BUSHFIRE PLANNING AUSTRALIA

STRATEGIC BUSHFIRE STUDY & BUSHFIRE ASSESSMENT REPORT

Expansion of Sunrise Lifestyle Village

4029 & 4045 Nelson Bay Road, Bob's Farm

Prepared for Hometown Australia Communities Pty Ltd

Bushfire Planning Australia

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FPA AUSTRALIA BRONZE MEMBER Fire Protection Association Australia

BPAD Bushfire Planning & Design Accredited Practitioner Level 2

Disclaimer and Limitation

This report is prepared solely for Hometown Australia Communities Pty Ltd C/- ADW Johnson (the 'Client') for the specific purposes of only for which it is supplied (the 'Purpose'). This report is not for the benefit of any other person; either directly or indirectly and is strictly limited to the purpose and the facts and matters stated in it and will not be used for any other application.

This report is based on the site conditions surveyed at the time the document was prepared. The assessment of the bushfire threat made in this report is made in good faith based on the information available to Bushfire Planning Australia at the time.

The recommendations contained in this report are considered to be minimum standards and they do not guarantee that a building or assets will not be damaged in a bushfire. In the making of these comments and recommendations it should be understood that the focus of this document is to minimise the threat and impact of a bushfire.

Finally, the implementation of the adopted measures and recommendations within this report will contribute to the amelioration of the potential impact of any bushfire upon the development, but they do not and cannot guarantee that the area will not be affected by bushfire at some time.

Document Status: 2280 - SBS & BAR SFPP

Version	Status	Purpose	Author	Review Date
1	Draft	Draft for Review	Katrina Mukevski	18 October 2022
2	Draft	Draft for Client Review	Stuart Greville	2 November 2022
3	Final	Final for Submission	Stuart Greville	3 November 2022

Certification

As the author of this Strategic Bushfire Study (SBS) and Bushfire Assessment Report (BAR), I certify this SBS & BAR provides the detailed information required by the NSW Rural Fire Service under Clause 44 of the Rural Fires Regulation 2013 and Appendix 1 of Planning for Bushfire Protection 2019 for the purposes of an application for a bush fire safety authority under section 100B(4) of the Rural Fires Act 1997.

BPAD Bushfire Planning & Design Accredited Practitioner Level 2

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Accredited Bushfire Practitioner

BPAD-26202

Date: 3 November 2022

In signing the above, I declare the report is true and accurate to the best of my knowledge at the time of issue

Executive Summary

Bushfire Planning Australia (BPA) has been engaged by Hometown Australia Communities Pty Ltd (the 'Proponent') c/- ADW Johnson to undertake a Strategic Bushfire Study (SBS) and Bushfire Assessment Report (BAR) to support a Planning Proposal that seeks to amend the Port Stephens Local Environmental Plan 2013 (PSLEP) to permit *caravan parks* on the subject site.

The BAR has also been prepared for the proposed expansion to the Sunrise Lifestyle Village, a manufactured home estate (MHE), within Lot 3622 DP622485 and Lot 2 DP622229, known as 4029 and 4045 Nelson Bay Road, Bobs Farm.

The existing caravan park currently occupies Lot 51 DP1175028 and has development consent to operate 193 long-term sites. The proposed development site, Lot 3622 DP622485 and Lot 2 DP622229, are the adjoining sites to the east and occupied by a rural residential property. The proposed development includes the addition of 62 manufactured home dwelling sites and ancillary community facilities and services. All sites within the existing caravan park and any additional sites are restricted to long-term occupation only. All dwellings are occupied by long-term residents who have signed a land lease agreement with the Operator. A land lease agreement grants the resident the right to occupy the residential site within the caravan park.

A caravan park is defined as a Special Fire Protection Purpose (SFPP) under the NSW Rural Fire Service (RFS) document Planning for Bushfire Protection 2019 (PBP 2019). As the successful outcome of the Planning Proposal will permit the expansion of an existing SFPP, an assessment of the bushfire hazard the site is exposed to has been undertaken and an appropriate combination of bushfire protection measures are recommended to ensure any future development is not exposed to an unacceptable risk of bushfire attack.

This BAR found the site was exposed to a medium to high bushfire hazard located primarily to the south of the site which is mapped as Category 1 Vegetation in the NSW Bushfire Prone Land Map (RFS 2021). There is an ecotone between disturbed and remnant vegetation located along the northern and eastern boundaries of Lot 2 DP622229 which will be retained for native species as part of the Planning Proposal. The vegetation to be retained forms a fauna movement corridor and transitions from a *tall heath* to a *forest*.

This Bushfire Assessment Report (BAR) has been prepared in accordance with the submission requirements detailed in Appendix 2 of PBP 2019 and has demonstrated the proposed expansion satisfies the Aims and Objectives of PBP 2019, including the Specific Objectives for SFPP developments.

The following recommendations have been designed to enable the proposed development to achieve Performance Criteria for SFPP developments detailed in Section 6.8 of PBP 2019:

1. The areas within the site identified as an Asset Protection Zone in **Figure 18** shall be managed as an Inner Protection Area (IPA) as outlined within Appendix 4 of PBP 2019 and the RFS document *Standards for asset protection zones*;
2. All land within the site; with the exception of the land proposed to be zoned C2 Environmental Conservation, shall be maintained as an IPA as outlined in Appendix 4 of PBP 2019;
3. All future buildings to be constructed on the proposed sites shall have due regard to the specific considerations given in the National Construction Code: Building Code of Australia (BCA) which makes specific reference to Australian Standard AS3959-2018 Construction of buildings in bushfire prone areas (AS3959-2018) and the NASH Standard Steel Framed Construction in Bushfire Prone Areas;
4. Where the new dwellings are not required to be comply with the BCA, each dwelling shall be constructed in accordance with the relevant Bushfire Attack Level (BAL) identified in **Table 7**. An Approval to Operate (issued under Section 68 of the Local Government Act 1993) shall include a BAL Contour Plan and require each new dwelling to be constructed to the

nominated BAL rating. Furthermore, a suitably worded instrument(s) must be created pursuant to section 88 of the Conveyancing Act 1917 clearly outlining the require BAL ratings for each dwelling;

5. All new sites are to be connected to a reliable water supply network and that suitable fire hydrants are located throughout the development site that are clearly marked and provided for the purposes of bushfire protection. Fire hydrant spacing, sizing and pressure shall comply with AS2419.1 2005 and section 6.8.3 of PBP 2019;
6. The internal access road is to be designed and constructed in accordance with section 6.8.2 of PBP 2019 **or** as shown in the plans contained in **Appendix A**;
7. Consideration should be given to landscaping and fuel loads on site to decrease potential fire hazards on site; and
8. A Bushfire Emergency Management and Evacuation Plan (BEMEP) shall be prepared that is consistent with the RFS Guidelines 'Development Planning – A Guide to Developing a Bush Fire Emergency Management and Evacuation Plan December 2014'.

This assessment has been made based on the bushfire hazards observed in and around the site at the time of inspection and production (November 2022).

Should the above recommendations be implemented, the future caravan park will result in a better bushfire outcome as the existing bushfire risk should be suitably mitigated to offer an acceptable level of protection to life and property for those persons and assets occupying the site but they do not and cannot guarantee that the area will not be affected by bushfire at some time.

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Terms and Abbreviations

Abbreviation	Meaning
APZ	Asset Protection Zone
AS2419-2005	Australian Standard – Fire Hydrant Installations
AS3959-2018	Australian Standard – Construction of Buildings in Bush Fire Prone Areas
BAR	Bushfire Assessment Report
BCA	Building Code of Australia
BC Act	NSW Biodiversity Act 2016
BDAR	Biodiversity Development Assessment Report
BMP	Bush Fire Management Plan
BPA	Bush Fire Prone Area (Also Bushfire Prone Land)
BPL	Bush Fire Prone Land
BPLM	Bush Fire Prone Land Map
BPM	Bush Fire Protection Measures
DoE	Commonwealth Department of the Environment
DPI Water	NSW Department of Primary Industries – Water
EPA Act	NSW Environmental Planning and Assessment Act 1979
EPBC Act	Commonwealth Environment Protection and Biodiversity Conservation Act 1999
FDI	Fire Danger Index
FMP	Fuel Management Plan
ha	hectare
IPA	Inner Protection Area
LGA	Local Government Area
MHE	Manufactured Home Estate
NPWS	NSW National Parks and Wildlife Service
OPA	Outer Protection Area
OEH	NSW Office of Environment and Heritage
PSC	Port Stephens Council
PBP 2019	Planning for Bushfire Protection 2019
RF Act	Rural Fires Act 1997
RF Regulation	Rural Fires Regulation
RFS	NSW Rural Fire Service
SBS	Strategic Bushfire Study
TSC Act	NSW Threatened Species Conservation Act 1995 (as repealed)
VMP	Vegetation Management Plan

1. Introduction

Bushfire Planning Australia (BPA) has been engaged by Hometown Australia Communities Pty Ltd c/- ADW Johnson to undertake a Strategic Bushfire Study (SBS) and Bushfire Assessment Report (BAR) to support a Planning Proposal that seeks to amend the Port Stephens Local Environmental Plan 2013 (PSLEP) to permit *caravan parks* on the subject site.

The Planning Proposal will regularise the approved existing use on part of the Lot 51, where an approved caravan park is located. The caravan park is approved under DA-16-2013-790-4 and comprises 193 sites on which manufactured homes are currently located or being installed. It currently operates as an over 55s resort-style community, known as Sunrise Port Stephens. All existing homes are occupied by long-term residents who have signed a land lease agreement with the Operator. A land lease agreement grants the resident the right to occupy the residential site within the caravan park.

The Planning Proposal seeks to facilitate the extension of this use to the two parcels of land east of Lot 51 DP 1175028, being Lot 3622 DP 622485 and Lot 2 DP 622229. Subject to development consent and further approvals, an additional 62 manufactured homes could potentially be accommodated on the Subject Land. In addition, the LEP amendment has the potential to support an expansion of the existing community facilities on the Subject Land.

To achieve the above objectives, it is proposed to amend Schedule 1 of the PSCLEP 2013 to include an additional permitted use over the Subject Land for the purposes of a 'caravan park'.

In addition to the Schedule 1 amendment, this Planning Proposal will also rezone part of the site from RU2 Rural Landscape to C2 Environmental Conservation for the purposes of retaining vegetation as a corridor to connect vegetation north and south of the site. The retention of this land has resulted in the loss of sites and was proposed as part of the ecological "avoid and minimise" process.

The assessment aims to consider and assess the bushfire hazard and associated potential bushfire threat relevant to the proposed development, and to outline the minimum mitigative measures which would be required in accordance with the provisions of the New South Wales Rural Fire Service (RFS) publication *Planning for Bushfire Protection 2019* (PBP 2019) that has been released and adopted through the *Environmental Planning and Assessment Amendment* (Planning for Bushfire Protection) *Regulation 2007* and the *Rural Fires Regulation 2021*.

2. Site Description

Table 1: Site Description

Address	4029 & 4045 Nelson Bay Road, Bobs Farm
Title	Lot 3622 DP622485 Lot 2 DP622229
LGA	Port Stephens Council
Site Area	4.16 ha
Land Use Zone	RU2 Primary Production (**Figure 1**)
Context	The site is located between Trotter Road (north) and Nelson Bay Road (south). Both lots contain a dwelling and industrial shed. Vegetation exists along the southern, northern and eastern boundary edges, although most is managed and maintained. To the west of the proposed site, is the existing Sunrise Lifestyle Village, whilst to the east there is a small, isolated patch of vegetation.
Fire History	The site lies within a local government area with a Fire Danger Index (FDI) rating of 100.

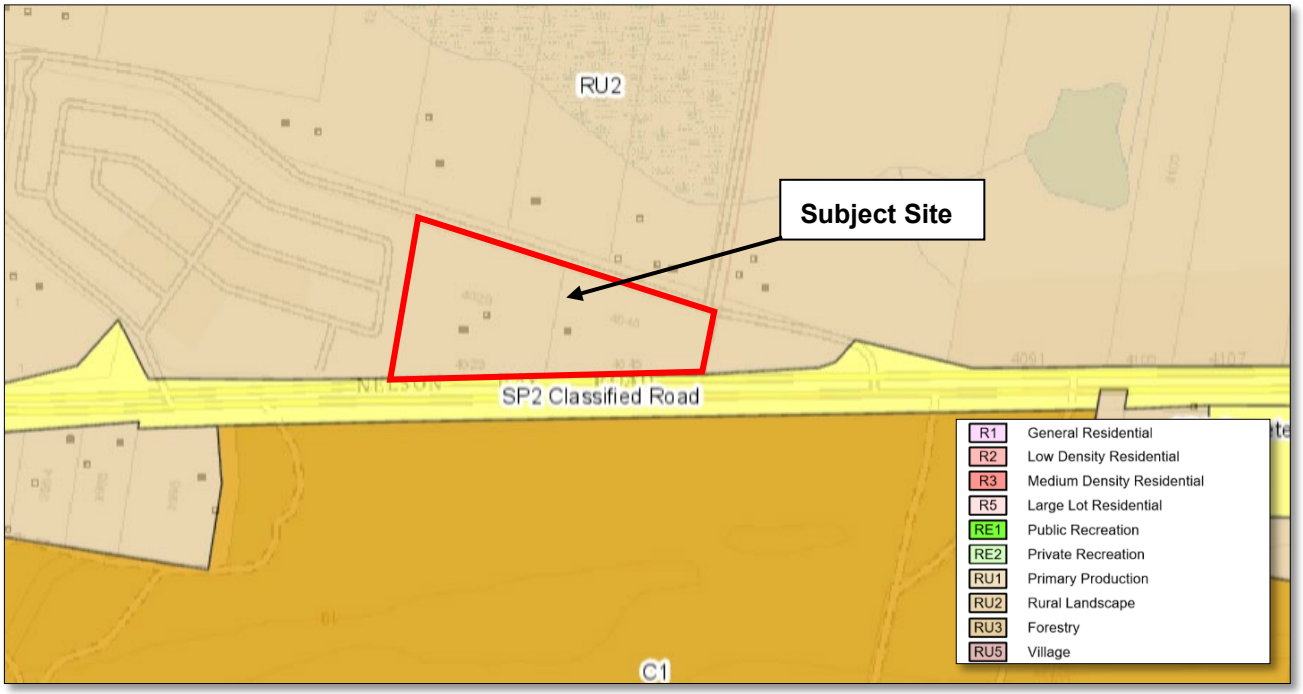

Figure 1: Port Stephens Local Environmental Plan 2013 (Land Zoning Map Sheet)

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Figure 2

Site Location

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Subject site
100m Buffer
140m Buffer

SOURCE:
Base Map © Department of Customer Service 2020

N
W
E
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0 250 500 750
Meters

A3 Scale: 1:15,000

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2.1. Bushfire Prone Land

Bushfire activity is prevalent in landscapes that carry fuel and the two predominant bushfire types are grassland and forest fires. Factors such as topographic characteristics and quantity of fuel loads influence the intensity and spread of fire. The scale of a bushfire hazard is tailored to the characteristics of the hazard, the size and characteristics of the affected population, types of land use exposed to bushfire, predicted development growth pressures and other factors affecting bushfire risk.

Figure 3 demonstrates the entire site is mapped as Vegetation Category 3 bushfire prone land. Vegetation Category 1 bushfire prone land exists within and beyond 140m north of the proposed site. Additionally, Vegetation Category 1 bushfire prone land exists to the south within and beyond 140m of the site and identified as the closest and primary bushfire hazard.

