



CLARKE DOWDLE & ASSOCIATES
DEVELOPMENT CONSULTANTS
SURVEYORS • PLANNERS • ECOLOGISTS • BUSHFIRE CONSULTANTS

STRATEGIC BUSHFIRE STUDY



at

**682A COLERIDGE ROAD,
BATEAU BAY**
(LOT 3 IN DP 716082)

March 2022

PO Box 3122, Umina Beach NSW 2257
Ph: (02) 4344 3553 Fax: (02) 4344 6636
EMAIL: admin@cdasurveys.com.au



EXECUTIVE SUMMARY

This Strategic Bushfire Study considers the proposed rezoning of the property located at 682A Coleridge Road, Bateau Bay.

The *Planning for Bush Fire Protection 2019* (PBP) statutory guideline introduces a range of strategic planning considerations which are intended to be addressed through the strategic principles and assessment requirements of PBP via the preparation of a Strategic Bush Fire Study. In terms of satisfaction of these principles concerning the proposed rezoning, the following is noted:

‘ensuring land is suitable for development in the context of bush fire risk’

The proposed rezoning does not present any substantial strategic issues on balance with the risk profile of the landscape. Whilst hazard and risk are not avoided, the risk is capable of being satisfactorily mitigated. This includes the ability to evacuate which is a core facet of minimising risk to life in bush fire-prone areas.

‘ensuring new development on BFPL will comply with PBP’

This strategic bush fire study identifies the proposed rezoning is capable of satisfying the statutory bush fire protection measures outlined by PBP. Further detail in relation to this would be required to be submitted as part of future subdivision applications to NSW RFS for integrated development.

‘minimising reliance on performance-based solutions’

Whilst this study cannot fully determine the potential for performance-based solutions as this is dependant upon a final subdivision settlement pattern, it is noted the proposed rezoning is capable of satisfying the acceptable outcomes as per PBP, as required.

‘providing adequate infrastructure associated with emergency evacuation and firefighting operations’

The study considers the strategic aspects of firefighting capability, relevant to the proposed rezoning. This includes how the proposal supports firefighting ability and enables suppression efforts to occur. From a strategic perspective, the proposed development does not involve any identifiable challenges or impediments, but rather seeks to establish a formalised road network that connects with informal fire trails, easement and access tracks to facilitate land management and support suppression, if required.

‘facilitating appropriate ongoing land management practices’

The proposed rezoning is unlikely to introduce any variation to existing or agreed land management practices beyond that which would otherwise be required if the land remained in its current zoning.

Having regard to the strategic principles for the exclusion of inappropriate development contained in Part 4 of PBP, this study does not identify elements of the proposed rezoning that would deem it to be considered inappropriate development pursuant to Part 4 of PBP.

This study demonstrates the proposal to rezone the subject site satisfies EP&A Act s.9.1 Direction 4.4 – ‘Planning for Bush Fire Protection’ and *Planning for Bush Fire Protection 2019*. The proposal is not considered incompatible with the surrounding environment and bushfire risk. With sound bushfire management, the proposal can coexist within the bushland setting. The Strategic Bushfire Study addresses all bushfire protection-related matters required for consideration at the pre-gateway stage, and therefore can proceed through to the next stage of the rezoning process.

CONTENTS

1.0 INTRODUCTION.....	4
1.1 Assumptions and Limitations	4
2.0 OBJECTIVES AND SCOPE OF THE ASSESSMENT	5
3.0 LEGISLATION	7
4.0 SITE IDENTIFICATION AND DESCRIPTION	8
4.1 Site Identification and Location	8
4.2 Bushfire Prone Mapping.....	9
4.3 Proposal	11
5.0 BUSH FIRE LANDSCAPE ASSESSMENT	13
5.1 Surrounding Vegetation	13
5.2 Topography	14
5.3 Fire weather	14
5.3 Fire History	16
5.4 Likely Fire Behaviour.....	16
6.0 LAND USE ASSESSMENT	19
6.1 The Risk Profile	19
6.2 Asset Protection Zones	19
6.3 Construction Requirements for Future Buildings	20
7.0 ACCESS AND EGRESS.....	23
8.0 EMERGENCY SERVICES	25
8.1 Neighbourhood Safer Places (NSPs)	25
9.0 INFRASTRUCTURE	26
9.1 Water.....	26
9.2 Electricity and gas	27
10.0 ADJOINING LAND	28
11.0 CONCLUSION	29

TABLES

Table 1: Strategic Bushfire Study Requirements	5
Table 2: Vegetation communities and corresponding structural formations.....	13
Table 3: Asset Protection Zones	20

APPENDIX

APPENDIX A PBP PERFORMANCE CRITERIA COMPLIANCE	31
--	----

DOCUMENT TRACKING

Project Location	682A Coleridge Road, Bateau Bay
Date	31/03/22
Prepared by	Kristan Dowdle
Reviewed by	Ashley Dowdle
Approved by	Kristan Dowdle
Status	FINAL
Version	5

1.0 INTRODUCTION

Clarke Dowdle & Associates has been engaged to conduct a Strategic Bushfire Study (the Study) on the property located at 682A Coleridge Road, Bateau Bay (subject site).

This Study has been prepared to inform and assist with the consideration of a Planning Proposal for lands situated within the Central Coast Council (CCC) Local Government Area (LGA). The objectives of the Planning Proposal are to amend the Local Environmental Plan (LEP).

The subject land has been mapped as bushfire prone land on the bush fire prone land (BFPL) maps (Figure 3) and therefore under the Ministerial Direction 4.4 (Planning for Bushfire Protection) issued under Section 9.1 of the *Environmental Planning and Assessment Act 1979*, where a Planning Proposal includes or is in close proximity to BFPL, the relevant planning authority must consult with the Commissioner of the NSW Rural Fire Service (RFS) following receipt of a gateway determination.

The gateway determination issued by the Department of Planning, Industry and Environment (DPIE) for this Planning Proposal, therefore, requires consultation with the RFS. The assessment detailed in this study seeks to outline how the Planning Proposal can adhere to the requirements of *Planning for Bushfire Protection* (PBP) (RFS 2019) and is to accompany a Gateway Review application, following feedback received from DPIE on the earlier Gateway application.

1.1 Assumptions and Limitations

The following assumptions and exclusions apply to this study:

- It focuses on the assessment of the proposed rezoning from a strategic land use planning perspective. It is not a detailed bush fire hazard assessment or management plan. It is expected such detail will be prepared and submitted for assessment at the subdivision stage;
- It is based on available data provided by the Department, as well as additional publicly-available information. It is assumed the evidence source utilised to inform this study are accurate can be reasonably relied upon for the purposes of its application;
- The existing vegetation on the entire site will be cleared;
- It is noted this study provides commentary on the interface between bush fire protection measures and the land use planning system;
- This study does not constitute a risk assessment; and
- It has been undertaken using a high-level approach, noting additional investigation and scrutiny of available information from a field-based perspective could be undertaken to enhance accuracy.

2.0 OBJECTIVES AND SCOPE OF THE ASSESSMENT

PBP (RFS, 2019) outlines broad principles and assessment considerations for strategic planning. It also specifies that bushfire protection measures need to be considered at the strategic planning stage to provide an opportunity to assess the suitability of future land uses within the broader bushfire hazard setting, to ensure that future land uses can meet the objectives of PBP. As such, this Study seeks to address the requirements for a strategic bushfire study, as listed in Table 4.2.1 of PBP, and are listed in Table 1 below.

