REPORT

Bushfire Assessment Report

New Wright Block, University of New England, Armidale

Prepared by:	**RPS AUSTRALIA EAST PTY LTD** Unit 2A, 45 Fitzroy Street Carrington, NSW 2294 Australia PO Box 120, Carrington NSW 2294	**Prepared for:**	**BILLARD LEECE PARTNERSIP** Level 6/72-80 Cooper Street Surrey Hills NSW 2010
T:	+61 2 4940 4200	**M:**	
E:	newcastle@rpsgroup.com.au	**T:**	+61 2 8096 4066
		E:	mati@blp.com.au

Author:	Duncan Scott-Lawson
Reviewed:	Ted Smith, Peak Land Management
Approved:	Ian Murphy
No.:	142444
Version:	2
Date:	9 January 2019

RPS

Document Status

Version	Purpose of Document	Approved by	Reviewed by	Review Date
Draft	Draft for BPAD Accredited review	Ian Murphy	Ted Smith, PEAK LAND MANAGEMENT	5th February 2019
Final	Client Review	Ian Murphy	Ted Smith, PEAK LAND MANAGEMENT	12th February 2019

Approval for Issue

Name	Signature	Date
Ted Smith		5th February 2019

BPD-PD Certification

Ted Smith
BPD-PD-17671 Accredited Bushfire Practitioner

BPAD Bushfire Planning & Design Accredited Practitioner Level 3

Contents

Tables

Figures

Plates

Appendices

Summary

RPS has been engaged by Billard Leece Partnership (BLP) to undertake a Bushfire Assessment Report (BFAR) for a proposed demolition of the existing building and construction of north, south, west blocks and hub referred to as the New Wright Block. The north, south and west blocks are designed for student accommodation and the hub designed to facilitate the student accommodation requirements. The location of the proposed development is bounded by Abbott Road, Elm Avenue and Meredith Street on the campus of New England University, Armidale.

This BFAR has been developed to satisfy the Planning Secretary's Environmental Assessment Requirements (SEARs) SDD9613 for the proposed New Wright Block development at University of New England.

In order to determine whether the proposed development is bushfire-prone, and if so, which setbacks and other relevant Bush Fire Protection Measures (BPMs) will be appropriate, this assessment adheres to the methodology and procedures outlined in Appendix 1 of PBP 2018 and cl. 44 of the *Rural Fire Regulation 2013* (RF Regulation 2013). This report adheres to the requirements appropriate to obtain a Bush Fire Safety Authority (BFSA) for Special Fire Protection Purpose (SFPP) developments.

The intention is for any building work occurring within an existing SFPP development is to achieve a better bush fire outcome (such as improved construction standards, APZs and evacuation management) than if the development did not proceed. This may result in a level of retrofitting of existing buildings and managing other portions of the site (i.e. APZs) to ensure an improved level of bush fire protection. Any works that result in intensification or increase in occupancy must carefully consider the risk to occupants and firefighters and ensure an appropriate combination of BPMs.

In summary, although the property is identified as bushfire prone land the site visit determined there was no classifiable bushfire hazard vegetation within the 140m assessment area. **Due to no bushfire hazard being present, adherence to PBP 2018 and construction to a Bushfire Attack Level (BAL) is not warranted.** Although the site does not have any direct bushfire threats, the following key recommendations have been generated to ensure best design practices are implement in this semi-rural setting.

- The entire development site is to be managed (Landscaping) as an Inner Protection Area (IPA) as outlined with section 4.1.3 and Appendix 4 of Planning for Bushfire Protection 2018;
- Abbott Road should be upgraded to two-way and provision of fire hydrants be located along Abbott Road outside parking and carriageway.
- Fire hydrant spacing, design and sizing comply with the Australian Standard AS2419.1:2005, and
- A Bush Fire Emergency Management and Evacuation Plan shall be prepared consistent with 'Development Planning A Guide to Developing a Bush Fire Emergency Management and Evacuation Plan December 2014' and Australian Standard AS3745 2010 'Planning for Emergencies in Facilities'. Attention within this plan should focus on the procedure to evacuate and close the assemble area in the event of a bushfire attack.

This assessment has been made based on the bushfire hazards in and around the site at the time of inspection and production (January 2019).

Finally, the implementation of the adopted measures and recommendations forwarded within this report are based on a thorough assessment under the Planning for Bushfire Protection 2018 to manage the risk caused by bushfire to people, property and public safety. The recommended bushfire protection measures will contribute to the amelioration of the potential impact of any

bushfire upon the development estate, but they do not and cannot guarantee that the area will not be affected by bushfire at some time.

RPS

Planning for Bush fire Protection 2018
Aims and Objectives

Objectives	Compliance
Afford buildings and their occupants protection from exposure to a bushfire	Yes
Provide for a defendable space to be located around buildings	Yes
Provide appropriate separation between a hazard and buildings which, in combination with other measures, minimize material ignition	Yes
Ensure appropriate operation access and egress for emergency services personnel and residents is available	Yes
Provide for ongoing management and maintenance of Bush fire Protection Measures	Yes
Ensure the utility services are adequate to meet the needs of firefighters	Yes

Planning for Bush fire Protection 2018
Special Objectives for Special Fire Protection Purposes (SFPP)

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

RPS

Planning for Bushfire Protection Compliance (PBP 2018)

Residential and rural Residential subdivisions - Performance Criteria and Compliance

	Performance Criteria	Acceptable solution	Compliance
ASSET PROTECTION ZONES	Radiant heat levels of greater than 10kW/m² (calculated at 1200K) are not experienced by emergency service personnel and occupants during firefighting and emergency management.	The building is provided with an APZ in accordance with Table A1.12.1 (see Appendix 1)	Yes
	Issues relating to slope are addressed, 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°	Yes
	APZs are managed and maintained to prevent the spread of a fire towards the building	The APZ is managed in accordance with the requirements of Appendix 4 of this document, and is wholly within the boundaries of the development site, and Mechanisms are in place to provide for the maintenance of the APZ over the life of the development, and Other structures located within the APZ need to be located further than 6m from the refuge building	Yes
LANDSCAPING	Landscaping is managed to minimise flame contact, reduce radiant heat levels, minimise ember and reduce the effect of smoke on residents and firefighters	Landscaping is in accordance with 'Asset Protection Zone standards' (see Appendix 4)	Yes
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 AS 3959 or NASH and Table 7.4b of PBP 2018 is applied	Yes
FIREFIGHTING	Firefighting vehicles are provided with safe, all-weather access to structures and hazard vegetation	SFPP access roads are two-wheel drive, all-weather roads, and Access is provided to all structures and hazard vegetation, and traffic management devices are constructed to not prohibit access by emergency services vehicles, and Access roads must provide suitable turning areas in accordance with Appendix 3.	Yes

	Performance Criteria	Acceptable solution	Compliance
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	Undetermined
ACCESS TO WATER	There is appropriate access to water supply	Hydrants are located outside of parking reserves and road carriageways to ensure accessibility to reticulated water for fire suppression, and Hydrants are provided in accordance with AS 2419.1:2005, and There is suitable access for a Category 1 fire appliance to within 4m of the static water supply where no reticulated supply is available	Yes
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, and 8m carriageway width kerb to kerb, and Parking is provided outside of the carriageway width, and Hydrants are to be located clear of parking areas, and There are through roads, and these are linked to the internal road system at an interval of no greater than 500m, and Curves of roads have a minimum inner radius of 6m, and The maximum grade road is 15° and average grade is 10°, and The road crossfall does not exceed 3°, and A minimum vertical clearance of 4m to any overhanging obstructions, including tree branches, is provided	Upgrade Abbott Road

