metres between the lowest tree branches and ground level. |
| Construction Standards<br><br>All construction works need to comply with a BAL of 40 from AS 3959-2009. |
| Water Supply<br><br>The site is required to have 10,000 Litres of water supply for fire fighting purposes which meets the following requirements:<br><br>• Is stored in an above ground water tank constructed of concrete or metal.<br>• All fixed above-ground water pipes and fittings required for fire fighting purposes |

must be made of corrosive resistant metal.
- Incorporate a ball or gate valve (British Standard Pipe (BSP) 65mm) and coupling (64mm CFA 3 thread per inch male fitting).
- The outlet/s of the water tank must be within 4m of the accessway and be unobstructed.
- Be readily identifiable from the building or appropriate identification signage to the satisfaction of CFA must be provided.
- Any pipework and fittings must be a minimum of 65mm (excluding the CFA coupling).

The site requests an alternative solution to the water supply standard permit conditions detailed above.

The water supply within the site total's 500,000L stored in a number of underground water tanks. The 10,000L of water required for fire fighting purposes will also be stored in an underground water tank with an external outlet that complies with the CFA requirements noted above for an above ground water tank.

Access

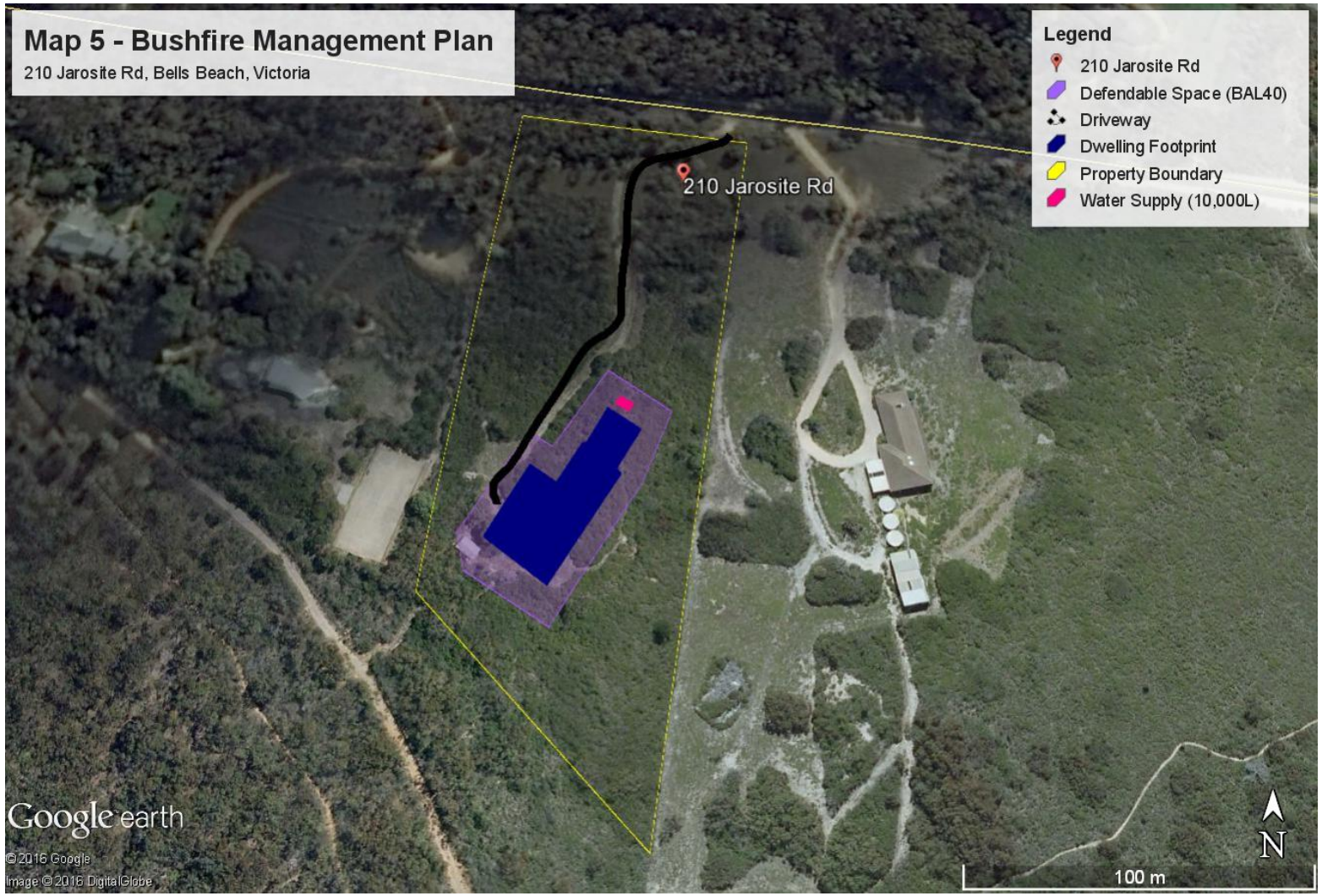
Where the access is less than 30 metres fire authority vehicles should be able to get within 4 metres of the water supply outlet.

