



Bushfire Assessment

Concept Plan: Medowie Christian School

Prepared for
EPM Projects Pty Ltd

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Prepared by	Mark Hawkins FPAA BPAD-A Certified Practitioner No. BPAD-L2_30419
Reviewed by	Danielle Meggos FPAA BPAD-A Certified Practitioner No. BPAD-L2-37742
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1 Property and Proposal

Name:	EPM Project Pty Ltd		
Street or property name:	Meadowie Christian School		
Suburb or locality:	Medowie	Postcode:	2318
Lot/DP no:	Lot 1 DP 1036306		
Local Government Area:	Port Stephens Council		
Type of development:	Concept Plan Proposal redevelopment of existing Special Fire Protection Purpose (SFPP) school facility		

1.1 Background

EPM Projects Pty Ltd commissioned Eco Logical Australia Pty Ltd (ELA) to prepare a bushfire assessment (BPA) for the Concept Plan Proposal for Meadowie Christian School (hereafter referred to as the subject land).

This assessment has been prepared by ELA Senior Bushfire Consultant, Mark Hawkins (FPAA BPAD Level 2 Certified Practitioner No. BPD-L2-30419). Mark is recognised by the NSW Rural Fire Service as a suitably qualified consultant in bushfire risk assessment.

1.2 Location and description of subject land

The subject land is located in the Port Stephens suburb of Medowie, approximately 8.7 kilometres southwest of Raymond Terrace. **Figure 1** shows the subject land in a local context. **Figure 2** shows the subject land in relation to the nearest bushfire prone vegetation. **Figure 3** shows the proposed Concept Plan layout and relevant BALs and **Figure 4** shows the proposed building layout.

The Port Stephens LGA has a fire danger index (FDI) of 100.

1.3 Description of Proposal

The Concept Plan involves the relocation of a single storey portable demountable (East Demountable) to a new location as proposed Block A, and the construction of a centrally located new two storey Discovery Centre, and the construction of a two storey building (Block F) in the place of the previous East Demountable.

This report will provide assessment for the Concept Plan for new Special Fire Protection Purpose (SFPP) facilities. Various non-SFPP assessed structures such as sports related facilities and carparks are proposed within the Concept Proposal but will not be included in the scope of this report. A Discovery Centre is proposed as part of the Concept Plan, however is not a permanent classroom facility.

A previous Concept Plan was submitted to Council and the NSW Rural Fire Service and has now been amended in design to incorporate the advice and requirements of both organisations.

