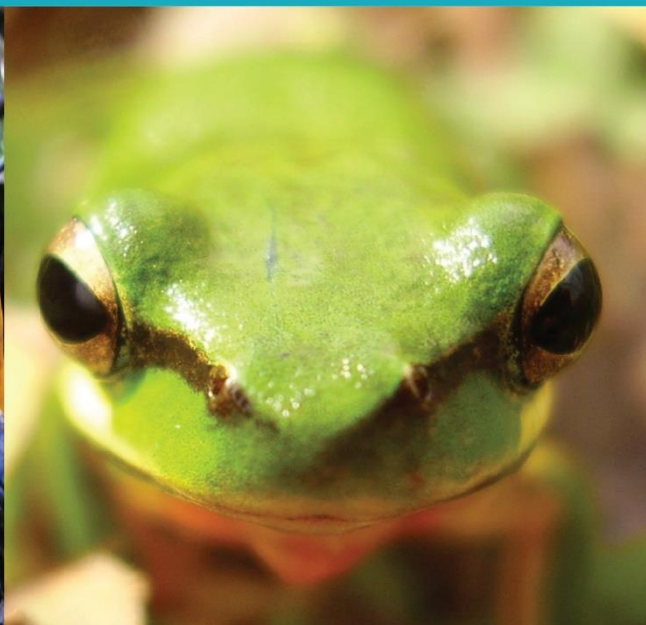




TRAVERS BUSHFIRE & ECOLOGY

A TBE ENVIRONMENTAL COMPANY



BUSHFIRE PROTECTION ASSESSMENT

Planning Proposal

Lot 6 DP 1217784

1411 The Northern Road

Bringelly

16 May 2022

(REF: 18EG25)

BUSHFIRE PROTECTION ASSESSMENT

Planning Proposal

Lot 6 DP 1217784, 1411 The Northern Road, Bringelly

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File:	18EG25

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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

This Bushfire Protection Assessment has been undertaken for the proposed rezoning and associated development of a Service Station and Food Outlet at Lot 6 - DP1217784, 1411 The Northern Road, Bringelly.

The site is currently zoned RU4 Primary Production Small Lots, pursuant to Liverpool Local Environmental Plan 2008, however will be rezoned as Enterprise, in line with adjacent properties as part of the Dwyer Road Precinct (State Environmental Planning Policy, Western Sydney Aerotropolis 2020).

The proposed use of the site is the construction of a Service Station and Fast-food Outlets, which will be permissible under the future Enterprise Zoning.

The proposed land use is categorised by the NSW Rural Fire Service (NSW RFS) Planning Policy Document *Planning for Bush Fire Protection* (PBP) as 'other development', and more specifically 'Buildings of Class 5 to 8 under the National Construction Code' and 'Hazardous Industry'.

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

Our assessment found that bushfire can potentially affect the site from the grassland located to the west, south and east of site resulting in possible ember attack, radiant heat and potentially flame attack.

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

The assessment has concluded that future development following a rezoning of the lot can achieve compliance with the planning principles of *PBP*.

This report assesses and identifies the potential protection measures which may be required. It is not suitable for submission for consent approval for specific land use, which should be assessed independently after the receipt of more detailed design layouts and information.

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>

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1. INTRODUCTION

Travers Bushfire & Ecology has been engaged to undertake a bushfire protection assessment for the proposed rezoning and proposed Service Station and Fast-food Outlet, located at Lot 6 DP1217784, 1411 The Northern Road, Bringelly.

The proposal is located on land identified as bushfire prone on the *Liverpool City Council Bushfire Prone Land Map* (refer Figure 1-1). *Direction 4.4, Planning for Bush Fire Protection 2019 (PBP)* identifies matters for consideration for planning proposals that will affect, or are in proximity to land mapped as bushfire prone.

As such, the proposal is subject to the requirements of Section 9.1(2) of the *Environmental Planning and Assessment Act 1979 (EP&A Act)* which requires Council to consult with the Commissioner of the NSW Rural Fire Service (RFS) and to take into account any requirements of, or comments by, the Commissioner related to section 4.4.1 of PBP.