Where the access is greater than 30m but less than 100m the following design and construction requirements apply:

- All-weather construction.
- A load limit of at least 5 tonnes.
- Provide a minimum trafficable width of 3.5m.
- Be clear of encroachments for at least 0.5m on each side and at least 4 m vertically.
- Curves must have a minimum inner radius of 10m.
- The average grade must be no more than 1 in 7 (14.4%) with a maximum grade of no more than 1 in 5 (20%) for no more than 50m.

Where the access is greater than 100m a turning area for fire fighting vehicles must be provided close to the building by one of the following:

- A turning circle with a minimum radius of eight metres.
- A driveway encircling the dwelling.
- The provision of other vehicle turning heads – such as a T or Y head – which meet the specification of Austroad Design for an 8.8 meter Service Vehicle.




Map 5 – Bushfire Management Plan (BMP) (To be read in conjunction with table 3 – Planning permit conditions). This map is based on the Site Plan A101 – Issue 5. The defendable space distances are based on table 4 section 6.4 of this document.

# 8 BUSHFIRE MANAGEMENT STATEMENT – SITES RESPONSE TO APPLICABLE SUB CLAUSES OF 52.47

Clause 52.47 contains a range of sub clauses with objectives, approved measures (AM), alternative measures (AltM) and decision guidelines. The table below details which clauses are relevant to this application. The following section demonstrates how the requirements have been met for the relevant standards.

Table 5 - Relevant clauses and measures applicable to the proposed development.

| Clause | Approved Measure | Achieved | Justification |
|---|---|---|---|
| Clause 52.47-1 – Dwellings in existing settlements – Bushfire protection objective | AM 1.1 | Not Applicable | The proposed development is within land zoned Rural Conservation Zone. |
| | AM 1.2 | Not Applicable | |
| | AM 1.3 | Not Applicable | |
| Clause 52.47-2.1 Landscape, siting and design objectives | AM 2.1 | Applicable | This development must address this clause. |
| | AM 2.2 | Applicable | |
| | AM 2.3 | Applicable | |
| Clause 52.47-2.2 Landscape, siting and design objectives | AM 3.1 | Applicable | This development can meet this clause. |
| | AM 3.2 | Not Applicable | The proposed development is a dwelling and response to this measure is not required. |
| | AltM 3.3 | Not Applicable | Adjoining land will not be used for defendable space |
| | AltM 3.4 | Not Applicable | Approved measure 3.1 can be achieved. |
| | AltM 3.5 | Not Applicable | BAL FZ is not required |
| | AltM 3.6 | Not Applicable | |
| Clause 52.47-2.3 Landscape, siting and design objectives | AM 4.1 | Achieved | This development must address this clause. |
| | AM 4.2 | Not Applicable | The proposed development is a dwelling and response to this measure is not required. |
| Clause 52.47-2.4 Subdivision objectives | AM 5.1 | Not Applicable | This application is not a subdivision. |
| | AM 5.2 | Not Applicable | |
| | AM 5.3 | Not Applicable | |
| | AM 5.4 | Not Applicable | |
| | AM 5.5 | Not Applicable | |

