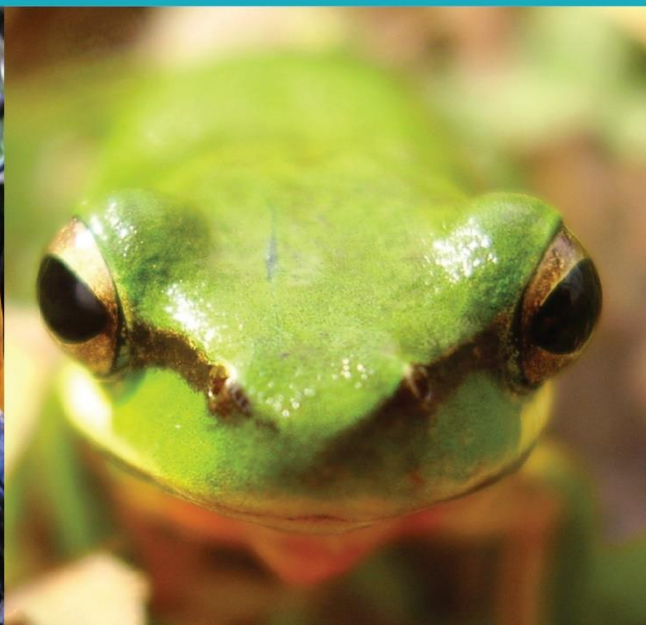




TRAVERS BUSHFIRE & ECOLOGY

A TBE ENVIRONMENTAL COMPANY



BUSHFIRE PROTECTION ASSESSMENT

Proposed Multi-storey Residential Development

Lot 3 DP 1257105

Edmondson Park

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

26 July 2022

(REF: 21UPG03)

BUSHFIRE PROTECTION ASSESSMENT

Proposed Multi-storey Residential Development

Lot 3 DP 1257105

Maxwell Crescent & Buchan Avenue, Edmondson Park

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Date:	26/07/22
File:	21UPG03

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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

Travers bushfire & ecology (TBE) prepared a bushfire report for the proposed subdivision at Gallipoli Drive & Buchan Avenue, Edmondson Park to create eight (8) super lots and two (2) residual allotments on the 5th May 2021.

This bushfire protection assessment has been undertaken for the construction of a multi-storey residential development within Site 5. On the corner of the future Maxwell Crescent and Buchan Avenue.

The proposal is categorised by the NSW Rural Fire Service (NSW RFS) as a multi-storey residential development and as outlined in section 8.2.2, must be assessed in accordance with *Planning for Bush Fire Protection (PBP 2019)*, *Residential and rural residential subdivisions (chapter 5)*. *PBP 2019* dictates that the subsequent extent of bushfire attack that can potentially emanate from a bushfire should not exceed a radiant heat flux of 29kW/m² in order to comply with the deemed to satisfy provisions of the *Building Code of Australia (BCA)* (NSW variation).

This assessment has found that bushfire can potentially affect the proposed development from the bushland vegetation to the east and south 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;

- Defendable space in accordance with the performance requirements of *PBP 2019*
- APZ and bushfire attack level (BAL) setbacks in accordance with the acceptable solutions outlined in *PBP 2019* for the eastern and southern 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*;
- Construction of the residential building in accordance with *Australian Standard AS3959 Construction of buildings in bushfire-prone areas 2018 (AS3959)*, and *PBP 2019 – BAL 29*.

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	6
1.4 Site description.....	6
1.5 Legislation and planning instruments	7
2. BUSHFIRE THREAT ASSESSMENT	8
2.1 Hazardous fuels	8
2.2 Effective Slope	8
2.3 Effective slope.....	8
2.4 Bushfire attack assessment.....	9
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	17
3.7 Gas	18
3.8 Electricity.....	18
4. CONCLUSION & RECOMMENDATIONS.....	20
4.1 Conclusion	20
4.2 Recommendations	20
5. REFERENCES	21