Table 1: Strategic Bushfire Study Requirements

ISSUE	DETAIL	ASSESSMENT CONSIDERATIONS
Bush fire landscape assessment	A bush fire 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.	<ul style="list-style-type: none"> The bush fire hazard in the surrounding area, including: <ul style="list-style-type: none"> Vegetation Topography Weather The potential fire behaviour that might be generated based on the above; Any history of bush fire in the area; Potential fire runs into the site and the intensity of such fire runs; and 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
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.	<ul style="list-style-type: none"> The risk profile of different areas of the development layout based on the above landscape study; The proposed land use zones and permitted uses; 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 The impact of the siting of these uses on APZ provision.
Access and egress	A study of the existing and proposed road networks both within and external to the masterplan area or site layout.	<ul style="list-style-type: none"> The capacity for the proposed road network to deal with evacuating residents and responding emergency services, based on the existing and proposed community profile; The location of key access routes and direction of travel; and The potential for development to be isolated in the event of a bush fire.
Emergency services	An assessment of the future impact of new development on emergency services.	<ul style="list-style-type: none"> 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.
Infrastructure	An assessment of the issues associated with infrastructure and utilities.	<ul style="list-style-type: none"> 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.
Adjoining land	The impact of new development on adjoining landowners and their ability to undertake bush fire management	<ul style="list-style-type: none"> 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.

To address the items listed in Table 1 the following methodology was employed for the Study;

PROPOSAL REVIEW

- Review of the proposed rezoning documentation (i.e., maps, specialist reports etc)

DESK-TOP REVIEW

- A desk-top review of available mapping to determine the extent/scale/locale of fieldwork

SITE INSPECTION

- Inspection of the subject site and surrounding bushfire hazard/s
- The inspection was for verification and/or otherwise of the desk-top review and gathered site-specific data on slope and vegetation

DESKTOP ANALYSIS

- Review and analysis of GIS mapping layers relevant to bushfire behaviour
- Mapping layers include recent aerial imagery from Nearmap, Fire history from NPWS, vegetation mapping from OEH, topographical data and the proposed layout provided by the client

REPORTING

- Determine requirements of *Planning for Bush Fire Protection* related to the subject site and development potential;
- Determine protection requirements relating to rezoning consisting of Asset Protection Zones and access
- Determine any areas of concern where bushfire or environmental constraints may prevent the development
- Final report a 'Strategic Bushfire Study' prepared to address EP&A Act s.117 (2) Direction 4.4

3.0 LEGISLATION

The NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) is the principal planning legislation for the state, providing a framework for the overall environmental planning and assessment of development proposals. Various legislation and instruments are integrated with the EP&A Act, including the *Rural Fires Act 1997* (RF Act).

When investigating the capability of bushfire prone land to be rezoned for residential purposes, councils must have regard to s.9.1 (2) Direction 4.4 – ‘Planning for Bushfire Protection’ of the EP&A Act. The objectives of Direction 4.4 are;

- 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.*

Direction 4.4 instructs councils on the bushfire matters which need to be addressed when drafting LEPs. This includes:

- Consultation with the Commissioner of the NSW RFS, and take into account any comments so made;
- Draft LEPs shall have regard to PBP; and
- Compliance with numerous bushfire protection provisions where development is proposed.

After the rezoning stage, future subdivision and the construction of buildings will also require assessment against PBP. These assessments are based on the final development applications for these proposals.

4.0 SITE IDENTIFICATION AND DESCRIPTION

4.1 Site Identification and Location

The subject site is currently known as 682A Coleridge Road, Bateau Bay (Lot 3 in DP 716082). The land is within the Local Government Area (LGA) of Central Coast Council (Fire Danger Index-100).

The property operates and functions as the Red Bus Service Depot, with internal roads, hardstand areas for bus parking and office and bus service buildings located on the property.

The remaining conditions within the site are managed lands throughout the site, excluding a small vegetated area on the north-east portions.

The site is connected to the town reticulated supply of water and the electrical grid.



Figure 1: Aerial Photo of Site (subject site bordered in blue)
Source: Nearmap, 2022

The subject site is currently zoned under the Wyong Local Environmental Plan (LEP) as SP2: Infrastructure (See Figure 2).

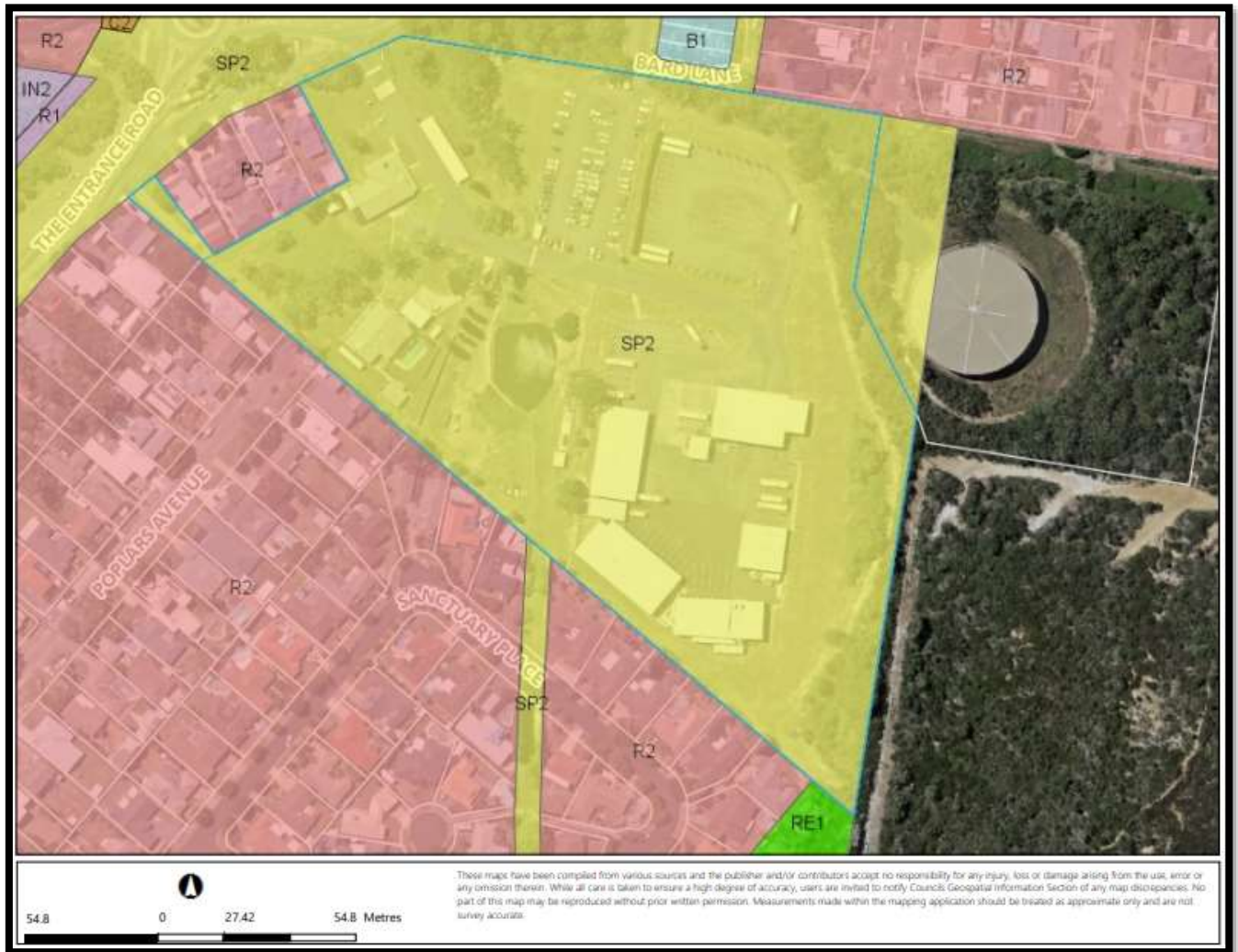


Figure 2: Current Land Zoning (subject site bordered in blue)
Source: Central Coast Council, 2022

4.2 Bushfire Prone Mapping

The land is mapped by Central Coast Council as being bushfire prone. The subject site has been mapped as being within the bushfire buffer (yellow) and containing Category 1 (red) vegetation on the eastern portions and therefore the planning requirements of PBP are applicable.

