Travers

bushfire & ecology

Bushfire Protection Assessment

Planning Proposal

Part Lot 627 DP 1163903
Lot 2C, Caulfield Close, Currans Hill

Under Section 9.1(2) Direction No 4.4
of the *EP&A Act*

March 2020
(REF:18CSL02)

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This report has been prepared to provide advice to the client on matters pertaining to the particular and specific development proposal as advised by the client and / or their authorised representatives. This report can be used by the client only for its intended purpose and for that purpose only. Should any other use of the advice be made by any person including the client then this firm advises that the advice should not be relied upon. The report and its attachments should be read as a whole and no individual part of the report or its attachments should be relied upon as meaning it reflects any advice by this firm. The report does not suggest or guarantee that a bush or grass fire will not occur and or impact the development. This report advises on matters published by the *NSW Rural Fire Service* in their guideline *Planning for Bush Fire Protection 2019* and other advice available from that organisation.

The mapping is indicative of available space and location of features which may prove critical in assessing the viability of the proposed works. Mapping has been produced on a map base with an inherent level of inaccuracy, the location of all mapped features are to be confirmed by a registered surveyor.

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EXECUTIVE SUMMARY

A bushfire protection assessment has been undertaken for the proposed amendment to the Minimum Lot Size Development Standard that applies to land located at Lot 2C, Caulfield Close, Currans Hill.

The site is located at the southern end of Caulfield Close and is zoned E4 - Environmental Living and in part E2 - Environmental Conservation. The planning proposal seeks to amend the Minimum Lot Size Development Standards to allow for a minimum lot size of 500m^2.

This report identifies matters for consideration for the planning proposal and highlights the required bushfire protection measures, including asset protection zones (APZs), for future development under the *Environmental Planning and Assessment Act 1979 (EP&A Act), Section 9.1(2) Direction 4.4* and in accordance *Planning for Bush Fire Protection 2019* (*PBP*) and *Community Resilience Practice Note 2/12 Planning Instruments and Policies*.

The key principle for the proposal is to ensure that future development is capable of complying with *PBP*. Planning principles for the proposal include the provision of adequate access including perimeter roads, establishment of adequate APZs for future housing, specifying minimum lot depths to accommodate APZs and the introduction of controls which avoid placing inappropriate developments in hazardous areas and placement of combustible material in APZs.

Our assessment found that bushfire can potentially affect the site from the woodland vegetation associated within the riparian corridor to the south & west resulting in possible ember attack and radiant heat attack. Indicative APZ's have also been provided to the eastern boundary of the site to provide a 'worst case' scenario based on woodland vegetation. This area includes a transmission easement to the east, which will be managed regularly in accordance with Transgrid guidelines.

The bushfire risk posed to the planning proposal can be mitigated if appropriate bushfire protection measures (including APZs) are put in place and managed in perpetuity.

The assessment has concluded that future development on site will provide compliance with the planning principles of *PBP* and *Community Resilience Practice Note 2/12 – Planning Instruments and Policies*.

GLOSSARY OF TERMS

AHIMS	Aboriginal Heritage Information System
APZ	asset protection zone
AS1596	*Australian Standard – The storage and handling of LP Gas*
AS2419	*Australian Standard – Fire hydrant installations*
AS3745	*Australian Standard – Planning for emergencies in facilities*
AS3959	*Australian Standard – Construction of buildings in bushfire-prone areas 2009*
BAL	*bushfire attack level*
BSA	Bushfire safety authority
EEC	endangered ecological community
FDI	fire danger index
IPA	inner protection area
LEP	*local environmental plan*
NCC	*National Construction Code*
OPA	outer protection area
PBP 2019	*Planning for Bush Fire Protection 2019*
RFS	NSW Rural Fire Service
SFPP	special fire protection purpose

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Introduction 1

Travers bushfire & ecology) has been requested by *Cardno to* undertake a bushfire protection assessment for the planning proposal located at Lot 2C (Part Lot 627 1163903), Caulfield Close, Currans Hill.

The proposal is located on land mapped by *Camden Council* as being bushfire prone. *Direction 4.4, Planning for Bush Fire Protection 2019 (PBP)* identifies matters for consideration for planning proposals that will affect, or are in proximity to land mapped as bushfire prone.

As such, the proposal is subject to the requirements of Section 9.1(2) of *the Environmental Planning and Assessment Act 1979 (EP&A Act)* which requires Council to consult with the Commissioner of the NSW Rural Fire Service (RFS) and to take into account any comments by the Commissioner.

1.1 Aims of the assessment

The aims of the bushfire protection assessment are to:

- review the bushfire threat to the landscape
- undertake a bushfire attack assessment in accordance with *PBP*
- provide advice on planning principles, including the provision of perimeter roads, asset protection zones (APZs) and other specific fire management issues
- review the potential to carry out hazard management over the landscape, taking into consideration the proposed retention of trees within the final development plans.

