

Hunter Valley Bushfire

Consulting Services



BUSHFIRE ASSESSMENT REPORT (BAR)

Change of Use for an existing coach house to a dwelling and an existing secondary dwelling to an eco-tourist facility

(PBP, 2019, PART 8 - OTHER DEVELOPMENTS and PART 7 – RESIDENTIAL INFILL DEVELOPMENT)

245 Station L, Lochinvar NSW 2321

(LOT 80, DP1003006)

19 June 2024

Table 1 – Document Version and Disclaimer

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No:	Reference:	Author:	Reviewer:
Version 1	24/05/31_BAR_report 245 Station L Lochinvar_V1	LMG	SF
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Table 2 - RFS Summary

Question:	Response:
<p>What is the recommended level of compliance with AS3959-2018?</p>	<p>The recommended level of compliance for the proposed development is BAL 12.5. however, the work is completed.</p>
<p>Can the proposed development comply with AS3959-2018 and RFS, 2019, Planning for Bushfire Protection?</p>	<p>Yes</p>
<p>Does the proposed development comply with the aims and objectives of the RFS, 2019, Planning for Bushfire Protection?</p>	<p>Yes – A table that demonstrates that the proposal is consistent with the aims and objectives of the RFS, 2019, Planning for Bushfire Protection is provided in Section 3.</p>
<p>Is referral to the NSW Rural Fire Service required?</p>	<p>This BAR is to accompany documentation to be submitted for a Building Information certificate to Council. Council may refer this report to the RFS for comment. This BAR is not the subject of a 100B Authority.</p>

EXECUTIVE SUMMARY

Hunter Valley Bushfire Consulting Services has been engaged to prepare a Bushfire Assessment Report (this Report) for an existing secondary dwelling house and an eco-tourist facility (the development) at 245 Station L, Lochinvar NSW 2321 (Lot 80, DP1003006) (the site).

This Report is required to inform a Building Information Certificate (BIC) and Development Application (DA) to be lodged with Maitland Council as the site is mapped as Bushfire Prone Land (BPL) under the Environmental Planning & Assessment Act 1979 (s10.3 – Bush fire prone land).

This Report demonstrates how the development conforms with the document titled 'Planning for Bushfire Protection' (PBP).

The aim of PBP is to provide for the protection of human life and minimise the impacts on property from the threat of bush fire, while having due regard to development potential, site characteristics and protection of the environment (p.10).

The table below shows the calculation of the BAL and related APZ which are to be applied to the proposal.

Plot/ Transect	Vegetation Formation	Slope	APZ width	Distance to vegetation	BAL
1 - North	low threat exclusion	0-5 - downslope	73m	142m	No Bal
2 - East	Grassland	Upslope	50m	33m	No Bal
3 - South	Grassland	upslope	50m	49m	No Bal
4 - West	Grassland	0-5 - downslope	32m	43m	<u>BAL12.5</u>

Council must be satisfied that the development conforms to the Bushfire Protection Measures (BPM)s listed within PBP under the EP&A ACT 1979 (s4.14 – Consultation and development consent – certain bush fire prone land). The recommendations below will ensure compliance with the PBP 2019.

Asset Protection Zones

1. To achieve a Bushfire Attack Level (BAL) of **BAL12.5**, an **APZ of 73m to the north, 50m to the south and 32m to the west; and 50m to the east** is to be managed as an Inner Protection Area (IPA) in accordance the lot is to be managed as an IPA, as described under 'Planning for Bushfire Protection (Appendix 4 – Asset Protect Zone Requirements)' and the document titled 'Standards for Asset Protection Zones'. This APZ is to be provided in perpetuity.

Access

2. Property access roads on the site must comply with the following requirements of Table 7.4a of

Planning for Bush Fire Protection 2019:

- a. property access roads are two-wheel drive, all weather roads
- b. there is suitable access for a Category 1 fire appliance to within 4m of the static water supply where no reticulated supply is available.
- c. minimum 4m carriageway width.
- d. a minimum vertical clearance of 4m to any overhanging obstructions, including tree branches.
- e. property access must provide a suitable turning area in accordance with Appendix 3.
- f. curves have a minimum inner radius of 6m and are minimal in number to allow for rapid access and egress.
- g. the minimum distance between inner and outer curves is 6m.
- h. the crossfall is not more than 10 degrees.
- i. maximum grades for sealed roads do not exceed 15 degrees and not more than 10 degrees for unsealed roads;

Services - Water

3. The site is to be linked to a reliable water supply network. In lieu of any available water hydrant, the provision of water must comply the following in accordance with Table 7.4a of *Planning for Bush Fire Protection 2019*:
 - a. a 20,000L static water supply tank must be provided on site.
 - b. connection for firefighting purposes is located within the IPA or non-hazard side and away from the structure.
 - c. 65mm Storz outlet with a ball valve is fitted to the outlet.
 - d. ball valve and pipes are adequate for water flow and are metal.
 - e. supply pipes from tank to ball valve have the same bore size to ensure flow volume.
 - f. a hardened ground surface for truck access is supplied within 4m.
 - g. above-ground tanks are manufactured from concrete or metal.
 - h. raised tanks have their stands constructed from non-combustible material or bush fire-resisting timber (see Appendix F of AS 3959).
 - i. unobstructed access can be provided at all times.
 - j. tanks on the hazard side of a building are provided with adequate shielding for the protection of firefighters.
 - k. all exposed water pipes external to the building are metal, including any fittings.
 - l. pumps are to be provided to the existing dam (Southeast of development). They are a minimum 5hp or 3kW petrol or diesel- powered pump and are to be shielded against bush fire attack; any hose and reel for firefighting connected to the pump shall be 19mm internal diameter.
 - m. fire hose reels are constructed in accordance with AS/NZS 1221:1997 and installed in accordance with the relevant clauses of AS 2441:2005; and
 - n. the gate or ball valve, pipes and tank penetrations are to be designed to allow for a full 50mm inner diameter water flow through the Storz fitting and must be of a metal construction.

Services – Gas

4. The provision of gas must comply the following in accordance with Table 7.4a of *Planning for Bush Fire Protection 2019*:
 - a. reticulated or bottled gas is installed and maintained in accordance with AS/NZS 1596:2014 and the requirements of relevant authorities, and metal piping is used.
 - b. all fixed gas cylinders are kept clear of all flammable materials to a distance of 10m and shielded on the hazard side.
 - c. connections to and from gas cylinders are metal.
 - d. polymer-sheathed flexible gas supply lines are not used; and
 - e. above-ground gas service pipes are metal, including and up to any outlets; and
 - f. Any gas cylinders that are within 10m of a dwelling:
 - i. Have their release valves directed away from the dwelling, and
 - ii. Are enclosed on the hazard side of the installation, and
 - iii. Have metal connections to and from the cylinders

Construction

5. All existing habitable buildings shall be upgraded to improve ember protection. This shall be achieved by enclosing all openings (excluding roof tile spaces) or covering openings with a non-corrosive metal screen mesh with a maximum aperture of 2mm. Where applicable, this includes any sub floor areas, openable windows, vents, weepholes, and eaves. External doors are to be fitted with draft excluders.
6. Roofing shall be gutter less or have leafless guttering and valleys to prevent the build-up of flammable material. Any materials used to prevent the build-up of debris in the gutter shall have a flammability index of no greater than 5.