	Performance Criteria	Acceptable solution	Compliance
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, and Parking is provided outside of the carriageway width, and Hydrants are located clear of parking areas, and There are through roads, and these are linked to the internal road system at an interval of no greater than 500m, and Curves of roads have a minimum inner radius of 6m, and The maximum grade road is 15° and average grade is 10°, and The road crossfall does not exceed 3°, and A minimum vertical clearance of 4m to any overhanging obstructions, including tree branches, is provided.	Yes
WATER SUPPLY	A water supply is provided for firefighting purposes	Reticulated water is to be provided to the development, where available, or A 10,000 litres minimum static water supply dedicated for firefighting purposes is provided for each occupied building where no reticulated water is available.	Yes
	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 the Australian Standard AS2419.1:2005, and Hydrants are not located within any road carriageway, and Reticulated water supply to SFPPs uses a ring main system for areas with perimeter roads	Yes
	Flows and pressure are appropriate	fire hydrant flows and pressures comply with AS2419:2005, and	Undetermined
	The integrity of the water supply is maintained	all above-ground water service pipes external to the building are metal, including and up to any taps	Undetermined
	A static water supply is provided for firefighting purposes in areas where reticulated water is not available	a connection for firefighting purposes is located within the IPA or non-hazard side and away from the structure; a 65mm Storz outlet with a ball valve is fitted to the outlet, and Ball valve and pipes are adequate for water flow and are metal, and Supply pipes from tank to ball valve have the same bore size to ensure flow volume, and Underground tanks have an access hole of 200mm to allow tankers to refill direct from the tank, and A hardened ground surface for truck access is supplied within 4m of the access hole, and	Yes

	Performance Criteria	Acceptable solution	Compliance
		Above-ground tanks are manufactured from concrete or metal, and Raised tanks have their stands constructed from non-combustible material or bush fire-resisting timber (see Appendix F AS 3959), and Unobstructed access can be provided at all times, and Tanks on the hazard side of a building are provided with adequate shielding for the protection of firefighters, and Underground tanks are clearly marked, and All exposed water pipes external to the building are metal, including any fittings, and Where pumps are provided, they are a minimum 5hp or 3kW petrol or diesel-powered pump, and are shielded against bush fire attack; any hose and reel for firefighting connected to the pump shall be19mm (internal diameter), and Fire hose reels are constructed in accordance with AS/NZS 1221:1997 Fire hose reels, and installed in accordance with AS 2441:2005 Installation of fire hose reels	
FOR ELECTRICITY SERVICES	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, and Where overhead, electrical transmission lines are proposed as follows: • 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 Guideline for Managing Vegetation Near Power Lines	Yes

	Performance Criteria	Acceptable solution	Compliance
FOR GAS SERVICES	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, and All fixed gas cylinders are kept clear of all flammable materials to a distance of 10m and shielded on the hazard side, and Connections to and from gas cylinders are metal, and If gas cylinders need to be kept close to the building, safety valves are directed away from the building and at least 2m away from any combustible material, so they do not act as a catalyst to combustion, and Polymer-sheathed flexible gas supply lines are not used; Above-ground gas service pipes are metal, including and up to any outlets.	Yes
EMERGENCY MANAGEMENT	A bushfire emergency and evacuation management plan is prepared	Bushfire 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, • NSW RFS Schools Program Guide (where applicable) • Australian Standard AS 3745:2010 Planning for emergencies in facilities, and • Australian Standard AS 4083:2010 Planning for emergencies – Health care facilities (where applicable), and The emergency and evacuation management plan should include a mechanism for the early relocation of occupants. *Note: A copy of the bush fire emergency management plan should be provided to the Local Emergency Management Committee for its information prior to occupation of the development.*	Made Condition of Consent

Performance Criteria	Acceptable solution	Compliance
Stable 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 their families in the case of aged care accommodation and schools) and staff in developing and implementing an Emergency Procedures Manual, and Detailed plans of all emergency assembly areas including 'on-site' and 'off-site' arrangements as stated in AS 3745 are clearly displayed, and an annual (as a minimum) trial emergency evacuation is conducted.	Made Condition of Consent

BUSHFIRE CERTIFICATION

The report has been prepared by Duncan Scott-Lawson, RPS. Ted Smith, PEAK LAND MANAGEMENT being a BPAD Level 3 Bushfire Practitioner, has reviewed this Bush Fire Assessment Report and subject to Rural Fire Service review and approval of the alternate solution understands the proposed development design conforms to the relevant specifications and requirements of AS 3959-2009 Building in Bushfire Prone Areas and Planning for Bushfire Protection (2018).

Terms and Abbreviations

Abbreviation	Meaning
AHIMS	Aboriginal Heritage Information Management System
APZ	Asset Protection Zone
AS2419-2005	Australian Standard – Fire Hydrant Installations
AS3959-2009	Australian Standard – Construction of Buildings in Bush Fire Prone Areas
BAL	Bush fire Attack Level
BC Act	*Biodiversity Conservation Act 1995*
BCA	Building Code of Australia
BRMC	Bushfire Risk Management Committee
BFRMP	Bush Fire Risk Management Plan
BPA	Bush Fire Prone Area (Also Bushfire Prone Land)
BPL	Bush Fire Prone Land
BPL Map	Bush Fire Prone Land Map
BPMs	Bush Fire Protection Measures
BFAR	Bush Fire Assessment Report
BFSA	Bush Fire Safety Authority
EPA Act	*NSW Environmental Planning and Assessment Act* 1979
EPBC Act	*Commonwealth Environment Protection and Biodiversity Conservation Act* 1997
FDI	Fire Danger Index
FMP	Fuel Management Plan
ha	Hectare
IPA	Inner Protection Area
kW/m^2	Kilowatts per metre squared (a measure of radiant heat)
LEP	Local Environment Plan
LGA	Local Government Area
NASH	National Association of Steel-framed Housing
OPA	Outer Protection Area
PBP 2018	Planning for Bushfire Protection 2018
RF Act	*Rural Fires Act* 1997
RF Regulation	*Rural Fires Regulation* 2013
RPS	RPS Australia East Pty Ltd
SEPP	State Environmental Planning Policy
URA	Urban Release Area