TABLE

Table 2-1 - Vegetation.....	8
Table 2-2 – Bushfire attack assessment.....	9
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).....	12
Table 3-3 – Performance criteria for reticulated water supplies (PBP guidelines pg. 47)	17
Table 3-4 – Performance criteria for gas supplies (PBP Guidelines pg. 47)	18
Table 3-5 – performance criteria for electricity services (pbp guidelines pg. 47).....	18

FIGURES

Figure 1-1 – Bushfire Prone Land Map	1
Figure 1-2 – Site Plan	3
Figure 1-3 – Level 1 Floor Plan	4
Figure 1-4 – Podium Building Plans	5
Figure 1-5 – Aerial appraisal	7
Figure 2-1- Vegetation to the East and south of Site 5.	10
Figure 3-1 – Turning head dimensions.....	16

ATTACHMENTS

SCHEDULE 1. Plan of Bushfire Protection Measures.....	22
APPENDIX 1. Management of Asset Protection Zones.....	23
APPENDIX 2. AHIMS Search	25

1. INTRODUCTION

Travers bushfire & ecology has been engaged to undertake a bushfire protection assessment for the proposed construction of a multi-storey residential development at Maxwell Crescent & Buchan Avenue, Edmondson Park. The proposed development is identified as bushfire prone on the *Liverpool 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: Liverpool City Council, 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 development will involve the construction of one-hundred and nineteen (119) units in Lot A (north) and one-hundred and forty-seven (147) units in Lot B (south). The development will consist of attached row-housing on the ground floor with seven storeys of multi-level units above.

