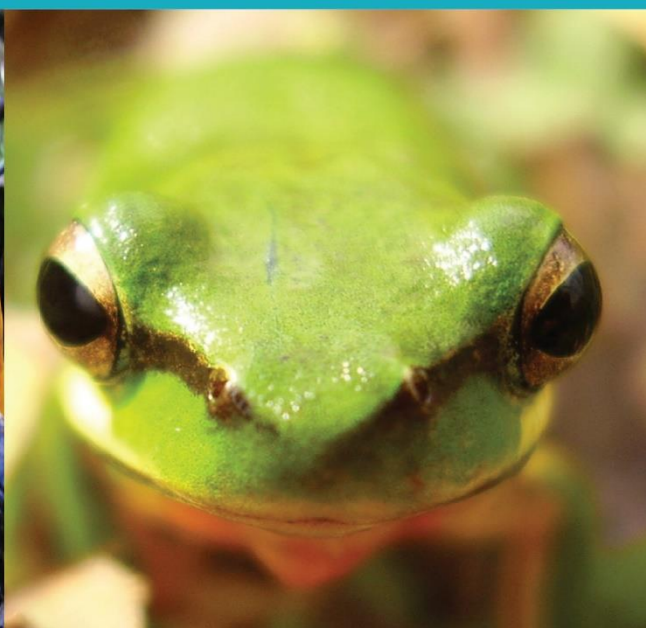




TRAVERS BUSHFIRE & ECOLOGY

A TBE ENVIRONMENTAL COMPANY



BUSHFIRE PROTECTION ASSESSMENT

Proposed Subdivision Development

Lot 1, DP 1265913

326-330 Caddens Road

Claremont Meadows

Under Section 100B of the Rural Fires Act (1997)

2 March 2022

(REF: 18BATH74)

www.traverseecology.com.au

BUSHFIRE PROTECTION ASSESSMENT

Proposed residential subdivision

Lot 1, DP 1265913 326-330 Caddens Road, Claremont Meadows

Report Authors:	Morgan Jeffery B. Sc.
Plans prepared:	Kyla Morris
Checked by:	Tony Hawkins, Manager of Bushfire Services – BPAD 48592 – Level 3
Date:	2/03/22
File:	18BATH74

This document is copyright ©



Disclaimer:

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 policies and specifications published by the NSW Rural Fire Service e.g. Planning for Bush Fire Protection 2019.

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.

EXECUTIVE SUMMARY

This bushfire protection assessment has been undertaken for the proposed residential subdivision of 326-330 Caddens Road, Claremont Meadows. The subdivision will involve the creation of sixty-three (63) new residential allotments.

The development is categorised by the NSW Rural Fire Service (RFS) as being a residential subdivision and this requires the RFS to issue a bushfire safety authority (BSA) in accordance with *Planning for Bush Fire Protection 2019 (PBP 2019)*.

The proposed residential subdivision must ensure that the extent of bushfire attack that can potentially impact a building envelope should not exceed a radiant heat flux of 29kW/m^2 . This rating assists in determining the size of the asset protection zone (APZ), which provides the necessary defensible space between hazardous vegetation and a building.

This assessment has found that bushfire can potentially affect the proposed development from the bushland vegetation to the south and the grassland to the north west of the development, resulting in future buildings being exposed to potential radiant heat and ember attack.

In recognition of the bushfire risk posed to the site by the surrounding bushland, *Travers bushfire & ecology* propose the following combination of bushfire measures;

- APZs in accordance with the minimum setbacks outlined within *PBP 2019* for most aspects
- Provision of access in accordance with the acceptable solutions outlined in *PBP 2019*;
- Water, electricity and gas supply in compliance with the acceptable solutions outlined in *PBP 2019*;
- Future dwelling construction in compliance with the appropriate construction sections of *AS3959-2009*, and *PBP 2019*.

GLOSSARY OF TERMS

AHIMS	Aboriginal Heritage Information System
APZ	asset protection zone
AS1596	<i>Australian Standard – The storage and handling of LP Gas</i>
AS2419	<i>Australian Standard – Fire hydrant installations</i>
AS3745	<i>Australian Standard – Planning for emergencies in facilities</i>
AS3959	<i>Australian Standard – Construction of buildings in bushfire-prone areas 2018</i>
BAL	<i>bushfire attack level</i>
BCA	<i>Building Code of Australia</i>
BSA	bushfire safety authority
DA	development application
DLUP	Development Land Use Plan
EEC	Endangered ecological community
EP&A Act	<i>Environmental Planning & Assessment Act 1979</i>
EP&A Regulation	<i>Environmental Planning and Assessment Regulation 2000</i>
FFDI	forest fire danger index
IPA	inner protection area
LEP	Local Environmental Plan
LGA	local government area
m	metres
NCC	<i>National Construction Code</i>
OPA	outer protection area
PBP 2019	<i>Planning for Bush Fire Protection 2019</i>
RF Act	<i>Rural Fires Act 1997</i>
RFS	NSW Rural Fire Service
SFR	short fire run
SFPP	special fire protection purpose
TBE	<i>Travers bushfire & ecology</i>

TABLE OF CONTENTS

1. INTRODUCTION	1
1.1 Aims of the assessment	1
1.2 Proposed development	2
1.3 Information collation	3
1.4 Site description.....	3
1.5 Legislation and planning instruments	4
2. BUSHFIRE THREAT ASSESSMENT	6
2.1 Hazardous fuels	6
2.2 Effective slope.....	7
2.3 Bushfire attack assessment.....	7
3. SPECIFIC PROTECTION ISSUES.....	11
3.1 Asset protection zones (APZs)	11
3.2 Building protection.....	12
3.3 Hazard management.....	12
3.4 Access for firefighting operations.....	12
3.5 Water supplies	19
3.6 Gas	21
3.7 Electricity.....	21
4. CONCLUSION & RECOMMENDATIONS.....	23
4.1 Conclusion	23
4.2 Recommendations	23
5. REFERENCES	24

TABLE

Table 2-1 - Vegetation.....	6
Table 2-2 – Bushfire attack assessment.....	8
Table 3-1 – Performance criteria for asset protection zones (PBP 2019 guidelines pg. 43).	11
Table 3-2 – Performance criteria for access within Residential Subdivisions (PBP 2019) Guidelines pg. 44).....	14
Table 3-3 – Performance criteria for reticulated water supplies (PBP guidelines pg. 47)	19
Table 3-4 – Performance criteria for gas supplies (PBP Guidelines pg. 47)	21
Table 3-5 – performance criteria for electricity services (pbp guidelines pg. 47).....	21

FIGURES

Figure 1-1 – Bushfire Prone Land Map	1
Figure 1-2 – Penrith City Council DCP – Claremont Meadows Stage 2.....	1
Figure 1-3 – Subdivision Layout Plan.....	2
Figure 1-4 – Aerial appraisal	4
Figure 2-1 Vegetation to South East on pathway (top right) and vegetation to South (top right)	9
Figure 2-2 - Unmanaged grassland North west of site (top row).....	10
Figure 3-1– Road network.....	13
Figure 3-2– Turning head dimensions.....	19

ATTACHMENTS

SCHEDULE 1. Plan of Bushfire Protection Measures.....	25
APPENDIX 1. Management of Asset Protection Zones.....	26
APPENDIX 2. AHIMS Search	28

1. INTRODUCTION

Travers bushfire & ecology has been engaged to undertake a bushfire protection assessment for the proposed residential subdivision development located at Lot 1, DP 1265913, Claremont Meadows. The proposed development is identified as bushfire prone on the *Penrith City Council* bushfire prone land map (refer Figure 1-1). This triggers a formal assessment by Council in respect of the NSW Rural Fire Service (RFS) policy against the provisions of *Planning for Bush Fire Protection (PBP)*.