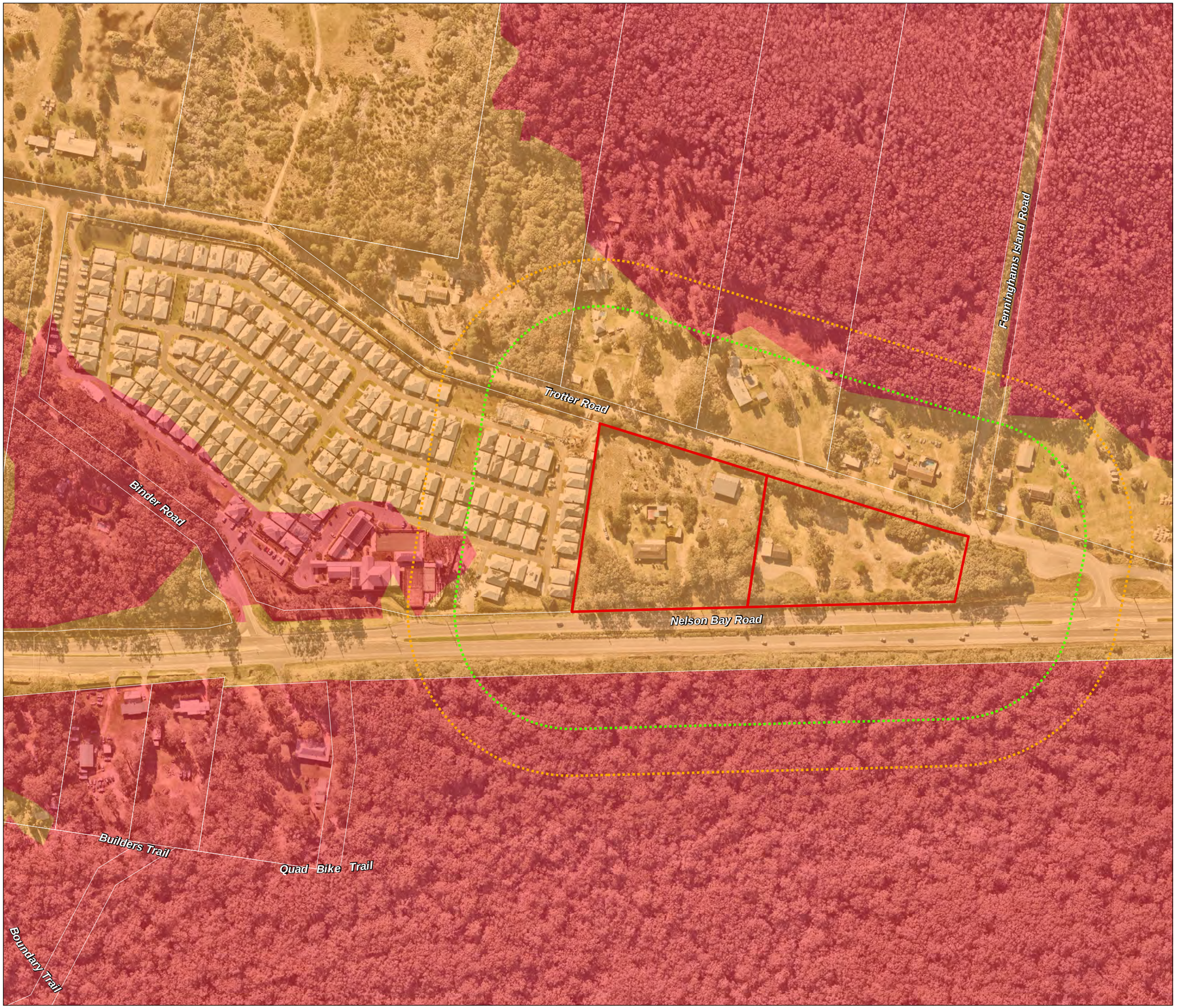

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Figure 3

NSW Bush Fire Prone Land

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- Subject Site
- 140m Buffer
- 100m Buffer

Bushfire Prone Land

- Vegetation Category 1
- Vegetation Category 3
- Buffer

SOURCE:
Cadastral Boundary: NSW Department of Finance, Services and Innovation 2022
Aerial photo: NearMap 08/07/2022
NSW Bush Fire Prone Land: NSW Rural Fire Service 2021

N
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0 25 50 75 100 125 150
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2.2. Background - Approved Development

Development consent was issued by Port Stephens Council on 26 August 2014 for a *caravan park* (DA-16-2013-790-4) on Lot 51; 4011 Nelson Bay Road, Bob's Farm. The approved development was subsequently modified on several occasions and the most recent consent permits 193 sites on which manufactured homes are currently located or being installed.

The most recent Bush Fire Safety Authority (RFS Ref: D19/1433) was issued by the RFS on 7 August 2019; subject to a combination of bushfire mitigation measures including APZs and construction standards for the manufactured homes.

Plate 1: Existing internal road network within Sunrise Village

Plate 2: Multiple visitor parking spaces provided outside carriageway of non-perimeter roads

2.3. Proposed Development

The Planning Proposal seeks to facilitate the extension of this adjoining use to the two parcels of land east of Lot 51 DP 1175028, being Lot 3622 DP 622485 and Lot 2 DP 622229. Subject to development consent and further approvals, an additional 62 manufactured homes could potentially be accommodated on the Subject Land. In addition, the LEP amendment has the potential to support an expansion of the existing community facilities on the Subject Land.

The proposed development is accessed by Trotter Road. The construction of new non-perimeter roads will connect to the existing Sunrise Lifestyle Village and provide direct access to each site.

Plans of the proposed development are contained in **Appendix A** and shown in **Figure 4**.

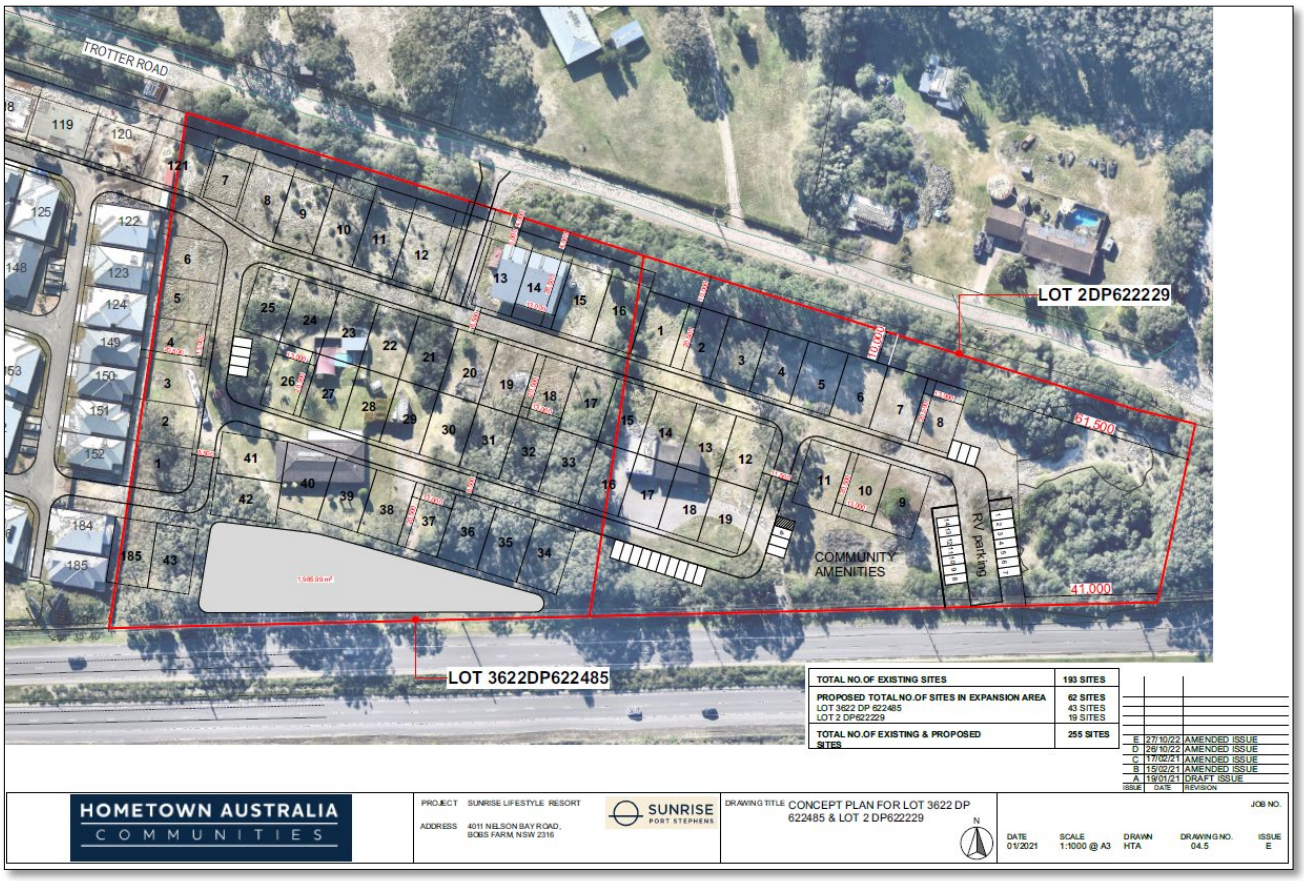

Figure 4: Proposed Development

3. Strategic Bushfire Study

3.1. Establishing Risk and Applying Treatment

The Strategic Bushfire Study (SBS) was introduced in NSW by Planning for Bush Fire Protection 2019 (PBP 2019). The SBS follows the principles of strategic planning generally in taking a long-term approach to land use planning and development expectations. The SBS aims to minimise or avoid the impact of natural hazards by taking a risk-based approach to the assessment of strategic planning policies and proposals. The SBS uses a macro-scale assessment, creates a risk profile and seeks treatment strategies to respond to the risk.

There are a number of national level guidance documents which provide helpful guidance in preparing strategic studies for natural hazard resilience. At a high level, the stage is set for consideration for natural hazards in strategic planning by the *Sendai Framework for Disaster Risk Reduction 2015 - 2030* (UNDRR, 2015), *The National Disaster Risk Reduction Framework* (Australian Government Department of Home Affairs, 2018), *Profiling Australia's Vulnerability: The interconnected causes and cascading effects of systemic disaster risk* (Australian Government Department of Home Affairs, 2018) and the *National Strategy for Disaster Resilience* (COAG 2011).

The *Land Use Planning for Disaster Resilient Communities* (the Handbook) published in 2020 by the Australian Institute for Disaster Resilience (AIDR) focuses on reducing disaster risk by improving strategic planning processes. The handbook aims to reduce both vulnerability and exposure of communities to natural hazard scenarios.

By considering natural hazards early and through its processes, land use planning can evaluate and select land use mechanisms to treat disaster risk.

The actions proposed by the Handbook are to understand disaster risk, make accountable decisions, establish governance, ownership and responsibility and ultimately, attract enhanced investment to reduce the risk. Ultimately, the goal is to make decisions which avoid risk. However, accepting that some level of risk is inevitable, the concept of risk tolerance and acceptable risk is highlighted. The Handbook uses a key principle introduced by the Planning Institute of Australia *National Land Use Planning Guidelines for Disaster Resilient Communities* (2015) which is the ALARP principle (As Low As Reasonably Practicable). This revolves around identifying risks that are broadly acceptable, tolerable, or generally intolerable and requires the identification of risk treatment options to move more towards the tolerable or broadly acceptable categories.

The Handbook also highlights the role that land use planning can play in climate change mitigation and adaptation. Future climate change models should be identified and utilised in the process of data gathering and analysis, whilst also acknowledging the uncertainties associated with those models.

The relationship with emergency management principles is highlighted by the Handbook. The integration of risk management and land use planning is recommended. The National Emergency Risk Assessment Guidelines produced by AIDR sets out the following structure for evaluating risk and applying risk treatment (taken from NERAG):

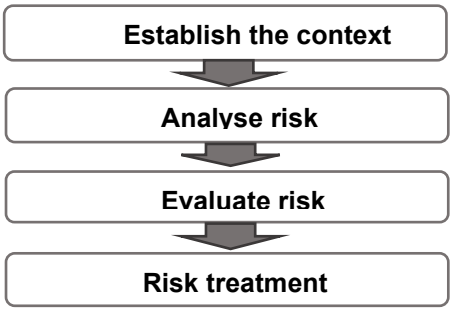

Figure 5: NERAG Risk Assessment Methodology

This process is appropriate for the SBS and will be followed to establish the risk and determine recommended risk treatments.

3.2. Ministerial Directions

Legislatively, planning proposals must follow the Ministerial Directions under Section 9.1(2) of the *Environmental Planning and Assessment Act 1979 (*EP&A Act*)*. Direction 4.3 requires a planning proposal, that is in proximity to land mapped as bushfire prone land, to have regard to PBP 2019, introduce controls that avoid placing inappropriate developments in hazardous areas and ensure that bushfire hazard reduction is not prohibited within the APZ.

A planning proposal must, where development is proposed, comply with the following provisions:

3(a) provide an Asset Protection Zone (APZ) incorporating at a minimum:

- *i. an Inner Protection Area bounded by a perimeter road or reserve which circumscribes the hazard side of the land intended for development and has a building line consistent with the incorporation of an APZ, within the property, and*
- *ii. an Outer Protection Area managed for hazard reduction and located on the bushland side of the perimeter road,*

3(b) for infill development (that is development within an already subdivided area), where an appropriate APZ cannot be achieved, provide for an appropriate performance standard, in consultation with the NSW Rural Fire Service. If the provisions of the planning proposal permit Special Fire Protection Purposes (as defined under section 100B of the Rural Fires Act 1997), the APZ provisions must be complied with,

3(c) contain provisions for two-way access roads which link to perimeter roads and/or to fire trail networks,

3(d) contain provisions for adequate water supply for firefighting purposes,

3(e) minimise the perimeter of the area of land interfacing the hazard which may be developed,

3(f) introduce controls on the placement of combustible materials in the Inner Protection Area.

3.3. Aim of the SBS

In accordance with PBP 2019, the Stategic Bushfire Study is a high level assessment that identifies land affected by natural hazards and directs development away from inappropriate and constrained lands. In a bush fire context, strategic planning must ensure that future land uses are in appropriate locations to minimise the risk to life and property from bush fire attack. Services and infrastructure that facilitate effective suppression of bush fires also needs to be provided for at the earliest stages of planning.

The bushfire risk is considered at the macro-scale, looking at fire runs, steep slopes and any areas of isolation. The amount of proposed development interfacing vegetation will also be considered. Firefighting access and evacuation potential must be considered and an assessment of traffic volumes and evacuation routes will be required. The potential for these evacuation routes to be non-trafficable during a bush fire event will be factored into the assessment.

This SBS follows the considerations outlined within Table 4.2.1 of PBP 2019 to identify and analyse the risk profile and apply risk treatment measures.

The aim of the SBS is to meet the following principles:

- ensure land is suitable for development in the context of bush fire risk;
- ensure new development on bush fire prone land will comply with PBP 2019;
- minimise reliance on performance-based solutions;
- provide adequate infrastructure associated with emergency evacuation and firefighting operations; and
- facilitate appropriate ongoing land management practices.

3.4. Bushfire Landscape Assessment

A bushfire landscape assessment considers the likelihood of a bushfire approaching an area, its potential severity and intensity, and the resultant impact on life and property in the context of the broader surrounding landscape.

With regard to proposed site, the bushfire hazard, potential fire behaviour, history of bushfires and fire runs, and operational response was assessed with the outcomes addressed in the following sections.

3.4.1. Vegetation

An assessment of vegetation is important in determining risk as different types of vegetation burn differently across the landscape. This is largely due to location and topography, structure and arrangement and available surface, elevated and canopy fuel loads.

Grasses and heath burn more quickly and erratically with fire consuming a large proportion of the plant matter, as they are influenced by finer fuels, open air, exposed drying conditions and variations in wind speed and direction, whilst forests burn with greater intensity due to substantial amounts of taller, dense and woodier fuels. The amount of plant matter consumed by forest fires also varies due to the availability of fine fuel loads, fuel moisture and localised wind conditions.

It is these traits in vegetation that determine potential radiant heat and flame characteristics which in turn define building setback requirements in accordance with PBP 2019.

Vegetation within the proposed site area has been mapped by Department of Planning and Environment 2022, with this work supported by onsite field investigations in accordance with the site assessment methodologies within Appendix 1 of PBP 2019 (carried out by BPA on 2 November 2022).

The vegetation communities within the study area have been characterised into structural formations according to David Keith (2004) *Ocean Shores to Desert Dunes* and PBP 2019 to determine likely maximum fuel loads in accordance with the NSW RFS fact sheet *Comprehensive Vegetation Fuel Loads (2019)* (**Table 2**).