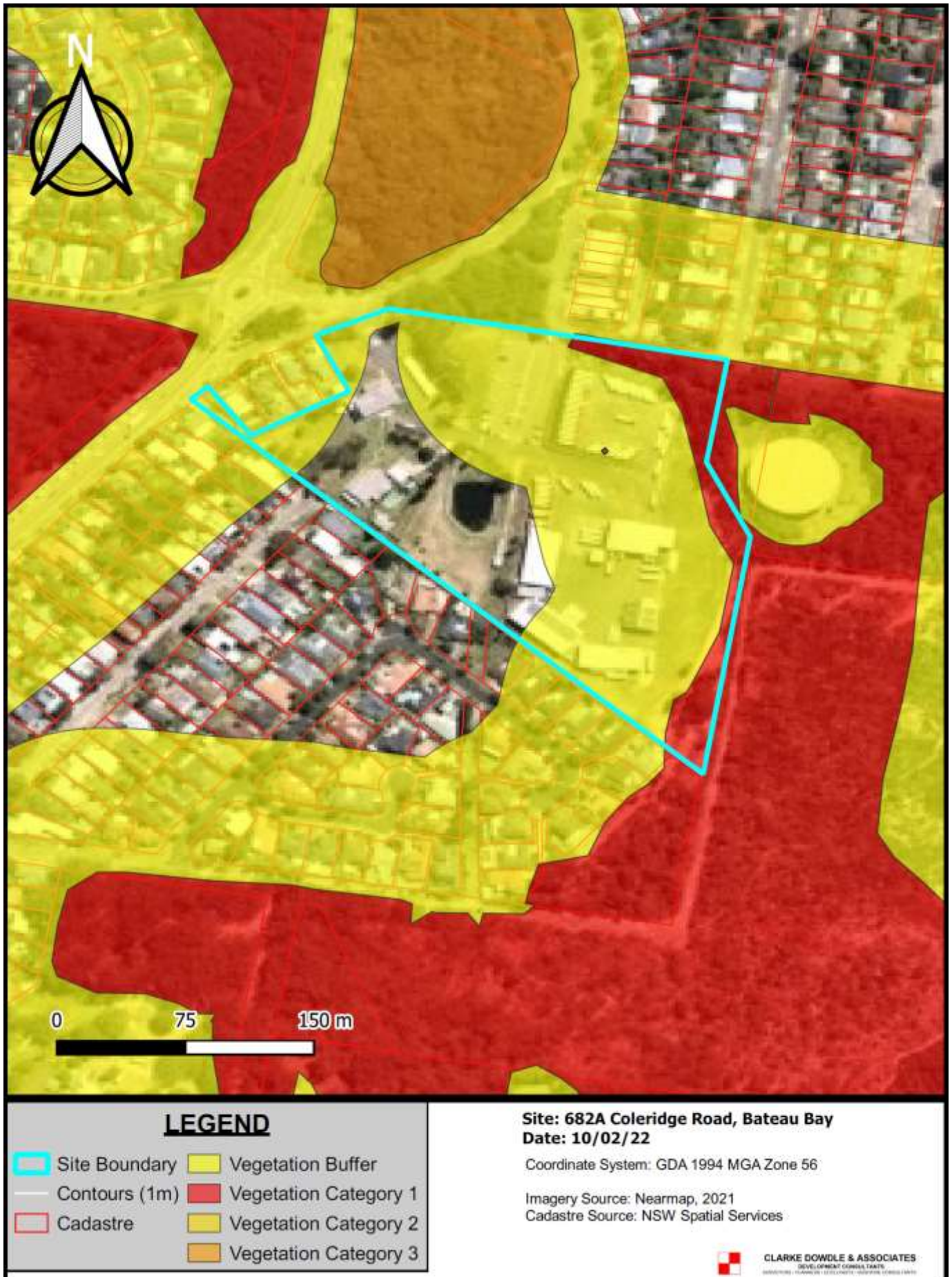


Figure 3: Bushfire Prone Mapping

4.3 Proposal

The proposed rezoning relates to the rezoning of the current allotment to allow for a residential subdivision comprising of:

- Residential Allotments
- Public Road
- Drainage Reserve
- Public Reserve

The following figure 4 provides an indicative lot layout of a proposed subdivision upon the property.

At the time of this Study, the zoning of the proposed residential allotment had not been allocated, however the zoning is to allow for a single dwelling approval.

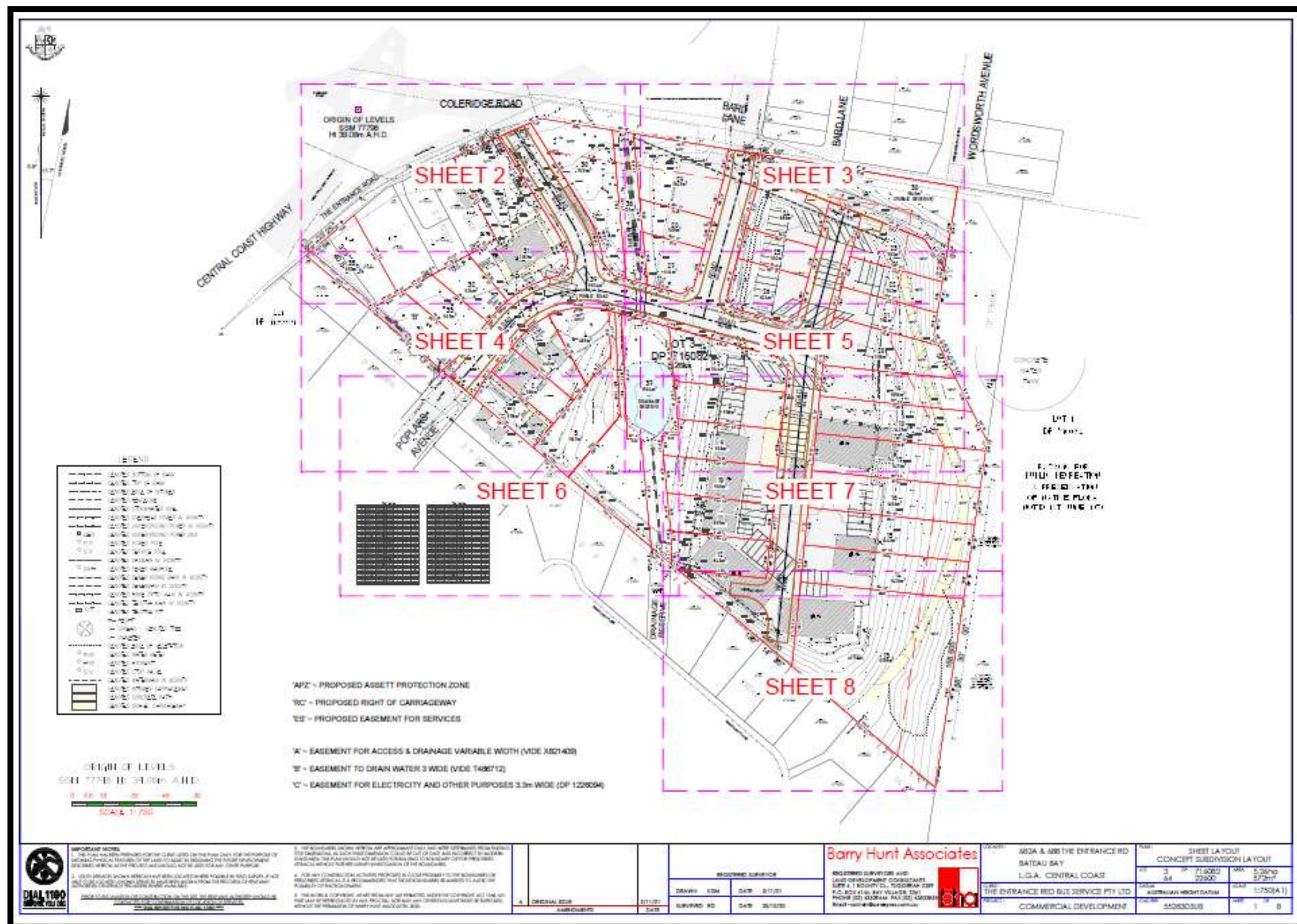


Figure 4: Proposed Subdivision/Rezoning Layout

5.0 BUSH FIRE LANDSCAPE ASSESSMENT

A bush fire 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.

