# Bushfire constraints advice for Masterplan and DCP

Moss Vale Road North Urban Release Area

(MVRN URA)

9 March 2018

BPAD Bushfire Planning & Design Accredited Practitioner Level 3

## DOCUMENT TRACKING

| Item | Detail |
|---|---|
| Project Name | Bushfire Constraints advice for Masterplan and DCP - Moss Vale Road North Urban Release Area (MVRN URA) |
| Project Number | 17HNG_8433 |
| Project Manager | Rod Rose |
| Prepared by | Natalie South and Rod Rose |
| Reviewed by | Rod Rose |
| Approved by | Rod Rose FPAA BPAD-Level 3 Certified Practitioner No. BPAD1940-L3) |
| Status | Draft |
| Version Number | 1 |
| Last saved on | 9 March 2018 |

This report should be cited as 'Eco Logical Australia March 2018. Bushfire Constraints advice for Masterplan and DCP - Moss Vale Road North Urban Release Area (MVRN URA).

## ACKNOWLEDGEMENTS

This document has been prepared by Eco Logical Australia Pty Ltd with support from Allen Price & Scarratts.

# Contents

# 1 Introduction

This constraints advice is based upon review of background information provided by Allen Price & Scarratts, a workshop and site inspection and desktop analysis of spatial data.

The advice has been prepared by Bushfire Technical Assistant Natalie South and Principal Bushfire Consultant Rod Rose (FPAA BPAD-Level 3 Certified Practitioner No. BPAD1940-L3). A site inspection occurred on 28 January 2018.

# 2 Bushfire threat assessment

The subject land is identified as bush fire prone land by Shoalhaven City Council. A bushfire protection Assessment is required for any future development in accordance with the *Environmental Planning and Assessment Act 1979,* Section 100B of the *Rural Fires Act 1997* and *Planning for Bush Fire Protection 2006* (RFS 2006), herein referred to as PBP.

A Bushfire Safety Authority, issued by the NSW Rural Fire Service (RFS), will be required for future subdivision and their concurrence will be required by Council for the Masterplanning and DCP.

The vegetation and slope have been assessed at a landscape level around the development footprint from a preliminary concept plan. In accord with PBP the predominant vegetation class has been calculated for a distance of at least 140 m out from each potential development site and out from the boundary of the subject land, and the slope class *"most significantly affecting fire behaviour having regard for vegetation found [on it]"* determined for a distance of at least 100 m in all directions.

The predominant vegetation may alter when more complete landscaping and revegetation plans are available; and these may also alter the APZ in affected areas.

# 3 Asset protection zones (APZ)

The 2006 version of PBP has been used to determine the width of Asset Protection Zones (APZ) as the latest advice from RFS is that the 2018 version may not be enacted until November 2018 or May 2019. The 2018 draft is currently with the Minister for approval and has substantial changes from the publicly exhibited version, but the specific nature of those changes has not been released. Notwithstanding this the PBP 2006 APZ setbacks within this report should meet the 'likely' new APZs under PBP 2018; the following identifies where the changes are likely to affect the subject proposal:

- APZ adjoining rainforest (riparian) areas may change from 10 m to 9 m or 11 m depending upon slope;
- APZ adjoining forest areas may change from 20 m to 23 m in upslope areas and from 25 m to 29 m in >0-5 degree downslope areas;
- In areas of >5 degrees – 10 degrees downslope adjoining forest the APZ may change from 35 m to 37 m.

**Figure 1** shows the required APZ under PBP 2006. If required a revised APZ map can be provided with the PBP 2018 dimensions, but it is not certain these will be the final APZ sizes. **Figure 1** identifies a 10 m wide APZ around the DCP area perimeter where it adjoins grassland; it may be possible for these APZs to be removed in negotiation with the RFS if it can be assured that these areas will be reliably and permanently grazed to a level that removes the bushfire risk or at least lowers it to an APZ standard. This may seem a logical description of the current situation but the definition of managed grassland is somewhat unclear and the RFS position on what is acceptable may change with PBP 2018.