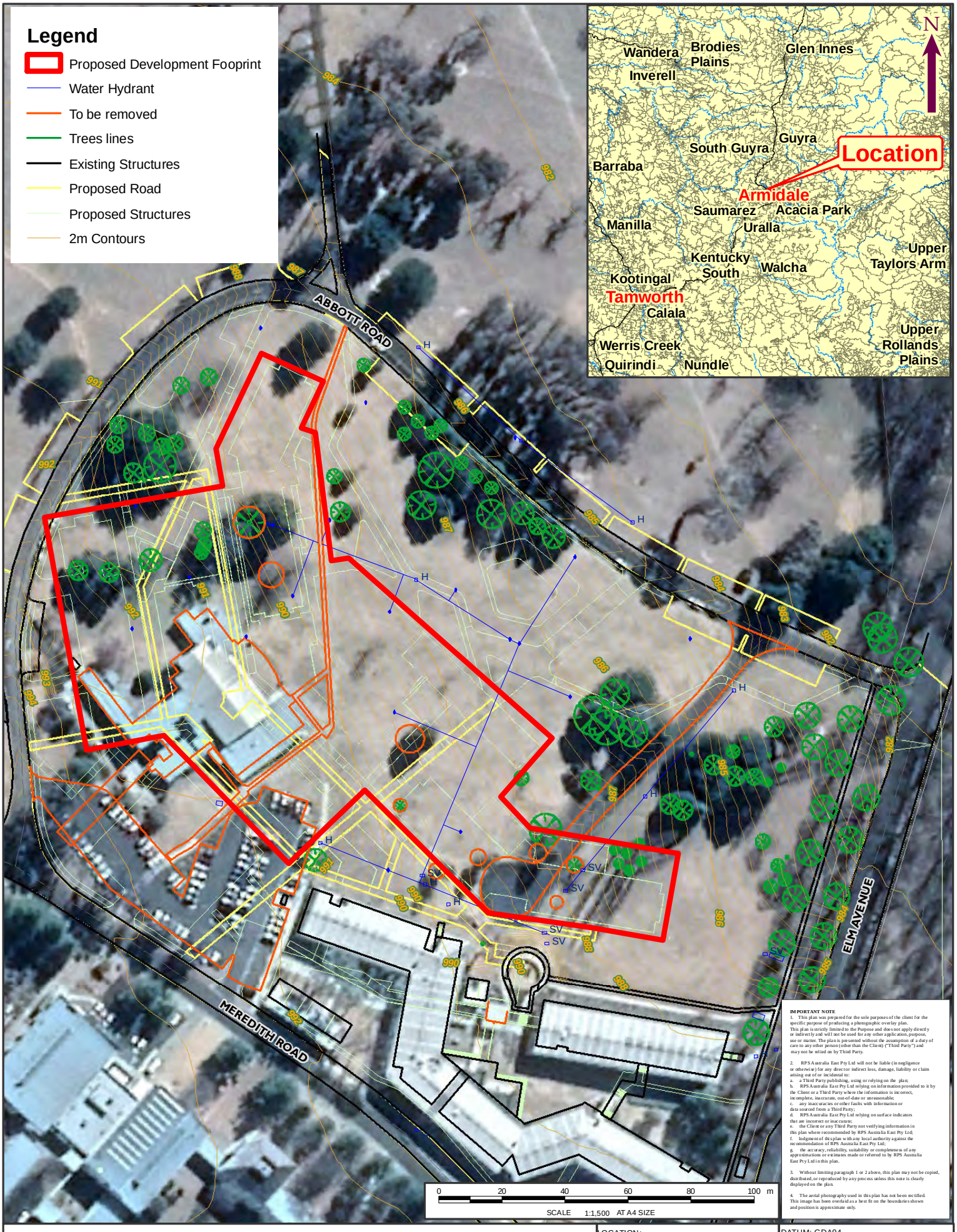
1 Introduction

RPS has been engaged by Billard Leece Partnership (BLP) to undertake a Bush Fire Assessment Report (BFAR) for a proposed demolition of the existing building and construction of north, south, west blocks and hub referred to as the New Wright Block. The north, south and west blocks are designed for student accommodation and the hub designed to facilitate the student accommodation requirements. The location of the proposed development is bounded by Abbott Road, Elm Avenue and Meredith Street on the campus of New England University, Armidale.

In order to determine whether the proposed development is bushfire-prone, and if so, which setbacks and other relevant Bush Fire Protection Measures (BFPM) will be appropriate, this assessment adheres to the methodology and procedures outlined in Appendix 1 of PBP 2018 and cl. 44 of the *Rural Fire Regulation 2013* (RF Regulation 2013). This report adheres to the requirements appropriate to obtain a Bush Fire Safety Authority (BFSA) for Special Fire Protection Purpose (SFPP) developments.

1.1 Site Particulars

Locality	Meredith Street, University of New England, Armidale NSW
LGA	Armidale City Council
Titles	Lot 10, DP 1142199
Area	The site is approximately 4.5ha in total.
Zoning	The site is zoned SP2 Educational Establishment Armidale Dumaresq Local Environmental Plan (LEP) 2012 (refer to **Figure 2**).
Boundaries	The site is bounded by Abbott Road, Elm Avenue and Meredith Street within the University of New England Campus on the northern outskirts of the town of Armidale. The site is surrounded by cleared and heavily modifies rural settling to the west, north and east with existing buildings associated with the university situated to the south.
Current Land Use	The site contains cleared lands associated with a managed landscape within the University of New England.
Topography	The site is relatively flat with a drainage line (Dumaresq Creek) running from the west to east to the north of the site.
Climate / Fire History	The site lies within a geographical area with a Fire Danger Index (FDI) rating of 80. Bushfire weather is therefore associated with long periods of drought, high temperatures, low humidity and gusty often north-westerly winds. The entire site is classified by NSW RFS as Category 3 Grassland Bushfire Prone Land, refer to **Figure 3**.



IMPORTANT NOTE

1. This plan was prepared for the sole purposes of the client for the specific purpose of producing a photographic overlay plan. This plan is strictly limited to the Purpose and does not apply directly or indirectly and will not be used for any other application, purpose, use or matter. The plan is presented without the assumption of a duty of care to any other person (other than the Client) ("Third Party") and may not be relied on by Third Party.

2. RPS Australia East Pty Ltd will not be liable (in negligence or otherwise) for any direct or indirect loss, damage, liability or claim arising out of or incidental to:
a. a Third Party publishing, using or relying on the plan;
b. RPS Australia East Pty Ltd relying on information provided to it by the Client or a Third Party where the information is incorrect, incomplete, inaccurate, out-of-date or unreasonable;
c. any inaccuracies or other faults with information or data sourced from a Third Party;
d. RPS Australia East Pty Ltd relying on surface indicators that are incorrect or inaccurate;
e. the Client or any Third Party not verifying information in this plan where recommended by RPS Australia East Pty Ltd;
f. lodgment of this plan with any local authority against the recommendation of RPS Australia East Pty Ltd;
g. the accuracy, reliability, suitability or completeness of any approximations or estimates made or referred to by RPS Australia East Pty Ltd in this plan.

3. Without limiting paragraph 1 or 2 above, this plan may not be copied, distributed, or reproduced by any process unless this note is clearly displayed on the plan.

4. The aerial photography used in this plan has not been rectified. This image has been overlaid as a best fit on the boundaries shown and position is approximate only.

FIGURE 1: SITE LOCATION

LOCATION: ARMIDALE UNI	DATUM: GDA94 PROJECTION: MGA Zone 56
JOB NO.: **PR 142444** PURPOSE: BTA Technician: Natalie.Wood Date: 4/02/2019	Data Sources: RPS, Client Google Sep2018

Path: J:\JOBS\142K\142444 Armidale\10 - Drafting\Arcgis Map Documents\Bushfire\142444 Figure 1 Location A A4P 20190204.mxd