1.2 Project synopsis

The aim of the Planning Proposal is to seek an amendment to the Camden Local Environmental Plan (CLEP) 2010. The proposed amendment is to apply a minimum lot size of 500m2 to the subject land.

An indicative layout sketch has been provided in Figure 1.2 and Schedule 1 attached, bushfire constraints have been highlighted and minimum APZs have been recommended. The final subdivision design should ensure that APZ's are either contained within the perimeter road or within the individual lot boundaries to ensure ongoing maintenance.

Recommendations have also been made for future road design, building construction, water supply and utilities.

Figure 1.1 – Zoning

Figure 1.2 – Proposed layout plan
(source: *Cardno*, Drawing No. 80219033-SK002, dated 25/03/2020)

1.3 Information collation

To achieve the aims of this report, a review of the information relevant to the property was undertaken prior to the initiation of field surveys. Information sources reviewed include the following:

- Lot Layout – Option 5, Currans Hill Subdivision, prepared by *Cardno*, dated 25/03/20
- Bushfire protection assessment – Rezoning Application Stage 3 Manooka Valley, prepared by *Travers bushfire & ecology* dated March 2017 (amended July 2017)

- Manooka Stage 3 Rezoning: Flora and Fauna Assessment – final report (version 2) prepared by *Biosis* dated 27th February 2017.
- Camden Local Environmental Plan 2010
- Camden Development Control Plan 2011
- NearMap aerial photography
- Topographical maps *DLPI of NSW* 1:25,000
- *Australian Standard 3959 Construction of buildings in bushfire-prone areas*
- *Planning for Bush Fire Protection 2019 (PBP)*
- *Community Resilience Practice Notes 2/12 Planning Instruments and Policies.*

An inspection of the proposed development site and surrounds was undertaken by Nicole van Dorst to assess the topography, slopes, aspect, drainage, vegetation and adjoining land use. The identification of existing bushfire measures and a visual appraisal of bushfire hazard and risk were also undertaken.

1.4 Site description

The site is located at Lot 2C Caulfield Close, Currans Hill (refer Figure 1.3). The site forms part of the greater Lot 627 DP 1163903.

The property is adjoined by Caulfield Close and residential land to the north, a mixture of managed land, grassland and bushland associated with the existing TransGrid Electrical Easement to the east and woodland vegetation associated with a riparian corridor to the south and west.

Figure 1.3 – Aerial appraisal
(source: Nearmap, 2018)

1.5 Legislation and planning instruments

1.5.1 Environmental Planning and Assessment Act 1979 (EP&A Act) and bushfire prone land

The *EP&A Act* governs environmental and land use planning and assessment within New South Wales (NSW). It provides for the establishment of environmental planning instruments, development controls and the operation of construction controls through the *National Construction Code (NCC).* The identification of bushfire prone land is required under Section 10.3 of the *EP&A Act*.

Bushfire prone land maps provide a trigger for the development assessment provisions. The property is located on land that is mapped by *Camden Council* as being bushfire prone – Category 2 open woodland vegetation (depicted orange) and its associated buffer (depicted yellow) (refer Figure 1.4).