The parameters to be analysed are discussed in the following subsections and consist of bushfire hazard (comprising vegetation and topography), fire weather, fire intensity patterns, fire history and ignition sources.

5.1 Surrounding Vegetation

The predominant vegetation communities known to occur throughout the area are listed in Table 2 below and mapped on Figure 5. The communities have been categorised into vegetation structural formations according to Keith (2004) and then converted under Appendix 1 in PBP.

The vegetation mapping presented in Figure 5 is sourced by Central Coast Council (Bell, 2019)

Table 2: Vegetation communities and corresponding structural formations

VEGETATION COMMUNITY	STRUCTURAL FORMATION (KEITH, 2004)	PBP CLASSIFICATION
Coastal Sand Wallum Heath	Sydney Coastal Heaths	Tall Heath
Coastal Sand Apple – Blackbutt Forest	Sydney Coastal Dry Sclerophyll Forests	Forest
Swamp Mahogany - Paperbark Forest	Coastal Swamp Forests	Forest
Buttonderry Foothills Forest	Sydney Coastal Dry Sclerophyll Forests	Forest

The predominant pattern of vegetation across the landscape is coastal type heath to the east; coastal swamp forests on the lower-lying areas to the north and west; and dry sclerophyll forest on the higher topography to the west. Further comments in relation to the structure and classification will be made in Section 6.2 of this report.



Figure 5: Vegetation Mapping
Source: Central Coast Council, 2022

5.2 Topography

Figure 6 shows the topography across the landscape within and beyond 200m of the subject site boundaries. The topographic mapping was sourced by the Commonwealth of Australia (Geoscience Australia) (1m contours). This data has a stated accuracy of 0.3m (95% Confidence Interval) vertical and 0.8m (95% Confidence Interval) horizontal.

The surrounding landscape whereby the bushfire hazards are located upon, consists of the lands rising to the east; and, falling in a gentle grade to the north-west and west.

5.3 Fire weather

As described in the *Central Coast Bush Fire Risk Management Plan 2020-2025* (Central Coast Bush Fire Management Committee) the area is cool temperate with predominately summer rainfall. The coastal strip is dominated by local coastal weather patterns (predominant coastal winds) and the western areas can be slightly warmer, drier and less humid, often influenced by wider wind systems.

The bush fire season generally runs from August to March whereby problematic fire weather can occur. Prevailing weather conditions associated with the bush fire season in the Central Coast BFMC area are associated with coastal conditions, and more generally north-westerly winds accompanied by high daytime temperatures and low relative humidity. There are also occasional dry lightning storms occurring during the bush fire season.

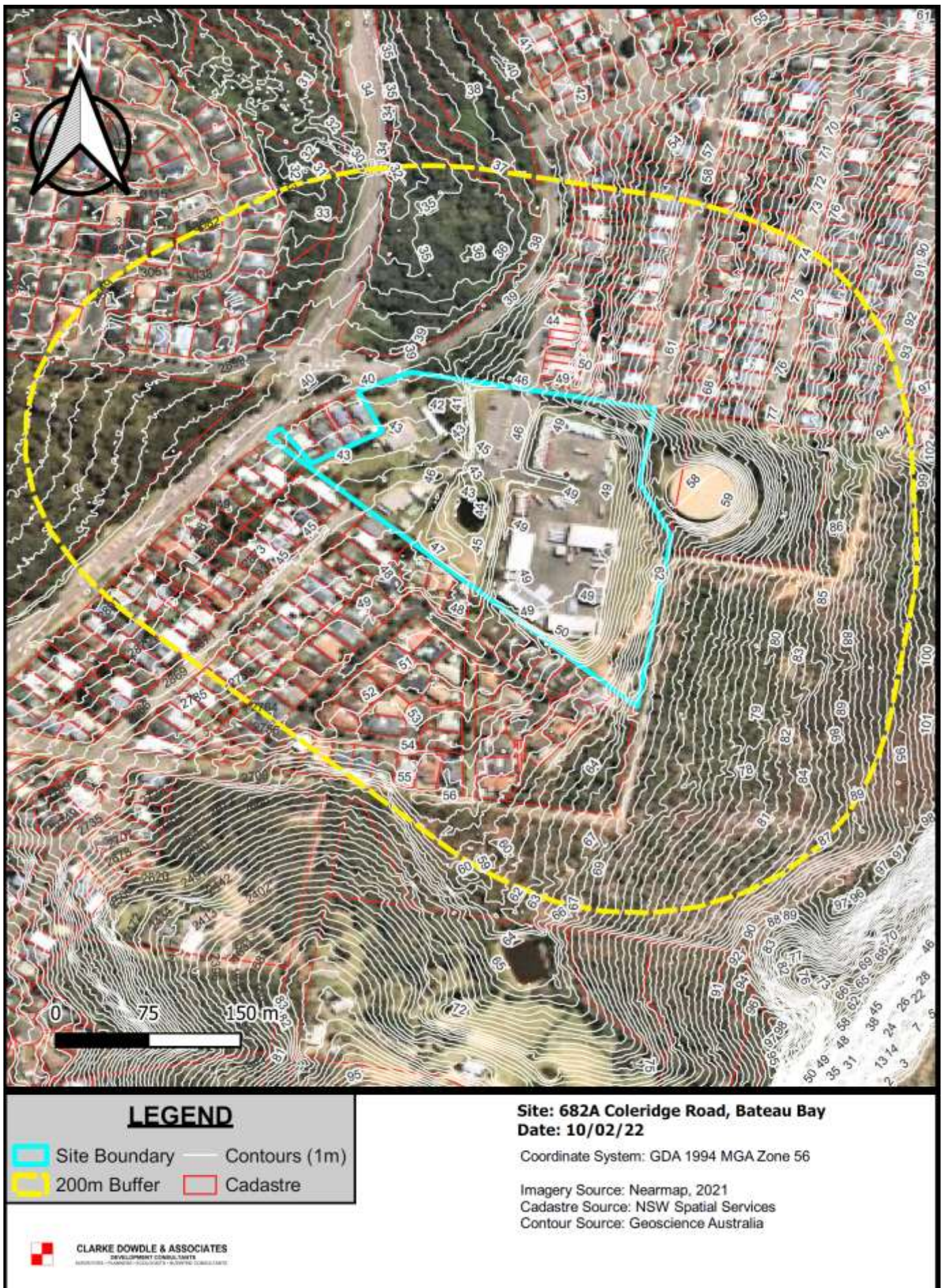


Figure 6: Topographic mapping

5.3 Fire History

The Central Coast BFMC area has on average 843 bush and grass fire incidents per year, of which 6 to 8 on average per year can be considered to be major fires. The main sources of ignition in the Central Coast BFMC area are:

- Illegal burning activity
- Escapes from legal burning
- Arson & Incendiarism
- Ignition of abandoned/stolen motor vehicles
- Lightning
- Arching electrical power lines
- Occurrence of an extended drought period;
- Lower than average rainfall through winter and spring;
- Persistent north-west winds; and
- Spring/summer thunderstorm activity ('dry' lightning strikes).