Figure 1-1 – Bushfire Prone Land Map

(source: Mecone Mosaic, 2022)

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 mitigation measures, including the provision of asset protection zones (APZs), construction standards and other specific fire management issues
- review the potential to carry out hazard management over the landscape.

1.2 Proposed development

The current proposal involves the creation of sixty-three (63) new residential allotments. The development forms part of the E2 Claremont Meadows Stage 2 as part of the Penrith City Council Development Control Plan (see Figure 1-2). The proposed is a green fields development.

Schedule 1 shows the proposed subdivision development and bushfire protection measures, including APZs, incorporating the surrounding land uses.

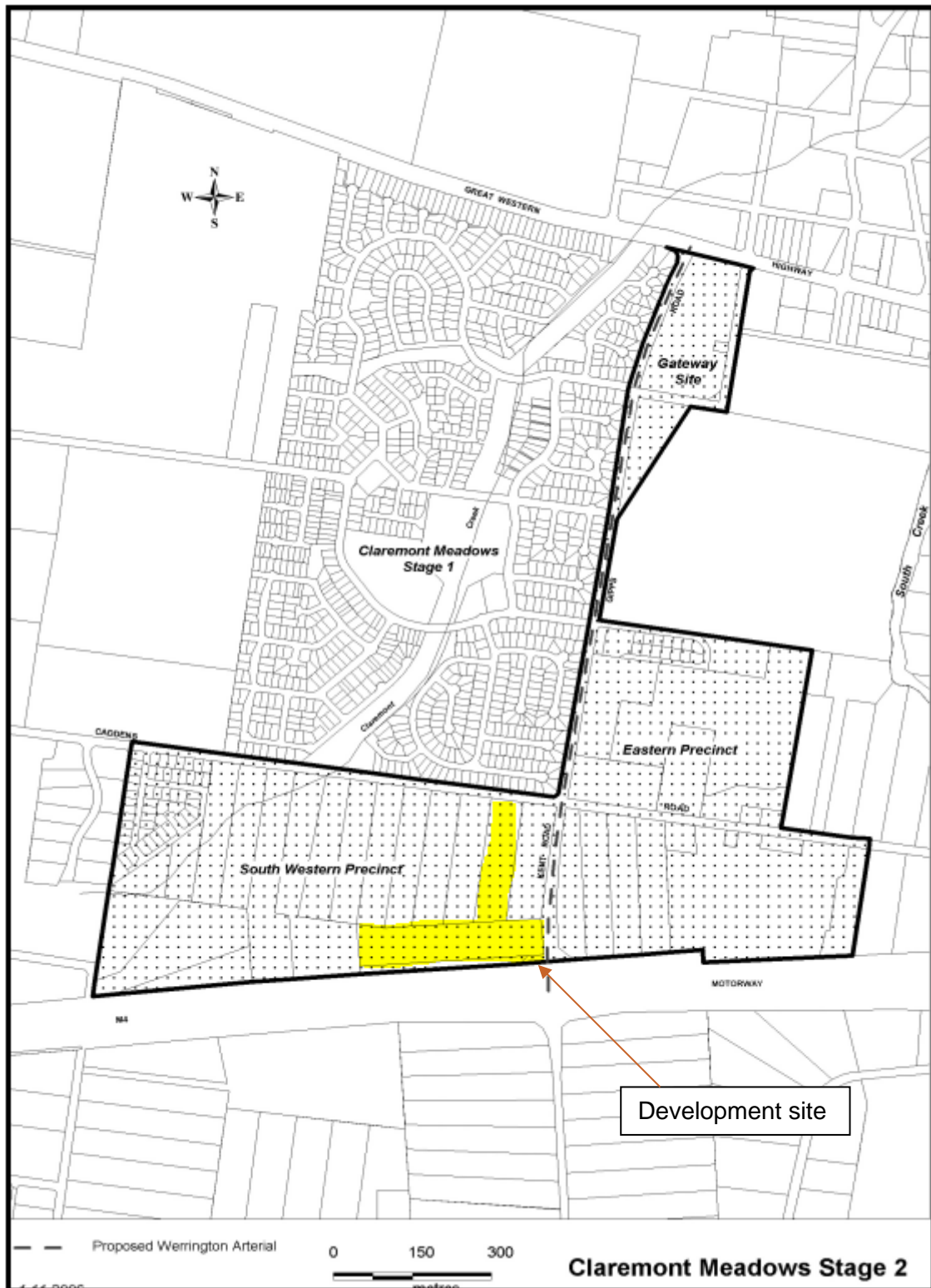


Figure 1-2 – Penrith City Council DCP – Claremont Meadows Stage 2

(Source: Penrith City Council, 2022)