Landscaping

7. Any new and existing landscaping on the site is to be consistent with the requirements of NSW RFS, 2019, 'Planning for Bushfire Protection' (Appendix 4 – Asset Protection Zone Requirements), which includes:
 - a. A clear area of low-cut lawn or pavement is maintained adjacent to the dwelling.
 - b. Fencing details in accordance with PBP (7.6 – Fences and gates).
 - c. The branches will not overhang the roof.
 - d. The tree canopy is not continuous; and
 - e. Any proposed windbreak is located on the elevation from which fires are likely to approach.

Emergency Management

8. A Bushfire Emergency Management and Evacuation plan is to be prepared for the site. This Bushfire Emergency Management and Evacuation Plan is to be prepared consistent with the: The NSW RFS document: A Guide to Developing a Bush Fire Emergency Management and Evacuation Plan NSW RFS Schools Program Guide

Australian Standard AS 3745:2010 Planning for emergencies in facilities; and Australian Standard AS 4083:2010 Planning for emergencies – Health care facilities (where applicable). the Bush Fire Emergency Management and an Evacuation Plan should include planning for the early relocation of occupants.

Note: A copy of the Bush Fire Emergency Management and Evacuation Plan should be provided to the Local Emergency Management Committee for its information prior to occupation of the development.

This BAR assesses the compliance of the proposed development with the documents PBP

2019 and AS3959 :2018. A construction level of BAL12.5 has been calculated in Table 5. An APZ has also been established from the same Table. Bushfire Protection Measures have been applied to the proposal.

Notwithstanding the precautions adopted, it should always be remembered that bushfires burn under a wide range of conditions and an element of risk, no matter how small, always remains and although the standard is designed to improve the performance of such

TERMS & ABBREVIATIONS

APZ	Asset Protection Zone
AS3959	Australian Standard 3959
BAL	Bushfire Attack Level
BAR	Bushfire Assessment Report
BFSA	Bush Fire Safety Authority
BPAD	Bushfire Planning and Design
BPL	Bushfire Prone Land
BPM	Bushfire Protection Measures
DA	Development Application
DBYD	Dial Before You Dig
DP	Deposited Plan
DSF	Dry Sclerophyll Forest
EP&A Act	Environmental Planning and Assessment Act 1979
FDI	Fire Danger Index
FPAA	Fire Protection Association of Australia
GIPA	Government Information (Public Access) Act 2009
IPA	Inner Protection Area
LEP	Local Environmental Plan
LGA	Local Government Area
NCC	National Construction Code
OPA	Outer Protection Area
PBP	Planning for Bushfire Protection and Addendum
RFS	NSW Rural Fire Service
RoW	Right of Way
SEED	Sharing and Enabling Environmental Data
SFPP	Special Fire Protection Purpose
URA	Urban Release Area

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1.0 INTRODUCTION

1.1 SITE PARTICULARS

Address:	245 Station L, Lochinvar NSW 2321 (the site) (FIGURES 1, 2 & 3).
Legal Description:	Lot 80, DP1003006
Total Area:	34,000 sqm (Approximate)
Local Government Area:	Maitland Council
Fire Danger Index (FDI):	100 – Greater Hunter
Boundaries:	RU2 – Rural Landscape
Current Land Use:	Residential
Significant Features:	<p>The site is characterised by rural land. Vehicular access is via Station Lane, which then links to the village of Lochinvar.</p> <p>The primary access to the site is directly off Station Lane, with secondary access directly off Station Lane also. An existing two storey, Heritage listed dwelling “Clifton” exists on the property. The site is located directly across from Lochinvar Railway Station and Carpark. The railway line is located immediately adjacent to the northern boundary of the property.</p> <p>The property has four (4) existing buildings, dams, a bore and outbuildings.</p> <p>The site is approximately 5km or a 5-minute drive to Lochinvar NSW RFS.</p>
Bushfire Prone Land Map:	The site is identified as BPL, being Vegetation Category 3. (Figure 4)
Environmental Features:	The site is NOT mapped as containing Biodiversity Values under the Biodiversity Conservation Act 2016. (Figure 5)
Climate/Fire History	The site lies within a geographical area of a FDI rating of 100. Extreme bushfire weather is therefore associated with long periods of drought, high temperatures, low humidity and gusty, often north-westerly winds.

Fire Trails: The Plan does not identify any fire trails that exist on the property that are on the Rural Fire Act (s.620 - Register of Certified Fire Trails).

1.2 SCOPE

The scope of this BAR is to identify the bush fire hazard and provide measures to assist Council and the RFS that the identified fire hazard would be reduced to a level that is considered necessary to provide adequate protection to life and property.

This BAR provides the required information to assist Council and the RFS in determining compliance in accordance with the PBP and AS3959-2018. Council is the final consenting authority and the future construction works must comply with the conditions listed in the Notice of Determination issued by Council.

1.3 PROPOSAL

The proposal is for a Change of use of an existing Coach House to a dwelling house and a Change of use of an existing Secondary dwelling to an Eco Tourist facility (the development) (**Figure 1**).

Under the Maitland Council Local Environmental Plan,

1. a **secondary dwelling** means a self-contained dwelling that—

- (a) is established in conjunction with another dwelling (the **principal dwelling**), and
- (b) is on the same lot of land as the principal dwelling, and
- (c) is located within, or is attached to, or is separate from, the principal dwelling.

2. an **eco-tourist facility** means a building or place that—

- (a) provides temporary or short-term accommodation to visitors on a commercial basis, and
- (b) is located in or adjacent to an area with special ecological or cultural features, and
- (c) is sensitively designed and located to minimise bulk, scale and overall physical footprint and any ecological or visual impact.

It may include facilities that are used to provide information or education to visitors and to exhibit or display items.

The development is defined as ‘other development’ under Section 8 (Clause 8.2.1) of the PBP and could be defined under the National Construction Code (NCC) as follows:

1. dwelling (Class 1a)

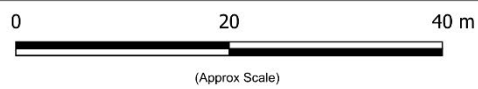
An illustration of the proposed siting of the development is provided as **(FIGURES 1)**.



Figure 1: Site Plan Showing Existing OSSM

Job 3706: 245 Station Lane, Lochinvar NSW - WMR

W Whitehead & Associates
Environmental Consultants



Revision	001
Drawn	CM
Approved	MS

1.4 ASSUMPTIONS OF THIS REPORT

The following assumptions have informed this BAR:

1. Plans provided as **(Figure 1.)**
2. Access to private properties, other than the site was not provided, so photos taken during the site inspection are from public areas, such as the road reserve.
3. The BAR may be assessed by NSW RFS and Council will develop conditions of consent. Any construction must comply with the conditions issued by NSW RFS and Council, not this BAR.