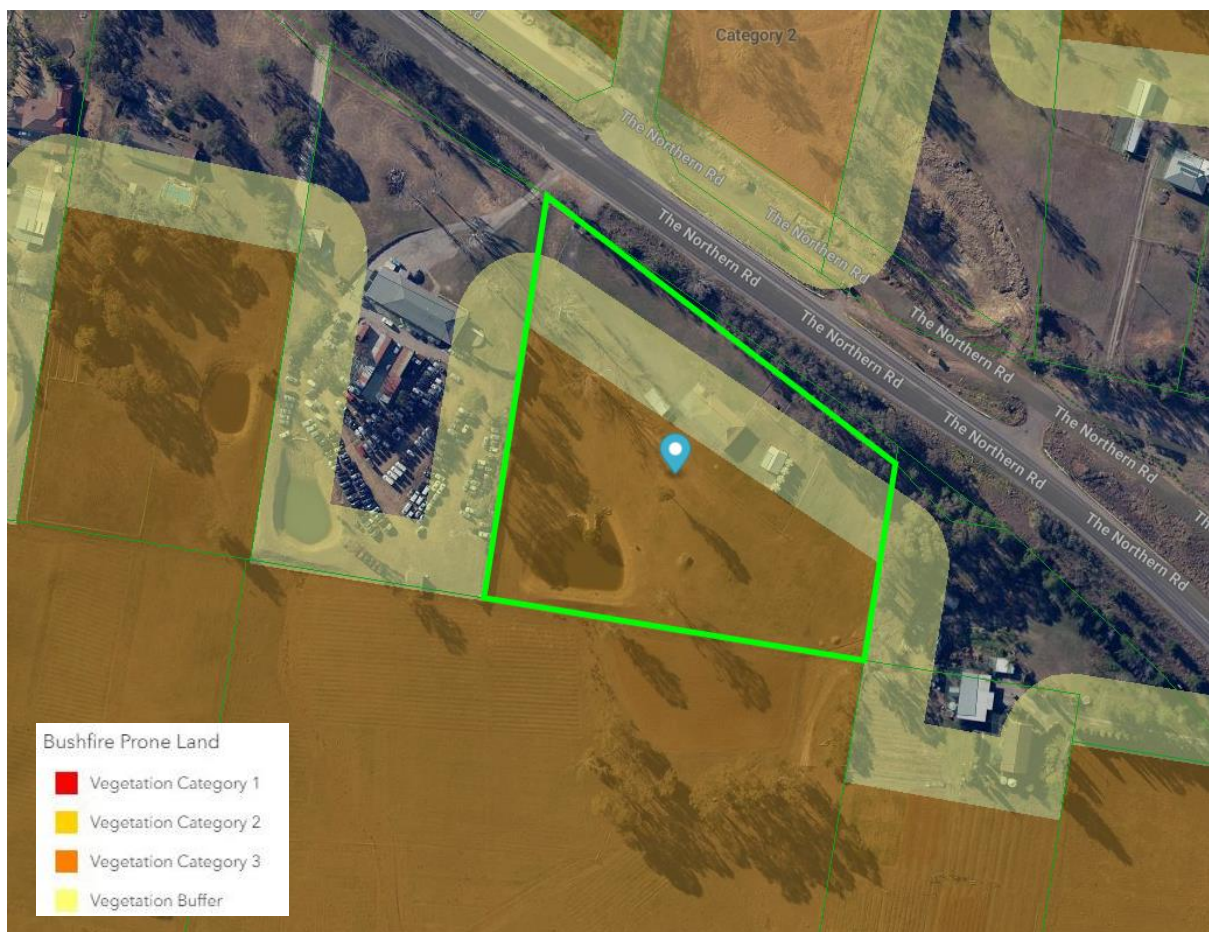


Figure 1-1 – Bushfire Prone Land Map

(Source: Mecone Mosaic, 2021)

1.1 Aims of the assessment

The objectives of this report are to:

- a) to protect life, property and the environment from bush fire hazards, by discouraging the establishment of incompatible land uses in bush fire prone areas, and
- b) to encourage sound management of bush fire prone areas.

The rezoning of the land, from a bushfire context, needs to ensure that future land uses are in a suitable location to minimise the risk and impact of bush fire attack. In addition, services and infrastructure to facilitate effective suppression of a bush fire also need to be provided.

The broad principles which should be applied to strategic level development are as follows:

- a) not all land is suitable for development in the context of bush fire risk
- b) any new development on bush fire prone land must comply with PBP
- c) infrastructure associated with emergency evacuation and firefighting operations must be provided
- d) Appropriate ongoing land management practices must be facilitated.

Strategic planning should provide for the exclusion of inappropriate development in bush fire prone areas as follows:

- a) when the bush fire risk makes it inappropriate for new development to occur
- b) for development that is likely to be difficult to evacuate during a bush fire
- c) for development that will adversely affect other bush fire protection strategies or place existing development at increased risk
- d) for development that is within an area of high bush fire risk where density of existing development may cause evacuation issues for both existing and new occupants.
- e) where environmental constraints to the site cannot be overcome.

1.2 Proposed Development

The site has an area of approximately 11.44 Ha and is currently zoned under the Liverpool Development Environmental Plan (LEP) 2008 as RU4 Primary Production Small Lot. The proposed future use of the site is a Service Station and Fast-Food Outlets; a preliminary concept design layout has been provided and is shown below in Figure 1-2.