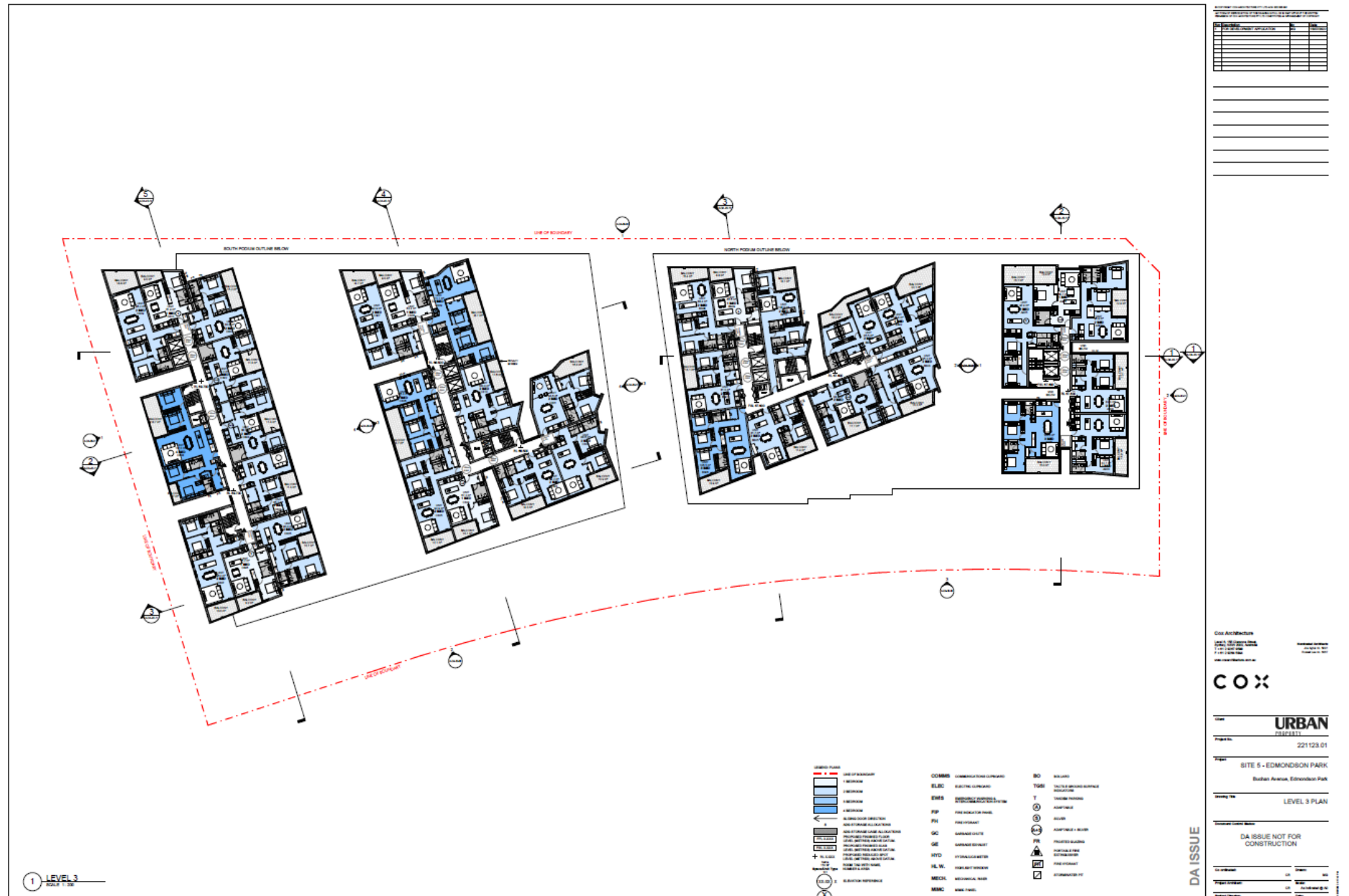


Figure 1-4 – Podium Building Plans
(source: Cox dated 15/07/2022)

1.3 Information collation

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

- Proposed building design plans prepared by Cox dated 18/02/2022;
- *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)*

1.4 Site description

The proposed development forms part of the larger Edmondson Park Release Area within the South West Growth Centre of the Liverpool Local Government Area (LGA). It is located to the north-west of Edmondson Park railway station and situated approximately 40km to the south west of Sydney CBD.

The subject land is located at Lot 3 DP 1257105, known as Maxwell Crescent & Buchan Avenue, Edmondson Park.

The site is bound by Edmondson Park Railway to the south and to the north and west by residential development and a future school. Maxwell's Creek is located within the centre of Lot 2 with conservation areas Maxwell Creek South located to the east and Ingleburn Conservation area located beyond the railway line to the south-west (refer Figure 1-5).



Figure 1-5 – Aerial appraisal
(Source: NearMap, 2022)

1.5 Legislation and planning instruments

Is the site mapped as bushfire prone?	Yes
Proposed development type	Multi-storey Residential Development
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	R1 – General Residential
Significant environmental features	No
Details of any Aboriginal heritage	No Known (refer Appendix 2)
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 Woodlands	Coastal Valley Grassy Woodland	10/18.07	10.5/20.2

As detailed in Table 2-2, an acceptable solution (adopting acceptable fuel load (Column 5 above) has been used for the eastern and southern aspects.

2.2 Effective Slope

The effective slope (post earthworks) 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 is described within Table 2-2.

2.3 Effective slope

The effective slope (post earthworks) 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.

2.4 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*;

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

<i>Aspect</i>	<i>Vegetation Formation</i>	<i>Effective Slope</i>	<i>Minimum APZ required</i>	<i>APZ provided</i>	<i>BAL Rating</i>
North	Low-threat	Flat	N/A	N/A	N/A
East	Grassy Woodlands	Flat	12m	15m*	BAL-29 (12-<18m)
West	Low-threat	Flat	N/A	N/A	N/A
South	Grassy Woodlands	Flat	12m	18m	BAL-29 (12-<18m)

Note*: Eastern boundary to have a 12m Inner Protection Area (IPA) and 3m Outer Protection Area (OPA).



Figure 2-1- Vegetation to the East and south of Site 5.

3. SPECIFIC PROTECTION ISSUES

Inline with Planning for Bush Fire Protection (PBP), Section 8.2.2 - Multi-storey residential development. Multi-storey developments are to comply with Chapter 5 – Residential and Rural Residential Subdivisions, of PBP 2019. The below tables outline the proposals compliance with the performance criteria of PBP.