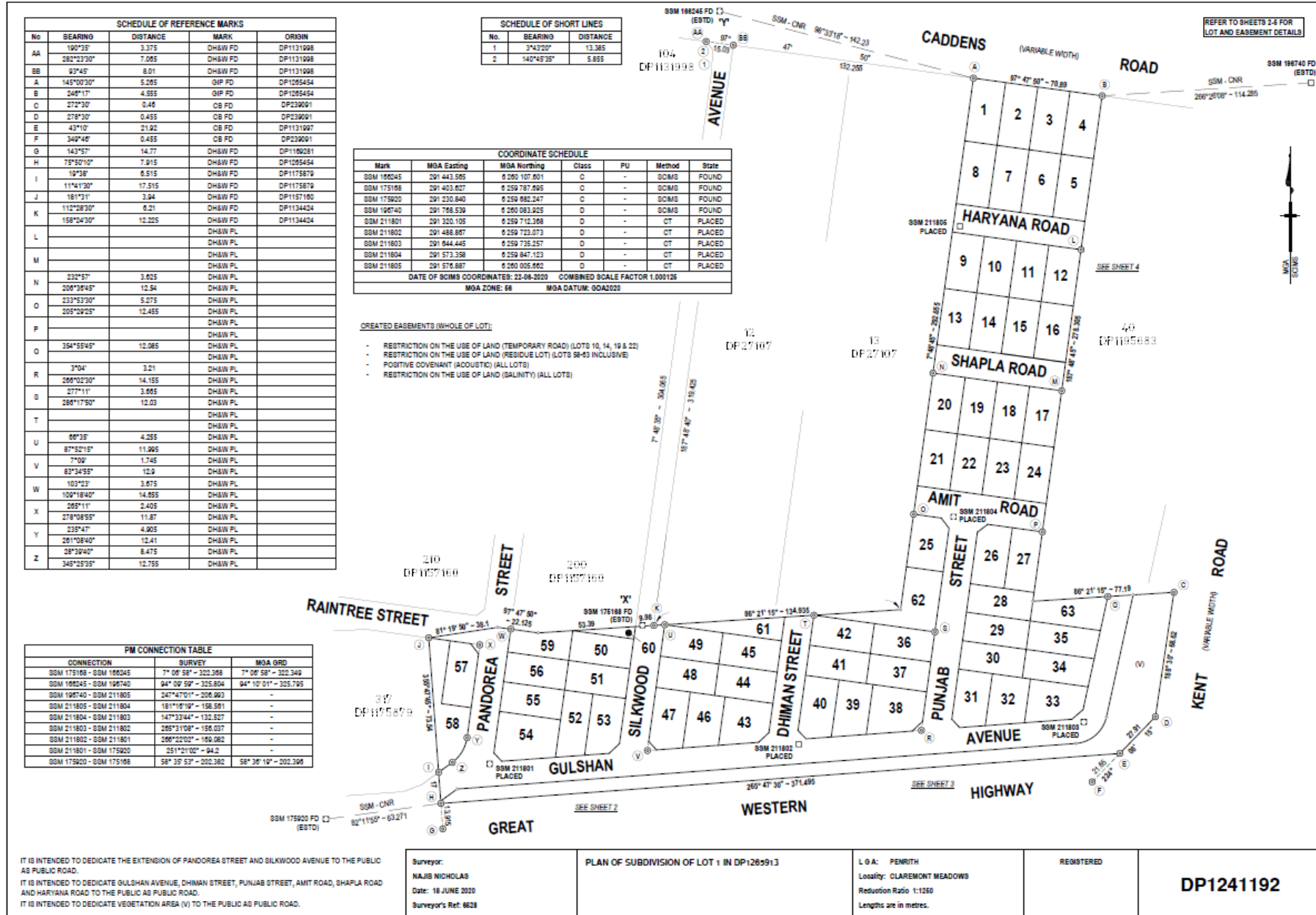


Figure 1-3 – Subdivision Layout Plan

(Source: Survey Nicholas, Najib. Ref. 6528, dated 18/06/2020)

1.3 Information collation

Information sources reviewed for the preparation of this report include the following:

- Survey Nicholas, Najib. Ref. 6528, dated 18/06/2020
- Penrith City Council Development Control Plan – Claremont Meadows, Stage 2.
- *NearMap* aerial photography
- Topographical maps DLPI of NSW 1:25,000
- *Australian Standard 3959 Construction of buildings in bushfire-prone areas (2018)*
- *Planning for Bush Fire Protection 2019 (PBP)*

An inspection of the proposed development site and surrounds was undertaken by Morgan Jeffery on 17th of February 2022 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 development is located within 326-330 Caddens Road, Claremont Meadows, and includes Lot 2 DP 1265913.

The development site is located within the local government area (LGA) of Penrith City Council immediately north of the Western Motorway and to the West of the South Creek riparian area (refer Figure 1-4).

The entire site is zoned R2 Low Density Residential, and forms part of the Claremont Meadows Stage 2 DCP site.



Figure 1-4 – Aerial appraisal

(Source: NearMap, 2022)

1.5 Legislation and planning instruments

Is the site mapped as bushfire prone?	Yes
Proposed development type	Residential Subdivision
Is the development considered integrated for the purposes of Section 100B of the <i>Rural Fires Act 1997</i> ?	Yes – referral to and approval by the NSW RFS is required for the issue of a bushfire safety authority (BSA)
Is the proposal located in an Urban Release Area as defined under Clause 273 of the EP&A Regulations?	Yes

Zoning	R2 – Low Density Residential
Significant environmental features	No
Details of any Aboriginal heritage	No Known – See Appendix 2 – AHIMS Report
Does the proposal rely on an alternative solution?	No

2. BUSHFIRE THREAT ASSESSMENT

To assess the bushfire threat and to determine the required width of an APZ for a development, an assessment of the potential hazardous vegetation and the effective slope within the vegetation is required. 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 in accordance with David Keith (2004) if using the simplified acceptable solutions in *PBP 2019*, or alternatively the vegetation class if adopting the comprehensive vegetation fuel loads (as allowable when undertaking an assessment under Method 2 of AS3959). The hazardous vegetation is calculated for a distance of at least 140m from a proposed building envelope.

The vegetation posing a bushfire threat to the proposed development includes:

Table 2-1 - Vegetation

<i>Vegetation community</i>	<i>Vegetation formation</i>	<i>Vegetation classification</i>	<i>Comprehensive fuel loads (t/ha)</i>	<i>Acceptable solution fuel loads (t/ha) (PBP 2019)</i>
Grey Box – Forest Red Gum grassy woodland (PCT 849)	Grassy Woodland	Coastal Valley Grassy Woodlands	10/18.07	10.5/20.2

The following assessment has adopted *PBP 2019* (column 5) fuel loads identified above for all aspects in order to comply with the acceptable solutions.

2.2 Effective slope

The effective slope has been assessed for up to 100m from the development site. 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 is described in detail within Table 2-2 below.

2.3 Bushfire attack assessment

The following assessment has determined the APZ and BAL levels via the following approaches;

- Table A1.12.2 & A1.12.5 of *PBP 2019*;
- Appendix B Method 2 (alternative solution) of *AS3959 Construction of buildings in bushfire prone areas* (2009); and
- Short fire run methodology as detailed in the NSW RFS document entitled *Short Fire Run Methodology for Assessing Bush Fire Risk for Low Risk Vegetation*.

A fire danger index (FDI) of 100 has been used to calculate bushfire behaviour on the site based on its location within the Greater Sydney region. Table 2-2 provides a summary of the bushfire attack assessment based on residential development and the methodologies identified above.