Table 2: Vegetation Communities and Corresponding Structural Formations and Fuel Loads

Vegetation Community	Structural formation (Keith 2004)	Structural formation (PBP 2019)	Overall fuel load (including surface, elevated, bark and canopy) tonnes/ha
Coastal Dune Dry Sclerophyll Forest	Dry Sclerophyll Forest (Shrubby)	Forest	31.1
Coastal Headland Heaths	Tall Heath	Tall Heath	36.9
Coastal Swamp Forest	Forested Wetland	Forest	34.1

Vegetation located along the southern site boundary was identified as a *Forest*, namely *Coastal Dune Dry Sclerophyll Forest,* whilst *Coastal Headland Heaths* were identified along the north / north-eastern site boundary.

Vegetation surrounding the site was identified as *Forests*, namely *Coastal Dune Dry Sclerophyll Forest* and *Coastal Swamp Forest*. The *Coastal Swamp Forest* extends north of Trotter Road and rural properties, also located north of the site. Within and beyond 140m south of the site, separated by Nelson Bay Road, *Coastal Dune Dry Sclerophyll Forest* is present and confirmed as the primary bushfire hazard (**Figure 6**).

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Figure 6

NSW State Vegetation Type (Class)

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Subject Site
140m Buffer
100m Buffer

Vegetation Class

- Coastal Headland Heaths
- Coastal Floodplain Wetlands
- Coastal Swamp Forests
- Coastal Dune Dry Sclerophyll Forests
- Not native vegetation

SOURCE:
Cadastral Boundary: NSW Department of Finance, Services and Innovation 2022
Aerial photo: NearMap 08/07/2022
Vegetation: © State Government of NSW and Department of Planning and Environment 2022

N W E S

0 25 50 75 100 125 150
Meters

A3 Scale: 1:3,000

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3.4.2. Topography

Topography and slope play a significant role in influencing the rate of fire spread and fire behaviour in relation to the potential for canopy involvement.

Research shows that the speed of an advancing bushfire front will double with every 10 degree increase in slope, so that on a 20 degree slope, its speed of advancement is four times greater than on flat ground. This is because the radiation and convection a fire creates preheats the unburned fuel ahead of the fire front causing it to combust at a quicker rate. This is done more effectively upslope than down. Fuel distributed across every layer of the vegetation community, in effect creating a ladder, also contributes to the likelihood of fire transfer to the canopy. This transfer is also more effective on steeper slopes.

Digital Elevation Modelling (DEM) shows us the topography within the locality of Bobs Farm ranges from peaks at 42 metres above sea level in parts of the Worimi National Park, approximately 3.7kms south-west of the site, to the bottom of Tilligerry Nature Reserve at 1 metre above sea level, within 1 km north of the site (**Figure 7**).

An assessment of the effective slope (that which sits underneath the bushfire hazardous vegetation) impacting the study area was undertaken using LIDAR point cloud data, DEM (NSW LPI) and results from field investigations carried out in October 2022. An assessment of the slope over a distance of 100m in the hazard direction, as is required within Appendix 1 of PBP 2019, was undertaken. Results revealed slopes within the study area to be mostly flat with a slight downslope of less than 2 degrees north of the site and a slight upslope of less than 1 degree south of the site (**Figure 8**).

In accordance with PBP 2019, development on steeper slopes, where the bushfire threat is downhill and has the potential to increase the rate of spread and intensity of bushfire, requires larger setbacks. Section 4 of this report addresses Asset Protection Zones and building setbacks commensurate with slope surveyed within the study area to achieve radiant heat levels ≤29kW/m^2.

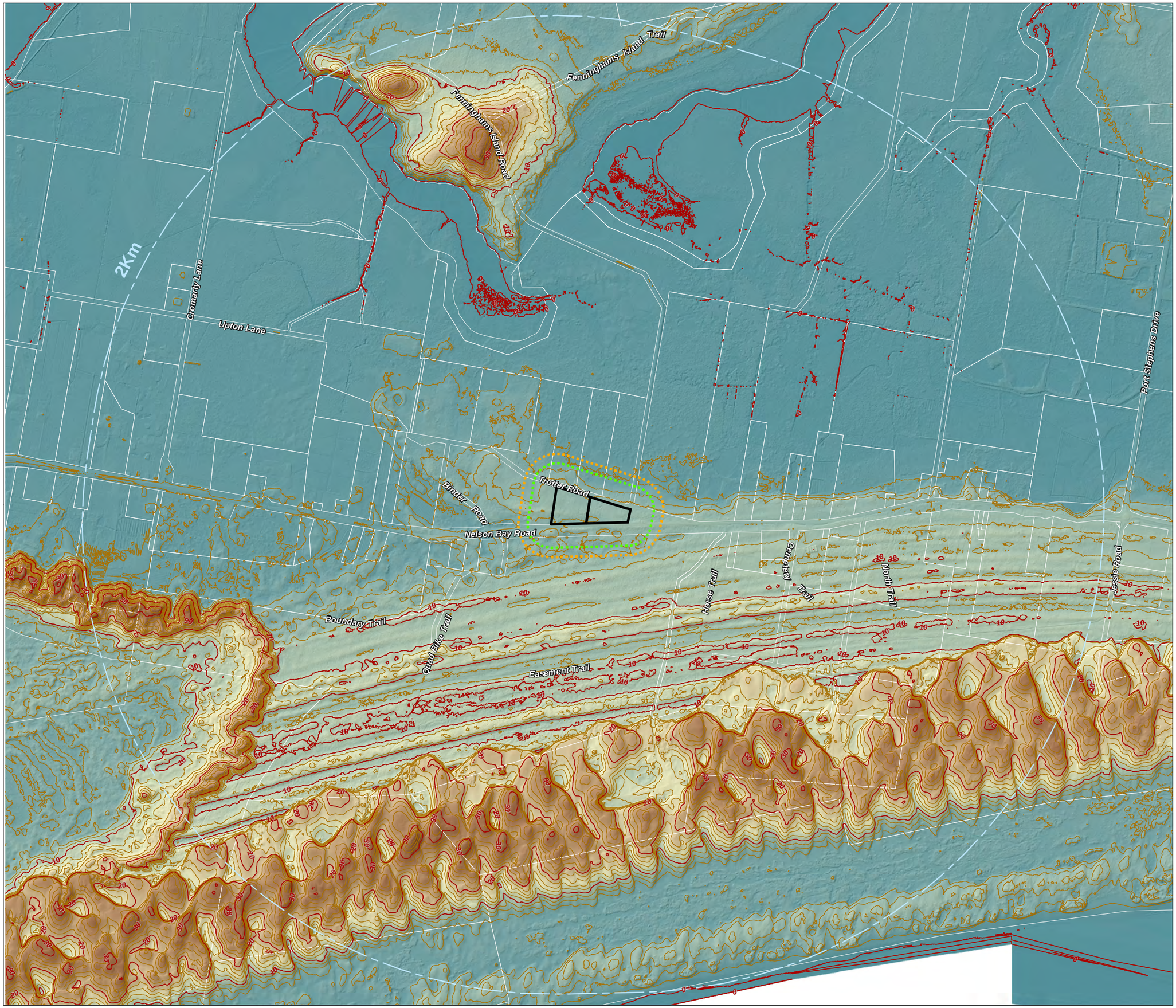

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Figure 7

Digital Elevation Model - 2Km

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- Subject Site
- 140m Buffer
- 100m Buffer
- Contour (10m)
- Contour (2m)

Elevation (AHD)
High : 38m
Low : 0m

SOURCE:
Cadastral Boundary: NSW Department of Finance, Services and Innovation 2022
Surface analysis based on Port Stephens1 metre Resolution LiDAR © Department Finance, Services and Innovation 2012

N W E S

0 250 500 750
Meters

A3 Scale: 1:15,000

File:2280-BobsFarm-Fig8-DEM-2Km-221102 Date: 2/11/2022

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Figure 8

Slope Analysis: LiDAR - 2Km

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Subject Site
140m Buffer
100m Buffer

Slope

0° - 5°
5° - 10°
10° - 15°
15° - 20°
>20°

SOURCE:
Cadastral Boundary: NSW Department of Finance, Services and Innovation 2022
Aerial photo: Maxar 2021
Surface analysis based on Port Stephens1 metre Resolution LiDAR © Department Finance, Services and Innovation 2012

N
W E
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0 250 500 750
Meters

A3 Scale: 1:15,000

File:2280-BobsFarm-Fig9-SlopeLiDAR-2Km-221102 Date: 2/11/2022

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3.4.3. Weather and Climate

The typical/average climate varies across the Port Stephens LGA from warm subtropical with the high altitude areas tending toward warm temperature. According to the *Lower Hunter Bush Fire Management Committee Bush Fire Risk Management Plan (2009)* (BFRMP), which includes the Port Stephens LGA, the official bushfire danger period ordinarily begins on 1 September and ends on 31 March.

Strong north-west to south-west winds often prevail within this time of year. Longer bush fire seasons occur when summer rainfall is lower than normal, with the bush fire season extending through Summer to early Autumn. Serious fires have occurred late in the season under dry summer conditions.

Prevailing weather conditions associated with the bushfire season in the Lower Hunter BFMC areas are north-westerly winds accompanied by high daytime temperatures and low relative humidity. There are also frequently dry lightning storms in the western areas occurring during the bushfire season.

The Forest Fire Danger Index (FFDI) given to the Port Stephens region is 100. The index is calculated from weather station data and is based on representative values of wind speed, temperature, humidity and fuel conditions.

The index represents a 1:50 year fire weather scenario and is applied to methodologies in calculating anticipated bushfire attack levels. It is possible that due to local variations in elevation, slope, and aspect, FFDI values at any point location may reflect values which are higher or lower than 100 resulting in different rates of fire spread across a landscape. **Table 3** provides a brief overview of point location weather data recorded at Bobs Farm (closest weather station with climate statistics to Williamtown RAAF BOM Site Number: 061078).

Table 3: Climate Statistics Recorded at Williamtown RAAF Weather Station (BOM Climate Statistics for Australian Locations, October 2022)

Weather Station	Williamtown RAAF
Mean maximum temp (degrees)	Highest 28.3 (January), Lowest 6.5 (July)
Highest temp (degrees)	45.5 (4 Jan 2020)
Mean number of days ≥ 30 degrees	9.4 (January)
Mean rainfall (mm)	Highest 128.3 (March), Lowest 60.6 (September)
Mean 3pm relative humidity (%)	Highest 62 (February), Lowest 50 (August September)
Mean 3pm windspeed (km/h)	Highest 23.5 (November/ December), Lowest 15.8 (May)
Lowest temp (degrees)	-3.9 (18 July 1970)
Mean minimum temp (degrees)	Highest 18.2 (January), Lowest 6.5 (July)

Climate change is influencing the frequency and severity of dangerous bushfire conditions in Australia. Fire risk is affected by four main factors, fuel load, fuel dryness, weather and ignition. Understanding the impacts of climate change on bushfires in NSW, relies on how climate change might affect these factors.

- Vegetation (ie fuel) growth will be affected by global increases in greenhouse gas emissions such as carbon dioxide as well as changes to rainfall patterns.
- Climate models have predicted that NSW will experience warmer drier periods of weather, drying vegetation and increasing bushfire risk. The 2019/2020 Black Summer bushfire season was predeeded by three years of increasing drought conditions.
- The risk of fire is increased by low rainfall and humidity and high temperature and wind speeds. There have been significant changes observed in recent decades towards more dangerous bushfire weather conditions for various regions of Australia. Observed changes in southern and eastern Australia include an earlier start to the bushfire season with dangerous weather conditions occurring significantly earlier in spring than they ever used to.
- In relation to fire ignition, there is some indication that climate change could influence the risk of ignitions from dry-lightning storms. Additionally, there has recently been a number of devastating fire events in Australia associated with extreme pyroconvection (including thunderstorm development in a fire plume), with recent research indicating a long-term trend towards increased risk factors associated with pyroconvection in southeast Australia.

According to the BFRMP, temperatures have been increasing in the Lower Hunter Region in recent decades. This warming trend is expected to continue, with anticipated considerable rainfall variability across seasons and from year to year. These projected changes include increasing maximum and minimum temperatures, increasing number of hot days, decreasing number of cold nights together with winter rainfall and increasing Autumn and Spring rainfall. Average fire weather and severe fire weather days are projected to increase in Summer and Spring.

In addition to the changing weather conditions, it is anticipated that the potential for wildfire ignition will increase and fuels may also change. There is increased capacity for lightning strikes within the landscape due to potentially more volatile weather conditions, increased ignition potential could lead to more challenging firefighting conditions. Over the longer term, fuels can become drier, areas of forested wetland or forest could become drier with a higher propensity to burn. The increased risk of hotter fires occurring on a more regular basis can also increase the risk of vegetation communities, such as forest, being impacted more frequently by fire and taking hundreds of years to recover (environment.nsw.gov.au).

In planning for a climate change future, the following mechanisms are recommended:

- Required setbacks from bushfire hazardous vegetation commensurate with an FFDI 100;
- Mechanical fuel reduction, where achievable, as opposed to controlled burning;
- Alternative landscaping initiatives and garden design that relies more on non combustible elements and use of succulent and drought resistant plantings; and
- Improved emergency management planning and procedures.

3.4.4. Bushfire Behaviour and Fire History

Information on fire history is a useful factor in understanding fire frequency and bushfire risk. Review of available fire history data within and surrounding the Port Stephens LGA indicates two (2) fires have been recorded over the last 10 years.

The largest and closest fire to the subject site was recorded in 2017, approximately 400m north-east of the site, across multiple rural properties whilst the other fire occurred in 2012, approximately 1.5km north-west of the site, north of Bobs Farm Creek (**Figure 9**).

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Figure 9

NSW Fire History

BUSHFIRE PLANNING AUSTRALIA

Subject site
100m Buffer
140m Buffer

Year of Fire

2012
2017

SOURCE:
Base Map © Department of Customer Service 2020
Fire History: NSW Rural Fire Service 2022

N
W E
S

0 250 500 750
Meters

A3 Scale: 1:15,000

File:2280-BobsFarm-Fig7-FireHistory-221027 Date: 27/10/2022

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3.4.4.1. Lower Hunter Bush Fire Risk Management Plan

According to the Bush Fire Risk Management Plan (BFRMP) the Port Stephens LGA has on average 200 bushfires per year, of which 3 on average can be considered to be major fires. The main sources of ignition include:

- Escapes from legal burning off;
- Incendiarism / arson; and
- Arcing power lines.

The BFRMP confirms there are no assets, except for an endangered flora, at risk of bushfire impact within the Bobs Farm area. **Figure 10** provides a snapshot of the study areas assets at risk (indicated as red and orange hatching and icons) as identified within the Lower Hunter BFRMP and specifically for the Bobs Farm area.

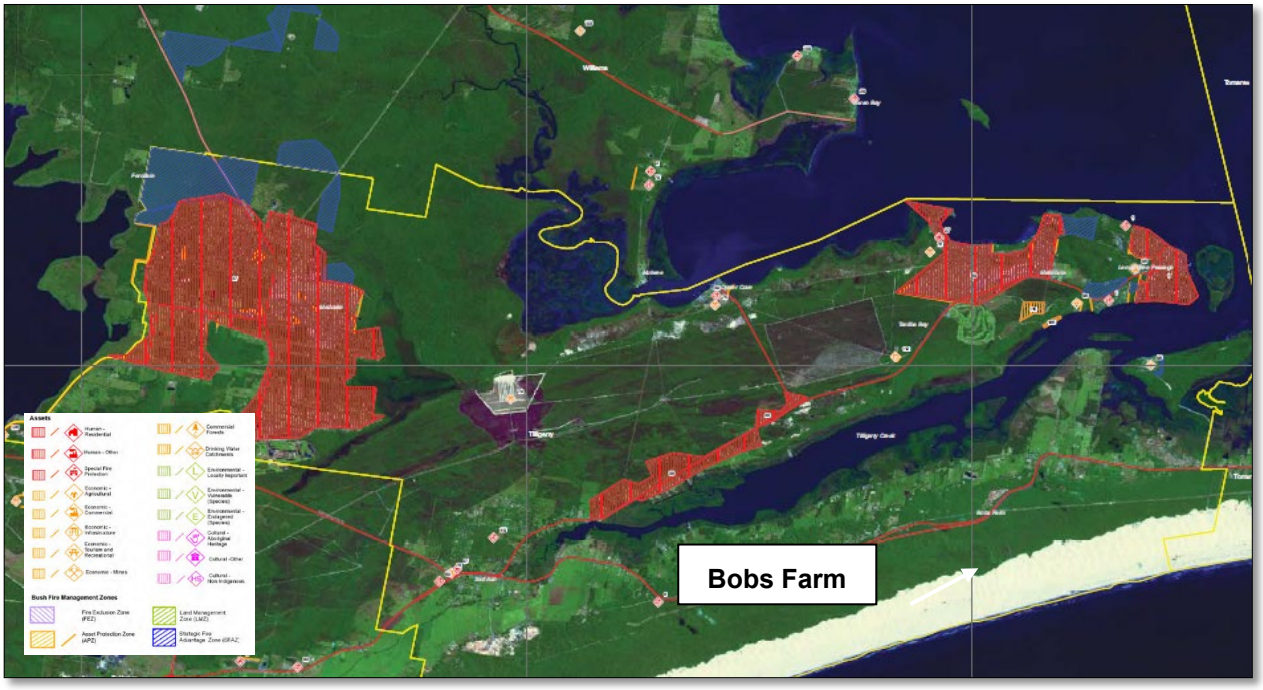

Figure 10: Human Settlement Assets Within Lower Hunter BFRMP

3.5. Land Use Assessment

A land use assessment identifies the appropriateness of siting different land uses in particular locations based on risk profiles.