Larger APZs are required for Special Fire Protection Purpose developments such as schools and child care centres. As a specific site for these type of developments (if being considered) are not known the APZ cannot be site specifically determined; however, if they are located in the 'mixed use' area abutting rainforest then the APZs required are likely to be in the order of 40 m under PBP 2006 and 47 m under PBP 2018.

# 4 APZ maintenance plan

APZs that are not roadways or similar developed areas will require a vegetation management regime to the satisfaction of the RFS. Vegetation management within an APZ would need to be as follows:

- No tree or tree canopy is to occur within 2 m of a dwelling roofline;
- The presence of a few shrubs or trees in the APZ 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;
  - 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.

PBP prefers APZ to be located within lot boundaries unless the area is a roadway or similarly devoid of bushfire hazard. Managed parkland and landscaped areas can theoretically be considered an APZ provided the responsibility and reliability for its maintenance in perpetuity is clear. A clear understanding of the long-term maintenance responsibility for any such areas needs to be communicated in any DA.

If APZs extend beyond lot boundaries in a manner other than described above, an easement may be required for each lot owner to perform APZ maintenance on the adjoining land. PBP requires the lot owner (the one benefiting from the APZ) to be responsible for its fuel management if maintenance is required.

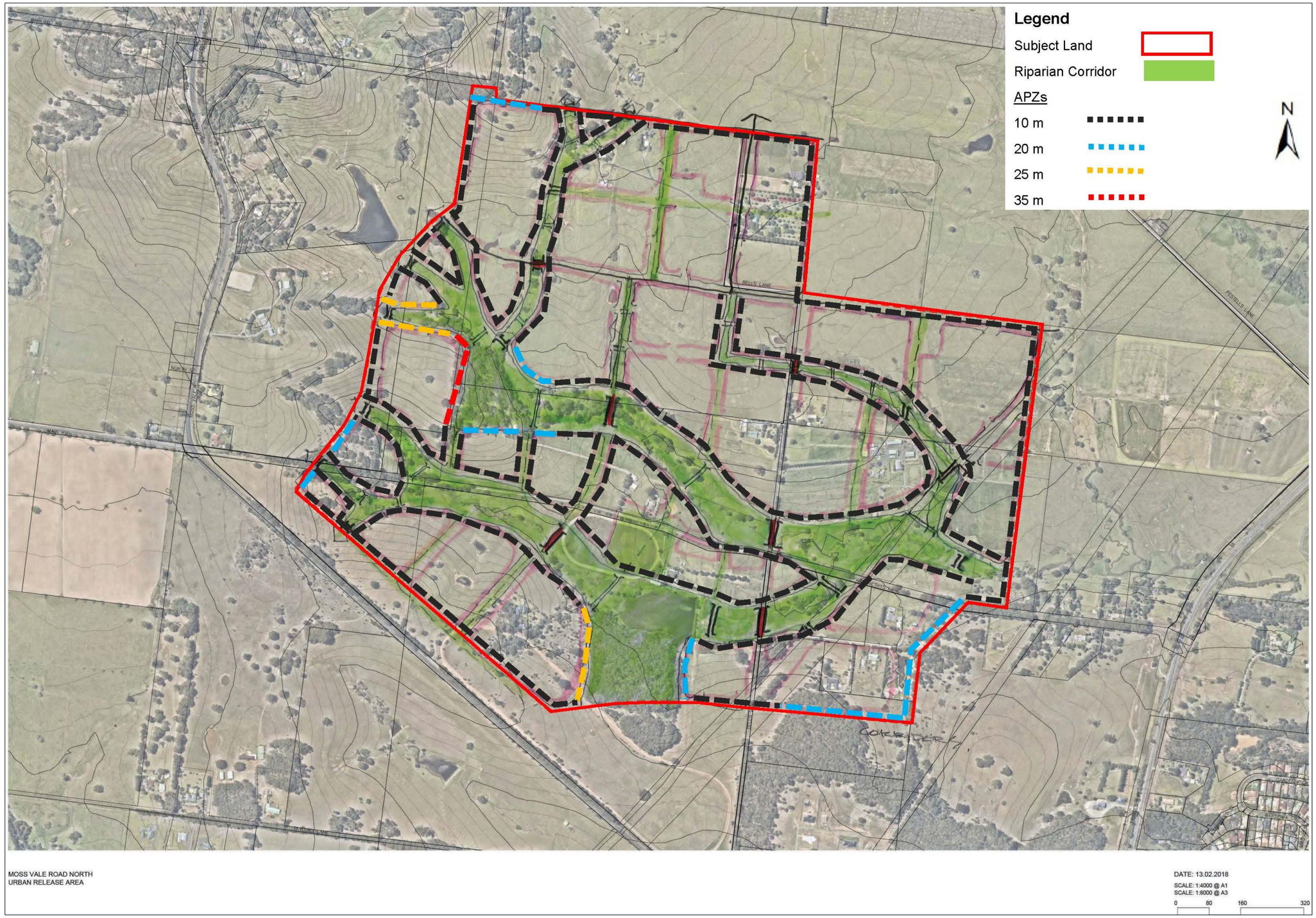



**Figure 1: Indicative Asset Protection Zones**

# 5 Water supply

It is assumed that the subject land will be serviced by reticulated water. The furthest point from any future dwellings to a hydrant is to be less than 70 m. The reticulated water supply needs to comply with the following acceptable solutions within Section 4.1.3 of PBP:

- Reticulated water supply to urban subdivisions uses a ring main system for areas with perimeter roads;
- Fire hydrant spacing, sizing and pressures comply with Australian Standard AS 2419.1 'Fire hydrant installations – System design installation and commissioning' (Standards Australia 2005). Where this cannot be met, the RFS will require a test report of the water pressures anticipated by the relevant water supply authority. In such cases, the location, number and sizing of hydrants shall be determined using fire engineering principles;