Table 2-2 – Bushfire attack assessment

Aspect	Vegetation Formation	Effective Slope	Minimum APZ required	APZ provided	BAL Rating
North East	Managed Grassland	Flat/ Upslope	N/A	N/A	N/A
North West	Unmanaged Grassland	1° Downslope	12m	12m	BAL-29 (12m- <17m) BAL-19 (17m-<25m) BAL-12.5 (25m-<50m)
East	Grassy Woodland	Upslope	12m	16.5m	BAL-29 (12m- <18m) BAL-19 (18m-<26m) BAL-12.5 (26m-<100m)
South	Grassy Woodland	4.57° Downslope	16m	20m	BAL-29 (16m- <23m) BAL-19 (23m-<32m) BAL-12.5 (32m-<100m)
West	Low-threat Managed land	1° Downslope	N/A	N/A	N/A

[†] **Note 1:** “Existing areas of managed gardens and lawns within curtilage of buildings” are identified as low threat vegetation not required to be considered for the purposes of *PBP*



***Figure 2-1 Vegetation to South East on pathway (top left) and vegetation to South (top right)
Grassland to North East of site (bottom row)***



Figure 2-2 - Unmanaged grassland North west of site (top row)

Remnant vegetation to North West (bottom row)

3. SPECIFIC PROTECTION ISSUES

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)

<i>Performance criteria</i>	<i>Acceptable solutions</i>	<i>Acceptable solution</i>	<i>Performance solution</i>	<i>Comment</i>
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	<input checked="" type="checkbox"/>	<input type="checkbox"/>	APZ provided in accordance with PBP
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	<input checked="" type="checkbox"/>	<input type="checkbox"/>	The APZ consists of landscaped areas, roads and turfed areas.
The APZ is provided in perpetuity	APZs are wholly within the boundaries of the development site	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Complies
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°	<input checked="" type="checkbox"/>	<input type="checkbox"/>	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	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Can be a condition of consent
	Fencing is constructed in accordance with section 7.6	<input checked="" type="checkbox"/>	<input type="checkbox"/>	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

Building construction standards for the proposed future dwellings located within 100m of bushfire prone land are to be applied in accordance with *AS3959 Construction of buildings in bushfire prone areas (2018)* and Section 7.5 of *Planning for Bush Fire Protection 2019*.

Building construction standards have been depicted within Schedule 1 so future purchasers have an idea regarding which construction level they can build to. The methodology used to determine the BAL levels is outlined in Section 2.3.

The proposed development is located in an urban release area (URA). As a result this DA application seeks to have the Subdivision BAL Plan provided attached (SCHEDULE 1) endorsed by the NSW RFS. Once endorsed this will allow future dwelling construction to occur via a streamlined assessment under the *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation) cl.273. This exempts the lots from reassessment of bush fire issues when land owners are ready to develop their lots.

Future applications for dwelling construction can apply for a Post Subdivision Bush Fire Attack Level (BAL Certificate) (PSBC) using Schedule 1 attached. An applicant can rely on this Post-Subdivision BAL Certificate for Complying Development up to and including BAL-29.

The PSBC can be issued by the RFS or a recognised bushfire consultant. Alternatively an applicant can proceed with an application via complying development.

3.3 Hazard management

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.

The entire development area (Stages 7-9) is to be managed as an IPA throughout the lifetime of the development and until each lot is sold / developed and the hazard is removed.

3.4 Access for firefighting operations

The proposed development will initially gain access via Silkwood Avenue until adjacent lots are developed and new roads are connected.

The development forms part of the approved Claremont Meadows Stage 2 DCP with the adjoining land to the north-west and east subject to future development and future additional road linkages.

As depicted below, the proposed road network provides for a series of perimeter roads and internal road linkages. All roads have a carriageway width of 8m. There are several temporary dead-end roads, all have appropriate turning heads and are less than 70m.

The proposal's compliance with the acceptable solutions outlined in *PBP 2019* is detailed within Table 3-2 below.

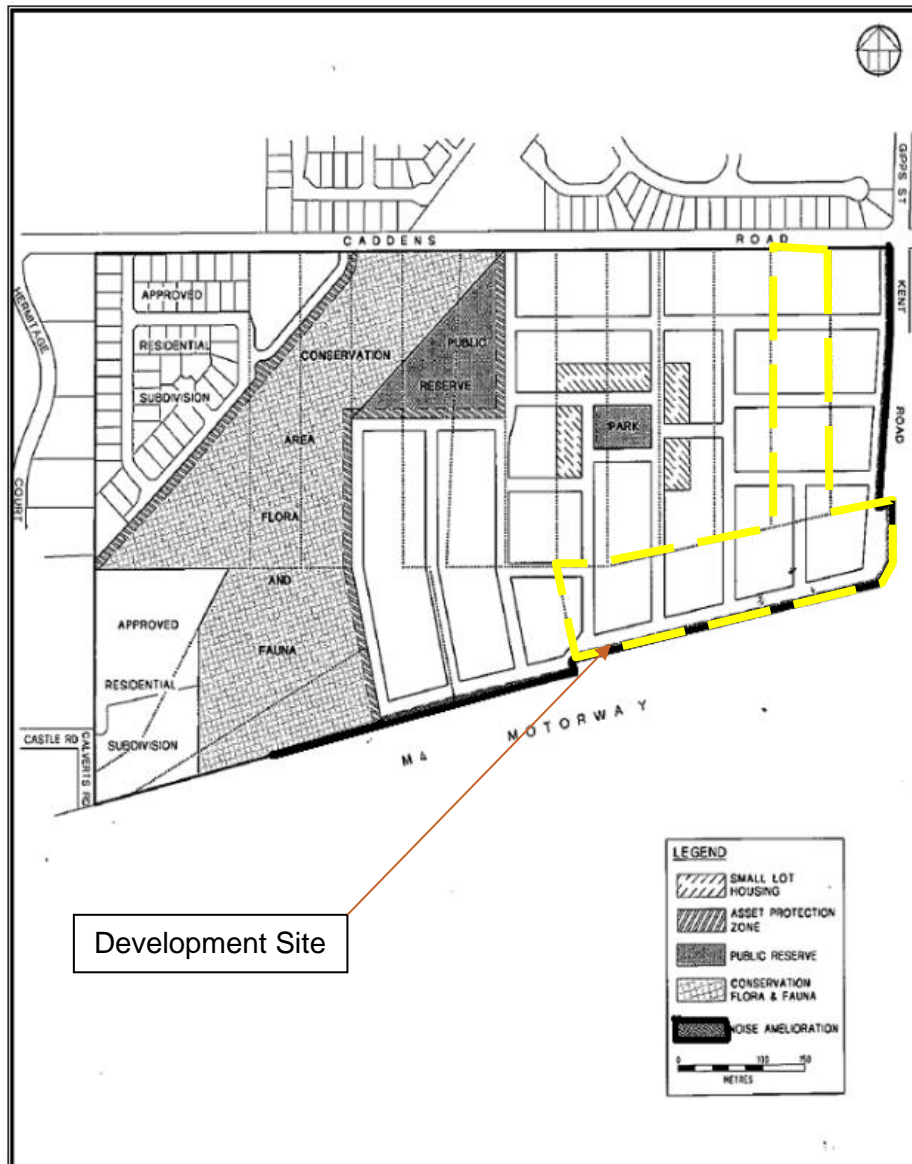


Figure 3-1– Road network

(Source: Penrith City Council, Claremont Meadows DCP, 2014)