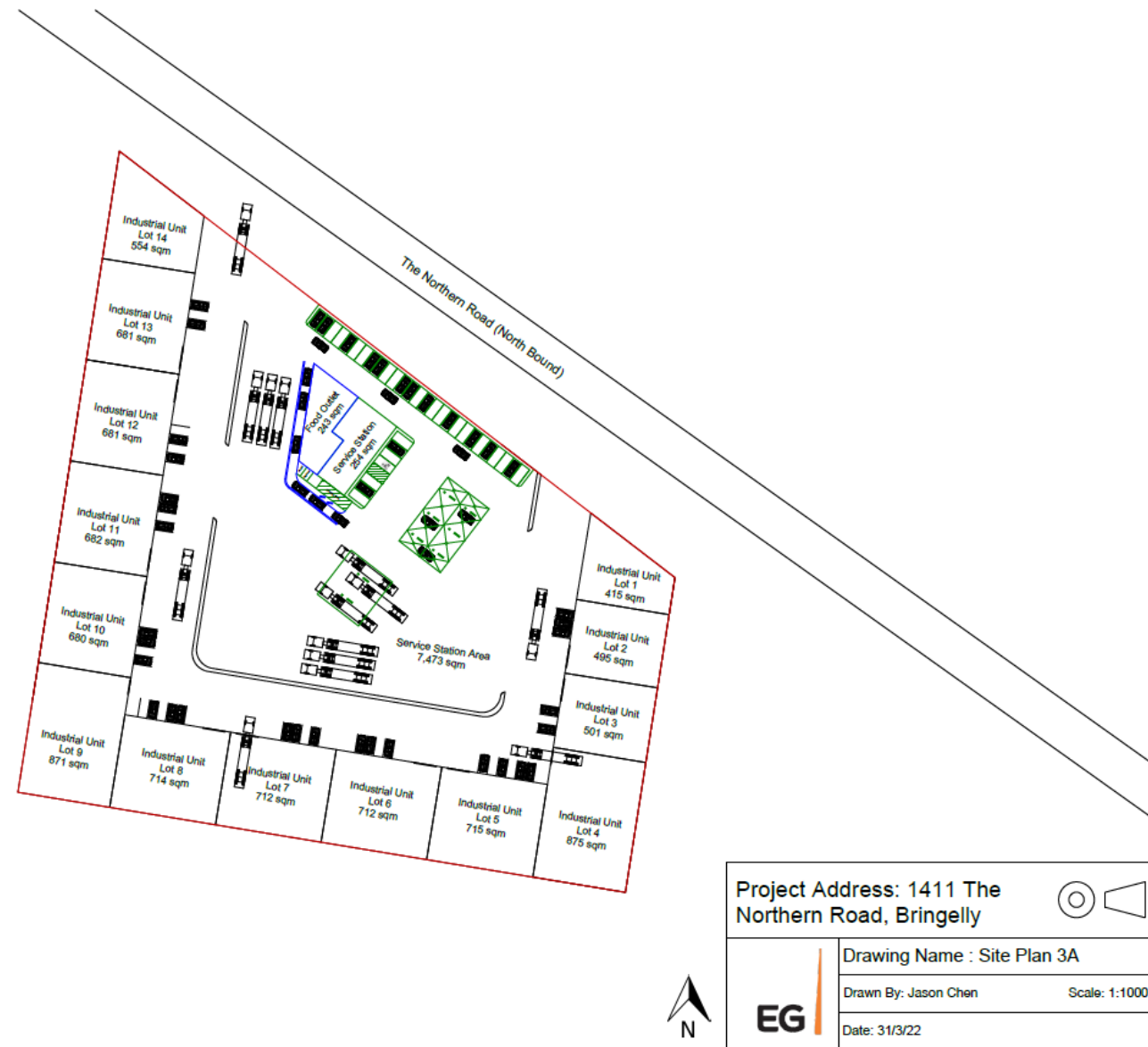


Figure 1-2 – Indicative Site Layout

(Source: EG Property Advisory, 31/3/2022)



Figure 1-3 – Aerial appraisal

(Source: Nearmaps 2021)

1.3 Information collation

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

- Liverpool Local Environmental Control Plan 2008
- Liverpool Development Control Plan 2008
- Liverpool City Council DCP Amendment Dec 2019
- *Nearmap* aerial photography
- Topographical maps *DLPI of NSW* 1:25,000
- *Australian Standard 3959 – 2018 Construction of buildings in bushfire-prone areas*
- The NSW Rural Fire Service document; *Planning for Bush Fire Protection 2019 (PBP)*
- *Community Resilience Practice Notes 2/12 Planning Instruments and Policies.*

An inspection of the proposed development site and surrounds was undertaken by Morgan Jeffery on 18 January 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 subject site is located at 1411 The Northern Road, Bringelly (Lot 6 DP 1217784), in the Liverpool City Council Local Government Area (LGA). The site is located approximately 3.5 kilometres from the new Western Sydney Airport and immediately west of the intersection of The Northern Road and Bringelly Road (refer Figure 1-2).

It is understood that the site was previously used for agricultural purposes and the majority of the site is cleared and has a mixed native/non-native grassland vegetation cover. The site has a low grade and slopes from north west to south east with land surrounding generally flat. The site has a dam in the southwest corner.

Site access and egress is in the north east of the Lot off The Northern Road.

The site is currently surrounded predominately by rural and rural residential land uses. Vegetation exists surrounding the site, varying between grassland, small patches of remnant vegetation and non-native and/or weed vegetation.

1.5 Legislation and planning instruments

1.5.1 *Environmental Planning and Assessment Act (1979)* and bush fire prone land

The *EP&A Act 1979*, governs environmental and land use planning and assessment within New South Wales. It provides for the establishment of environmental planning instruments, development controls and the operation of construction controls through the Building Code of Australia (BCA). The identification of bushfire prone land is required under Section 10.3 of the *EP&A Act*.

Planning for Bushfire Protection (PBP) stipulates that if a proposed amendment to land use zoning or land use affects a designated bushfire prone area then the Section 9.1(2) Direction No 4.14 of the *EP&A Act* must be applied. This requires Council to consult with the Commissioner of the RFS and to take into account any comments by the Commissioner and to have regard to the planning principles of *PBP*.

1.5.3 *Planning for Bush Fire Protection 2019 (PBP)*

Bushfire protection planning requires the consideration of the RFS planning document entitled *PBP*. *PBP* provides planning principles for rezoning to residential land as well as guidance on effective bushfire protection measures.

For strategic development proposals in bush fire prone areas *PBP* requires, as a minimum, assessment of the components in Table 1-1 below. These issues are addressed in Section 3 of this report, where appropriate and are within the constraints of final land-use.