Figure 2. Locality Map (Source: SEED Portal 10/10/2022)

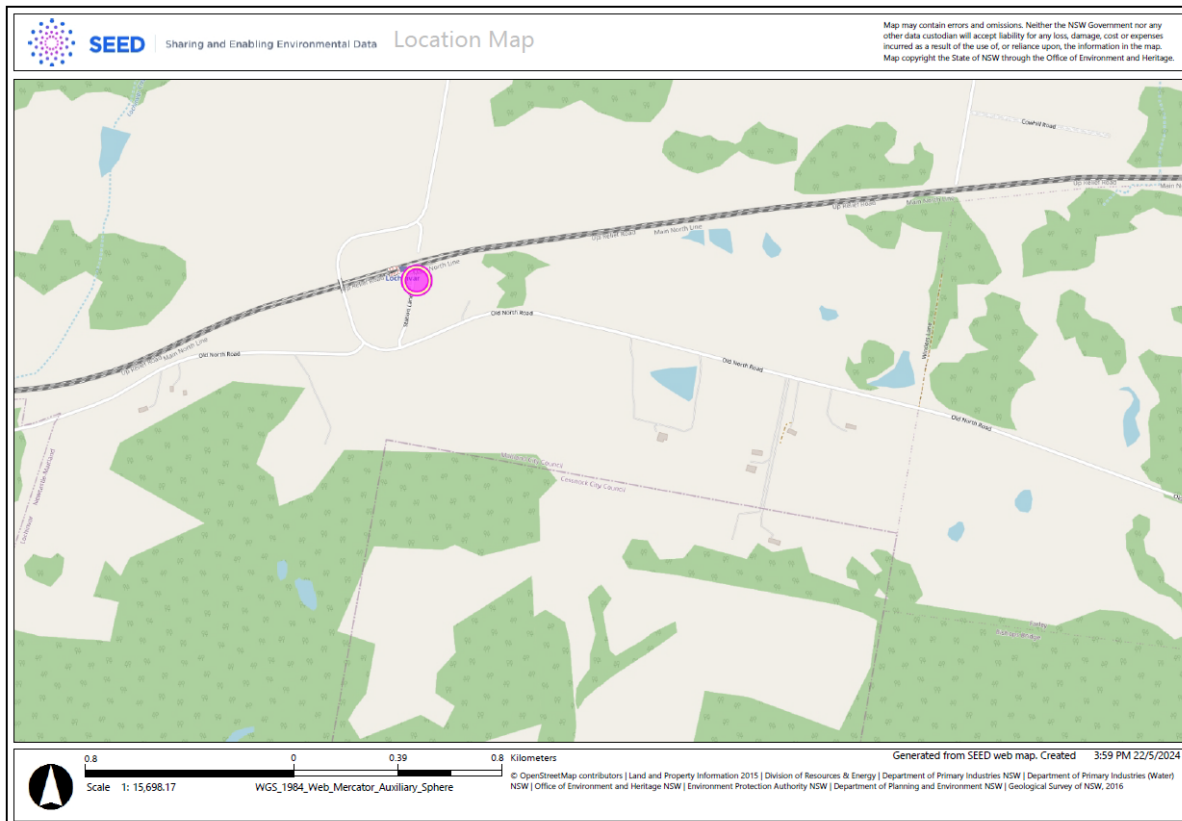
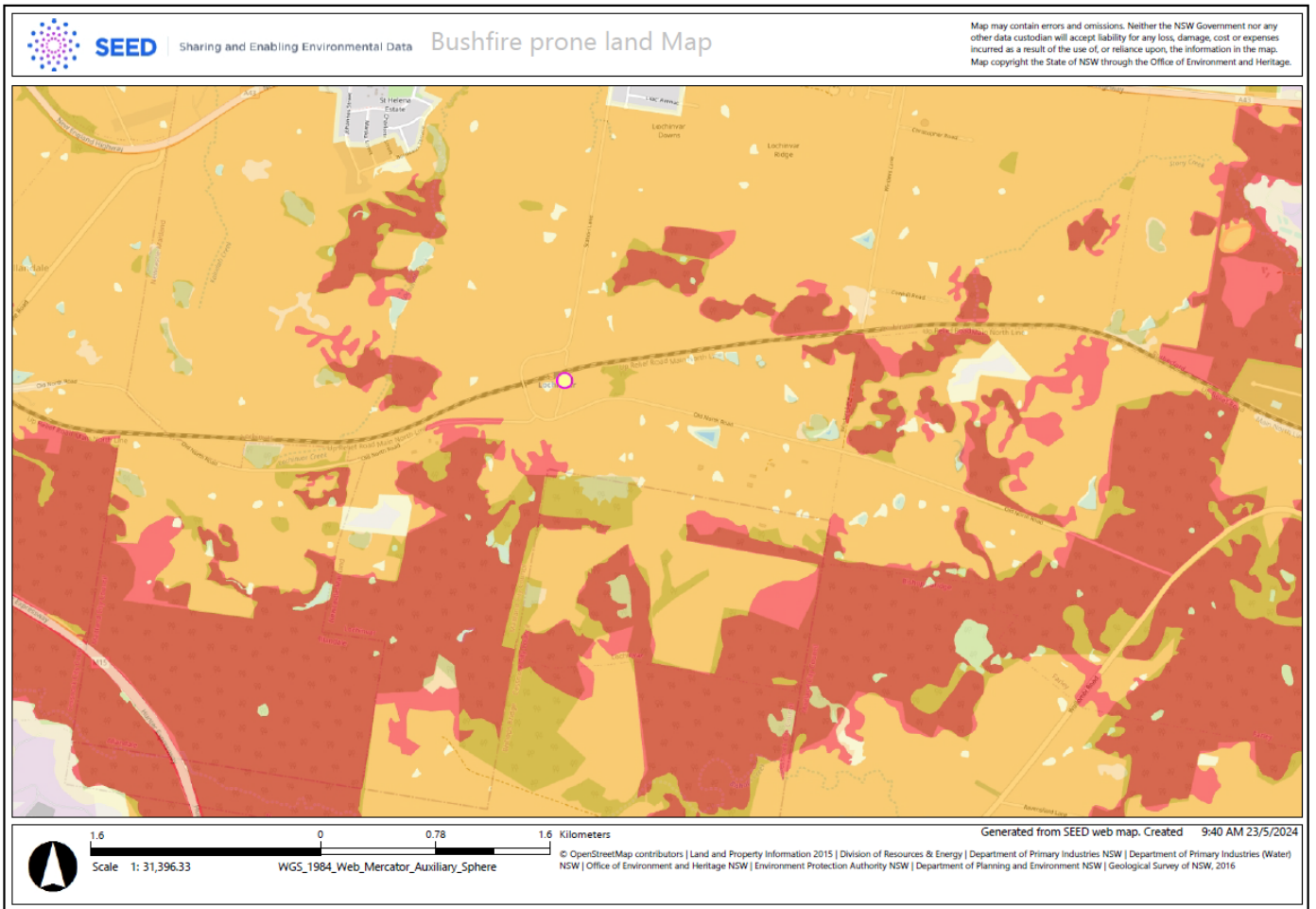