## 8.1 52.47-2 Bushfire protection objectives

### 8.1.1 52.47-2.1 Landscape, siting and design objectives

Development is appropriate having regard to the nature of the bushfire risk arising from the surrounding landscape.

Development is sited to minimise the risk from bushfire.

Development is sited to provide safe access for vehicles, including emergency vehicles.

Building design minimises vulnerability to bushfire attack.

| Approved Measure | Requirement |
|---|---|
| AM 2.1 | **The bushfire risk to the development from the landscape beyond the site can be mitigated to an acceptable level.**<br><br>**Response:**<br><br>This report provides a comprehensive report on the bushfire hazards associated with the development site at 210 Jarosite Rd, Bells Beach. The site is able to mitigate the risks to an acceptable level as it can meet a BAL of 40.<br><br>The BAL of 40 can be met by using the following inputs;<br><br>• 'Forest Fire Danger Index'(FFDI) of 100 and<br>• Flame Temperature of 1090K.<br><br>The bushfire risk can be mitigated in the form of providing defendable space for a BAL of 40, appropriate water supply, access and egress. |
| AM 2.2 | **A building is sited to ensure the site best achieves the following:**<br><br>• **The maximum separation distance between the building and the bushfire hazard.**<br>• **The building is in close proximity to a public road.**<br>• **Access can be provided to the building for emergency service vehicles.**<br><br>**Response:**<br><br>The dwelling has been located to allow defendable space for a BAL of 40. It uses the siting to maximize the protection that neighbouring properties to the east and west provide.<br><br>The building has good access to a good quality public road being Jarosite Road that leads north east to the Ocean and further on to the Township of |

Torquay.

Access can be provided for emergency services.

| | |
|---|---|
| AM 2.3 | **A building is designed to reduce the accumulation of debris and entry of embers.**<br><br>**Response:**<br><br>The building will be designed and constructed to a BAL of 40 in accordance with the requirements detailed in AS 3959-2009.<br><br>The dwelling is proposed to be constructed from non combustible materials and will be ember resistant. |

### 8.1.2 52.47-2.2 Defendable space and construction objective

| Approved Measure | Requirement |
|---|---|
| AM 3.1 | **A building used for a dwelling (including an extension or alteration to a dwelling), a dependant person's unit, industry, office or retail premises is provided with defendable space in accordance with:**<br><br>• **Column A, B or C of Table 2 to Clause 52.47-3 wholly within the title boundaries of the land; or**<br>• **If there are significant siting constraints, Column D of Table 2 to Clause 52.47-3.**<br><br>**The building is constructed to the bushfire attack level that corresponds to the defendable space provided in accordance with Table 2 to Clause 52.47-3.**<br><br>**Response:**<br><br>The site is able to meet the defendable space requirements for a BAL of 40 as per Table 2 to Clause 52.47-3 and will be contained wholly within the property boundaries. |

### 8.1.3 52.47-2.3 Water supply and access objectives

| Approved Measure | Requirement |
|---|---|
| AM 4.1 | **A building used for a dwelling (including an extension or alteration to a dwelling), a dependant person's unit, industry, office or retail premises is provided with:**<br>• **A static water supply for fire fighting and property protection purposes specified in Table 4 to Clause 52.47-3.**<br>• **Vehicle access that is designed and constructed as specified in Table 5 to Clause 52.47-3.**<br>**The water supply may be in the same tank as other water supplies provided that a separate outlet is reserved for fire fighting water supplies.**<br>**Response:**<br>The dwelling is able to meet the water requirements by providing 10,000 Litres of water solely for the purposes of fire fighting and will allow fire authorities to get within 4 meters.<br>The site is able to provide access for emergency service vehicles and as the driveway is greater than 100m the property will provide a turning area for vehicles. |

# 9 REFERENCES

CFA (2011). FSG LUP 0003 Assessing vegetation in a bushfire management overlay (BMO. Country Fire Authority, Burwood East, Victoria.