Table 3-2 – Performance criteria for access within Residential Subdivisions (PBP 2019) Guidelines pg. 44)

Performance criteria		Acceptable solution	Acceptable solution	Performance solution	Comment
ACCESS (GENERAL REQUIREMENTS)	Firefighting vehicles are provided with safe, all weather access to structures.	Property access roads are two-wheel drive, all-weather roads	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Complies.
		Perimeter roads are provided for residential subdivisions of three or more allotments.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	All proposed roads are internal roads contained within a broader subdivision plan. The surrounding land will be developed in accordance with the DCP and therefore perimeter roads are not required.
		Subdivisions of three or more allotments have more than one access in and out of the development.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Complies.
		Traffic management devices are constructed to not prohibit access by emergency services vehicles.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Can be a condition of consent.
		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.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Complies. All roads will be sealed.
		All roads are through roads	<input checked="" type="checkbox"/>	<input type="checkbox"/>	All roads are planned to be connected to adjoining development

Performance criteria		Acceptable solution	Acceptable solution	Performance solution	Comment
		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.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Turning heads have been constructed on all temporary dead-end roads with turning radius of 22m and comply with Appendix 3 of PBP. Although temporary "No parking" signs are to be erected within the turning head.
		Where kerb and guttering are provided on perimeter roads, roll top kerbing should be used to the hazard side of the road.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Can be a condition of consent.
		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.	N/A	N/A	No access/egress roads transit through forest, woodland or heath vegetation
		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.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	All roads are two (2) way.
	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	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Can be a condition of consent.

Performance criteria		Acceptable solution	Acceptable solution	Performance solution	Comment
		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.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Can be a condition of consent.
		Hydrants are provided in accordance with AS 2419.1:2005.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Can be a condition of consent.
		There is suitable access for a Category 1 fire appliance to within 4m of the static water supply where no reticulated supply is available.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Reticulated water is provided.

Performance criteria		Acceptable solution	Acceptable solution	Performance solution	Comment
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	Are two-way sealed roads.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Complies.
		Minimum 8m carriageway width kerb to kerb.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Complies. All roads are 8m.
		Parking is provided outside of the carriageway width.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Can be a condition of consent.
		Hydrants are located clear of parking areas.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Can be a condition of consent.
		There are through roads, and these are linked to the internal road system at an interval of no greater than 500m.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Complies.
		Curves of roads have a minimum inner radius of 6m.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Can be a condition of consent.

<i>Performance criteria</i>	<i>Acceptable solution</i>	<i>Acceptable solution</i>	<i>Performance solution</i>	<i>Comment</i>
management on the interface.	The maximum grade road is 15° and average grade is 10°.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Can be a condition of consent.
	The road crossfall does not exceed 3°.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Can be a condition of consent.
	A minimum vertical clearance of 4m to any overhanging obstructions, including tree branches, is provided.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Can be a condition of consent

<i>Performance criteria</i>	<i>Acceptable solution</i>	<i>Acceptable solution</i>	<i>Performance solution</i>	<i>Comment</i>
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.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Complies. All roads are 8m.
	Parking is provided outside of the carriageway width.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Can be a condition of consent. There is no allowance for street parking, "No parking" signs are to be erected to ensure roadways are clear.
	Hydrants are located clear of parking areas.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Can be a condition of consent.
	Roads are through roads, and these are linked to the internal road system at an interval of no greater than 500m.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	All current dead-end roads are temporary and will connect through with incoming neighbouring development as indicated in Figure 3-1 above. Turning heads comply with Figure 3-2
	Curves of roads have a minimum inner radius of 6m.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Can be a condition of consent.

Performance criteria		Acceptable solution	Acceptable solution	Performance solution	Comment
		The road crossfall does not exceed 3°.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Can be a condition of consent.
		A minimum vertical clearance of 4m to any overhanging obstructions, including tree branches, is provided.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Can be a condition of consent.

Performance criteria		Acceptable solution	Acceptable solution	Performance solution	Comment
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.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	All allotments are provided with direct frontage to the public road system. No further requirements are necessary.