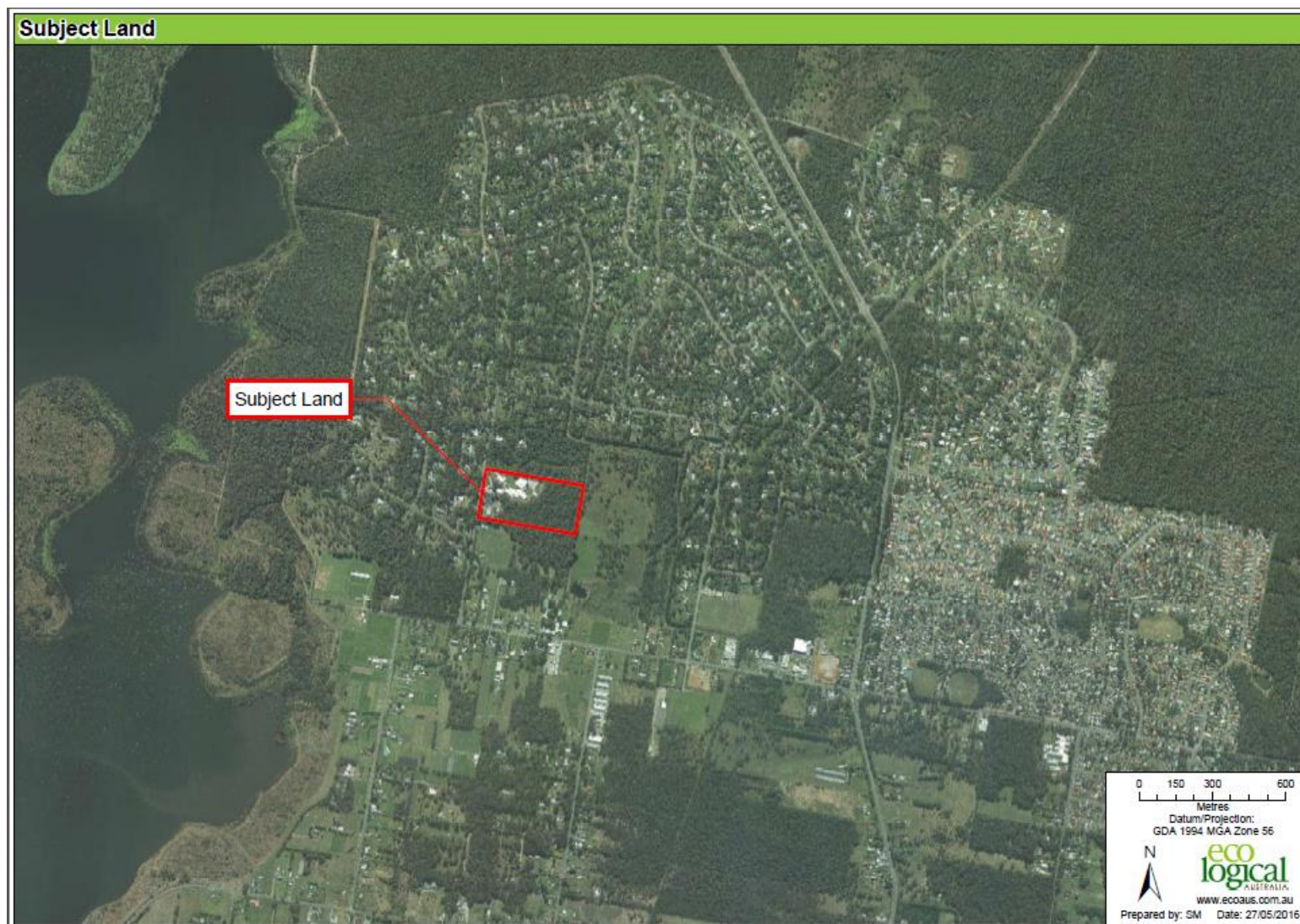


Figure 1: Aerial photograph depicting the subject land

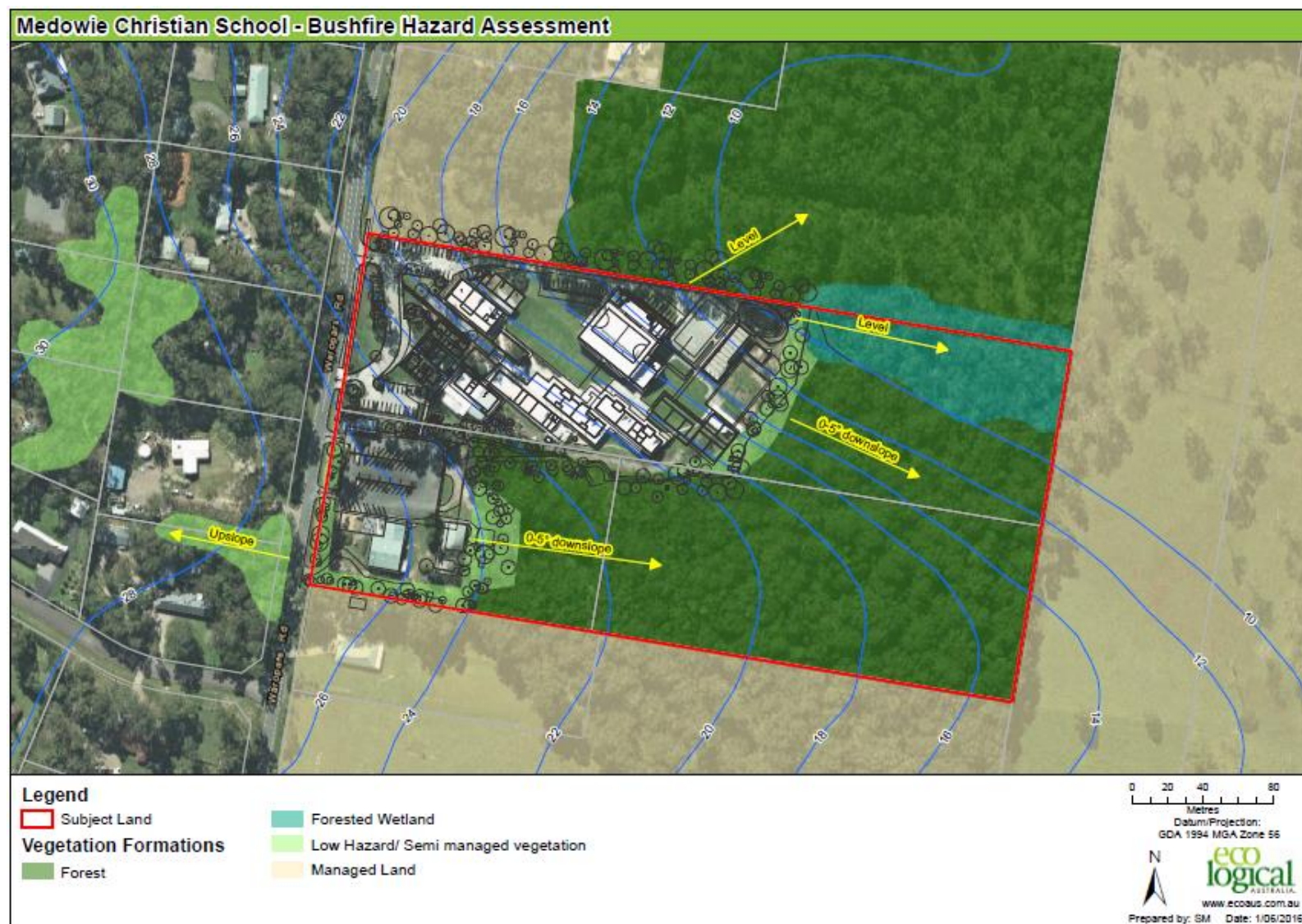


Figure 2: Aerial photograph depicting the vegetation and slope relating to the proposed development