A review of the fire history mapping from NPWS highlights several fires including wildfires and prescribed burns that have occurred within a 1km radius of the subject site.

The major fire to partially impact the site, occurred from the west and is known as the Cutrock Road Wildfire that occurred in 1991 which in total was a ~1008 Hectare fire (see Figure 7).

Several wildfires fires have also occurred to the east within Wyrabalong National Park. These include; the Crackneck Pt. #3 (1991); Wyrabalong Fire (2007); Yumbool Pt. #2 (1991) and Crackneck 4 (2003). These fires have not directly impacted the subject site however have occurred near the eastern boundary of the property.

5.4 Likely Fire Behaviour

Utilising the information provided in the preceding sections on hazard, weather, history and ignition sources, likely fire behaviour and potential fire paths and scenarios can be predicted. As indicated in Figure 8, the problematic fire scenario is the combination of undesirable fire weather (i.e., hot and dry north-westerly westerly winds during late spring and summer) with ignition from dry lightning strikes to the west/north-west or human-induced ignition from the road corridors/arson creating the potential for a bushfire to spread from the west to potentially impact the western/northern western section of the subject site. This pathway is similar to the fire behaviour of the Cutrock Road wildfire. It is noted that residential development to the west of the site since the time of the 1991 wildfire has reduced the area of vegetation.

The adjoining Coleridge Road and The Entrance Road would be the fire fighting defence point for fires that potentially impacting the site.

Another potential fire pathway, is from the vegetation to the east of the site. As noted in Section 5.3 is that several fires have occurred within the adjoining national park. The fires appear to have not directly impacted the site and would require easterly winds in order to be directed towards the subject site of which are not typical with large scale fire events. It is noted that due to the site being located downslope and to the east of the bushfire hazard, the possible fire scenario is a flank fire from a wildfire burning in a north-south and/or south-north fire run. However, as stated, due to the topography, heath type vegetation and orientation, a large-scale wildfire from these aspects is not likely.



Figure 7: Fire History

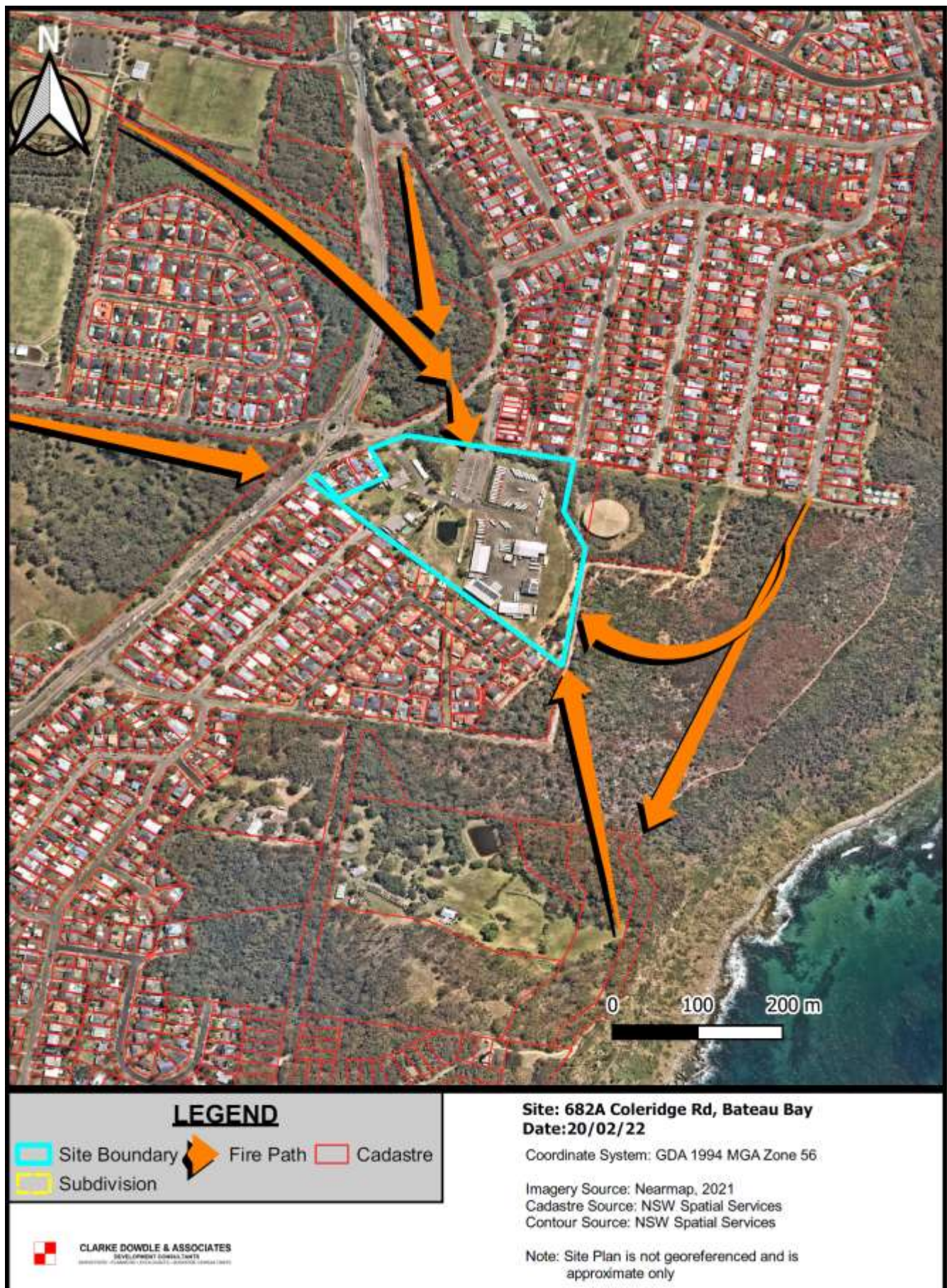


Figure 8: Potential Fire Pathways

6.0 LAND USE ASSESSMENT

6.1 The Risk Profile

Risk is the function of likelihood and consequence, where the consequence is a factor of exposure and vulnerability.

In terms of event likelihood, the risk of a bushfire igniting, spreading and causing damage to future development at the subject site has been assessed following the outcomes of the preceding **Bushfire Landscape Assessment**. The Central BFRMP also identifies that deliberate ignition is observed, largely as a result of the interface of the urban population with a hazard. This translates to an *almost certain probability of higher fire danger* (relevant to historic observed conditions of the Greater Sydney fire weather region), *likely probability of ignition*, and the probability of resulting bush fire occurring is *possible*.

From a risk consequence perspective, the proposed rezoning immediately adjoins vegetation to the west. Thus, exposure to potential flame contact, radiant heat and ember attack is potentially present, unless otherwise mitigated via strategic and/or site-based bush fire protection measures.

Having regard to *vulnerability*, the rezoning alters the nature of the land use, the following land use risk profile has been identified in the Study:

- The requirement and ability of the site to accommodate Asset Protection Zones wholly within the subject site;
- The ability for any future works to incorporate perimeter roads into the design;
- The study site does not contain any significant cumulative risks;
- The feasibility of complementary and consistent risk management through the landscape and building design, and community programs for any future works.

6.2 Asset Protection Zones

Appendix 1 of PBP provides a methodology for determining the Asset Protection Zone (APZ) required for any given proposed development. APZ's describe the distance between the proposed development (the asset) and the hazard (the bushland) and vary according to topography and vegetation type. PBP states that the primary purpose of an APZ is to ensure that a progressive reduction of bushfire fuels occurs between the bushfire hazard and any habitable structures within the development.