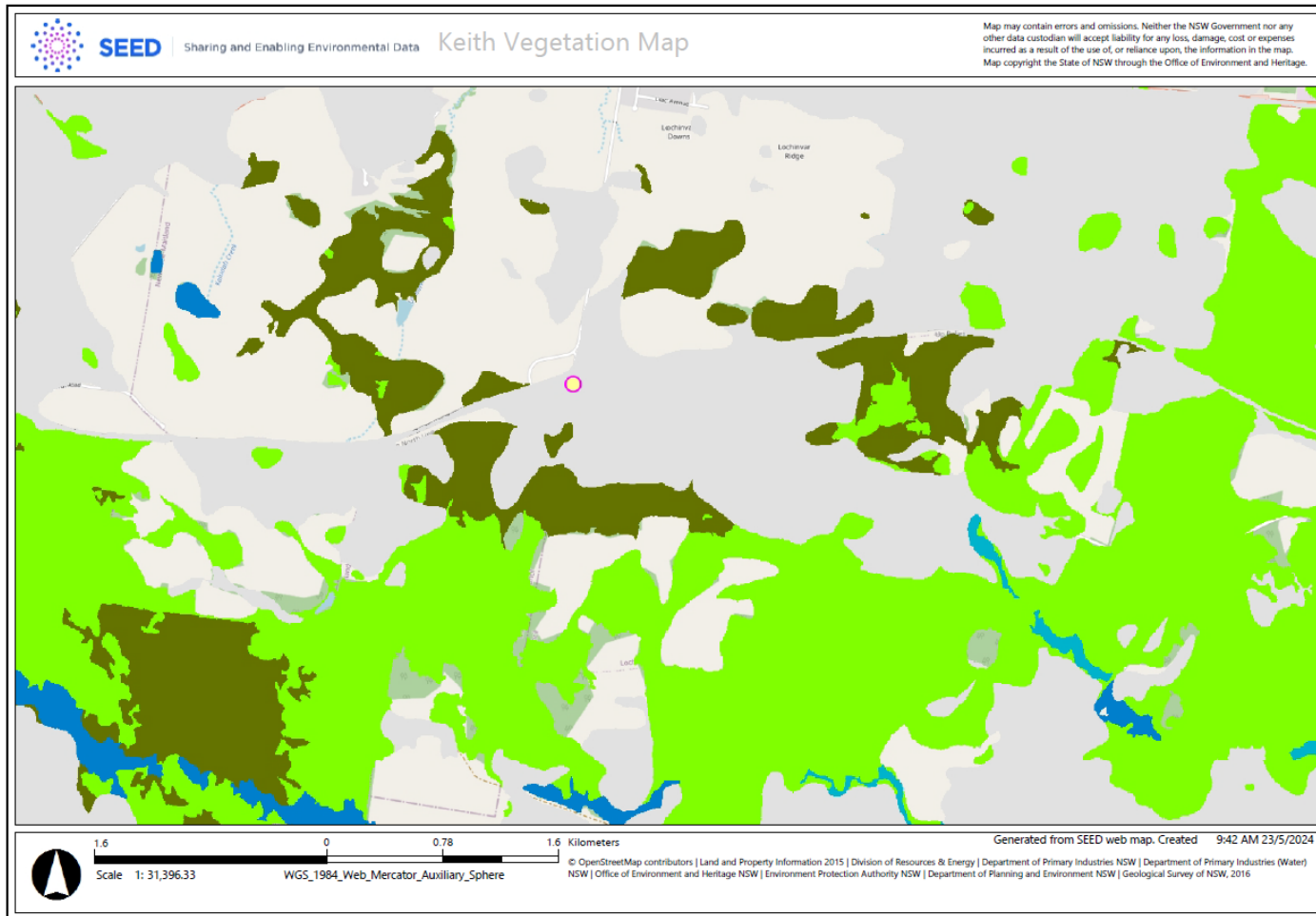
Figure 4. Bushfire Prone Land Map (Source: Maitland Council Online Mapping 26/10/2022)



Legend

- NSW Bush Fire Prone Lands**
- 0
 - 1
 - 2
 - 3

Figure 6. Keith Vegetation Map (Source: SEED Portal NSW)



2.0 ASSESSMENT

2.1 VEGETATION ASSESSMENT

The vegetation was determined by the following methods:

1. Site inspection on 4 May 2024 to assess vegetation formation in accordance with PBP (A1.2) (p.81) and Keith 'Ocean Shores to Desert Dunes'.
2. Refer to the site image in Figure 6 below.

The vegetation formation in all directions around the development to 140 metres is:

Table 2– Vegetation

Plot	PBP-2019	AS3959-2018	NSW Comprehensive Fuel Loads	Ecological Report
Plot 1 - North	Low threat vegetation - exclusion	Low Threat exclusion	N/A	N/A
Plot 2 - East	Grassland	grassland	N/A	N/A
Plot 3 - South	Grassland	grassland	N/A	N/A
Plot 4 - West	Grassland	Grassland	N/A	N/A

2.2 SLOPE ASSESSMENT

The effective and site slope was determined by the following methods:

- 1 Site Inspection on 4 May 2024 to observe slope.
- 2 Use of 2m contours on site plan in Figure 1.

The effective slope of the land under the significant vegetation at 100m is:

Table 3– Slope

Transect	Rise (m)	Run (m)	Slope (%)	Slope (o)
North	-	-	-	0–5-degree downslope
East	-	-	-	upslope
South	-	-	-	upslope
West	-	-	-	0–5-degree crossslope

2.3 DETERMINATION OF FIRE DANGER INDEX (FDI)

The FFDI was determined by referring to the RFS, 2020, 'Building in Bushfire Prone Areas Single Dwelling Application Kit' (p.9). The NSW Local Government Areas (LGA) Fire Danger Index (FDI) is repeated below for quick reference.

The LGA is Central Coast Council in accordance with the NSW Planning Portal, which was viewed on 6 October 2022 and therefore the FDI is Greater Sydney Region (100) in accordance with Table 5 below.

Table 4 – NSW Local Government Areas (LGA) Fire Danger Index (FDI)

Far North Coast (80) Ballina Byron Clarence Valley Kyogle Lismore Richmond Valley Tweed	Illawarra/Shoalhaven (100) Kiama Shellharbour Shoalhaven Wingecarribee Wollondilly Wollongong	Northern Slopes (80) Gunnedah Gwydir Inverell Liverpool Plains Tamworth Regional	Eastern Riverina (80) Albury Coolamon Greater Hume Junee Lockhart Wagga Wagga
North Coast (80) Bellingen Coffs Harbour Mid-Coast Port Macquarie- Hastings Kempsey Nambucca	Far South Coast (100) Bega Valley Eurobodalla	North Western (80) Moree Plains Narrabri Walgett Warrumbungle	Southern Riverina (80) Berrigan Edward River Federation Murray River
Greater Hunter (100) Cessnock Dungog Lake Macquarie Maitland Muswellbrook Newcastle Port Stephens Singleton Upper Hunter	Monaro Alpine (80) Snowy Monaro	Upper Centre West Plains (80) Bogan Coonamble Gilgandra Warren	Northern Riverina (80) Carrathool Griffith Hay Leeton Narrandera Murrumbidgee

<p>Greater Sydney Region (100) All Sydney Metropolitan Councils Plus, Blue Mountains, Hawkesbury, and Central Coast</p>	<p>Southern Ranges (100) Queanbeyan-Palerang Goulburn Mulwaree Upper Lachlan Yass Valley</p>	<p>Lower Central West Plains (80) Bland Dubbo Regional Forbes Lachlan Narromine Parkes Temora Weddin</p>	<p>South Western (80) Balranald Wentworth</p>
	<p>Central Ranges (100) Bathurst Blayney Cabonne Cowra Lithgow Mid-Western Regional Oberon Orange</p>	<p>Southern Slopes (80) Hilltops Cootamundra-Gundagai Snowy Valleys</p>	<p>Far Western (80) Bourke Brewarrina Broken Hill Central Darling Cobar Unincorporated NSW</p>
	<p>New England (80) Armidale Regional Glenn Innes Severn Tenterfield Uralla Walcha</p>		

The above table was taken from the NSW RFS, 2020, 'Single Dwelling Application Kit'.