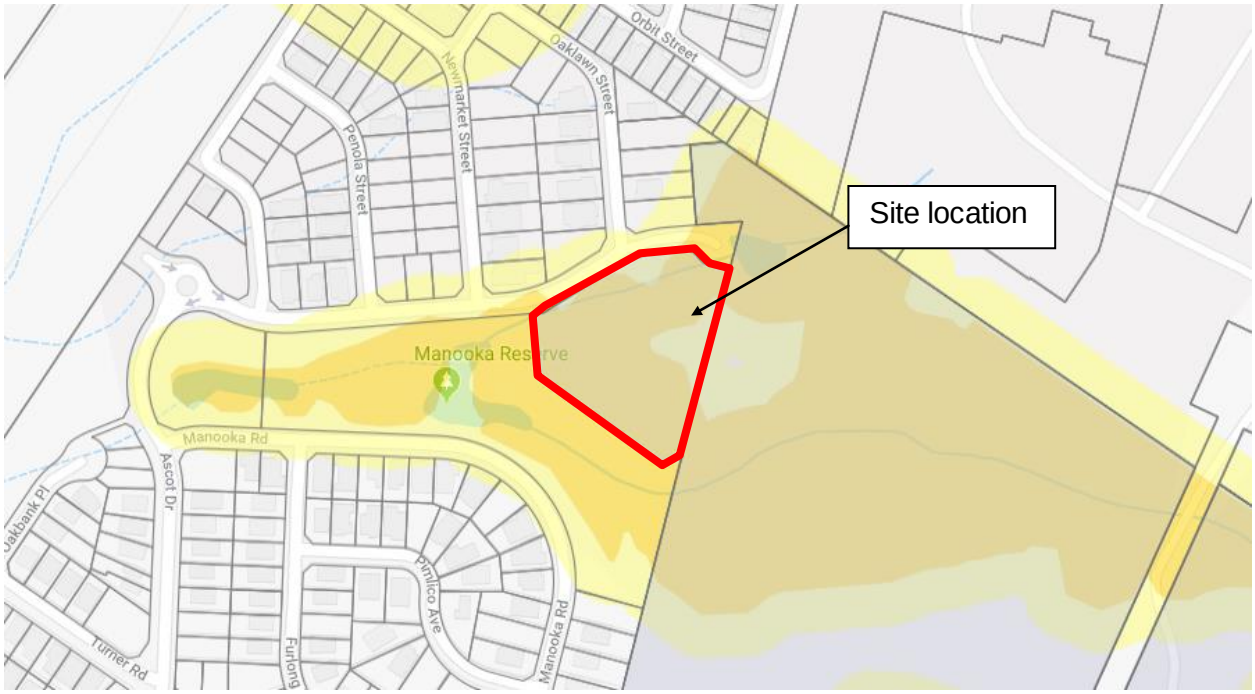

Figure 1.4 – Bushfire prone land map (11th October 2013)
(Source: Camden Council)

PBP (pg 4) stipulates that if a proposed amendment to land use zoning or land use affects a designated bushfire prone area then the Section 9.1(2) Direction No 4.4 of the *EP&A Act* must be applied. This requires Council to consult with the Commissioner of the RFS and to take into account any comments by the Commissioner and to have regard to the planning principles of *PBP* (detailed within Section 1.5.3).

1.5.2 Local Environmental Plan (LEP)

A LEP provides for a range of zonings which list development that is permissible or not permissible, as well as the objectives for development within a zone.

The proposal, including the provision of APZs, would seek to comply with the objectives of the zoning with APZ's excluded from the E2 zoned land.

1.5.3 Planning for Bush Fire Protection 2019 (PBP)

Bushfire protection planning requires the consideration of the RFS planning document entitled *PBP.* The policy aims to provide for the protection of human life (including fire fighters) and to minimise impacts on property and the environment from the threat of bushfire, while having due regard to development potential, on site amenity and protection of the environment.

PBP outlines the following planning principles that must be achieved for all planning proposals:

1. provision of a perimeter road with two way access which delineates the extent of the intended development.
2. provision, at the urban interface, for the establishment of adequate APZs for future housing.
3. specifying minimum residential lot depths to accommodate APZs for lots on perimeter roads.
4. minimising the perimeter of the area of land interfacing the hazard, which may be developed.
5. introduction of controls which avoid placing inappropriate developments in hazardous areas, and
6. introduction of controls on the placement of combustible materials in APZs.

In addition to the above, *PBP* outlines the bushfire protection measures required to be assessed for new development in bushfire prone areas.

The planning proposal has been assessed in compliance with the following measures to ensure that future development is capable of complying with *PBP*:

- asset protection zones
- building construction and design
- access arrangements
- water supply and utilities
- landscaping
- emergency arrangements

1.5.4 National Construction Code (NCC) and the Australian Standard AS3959 Construction in bushfire-prone areas 2018 (AS3959)

The *NCC* is given effect through the *EP&A Act* and forms part of the regulatory environment of construction standards and building controls. The *NCC* outlines objectives, functional statements, performance requirements and deemed to satisfy provisions. For residential dwellings these include Classes 1, 2 and 3 buildings. The construction manual for the deemed to satisfy requirements is *AS3959.*

Although consideration of *AS3959* is not specifically required in a planning proposal, this report (Section 3.2) provides the indicative setbacks for each dwelling construction level and can be used in future planning for master plans and / or subdivision proposals.

1.6 Environmental and cultural constraints

1.6.1 Environmental constraints

A review of the broader Manooka Valley Flora and Fauna Assessment prepared by Biosis (dated 27st February 2017) has been undertaken. The mapping has not identified any Critically Endangered Ecological Community (CEEC) or Endangered Ecological Community (EEC) within the current study area. A small portion of the site (south-eastern corner) is mapped as exotic grassland vegetation with the remainder of the site identified as cleared land (refer Figure 1.5).

Figure 1.5 – Vegetation Community (Biosis, 2017)

1.6.2 Cultural constraints

A basic search was conducted on the Aboriginal Heritage Information System (AHIMS). The results show that there are four (4) identified Aboriginal sites of significance within the broader Lot 627 DP 1163903 or within 50m of the site.

Bushfire Threat Assessment 2

To assess the bushfire threat and to determine the required width of an APZ for a development, a review of the elements that comprise the overall threat needs to be completed.

PBP provides a methodology to determine the size of any APZ that may be required to offset possible bushfire attack. These elements include the potential hazardous landscape that may affect the site and the effective slope within that hazardous vegetation.

2.1 Hazardous fuels

PBP guidelines require the identification of the predominant vegetation formation, for a distance of at least 140m from a proposed development envelope, in accordance with David Keith (2004) to determine APZ distances.