Under the *Rural Fires Act 1997* and PBP 2019 the proposed land uses fall mostly into the category of residential infill and other development. PBP provides performance criteria for the proposed uses.

Using an FFDI of 100 and the vegetation formations and effective slope described in Section 4.8 of this report, APZ setback requirements were calculated in accordance with Section 6.8 and Table A1.12.2 of PBP 2019.

3.6. Access and Egress

PBP requires sufficient access with design objectives that enable safe evacuation away from an area whilst facilitating adequate emergency and operational response. All areas affected by bushfire prone land should have an alternate access or egress option dependant on bushfire risk, density of development, population and the chances of roads being cut-off by fire, smoke and accidents for prolonged periods of time.

Current access/egress within the study area allows distribution of local traffic in and around the coastal township. Access routes in and out of Bobs Farm is limited to Nelson Bay Road.

Minor access roads between the more major transport routes allows for emergency response and traffic flow of the current population in and out of the area. An increase in density, however, as is experienced during the seasonal summer periods and with potential additional development, may see congestion of roads at any one period of time.

Due to the location of the main access/egress routes currently dissecting vegetated corridors into Bobs Farm there is a high probability that impedance by smoke and fire could occur which may also hinder evacuation timeframes and impose implications from a safety perspective with roads being cut off.

The proposed development must also ensure there is adequate access/egress. Section 6.8 of PBP requires a development to provide safe operational access to structures and water supply for emergency services while residents are seeking to evacuate.

All new roads would need to comply with the following requirements, in accordance with Table 6.8b of PBP:

- ❑ All roads are two-wheel drive, sealed, all-weather roads;
- ❑ A secondary access is provided to the development;
- ❑ Traffic management devices do no prohibit access by emergency services vehicles;
- ❑ Maximum grades for sealed roads do not exceed 15 degrees and an average grade of not more than 10 degrees;
- ❑ Carriageway width kerb to kerb shall be a minimum of 5.5 metres and have a minimum vertical clearance of 4 metres to overhanging obstructions and tree branches;
- ❑ All parking shall be provided outside of the carriageway width;
- ❑ Curves of roads shall have a minimum inner radius of 6 metres and crossfall shall not exceed 3 degrees;
- ❑ Dead end roads incorporate a minimum 12 metres outer radius turning circle and are clearly sign posted as a dead end;
- ❑ One way only public access roads are no less than 3.5 metres wide and have designated parking bays with hydrants located outside of these areas to ensure accessibility to reticulated water;
- ❑ The capacity of roads/bridges/causeways is sufficient to carry fully loaded firefighting vehicles (up to 23 tonnes) with bridges/causeways clearly indicating load rating;
- ❑ Perimeter roads are two-way with a minimum carriageway width of 8 metres kerb to kerb;
- ❑ Where kerb and guttering is provided on perimeter roads, roll top kerbing should be used to the hazard side of the road.

There is no impediment to these standards being achieved. The existing Sunrise Village is directly accessible from Binder Road and a second emergency egress is provided at the northern end of the village to Trotter Road. The proposed extension provides a third exit point from the site to Trotter

Road. All three access routes provide immediate access to Nelson Bay Road, in both directions (east and west) which is a separated dual lane carriegway. The increased population on the subject site is unlikely to affect the capacity of Nelson Bay Road. Furthermore, the existing MHE operates a community bus which is available to evacuate residents who do not have access to private vehicles.

Plate 3: Access to Sunrise Village from Nelson Bay Road is via Binder Road

Plate 4: Emergency egress from existing Sunrise Village to Trotter Road

3.7. Emergency Services

With an increase in population comes a growing demand on emergency services and it is prudent that consideration be given to the future impact on firefighter numbers, appliances, infrastructure, training and response time. Currently within a 30-kilometre radius of the study area there are three Rural Fire Brigades, and two Fire and Rescue NSW fire stations (**Table 4**).

Their locations are spaced kilometres apart which may impact quick response to bushfire and building fire emergencies and has in previous times often relied upon attendance from out of area brigades to assist with larger bushfire emergencies.

Table 4: Fire Brigades within 30kms of the Study Area

Rural Fire Brigades	Address	Distance to Subject Site
Salt Ash Rural Fire Station	2 Michael Drive, Salt Ash	14km or 12 minutes
Tilligerry Rural Fire Brigade	1 Success Street, Tanilba Bay	24.3km or 19 minutes
Medowie Fire Station	47B Ferodale Road, Medowie	22.7km or 18 minutes

Fire & Rescue NSW Stations	Address	Distance to Subject Site
Fire & Rescue Salamander Bay	194 Salamander Way, Salamander Bay	9.3km or 7 minutes
Raymond Terrace	5 Leisure Way, Raymond Terrace	27.8km or 22 minutes

Due to the small number of Rural Fire Brigades and FRNSW stations there is a significant requirement for the community to understand their risk and ensure they have a bushfire survival plan that outlines their emergency arrangements and course of action, particularly where there is tourist accommodation. Discussions with NSW RFS confirmed that education of both the existing and proposed community would be a significant benefit in undertaking safe evacuation of the area. It was clear from our discussions that an informed community is easier to evacuate. Providing the community with information regarding potential evacuation routes and timing of evacuation, in line with the BTS, would significantly assist a safe evacuation process.

Potential growth in population should also prompt the Port Stephens Council and RFS District Office to assess the implications on resource capabilities and the need for extra bushfire management and community advisory roles, stations, firefighting volunteers, equipment and/or increased training opportunities (ie Breathing Apparatus and village training) to cater for future development and capacity, particularly in those areas adjacent to substantial areas of bushland.

3.8. Infrastructure

An assessment of the issues associated with infrastructure and utilities considers the life safety issues of fire in proximity to high voltage power lines and natural gas supply lines and the pressures a major bushfire event puts on flow rates of reticulated water systems and telecommunications infrastructure.

Above ground low and high voltage power lines exist in the Bobs Farm region. Generally, the energy authority's vegetation management policies and procedures assist with managing fire risks associated with existing vegetation within close proximity to powerlines to prevent ignitions.

Any new development as a result of rezoning can site electricity, and communication cables underground so as to both reduce the bushfire risk from sparking power lines and protect the infrastructure supply in a bushfire event.

The extent of the existing water supply is such that an increase in demand should not detrimentally impact water pressure and flow to the study area. Additional static water supply systems can be recommended with new development to lessen dependence on reticulated systems.

In accordance with Section 5.3.3 of PBP, any new development shall provide adequate services of water for the protection of buildings during and after the passage of a bushfire and will locate gas and electricity so as not to contribute to the risk of fire to any building.

- Fire hydrant spacing, sizing, flows and pressure will comply with AS 2419.1 – 2005. Hydrants will be located outside of parking reserves and road carriageways.
- All sites within proposed developments will be connected to the internal reticulated water supply.
- All electricity services will be located underground.
- Any reticulated or bottled gas should be installed and maintained according to the requirements of the relevant authorities and AS 1596-2014.

3.9. Adjoining Land

Consideration of the implications of a change in land use on adjoining land, including increased pressure on bushfire protection measures, should also be undertaken.

The anticipated impact on adjoining land would be:

- An increase in traffic to the local area and added dependence on reticulated water supply, both of which have been addressed in the sections above; and
- Pressures on landowners and management agencies to more frequently manage bushfire hazardous vegetation on their properties.

With regards to the latter, although Asset Protection Zones are expected to be provided for wholly within the boundary of developable sites, there may be increased pressures for prescribed burning to complement bushfire protection measures, particularly in the larger tracts of vegetation leading into Bobs Farm. Given the biodiversity values of the study area, fire frequencies will need to be directed by already known and established fire regimes and seasonality so as to maintain plant growth cycles, habitat and breeding opportunities of fauna species.

4. Bushfire Hazard Assessment

4.1. Aims and Objectives

The assessment aims to consider and assess the bushfire hazard and associated potential bushfire threat relevant to the proposed development, and to outline the minimum mitigative measures which would be required in accordance with the provisions of the New South Wales Rural Fire Service (RFS) publication *Planning for Bushfire Protection 2019* (PBP 2019) and the *Rural Fires Regulation 2013.*

This assessment has been undertaken in accordance with clause 44 of the Rural Fires Regulation 2013. This BAR also addresses the aims and objectives of PBP 2019, being:

- Afford buildings and their occupants protection from exposure to a bushfire;
- Provide for a defendable space to be located around buildings;
- Provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent the likely fire spread to buildings;
- Ensure that appropriate operational access and egress for emergency service personnel and occupants is available;
- Provide for ongoing management and maintenance of bushfire protection measures (BPMs); and
- Ensure that utility services are adequate to meet the needs of firefighters.

A compliance table demonstrating compliance with PBP 2019 is provided in **Appendix D**.

4.2. Specific Objectives for Special Fire Protection Purposes

The aims and objectives listed in section 1.1 of PBP 2019 remain applicable to SFPP developments, however further consideration has been given to SFPP developments due to the nature of these environments and the occupants they accommodate. Occupants of SFPP developments are generally more vulnerable to bushfire attack therefore specific objectives have been put in place to ensure greater protection is provided (section 6.2 PBP 2019). Specific objectives include:

- Minimise levels of radiant heat, localised smoke and ember attach through increased APZ, building design and siting;
- Provide for an appropriate operational environment for emergency service personnel during firefighting and emergency management;
- Ensure the capacity of existing infrastructure (such as roads and utilities) can accommodate the increase in demand during emergencies as a result of the development; and
- Ensure emergency evacuation procedures and management which provides for the special characteristics and needs of occupants.

As a caravan park is classified as a SFPP development, the specific objectives and acceptable solutions for a SFPP development have been considered.

However, all sites within Sunrise Estate (and any additional sites) are restricted to long-term occupation only. Each dwelling is occupied by a long-term resident/s who have signed a land lease agreement with the Operator. A land lease agreement grants the resident the right to occupy the residential site within the caravan park.

Unlike people that stay at a typical tourist focused caravan park occupied on a short-term basis, the RFS acknowledge that long-term occupants (exceeding six weeks) will be familiar with their

surrounds, safe refuge areas and evacuation routes; thus present a risk profile commensurate with a standard residential development.

4.2.1. Specific Residential-Based SFPP

Whilst caravan parks can be built to achieve all levels of construction required under the NCC, manufactured homes installed in caravan parks are not required to obtain separate development consent for each dwelling. Instead, dwellings must comply with the design, construction and installation requirements of Part 2, Division 4 of the *Local Government (Manufactured Home Estates, Caravan Parks, Camping Grounds and Moveable Dwellings) Regulation* 2005 ('the Regulation'). A Notice of Completion of Installation is required by Clause 68 of the Regulation and can be used to require evidence of construction standards, including BAL and AS3959-2018.

The acceptable solution for manufactured housing is the provision of an APZ which achieves 10kW/m^2; being commensurate with the SFPP development (Table A1.12.1).

However, where evidence can be provided with the Notice of Completion of Installation, which confirms that all dwellings used for long-term occupation have been constructed to the appropriate construction standards under AS3959-2018 or NASH standard, the dwelling shall be provided with an APZ which meets 29kW/m^2 in line with Tables A1.12.2 of PBP 2019; being for a standard residential dwelling. With this in mind, APZs of 16m-24m may be required, as compared to a 67m APZ which would be required for a SFPP (short term site) exposed to the identical bushfire hazard.

4.3. Vegetation Assessment

Vegetation classification over the site and surrounding area has been carried out as follows:

- Aerial Photograph Interpretation to map the vegetation classification
- Reference to NSW State Vegetation Type Mapping, Department of Planning and Environment 2022 (**Figure 11**); and
- Site inspection completed by Stuart Greville on 1 November 2022 (**Plates 5-10**).

In accordance with PBP 2019, an assessment of the vegetation over a distance of 100m in all directions from the site was undertaken. Vegetation that may be considered a bushfire hazard was identified in all directions from the development footprint. The vegetation classification is based on the revised Table 2.3 in AS3959-2018 and Appendix 1 of PBP 2019. The unmanaged fuel loads detailed in the *RFS Comprehensive Fuel Loads Fact Sheet* (March 2019) have been adopted for the purpose of assessing the bushfire hazard. The findings of the site inspection were compared to the available vegetation mapping. The inconsistencies between the mapping sources and hazardous vegetation mapped on the NSW RFS Bushfire Prone Land maps were quantified during the site inspection.

4.3.1. Reliability Assessment

Although the bushfire prone land mapping is intended to be regularly updated, land use and vegetation cover that contribute to bushfire hazards are subject to change. A reliability assessment was undertaken for the subject site and all land within 140m. In this instance the bushfire prone land mapping is mostly consistent with existing vegetation present within the site.

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Figure 11

NSW State Vegetation Type (Class)

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- Subject Site
- 140m Buffer
- 100m Buffer

Vegetation Class

- Coastal Headland Heaths
- Coastal Floodplain Wetlands
- Coastal Swamp Forests
- Coastal Dune Dry Sclerophyll Forests
- Not native vegetation

SOURCE:
Cadastral Boundary: NSW Department of Finance, Services and Innovation 2022
Aerial photo: NearMap 08/07/2022
Vegetation: © State Government of NSW and Department of Planning and Environment 2022

N
W E
S

0 25 50 75 100 125 150
Meters

A3 Scale: 1:3,000

File:2280-BobsFarm-Fig3-Vegetation-SV-Class-221102 Date: 2/11/2022

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Plate 5: Looking west along 10m wide fauna corridor between site and Trotter Road – *Tall Heath*

Plate 6: T3 – Northern side of Trotter Road indicating *forest* vegetation setback from road

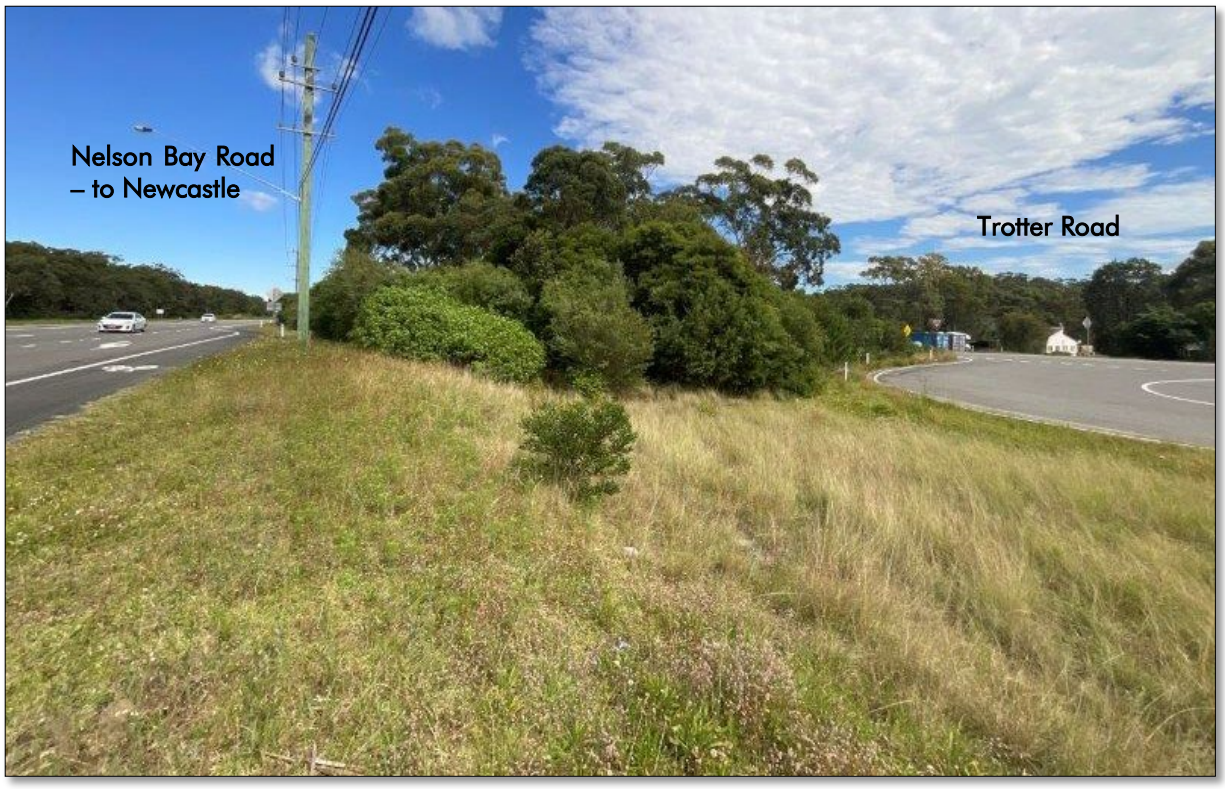

Plate 7: T4 – looking west towards narrow and isolated pocket of forest vegetation to be retained

Plate 8: Vegetation (*forest* transitions to *heath*) corridor between Trotter Road and subject site to be retained (<50m wide)

Plate 9: T8 – looking south west from Sunrise Village across Nelson Bay Road to *forest* hazard

Plate 10: Fenninghams Island Road looking north towards *Coastal Swamp Forest*

4.4. Slope Assessment

The slope assessment was undertaken as follows:

- Review of LiDAR point cloud data – including DEM (NSW LPI);
- Detail survey of existing and design contours; and
- Site inspection completed on 1 November 2022.