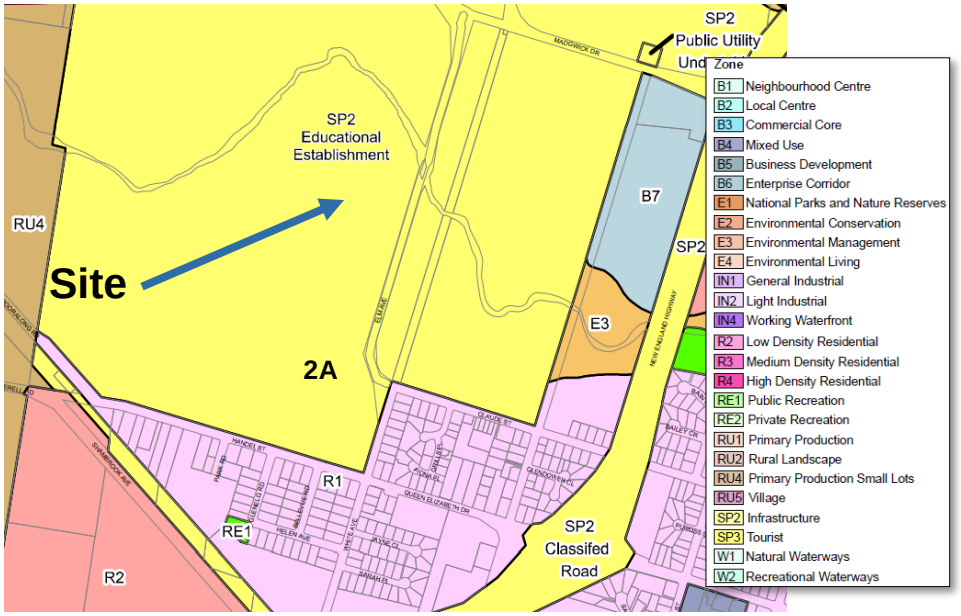


Figure 2 Armidale Dumaresq LEP Land Zoning Map (LEP, 2012)

Figure 3 Bushfire Prone Land Map of the Site – Category 3 Grassland (NSW RFS Website, 2018)

1.2 Description of Proposal

The proposed development is for a new residential college (New Wright Block) for the students of the existing University of New England (UNE). The proposed new college will be located adjacent to the existing Wright College. The proposed New Wright Block will include the following:

- Demolition of the existing Wright Centre building;
- Construction of three (3) detached residential buildings that have a height of three (3) story's and contains approximately 345 student beds over a mixture of accommodation styles, within.
- Provision of 238 new car parking spaces that will be provided 'at-grade' located around the college. (perhaps include anything about the location of the new parking is in the same location as the existing parking spaces (and numbers if known).
- Construction of a new central 'Hub' building that will accommodate ancillary communal uses for the residents such as gymnasium, study areas, games rooms, music rooms, and the like.
- A centralised informal amphitheatre that will be integrated within the landscape setting and be utilised for outdoor open space for the residents.
- Landscaping throughout the site surrounding the proposed college and existing college.

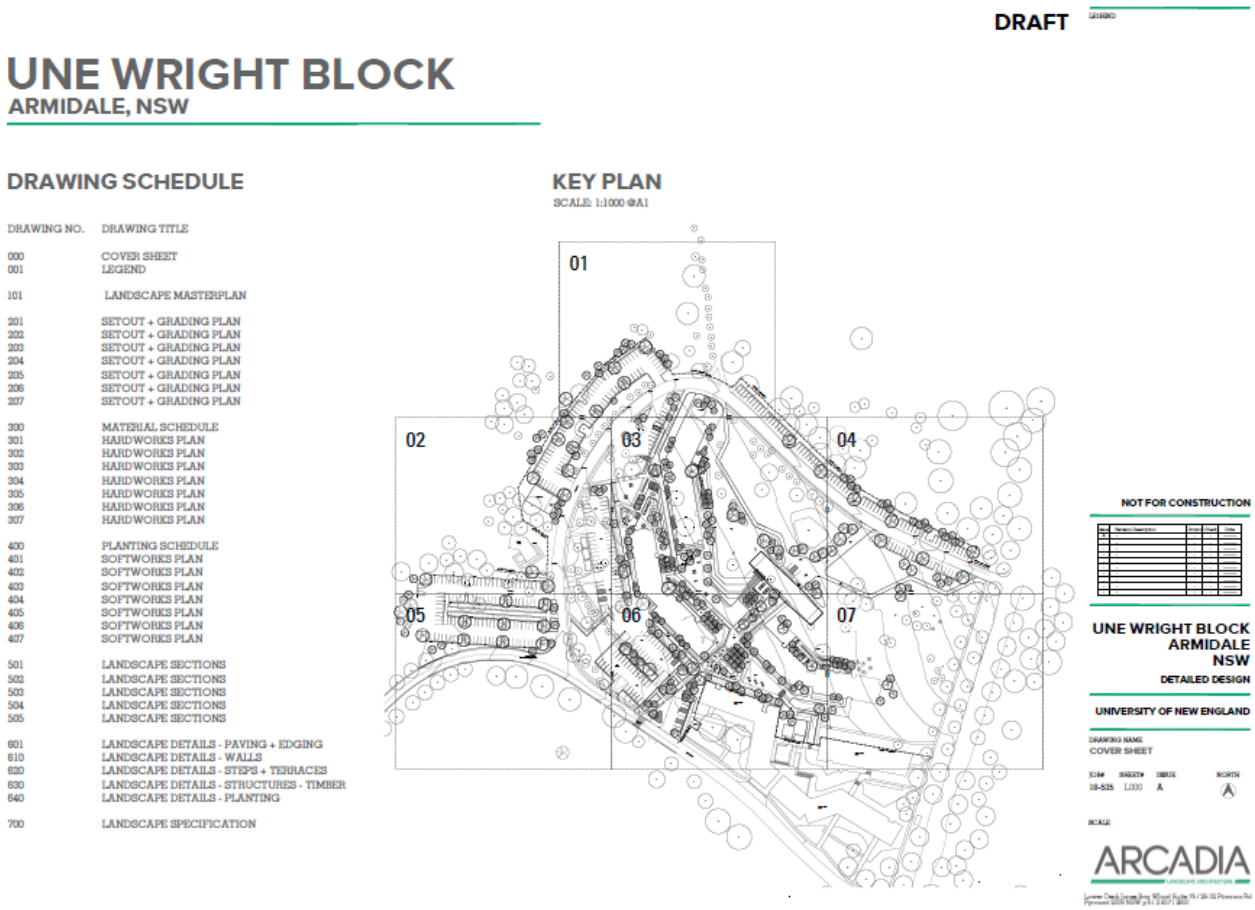


Figure 4 Key Plan of the proposed development, Arcadia, 2018

1.3 Objectives of Assessment

This assessment has been undertaken in accordance with Clause 44 of the RF Regulation. This BTA also addresses the six objectives listed in section 1.1 of PBP 2018, which provide for the protection of human life and minimize impacts on property.

- 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, minimize material ignition;
- Ensure appropriate operation access and egress for emergency services personnel and residents is available;
- Provide for ongoing management and maintenance of Bush fire Protection Measures; and
- Ensure the utility services are adequate to meet the needs of firefighters.

1.4 Specific Objectives for Special Fire Protection Purpose (SFPP) Developments

The aims and objectives listed in section 1.1 of PBP 2018 remain applicable to SFPP, however further consideration has been given to SFPP developments to ensure protection measures are fully incorporated at the design stage of the development. Specific objectives listed in section 6.2 of PBP 2018 are:

- Minimise levels of radiant heat, smoke and embers attack through increased APZ, building design and siting;
- Provide 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 handle 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.

With the above in mind, consideration needs to be given to the appropriate Asset Protection Zone (APZ); access for emergency services to the bush fire hazard, structures, water supply. Due to the vulnerable nature of the occupants of SFPP developments, there is more reliance on the provision of an APZ and emergency management. Consideration also needs to be given to the location of water, electricity and gas services.

2 Bushfire Hazard Assessment

2.1 Vegetation Assessment

2.1.1 Methodology

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

- Aerial photograph Interpretation to map the vegetation classification and extent;
- Site inspection (11th January 2019); and
- Reference to regional vegetation community mapping.