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"/>	Complies, Eastern boundary to have a 12m Inner Protection Area (IPA) and 3m Outer Protection Area (OPA) to comply with Figure A4.1 of PBP 2019.
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"/>	Complies
The APZ is provided in perpetuity	APZs are wholly within the boundaries of the development site	<input checked="" type="checkbox"/>	<input type="checkbox"/>	APZ are within the Lot, roadway and rail corridor.
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).

Performance criteria	Acceptable solutions	Acceptable solution	Performance solution	Comment
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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 2.4.

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.

3.4 Access for firefighting operations

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

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)	Property access roads are two-wheel drive, all-weather roads	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Complies.
	Firefighting vehicles are provided with safe, all-weather access to structures. Perimeter roads are provided for residential subdivisions of three or more allotments.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	This multi-storey residential development, Lot has not been subdivided. There are public roads on the North and western boundary, also

Performance criteria		Acceptable solution	Acceptable solution	Performance solution	Comment
					<p>an access track outside the southern boundary in the APZ.</p> <p>The eastern boundary has a 4m wide private road solely for fire truck access with a Type D turning head (refer Schedule 1).</p>
		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"/>	Complies
		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 checked="" type="checkbox"/>	<input type="checkbox"/>	Complies

Performance criteria		Acceptable solution	Acceptable solution	Performance solution	Comment
		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.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Complies
		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 to 23 tonnes); bridges / causeways are to clearly indicate load rating.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Can be a condition of consent.
	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.

Performance criteria		Acceptable solution	Acceptable solution	Performance solution	Comment
		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
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.
		Parking is provided outside of the carriageway width.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Complies. Parking is provided outside of the 5.5m carriageway width, within the complex.
		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"/>	Complies
		Curves of roads have a minimum inner radius of 6m.	<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.

Performance criteria		Acceptable solution	Acceptable solution	Performance solution	Comment
PROPERTY	Firefighting vehicles can access the dwelling and exit the	There are no specific access requirements in an urban area where an unobstructed path (no greater than 70m) is provided between the	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Complies.

Performance criteria	Acceptable solution	Acceptable solution	Performance solution	Comment
property safely.	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.			