1.4 DETERMINATION OF BUSHFIRE ATTACK LEVEL (BAL)

The assessment of vegetation and slope has been used to calculate the following BALs:

Table 5 – Bushfire Attack Level (BAL)

Plot/ Transect	Vegetation Formation	Effective Slope	APZ width	Distance to vegetation	BAL
1 - North	Low Threat exclusion	0-5 degree downslope	73m	142m	No BAL
2 - East	grassland	upslope	50m	50m	No BAL
3 - South	grassland	upslope	50m	50m	No BAL
4 - West	grassland	0-5 degrees crossslope	32m	43m	BAL12.5

Figure 6. 140m Buffer Map and distances to Vegetation (Source: SEED Portal)

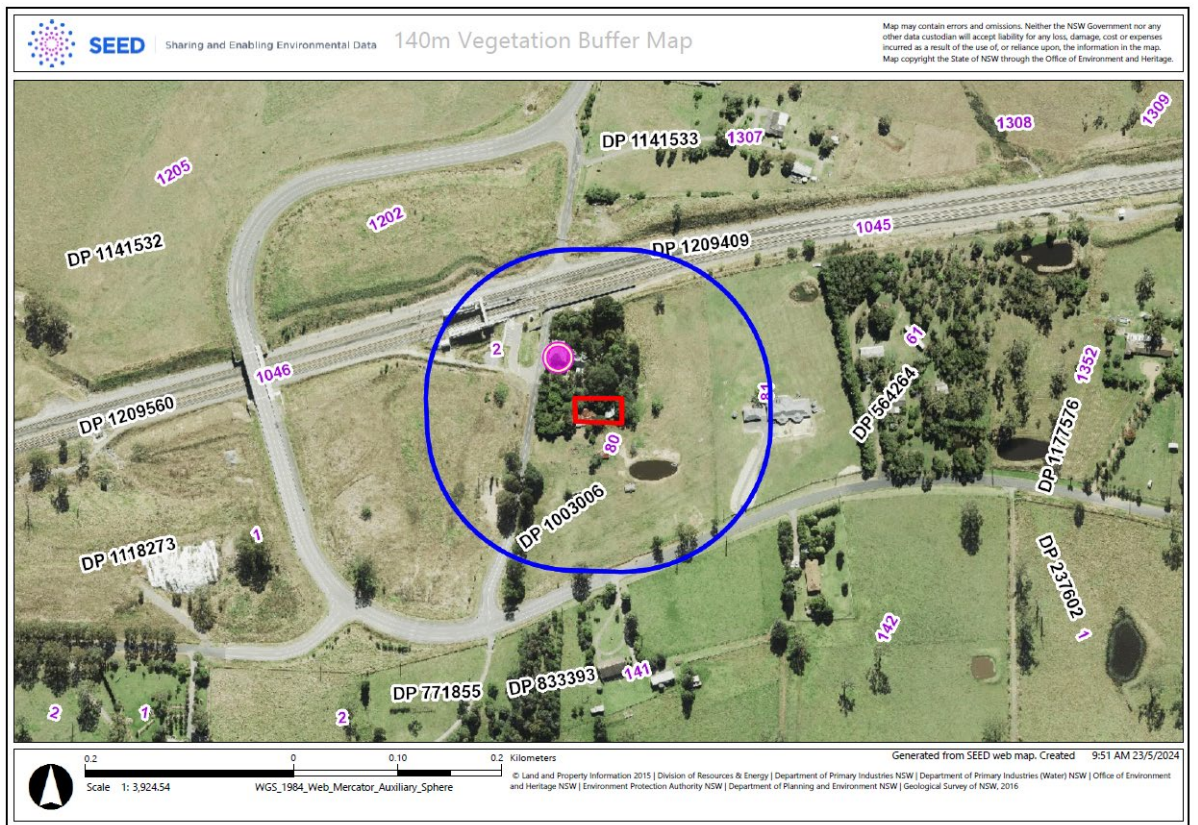


Photo 1 – Northern Perspective showing grassland vegetation to the west



Photo 2 – Eastern Perspective



Photo 3 – Southern Perspective



Photo 4: Railway line to the north



Photo 5 – Primary access to the property.



3.0 BUSHFIRE PROTECTION MEASURES

3.1 ASSET PROTECTION ZONES

The RFS, 2019, Planning for Bushfire Protection states that the intent of these Bushfire Protection Measures is 'to minimise the risk of bush fire attack and provide protection for emergency services personnel, residents and others assisting firefighting activities' (p.65).

Compliance with Table 7.4a – Performance criteria and acceptable solutions for residential infill development in relation to APZs is demonstrated below.

Table 6 - Compliance with PBP for Asset Protection Zones

No	Acceptable Solution	Response
1	An APZ is provided in accordance with Table A1.12.2 or A1.12.3 in Appendix 1.	<p>Yes – the property is to be managed and maintained as an Inner Protection Area (IPA)</p> <ol style="list-style-type: none"> 1. for a minimum length of 50m to the east and south from the development. 2. from the north and west of the development to the property boundaries. <p>A recommendation is to be placed below.</p>
2	APZs are managed in accordance with the requirements of Appendix 4 of PBP.	<p>the APZ setbacks identified in 1 above are to be managed as an Inner Protection Area (IPA) in accordance with the provisions in Appendix 4 of the PBP 2019.</p> <p>The management of the site as an IPA will occur in perpetuity.</p> <p>A recommendation is to be placed below.</p>
3	APZs are wholly within the boundaries of the development site.	This APZ listed in Table 5 above is wholly within the site
	APZs are located on lands with a slope less than 18 degrees.	Table 5 and Figure 1 above show that the slope of lands on which APZs are to be located are no greater than 18 degrees.

3.2 ACCESS

The RFS, 2019, Planning for Bushfire Protection states that the intent of these Bushfire Protection Measures is 'to minimise the risk of bush fire attack and provide protection for emergency services personnel, residents and others assisting firefighting activities' (p.65).

A performance solution has been discussed in Section 4 of this report, where some acceptable solutions listed in Table 7 cannot comply.

Compliance with Table 7.4a is demonstrated below.

Table 7 – Compliance with PBP for Access

No	Acceptable Solutions	Response
1	Property access roads are two-wheel drive, all-weather roads.	The existing property access roads (primary and secondary) are two-wheel drive and all-weather surface. Refer to Figure 1 and photo 5. A recommendation is to be placed below.
2	The capacity of road surfaces and any bridges/causeways is sufficient to carry a fully loaded firefighting vehicles (up to 23 tonnes); bridges and causeways clearly indicate load rating.	There are no bridges or causeways as a part of the property access.
3	Property access to private dwellings have passing bays every 200m that are 20m long by 3m wide, making a minimum trafficable width of 6m at the passing bay.	There are no existing buildings located more than 200m from Station Lane property entrances.
4	Hydrants are provided in accordance with 2419.1:2005.	There are no hydrants in existence along Station Lane.