Recently these vegetation groups have been subject to further fuel load research by the University of Wollongong (UoW) and Dr Penny Watson. These fuel loads have been published in PBP 2019 (Table A1.12.8) with further breakdown of fuel loads listed within the NSW RFS document – 'Comprehensive Vegetation Fuel Loads'. The fuel loads adopted in this assessment are based on PBP 2019 'deemed to satisfy' and are current best practice.

The hazardous vegetation within 140m of the planning proposal (to the east) has been mapped by Bioisis (refer Figure 1.5) and consists of a mixture of grassland, woodland and forested wetland. The vegetation within Manooka Reserve to the south and west is mapped by NPWS (2002) as Shale Plains Woodland.

Table 2.1 – Vegetation / fuel load

Vegetation community	Vegetation Class / Fuel load
Cumberland Plain Woodland	Woodland (grassy & woody) (10.5 / 20.2 t/ha)
Cumberland Plain Woodland - derived shrubland	
Shale Plains Woodland	
River-Flat Eucalypt Forest	Coastal Floodplain Wetland (8.2 / 15.1 t/ha)
Exotic Grassland	Grassland (6 / 6 t/ha)

Photo 1: Woodland vegetation located within the riparian corridor (south)

A TransGrid easement runs parallel and adjacent to the development area to the immediate east. This easement consists of a mixture of managed land, grassland and bushland. A worst case scenario has been adopted and a 'woodland' vegetation formation has been used in the calculations. A reassessment of the APZ required will be undertaken at subdivision stage following a further review of the future maintenance of the easement.

2.2 Effective slope

The effective slope is determined by reviewing the slopes within 100m of the development boundary. Effective slope refers to that slope which provides the most effect upon likely fire behaviour. A mean average slope may not in all cases provide sufficient information such that an appropriate assessment can be determined.

The effective slope within the hazardous vegetation to the south and west is 5 – 10 degrees downslope. The effective slope within the grassland / potential future woodland vegetation to the east is level to upslope.

2.3 Bushfire attack assessment

A fire danger index (FDI) of 100 has been used to calculate bushfire behaviour on the site using forest vegetation located within the Greater Sydney region.

Table 2.2 below provides a summary of the bushfire attack assessment and the minimum required APZs in compliance with BAL 29 building construction standards as outlined in PBP 2019.

Table 2.2 – Bushfire attack assessment

Aspect	Vegetation formation within 140m of development	Effective slope of land	Minimum APZ required *PBP 2019* (metres)	Building construction standards (Table A1.12.5 of *PBP 2019)* (metres)
North	Managed lands	N/A	N/A	N/A
South, south-east and west	Woodland	5-10 ^{0D}	20	BAL 29 (20-<28) BAL 19 (28 - <39) BAL 12.5 (39-<100)
East	Woodland	Level to upslope	12	BAL 29 (12-<18) BAL 19 (18 - <26) BAL 12.5 (26-<100)

*Notes: * Slope is either 'U' meaning up slope or 'C' meaning cross slope or 'D' meaning down slope*

Specific Protection Issues 3

3.1 Asset protection zones (APZs)

Table 3.1 outlines the proposal's compliance with the performance criteria for APZs.

Table 3.1 – Performance criteria for asset protection zones (*PBP* 2019 guidelines pg. 43)

Performance criteria	Acceptable solutions	Acceptable solution	Performance solution	Comment
Potential building footprints will not be exposed to radiant heat levels exceeding 29kW/m^2 on each proposed lot	APZs are provided in accordance with Tables A1.12.2 and A1.12.4 based on the FFDI	☑	☐	Refer Section 2.3. APZ's have been recommended based on a radiant heat exposure of less than 29kW/m^2.
APZs are managed and maintained to prevent the spread of a fire towards the building	APZs are managed in accordance with the requirements of Appendix 4	☑	☐	The APZ will consist of landscaped areas
The APZ is provided in perpetuity	APZs are wholly within the boundaries of the development site	☑	☐	APZ's are confined within the boundary of the site and over proposed formed road widths.
APZ maintenance is practical, soil stability is not compromised and the potential for crown fires is minimised	The APZ is located on lands with a slope of less than 18^o	☑	☐	Complies. All slopes are less than 18 degrees.
Landscaping is designed and managed to minimise flame contact and radiant heat to buildings, and the potential for wind-driven embers to cause ignitions	Landscaping is in accordance with Appendix 4	☑	☐	Can be a condition of consent
	Fencing is constructed in accordance with section 7.6	☑	☐	Can be a condition of consent (see Note 1 below).
Note 1: Section 7.6 of PBP states that all fences in bush fire prone areas should be made of either hardwood or non-combustible material. However, in circumstances where the fence is within 6m of a building or in areas of BAL 29 or greater, they should be made of non-combustible material only.				