CFA (2011). Landscaping for Bushfire: Garden design and plant selection. Country Fire Authority, Burwood East, Victoria.

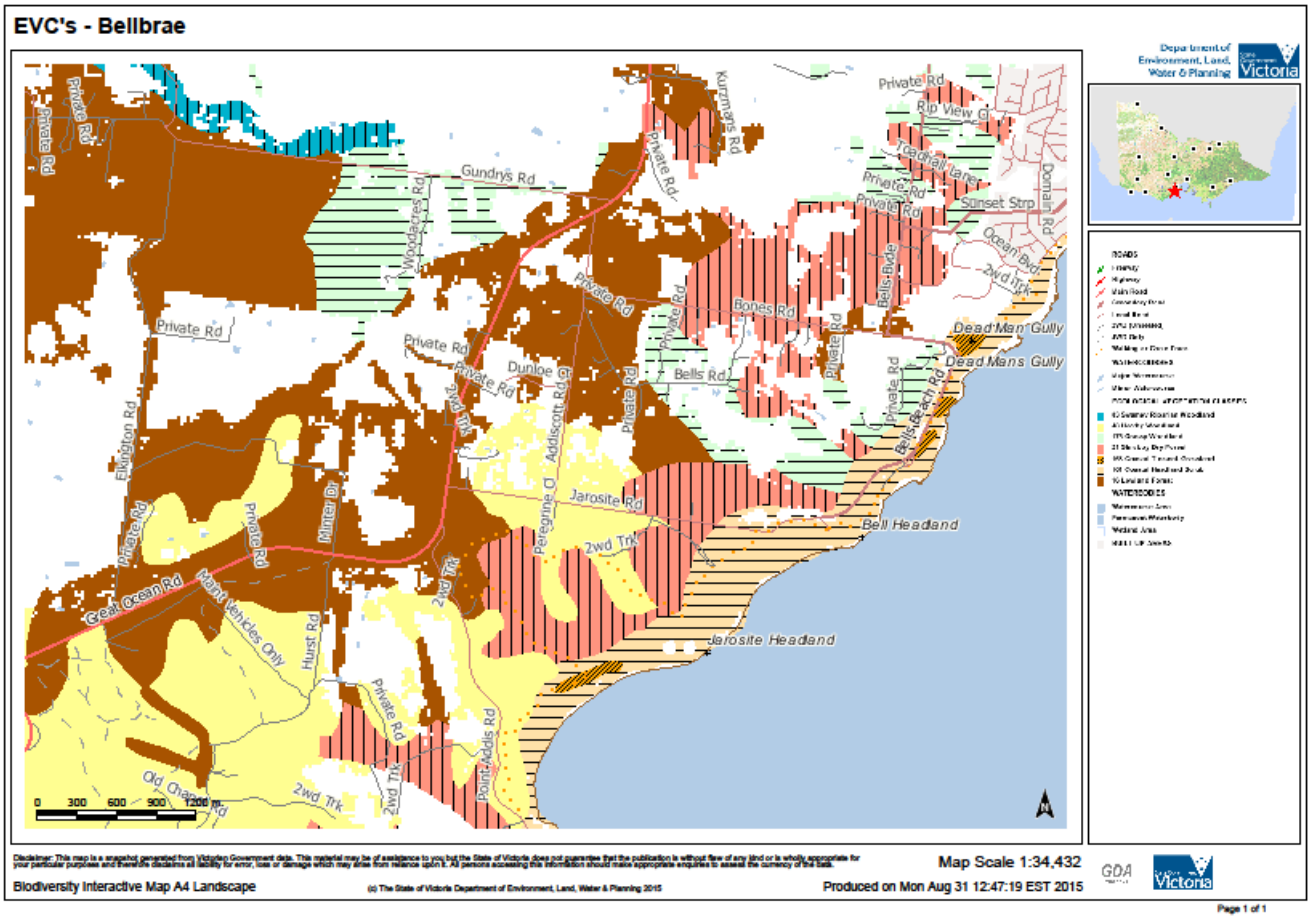
CFA (2012). FSG LUP 0002 Requirements for water supply and access in the Bushfire Management Overlay (BMO). Country Fire Authority, Burwood East, Victoria.