In accordance with PBP 2018, an assessment of the vegetation over a distance of 140m 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 appendix 1 PBP 2018.

2.1.2 Predominant Vegetation Formation

The determined vegetation classifications are displayed in **Table 1**. **Plates 1 – 4** depict the site and surrounding vegetation.

Table 1 Vegetation Classification

Direction of Bushfire Attack	Description and distance of Vegetation or other infrastructure	Classification of Vegetation Formations	Overall Fuel Load (t/ha)
North	Modified Landscape – managed grasslands, scattered native and introduced ornamental trees	Excluded: Low-threat vegetation	N/A
East	Modified Landscape – managed grasslands, scattered native and introduced ornamental trees	Excluded: Low-threat vegetation	N/A
South	Existing development, residential buildings, roads, paths and managed grasslands.	Excluded: Non-vegetated areas	N/A
West	Modified Landscape – managed grasslands, scattered native and introduced ornamental trees	Excluded: Low-threat vegetation	N/A

Vegetation to the south

Plate 2 illustrates that the landscape to the south of the site comprises of buildings, roads, paths and managed grasslands. This area is classified as modified landscape, non-vegetation and not a bushfire hazard.

Vegetation to the west, north and east

The vegetation to the west, north and east comprises of grasses with separated individual trees, devoid of any shrub layer (refer to **Plate 1, 3** and **4**). The grasses (ground cover) are maintained to below 10cm and are managed consistent with golf courses, public reserves and sporting fields. The trees canopies are separated by >15m. with overall density of the canopy coverage is <10%. The dominate vegetation is grasslands, with the individual and scattered trees forming no connectivity to other patches of vegetation that may contribute to a fire run towards the site. The vegetation is consistent with the requirements for APZ and this assessment classifies the vegetation to the west, north and east as Modified Landscape – managed grasslands, scattered native and introduced ornamental trees and excluded from the assessment as Low-threat vegetation and is not considered a fire hazard.

Plate 1 Modified Landscape – managed grasslands to the east of the site

Plate 2 Existing residential, roads, paths and managed grassland development to the south of the site

Plate 3 Modified Landscape – managed grasslands to the west of the site

Plate 4 Modified Landscape – managed grasslands north of the site

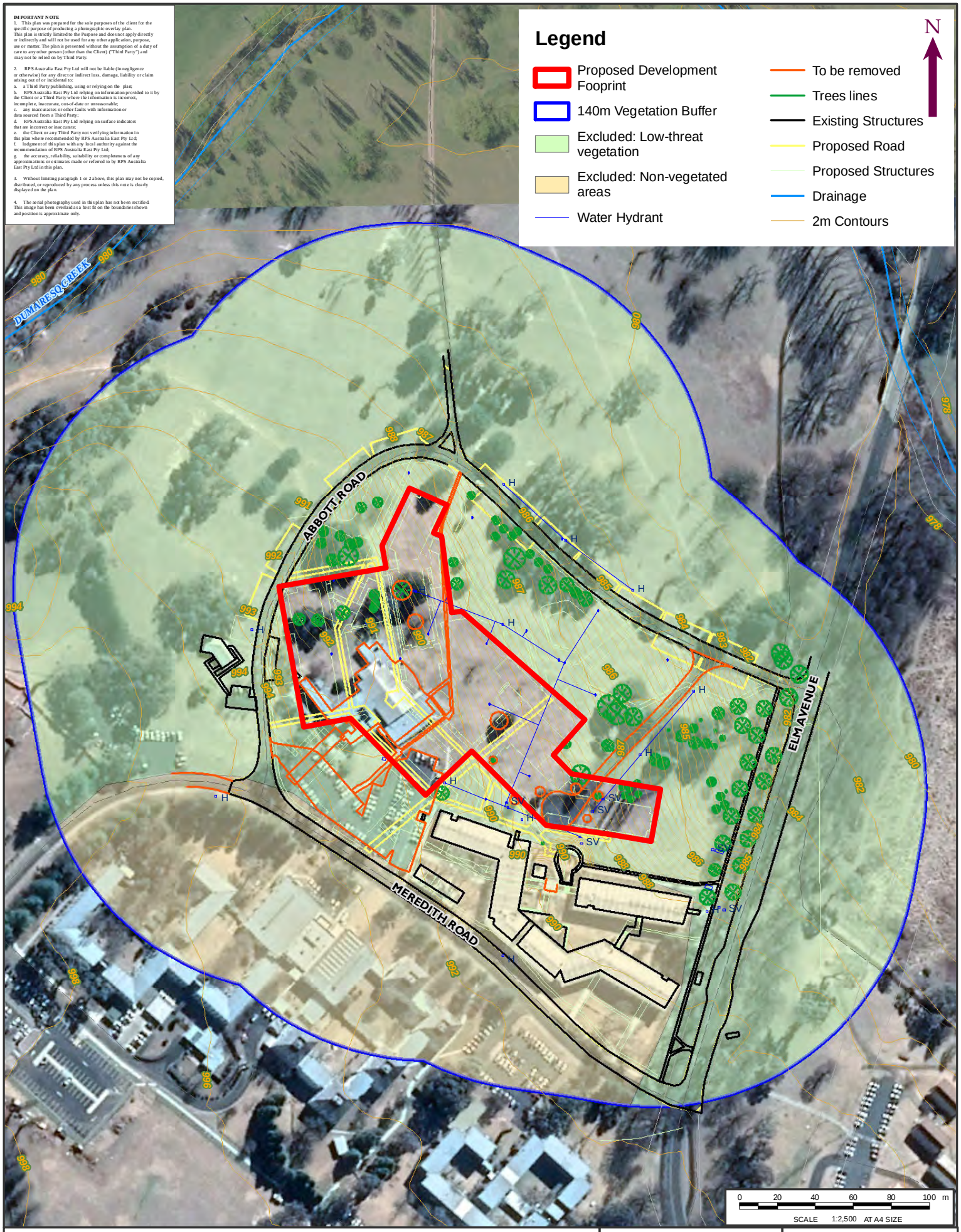


FIGURE 5: VEGETATION CLASSIFICATION

LOCATION: ARMIDALE UNI	DATUM: GDA94 PROJECTION: MGA Zone 56
JOB NO.: **PR 142444** PURPOSE: BTA Technician: Natalie.Wood Date: 4/02/2019	Data Sources: RPS, Client Google Sep2018

Path: J:\JOBS\142K\142444 Armidale\10 - Drafting\Arcgis Map Documents\Bushfire\142444 Figure 5 Vegetation A A4P 20190204.mxd

NEW_A4_Portrait 2018 Rev: B Produced:NW Reviewed: NW Date: 10/05/2018

2.2 Effective Slope Assessment

The slope of the land under the classified vegetation has a direct influence on the rate of fire spread, the intensity of the fire and the ultimate level of radiant heat flux.

In accordance with PBP 2018 an assessment of the slope over a distance of 100m under the classified vegetation is required. The topography of the site and surrounds would be evaluated to identify both the average slope and the maximum slope present under classified vegetation. These values help determine the vegetation that possess bushfire threat and significantly influence fire behavior.

This assessment has determined that there is no classifiable vegetation within 140m of the site. No slope assessment is required.

2.3 Bush fire Attack Level (BAL) for the proposed development

If no bushfire hazard (classifiable vegetation) exists within the assessment area (140m surrounding the site). Minimal attack from radiant heat and flame due to the distance of the site from the vegetation, although some attack by burning debris is possible. There is insufficient threat to warrant specific construction requirements. Although no BAL construction level is required, this report will recommend Bushfire Protection Measures and Emergency Response procedures to be implemented as best practice.