3.2 Building protection

In terms of future subdivision approval, the minimum APZ must be provided in accordance with *PBP.* The APZs provided in Table 2.2 (Section 2.3) of this report comply with the setbacks provided in *PBP 2019* (Table A1.12.5)

Although not required in terms of a planning proposal, the following advice in relation to building construction levels can be used for future planning and subdivision design.

The construction classification system is based on five (5) bushfire attack levels (BAL). These are BAL – Flame Zone (FZ), BAL 40, BAL 29, BAL 19 and BAL 12.5 AS3959 – *Construction of buildings in bushfire-prone areas (2018).* The lowest level, BAL 12.5, has the longest APZ distance while BAL – FZ has the shortest APZ distance. These allow for varying levels of building design and use of appropriate materials.

Table 2.2 provides an indication of the BAL setbacks that are likely to apply for future building construction. These BAL levels are for planning purposes only and will be assessed / confirmed prior to building construction stage. The APZ depicted in Schedule 1 attached is based on BAL 29 building construction for those lots fronting the bushfire hazard.

3.3 Hazard management

In terms of implementing and / or maintaining APZs, there is no physical reason that would constrain hazard management from being successfully carried out by normal means (e.g. mowing / slashing).

APZs are required to be managed as an IPA in accordance with RFS guidelines *Standards for Asset Protection Zones* (RFS, 2005), with landscaping design to comply with Appendix 4 of *PBP*. Appendix 2 provides maintenance advice for vegetation within the APZ

A summary of the guidelines for managing APZs is attached as Appendix 1 to this report.

Minimum APZs have been recommended and are depicted in Schedule 1. The APZ will consist of an IPA only.

3.4 Access for fire fighting operations

Future residential development within the site will access Caulfield Close in the north.

An indicative layout sketch has been provided (refer Schedule 1 attached). Future road design should comply with the performance criteria and acceptable solutions for public roads as outlined within the tables below. Perimeter roads (fronting the bushfire hazard) are to have a carriageway width of 8m (excluding parking). Internal roads are required to have a carriageway width of 5.5m (excluding parking) as allowable within *PBP 2019.*

Table 3.2 below outlines the performance criteria and acceptable solutions for future access within residential subdivision design.

Table 3.2 – Performance criteria for access within residential subdivisions (*PBP* 2019) guidelines pg. 44)

Performance criteria		Acceptable solution
ACCESS (GENERAL REQUIREMENTS)	Firefighting vehicles are provided with safe, all weather access to structures.	Property access roads are two-wheel drive, all-weather roads
		Perimeter roads are provided for residential subdivisions of three or more allotments.
		Subdivisions of three or more allotments have more than one access in and out of the development.
		Traffic management devices are constructed to not prohibit access by emergency services vehicles.
		Maximum grades for sealed roads do not exceed 15 degrees and an average grade of not more than 10 degrees or other gradient specified by road design standards, whichever is the lesser gradient.
		All roads are through roads
		Dead end roads are not recommended, but if unavoidable, dead ends are not more than 200m in length, incorporate a minimum 12 metres outer radius turning circle, and are clearly sign posted as a dead end.
		Where kerb and guttering are provided on perimeter roads, roll top kerbing should be used to the hazard side of the road.
		Where access / egress can only be achieved through forest, woodland or heath vegetation, secondary access shall be provided to an alternate point on the existing public road system.
		One way only public access roads are no less than 3.5 metres wide and have designated parking bays with hydrants located outside of these areas to ensure accessibility to reticulated water for fire suppression.
	The capacity of access roads is adequate for firefighting vehicles	The capacity of perimeter and non-perimeter road surfaces and any bridges / causeways is sufficient to carry fully loaded firefighting vehicles (up to 23 tonnes); bridges / causeways are to clearly indicate load rating.
	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.
		Hydrants are provided in accordance with *AS 2419.1:2005.*

Performance criteria		Acceptable solution
		There is suitable access for a Category 1 fire appliance to within 4m of the static water supply where no reticulated supply is available.

Performance criteria		Acceptable solution
PERIMETER ROADS	Access roads are designed to allow safe access and egress for firefighting vehicles while residents are evacuating as well as providing a safe operational environment for emergency service personnel during firefighting and emergency management on the interface.	Are two-way sealed roads.
		Minimum 8m carriageway width kerb to kerb.
		Parking is provided outside of the carriageway width.
		Hydrants are located clear of parking areas.
		There are through roads, and these are linked to the internal road system at an interval of no greater than 500m.
		Curves of roads have a minimum inner radius of 6m.
		The maximum grade road is 15° and average grade is 10°.
		The road crossfall does not exceed 3°.
		A minimum vertical clearance of 4m to any overhanging obstructions, including tree branches, is provided.