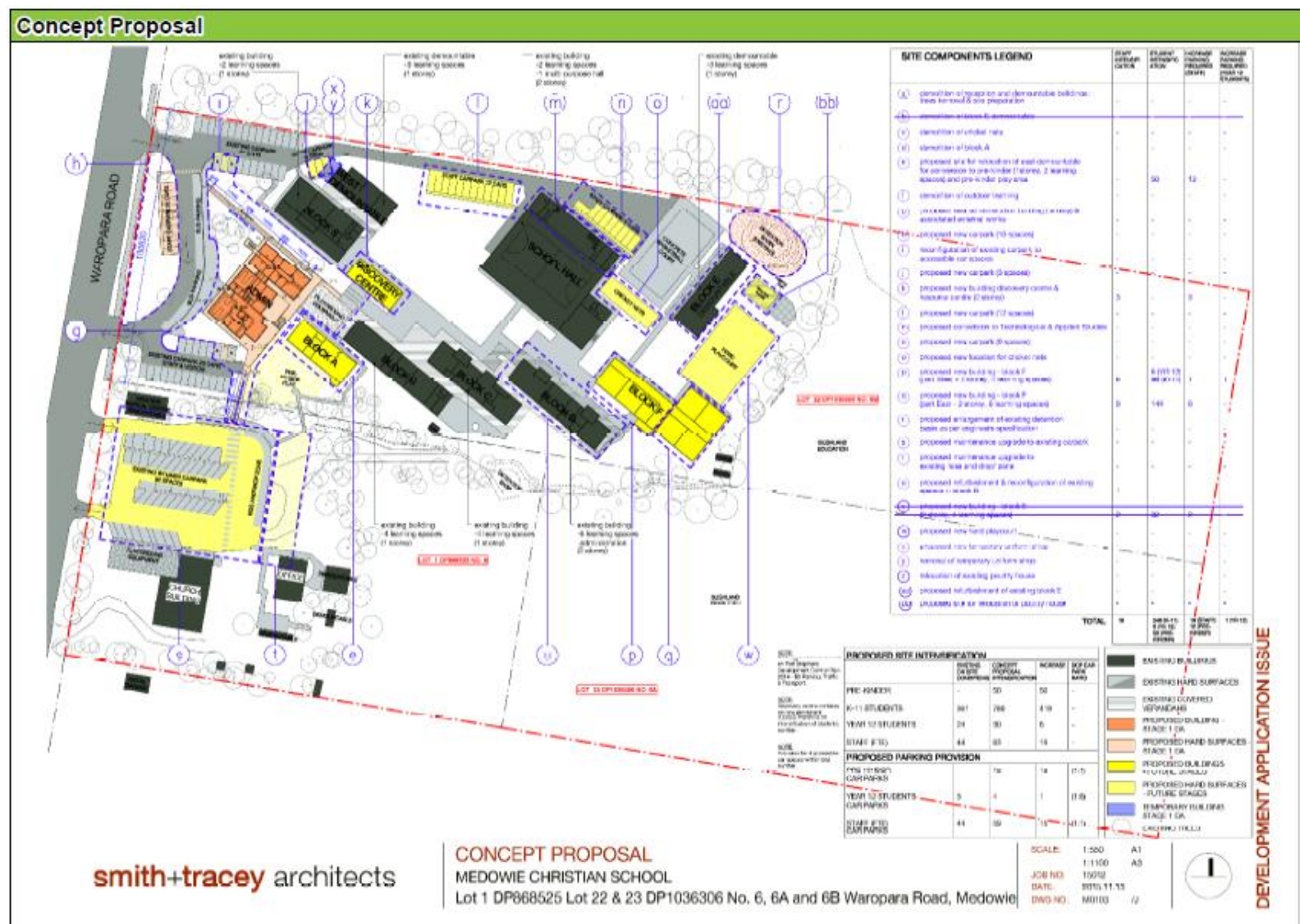


Figure 3: Proposed Concept Plan layout



Figure 4: Proposed Concept Plan building APZ

2 Assessment requirements

A bushfire assessment must consider the requirements of 'Planning for Bush Fire Protection 2006' (NSW Rural Fire Service 2006). Section 4.2 of 'Planning for Bush Fire Protection 2006' (PBP) addresses the assessment and bushfire protection requirements for development involving schools.

The proposal constitutes an infill Special Fire Protection Purpose (SFPP) development as per PBP Section 4.2.5. As such the specific objectives for infill development (PBP Section 4.3.2) have been relied upon.

SFPP developments are treated and assessed differently to other developments, and they require a higher standard of bushfire protection due to one or more of the following reasons:

- Occupants may not originate from the area and therefore may be less educated in relation to bushfire impacts;
- They may have a reduced capacity to evaluate risk and respond adequately to the bushfire threat;
- They may be more vulnerable to stress arising from bushfire threat; and
- They may present logistical difficulties for evacuation, due to reduced mobility, larger numbers of people, communication barriers and the requirement for increased supervision.

The PBP specific objectives for SFPP development are to:

- *Provide for the special characteristics and needs of occupants. Unlike residential subdivisions, which can be built to withstand the fire event, enabling occupants and firefighters to provide property protection after the passage of fire, occupants of SFPP developments may not be able to assist in property protection. They are more likely to be adversely affected by smoke or heat while being evacuated.*
- *Provide for safe emergency evacuation procedures. SFPP developments are highly dependent on suitable emergency evacuation arrangements, which require greater separation from bushfire threats. During emergencies, the risk to firefighters and other emergency services personnel can be high through prolonged exposure, where door-to-door warnings are being given and exposure to the bushfire is imminent.*

3 Bushfire Hazard

The hazard assessment provides the basis for the calculation of asset protection zones and building construction standards. These are defined in the following sections.

For the purposes of PBP, bushfire hazard is the combination of vegetation type and slope. PBP requires the assumption that a worst-case scenario bushfire can occur within all vegetation types of a significant size regardless of direction, aspect, fire history and the general risk of fire.

3.1 Vegetation types

There is land that is consistent with managed land to the west, northwest and south of the subject land, including the recently constructed Asset Protection Zone to the east. Immediately adjoining to the south is the Medowie Church and further south is managed rural residential development.

To the north is Forest that is currently undergoing management through slashing and grazing to return it to its previously managed state. To the northeast is a mixture of Forested Wetland and Forest vegetation located further away.

This Forested Wetland is dominated by Melaleucas and ground storey rushes that has connectivity to forest on slightly higher ground further to the north. The Forested Wetland is assessed by PBP as a 'Forest' due to its connectivity. To the east, southeast and south are areas of vegetation that are grouped under the PBP category of 'Forest'.

3.2 Effective slope

The slope extends from Waropara Road downhill to the east and becomes level to the north-east of the existing tennis court into the Forested Wetland area. To the east and southeast the land varies, however the effective slope is considered within the PBP slope class of 'Downslope 0-5 degrees'.

Figure 2 depicts the slopes surrounding the site using 2m contour information which has been verified onsite.

4 Asset Protection Zones (APZ)

PBP has been used to determine the width of Asset Protection Zones (APZ) using the vegetation and slope data identified in Section 2.1. **Table 1** shows the proposed APZ for the Concept Plan.

4.1 Concept Plan Proposal

The required APZ for a SFPP development against 'Forest' vegetation on a 'Downslope 0-5 degrees' is 70 metres according to Table A2.6 in PBP.