An assessment of the slope over a distance of 140m in the hazard direction from the site boundary was undertaken. The effective slope was then calculated under the classified vegetation where there was a fire run greater than 50m. The topography of the site has been evaluated to identify both the average slope and by identifying the maximum slope present. These values help determine the level of gradient which will most significantly influence the fire behaviour of the site.

The effective slope in all directions is shown in **Figure 12, Figure 13** and **Table 5.**

The final bushfire hazard assessment defining vegetation classifications and effective slope is shown in **Figure 14.**

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Figure 12

Digital Elevation Model

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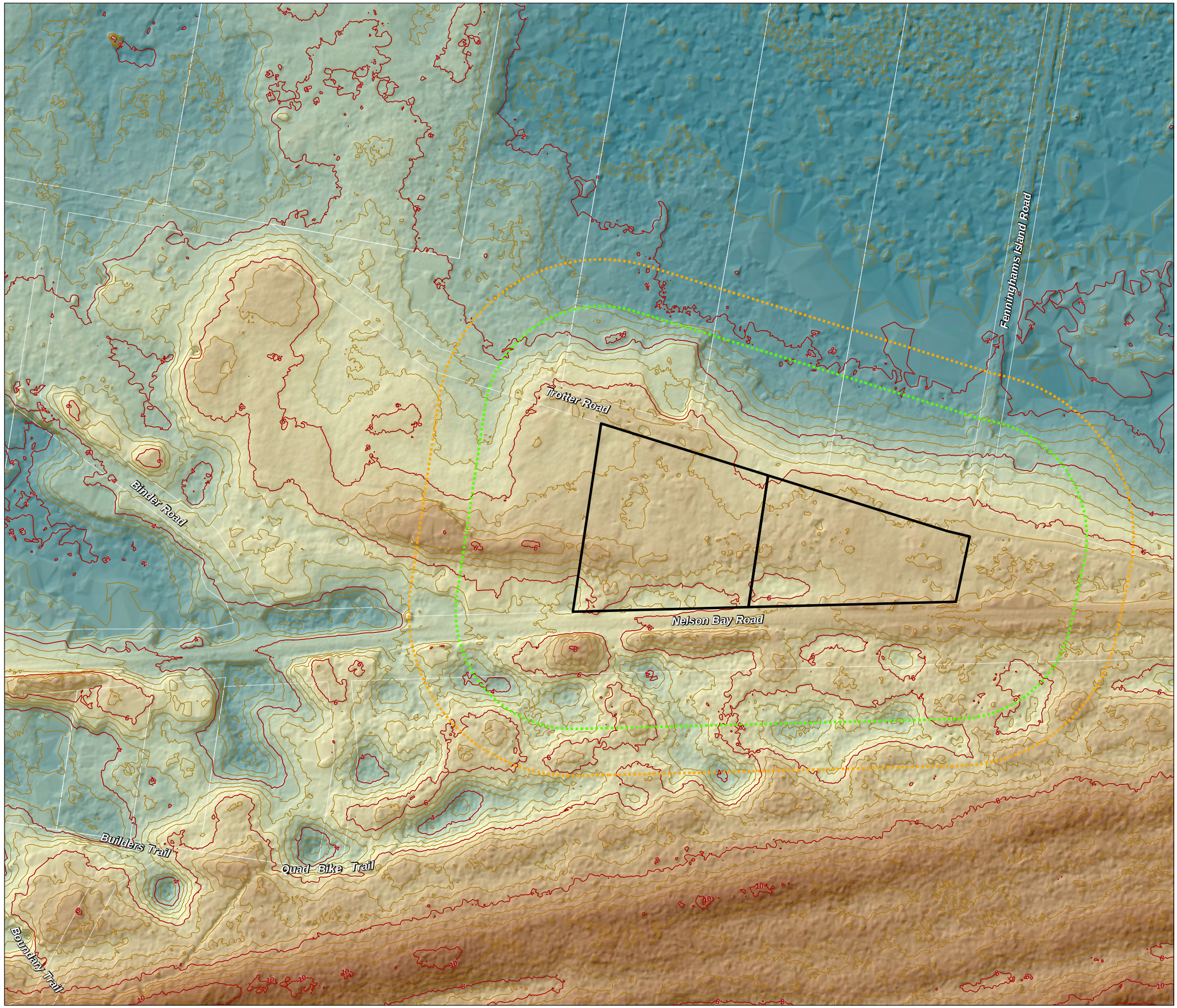

- Subject Site
- 140m Buffer
- 100m Buffer
- Contour (2m)
- Contour (0.5m)

Value

- High : 11m
- Low : 1m

SOURCE:
Cadastral Boundary: NSW Department of Finance, Services and Innovation 2022
Surface analysis based on Port Stephens1 metre Resolution LiDAR © Department Finance, Services and Innovation 2012

N W E S

0 25 50 75 100 125 150
Meters

A3 Scale: 1:3,000

File:2280-BobsFarm-Fig4-DEM-221102 Date: 2/11/2022

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Figure 13

Slope Analysis: LiDAR

BUSHFIRE PLANNING AUSTRALIA

Subject Site
140m Buffer
100m Buffer
Contour (2m)

Slope

0° - 5°
5° - 10°
10° - 15°
15° - 20°
>20°

SOURCE:
Cadastral Boundary: NSW Department of Finance, Services and Innovation 2022
Aerial photo: NearMap 08/07/2022
Surface analysis based on Port Stephens1 metre Resolution LiDAR © Department Finance, Services and Innovation 2012

N
W E
S

0 25 50 75 100 125 150
Meters

A3 Scale: 1:3,000

File:2280-BobsFarm-Fig5-SlopeLiDAR-221102 Date: 2/11/2022

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4.5. Significant Environmental Features

A Streamlined Biodiversity Development Assessment Report (BDAR) has been prepared by AEP which resulted in a number of Ecosystem credits being required to offset the residue impact of the proposed development.

4.6. Threatened Species, populations or ecological communities

All bushfire mitigation measures; including APZs have considered the existing and potential biodiversity values to avoid impact where possible.

4.7. Aboriginal Objects

An Aboriginal Due Diligence Assessment has been prepared by McCardle Heritage which concludes that the site does not contain any sites or potential archaeological deposits (PADs) of Aboriginal heritage significance, and as a result an Aboriginal Heritage Impact Permit (AHIP) would not be required for the future development.

4.8. Results

All vegetation identified within the current Bush Fire Prone Land map was confirmed during the site inspection. The majority of vegetation within the site will be removed with the exception of a small portion of remnant vegetation in the eastern part of the site that is connected to an isolated patch of vegetation identified as part of a fauna movement corridor. An additional strip of vegetation 10m wide within the site will be retained along the northern boundary. The vegetation to be retained will be protected from future clearing and zoned C2 Environmental Conservation. The combined area of unmanaged vegetation is approximately 6,000m^2 which includes the vegetation within the road verges.

The primary hazard to the south is separated by the 50m wide dual lane Nelson Bay Road. Trotter Road and the managed curtilages surrounding the exiting dwellings separates the site from the Coastal Swamp Forest to the north.

The closest hazard, being the fauna corridor less than 1 hectare is considered a low threat, but cannot be excluded as a hazard as there are areas of Category 1 vegetation within 100m to the north and south. The hazard transitions west from a shrubby *forest* (Coastal Dune DSF) into a tall heath (Coastal Headland Heath).

The results of hazard assessment are detailed in **Table 5** and shown in **Figure 14**.

Table 5: Slope and Vegetation Assessment Results

Transect	Vegetation or Other Infrastructure	Vegetation Classification (PBP 2019)	Slope
T1 North-west	Trotter Road to the edge of a Forest vegetation	Excluded Low threat vegetation	1.0° Downslope
T2 North-west	Coastal Swamp Forest north of Trotter Road	*Forest* *(Coastal Swamp Forest)*	1.9° Downslope
T3 North	Trotter Road to northern rural property boundary	Excluded Low threat vegetation	2.5° Downslope
T4 East	Isolated vegetation located immediately to the east of the site (<1 hectare)	*Forest* *(Coastal Dune DSF)*	0.1° Downslope
T5 South-east	South-eastern site boundary to the primary bushfire hazard, separated by Nelson Bay Road	Excluded Low threat vegetation	1.6° Downslope
T6 South	Southern site boundary to the primary bushfire hazard, separated by Nelson Bay Road	Excluded Low threat vegetation	0.8° Downslope
T7 South	Undisturbed forest vegetation south of Nelson Bay Road, identified as the primary bushfire hazard	*Forest* *(Coastal Dune DSF)*	-0.8° Upslope
T8 South-west	Southern site boundary to the primary bushfire hazard, separated by Nelson Bay Road	Excluded Low threat vegetation	-0.4° Upslope
T9 South-west	Undisturbed forest vegetation south of Nelson Bay Road, identified as the primary bushfire hazard	*Forest* *(Coastal Dune DSF)*	-0.1° Upslope
T10 North	10m wide band of unmanaged tall heath spreading from Trotter Road reserve into site	*Tall Heath* *(Coastal Headland Heath*	0.1° Downslope

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Figure 14

Slope & Vegetation Assessment

BUSHFIRE PLANNING AUSTRALIA

- Subject Site
- 140m Buffer
- 100m Buffer
- Contour (2m)
- Contour (0.5m)
- RL
- Downslope transect
- Upslope transect
- Approved and under construction Ingenia MHE

Vegetation Class

- Coastal Headland Heaths
- Coastal Dune Dry Sclerophyll Forest
- Coastal Swamp Forests
- Not native vegetation

SOURCE:
Cadastral Boundary: NSW Department of Finance, Services and Innovation 2022
Vegetation: BPA 2022
Aerial photo: NearMap 08/07/2022
Surface analysis based on Port Stephens1 metre Resolution LiDAR © Department Finance, Services and Innovation 2012

N W E S

0 25 50 75 100 125 150
Meters

A3 Scale: 1:3,000

File:2280-BobsFarm-Fig6-SlopeVeg-221104 Date: 4/11/2022

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5. Bushfire Protection Measures

This BAR has adopted the methodology to determine the appropriate Bushfire Protection Measures (BPMs) detailed in PBP 2019. As part of the BAR, the recommended BPMs demonstrate the aims and objectives of PBP 2019 have been satisified; includinig the matters considered by the RFS necessary to protect persons, property and the environment from the danger that may arise from a bushfire.

- APZs
- Access
- Water Supply and Utilities
- Building Construction and Design
- Landscaping
- Emergency Management Arrangements

5.1. Asset Protection Zones

An APZ is an area surrounding a development that is managed to reduce the bushfire hazard to an acceptable level to mitigate the risk to life and property. The required width of the APZ varies with slope and the type of hazard. An APZ can consist of both an inner protection area (IPA) and an outer protection area (OPA). In this instance the entire APZ and the balance of the development site shall be managed as an IPA.

An APZ can include the following:

- Lawns;
- Discontinuous gardens;
- Swimming pools;
- Roads, driveways and managed verges;
- Unattached non-combustible garages with suitable separation from the dwelling;
- Open space / parkland; and
- Car parking.

The presence of a few shrubs or trees in the APZ is acceptable provided that they:

- Do not touch or overhang any buildings;
- Are well spread out and do not form a continuous canopy;
- Are not species that retain dead material or deposit excessive quantities of ground fuel in a short period or in a danger period; and
- Are located far enough away from any dwelling so that they will not ignite the dwelling by direct flame contact or radiant heat emission.

Woodpiles, wooden sheds, combustible material storage areas, large areas / quantities of garden mulch, stacked flammable building materials etc. are not recommended in the APZ.