Table 1-1 Requirements for a Bush Fire Strategic Study

Issue	Detail	Assessment Considerations	Comment
Bush fire landscape assessment	A bushfire landscape assessment considers the likelihood of a bush fire, its potential severity and intensity and the potential impact on life and property in the context of the broader surrounding landscape.	<p>The bush fire hazard in the surrounding area, including:</p> <ul style="list-style-type: none"> • Vegetation • Topography • Weather <p>The potential fire behaviour that might be generated based on the above;</p> <p>Any history of bush fire in the area; and</p> <p>The difficulty in accessing and suppressing a fire, the continuity of bush fire hazards or the fragmentation of landscape fuels and the complexity of the associated terrain.</p>	Considered in this assessment
Land use assessment	The land use assessment will identify the most appropriate locations within the masterplan area or site layout for the proposed land uses.	<p>The risk profile of different areas of the development layout based on the above landscape study;</p> <p>The proposed land use zones and permitted uses;</p> <p>The most appropriate siting of different land uses based on risk profiles within the site (i.e. not locating development on ridge tops, SFPP development to be located in lower risk areas of the site); and</p> <p>The impact of the siting of these uses on APZ provision.</p>	Considered in this assessment, however, final assessment will be dependent on land use and location of assets.
Access and egress	A study of the existing and proposed road networks both within and external to the masterplan area or site layout.	<p>The capacity for the proposed road network to deal with evacuating residents and responding emergency services, based on the existing and proposed community profile;</p> <p>The location of key access routes and direction of travel; and</p> <p>The potential for development to be isolated in the event of a bush fire.</p>	Considered in this assessment, however, final assessment will be dependent on land use and location of assets

Issue	Detail	Assessment Considerations	Comment
Emergency services	An assessment of the future impact of new development on emergency services.	Consideration of the increase in demand for emergency services responding to a bush fire emergency including the need for new stations/ brigades; and Impact on the ability of emergency services to carry out fire suppression in a bush fire emergency.	Considered in this assessment, however, final assessment will be dependent on land use and location of assets
Infrastructure	An assessment of the issues associated with infrastructure and utilities.	The ability of the reticulated water system to deal with a major bush fire event in terms of pressures, flows, and spacing of hydrants; and Life safety issues associated with fire and proximity to high voltage power lines, natural gas supply lines etc.	Considered in this assessment, however, final assessment will be dependent on land use and location of assets
Adjoining land	The impact of new development on adjoining landowners and their ability to undertake bush fire management.	Consideration of the implications of a change in land use on adjoining land including increased pressure on BPMs through the implementation of Bush Fire Management Plans.	Considered in this assessment, however, final assessment will be dependent on land use and location of assets

1.6 Environmental and cultural constraints

1.6.1 Environmental constraints

Future development will require clearing all vegetation from the subject site; however, the impact is considered low as only a small amount of remnant native bushland exists on the site.

The dam in the south west corner of the site will be required to be drained. Dams in this area may be habitat for Common Long Neck Turtles, identified as present in the area..

Endangered ecological communities have not been identified on the site.

Future development, is not foreseen to have any significant ecological impacts as the majority of the site is managed grassland.

1.6.2 Cultural constraints

A basic search was conducted on the Aboriginal Heritage Information System (AHIMS). The results show that there are no identified Aboriginal sites of significance within 50 m of the site or within.

A copy of the AHIMS search is attached in Appendix 2.

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 Fire History

A search of the SEED webmap (NPWS Fire history) shows no recorded fire history for the site.

No fires have been recorded within the surrounding District as can be seen in Figure 2-1 below.

The fire history does not suggest nor should it be implied that a major fire will or could not impact the site or impact the surrounding area and pose an elevated threat to development. It is considered reasonable to assume however that the risk of a major bushfire is relatively low due to the vegetation type and the increase in development and consequent vegetation clearing in the area.