Table 1: Threat assessment, APZ and bushfire attack level Concept Plan

Direction from envelope	Slope ¹	Vegetation ²	PBP required APZ ³	Proposed APZ	AS3959 Construction Standard ⁴	Comment
North-east (Block F)	Level	Forest	60 m	61.5 m	BAL-12.5	Separation to boundary is achieved onsite
East & South (Block F)	Downslope 0-5 ⁰	Forest	70 m	70 m	BAL-12.5	Vegetation clearing has been completed
North-east (Discovery Centre)	Downslope 0-5 ⁰	Forest	25m (Non-SFPP)	41.5m	BAL-29	Separation to boundary is achieved onsite
All other directions	Managed lands					

¹ Effective slope assessed over 100 m from proposed development where the bushfire hazard occurs.

² Predominant vegetation classification over 140 m from proposed development.

³ Minimum APZ required by PBP acceptable solution for SFPP.

⁴ Bushfire Attack Level (BAL) corresponding to construction requirements under AS 3959-2009 'Construction of Buildings in Bushfire Prone Areas'.

4.1.1 APZ maintenance plan

As part of the vegetation management within the subject land, the landscaping density and structure is to comply with the performance requirements of an IPA as described by PBP. The following fuel management specifications can be used as a guide to achieve the IPA performance requirements:

- The presence of a few shrubs or trees in the IPA is acceptable provided that they:
 - are well spread out and do not form a continuous canopy;
 - are not species that retain dead material or deposit excessive quantities of ground fuel in a short period or in a danger period; and
 - are located far enough away from the building so that they will not ignite the building by direct flame contact or radiant heat emission;
- Any landscaping or plantings should preferably be local endemic mesic species or other low flammability species;
- A minimal ground fuel is to be maintained to include less than 4 tonnes per hectare of fine fuel (fine fuel means ANY dead or living vegetation of <6 mm in diameter e.g. twigs less than a pencil in thickness. 4 t/ha is equivalent to a 1 cm thick layer of leaf litter); and
- Any structures storing combustible materials such as firewood (e.g. sheds) must be sealed to prevent entry of burning debris.

The fuel management specifications to achieve the OPA performance requirements are similar in intent as an IPA however the clumping of vegetation is permitted provided vegetation is not continuous and a fuel loading of 8 t/ha is commonly used.

5 Construction standard

The building construction standard is based on the determination of the Bushfire Attack Level (BAL) in accordance with Method 1 of AS 3959-2009 '*Construction of Buildings in Bushfire Prone Areas*' (Standards Australia 2009). The BAL is based on known vegetation type, effective slope and managed separation distance between the development and the bushfire hazard.

5.1 Concept Plan

In response to the predicted bushfire attack, the SFPP buildings proposed as per the Concept Plan are to be constructed to comply with BAL-12.5 under Australian Standard AS 3959-2009 '*Construction of buildings in bushfire-prone areas*'. It is important that the most recent and current version of AS 3959 is consulted. Additionally, the NSW variation to AS 3959 as outlined in PBP 2010 Appendix 3 Addendum is to be applied as applicable to the proposed development. These measures are included in Appendix 1.

The proposed Discovery Centre is not a permanent classroom and its use has been designed as an additional feature to the students learning experience, much the same as an auditorium or sports field. Therefore, given the occupation of the Centre is optional, it is not considered to be a SFPP building.

6 Water supply

There are hydrants located throughout the school and along Waropara Road which supply reticulated water. The furthest point from the proposed development to a hydrant will be less than 90 m easily allowing for a firefighting tanker to be within 20 metres of the hydrant and all parts of the proposed development being within 70 metres of the tanker.

7 Gas and electrical supplies

In accordance with PBP, electricity should be underground wherever practicable. Where overhead electrical transmission lines are installed:

- Lines are to be installed with short pole spacing, unless crossing gullies; and
- No part of a tree should be closer to a powerline than the distance specified in “*Vegetation Safety Clearances*” issued by Ausgrid (NS179, December 2010).

Any gas services are to be installed and maintained in accordance with AS/NZS 1596:2014 The storage and handling of LP Gas (Standards Australia 2014).

8 Access

The property is directly accessible from Waropara Road to the west, which is a sealed two-way public road which can be utilised to attend an incident on the subject land. Waropara Road also offers several alternate routes into Medowie and to the north, south and west. Additional access provisions in regards to bushfire protection are not required for this proposal.