2.4 Significant Environmental Features

The site is not identified on land of high biodiversity value in accordance with the NSW OEH Biodiversity Values Map search in January 2019 (Appendix A). Given the disturbed nature of the site, there is a low probability of significant environmental features occurring on the site.

2.5 Significant Threatened Species

A search of the Atlas of NSW Wildlife Database was conducted in January 2019. The Atlas includes records of threatened species listed under both the NSW *Biodiversity Conservation* Act 2017 and the Commonwealth *Environment Protection and Biodiversity Conservation* Act 1999. Two records of one threatened species, Koala (*Phascolarctos cinereus*) have been recorded on the site (Appendix A). The development footprint does not overlay the location of these sightings.

2.6 Cultural Significance

A search of The Aboriginal Heritage Information Management System (AHIMS) in January 2019 (Appendix A) confirmed that there are 2 records of Aboriginal or Cultural Heritage sites in or round the site.

3 Bushfire Assessment

This section assesses the Bushfire Protection Measures (BPMs) for the proposed development in consideration of the acceptable solutions required for each performance criteria within PBP 2018. In circumstances where new building projects within existing SFPP developments are proposed, an appropriate combination of BPMs and compliance with the performance criteria within Tables 6.4a to 6.4d of PBP 2018 is required.

The intention is for any building work occurring within an existing SFPP development is to achieve a better bush fire outcome (such as improved construction standards, APZs and evacuation management) than if the development did not proceed. This may result in a level of retrofitting of existing buildings and managing other portions of the site (i.e. APZs) to ensure an improved level of bush fire protection.

3.1 Setbacks and 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). An APZ can include the following:

- footpaths;
- lawns;
- discontinuous gardens;
- swimming pools;
- driveways;
- unattached non-combustible garages with suitable separation from the dwelling;
- open space / parkland; and
- car parking.

Isolated areas of shrub and timbered vegetation are generally not a bushfire hazard as they are not large enough to produce fire of an intensity that will threaten dwellings. These areas include narrow strips of vegetation along road corridors.

The APZ on this site is wholly within the site boundaries and is not located on land >18 degrees slope, and there are no proposed structures within the APZ. The ongoing maintenance of APZs are recognised under 100C of the *Rural Fires Act* 1997and is supported in 2.8(1)(d) of the *Biodiversity Conservation Act*. Any clearing of vegetation within the site to allow the development to occur may require assessment under the *Biodiversity Conservation Act* 2016.

Any areas that are designated Asset Protection Zones, should be signposted to ensure community is aware that the area is to be maintained for Bush fire protection purposes, as indicated in **Plate 5** below.

Plate 5 Indication of APZ signage

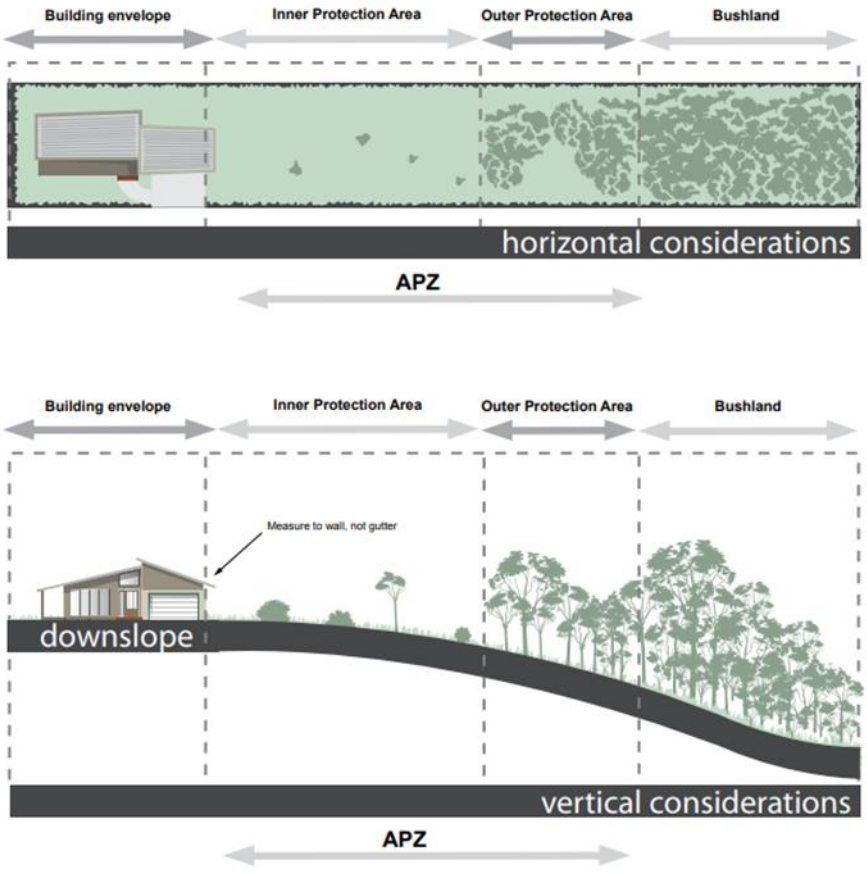


Figure 6 Components of an APZ (Figure A4.1 - PBP 2018)

3.1.1 Inner Protection Area (IPA)

The IPA extends from the edge of the OPA to the development. The IPA is the area closest to the asset and creates a fuel-managed area which can minimise the impact of direct flame contact and radiant heat on the development and be a defendable space. The intent of an IPA is to stop the transmission of flame and reduce the transmission of radiant heat by the elimination of available fire fuel. This area also allows airborne embers to fall safely without igniting further outbreaks and provides a safer firefighting position and is operationally important for implementation of clear fire control lines.

In practical terms the IPA is typically the curtilage around the dwelling, consisting of a mown lawn and well-maintained gardens. When establishing and maintaining an IPA the following requirements apply:

- Vegetation within the IPA should be kept to a minimum level. Litter fuels (leaves and vegetation debris) within the IPA should be continually removed and kept below 1cm in height and be discontinuous. There is minimal fine fuel at ground level which could be set alight by a bushfire;
- Canopy cover should be less than 15% (at maturity) trees (at maturity) should not touch or overhang the building and should be separated by 2 to 5m;
- Lower limbs of canopy trees should be removed up to a height of 2m above ground;
- Preference should be given to smooth barked and evergreen trees;
- Large discontinuities or gaps in the shrub vegetation shall be established to slow down or break the progress of fire towards buildings;
- Shrubs should not be located under trees and not form more than 10% ground cover
- Clumps of shrubs should be separated from exposed windows and doors by a distance of at least twice the height of the vegetation.
- Grasses should be kept mown (as a guide grass should be kept to no more than 100mm in height)

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

3.1.2 Determining the appropriate setbacks

The requirement for SFPP development in PBP (2018) is based on providing suitable building design, construction and sufficient space to ensure that radiant heat levels do not exceed critical limit for firefighters and other emergency service personnel undertaking operations, including supporting or evacuating occupants.

There is no classified hazardous vegetation within 140 of the site. The vegetation surrounding the site is managed and does not have the capacity to sustain a bushfire. The closes vegetation that has the capacity to sustain a bushfire is the creek line over 180m to the north-west. The orientation of this creek line will not propagate radiant heat towards the site. No set-backs are required for this site, as the landscape within the assessment area will not sustain a bushfire.