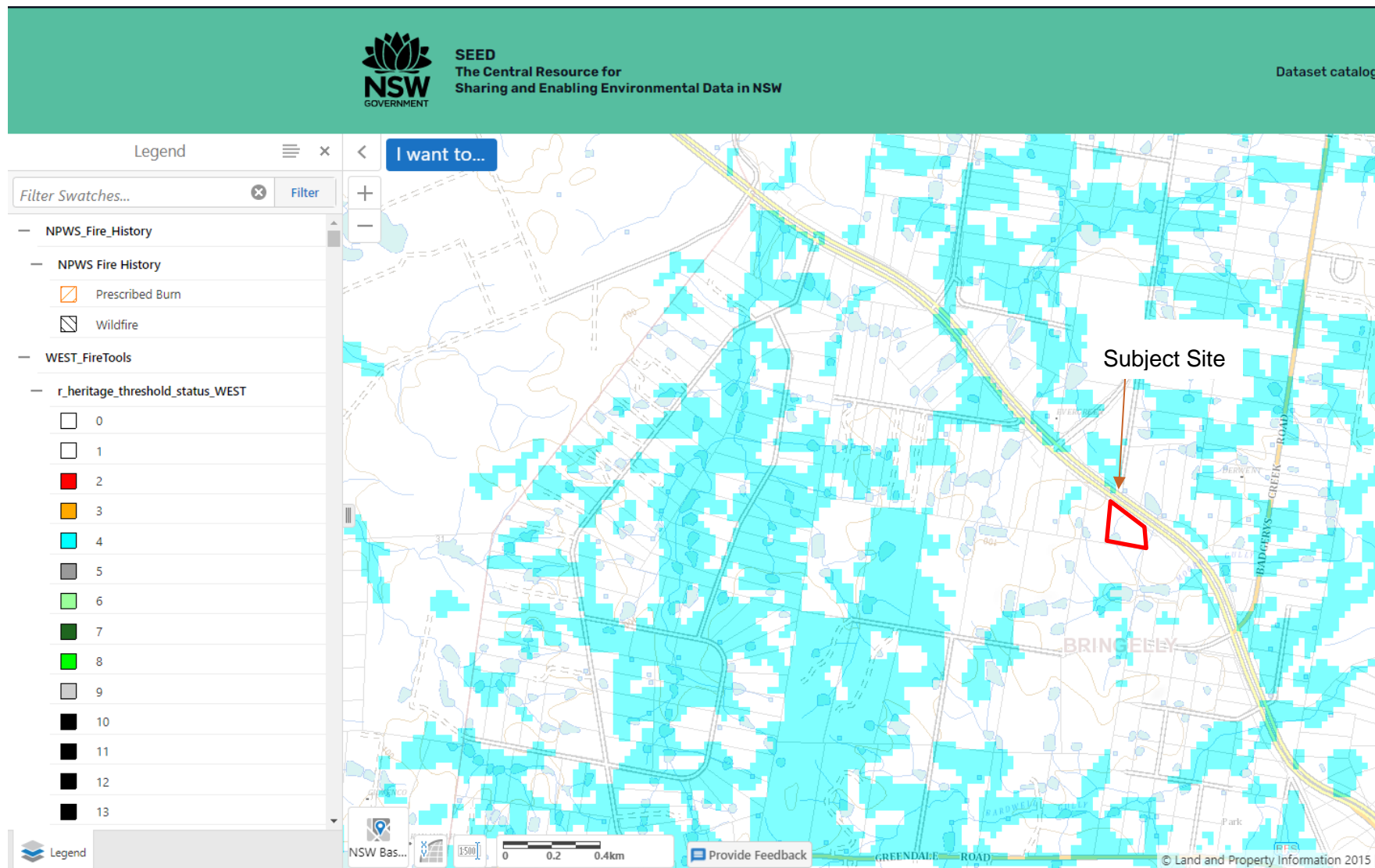


Figure 2-1- Fire history for district surrounding site
 (Source: NPWS Fire History - Seed Webmap, 2022)

2.2 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 main vegetation threat is category 3 and is considered to be medium bush fire risk and is consistent with Grasslands, freshwater wetlands, semi-arid woodlands, alpine complex and arid shrublands.

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

Table 2-1 - Vegetation

Aspect	Vegetation formation	Vegetation classification	Comprehensive fuel loads (t/ha)	Comment
North	Grassland	Grassland	4.5	Grassland onsite with The Northern Road creating APZ along North-North eastern boundary.
East	Grassland/ rainforest (remnant)	Grassland	4.5	Mapped Unmanaged grassland onsite with small remnant forest vegetation adjoining off site. Main threat posed to north eastern corner of site
South	Grassland	Grassland	4.5	Unmanaged Grassland onsite and offsite on adjacent property.
West	Grassland	Grassland	4.5	Unmanaged Grassland onsite and offsite on adjacent property.

The following assessment has adopted the comprehensive fuel loads (column four) identified above.

2.3 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 provided in detail within table 2-2 below, however can be summarised as follows;

- 1-4 degrees upslope to the west,
- 0-1 degrees downslope to the south-east & east

2.4 Bushfire attack assessment

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

- Appendix B Method 2 (alternative solution) of *AS3959 2018 Construction of buildings in bushfire prone areas*

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 Basin. Grassland areas of the site should be calculated at a Grass Fire Danger Index (GFDI) of 130 for the Greater Sydney Basin. Table 2-2 provides a summary of the bushfire attack assessment based on the methodologies identified above.

Table 2-2 - Bushfire Attack Assessment Summary

Aspect	Predominant* Vegetation Class	Effective Slope	Minimum APZ Required SFPP	Minimum APZ Required Non SFPP (BAL 29)
North	Grassland/ Low Threat (Highway Boundary)	Flat	N/A (Not main threat to site)	N/A (Not main threat to site)
East	Grassland/ Remnant	Flat	36m	10m
South	Grassland	2.86° Downslope	40m	12m
West	Grassland	2.86° Upslope	40m	12m

***Note 1:** In cases where there are a mix of vegetation types, it is the higher hazard that is said to predominate (as per *PBP 2019*)

Note 2: Considering the indicative site plan figure 1-2, the above Minimum APZ requirements are unable to be made on the subject site. In order to comply with PBP requirements a temporary 88B easement agreement will be required to be entered into with neighbouring landholders to ensure temporary managed APZ's adjacent to site until grassland bushfire threat is removed.



Figure 2-2 – South of property (top left), South east (top right), East (bottom left), Northern Boundary (bottom right)

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 (10kW/m ² for SFPP) on each proposed lot	APZs are provided in accordance with Tables A1.12.2 and A1.12.4 based on the FFDI	<input type="checkbox"/>	<input checked="" type="checkbox"/>	APZs can be achieved within the site area. Although considering the indicative Site Plan 3A
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"/>	Can be made a condition of consent.
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 potential APZ 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 made a condition of consent

3.2 Building protection

Building construction standards for proposed future buildings located within 100m of bushfire prone land are to be applied in accordance with *AS3959 C construction of buildings in bushfire prone areas (2018)* or *NASH Standard - Steel Framed Construction in Bushfire Areas* and Section 7.5 of *Planning for Bush Fire Protection 2019* and will be determined by the final layout and designated use.