Using the vegetation and slope data presented in Section 5 of this report, APZs have been determined and accommodated within the subject site. The required APZ distances are presented in Table 3 whilst Figure 12 provides the APZ layer on the proposed rezoning plan.

Areas that will require an APZ at an interface with a bushfire hazard that will not already be provided by roads or open space are listed in Table 3 below.

Table 3: Asset Protection Zones

Aspect	Vegetation ¹ within 140m of development	Effective Slope of Land	APZ Required
North	Managed Lands	-	-
North-West	Forest	0-5° Down Slope	29m
West	Forest	0-5° Down Slope	29m
South	Managed Lands	-	-
East	Tall Heath	Flat/Up Slope	16m

Notes for Table 1:

- (1) Refer to Keith (2004) and Appendix 1 in *PBP*
- (2) Refer to A1.12.1 in *PBP* for Residential Subdivision Development

The above-stated APZ's can be wholly accommodated within the site and proposed subdivision layout. Figure 10 provides a site plan of the required APZ's.

6.3 Construction Requirements for Future Buildings

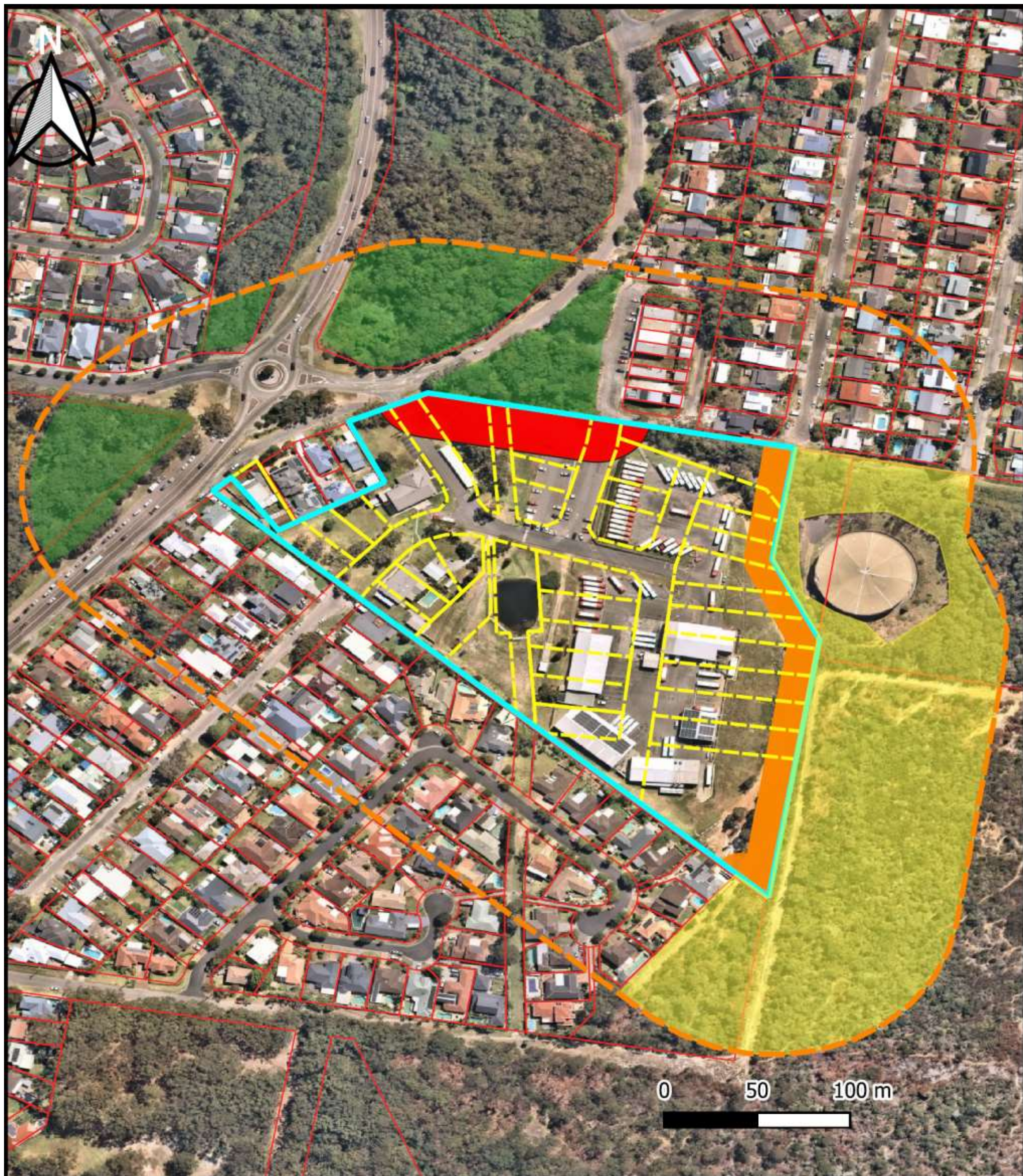
Buildings proposed within bushfire prone land are required to be assessed to ascertain the Bushfire Attack Level (BAL) in order to design and construct the building in compliance with the corresponding suite of construction specifications listed within Australian Standard *AS 3959- 2018 Construction of buildings in bushfire prone areas*. Such an assessment does not occur until the development application stage.

Based on the minimum APZ dimensions listed in Table 3, those buildings closest to the hazard will have a maximum rating of BAL-29. The rating reduces to BAL-19, BAL-12.5 and BAL-LOW (no requirements) the further a building is located from a hazard.

The following figure 9 as sourced from Table A1.7A in *PBP* provides a background of potential bushfire impacts associated with the corresponding BAL ratings.

Heat flux exposure	Description	AS 3959 construction level
N/A	Minimal attack from radiant heat and flame due to the distance of the building from the vegetation, although some attack by burning debris is possible. There is insufficient threat to warrant specific construction requirements.	BAL-LOW
≤12.5	Attack by burning debris is significant with radiant heat (not greater than 12.5kW/m ²). Radiant heat is unlikely to threaten building elements (such as unscreened glass). Specific construction requirements for ember protection and accumulation of debris are warranted.	BAL-12.5
>12.5 ≤19	Attack by burning debris is significant with radiant heat flux (not greater than 19kW/m ²) threatening some building elements (such as screened glass). Specific construction requirements for embers and radiant heat are warranted.	BAL-19
>19 ≤29	Attack by burning debris is significant and radiant heat flux (not greater than 29kW/m ²) threatens building integrity. Specific construction requirements for ember and higher levels of radiant heat are warranted. Some flame contact is possible.	BAL-29
>29 ≤40	Radiant heat flux and potential flame contact could threaten building integrity.	BAL-40
>40	Significant radiant heat and significantly higher likelihood of flame contact from the fire front will threaten building integrity and result in significant risk to residents.	BAL-FZ

Figure 9: BAL ratings
Source: PBP



LEGEND

- | | | |
|---------------|------------|----------|
| Site Boundary | Tall Heath | 29m APZ |
| 100m Buffer | Forest | Cadastre |
| Subdivision | 16m APZ | |



CLARKE DOWDLE & ASSOCIATES
 DEVELOPMENT CONSULTANTS
 SURVEYORS • PLANNERS • ECOSYSTEMS • BUSHFIRE CONSULTANTS

Site: 682A Coleridge Rd, Bateau Bay
Date: 20/02/22

Coordinate System: GDA 1994 MGA Zone 56

Imagery Source: Nearmap, 2021

Cadastre Source: NSW Spatial Services

Contour Source: NSW Spatial Services

Note: Site Plan is not georeferenced and is approximate only

Figure 10: APZ Site Plan

7.0 ACCESS AND EGRESS

Access into and egress out of the subject site is currently available from Coleridge Road to the west. The proposed subdivision will involve additional roads connecting to the surrounding road network, including; Poplars Avenue to the southwest (away from a bushfire hazard) and Bard Lane to the north.