3.2 Landscaping and Vegetation Management

Landscaping should be designed and managed to minimise flame contact and radiant heat to buildings and the potential for wind driven embers to cause ignitions. All landscaping shall be managed in accordance with the APZ requirements as outlined in Appendix 4 of PBP 2018.

In choosing plants for landscaping consideration should be given to plants that possess properties, which help to protect buildings. If the plants themselves can be prevented from ignition, they can improve the defence of buildings by:

- Filtering out wind-driven burning debris and embers;
- Acting as a barrier against radiation and flame; and
- Reducing wind forces.

Consequently, landscaping of the site should consider the following:

- Meet the specifications of an Inner Protection Area (IPA) detailed in PBP 2018;
- Priority given to retaining or planting species which have a low flammability and high moisture content;
- Priority given to retaining or planting 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; and
- Create discontinuous or gaps in the vegetation to slow down or break the progress of fire towards the dwellings.

Specific landscaping commitments from the project include the following features:

- Setbacks which wrap around three sides of the development for bushfire management;
- A combination of hard and soft landscaping;
- An intensive area of planting centered on a contoured garden mound on the southern boundary of the site to provide an effective screening of the development from future residential development; and
- A selection of plants suitable to the landscape objectives based on native species.

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 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 essential that any vegetation and landscaped areas and surrounds are subject to ongoing fuel management and reduction to ensure that fine fuels do not build up.

3.3 Access

In the event of a serious bushfire threat to the proposed development, it will be essential to ensure that adequate ingress/ egress and the provision of defendable space are afforded in the building design. There are no wetland or periodically inundated lands within the site. All access roads are sealed, all weather and two-wheel drive with minimum 4m vertical clearance and minimum distance between inner and outer curve of 6-metres. Maximum grades on all roads do not exceed 15 degrees and average grades are not more than 10 degrees and cross fall of pavement is not more than 10 degrees. Dead-end roads do exist in the existing development that require sign-posting.

To ensure appropriate emergency services access and residential egress, Abbott Road should be upgraded to two-way access with hydrants provided outside the carriage way and parking.

Plate 6 Abbott Road illustrating One-way and hydrant location

3.4 Water

Intent of water measures is to provide adequate services of water for the protection of buildings during and after the passage of a bush fire.

The fire hoses should be positioned in consideration of future building envelopes. Provision of access to this supply should be provided for fire-crews in the form of readily accessible and easily located fire hoses. They shall be positioned along the Abbott Road and associated with no-parking areas. Fire hose spacing, sizing and pressure should comply with AS2419:2005. Fire hose are not to be located within any road carriageway. All above ground water pipes external to the building are metal, including and up to any taps.

3.5 Electricity

Intent of electricity measures are to locate electricity so as not to contribute to the risk of fire to a building. All electricity supplies are underground and do not contribute to fire risk.

3.6 Gas

Intent of gas measures are to locate gas so as not to contribute to the risk of fire to a building. The development design does not provide any indication of the location and design of gas supply and infrastructure. Should gas be provided on site the following recommendations are provided.

Location and design of gas services will not lead to ignition.

Any reticulated or bottled gas should be installed and maintained according to the requirements of the relevant authorities and AS/NZS 1596:2014. All fixed gas cylinders are kept clear of all flammable materials to a distance of 10m and shielded on the hazard side. All above-ground pipes and connections to and from gas cylinders are metal, and polymer-sheathed flexible gas supply lines to gas meters adjacent to buildings are not permitted. Furthermore, if gas cylinders need to be kept close to the building, safety valves are

directed away from the building and at least 2m away from any combustible material, so they do not act as a catalyst to combustion.

3.7 Emergency Evacuation Management

Intent of Emergency evacuation measures is to provide suitable emergency and evacuation arrangements for occupants of SFPP developments. The occupants of SFPP developments are often more vulnerable to bushfire attack as they are less familiar with their surroundings and may be less educated in relation to bush fire impacts. Furthermore, these residents are less likely to be able to defend the property from bushfire attack. It is imperative that evacuation management is clearly defined to ensure that harm to employees and occupants and loss of life does not occur.

It is recommended that an Emergency Management Committee be established, consisting of permanent and non-permanent residences for the site, and a consultant engaged to develop a Bush fire Emergency Management Plan to outline all actions and procedures for occupants of the site in the event of an emergency bushfire. This plan should consider the distance and time required to evacuate to the nearest potential off site refuge area when determining the preferred emergency management procedure. A Shelter-in-Place refuge area might be a more acceptable solution in unforeseen bushfire emergencies. The Plan should have regard to the RFS guidelines 'Development Planning: A guide to developing a Bush Fire Emergency Management and Evacuation Plan' (2014) and Australian Standard AS 3745:2010 Planning for emergencies in facilities, and all Emergency Assembly Areas including 'onsite' and 'offsite' arrangements as stated in AS 3745-2002 are clearly displayed, and all staff and residences complete an annual (as a minimum) trail emergency evacuation.

The Plan should be circulated to all employees and they should be made aware that on days when the RFS decide the Fire Danger Rating is Catastrophic, emergency evacuation should be made a priority.

Due to the nature of the development it is recommended that an annual emergency simulation exercise is undertaken by all employees and permeant residence (if any) of the caravan park to satisfy local emergency services and prepare all personnel for a possible fire event.

4 Conclusion and Recommendations

It is clear from this investigation and assessment that the site is NOT Bushfire Prone Land and provisions of PBP 2018 do not apply. The recommendations outlined within this assessment will substitute as appropriate actions to reduce the risk of damage and/or harm in the event of a bushfire event from the surrounding landscape outside the 140m assessment Area.

This BFAR found the land surrounding the proposed development supports vegetation consistent with a grasslands and non-vegetated areas. The vegetation that forms a bush fire threat exists to the north, east and west of the site.

In summary, although the property is identified as bushfire prone land the site visit determined there was no classifiable bushfire hazard vegetation within the 140m assessment area. Due to no bushfire hazard being present, adherence to PBP 2018 and construction to a Bushfire Attack Level (BAL) is not warranted. Although the site does not have any direct bushfire threats, the following key recommendations have been generated to ensure best design practices are implement in this semi-rural setting.

- The entire development site is to be managed (Landscaping) as an Inner Protection Area (IPA) as outlined with section 4.1.3 and Appendix 4 of Planning for Bushfire Protection 2018;
- Abbott Road should be upgraded to two-way and provision of fire hydrants be located along Abbott Road outside parking and carriageway.
- Fire hydrant spacing, design and sizing comply with the Australian Standard AS2419.1:2005, and
- A Bush Fire Emergency Management and Evacuation Plan shall be prepared consistent with 'Development Planning A Guide to Developing a Bush Fire Emergency Management and Evacuation Plan December 2014' and Australian Standard AS3745 2010 'Planning for Emergencies in Facilities'. Attention within this plan should focus on the procedure to evacuate and close the assemble area in the event of a bushfire attack.

This assessment has been made based on the bushfire hazards in and around the site at the time of inspection and production (January 2019).

5 Bibliography

Australian Building Codes Board (2010), Building Code of Australia, Class 1 and Class 10 Buildings, Housing Provisions Volume 2.