3.3 Hazard management

APZs are required to be managed as an inner protection area (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 of this report provides additional maintenance advice for vegetation within the APZ.

3.4 Access for firefighting operations

Future layout design should be compliant with the guidelines and acceptable solutions of *PBP*.

Dependent on use, a secondary emergency access/egress point may be required. The main access/ egress will be from The Northern Road.

Typical acceptable solutions are shown in Table 3-2 below.

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

Performance criteria	Solution	Compliance		Comments
		Acceptable solution	Performance criteria	
Firefighting vehicles are provided with safe, all-weather access to structures and hazard vegetation.	Property access roads are two-wheel drive, all weather roads.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Can be made a condition of consent
The capacity of access roads is adequate for firefighting vehicles.	The capacity of road surfaces and any bridges/ causeways is sufficient to carry fully loaded firefighting vehicles (up to 23 tonnes), bridges and causeways are to clearly indicate load rating.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Can be made a condition of consent

Performance criteria	Solution	Compliance		Comments
		Acceptable solution	Performance criteria	
There is appropriate access to water supply.	Hydrants are provided in accordance with the relevant clauses (if any) of AS 2419.1:2005	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Can be made a condition of consent
Firefighting vehicles can access the building/s and exit the property safely.	The internal road network provides numerous alternative access routes for all buildings.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Depending on the proposed size of development this will be a requirement. Can be made a condition of consent
	Access roads have a minimum 4m carriageway width;	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Can be made a condition of consent
	Access roads have passing bays every 200m that are 20m long by 2m wide, making a minimum trafficable width of 6m at the passing bay;	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Can be made a condition of consent
	A minimum vertical clearance of 4m is maintained to any overhanging obstructions, including tree branches;	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Can be made a condition of consent
	Internal roads are through-roads, and large hard-stand areas provide suitable turning areas exceeding the requirements of Appendix 3 of PBP;	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Can be made a condition of consent
	Curves have a minimum inner radius of 6m and are minimal in number to allow for rapid access and egress;	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Can be made a condition of consent

Performance criteria	Solution	Compliance		Comments
		Acceptable solution	Performance criteria	
	The minimum distance between inner and outer curves is 6m;	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Can be made a condition of consent
	The crossfall is not more than 10 degrees;	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Can be made a condition of consent
	Maximum grades for sealed roads do not exceed 15 degrees and not more than 10 degrees for unsealed roads; and	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Can be made a condition of consent

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. 67)

Performance criteria	Solution	Compliance		Comment
		Acceptable solution	Performance criteria	
Adequate water supply is provided for firefighting purposes.	Reticulated water is to be provided to the development, where available.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Can be made a condition of consent
Water supplies are located at regular intervals, and The water supply is accessible and reliable for firefighting operations.	Fire hydrant spacing, design and sizing comply with the relevant clauses of AS 2419.1:2005; Hydrants are not located within any road carriageway;	<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

Performance criteria	Solution	Compliance		Comment
		Acceptable solution	Performance criteria	
The integrity of the water supply is maintained.	All above-ground water service pipes are metal, including and up to any taps. Above ground water storage tank shall be of concrete or metal	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Can be made a condition of consent
A static water supply is provided for firefighting purposes in areas where reticulated water is not available.	N/A – reticulated water is provided	N/A	N/A	

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. 68)

Performance criteria	Solution	Compliance		Comment
		Acceptable solution	Performance criteria	
Location and design of gas services will not lead to ignition of surrounding bushland or the fabric of buildings.	Reticulated or bottled gas bottles are to be installed and maintained in accordance with <i>AS/NZS 1596 (2014)</i> , 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

Performance criteria	Solution	Compliance		Comment
		Acceptable solution	Performance criteria	
	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. 68)

Performance criteria	Solution	Compliance		
		Acceptable solution	Performance criteria	
Location of electricity services limits the possibility of ignition of surrounding bushland or the fabric of buildings.	Where practicable, electrical transmission lines are underground.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
	Where overhead electrical transmission lines are proposed: <ul style="list-style-type: none"> lines are installed with short pole spacing (30m), unless crossing gullies, gorges or riparian areas; and no part of a tree is closer to a power line than the distance set out in ISSC3 Guideline for Managing Vegetation Near Power Lines. 	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

3.8 Emergency Management and Evacuation

Depending on planned use, an emergency management and evacuation plan may be required. Where this is required, the plan should be consistent with the NSW RFS publication; *A Guide to developing a Bush fire emergency and evacuation Plan* and the Australian Standard AS3745:2010 *planning for emergencies in facilities*.

4. CONCLUSION & RECOMMENDATIONS

4.1 Conclusion

Our assessment found that bushfire can potentially affect the site from grassland vegetation from the east, west and south. The overall fire risk from this vegetation, after considering fire history, climate and available mitigation options is comparatively low.

The site can accommodate asset protection zones within its boundaries with a minimum of environmental disturbance, while still providing viable options for a number of designs and development types.

Assessment of the indicative site plan provided in figure 1-2 shows that, the minimum APZ requirements are unable to be achieved within the subject site. In order to comply with PBP requirements a temporary 88B easement agreement will be required to be entered into with neighbouring landholders to ensure temporary managed APZ's adjacent to site until grassland bushfire threat is removed.