- Hydrants are not located within any road carriageway;
- All above ground water and gas service pipes external to the building are metal, including and up to any taps; and
- The PBP provisions of parking on public roads are met.

# 6 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 the *'ISSC 3 Guideline for the Management of Vegetation in the Vicinity of Electricity Assets*' (Industry Safety Steering Committee 2016).

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

# 7 Access

The critical access constraints can be summarised as:

- Provision of two alternate egress routes to a safer place e.g. Nowra or Cambewarra or potentially the Village Centre. These alternate routes need to be available from every potential dwelling and workplace. Cul-de-sacs are only permissible where they are <200 m in length.
- Given the size of the development, more than two egress routes are highly desirable, although it is arguable that mass off-site evacuation would ever be required given the primary risk is external grassfire or fire within riparian areas or relatively small patches of forest. These concepts would need to be clarified with RFS, however, the authors view is that an effective internal road network and two major external egress routes should suffice.
- Perimeter roads need to adjoin all internal bushfire prone lands i.e. riparian and forest areas. Perimeter roads normally require an 8 m wide trafficable surface, however given the lower risk abutting the riparian areas/forest it may be feasible to negotiate with the RFS a lesser width road if desired.
- A perimeter road between the external lots/development areas and the surrounding grassland is also required. These are not evident in the current roading concepts. It may be possible to negotiate with the RFS a lesser standard of road e.g. a fire trail, but this cannot be assumed as certain. The acceptable solution in PBP requires 8 m wide perimeter roads around the full perimeter of the DCP developed area. Arguments regarding managed grassland (grazing) surrounding the site could also potentially be negotiated with RFS whereby no perimeter road or trail is required.

All public roads should comply with the PBP design requirements in **Table 1**. If fire trails are permitted in lieu of perimeter roads (around the DCP boundary areas) then the PBP design requirements in Table 2 apply.