Performance criteria		Acceptable solution
NON-PERIMETER ROADS	Access roads are designed to allow safe access and egress for medium rigid firefighting vehicles while residents are evacuating.	Minimum 5.5m carriageway width kerb to kerb.
		Parking is provided outside of the carriageway width.
		Hydrants are located clear of parking areas.
		Roads are through roads, and these are linked to the internal road system at an interval of no greater than 500m.
		Curves of roads have a minimum inner radius of 6m.
		The road crossfall does not exceed 3°.

Performance criteria		Acceptable solution
		A minimum vertical clearance of 4m to any overhanging obstructions, including tree branches, is provided.

Performance criteria		Acceptable solution
PROPERTY ACCESS	Firefighting vehicles can access the dwelling and exit the property safely.	There are no specific access requirements in an urban area where an unobstructed path (no greater than 70m) is provided between the most distant external part of the proposed dwelling and the nearest part of the public access road (where the road speed limit is not greater than 70kph) that supports the operational use of emergency firefighting vehicles.
		In circumstances where this cannot occur, the following requirements apply:
		minimum 4m carriageway width;
		in forest, woodland and heath situations, rural property access roads have passing bays every 200m that are 20m long by 2m wide, making a minimum trafficable width of 6m at the passing bay;
		a minimum vertical clearance of 4m to any overhanging obstructions, including tree branches;
		provide a suitable turning area in accordance with Appendix 3;
		curves have a minimum inner radius of 6m and are minimal in number to allow for rapid access and egress;
		the minimum distance between inner and outer curves is 6m;
		the crossfall is not more than 10 degrees;
		maximum grades for sealed roads do not exceed 15 degrees and not more than 10 degrees for unsealed roads; and
		a development comprising more than three dwellings has access by dedication of a road and not by right of way.
		Note: Some short constrictions in the access may be accepted where they are not less than 3.5m wide, extend for no more than 30m and where the obstruction cannot be reasonably avoided or removed. The gradients applicable to public roads also apply to community style development property access roads in addition to the above.

3.5 Water supplies

Town reticulated water supply is available to the property in the form of an underground reticulated water system.

Table 3.3 outlines the performance criteria and acceptable solutions for reticulated water supply.

Table 3.3 – Performance criteria for reticulated water supplies (*PBP* guidelines pg. 47)

Performance criteria	Acceptable solutions
Adequate water supplies is provided for firefighting purposes.	Reticulated water is to be provided to the development, where available.
	A static water supply is provided for non-reticulated developments or where reticulated water supply cannot be guaranteed
	Static water supplies shall comply with Table 5.3d.
Water supplies are located at regular intervals. The water supply is accessible and reliable for firefighting operations.	Fire hydrant, spacing, design and sizing complies with the relevant clauses of Australian Standard *AS 2419.1:2005.*
	Hydrants are not located within any road carriageway.
	Reticulated water supply to urban subdivisions uses a ring main system for areas for areas with perimeter roads.
Flows and pressure are appropriate.	Fire hydrant flows and pressures comply with the relevant clauses of *AS 2419.1:2005.*
The integrity of the water supply is maintained.	All above-ground water service pipes are metal, including and up to any taps.
	Above ground water storage tank shall be of concrete or metal

3.6 Gas

Table 3.4 outlines the required performance criteria for the gas supply.

Table 3.4– Performance criteria for gas supplies (*PBP* guidelines pg. 47)

Performance criteria	Acceptable solutions
Location of gas services will not lead to the ignition of surrounding bushland or the fabric of buildings.	Reticulated or bottled gas bottles are to be installed and maintained in accordance with *AS/NZS 1596 (2014)*, the requirements of relevant authorities and metal piping is to be used.
	All fixed gas cylinders are to be kept clear of flammable materials to a distance of 10m and shielded on the hazard side.
	Connections to and from gas cylinders are metal.
	Polymer sheathed flexible gas supply lines are not used.
	Above ground gas service pipes are metal, including and up to any outlets.

3.7 Electricity

Table 3.5 outlines the required performance criteria for electricity supply.

Table 3.5 – Performance criteria for electricity services (*PBP* guidelines pg. 47)

Performance criteria	Acceptable Solutions
Location of electricity services limit the possibility of ignition of surrounding bushland or the fabric of buildings.	Where practicable, electrical transmission lines are underground.
	Where overhead electrical transmission lines are proposed: • 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 ISSC3 Guideline for Managing Vegetation Near Power Lines.

Conclusion & Recommendations

4

4.1 Conclusion

A bushfire protection assessment has been undertaken for the planning proposal located at Lot 2C, Caulfield Close, Currans Hill.

Our assessment found that bushfire can potentially affect the site from the woodland vegetation associated with the riparian corridor to the south and west and the woodland extending beyond the electrical easement to the east resulting in possible ember attack and radiant heat attack.

The bushfire risk posed to the planning proposal however can be mitigated if appropriate bushfire protection measures (including APZs) are put in place and managed in perpetuity.

Future development on site is to comply with the following planning principles.