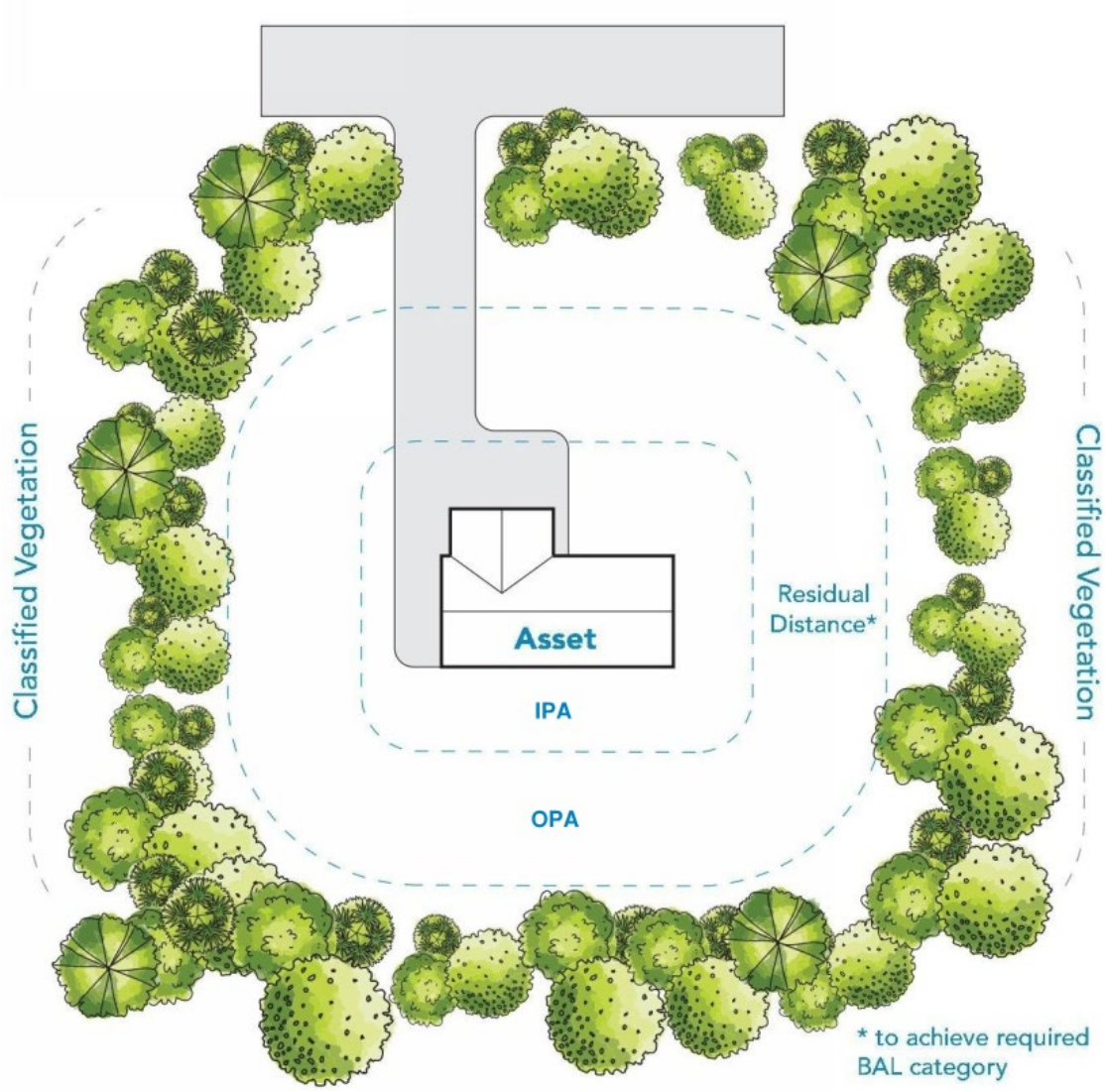


Figure 15: Asset Protection Zone – Inner & Outer Protection Areas

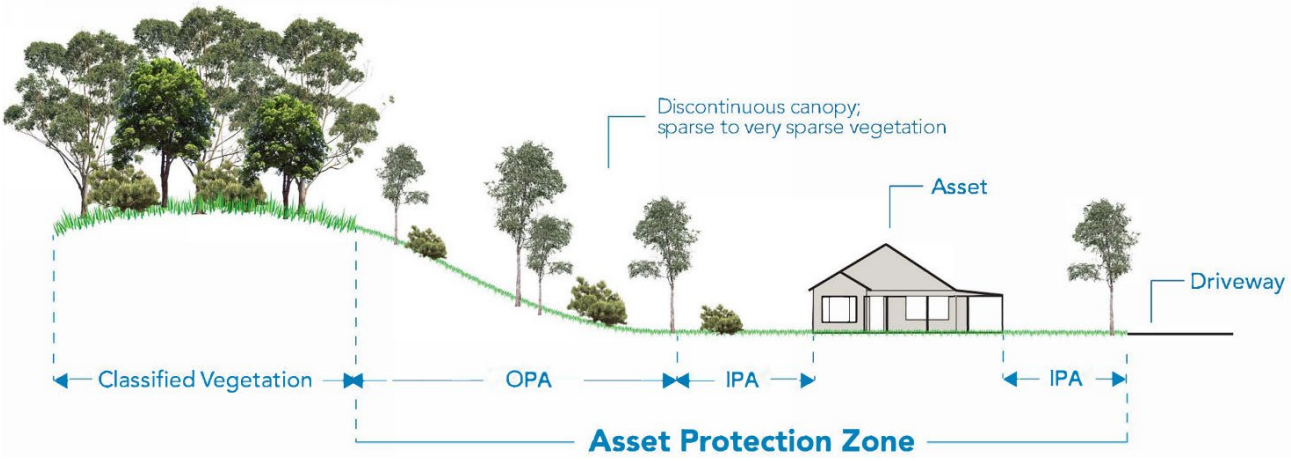


Figure 16: Asset Protection Zone profile

5.1.1. Special Fire Protection Purposes

Special Fire Protection Purpose (SFPP) developments mean the occupants of the proposed development may be more vulnerable to bush fire attack and therefore may require greater protection from such threats as well as assisted evacuation. SFPPs include schools, seniors housing, child care centres, hospitals and short-term tourist accommodation.

Section 6.8 of PBP 2019 provides protection measures for SFPP developments. In comparison to a standard residential development where radiant heat levels of no greater than 29kW/m^2 are acceptable, radiant heat levels of greater than 10kW/m^2 must not be experienced by on any part of the buildings. To achieve radiant heat levels of less than 10kW/m^2, APZs of 67m or greater are typically required (based on Table A1.12.1 of PBP 2019) for a *forest* vegetation formation.

Objectives for SFPP developments place emphasis on the space surrounding buildings (as defendable space and APZs) and less reliance on construction standards. SFPP developments are highly dependent on suitable emergency evacuation arrangements, which require greater separation from bush fire threats.

5.1.2. Determining the Appropriate Setbacks

To achieve compliance with the performance criteria for APZs (Table 6.3a), the Acceptable Solutions outlined in Table A1.12.1 of PBP 2019 may be adopted as a deemed-to-satisfy solution.

Alternatively, the appropriate APZ setback may be determined to achieve the Performance Criteria by adopting a performance-based solution. Based on the unique site characteristics identified by the BAR, the intensity of a bushfire event presented as the radiant heat exposure was calculated at several locations throughout the development site using the NBC Bushfire Attack Assessor V4.1. The nominated fuel loads for the respective vegetation classifications as published by the RFS in March 2019 have been used to determine the APZs and the effective slope obtained from the Digital Elevation Model (DEM) for each transect.

As the site lies within the Port Stephens Council LGA, it is assessed under a FDI rating of 100. The Detailed Method (Method 2) outlined in Australian Standard *AS3959-2018 Construction of buildings in bushfire prone areas* was used to calculate the potential level of radiant heat flux generated at the nominated locations (see transects T1-T9). To ensure the APZs achieve the intent of Section 6.3 of PBP 2019, the APZs have been determined to ensure all lots are able to accomomodate a dwelling (long-term occupation) that will not be exposed to radiant heat levels exceeding 29kW/m^2. The NBC Bushfire Attack Assessor report detailing the inputs used is contained in **Appendix D**.

5.1.2.1. Specific Residential-based SFPP: Manufactured Home Estates

Although the proposed development does not include the construction of any dwellings, each future dwelling shall be constructed in accordance with the relevant Bushfire Attack Level (BAL) identified in **Table 7**. The Approval to Operate shall include a BAL Contour Plan and require each dwelling to be constructed to the nominated BAL rating (maximum BAL-29). Furthermore, a suitably worded instrument(s) will be created pursuant to section 88B of the *Conveyancing Act 1917* clearly outlining the require BAL ratings for each dwelling. In this regard, each new dwelling will be sited to ensure radiant heat levels do not exceed 29kW/m^2.

Refer to **Table 6** and **Figure 18** for the required APZs.

Table 6: Required APZ setbacks

Transect	Vegetation Classification (PBP 2019)	Slope	APZ Table A1.12.1 (SFPP – short-term)	APZ Table A1.12.2 (Long-term residential)	APZ 29kW/m²	APZ Provided
T1 North-west	Excluded	1.0° Downslope	N/A	N/A	N/A	N/A
T2 North-west	*Forest (Coastal Swamp Forest)*	1.9° Downslope	79m	29m	28m	>40m
T3 North	Excluded	2.5° Downslope	N/A	N/A	N/A	N/A
T4 East	*Forest (Coastal Dune Dry Sclerophyll Forest)*	0.0° Level	67m	24m	24m	24m
T5 South-east	Excluded	1.6° Downslope	N/A	N/A	N/A	N/A
T6 South	Excluded	0.8° Downslope	N/A	N/A	N/A	N/A
T7 South	*Forest (Coastal Dune Dry Sclerophyll Forest)*	0.0° Level	67m	24m	24m	24m
T8 South-west	Excluded	0.0° Level	N/A	N/A	N/A	N/A
T9 South-west	*Forest (Coastal Dune Dry Sclerophyll Forest)*	0.0° Level	67m	24m	24m	24m
T10	*Tall Heath (Coastal Headland Heaths)*	0.0° Level	50m	16m	16m	16m

5.3. Landscaping and Vegetation Management

In APZs and IPAs, the design and management of the landscaped areas in the vicinity of buildings have the potential to improve the chances of survival of people and buildings. Reduction of fuel does not require the removal of all vegetation. Trees and plants can provide some bushfire protection from strong winds, intense heat and flying embers (by filtering embers) and changing wind patterns.

Generally landscaping in and around a bushfire hazard should consider the following:

- Priority given to retaining species that have a low flammability;
- Priority given to retaining species which do not drop much litter in the bushfire season and which do not drop litter that persists as ground fuel in the bush fire season;
- Priority given to retaining smooth barked species over stringy bark; and
- Create discontinuous or gaps in the vegetation to slow down or break the progress of fire towards the dwellings.

Landscaping within APZs and IPAs should give due regard to fire retardant plants and ensure that fuel loads do not accumulate as a result of the selected plant varieties.

The principles of landscaping for bushfire protection aim to:

- Prevent flame impingement on dwellings;
- Provide a defendable space for property protection;
- Reduce fire spread;
- Deflect and filter embers;
- Provide shelter from radiant heat; and
- Reduce wind speed.

Plants that are less flammable have the following features;

- High moisture content;
- High levels of salt;
- Low volatile oil content of leaves;
- Smooth barks without ‘ribbons’ hanging from branches or trunks; and
- Dense crown and elevated branches.

Avoiding understorey planting and regular trimming of the lower limbs of trees also assists in reducing fire penetration into the canopy. Rainforest species such as Syzygium and figs are preferred to species with high fine fuel and/or oil content.

Trees with loose, fibrous or stringy bark should be avoided. These trees can easily ignite and encourage ground fire to spread up to, and then through the crown of trees.

Consideration should be given to vegetation fuel loads present on site with particular attention to APZs.

Careful thought must be given to the type and physical location of any proposed site landscaping. Inappropriately selected and positioned vegetation has the potential to ‘replace’ any previously removed fuel load.

Bearing in mind the desired aesthetic and environment sought by site landscaping, some basic principles have been recommended to help minimise the chance of such works contributing to the potential hazard on site.

Whilst it is recognised that fire-retardant plant species are not always the most aesthetically pleasing choice for site landscaping, the need for adequate protection of life and property requires that a suitable balance between visual and safety concerns be considered.

It is reiterated again that it is essential that any landscaped areas and surrounds are subject to ongoing fuel management and reduction to ensure that fine fuels do not build up.

5.4. Construction Standards - Bushfire Attack Level

All future buildings, including single dwellings (Class 1a buildings), constructed within the site are recommended to satisfy the Performance Requirements of the National Construction Code: Building Code of Australia (BCA).

Accordingly, all forthcoming habitable buildings shall satisfy the requirements of Part 3.7.4 of the BCA. The *Deemed-to-Satisfy* (DTS) provision of the BCA can only be achieved if dwellings in bushfire prone areas are constructed in accordance with Australian Standard *AS3959-2018 Construction of buildings in bushfire prone areas*. Alternatively, the DTS provisions can also be achieved if the habitable building is constructed in accordance with the NASH Standard 'Steel Framed Construction in Bushfire Areas'.

Building design and the materials used for construction of future dwellings should be chosen based on the information contained within AS3959-2018, and accordingly the designer/architect should be made aware of this recommendation.

The determinations of the appropriate bushfire attack level (BAL) is based on the maximum potential radiant heat exposure. BALs are based upon parameters such as weather modelling, fire-line intensity, flame length calculations, as well as vegetation and fuel load analysis. The determination of the BAL is derived by assessing the:

- Relevant FDI = *100*;
- Flame temperature = *1090K/1200K*;
- Slope = *level*;
- Vegetation classification = *forest*; and
- Building location.

The Detailed Method (Method 2) outlined in AS3959-2018 was used to calculate the Bushfire Attack Level (BAL) for the development. The NBC Bushfire Attack Assessor V4.1 was used to model the bushfire radiant heat exposure which determined the applicable BAL.

The greatest bushfire hazard was found to the south of the site being a *forest*.

The objective of the concept development layout is to demonstrate all future lots will be exposed to BAL-29 or less. It is acknowledged that some sites indicated on the concept layout are located within the prescribed APZ per Table A1.12.2; however, the layout proposed is only a concept at this stage and can be adjusted following a more detailed assessment as part of the DA. The site is; however, suitable for the intended use and proposed rezoning to allow for the extension of the Sunrise caravan park.

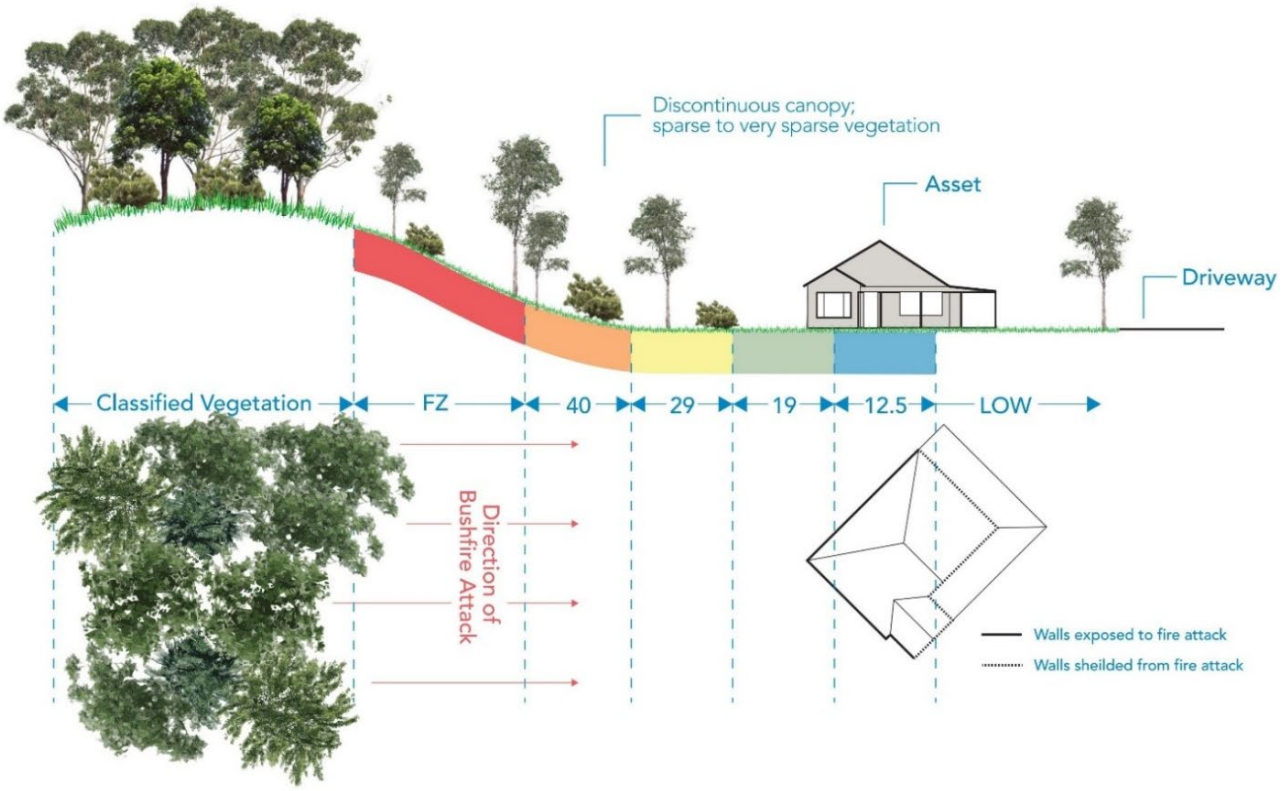


Figure 17: BAL example

Table 7: Bushfire Attack Levels

Transect	Vegetation Classification (PBP 2019)	Slope	APZ Provided	Distance from Hazard	Bushfire Attack Level (BAL)
T1, T3, T5, T6 & T8	Excluded	Downslope	N/A	N/A	BAL-LOW
T2 (North-west)	*Forest (Coastal Swamp Forest)*	1.9° Downslope	29m	0m-<22m	BAL-FZ
				22m-<29m	BAL-40
				29m-<40m	**BAL-29**
				40m-<54m	BAL-19
				54m-<100m	BAL-12.5
				67m	10kW/m^2
T4 (East)	*Forest (Coastal Dune Dry Sclerophyll Forest)*	0.0° Level	24m	0m-<18m	BAL-FZ
				18m-<24m	BAL-40
				24m-<33m	**BAL-29**
				33m-<45m	BAL-19
				45m-<100m	BAL-12.5
				67m	10kW/m^2
T7 (South)	*Forest (Coastal Dune Dry Sclerophyll Forest)*	0.0° Level	24m	0m-<18m	BAL-FZ
				18m-<24m	BAL-40
				24m-<33m	**BAL-29**
				33m-<45m	BAL-19
				45m-<100m	BAL-12.5
				67m	10kW/m^2
T9 (South-west)	*Forest (Coastal Dune Dry Sclerophyll Forest)*	0.0° Level	24m	0m-<18m	BAL-FZ
				18m-<24m	BAL-40
				24m-<33m	**BAL-29**
				33m-<45m	BAL-19
				45m-<100m	BAL-12.5
				67m	10kW/m^2
T10 (North)	Tall Heath (Coastal Headland Heaths)	0.0° Level	16m	0m-<12m	BAL-FZ
				12m-<16m	BAL-40
				16m-<23m	**BAL-29**
				23m-<32m	BAL-19
				32m-<100m	BAL-12.5
				50m	10kW/m^2

Project: 4029 & 4045 Nelson Bay Road, Bobs Farm
Job No: 2280

Figure 18

Asset Protection Zone

BUSHFIRE PLANNING AUSTRALIA

- Subject Site
- 140m Buffer
- 100m Buffer
- Approved and under construction Ingenia MHE

Vegetation Class

- Coastal Headland Heaths
- Coastal Dune Dry Sclerophyll Forest
- Coastal Swamp Forests
- Not native vegetation
- 10kW/m2
- Asset Protection Zone

SOURCE:
Cadastral Boundary: NSW Department of Finance, Services and Innovation 2022
Vegetation: BPA 2022
Aerial photo: NearMap 08/07/2022
Surface analysis based on Port Stephens1 metre Resolution LiDAR © Department Finance, Services and Innovation 2012

N W E S

0 25 50 75 100 125 150
Meters

A3 Scale: 1:3,000

File:2280-BobsFarm-Fig11-APZ-221104 Date: 4/11/2022

5.5. Access

Immediate access to the site will be provided through the existing Sunrise Village. An additional (third) emergency egress will be provided from the subject site to Trotter Road; north of the site.