Changes to the access requirements under PBP 2018 are unclear as the publicly exhibited version has apparently changed considerably. It is anticipated that the PBP 2006 access requirements are likely to satisfy the PBP 2018 guideline based upon the exhibited draft and informal RFS comments over recent weeks.

**Table 1: Performance criteria for proposed public roads[1]**

| Performance Criteria | Acceptable Solutions |
|---|---|
| **The intent may be achieved where:** | |
| • firefighters are provided with safe all weather access to structures (thus allowing more efficient use of firefighting resources) | • public roads are two-wheel drive, all weather roads |
| • public road widths and design that allows safe access for firefighters while residents are evacuating an area | • urban perimeter roads are two-way, that is, at least two traffic lane widths (carriageway 8 metres minimum kerb to kerb), allowing traffic to pass in opposite directions. Non perimeter roads comply with Table 4.1 – Road widths for Category 1 Tanker (Medium Rigid Vehicle)<br>• the perimeter road is linked to the internal road system at an interval of no greater than 500 metres in urban areas<br>• traffic management devices are constructed to facilitate access by emergency services vehicles<br>• public roads have a cross fall not exceeding 3 degrees<br>• public roads are through roads. Dead end roads are not recommended, but if unavoidable, dead ends are not more than 200 metres in length, incorporate a minimum 12 metres outer radius turning circle, and are clearly sign posted as a dead end and direct traffic away from the hazard<br>• curves of roads (other than perimeter roads) are a minimum inner radius of six metres<br>• the minimum distance between inner and outer curves is six metres.<br>• 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<br>• there is a minimum vertical clearance to a height of four metres above the road at all times |
| • the capacity of road surfaces and bridges is sufficient to carry fully loaded firefighting vehicles | • the capacity of road surfaces and bridges is sufficient to carry fully loaded firefighting vehicles (approximately 15 tonnes for areas with reticulated water, 28 tonnes or 9 tonnes per axle for all other areas). Bridges clearly indicated load rating |
| • roads that are clearly sign posted (with easy distinguishable names) | • public roads greater than 6.5 metres wide to locate hydrants outside of parking reserves to ensure accessibility to reticulated water for fire suppression |

| Performance Criteria | Acceptable Solutions |
|---|---|
| and buildings / properties that are clearly numbered | • public roads between 6.5 metres and 8 metres wide are No Parking on one side with the services (hydrants) located on this side to ensure accessibility to reticulated water for fire suppression |
| • there is clear access to reticulated water supply | • public roads up to 6.5 metres wide provide parking within parking bays and locate services outside of the parking bays to ensure accessibility to reticulated water for fire suppression<br>• one way only public access roads are no less than 3.5 metres wide and provide parking within parking bays and located services outside of the parking bays to ensure accessibility to reticulated water for fire suppression |
| • parking does not obstruct the minimum paved width | • parking bays are a minimum of 2.6 metres wide from kerb to kerb edge to road pavement. No services or hydrants are located within the parking bays<br>• public roads directly interfacing the bush fire hazard vegetation provide roll top kerbing to the hazard side of the road |

[1] PBP page 21

**Table 2: Performance criteria for fire trails*[1]**

| Performance Criteria | Acceptable Solutions |
|---|---|
| **The intent may be achieved where:** | |
| • the width and design of the fire trails enables safe and ready access for firefighting vehicles | • a minimum carriageway width of four metres with an additional one metre wide strip on each side of the trail (clear of bushes and long grass is provided<br>• the trail is a maximum grade of 15 degrees if sealed and not more than 10 degrees if unsealed<br>• a minimum vertical clearance of four metres to any overhanging obstructions, including tree branches is provided<br>• the crossfall of the trail is not more than 10 degrees<br>▪ the trail has the capacity for passing by:<br>- reversing bays using the access to properties to reverse fire tankers, which are six metres wide and eight metres deep to any gates, with an inner minimum turning radius of six metres and outer minimum radius of 12 metres; and / or<br>- a passing bay every 200 metres, 20 metres long by three metres wide, making a minimum trafficable width of seven metres at the passing bay<br>*Note: Some short construction in the access may be accepted where they are not less than the minimum (3.5m) and extend for no more than 30m and where obstruction cannot be reasonably avoided or removed* |