Table 4.1 – Planning principles

Planning principles	Recommendations
Provision of a perimeter road with two way access which delineates the extent of the intended development.	A perimeter road (8m carriageway width) is to be provided adjacent to all bushland areas.
Provision, at the urban interface, for the establishment of adequate APZs for future housing.	APZs have been recommended in compliance with BAL 29 (*PBP 2019*).
Specifying minimum residential lot depths to accommodate APZs for lots on perimeter roads.	Future subdivision design is to allow for the minimum APZs as recommended within Table 2.2 and as depicted within Schedule 1 attached.
Minimising the perimeter of the area of land interfacing the hazard, which may be developed.	Compliant.
Introduction of controls which avoid placing inappropriate developments in hazardous areas.	Future development consists of residential dwellings and is appropriate for the level of bushfire risk.
Introduction of controls on the placement of combustible materials in APZs.	Compliant – can be made a condition of consent.

The following recommendations are provided to ensure that future residential development is in accordance with, or greater than, the requirements of *PBP.*

4.2 Recommendations

Recommendation 1 - APZs are to be provided to the future residential development. APZs are to be measured from the exposed wall of any dwelling toward the hazardous vegetation. The minimum APZ must be achievable within all lots fronting the bushfire hazard as nominated in Table 2.2 and also as generally depicted in Schedule 1.

Recommendation 2 - Fuel management within the APZs is to be maintained as an inner protection area with regular maintenance of the landscaped areas, mowing of lawns in accordance with the guidelines provided in Appendix 1, and as advised by the RFS in their publications.

Recommendation 3 - Building construction standards for the proposed future dwellings within in accordance with *AS3959 Construction of buildings in bushfire prone areas (2018)*, and *Planning for Bush Fire Protection 2019.*

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Recommendation 4 –Access roads are to comply with the performance criteria as outlined within Section 5.3b of *PBP 2019* (refer Section 3.4 of this report).

Recommendation 5 – Water, electricity and gas supply is to comply with the acceptable solutions as provided within Section 5.3c of *PBP* (refer Sections 3.5, 3.6 and 3.7 of this report).

REFERENCES

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

Chan, K.W. (2001) – *The suitability of the use of various treated timbers for building constructions in bushfire prone areas*. Warrington Fire Research

Councils of Standards Australia AS3959 (2018) – *Australian Standard Construction of buildings in bush fire-prone areas*

Hon Brad Hazzard (7 June 2012) – *Planning proposal to rezone land at Boundary Road, Medowie from 1 (c1) Rural Small Holdings Zone to 1(c5) Rural Small Holdings, 1(c4) Rural Small Holdings and 7(a) Environmental Protection*

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

Rural Fire Service (2019) - *Planning for bushfire protection– a guide for councils, planners, fire authorities and developers*. NSW Rural Fire Service

Rural Fire Service (2006) - Bushfire Attack Software on RFS web site

Tan, B., Midgley, S., Douglas, G. and Short (2004) - *A methodology for assessing bushfire attack.* RFS Development Control Service

Travers, J. (2003) *The Ecological Management of Asset Protection Zones at Wallarah Peninsula – A Case Study*

Umwelt, 2012. *Ecological Assessment for Rezoning Application Lots 93 – 96 Boundary Road, Medowie*

Plan of Bushfire Protection Measures

S1

Legend

- Site location
- Contours - 1m (source: LiDAR)
- Asset Protection Zone (Inner Protection Area)
- Proposed rezoning - E2 Environmental Management

Aerial source:Nearmap

PROJECT & MXD REFERENCE	DATE & ISSUE	SCALE & COORDINATE SYSTEM
Lot 2C, Caulfield Close, Currans Hill 18CSL02_BF001	27/03/2020 Issue 1	1:1,506 @ A4 GDA 1994 MGA Zone 56

0 20 40 m

Disclaimer: The mapping is indicative of available space and location of features which may prove critical in assessing the viability of the proposed works. Mapping has been produced on a map base with an inherent level of inaccuracy, the location of all mapped features are to be confirmed by a registered surveyor.