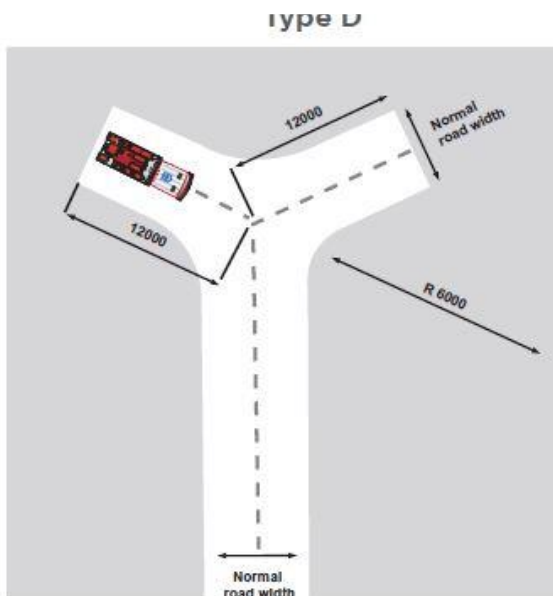
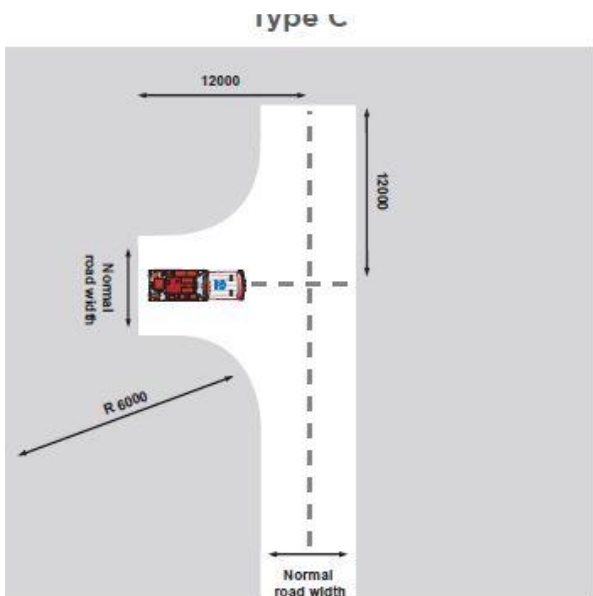
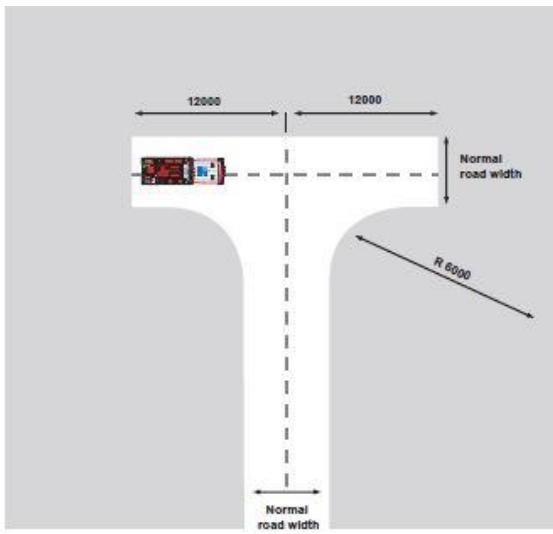
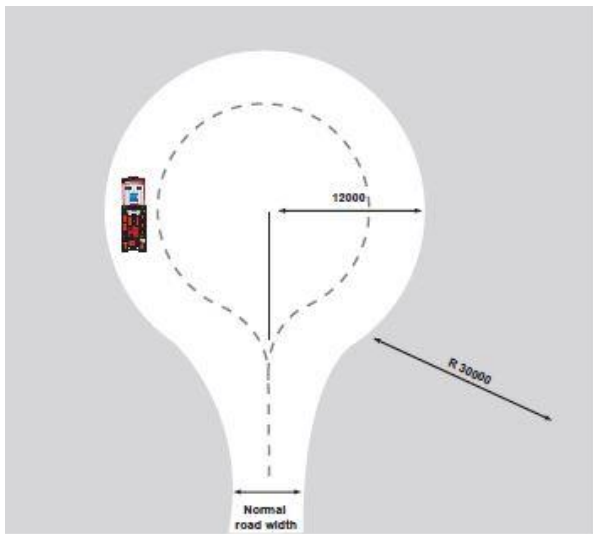


Figure 3-1 – Turning head dimensions

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 firefighting purposes.	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.
	A static water supply is provided for non-reticulated developments or where reticulated water supply cannot be guaranteed	N/A	N/A	
	Static water supplies shall comply with Table 5.3d.	N/A	N/A	
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"/>	

3.7 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.

3.8 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 multi-storey residential development of Maxwell Crescent and Buchan Avenue. The development will involve the construction of one-hundred and nineteen (119) units in Lot A (north) and one-hundred and forty-seven (147) units in Lot B (south).

This assessment has found that bushfire can potentially affect the proposed development from the extensive bushland vegetation to the east and south 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 all aspects;
- Use of an acceptable solution to determine minimum APZ and bushfire attack level (BAL) setbacks for the eastern and southern aspect.
- 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. The eastern aspect is to have an inner and outer protection area.

Recommendation 3 - Access is to comply with the acceptable solutions outlined in Section 5.3.2 of *Planning for Bush Fire Protection 2019*.

Recommendation 4 - 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* for BAL-29.

Recommendation 5 - Water, electricity and gas supply is to comply with Section 5.3.3 of *Planning for Bush Fire Protection 2019*.