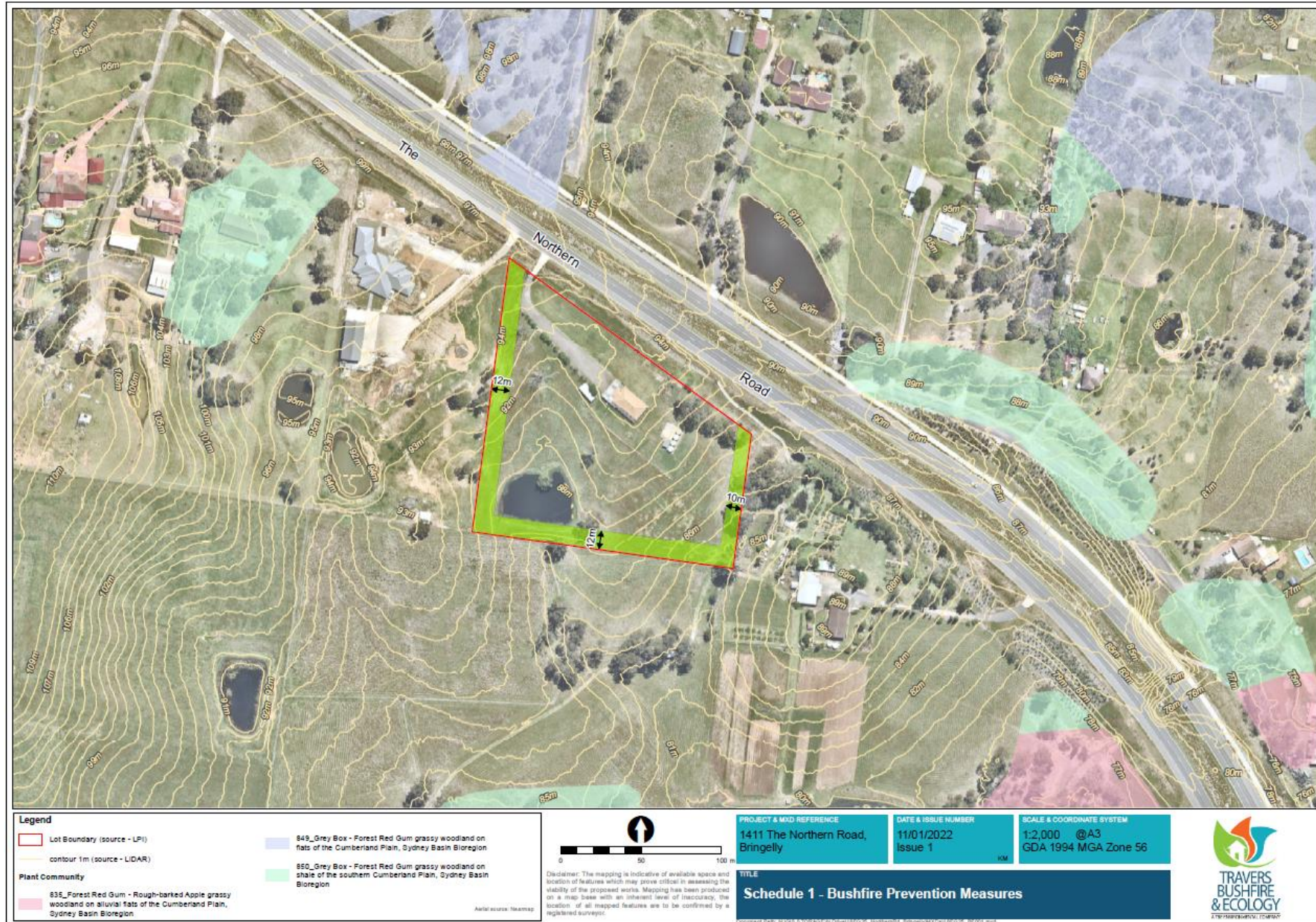
The assessment has concluded that rezoning of the site and future development of the Lot can comply with the planning requirements of *PBP*.

The Schedule 1 Plan of Bushfire Assessment has been created as an indication of APZ's compliant with Planning for Bushfire Protection.

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*.
- 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 ASSESSMENT