Councils of Standards Australia (1999), AS 3959 – 1999: Construction of Buildings in Bushfire-prone Areas. SAI Global

Councils of Standards Australia (2002), AS 1596-2002: Storage and handling of LPG Gas. SAI Global

Councils of Standards Australia (2005), AS 2419. –2005: Fire hydrant installations System design, installation and commissioning. SAI Global

Environmental Assessment Legislation Amendment Act (2002). Accessed online: https://www.legislation.nsw.gov.au/#/view/act/1979/203

Environmental Planning & Assessment Amendment (Planning for Bush Fire Protection) Regulation 2007, accessed online: https://www.legislation.nsw.gov.au/regulations/2014-285.pdf

Keith, David (2004), Ocean Shores to Desert Dunes – The Native Vegetation of New South Wales and the ACT, The Department of Environment and Climate Change.

Armidale Dumaresq Local Environmental Plan 2012: Land Zoning Map – Sheet LZN_002AA: Accessed online January 2019 from: https://www.legislation.nsw.gov.au/maps/9d958c32-9ba6-4140-82ee-863dccb701ef/0111_COM_LZN_001_160_20140403.pdf

NSW RFS, Bushfire Prone Land Map. Accessed online January 2019 from: https://www.rfs.nsw.gov.au/plan-and-prepare/building-in-a-bush-fire-area/planning-for-bush-fire-protection/bush-fire-prone-land/check-bfpl

Minimum Vegetation Clearances for Power Lines, ISSC3 - NSW Resources and Energy - NSW Government Accessed online: https://www.resourcesandenergy.nsw.gov.au/energy-supply-industry/pipelines-electricity-gas-networks/electricity-networks/safety/ISSC3-guideline-for-managing-vegetation-near-power-lines.pdf

NSW Rural Fire Service (2018). Planning for Bushfire Protection – A Guide for Councils, Planners, Fire Authorities, Developers and Home Owners.

Office of Environment and Heritage, Aboriginal Heritage Information Management System (AHIMS): Accessed online January 2019 from: https://www.environment.nsw.gov.au/awssapp/Login.aspx

Office of Environment and Heritage, Bionet Wildlife Atlas: Accessed online January 2019 from: https://www.environment.nsw.gov.au/AtlasApp/Default.aspx?a=1

Office of Environment and Heritage, Biodiversity Values Map: Accessed online January 2019 from: https://www.lmbc.nsw.gov.au/Maps/index.html?viewer=BVMap

Rural Fires Amendment Regulation (2007), accessed online: http://www.austlii.edu.au/au/legis/nsw/num_reg/rfafsar20072007109593.pdf

Rural Fires Regulation (2013), accessed online: https://www.legislation.nsw.gov.au/#/view/regulation/2013/488

Rural Fire Services (2014) Development Planning: A guide to developing a Bush Fire Emergency Management and Evacuation Plan. Accessed online from: http://www.rfs.nsw.gov.au/__data/assets/pdf_file/0020/29270/Development-Planning-Guide-to-developing-a-Bush-Fire-Emergency-Management-and-Evacuation-Plan.pdf

Rural Fires and Environmental Assessment Legislation Amendment Act 2002.

Standards Australia (2009). AS 3959 – 2009: Construction of Buildings in Bushfire-prone Areas.

Appendix A

AHIMS, BV Map and Wildlife Atlas Searches

RPS

Office of Environment & Heritage
NSW GOVERNMENT

AHIMS Web Services (AWS)
Search Result

Purchase Order/Reference : Armidale
Client Service ID : 391506

Duncan Scott-Lawson

Date: 09 January 2019

Dear Sir or Madam:

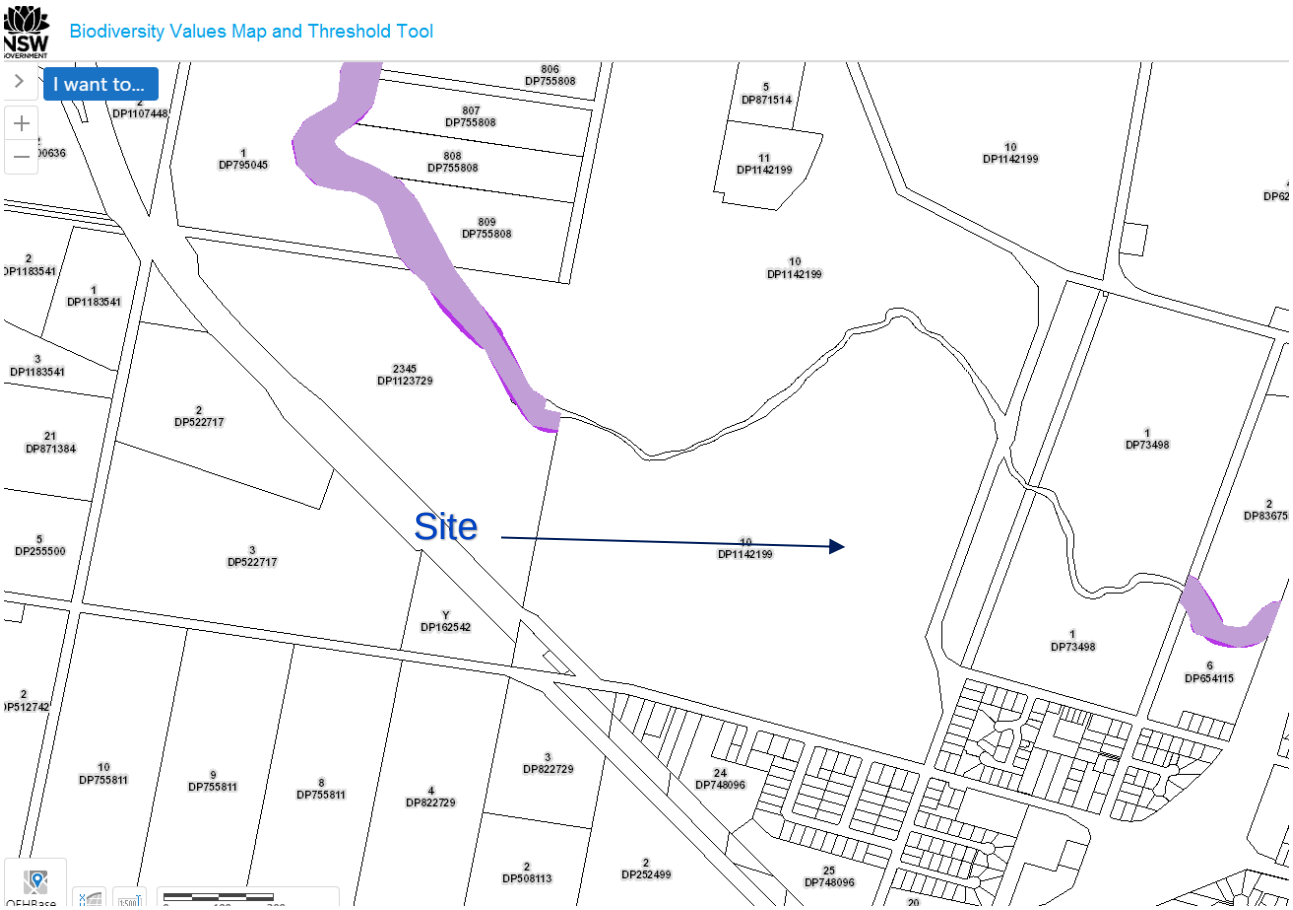
AHIMS Web Service search for the following area at Lot : 10, DP:DP1142199 with a Buffer of 50 meters, conducted by Duncan Scott-Lawson on 09 January 2019.

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 the Office of the Environment and Heritage AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

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

NSW OEH Biodiversity Map



NSW Bionet – Altas of NSW Wildlife