All future internal roads are able to satisfy PBP 2019, and as indicated in Plate 2, multiple visitor parking spaces will be provided outside of the primary carriageway. It is noted that all dwellings within the existing Sunrise Village and any future development are provided within a minimum of 1 off-street parking space (internal lock-up garage). Furthermore, residents have access to a community base and the local public bus service.

5.6. Services - water, electricity and gas

5.6.1. Water

Fire hydrant spacing, sizing and pressure should comply with AS 2419.1 – 2005. Hydrants are not to be located within any road carriageway.

All lots within the proposed development will be connected to the internal reticulated water supply.

5.6.2. Electricity

All new electricity services are located underground.

5.6.3. Gas

Any reticulated or bottled gas should be installed and maintained according to the requirements of the relevant authorities and AS 159-2002. It is expected that the location of gas services will not lead to ignition of surrounding bushland or the fabric of buildings.

6. Conclusion and Recommendations

Bushfire Planning Australia has been engaged by Hometown Australia Communities Pty Ltd to undertake a Strategic Bushfire Study to support a Planning Proposal that seeks to amend the Port Stephens Local Environmental Plan 2013 to permit *caravan parks* on the subject site.

The existing Sunrise Village currently occupies Lot 51 DP1175028 and has development consent to operate 193 long-term sites. The proposed development site, Lot 3622 DP622485 and Lot 2 DP622229, are the adjoining sites to the east and occupied by a rural residential property. The proposed development includes the addition of 62 manufactured home dwelling sites and ancillary community facilities and services.

This BAR found the site was exposed to a medium to high bushfire hazard located primarily to the south of the site separated by a 40m wide divided dual carriageway - Nelson Bay Road. A small, isolated patch of forest vegetation will be retained at the eastern end of the subject site. The existing vegetation combines with a discontinuous area of vegetation retained as a fauna movement corridor to total a combined area of approximately 6,000m^2 of unmanaged forest vegetation including existing vegetation within the road reserve (Nelson Bay Road and Trotters Road).

There is an ecotone between disturbed and remnant vegetation located along the northern and eastern boundaries of Lot 2 DP622229 which will be retained and zoned C2 as part of the Planning Proposal.

This Bushfire Assessment Report has been prepared in accordance with the submission requirements detailed in Appendix 2 of PBP 2019 and has demonstrated the proposed expansion satisfies the Aims and Objectives of PBP 2019, including the Specific Objectives for SFPP developments.

The following recommendations have been designed to enable the proposed development to achieve Performance Criteria for SFPP developments detailed in Section 6.8 of PBP 2019:

1. The areas within the site identified as an Asset Protection Zone in **Figure 18** shall be managed as an Inner Protection Area (IPA) as outlined within Appendix 4 of PBP 2019 and the RFS document *Standards for asset protection zones*;
2. All land within the site; with the exception of the land proposed to be zoned C2 Environmental Conservation, shall be maintained as an IPA as outlined in Appendix 4 of PBP 2019;
3. All future buildings to be constructed on the proposed sites shall have due regard to the specific considerations given in the National Construction Code: Building Code of Australia (BCA) which makes specific reference to Australian Standard AS3959-2018 Construction of buildings in bushfire prone areas (AS3959-2018) and the NASH Standard Steel Framed Construction in Bushfire Prone Areas;
4. Where the new dwellings are not required to be comply with the BCA, each dwelling shall be constructed in accordance with the relevant Bushfire Attack Level (BAL). An Approval to Operate (issued under Section 68 of the Local Government Act 1993) shall include a BAL Contour Plan and require each new dwelling to be constructed to the nominated BAL rating. Furthermore, a suitably worded instrument(s) must be created pursuant to section 88 of the Conveyancing Act 1917 clearly outlining the require BAL ratings for each dwelling;
5. All new sites are to be connected to a reliable water supply network and that suitable fire hydrants are located throughout the development site that are clearly marked and provided for the purposes of bushfire protection. Fire hydrant spacing, sizing and pressure shall comply with AS2419.1 2005 and section 6.8.3 of PBP 2019;
6. The internal access road is to be designed and constructed in accordance with section 6.8.2 of PBP 2019 **or** as shown in the plans contained in **Appendix A**;

7. Consideration should be given to landscaping and fuel loads on site to decrease potential fire hazards on site; and
8. A Bushfire Emergency Management and Evacuation Plan (BEMEP) shall be prepared that is consistent with the RFS Guidelines 'Development Planning – A Guide to Developing a Bush Fire Emergency Management and Evacuation Plan December 2014'.

While it was revealed that some dwelling sites are located within the recommended APZ; the proposed layout is only a concept at this stage and can be adjusted following a more detailed assessment as part of a subsequent development application.

In conclusion the site was found to be appropriate for the intended land use that will permit the extension of the Sunrise caravan park. Development of the subject site as a caravan park occupied by long-term residents would not expose residents to an unacceptable bushfire risk.

This assessment has been made based on the bushfire hazards observed in and around the site at the time of inspection and production (November 2022).

Should the above recommendations be implemented, the future caravan park will result in a better bushfire outcome as the existing bushfire risk should be suitably mitigated to offer an acceptable level of protection to life and property for those persons and assets occupying the site but they do not and cannot guarantee that the area will not be affected by bushfire at some time.

7. References

- NSW Rural Fire Service (2005). Standards for Asset Protection Zones. NSW Rural Fire Service.
- NSW Rural Fire Service (2019). Planning for Bushfire Protection – A Guide for Councils, Planners, Fire Authorities, Developers and Home Owners.
- Ramsay, GC and Dawkins, D (1993). Building in Bushfire-prone Areas – Information and Advice. CSIRO and Standards Australia.
- Rural Fires and Environmental Assessment Legislation Amendment Act 2002.
- Standards Australia (2018). AS 3959 – 2018: Construction of Buildings in Bushfire-prone Areas.

Appendix A: Indicative Layout of Expansion of Sunrise Estate

TOTAL NO.OF EXISTING SITES	**193 SITES**
PROPOSED TOTAL NO.OF SITES IN EXPANSION AREA LOT 3622 DP 622485 LOT 2 DP622229	**62 SITES** 43 SITES 19 SITES
TOTAL NO.OF EXISTING & PROPOSED SITES	**255 SITES**

ISSUE	DATE	REVISION
E	27/10/22	AMENDED ISSUE
D	26/10/22	AMENDED ISSUE
C	17/02/21	AMENDED ISSUE
B	15/02/21	AMENDED ISSUE
A	19/01/21	DRAFT ISSUE

HOMETOWN AUSTRALIA COMMUNITIES

PROJECT SUNRISE LIFESTYLE RESORT

ADDRESS 4011 NELSON BAY ROAD, BOBS FARM, NSW 2316

SUNRISE PORT STEPHENS

DRAWING TITLE CONCEPT PLAN FOR LOT 3622 DP 622485 & LOT 2 DP622229

N

JOB NO.

DATE	SCALE	DRAWN	DRAWING NO.	ISSUE
01/2021	1:1000 @ A3	HTA	04.5	E

Appendix B: Planning for Bushfire Protection 2019 Compliance Tables

Table 1: Aims and Objectives of Planning for Bushfire Protection 2019

Objectives	Satisfied	Comment
➢ Afford buildings and their occupants protection from exposure to a bush fire	✓	APZs along the interface with the vegetation within the site is provided by a combination of roads and managed land that separate the sites from the primary threat and adequate setbacks provide defendable space from areas of reduced vegetation.
➢ Provide for a defendable space to be located around buildings	✓	Where required, each site is provided with an APZ that accommodates a building footprint that will not be exposed to radiant heat levels exceeding 29kW/m^2. The APZ provides a defendable space that is capable of providing an environment in which a person can undertake property protection after the passage of bushfire with some level of safety. An APZ will also be provided to ensure all existing dwellings within the site; including along the northern boundary, have sufficient defendable space.
➢ Provide appropriate separation between a hazard and buildings, which, in combination with other measures, prevent the likely fire spread to buildings	✓	The APZs have been calculated to provide a suitable buffer between any future dwellings and the bushfire hazard; commensurate with the vegetation formation and slope.
➢ Ensure that safe operational access and egress for emergency service personnel and residents is available	✓	All future residents have direct access to multiple internal roads that lead away from the development site in the opposite direction to the bushfire hazard. Due to the proposed road widths and road layout within the development site, emergency service personnel will continue to have unobstructed access to the site whilst residents are evacuating in the opposite direction.
➢ Provide for ongoing management and maintenance of BPMs	✓	All APZs are contained with common property or within land owned by operator and will be maintained by the operator of the caravan park in accordance with Appendix 4 of the PBP 2019 and Standards for APZs.
➢ Ensure that utility services are adequate to meet the needs of firefighters	✓	The development includes all essential utility services to meet the needs of firefighters; including a reliable water supply.

Table 2: Performance Criteria and Acceptable Solutions for SFPP Developments (Chapter 6 PBP 2019)

Intent of Measure	Performance Criteria	Acceptable Solution	Complies	Comment
6.8.1 ASSET PROTECTION ZONES Table 6.8a To provide suitable building design, construction and sufficient space to ensure that radiant heat levels at buildings does not exceed critical limits for firefighters and other emergency services personnel undertaking operations, including supporting or evacuating occupants.	Radiant heat levels of greater than 10kW/m^2 (1200K) are not experienced at any part of the building.	The building is provided with an APZ in accordance with Table A1.12.1. in Appendix 1.	✓	The proposed expansion to the existing caravan park has been designed to ensure APZs are provided to achieve the Acceptable Solutions for residential infill development.
	APZ maintenance is practical, soil stability is not compromised and the potential for crown fires is negated.	The APZ is not located on lands with a slope exceeding 18°	✓	All APZs are located on land with slopes 5° or less.
	APZs are managed and maintained to prevent the spread of a fire towards the building. The APZ is provided in perpetuity.	The APZ is managed in accordance with the requirements of Appendix 4 of PBP 2019 and is wholly within the boundaries of the development site.	✓	The APZ will be required to be maintained in accordance with Appendix 4 of the PBP 2019 and Standards for APZs by the operator of the caravan park.
		Mechanisms are in place to provide for the maintenance of the APZ over the life of the development.	✓	
		Other structures located within the APZ need to be located further than 6m from the refuge building.	✓	Any ancillary structures will be greater than 6m from the primary structure.
	VARIATIONS: Manufactured Home Estates	An APZ in accordance with Table A1.12.1 in Appendix 1 of this document is provided to all new dwellings; or	✓	The site layout has been designed to ensure all sites are able to be provided with sufficient area to provide a dwelling exposed to 29kW/m^2 or less. Whilst the proposed development does not seek consent for the construction of any new dwellings, the Community Management Statement shall require each dwelling to be constructed to the nominated BAL rating. Furthermore, a suitably worded instrument(s) must be created pursuant to section 88 of the Conveyancing Act 1917 clearly outlining the require BAL ratings for each dwelling. It is not considered reasonable for ALL new dwellings to be construction in accordance with BAL-29 (including dwellings >100m from any hazard). In this regard the dwellings have been assessed as a typical residential property.
		An APZ in accordance with Table A1.12.2 in Appendix 1 of this document is provided where it is demonstrated that all new dwellings will be constructed in accordance with BAL-29.		

Intent of Measure	Performance Criteria	Acceptable Solution	Complies	Comment
LANDSCAPING	Landscaping is designed and managed to minimise flame contact and radiant heat to buildings, and the potential for wind-driven embers to cause ignitions.	Landscaping is in accordance with APZ standards (see Appendix 4). Fencing is constructed in accordance with section 7.6.	✓	All new landscaping will be designed and planted in accordance with the guidelines relevant at the time of planting.
CONSTRUCTION	The proposed building can withstand bush fire attack in the form of wind, smoke, embers, radiant heat and flame contact.	A construction level of BAL-12.5 under AS3959 or NASH and Table 6.8a is applied	✓	Whilst the proposed development does not seek consent for the construction of any new dwellings, the Community Management Statement shall include the BAL Contour Plan (**Figure 18**) and require each dwelling to be constructed to the nominated BAL rating. Furthermore, a suitably worded instrument(s) must be created pursuant to section 88 of the Conveyancing Act 1917 clearly outlining the require BAL ratings for each dwelling. It is not considered reasonable for ALL new dwellings to be construction in accordance with BAL-29 (including dwellings >100m from any hazard). In this regard the dwellings have been assessed as a typical residential property.
	VARIATIONS: Manufactured Home Estates	Where an APZ in accordance with Table A1.12.1 in Appendix 1 of this document the construction standards for BAL-12.5 shall apply; or		
		Where an APZ in accordance with Table A1.12.2 in Appendix 1 of this document the construction standards for BAL-29 shall apply.		
6.8.2 **ACCESS** **Table 6.8b** To provide safe operational access for emergency services personnel in suppressing a bush fire, while residents are accessing or egressing an area. **FIREFIGHTING VEHICLES**	Firefighting vehicles are provided with safe all weather access to structures and hazard vegetation.	SFPP access roads are two-wheel drive, all-weather roads	✓	All roads are all-weather, sealed roads allowing safe and direct access for fire fighting vehicles to all lots.
		Access is provided to all structures and hazard vegetation.	✓	
		Traffic management devices are constructed to not prohibit access by emergency services vehicles.	✓	
		Access roads must provide suitable turning areas in accordance with Appendix 3.	✓	
ACCESS ROAD CAPACITY	The capacity of access roads is adequate for firefighting vehicles.	The capacity of road surfaces and any bridges/ causeways is sufficient to carry fully loaded firefighting vehicles (up to 23 tonnes); bridges and causeways are to clearly indicate load rating.	✓	All new roads will have sufficient capacity to carry fully loaded fire fighting vehicles.
ACCESS TO WATER	There is appropriate access to water supply.	Hydrants ae located outside of parking reserves and road carriageways to ensure accessibility to reticulated water for fire suppression.	✓	The reticulated water supply will be extended into the expanded caravan park.