Department of Transport, Planning and Local Infrastructure (2014) Planning Practice Note 65 – Preparing and Assessing a Planning Application under the Bushfire Provisions in Planning Schemes. Victorian Government, Melbourne

Standards Australia (2009). AS 39359-2009 Construction of Buildings in Bushfire Prone Areas. Standards Australia, North Sydney, New South Wales.

# 10 APPENDICES

**Appendix 1 – EVC's of the surrounding area and their description.**




**EVC 48 – Heathy Woodland (Otway Ranges Bioregion) (Solid Yellow Area)**

Spans a variety of geologies but is generally associated with nutrient-poor soils including deep uniform sands (Aeolian or outwash) and Tertiary sand/clay which has been altered to form quartzite gravel. Eucalypt-dominated low woodland to 10m tall lacking a secondary tree layer and generally supporting a diverse array of narrow or ericoid-leaved shrubs except where frequent fire has reduced this to a dense cover of bracken. Geophytes and annuals can be quite common but the ground cover is normally fairly sparse.

Dominant tree species include *Eucalyptus oblique* (Messmate Stringybark) and *Eucalyptus baxteri* (Brown Stringybark).

**EVC 16 – Lowland Forest (Solid Brown Area)**

Open forest to 25m tall characterised by the diversity of species and life forms in each stratum. Includes a variety of heathy understorey shrubs. It grows on a wide variety of geology and soils.

Dominant tree species *Euclayptus oblique* (Messmate Stringybark), *Eucalyptus baxteri* (Brown Stringybark) and *Eucalyptus radiate* (Narrow-leaf Peppermint).

**EVC 21 – Shrubby Dry Forest (Pink with vertical line)**

Occurs on a range of geologies on exposed aspects such as ridge-lines and medium to steep upper slopes, often in high rainfall areas and on shallow infertile soils. The over storey is a low, open forest to 20m tall characterised by the diversity and variability of the eucalypts. The understory often lacks a secondary tree layer but contains a well-developed medium to low shrub layer. The ground layer is often very sparse with tussock-forming graminoids being the dominant life form.

Dominant tree species include *Eucalyptus tricarpa* (Red Ironbark), *Eucalyputs cypellocarpa* (Mountain Grey-gum) and *Eucalyptus oblique* (Messmate Stringybark).

**EVC 161 – Coastal Headland Scrub (Beige colour with horizontal line)**

Scub or low shrubland to 2m tall on steep, rocky coastal headlands often associated with cliffs exposed to the stresses of extreme salt-laden winds and salt spray from the south west. Occurs on shallow sands along rocky sections of the coast.

## Appendix 2 – Bushfire History and Prescribed Burns in the Area (DEPI – Biodiversity Interactive Map – showing bushfire history).

Figure 1 – Natural Bushfires in the area since 1970. Pink areas on the map indicate wildfires.