In the unlikely event that access to the west and north-west is cut in both directions and both roads are impassable, the proposed road connecting to Poplars Avenue to the south-west, would provide a safe access/egress route as a result of no hazard being located upon this aspect (See Figure 11).

Based upon the multiple proposed access and egress points, although no traffic assessment was conducted, the surrounding road infrastructure is deemed to be capable to allow safe movement to and from the intended residential land usage.

With regards to the future subdivision stages within the subject site, any application will need to address and comply with the access requirements under PBP (see Appendix A) and achieve:

- a road design that facilitates the safe access and egress for residents and emergency service personnel, including multiple access/egress options for each area;
- a road design with adequate capacity to facilitate a satisfactory emergency evacuation



Figure 11: Indicative Development and Access plan

8.0 EMERGENCY SERVICES

Any development inherently increases demand or reliance on local emergency services, at least to an extent. Due to the small nature of the planning proposal and future land usage, the increase is seen as small and not significant.

Concerning the existing emergency infrastructure, the following RFS stations are located nearby;

- Wamberal RFS (~4.5km to the south-west);

Additional NSW Fire and Rescue resources stationed at Bateau Bay would also attend any emergency and is located approximately 3km north. The proximity of emergency services to the precinct is considered adequate, provided emergency management and planning fosters a 'leave early' approach.

In addition, any future development within the subject site will require compliance with PBP for access and also water including ensuring water volumes and hydrant pressures comply with Australian Standard AS 2419 *Fire hydrant installations - System design, installation and commissioning*, and will of benefit to the local emergency services for the site and also the adjoining lands.

The combined land use, access and egress and infrastructure responses of the proposed rezoning to bush fire hazard and risk, analysed by this study, seek to limit the potential exposure of persons and property to unacceptable or intolerable bush fire risk. It does this by adopting measures in a combination approach, utilising a suite of bushfire protection measures that satisfy the strategic principles of PBP, which also minimises the potential demand on emergency services in the event of bush fire.

8.1 Neighbourhood Safer Places (NSPs)

Neighbourhood Safer Places (NSPs) are a place of last resort during a bush fire emergency. They are to be used when all other options in your bush fire survival plan can't be put into action safely

There is one NSPs in close proximity to the subject land, which is situated at:

- Kurraba Oval (Open Space), ~7.5km north-west, located at Kurraba Road, Berkeley Vale

9.0 INFRASTRUCTURE

9.1 Water

Any future subdivision upon the subject site is required to comply with PBP. This will include fire hydrant spacing, sizing and pressures that should comply with AS 2419.1 – 2005. Where this cannot be met, the RFS will require a test report of the water pressures anticipated by the relevant water supply authority. In such cases, the location, number and sizing of hydrants shall be determined using fire engineering principles. Fire hydrants should not be located within any road carriageway. All above ground water and gas service pipes external to the building are to be metal, including and up to any taps.

Appendix A identifies the acceptable solution requirements of Section 5.3.4 of PBP, while Table 6 identifies the requirements for lots that may require a static water supply (i.e., if >70 m from hydrant points).

The PBP acceptable solution requirements for water is achievable.

9.2 Electricity and gas

Any future subdivision upon the site is required to comply with PBP. This will include either underground electricity supply to the subject land or if the electrical transmission line to the subject land is above ground, no part of a tree is to be closer than 0.5 m to the powerline conductors.

Reticulated or bottled gas on the lot is to be installed and maintained in accordance with Australian Standard AS/NZS 1596 'The storage and handling of LP Gas' (Standards Australia 2014) and the requirements of relevant authorities (metal piping must be used).

Details for compliance with PBP are provided in Appendix A.

10.0 ADJOINING LAND

Future development should not be reliant on any off-site bushfire mitigation measures. All buildings and land uses should be designed to be resilient to bushfire attack in circumstances where no additional fuel management occurs outside of the subject land.

The proposed land uses are not likely to impact on the ability for bushfire management activities to be undertaken on adjoining land. Given the adherence to PBP and other land use planning requirements, the proposed land uses should not increase bushfire management needs for retained and/or adjoining bushfire prone vegetation.

11.0 CONCLUSION

Clarke Dowdle & Associates were engaged to conduct a Strategic Bushfire Study on the property located at 682A Coleridge Road, Bateau Bay. The assessment was performed in February 2022 and was conducted in accordance with the procedures and methods recommended in the NSW Rural Fire Service published document '*Planning for Bushfire Protection, 2019*' (PBP).

This strategic bushfire study has assessed the bushfire risk to the Planning Proposal, the appropriateness of the proposed land uses and the ability for appropriate bushfire protection measures to be provided. It has been found that the Planning Proposal meets the aim and objectives of PBP and can achieve required APZs and other bushfire mitigation measures and does not impose additional mitigation actions on adjoining land. At the detailed design phase, lot design / APZ provision, infrastructure, access and construction plans are required to meet the specifications outlined in PBP 2019. However, the assessment of the Planning Proposal in this Strategic Bushfire Study identifies that the orderly provision of bushfire protection measures to achieve the deemed to satisfy standards prescribed within PBP is achievable.

In conclusion, the proposal to rezone the subject site satisfies EP&A Act s.9.2 Direction 4.4 – 'Planning for Bush Fire Protection' and Planning for Bush Fire Protection 2019. The proposal is not considered incompatible with the surrounding environment and bushfire risk. With sound bushfire management, the proposal can coexist within the bushland setting.

The determining authorities and Rural Fire Service may suggest further or additional measures to be implemented in the planning and construction on the subject site.

We would be pleased to provide further information on any aspects of this report.

For and on behalf of

Clarke Dowdle and Associates



Kristan Dowdle

B. Env. Sc.

Grad Dip. Design in Bushfire Prone Areas

BPAD Certified Practitioner (FPA Australia)

Bushfire Consultant

Disclaimer

PBP States;

Due to a range of limitations, the measures contained in this document do not guarantee that loss of life, injury and/or property damage will not occur during a bush fire event.

AS 3959-2018 states;

It should be borne in mind that the measures contained in this standard cannot guarantee that the building will survive a bushfire event on every occasion. This is substantially due to the unpredictable nature and behaviour of fire and extreme weather conditions.

This report provides the required information to assist Local Council and the Rural Fire Service in determining compliance in accordance with PBP and AS 3959-2018 and as stated above, this report does not guarantee that the proposal will withstand bushfire attack on every occasion.

REFERENCES

- Bell (2019), *A Revised Interim Vegetation Classification of the Central Coast Local Government Area*
- Central Coast Bush Fire Management Committee (2020). *Bush Fire Risk Management Plan 2020-2025*. Approved by NSW Bush Fire Coordinating Committee.
- Intersect Traffic (2020) *Traffic Impact Assessment – Residential Planning Proposal – Pacific Highway, Lake Munmorah*.
- Keith, D. (2004), *Ocean Shores to Desert Dunes*. Department of Environment and Conservation, Sydney
- National Construction Code (NCC) (2019), Building Codes Australia, *Class 1 and Class 10 Building Housing Provisions Volume 2*
- NSW Rural Fire Service and Department of Planning (2019), *Planning for Bushfire Protection, A guide for Councils, Planners, Fire Authorities and Developers*. NSW Rural Fire Service.
- Schauble, J. (2004). *The Australian Bushfire Safety Guide*. Harper Collins Publishers, Sydney, Australia.
- Sivertsen, D., Roff, A., Somerville, M., Thonell, J., and Denholm, B. 2011. *Hunter Native Vegetation Mapping. Geodatabase Guide (Version 4.0)*, Internal Report for the Office of Environment and Heritage, Department of Premier and Cabinet, Sydney, Australia.
- Standards Australia, (2018), AS3959 Construction of Buildings in Bushfire-prone Areas. Standards Australia International

APPENDIX A

PBP PERFORMANCE CRITERIA COMPLIANCE

The following tables outline the performance requirements and acceptable solutions provided in Section 4.2 of PBP for any future subdivision's compliance.