Intent of Measure	Performance Criteria	Acceptable Solution	Complies	Comment
		Hydrants are provided in accordance with AS2419.1:2005	✓	
		There is suitable access for Category 1 fire appliance to within 4m of the static water supply where no reticulated supply is available.	✓	
PERIMETER ROADS	Perimeter access roads are designed to allow safe access and egress for medium rigid firefighting vehicles while occupants are evacuating as well as providing a safe operational environment for emergency service personnel during firefighting and emergency management on the interface.	There are two-way sealed roads.	✓	The proposed internal road network provides perimeter roads and a secondary egress to Trotter Road.
		8m carriageway width kerb to kerb.	✓	
		Hydrants are to be located clear of parking areas.	✓	
		There are through roads, and these are linked to the internal road system at an interval of no greater than 500m.	✓	
		Curves of roads have a minimum inner radius of 6m.	✓	
		The maximum grade road is 15° and average grade is 10°.	✓	
		The road crossfall does not exceed 3°.	✓	
		A minimum vertical clearance of 4m to any overhanging obstructions, including tree branches; and	✓	
NON-PERIMETER ROADS	Non-perimeter access roads are designed to allow safe access and egress for medium rigid firefighting vehicles while occupants are evacuating.	Minimum 5.5m width kerb to kerb.	✓	The proposed internal roads that may be considered non-perimeter roads as they do not adjoin a property boundary (perimeter) provide safe circulation throughout the caravan park offering multiple egress routes from every site.
		Parking is provided outside of the carriageway.	✓	
		Hydrants are to be located clear of parking areas.	✓	
		There are through roads, and these are linked to the internal road system at an interval of no greater than 500m.	✓	
		Curves of roads have a minimum inner radius of 6m.	✓	
		The maximum grade road is 15° and average grade is 10°.	✓	
		The road crossfall does not exceed 3°.	✓	

Intent of Measure	Performance Criteria	Acceptable Solution	Complies	Comment
		A minimum vertical clearance of 4m to any overhanging obstructions, including tree branches; and	✓	
6.8.3 SERVICES Table 6.8c To provide adequate services for water for the protection of buildings during and after the passage of a bushfire, and not to locate gas and electricity so as not to contribute to the risk of fire to a building. **WATER**	A water supply is provided for firefighting purposes	Reticulated water is to be provided to the development, where available	✓	A reticulated water supply is provided.
		A static water supply is provided where no reticulated water is available	**N/A**	
	Water supplies are located at regular intervals The water supply is accessible and reliable for firefighting operations	Fire hydrant spacing, design and sizing comply with AS2419.1:2005;	✓	A series of fire hydrants will be located throughout the caravan park.
		Hydrants are not located within any road carriageway;	✓	
		Reticulated water supply to SFPPs uses a ring main system for areas with perimeter roads.	✓	A new water supply ring main will be provided throughout the new component of the caravan park.
	Flows and pressures are appropriate	Fire hydrant flows and pressures comply with AS2419.1:2005.	✓	
	The integrity of the water supply is maintained	All above ground water service pipes are metal, including and up to any taps.	**N/A**	
ELECTRICITY	Location of electricity services limits the possibility of ignition of surrounding bushland or the fabric of buildings.	Where practicable, electrical transmission lines are underground.	✓	All transmission lines will be located underground.
		Where overhead electrical transmission lines are proposed as follows: - lines are installed with short pole spacing (30 metres), unless crossing gullies, gorges or riparian areas; and - no part of a tree is closer to a power line than the distance set out in accordance with the specifications in ISSC3 Guideline for	**N/A**	

Intent of Measure	Performance Criteria	Acceptable Solution	Complies	Comment
		Managing Vegetation Near Power Lines		
GAS	Location of gas services will not lead to ignition of surrounding bushland or the fabric of buildings.	Reticulated or bottled gas is installed and maintained in accordance with AS 1596:2014 and the requirements of relevant authorities, metal piping is to be used.	✓ **Able to comply**	
		All fixed gas cylinders are kept clear of all flammable materials to a distance of 10 metres and shielded on the hazard side;	✓	All tanked gas stored on site will be sited and secured with appropriate shielded from the bushfire hazard.
		Connections to and from gas cylinders are metal:	✓	
		Polymer-sheathed flexible gas supply lines are not used; and	✓	
		Above-ground gas service pipes are metal, including and up to any outlets.	✓	
6.8.4 EMERGENCY MANAGEMENT PLANNING **Table 6.8d** To provide suitable emergency and evacuation arrangements for occupants of SFPP developments	A bush fire emergency and evacuation management plan is prepared.	Bush fire emergency management and evacuation plan is prepared consistent with the: ❑ the NSW RFS document: A Guide to Developing a Bush Fire Emergency Management and Evacuation Plan; and ❑ AS3745:2010 Planning for emergencies in facilities.	✓ **Able to comply**	A Bushfire Management Plan is recommended to be prepared for the caravan park.
		The emergency and evacuation management plan should include a mechanism for the early relocation of occupants.	✓ **Able to comply**	
	Appropriate and adequate management arrangements are established for consultation and implementation of the bush fire emergency and evacuation management plan.	An Emergency Planning Committee is established to consult with residents and staff in developing and implementing an Emergency Procedures Manual.	✓ **Able to comply**	Where required, consultation with staff and residents will be undertaken during the preparation of the Bushfire Management Plan.
		Detailed plans of all emergency assembly areas including 'on-site' and 'off-site' arrangements as started in AS3745 are clearly displayed, and an annual (as a minimum) trial	✓ **Able to comply**	

Intent of Measure	Performance Criteria	Acceptable Solution	Complies	Comment
		emergency evacuation is conducted.		

Appendix C: AHIMS Report

AHIMS Web Services (AWS)
Search Result

Your Ref/PO Number : 2280 Bobs Farm

Client Service ID : 729416

Katrina Greville

21 Costata Crescent
Adamstown New South Wales 2289

Attention: Katrina Greville

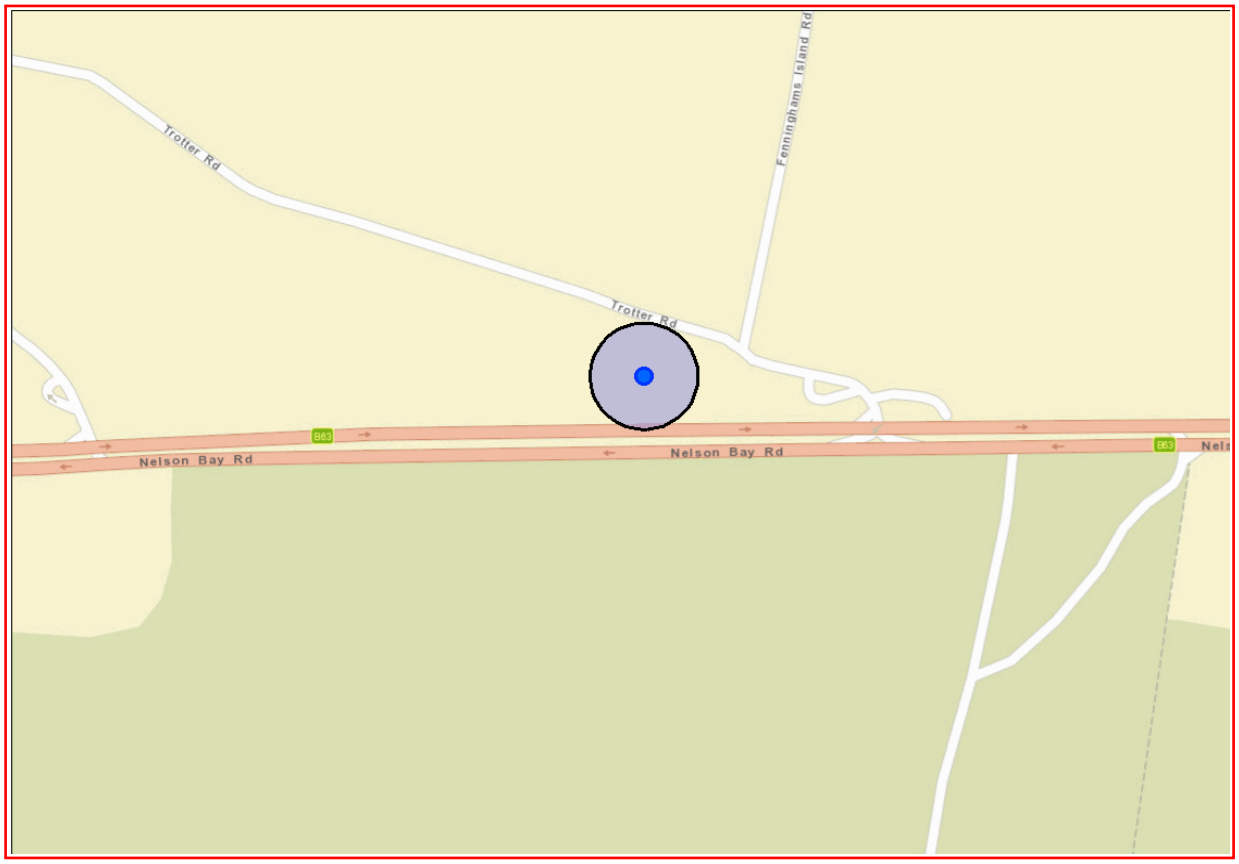
Email: klmukevski@bigpond.com

Date: 03 November 2022

Dear Sir or Madam:

AHIMS Web Service search for the following area at Address : 4045 NELSON BAY ROAD BOBS FARM 2316 with a Buffer of 50 meters, conducted by Katrina Greville on 03 November 2022.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.



A search of Heritage NSW AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

0	**Aboriginal sites are recorded in or near the above location.**
0	**Aboriginal places have been declared in or near the above location. ***

If your search shows Aboriginal sites or places what should you do?

- You must do an extensive search if AHIMS has shown that there are Aboriginal sites or places recorded in the search area.
- If you are checking AHIMS as a part of your due diligence, refer to the next steps of the Due Diligence Code of practice.
- You can get further information about Aboriginal places by looking at the gazettal notice that declared it. Aboriginal places gazetted after 2001 are available on the NSW Government Gazette (https://www.legislation.nsw.gov.au/gazette) website. Gazettal notices published prior to 2001 can be obtained from Heritage NSW upon request

Important information about your AHIMS search

- The information derived from the AHIMS search is only to be used for the purpose for which it was requested. It is not be made available to the public.
- AHIMS records information about Aboriginal sites that have been provided to Heritage NSW and Aboriginal places that have been declared by the Minister;
- Information recorded on AHIMS may vary in its accuracy and may not be up to date. Location details are recorded as grid references and it is important to note that there may be errors or omissions in these recordings,
- Some parts of New South Wales have not been investigated in detail and there may be fewer records of Aboriginal sites in those areas. These areas may contain Aboriginal sites which are not recorded on AHIMS.
- Aboriginal objects are protected under the National Parks and Wildlife Act 1974 even if they are not recorded as a site on AHIMS.
- This search can form part of your due diligence and remains valid for 12 months.

Level 6, 10 Valentine Ave, Parramatta 2150
Locked Bag 5020 Parramatta NSW 2124
Tel: (02) 9585 6345

ABN 34 945 244 274
Email: ahims@environment.nsw.gov.au
Web: www.heritage.nsw.gov.au

Appendix D: NBC Bushfire Attack Assessor V4.1 Report

NBC Bushfire Attack Assessment Report V4.1

AS3959 (2018) Appendix B - Detailed Method 2

Print Date: 3/11/2022 **Assessment Date:** 2/11/2022

Site Street Address: 2280 4029 & 4045 Nelson Bay Road, Bobs Farm

Assessor: Stuart Greville; Bushfire Planning Australia

Local Government Area: Port Stephens **Alpine Area:** No

Equations Used

Transmissivity: Fuss and Hammins, 2002
Flame Length: RFS PBP, 2001/Vesta/Catchpole
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: Forest - Acceptable Solutions

Vegetation Information

Vegetation Type: Forest (including Coastal Swamp Forest)

Vegetation Group: Forest and Woodland

Vegetation Slope: 0 Degrees **Vegetation Slope Type:** Downslope

Surface Fuel Load(t/ha): 22 **Overall Fuel Load(t/ha):** 36.1

Vegetation Height(m): 2 Only Applicable to Shrub/Scrub and Vesta

Site Information

Site Slope: 0 Degrees **Site Slope Type:** Downslope

Elevation of Receiver(m): Default **APZ/Separation(m):** 24

Fire Inputs

Veg./Flame Width(m): 100 **Flame Temp(K):** 1090

Calculation Parameters

Flame Emissivity: 95 **Relative Humidity(%):** 25

Heat of Combustion(kJ/kg 18600 **Ambient Temp(K):** 308

Moisture Factor: 5 **FDI:** 100

Program Outputs

Level of Construction: BAL 29 **Peak Elevation of Receiver(m):** 9.4

Radiant Heat(kW/m2): 29 **Flame Angle (degrees):** 61

Flame Length(m): 21.49 **Maximum View Factor:** 0.456

Rate Of Spread (km/h): 2.64 **Inner Protection Area(m):** 0

Transmissivity: 0.837 **Outer Protection Area(m):** 0

Fire Intensity(kW/m): 49240

BAL Thresholds

	BAL-40:	BAL-29:	BAL-19:	BAL-12.5:	10 kw/m2:	Elevation of Receiver:
Asset Protection Zone(m):	18	23	33	43	67	6

Run Description:	North - Performance Solution		
Vegetation Information			
Vegetation Type:	Coastal Swamp Forests		
Vegetation Group:	Forested Wetlands		
Vegetation Slope:	0 Degrees	**Vegetation Slope Type:**	Downslope
Surface Fuel Load(t/ha):	22.6	**Overall Fuel Load(t/ha):**	34.1
Vegetation Height(m):	1.4	Only Applicable to Shrub/Scrub and Vesta	
Site Information			
Site Slope:	0 Degrees	**Site Slope Type:**	Downslope
Elevation of Receiver(m):	Default	**APZ/Separation(m):**	24
Fire Inputs			
Veg./Flame Width(m):	100	**Flame Temp(K):**	1090
Calculation Parameters			
Flame Emissivity:	95	**Relative Humidity(%):**	25
Heat of Combustion(kJ/kg	18600	**Ambient Temp(K):**	308
Moisture Factor:	5	**FDI:**	100
Program Outputs			
Level of Construction:	BAL 29	**Peak Elevation of Receiver(m):**	9.5
Radiant Heat(kW/m2):	28.1	**Flame Angle (degrees):**	61
Flame Length(m):	21.72	**Maximum View Factor:**	0.443
Rate Of Spread (km/h):	2.71	**Inner Protection Area(m):**	12
Transmissivity:	0.835	**Outer Protection Area(m):**	12
Fire Intensity(kW/m):	47781		

BAL Thresholds

	BAL-40:	BAL-29:	BAL-19:	BAL-12.5:	10 kw/m2:	Elevation of Receiver:
Asset Protection Zone(m):	18	23	33	45	67	6

Run Description:	South - Performance Solution

Vegetation Information

Vegetation Type:	Coastal Dune DSF		
Vegetation Group:	Dry Sclerophyll Forests (Shrubby)		
Vegetation Slope:	0 Degrees	**Vegetation Slope Type:**	Downslope
Surface Fuel Load(t/ha):	20.5	**Overall Fuel Load(t/ha):**	31.1
Vegetation Height(m):	2	Only Applicable to Shrub/Scrub and Vesta	

Site Information

Site Slope:	0 Degrees	**Site Slope Type:**	Downslope
Elevation of Receiver(m):	Default	**APZ/Separation(m):**	22

Fire Inputs

Veg./Flame Width(m):	100	**Flame Temp(K):**	1090

Calculation Parameters

Flame Emissivity:	95	**Relative Humidity(%):**	25
Heat of Combustion(kJ/kg	18600	**Ambient Temp(K):**	308
Moisture Factor:	5	**FDI:**	100

Program Outputs

Level of Construction:	BAL 29	**Peak Elevation of Receiver(m):**	8.62
Radiant Heat(kW/m2):	29	**Flame Angle (degrees):**	61
Flame Length(m):	19.72	**Maximum View Factor:**	0.453
Rate Of Spread (km/h):	2.46	**Inner Protection Area(m):**	0
Transmissivity:	0.841	**Outer Protection Area(m):**	0
Fire Intensity(kW/m):	39528		

BAL Thresholds

	BAL-40:	BAL-29:	BAL-19:	BAL-12.5:	10 kw/m2:	Elevation of Receiver:
Asset Protection Zone(m):	16	22	40	42	63	6