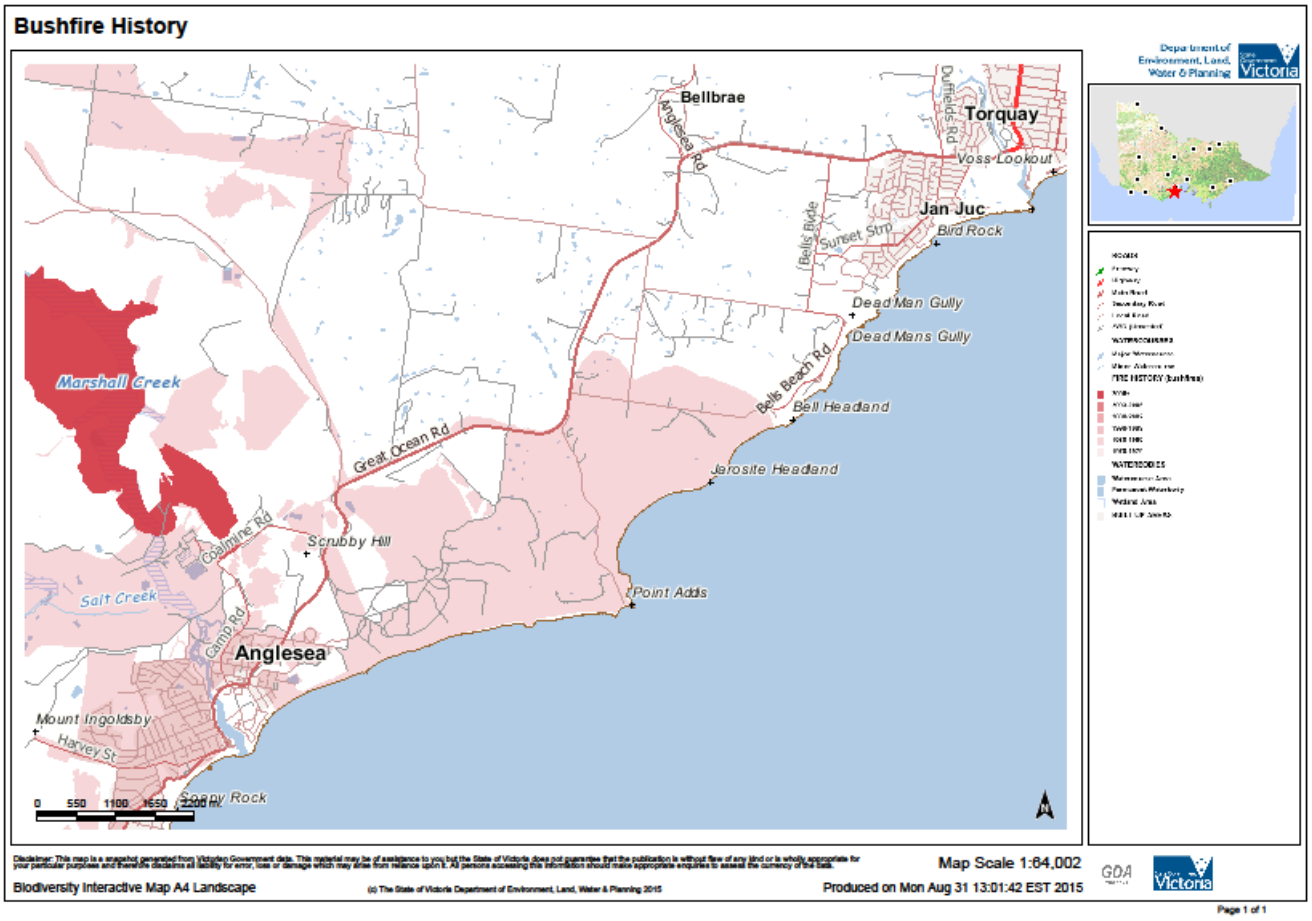


Figure 2 – Prescribed Burns in the area since 1970. Most of the prescribed burns indicated on the map shaded as areas of grey have occurred since the 2008 Black Saturday bushfires.