Recommendation 6 - 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 (2019) – *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.*
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SCHEDULE 1. PLAN OF BUSHFIRE PROTECTION MEASURES



DISCLAIMER: CAD not georeferenced and has been aligned to LPI boundaries. Verification by a registered surveyor required prior to finalisation

Legend

	Site boundary (source:LPI)		Asset Protection Zone (APZ)
	Contour 1m (source:LiDAR)		Inner Protection Area
			Outer Protection Area

Aerial source: Nearmap



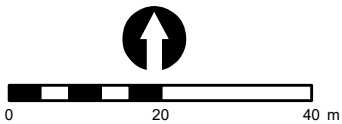
PROJECT & MXD REFERENCE
Gallipoli Ave & Buchan Dr,
Edmonson Park
21UPG03_BF001

DATE & ISSUE NUMBER
30/05/2022
Issue 1

SCALE & COORDINATE SYSTEM
1:1,000
GDA 1994 MGA Zone 56

TITLE
Schedule 1 - Bushfire Protection Measures

Document Path: N:\GIS STORAGE\N Drive\21UPG03_GallipoliBuchanDr_EdmonsonPark\MXD\21UPG03_BF001.mxd

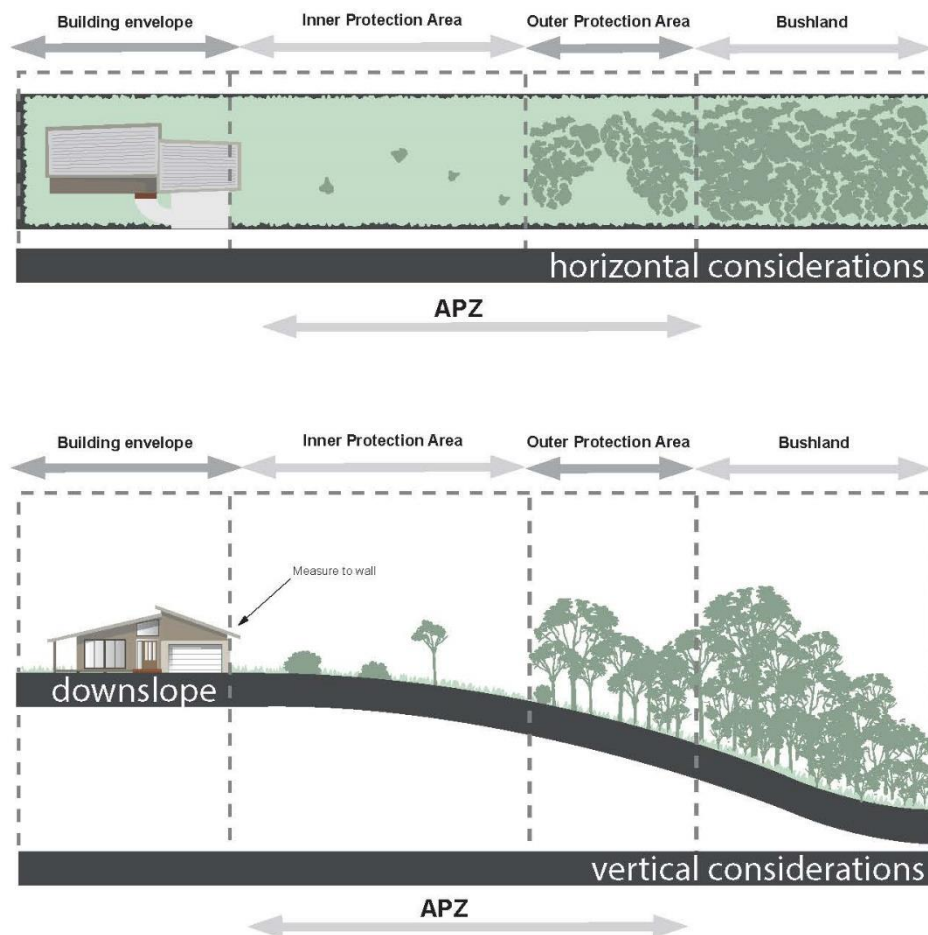


Disclaimer: The mapping is indicative of available space and location of features which may prove critical in assessing the viability of the proposed works. Mapping has been produced on a map base with an inherent level of inaccuracy, the location of all mapped features are to be confirmed by a registered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