TITLE

Schedule 1 - Bushfire Protection Measures

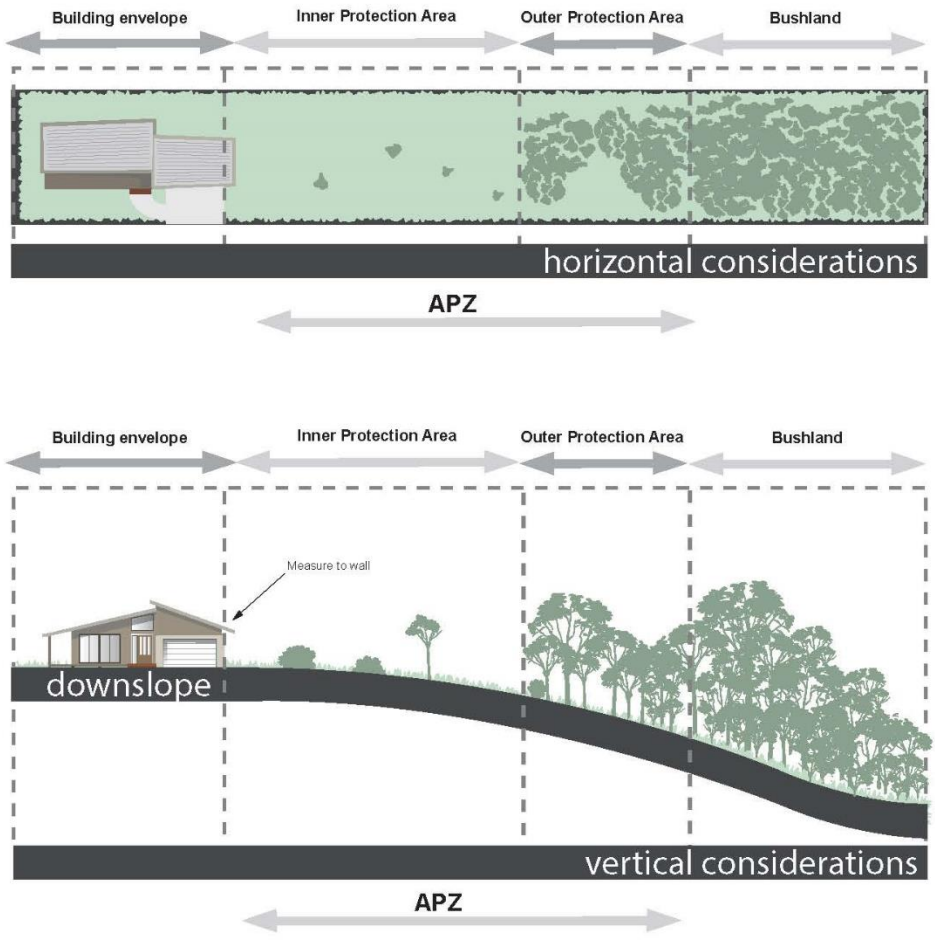
Document Path: N:\GIS STORAGE\N Drive\18CSL02_CaulfieldCls_CurransHill\MXDs\18CSL02_BF001.mxd

Management of Asset Protection Zones

A1

The RFS provides basic advice in respect of managing APZs through documents such as, *Standards for Asset Protection Zones* (RFS, 2005), with landscaping to comply with Appendix 5 of *PBP*.

The APZ generally consists of two subordinate areas, an inner protection area (IPA) and an outer protection area (OPA). The OPA is closest to the bush and the IPA is closest to the dwellings. The property is to be managed to IPA standards only. A typical APZ is graphically represented below:



APZs and progressive reduction in fuel loads (Source: PBP, 2019)

Note: Vegetation management as shown is for illustrative purposes only. Specific advice is to be sought regarding vegetation removal and retention from a qualified and experienced expert to ensure APZs comply with the RFS performance criteria.

The following provides maintenance advice for vegetation within the IPA and OPA. The APZ is to be maintained in perpetuity and should be undertake regularly, particularly in advance of the bushfire season.

Inner protection area (IPA)
Fuel loads within the IPA are to be maintained so it does not exceed 4t/ha.

Trees are to be maintained to ensure;

- canopy cover does not exceed 15% at maturity;
- trees (at maturity) do not touch or overhang the building;
- lower limbs should be removed up to a height of 2m above ground;
- tree canopies should be separated by 2 to 5m; and
- preference should be given to smooth barked and evergreen trees.

Shrubs are to be maintained to ensure;

- create large discontinuities or gaps in the vegetation to slow down or break the progress of fire towards buildings;
- shrubs should not be located under trees;
- shrubs should not form more than 10% of ground cover; and
- clumps of shrubs should be separated from exposed windows and doors by a distance of at least twice the height of vegetation.

Grass is to be maintained to ensure:

- grass should be kept mown (as a guide grass should be kept to no more than 100mm in height); and
- leaves and vegetation debris should be removed (litter fuel within the IPA should be kept below 1cm)

General advice for landscaping is provided below:

- Suitable impervious areas being provided immediately surrounding the building such as courtyards, paths and driveways;
- Restrict planting in the immediate vicinity of the building which may over time and if not properly maintained come into contact with the building;
- When considering landscape species consideration needs to be given to estimated size of the plant at maturity;
- Avoid species with rough fibrous bark, or which retain/shed bark in long strips or retain dead material in their canopies;
- Use smooth bark species of trees species which generally do not carry a fire up the bark into the crown;
- Avoid planting of deciduous species that may increase fuel at surface / ground level (i.e. leaf litter);
- Avoid climbing species to walls and pergolas;
- Locate combustible materials such as woodchips / mulch, flammable fuel stores away from the building;
- Locate combustible structures such as garden sheds, pergolas and materials such timber garden furniture way from the building; and
- Use of low flammability vegetation species.