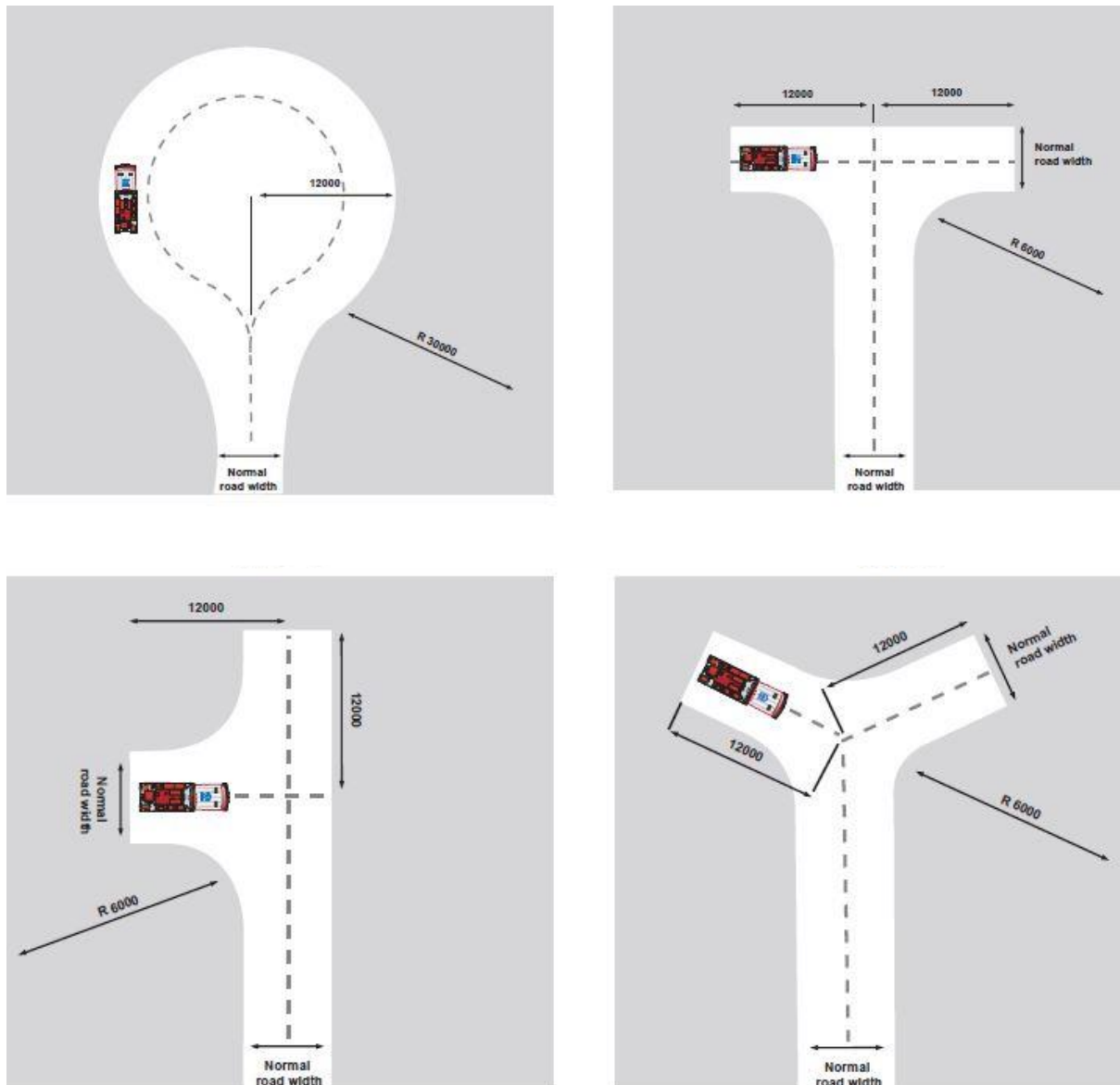


Figure 3-2– Turning head dimensions

3.5 Water supplies

The intent of measures is to provide adequate services of water for the protection of buildings during and after the passage of bushfire. Table 3-3 outlines the proposal's compliance with the acceptable solutions for reticulated water supply.

Table 3-3 – Performance criteria for reticulated water supplies (PBP guidelines pg. 47)

Performance criteria	Acceptable solutions	Acceptable solution	Performance solution	Comment
Adequate water supplies is provided for	Reticulated water is to be provided to the development, where available.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Reticulated water is available to the development.

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

3.6 Gas

The intent of measures is to locate gas so as not to contribute to the risk of fire to a building. Table 3-4 outlines the required acceptable solutions for gas supply.

Table 3-4 – Performance criteria for gas supplies (PBP Guidelines pg. 47)

Performance criteria	Acceptable solutions	Acceptable solution	Performance solution	Comment
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.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Can be made a condition of consent.
	All fixed gas cylinders are to be kept clear of flammable materials to a distance of 10m and shielded on the hazard side.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Can be made a condition of consent.
	Connections to and from gas cylinders are metal.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Can be made a condition of consent.
	Polymer sheathed flexible gas supply lines are not used.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Can be made a condition of consent.
	Above ground gas service pipes are metal, including and up to any outlets.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Can be made a condition of consent.

3.7 Electricity

The intent of measures is to locate electricity so as not to contribute to the risk of fire to a building. Table 3-5 outlines the required acceptable solutions for the subdivision's electricity supply.

Table 3-5 – performance criteria for electricity services (pbp guidelines pg. 47)

Performance criteria	Acceptable Solutions	Acceptable solution	Performance solution	Comment
Location of electricity services limit the possibility of ignition of	Where practicable, electrical transmission lines are underground.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Can be made a condition of consent.

<i>Performance criteria</i>	<i>Acceptable Solutions</i>	<i>Acceptable solution</i>	<i>Performance solution</i>	<i>Comment</i>
surrounding bushland or the fabric of buildings.	<p>Where overhead electrical transmission lines are proposed:</p> <p>lines are installed with short pole spacing (30m), unless crossing gullies, gorges or riparian areas; and</p> <p>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.</p>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Can be made a condition of consent.

4. CONCLUSION & RECOMMENDATIONS

4.1 Conclusion

This bushfire protection assessment has been undertaken for the proposed residential subdivision of 326-330 Caddens Road, Claremont Meadows. The subdivision will involve the creation of sixty-three (63) new residential allotments.

This assessment has found that bushfire can potentially affect the proposed development from the bushland vegetation in the south and grassland to the north west of the development resulting in future buildings being exposed to potential radiant heat and ember attack.

In recognition of the bushfire risk posed to the site by the surrounding bushland, *Travers bushfire & ecology* propose the following combination of bushfire measures;

- APZs in accordance with the minimum setbacks outlined within *PBP 2019* for most aspects
- Provision of access in accordance with the acceptable solutions outlined in *PBP 2019*;
- Water, electricity and gas supply in compliance with the acceptable solutions outlined in *PBP 2019*;
- Future dwelling construction in compliance with the appropriate construction sections of *AS3959-2009*, and *PBP 2019*.

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

4.2 Recommendations

Recommendation 1 - The development is as generally indicated on the attached SCHEDULE 1 - Plan of Bushfire Protection Measures .

Recommendation 2 - APZs are to be provided to the proposed development as outlined in Table 2-2 and as generally depicted within SCHEDULE 1.

Recommendation 3 – APZ to the North West is temporary until adjacent development begins and the grassland threat removed.

Recommendation 4 - Access is to comply with the acceptable solutions outlined in Section 5.3.2 of *Planning for Bush Fire Protection 2019*.

Recommendation 5 - Building construction standards for the proposed future dwellings within 100m of bushfire prone land are to be applied in accordance with *AS3959 Construction of buildings in bushfire prone areas (2018)*, and *Planning for Bush Fire Protection 2019*.