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 both IPA & OPA standards. 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: 12 April 2022

52 The Avenue

Kariong New South Wales 2099

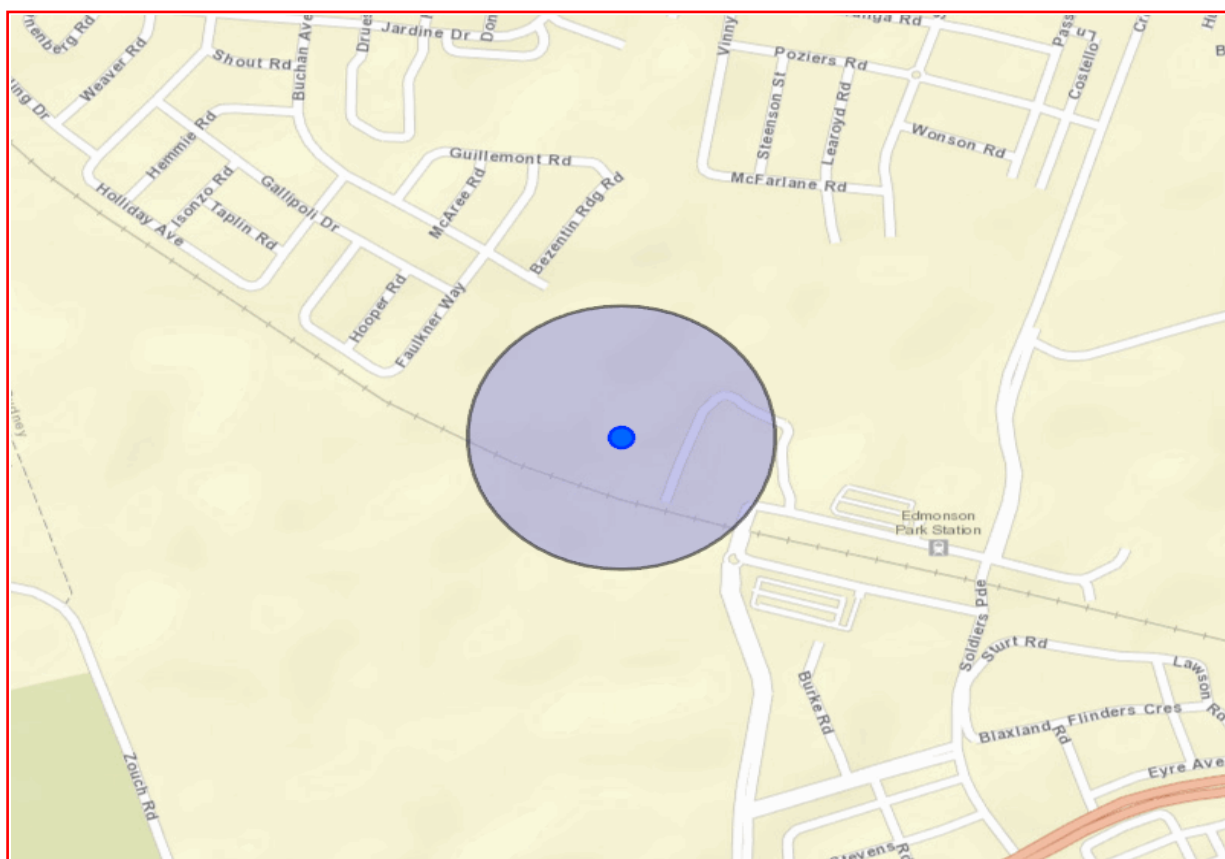
Attention: Morgan Jeffery

Email: mjeffery@traverseecology.com.au

Dear Sir or Madam:

AHIMS Web Service search for the following area at Address : GALLIPOLI DRIVE EDMONDSON PARK 2174 with a Buffer of 200 meters, conducted by Morgan Jeffery on 12 April 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.