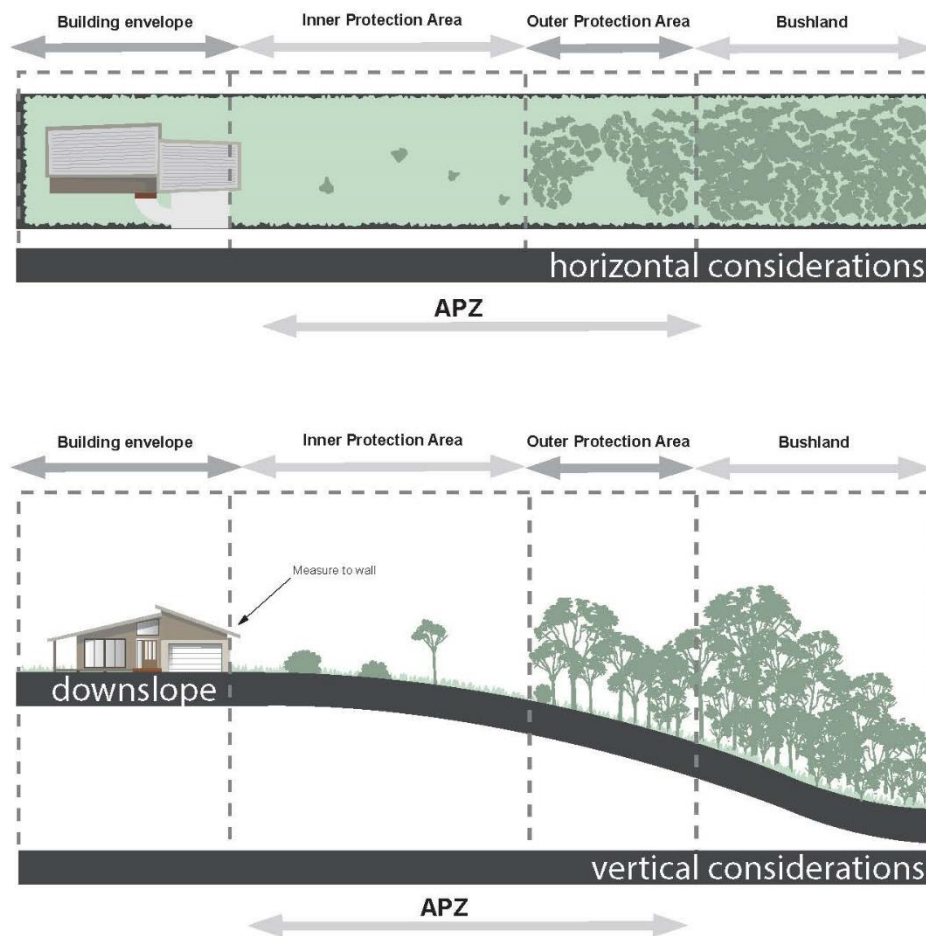


APPENDIX 1. MANAGEMENT OF ASSET PROTECTION ZONES

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*.

In forest vegetation an APZ may consist of two subordinate areas, an inner protection area (IPA) and an outer protection area (OPA). The IPA is the area immediately surrounding the building and the OPA (up to 30% of the total APZ width) is between the IPA and the hazard.

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



AHIMS Web Services (AWS) Search Result

Your Ref/PO Number : 1411 The Northern Road

Client Service ID : 653203

Morgan Jeffery

Date: 20 January 2022

52 The Avenue

Kariong New South Wales 2099

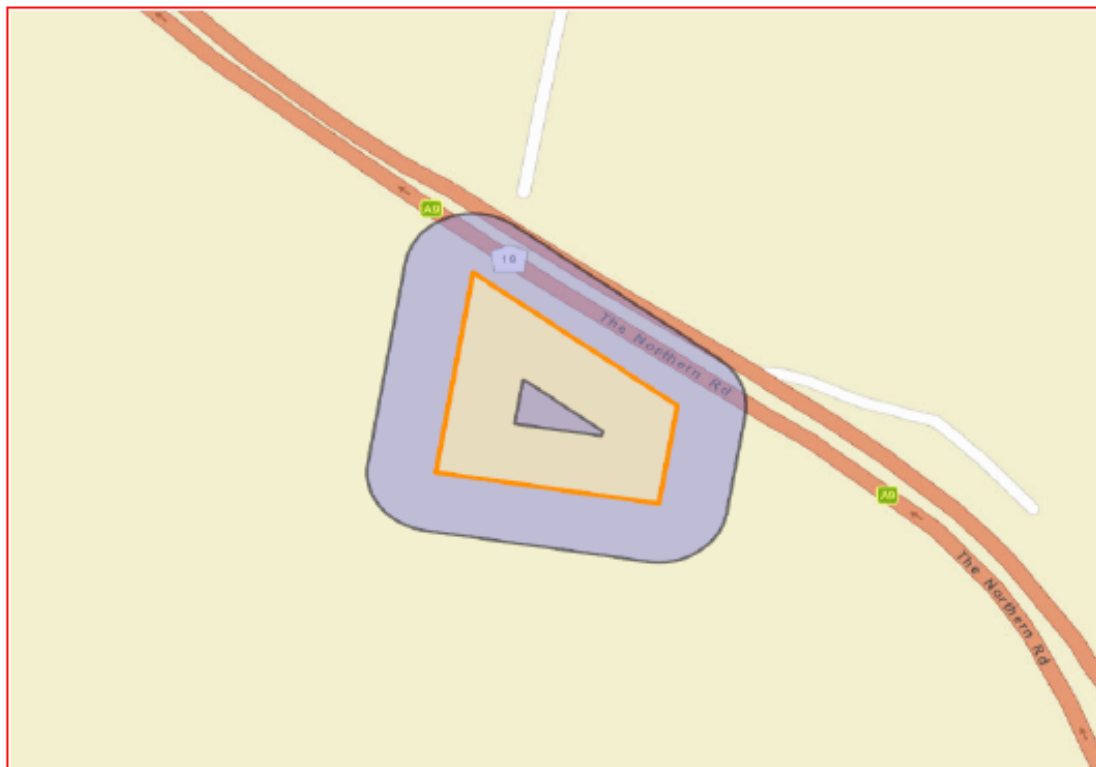
Attention: Morgan Jeffery

Email: mjeffery@traverseecology.com.au

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lot : 6, DP:DP1217784, Section : - with a Buffer of 50 meters, conducted by Morgan Jeffery on 20 January 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. *