Asset Protection Zones

Intent of measures: to provide sufficient space and maintain reduced fuel loads to ensure radiant heat levels at the buildings are below critical limits and prevent direct flame contact.

	PERFORMANCE CRITERIA	ACCEPTABLE SOLUTIONS
ASSET PROTECTION ZONES	potential building footprints must not be exposed to radiant heat levels exceeding 29 kW/m ² on each proposed lot.	APZs are provided in accordance with Tables A1.12.2 and A1.12.3 based on the FFDI.
	APZs are managed and maintained to prevent the spread of a fire towards the building.	APZs are managed in accordance with the requirements of Appendix 4.
	the APZs is provided in perpetuity.	APZs are wholly within the boundaries of the development site
	APZ maintenance is practical, soil stability is not compromised and the potential for crown fires is minimised.	APZs are located on lands with a slope less than 18 degrees.
LANDSCAPING	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; and fencing is constructed in accordance with section 7.6.

Access

Intent of measures: to provide safe operational access to structures and water supply for emergency services, while residents are seeking to evacuate from an area.

	PERFORMANCE CRITERIA	ACCEPTABLE SOLUTIONS
ACCESS	firefighting vehicles are provided with safe, all-weather access to structures.	<ul style="list-style-type: none"> property access roads are two-wheel drive, all-weather roads; perimeter roads are provided for residential subdivisions of three or more allotments; subdivisions of three or more allotments have more than one access in and out of the development; traffic management devices are constructed to not prohibit access by emergency services vehicles; maximum grades for sealed roads do not exceed 15 degrees and an average grade of not more than 10 degrees or other gradient specified by road design standards, whichever is the lesser gradient; all roads are through roads; dead end roads are not recommended, but if unavoidable, are not more than 200 metres in length, incorporate a minimum 12 metres outer radius turning circle, and are clearly sign posted as a dead end; where kerb and guttering is provided on perimeter roads, roll top kerbing should be used to the hazard side of the road; where access/egress can only be achieved through forest, woodland and heath vegetation, secondary access shall be provided to an alternate point on the existing public road system; and one way only public access roads are no less than 3.5 metres wide and have designated parking bays with hydrants located outside of these areas to ensure accessibility to reticulated water for fire suppression.
	the capacity of access roads is adequate for firefighting vehicles	the capacity of perimeter and non-perimeter road surfaces and any bridges/causeways is sufficient to carry fully loaded firefighting vehicles (up to 23 tonnes); bridges/causeways are to clearly indicate load rating.
	there is appropriate access to water supply.	<ul style="list-style-type: none"> hydrants are located outside of parking reserves and road carriageways to ensure accessibility to reticulated water for fire suppression; hydrants are provided in accordance with the relevant clauses of AS 2419.1:2005 - <i>Fire hydrant installations System design, installation and commissioning</i>; and there is suitable access for a Category 1 fire appliance to within 4m of the static water supply where no reticulated supply is available.
PERIMETER ROAD	access roads are designed to allow safe access and egress for firefighting vehicles while residents are evacuating as well as providing a safe operational environment for emergency service personnel during firefighting and emergency management on the interface.	<ul style="list-style-type: none"> are two-way sealed roads; minimum 8m carriageway width kerb to kerb; parking is provided outside of the carriageway width; hydrants are located clear of parking areas; are through roads, and these are linked to the internal road system at an interval of no greater than 500m; curves of roads have a minimum inner radius of 6m; the maximum grade road is 15 degrees and average grade of not more than 10 degrees; the road crossfall does not exceed 3 degrees; and a minimum vertical clearance of 4m to any overhanging obstructions, including tree branches, is provided.

NON-PERIMETER ROAD	<p>access roads are designed to allow safe access and egress for firefighting vehicles while residents are evacuating.</p>	<ul style="list-style-type: none"> • minimum 5.5m carriageway width kerb to kerb; • parking is provided outside of the carriageway width; • hydrants are located clear of parking areas; • roads are through roads, and these are linked to the internal road system at an interval of no greater than 500m; • curves of roads have a minimum inner radius of 6m; • the road crossfall does not exceed 3 degrees; and • a minimum vertical clearance of 4m to any overhanging obstructions, including tree branches, is provided.
PROPERTY ACCESS	<p>firefighting vehicles can access the dwelling and exit the property safely</p>	<ul style="list-style-type: none"> • 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. <p>In circumstances where this cannot occur, the following requirements apply:</p> <ul style="list-style-type: none"> • minimum 4m carriageway width; • in forest, woodland and heath situations, rural property access roads have passing bays every 200m that are 20m long by 2m wide, making a minimum trafficable width of 6m at the passing bay; • a minimum vertical clearance of 4m to any overhanging obstructions, including tree branches; • provide a suitable turning area in accordance with Appendix 3; • curves have a minimum inner radius of 6m and are minimal in number to allow for rapid access and egress; • the minimum distance between inner and outer curves is 6m; • the crossfall is not more than 10 degrees; • maximum grades for sealed roads do not exceed 15 degrees and not more than 10 degrees for unsealed roads; and • a development comprising more than three dwellings has access by dedication of a road and not by right of way.

Services-Water, electricity and gas

Intent of measures: to provide adequate services of water for the protection of buildings during and after the passage of a bush fire, and to locate gas and electricity so as not to contribute to the risk of fire to a building.

	PERFORMANCE CRITERIA	ACCEPTABLE SOLUTIONS
WATER SUPPLY	adequate water supplies is provided for firefighting purposes.	<ul style="list-style-type: none"> reticulated water is to be provided to the development where available; a static water and hydrant supply is provided for non-reticulated developments or where reticulated water supply cannot be guaranteed; and static water supplies shall comply with Table 5.3d.
	<ul style="list-style-type: none"> water supplies are located at regular intervals; and the water supply is accessible and reliable for firefighting operations. 	<ul style="list-style-type: none"> fire hydrant, spacing, design and sizing complies with the relevant clauses of Australian Standard AS 2419.1:2005; hydrants are not located within any road carriageway; and reticulated water supply to urban subdivisions uses a ring main system for areas with perimeter roads.
	flows and pressure are appropriate	<ul style="list-style-type: none"> fire hydrant flows and pressures comply with the relevant clauses of AS 2419.1:2005.
	the integrity of the water supply is maintained.	<ul style="list-style-type: none"> all above-ground water service pipes are metal, including and up to any taps; and above-ground water storage tanks shall be of concrete or metal
ELECTRICAL SERVICES	location of electricity services limits the possibility of ignition of surrounding bush land or the fabric of buildings.	<ul style="list-style-type: none"> where practicable, electrical transmission lines are underground; where overhead, electrical transmission lines are proposed as follows: <ul style="list-style-type: none"> lines are installed with short pole spacing of 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 <i>Guideline for Managing Vegetation Near Power Lines</i>.
GAS SERVICES	location and design of gas services will not lead to ignition of surrounding bushland or the fabric of buildings.	<ul style="list-style-type: none"> reticulated or bottled gas is installed and maintained in accordance with AS/NZS 1596:2014 - <i>The storage and handling of LP Gas</i>, the requirements of relevant authorities, and metal piping is used; all fixed gas cylinders are kept clear of all flammable materials to a distance of 10m and shielded on the hazard side; connections to and from gas cylinders are metal; polymer-sheathed flexible gas supply lines are not used; and above-ground gas service pipes are metal, including and up to any outlets.