5	<p>There is suitable access for a Category 1 fire appliance within 4m of the static water supply, where no reticulated supply is available.</p>	<p>There is no reticulated water supply existing on the site. A minimum of 20,000L dedicated static water supply is to be provided for firefighting.</p> <p>A recommendation is placed below.</p>
6	<p>No specific access requirements apply in areas where firefighting can occur directly from the hydrant in accordance with AS 2419. Where this cannot occur, the following requirements apply:</p> <ul style="list-style-type: none"> • _Minimum carriageway width of 4m • _In forest, woodland and heath situations, rural property roads have passing bays every 200m that are 20m long by 2m wide, making a minimum trafficable width of 6m, at the passing bay. 	<p>There are no hydrants. Existing access roads are a minimum of 4m in width.</p> <p>A recommendation is to be placed below.</p>
7	<p>A minimum vertical clearance of 4m to any overhanging obstructions, including tree branches.</p>	<p>A minimum vertical clearance of 4m can be provided around existing buildings and access roads.</p> <p>A recommendation is to be placed below.</p>
8	<p>Property access must provide a suitable turning area in accordance with Appendix 3.</p>	<p>The existing property access provides a suitable turning area in accordance with the provisions of Appendix 3 of the PBP 2019. Refer to the site image in Figure 1 above.</p> <p>A recommendation is to be placed below.</p>
9	<p>Curves have a minimum inner radius of 6m and are minimal in number to allow for rapid access and egress.</p>	<p>The existing property access provides a suitable turning area in accordance with the provisions of Appendix 3 of the PBP 2019. Refer to</p>

		the site image in Figure 1 above.
10	The minimum distance between inner and outer curves is 6m.	The existing property access provides a suitable turning area in accordance with the provisions of Appendix 3 of the PBP 2019. Refer to the site image in Figure 1 above.
11	The cross fall is not more than 10 degrees	The cross fall of the existing primary and secondary property access road is not more than 10 degrees
12	Maximum grades for sealed roads do not exceed 15 degrees and not more than 10 degrees for unsealed roads	Property access roads are two-wheel drive with the parts of the access greater than 10 degrees.
13	A development comprising more than three dwellings has formalised access by dedication of a road and not a right of way.	The development is two rural dwellings.

3.3 WATER SUPPLIES

The RFS, 2019, Planning for Bushfire Protection states that the intent of these Bushfire Protection Measures is 'to minimise the risk of bush fire attack and provide protection for emergency services personnel, residents and others assisting firefighting activities' (p.65).

Table 8 – Compliance with PBP for Water Supply

No	Acceptable Solutions	Response
1	Reticulated water is to be provided to the development, where available	Reticulated water is not available on the property.
2	A static water supply is provided where no reticulated water is available	A 20,000L non-combustible (i.e., concrete or metal) water tanks is to be dedicated for firefighting purposes. The site also has a dam – this will also contain a pump.
3	Fire hydrant spacing, design and sizing comply with the Australian Standard AS 2419.1:2005	N/A
4	Hydrants are not located within any road carriageway	N/A
5	Reticulated water supply to urban subdivisions uses a ring main system for areas with perimeter roads	The development is not an urban subdivision.
6	Fire hydrant flows and pressures comply with Table 2.2 of AS 2419.1:2005	N/A
7	All above-ground water service pipes external to the building are metal, including and up to any taps	All above-ground water service pipes external to the buildings are to be metal, including and up to any taps.

8	Where no reticulated water supply is available, water for firefighting purposes is provided in accordance with Table 5.3d.	A static water supply will be provided from a dedicated water tank and dam on the property.
9	A connection for firefighting purposes is located within the IPA or non-hazard side and away from the structure; 65m Storz outlet with ball valve is fitted to the outlet.	The water tank that dedicates 20,000L for firefighting purposes is to be fitted with a 65m Storz outlet with ball valve fitted to the outlet. Photo 9 below provides an example of this type of outlet.
10	Ball valve and pipes are adequate for water flow and are metal	Ball and valve pipes are to be metal.
11	Supply pipes from tank to ball valve have the same bore size to ensure flow volume.	Supply pipes from the tank to ball valve are to have the same bore size.
12	Underground tanks have an access hole of 20mm to allow tankers to refill direct from the tank.	No underground tanks are proposed
13	A hardened ground surface for truck access is supplied within 4m	The primary property access provides direct access to this dedicated water supply
14	Above-ground tanks are manufactured from concrete or metal.	The dedicated water supply tank will be concrete or metal.
15	Raised tanks have their stands constructed from non-combustible material or bush fire-resisting timber.	The dedicated water supply tank will not be raised, but rather placed on the ground
16	Underground tanks are clearly marked	No underground tanks are proposed.



Photo 9 - 65mm Storz outlet on a non-combustible water tank.

3.4 ELECTRICITY SERVICES

The RFS, 2019, Planning for Bushfire Protection states that the intent of these Bushfire Protection Measures is 'to minimise the risk of bush fire attack and provide protection for emergency services personnel, residents and others assisting firefighting activities' (p.65).

Table 9 – Compliance with Table 7.4a of the PBP 2019

Performance Solutions	Acceptable Solutions	Response
Location of electricity services limits the possibility of ignition of surrounding bush land or the fabric of buildings.	Where practicable, electrical transmission lines are underground.	The existing electricity supply is aboveground.
	Where overhead, electrical transmission lines are proposed as follows: <ul style="list-style-type: none"> • Lines are installed with short pole spacing (30m), 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 Guidelines for Managing Vegetation Near Power Lines. 	The electricity supply is existing

3.5 GAS SERVICES

The RFS, 2019, Planning for Bushfire Protection states that the intent of these Bushfire Protection Measures is 'to minimise the risk of bush fire attack and provide protection for emergency services personnel, residents and others assisting firefighting activities' (p.65).

Table 10 - compliance with Table 7.4a of the PBP 2019

Performance Solutions	Acceptable Solutions	Response
Location and design 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/NZS 1596:2014 and the requirements of relevant authorities, and metal piping is used.	Any new reticulated or bottled gas is able to be installed and maintained in accordance with AS/NZS 1596:2014 and the requirements of relevant authorities, and metal piping is used.
	All fixed gas cylinders are kept clear of all flammable materials to a distance of 10m and shielded on the hazard side.	All fixed gas cylinders are kept clear of all flammable materials to a distance of 10m and shielded on the hazard side.
	Connections to and from gas cylinders are metal.	Any new connections to and from gas cylinders are metal.
	Polymer-sheathed flexible gas supply lines are not used.	Polymer-sheathed flexible gas supply lines are not to be used.
	Above-ground gas service pipes are metal, including and up to any outlets.	Any new above-ground gas service pipes are to be metal, including and up to any outlets.

3.6 CONSTRUCTION

The NSW RFS, 2019, 'Planning for Bushfire Protection' states that:

'The NCC contains Performance Requirements and Deemed-to-Satisfy provisions relating to the construction of buildings in bush fire prone areas. In NSW, these provisions apply to Class 1, 2 and 3 buildings, Class 4 parts of a building, Class 9 buildings that are SFPP, and associated class 10a buildings and decks' (p.21).

The National Construction Code 2019 (NCC) (P2.7.5 – Buildings in bushfire prone areas) identifies that 'A Class 1 building or Class 10a building or deck associated with a Class 1 building that is constructed in a designated bushfire prone area must, to the degree necessary, be designed and constructed to reduce the risk of ignition from a bushfire, appropriate to the: a) potential for ignition caused by burning embers, radiant heat or flame generated by a bushfire; and b) intensity of the bushfire attack of the building' (p.73).

Compliance with Table 7.4a – Performance criteria and acceptable solutions for residential infill development in relation to Construction Standards is demonstrated below.