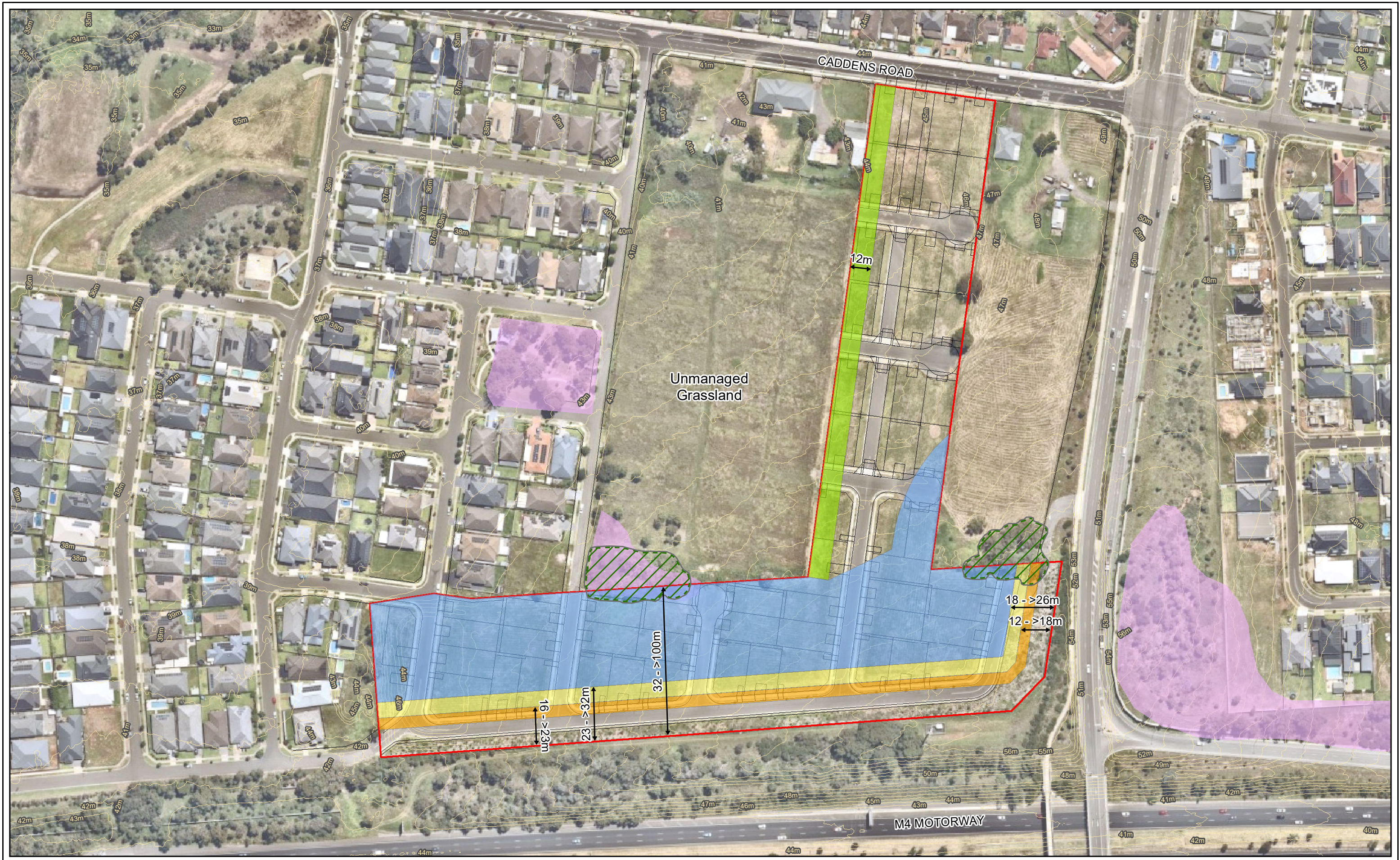
Recommendation 6 - Water, electricity and gas supply is to comply with Section 5.3.3 of *Planning for Bush Fire Protection 2019*.

Recommendation 7 - Fencing is to comply with Section 7.6 of *PBP*. 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.

5. 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 (2009) – *Australian Standard Construction of buildings in bush fire-prone areas.*
- 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.
- Tan, B., Midgley, S., Douglas, G. and Short (2004) - *A methodology for assessing bushfire attack.* RFS Development Control Service.

SCHEDULE 1. PLAN OF BUSHFIRE PROTECTION MEASURES



Legend

Lot boundary (source - LPI)

Contour 1m (source - LiDAR)

Temporary Asset Protection Zone (APZ)

Remnant Vegetation

Bushfire Attack Level (BAL)

BAL 29

BAL 19

BAL 12.5

Vegetation Community

Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion

Aerial source: Neamap

0

50

100 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.

PROJECT & MXD REFERENCE

326 - 330 Caddens Road,
Claremont Meadows
18BATH74_BF001

DATE & ISSUE NUMBER

2/03/2022
Issue 1


SCALE & COORDINATE SYSTEM

1:2,000 @A3
GDA 1994 MGA Zone 56

TITLE

Schedule 1 - Bushfire Provention Measures

Document Path: N:\GIS STORAGE\N Drive\18BATH74_326CaddensRd_ClaremontMeadows\MXD\18BATH74_BF001.mxd



TRAVERS
BUSHFIRE
& ECOLOGY

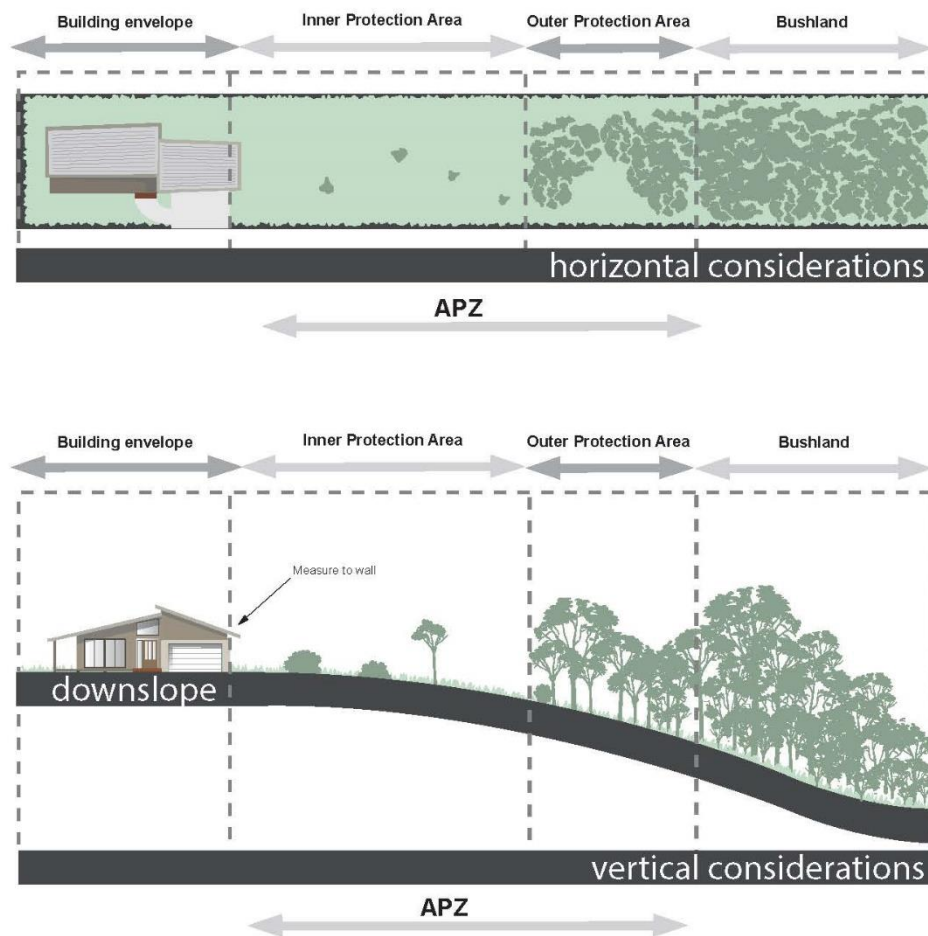
A TRE ENVIRONMENTAL COMPANY

Document Set ID: 9942223
Version: 1, Version Date: 11/03/2022

APPENDIX 1. MANAGEMENT OF ASSET PROTECTION ZONES

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 4 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 table adapted from *PBP 2019* provides maintenance advice for vegetation within the IPA and OPA. The APZ is to be maintained in perpetuity and maintenance should be undertaken regularly, particularly in advance of the bushfire season