| Performance Criteria | Acceptable Solutions |
|---|---|
| • fire trails are trafficable under all weather conditions. Where the fire trail joins a public road, access shall be controlled to prevent use by non authorised persons | • the fire service is accessible to firefighters and maintained in a serviceable condition by the owner of the land<br>• appropriate drainage and erosion controls are provided<br>• the fire trail system is connected to the property access road and / or to the through road system at frequent intervals of 200 metres or less<br>• fire trails do not traverse a wetlands or other land potentially subject to periodic inundation (other than a flood or storm surge)<br>• gates for fire trails are provided and locked with a key / lock system authorized by the local RFS |
| • fire trails designed to prevent ween infestation, soil erosion and other land degradation | • fire trail does not adversely impact on natural hydrological flows<br>• fire trail design acts as an effective barrier to the spread of weeds and nutrients<br>• fire trail construction does not expose acid-sulphate soils |

***[1]** PBP page 25

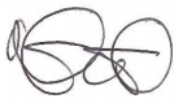
# 8 Staging

The stage development of areas often exposes the edge of each stage to a temporary bushfire risk. Clear information on how these risks are managed will be required e.g. temporary APZ maintained beyond buildings to the extent that the longer term Bushfire Attack Level (BAL) is achieved for the effected buildings. Similarly, temporary perimeter roads/trails may be required to ensure no building is inadequately protected by a road/trail between it and the hazard. Alternate egress routes are also essential for each stage of development.

# 9 Conclusion

Subject to inclusion of the bushfire protection measures outlined in this report, the proposed masterplan and DCP is potentially able to meet the bushfire protection requirements under Planning for Bushfire Protection 2006 (and potentially PBP 2018). Engagement of the NSW RFS and potential negotiation of less restrictive bushfire protection measures should occur as soon as possible to avoid potential redesign of the Masterplan and DCP. This is best undertaken when more detail is available on APZ, roading and landscaping/revegetation patterns.

Yours sincerely,



Natalie South
**Bushfire Technical Assistant**

Rod Rose
**Principal Bushfire Consultant**
**FPAA BPAD Certified Practitioner No. BPAD1940-L3**

# 10 References

Industry Safety Steering Committee. 2016. *ISSC3 Guideline for Managing Vegetation Near Power Lines*. (updated from Energy Australia. 2002. *Network Standard NS 179 (Vegetation Safety Clearances)).*

NSW Rural Fire Service (RFS). 2006. *Planning for Bush Fire Protection: A Guide for Councils, Planners, Fire Authorities, Developers and Home Owners* including the 2010 Appendix 3 Addendum. Australian Government Publishing Service, Canberra.

NSW Rural Fire Service (RFS). 2018. *DRAFT - Planning for Bush Fire Protection: A Guide for Councils, Planners, Fire Authorities, Developers and Home Owners* including the 2010 Appendix 3 Addendum. Australian Government Publishing Service, Canberra.

Standards Australia. 2005. *Fire hydrant installations - System design, installation and commissioning*, AS2419.1, Fourth edition 2005, SAI Global, Sydney.

Standards Australia 2014. *The storage and handling of LP Gas*, AS/NZS 1596:2014, Eighth edition 2014, SAI Global, Sydney.

Standards Australia. 2009. *Construction of buildings in bushfire-prone areas, AS 3959-2009*. SAI Global, Sydney

ecological AUSTRALIA


**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 02 9542 5622

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

**SYDNEY**
Suite 1, Level 1
101 Sussex Street
Sydney NSW 2000
T 02 8536 8650
F 02 9542 5622

**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

**MUDGEE**
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