Table 11 – Compliance with PBP for Construction

No	Acceptable Solution	Response
1.	BAL is determined in accordance with Tables A1.12.5 to A1.12.7.	This BAR identifies that the APZ has been calculated in accordance with Table A1.12.2 (p.90) in Planning for Bushfire Protection (Appendix 1 – Site Assessment Methodology). The existing development is to be retrofitted to provide ember protection in accordance with BAL12,5 provisions.
2	Construction is provided in accordance with the NCC and as modified by section 7.5 (please see advice on construction in the flame zone)	The development is existing. As a minimum the development is to be retrofitted to provide ember protection A recommendation is to be placed below.
3	Fencing and gates are constructed in accordance with section 7.6	The construction level is BAL12.5, therefore the any fencing and gates within 6m of the development are to be hard-wood or non-combustible material in accordance with PBP (7.6 – Fences and gates). A recommendation is to be placed below.

4	Class 10a buildings are constructed in accordance with section 8.3.2.	N/A – there is no detached class 10a buildings proposed as part of this development.
5	An APZ is provided in accordance with Table A1.12.2 or A1.12.3 in Appendix 1 of this document around the entire building or structure.	Yes, an APZ is provided around the entire dwelling. A recommendation is to be placed below.
6	<p>The existing dwelling is required to be upgraded to improve ember protection. This is to be achieved by enclosing or covering all openings with a corrosion-resistant steel, bronze or aluminium mesh with a maximum aperture of 2mm. Where applicable, this includes the openable portion of the windows, vents, weepholes and eaves, but does not include roof tile spaces. Weather strips, draught excluders or draught seals shall be installed at the base of side hung external doors as per AS3959. The subfloor space must be enclosed.</p>	<p>There are existing dwellings applicable. This requirement can be achieved. A recommendation is to be placed below.</p>

3.7 LANDSCAPING

The RFS, 2019, Planning for Bushfire Protection states that the intent of these Bushfire Protection Measures is 'to minimise the risk of bush fire attack and provide protection for emergency services personnel, residents and others assisting firefighting activities' (p.65).

Compliance with Table 7.4a – Performance criteria and acceptable solutions for residential infill development in relation to landscaping is demonstrated below.

Table 12 – Compliance with PBP for Landscaping

No	Acceptable Solutions	Response
1.	Compliance with the NSW RFS 'Asset protection zone standards' (see Appendix 4).	The vegetation around the existing buildings is to be managed and maintained as an Inner Protection Area (IPA) in accordance with the provisions in Appendix 4 of the Planning for Bushfire Protection 2019.
2	A clear area of low-cut lawn or pavement is maintained adjacent to the house.	The subject site is to be maintained as managed land. A recommendation is to be placed below.
3	Fencing is construction in accordance with section 7.6.	The BAL is BAL12.5 and therefore fencing and gates within 6m of the development are to be hard-wood or non-combustible material in accordance with PBP (7.6 – Fences and gates).
4	Trees and shrubs are located so that: <ul style="list-style-type: none"> • The branches will not overhang the roof. • The tree canopy is not continuous; and • Any proposed windbreak is located on the elevation 	A recommendation is to be placed below.

	from which fires are likely to approach.	
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Guidance on landscaping can be found within 'The Complete Bushfire Safety Book (Part 10 – Planting for bushfire protection) (pp.154-178).

3.8 EMERGENCY MANAGEMENT

The RFS, 2019, Planning for Bushfire Protection states that the intent of these Bushfire Protection Measures is 'to minimise the risk of bush fire attack and provide protection for emergency services personnel, residents and others assisting firefighting activities' (p.65).

Compliance with Table 7.4a – Performance criteria and acceptable solutions for residential infill development in relation to emergency management is demonstrated below.

Table 13 – Compliance with PBP for Emergency Management

No	Complies	Response
1	Able to Comply	The development is not for home-based childcare, but the development is in a bushfire prone area and therefore it is recommended that the current and future occupants prepare an Emergency Management and Evacuation Plan for the site. A Guide to prepare this plan is available from the NSW RFS Website < www.rfs.nsw.gov.au >.

4.0 BETTER BUSHFIRE OUTCOME FOR THE SITE

This bushfire assessment report (BAR) discusses compliance of the development with the document Planning for Bushfire Protection 2019 (PBP). The development is a Change of use for: 1. a coach house to a dwelling and 2. A secondary dwelling to an eco-tourist facility. Refer to Figure 1 in this report. Both buildings have been assessed for compliance with the provisions of Section 7 (table 7.4a) of the PBP 2019 – Residential Infill Development.

Clause 8.2.1 of PBP 2019, requires that this report address the issue of increased residential densities for a development. Clause 7.8 of PBP 2019 addresses existing buildings. This site contains an existing two storey heritage listed dwelling "Clifton" and a Loft, in addition to the subject development. The property is also 34,000 sqm in area. The following bushfire protection measures: asset protection zones (APZs), Construction, access, water and landscaping are to be applied to the whole site and are listed below: -

1. APZs – An APZ of 32m to the west; 50m to both the south and east; and 73m to the north, have been calculated for the development. These APZs include the existing two storey dwelling and Loft buildings.
2. All the existing habitable buildings are to be upgraded to include ember protection. This shall be achieved by enclosing all openings (excluding roof tile spaces) or covering openings with a non-corrosive metal screen mesh with a maximum aperture of 2mm. Where applicable, this includes any sub floor areas, openable windows, vents, weepholes, and eaves. External doors are to be fitted with draft excluders.
3. Roofing shall be gutter less or have leafless guttering and valleys to prevent the build-up of flammable material. Any materials used to prevent the build-up of debris in the gutter shall have a flammability index of no greater than 5.
4. Property access roads must comply with the following requirements of Table 7.4a of *Planning for Bush Fire Protection 2019*:
 - a. property access roads are two-wheel drive, all weather roads
 - b. there is suitable access for a Category 1 fire appliance to within 4m of the static water supply where no reticulated supply is available.
 - c. minimum 4m carriageway width.
 - d. a minimum vertical clearance of 4m to any overhanging obstructions, including tree branches.
 - e. property access must provide a suitable turning area in accordance with Appendix 3.
 - f. curves have a minimum inner radius of 6m and are minimal in number to allow for rapid access and egress.
 - g. the minimum distance between inner and outer curves is 6m.
 - h. the crossfall is not more than 10 degrees.
 - i. maximum grades for sealed roads do not exceed 15 degrees and not more than 10 degrees for unsealed roads.

The development is to be linked to a reliable water supply network. In lieu of any available water hydrant, the provision of water must comply the following in accordance with Table 7.4a of *Planning for Bush Fire Protection 2019*:

- a. a 20,000L static water supply tank must be provided on site.
 - b. connection for firefighting purposes is located within the IPA or non-hazard side and away from the structure.
 - c. 65mm Storz outlet with a ball valve is fitted to the outlet.
 - d. ball valve and pipes are adequate for water flow and are metal.
 - e. supply pipes from tank to ball valve have the same bore size to ensure flow volume.
 - f. a hardened ground surface for truck access is supplied within 4m.
 - g. above-ground tanks are manufactured from concrete or metal.
 - h. raised tanks have their stands constructed from non-combustible material or bush fire-resisting timber (see Appendix F of AS 3959).
 - i. unobstructed access can be provided at all times.
 - j. tanks on the hazard side of a building are provided with adequate shielding for the protection of firefighters.
 - k. all exposed water pipes external to the building are metal, including any fittings.
 - l. pumps are to be provided to the existing dam (Southeast of development). They are a minimum 5hp or 3kW petrol or diesel- powered pump and are to be shielded against bush fire attack; any hose and reel for firefighting connected to the pump shall be 19mm internal diameter.
 - m. fire hose reels are constructed in accordance with AS/NZS 1221:1997 and installed in accordance with the relevant clauses of AS 2441:2005; and
 - n. the gate or ball valve, pipes and tank penetrations are to be designed to allow for a full 50mm inner diameter water flow through the Storz fitting and must be of a metal construction.
5. Any new and existing landscaping is to be consistent with the requirements of NSW RFS, 2019, 'Planning for Bushfire Protection' (Appendix 4 – Asset Protection Zone Requirements), which includes:
- a. A clear area of low-cut lawn or pavement is maintained adjacent to the dwelling.
 - b. Fencing details in accordance with PBP (7.6 – Fences and gates).
 - c. The branches will not overhang the roof.
 - d. The tree canopy is not continuous; and
 - e. Any proposed windbreak is located on the elevation from which fires are likely to approach.