9 Assessment of environmental issues

An Ecological Constraints Assessment (Eco Logical Australia 2014) was prepared for the subject land and it was found that the most significant ecological values on the site are contained in the north east corner. This area contains Swamp Sclerophyll Forest EEC, habitat for threatened plants, breeding and foraging habitat for some threatened fauna and forms part of a buffer to preferred Koala habitat mapped within the Comprehensive Koala Plan of Management.

The remainder of the site is divided into disturbed or cleared land and forest vegetation. The forest vegetation provides foraging habitat for a wide range of threatened fauna. However, the threatened fauna that are predicted to occur would only expected to use the site on occasion and no species were recorded on the site.

10 Bushfire maintenance plans and fire emergency procedures

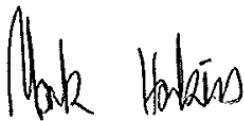
Any existing bushfire maintenance plans and fire emergency procedures will need to be amended to incorporate the new development prior to occupation.

11 Recommendations & conclusion

The proposal consists of the relocation and construction of buildings over the future of the school. The buildings detailed within the scope of the Concept Proposal can comply with the requirements of PBP. The following recommendations apply:

- a. The proposed Concept Plan SFPP buildings be constructed or retrofitted (if relocated) to comply with BAL-12.5 under Australian Standard AS 3959-2009 '*Construction of buildings in bushfire-prone areas*' (Standards Australia 2009). The NSW variation to AS 3959 as outlined in PBP (within the 2010 Appendix 3 Addendum) are to be implemented as applicable to the proposed developments (refer to Appendix 1 of this report).
- b. The proposed Discovery Centre be constructed to comply with BAL-29 under Australian Standard AS 3959-2009 '*Construction of buildings in bushfire-prone areas*' (Standards Australia 2009). The NSW variation to AS 3959 as outlined in PBP (within the 2010 Appendix 3 Addendum) are to be implemented as applicable to the proposed developments (refer to Appendix 1 of this report).
- c. Asset protection zones are to be consistent with the requirements of Section 4 of this report.
- d. Any existing bushfire maintenance plans and fire emergency procedures will need to be amended to incorporate the new development prior to occupation.

In the author's professional opinion the proposed development can comply with '*Planning for Bush Fire Protection*' (NSWRFS 2006) for new SFPP development.



Mark Hawkins
Senior Bushfire Consultant
FPAF BPAD Certified Practitioner No. BPD-L2-30419



Eco Logical Australia (ELA) is recognised by the NSW Rural Fire Service and the NSW Department of Planning as a suitably qualified consultant as the company is listed as a Certified Business (BPD-BA-1940) under the Fire Protection Association of Australia's BPAD program.

References

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HEAD OFFICE

Suite 2, Level 3
668-672 Old Princes Highway
Sutherland NSW 2232
T 02 8536 8600
F 02 9542 5622

CANBERRA

Level 2
11 London Circuit
Canberra ACT 2601
T 02 6103 0145
F 02 6103 0148

COFFS HARBOUR

35 Orlando Street
Coffs Harbour Jetty NSW 2450
T 02 6651 5484
F 02 6651 6890

PERTH

Suite 1 & 2
49 Ord Street
West Perth WA 6005
T 08 9227 1070
F 08 9322 1358

DARWIN

16/56 Marina Boulevard
Cullen Bay NT 0820
T 08 8989 5601
F 08 8941 1220

SYDNEY

Level 6
299 Sussex Street
Sydney NSW 2000
T 02 8536 8650
F 02 9264 0717

NEWCASTLE

Suites 28 & 29, Level 7
19 Bolton Street
Newcastle NSW 2300
T 02 4910 0125
F 02 4910 0126

ARMIDALE

92 Taylor Street
Armidale NSW 2350
T 02 8081 2681
F 02 6772 1279

WOLLONGONG

Suite 204, Level 2
62 Moore Street
Austinmer NSW 2515
T 02 4201 2200
F 02 4268 4361

BRISBANE

Suite 1 Level 3
471 Adelaide Street
Brisbane QLD 4000
T 07 3503 7191
F 07 3854 0310

HUSKISSON

Unit 1 51 Owen Street
Huskisson NSW 2540
T 02 4201 2264
F 02 4443 6655

NAROOMA

5/20 Canty Street
Narooma NSW 2546
T 02 4476 1151
F 02 4476 1161

MUDGEES

Unit 1, Level 1
79 Market Street
Mudgee NSW 2850
T 02 4302 1230
F 02 6372 9230

GOSFORD

Suite 5, Baker One
1-5 Baker Street
Gosford NSW 2250
T 02 4302 1220
F 02 4322 2897

1300 646 131
www.ecoaus.com.au