	Inner Protection Area	Outer Protection Area
Trees	<ul style="list-style-type: none"> ➤ Tree canopy cover should be less than 15% at maturity; ➤ Trees at maturity should not touch or overhang the building; ➤ Lower limbs should be removed up to a height of 2m above the ground; ➤ Tree canopies should be separated by 2 to 5m; and ➤ Preference should be given to retaining smooth barked and evergreen trees. 	<ul style="list-style-type: none"> ➤ Tree canopy cover should be less than 30%; and ➤ Canopies should be separated by 2 to 5m.
Shrubs	<ul style="list-style-type: none"> ➤ Large discontinuities or gaps in the vegetation should be provided to slow down or break the progress of fire towards buildings; ➤ Shrubs should not be located under trees; ➤ Shrubs should form less than 10% ground cover; and ➤ Clumps of shrubs should be separated from exposed windows and doors by a distance of at least twice the height of the vegetation. 	<ul style="list-style-type: none"> ➤ Shrubs should not form a continuous canopy; and ➤ Shrubs should form less than 20% of ground cover.
Grass and Leaf Litter	<ul style="list-style-type: none"> ➤ Grass should be kept mown to a height of less than 100mm; and ➤ Leaves and other debris should be removed 	<ul style="list-style-type: none"> ➤ Grass should be kept mown to a height of less than 100mm; and ➤ Leaf and other debris should be removed.
	All Management Zones	
Weeds	<ul style="list-style-type: none"> ➤ All weeds should be removed in accordance with best practice guidelines, and measures taken to prevent their further spread 	
Landscaping	<ul style="list-style-type: none"> ➤ 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. 	

APPENDIX 2. AHIMS SEARCH

Morgan Jeffery

Date: 02 March 2022

52 The Avenue

Kariong New South Wales 2099

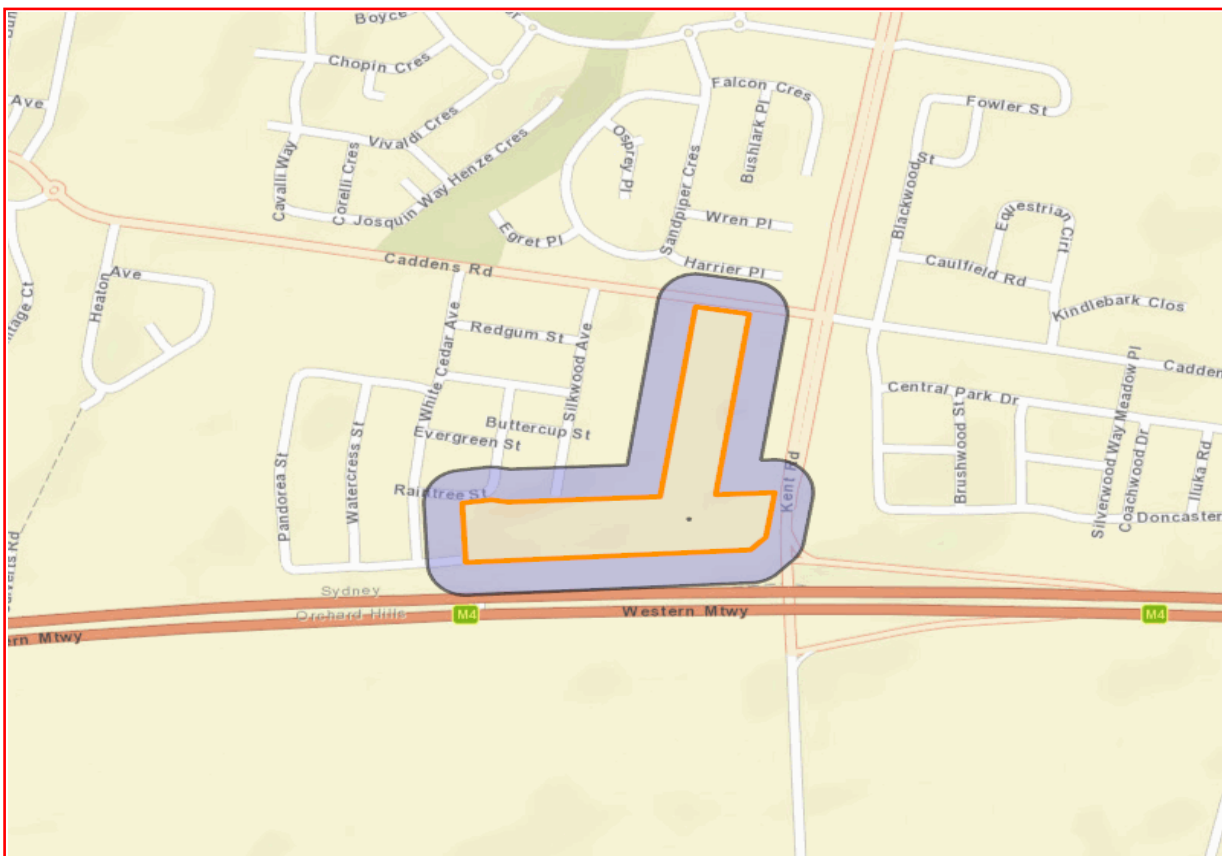
Attention: Morgan Jeffery

Email: mjeffery@traverseecology.com.au

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lot : 1, DP:DP1265913, Section : - with a Buffer of 50 meters, conducted by Morgan Jeffery on 02 March 2022.

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 Heritage NSW AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

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

If your search shows Aboriginal sites or places what should you do?

- You must do an extensive search if AHIMS has shown that there are Aboriginal sites or places recorded in the search area.
- If you are checking AHIMS as a part of your due diligence, refer to the next steps of the Due Diligence Code of practice.
- You can get further information about Aboriginal places by looking at the gazettal notice that declared it. Aboriginal places gazetted after 2001 are available on the [NSW Government Gazette \(https://www.legislation.nsw.gov.au/gazette\)](https://www.legislation.nsw.gov.au/gazette) website. Gazettal notices published prior to 2001 can be obtained from Heritage NSW upon request

Important information about your AHIMS search

- The information derived from the AHIMS search is only to be used for the purpose for which it was requested. It is not to be made available to the public.
- AHIMS records information about Aboriginal sites that have been provided to Heritage NSW and Aboriginal places that have been declared by the Minister;
- Information recorded on AHIMS may vary in its accuracy and may not be up to date. Location details are recorded as grid references and it is important to note that there may be errors or omissions in these recordings,
- Some parts of New South Wales have not been investigated in detail and there may be fewer records of Aboriginal sites in those areas. These areas may contain Aboriginal sites which are not recorded on AHIMS.
- Aboriginal objects are protected under the National Parks and Wildlife Act 1974 even if they are not recorded as a site on AHIMS.
- This search can form part of your due diligence and remains valid for 12 months.