5.0 RECOMMENDATIONS

This report provides a series of responses to demonstrate how the development complies with PBP. The recommendations made below are to support the development.

These recommendations have been compiled and written in a specific format below whereby they can be utilised by the consent authority in their development of Conditions of Consent, which would be listed on the Notice of Determination (NoD). Any recommendations made by the NSW RFS under S100B of the Rural Fires Act, 1997 are to also be included.

Asset Protection Zones

9. To achieve a Bushfire Attack Level (BAL) of **BAL12.5, an APZ of 73m to the north, 50m to the south and 32m to the west; and 50m to the east** is to be managed as an Inner Protection Area (IPA) in accordance the lot is to be managed as an IPA, as described under 'Planning for Bushfire Protection (Appendix 4 – Asset Protect Zone Requirements)' and the document titled 'Standards for Asset Protection Zones'. This APZ is to be provided in perpetuity.

Access

10. Property access roads on the site must comply with the following requirements of Table 7.4a of

Planning for Bush Fire Protection 2019:

- j. property access roads are two-wheel drive, all weather roads
- k. there is suitable access for a Category 1 fire appliance to within 4m of the static water supply where no reticulated supply is available.
- l. minimum 4m carriageway width.
- m. a minimum vertical clearance of 4m to any overhanging obstructions, including tree branches.
- n. property access must provide a suitable turning area in accordance with Appendix 3.
- o. curves have a minimum inner radius of 6m and are minimal in number to allow for rapid access and egress.
- p. the minimum distance between inner and outer curves is 6m.
- q. the crossfall is not more than 10 degrees.
- r. maximum grades for sealed roads do not exceed 15 degrees and not more than 10 degrees for unsealed roads;

Services - Water

11. The site is to be linked to a reliable water supply network. In lieu of any available water hydrant, the provision of water must comply the following in accordance with Table 7.4a of *Planning for Bush Fire Protection 2019*:
- o. a 20,000L static water supply tank must be provided on site.
 - p. connection for firefighting purposes is located within the IPA or non-hazard side and away from the structure.
 - q. 65mm Storz outlet with a ball valve is fitted to the outlet.
 - r. ball valve and pipes are adequate for water flow and are metal.
 - s. supply pipes from tank to ball valve have the same bore size to ensure flow volume.
 - t. a hardened ground surface for truck access is supplied within 4m.
 - u. above-ground tanks are manufactured from concrete or metal.
 - v. raised tanks have their stands constructed from non-combustible material or bush fire-resisting timber (see Appendix F of AS 3959).
 - w. unobstructed access can be provided at all times.
 - x. tanks on the hazard side of a building are provided with adequate shielding for the protection of firefighters.
 - y. all exposed water pipes external to the building are metal, including any fittings.
 - z. pumps are to be provided to the existing dam (Southeast of development). They are a minimum 5hp or 3kW petrol or diesel- powered pump and are to be shielded against bush fire attack; any hose and reel for firefighting connected to the pump shall be 19mm internal diameter.
 - aa. fire hose reels are constructed in accordance with AS/NZS 1221:1997 and installed in accordance with the relevant clauses of AS 2441:2005; and
 - bb. the gate or ball valve, pipes and tank penetrations are to be designed to allow for a full 50mm inner diameter water flow through the Storz fitting and must be of a metal construction.

Services – Gas

12. The provision of gas must comply the following in accordance with Table 7.4a of *Planning for Bush Fire Protection 2019*:
- a. reticulated or bottled gas is installed and maintained in accordance with AS/NZS 1596:2014 and the requirements of relevant authorities, and metal piping is used.
 - b. all fixed gas cylinders are kept clear of all flammable materials to a distance of 10m and shielded on the hazard side.
 - c. connections to and from gas cylinders are metal.
 - d. polymer-sheathed flexible gas supply lines are not used; and
 - e. above-ground gas service pipes are metal, including and up to any outlets; and
 - f. Any gas cylinders that are within 10m of a dwelling:

- iv. Have their release valves directed away from the dwelling, and
- v. Are enclosed on the hazard side of the installation, and
- vi. Have metal connections to and from the cylinders

Construction

13. All existing habitable buildings shall be upgraded to improve ember protection. This shall be achieved by enclosing all openings (excluding roof tile spaces) or covering openings with a non-corrosive metal screen mesh with a maximum aperture of 2mm. Where applicable, this includes any sub floor areas, openable windows, vents, weepholes, and eaves. External doors are to be fitted with draft excluders.
14. Roofing shall be gutter less or have leafless guttering and valleys to prevent the build-up of flammable material. Any materials used to prevent the build-up of debris in the gutter shall have a flammability index of no greater than 5.

Landscaping

15. Any new and existing landscaping on the site is to be consistent with the requirements of NSW RFS, 2019, 'Planning for Bushfire Protection' (Appendix 4 – Asset Protection Zone Requirements), which includes:
- a. A clear area of low-cut lawn or pavement is maintained adjacent to the dwelling.
 - b. Fencing details in accordance with PBP (7.6 – Fences and gates).
 - c. The branches will not overhang the roof.
 - d. The tree canopy is not continuous; and
 - e. Any proposed windbreak is located on the elevation from which fires are likely to approach.

Emergency Management

16. A Bushfire Emergency Management and Evacuation plan is to be prepared for the site. This Bushfire Emergency Management and Evacuation Plan is to be prepared consistent with the: The NSW RFS document: A Guide to Developing a Bush Fire Emergency Management and Evacuation Plan NSW RFS Schools Program Guide Australian Standard AS 3745:2010 Planning for emergencies in facilities; and Australian Standard AS 4083:2010 Planning for emergencies – Health care facilities (where applicable). the Bush Fire Emergency Management and an Evacuation Plan should include planning for the early relocation of occupants.

Note: A copy of the Bush Fire Emergency Management and Evacuation Plan should be provided to the Local Emergency Management Committee for its information prior to occupation of the development.

CONCLUSION

This BAR assesses the compliance of the proposed development with the documents PBP 2019 and AS3959 :2018. A construction level of BAL12.5 has been calculated in Table 5 of Section 2.4. An APZ has also been established from the same Table. Bushfire Protection Measures have been applied to the proposal. Increased residential densities (Clause 8.2.1) and existing habitable buildings (Clause 7.8) have been considered. It is recommended that the above recommendations be applied to the development.

REFERENCE LIST

Australian Standard AS3959-2018 – Construction of Buildings in Bushfire Prone Areas (AS3959), < <http://www.as3959.com.au/>>

GlobalX Terrain, 2019, 'Property Title and Deposited Plan Search', < <https://app.globalxterrain.com/>>

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Webster, Joan, 2000, 'The Complete Bushfire Safety Book', Random House