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# STRATEGIC BUSHFIRE STUDY



at

**7 POMONA ROAD,  
EMPIRE BAY, NSW**  
(LOT 1 in DP 610629)

**June 2022**

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## EXECUTIVE SUMMARY

This Strategic Bushfire Study considers the proposed amendment to Schedule 1 of Gosford Local Environmental Plan (LEP) 2014 to include an additional permitted use of a caravan park on the property located at 7 Pomona Road, Empire 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 additional permitted land usage, the following is noted:

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

The proposed additional permitted land usage 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 additional permitted use 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 settlement pattern, it is noted the proposed additional permitted use 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 additional permitted land usage. 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 additional permitted use 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 additional permitted land usage 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 additional permitted land usage process.

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### DOCUMENT TRACKING

<b>Project Location</b>	7 Pomona Road, Empire Bay
<b>Date</b>	30/06/22
<b>Prepared by</b>	Kristan Dowdle
<b>Reviewed by</b>	Ashley Dowdle
<b>Approved by</b>	Kristan Dowdle
<b>Status</b>	FINAL
<b>Version</b>	3

## 1.0 INTRODUCTION

Clarke Dowdle & Associates has been engaged to conduct a Strategic Bushfire Study (the Study) on the property located at 7 Pomona Road, Empire 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 Schedule 1 of Gosford Local Environmental Plan (LEP) 2014 to include an additional permitted use of a caravan park

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 proposal 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 and can be reasonably relied upon for the purposes of its application;
- The existing vegetation on the entire site will be maintained as an Asset Protection Zone (APZ);
- 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
<b>Bush fire landscape assessment</b>	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"> <li>The bush fire hazard in the surrounding area, including:                             <ul style="list-style-type: none"> <li>Vegetation</li> <li>Topography</li> <li>Weather</li> </ul> </li> <li>The potential fire behaviour that might be generated based on the above;</li> <li>Any history of bush fire in the area;</li> <li>Potential fire runs into the site and the intensity of such fire runs; and</li> <li>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</li> </ul>
<b>Land use assessment</b>	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"> <li>The risk profile of different areas of the development layout based on the above landscape study;</li> <li>The proposed land use zones and permitted uses;</li> <li>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</li> <li>The impact of the siting of these uses on APZ provision.</li> </ul>
<b>Access and egress</b>	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"> <li>The capacity for the proposed road network to deal with evacuating residents and responding emergency services, based on the existing and proposed community profile;</li> <li>The location of key access routes and direction of travel; and</li> <li>The potential for development to be isolated in the event of a bush fire.</li> </ul>
<b>Emergency services</b>	An assessment of the future impact of new development on emergency services.	<ul style="list-style-type: none"> <li>Consideration of the increase in demand for emergency services responding to a bush fire emergency including the need for new stations/brigades; and</li> <li>Impact on the ability of emergency services to carry out fire suppression in a bush fire emergency.</li> </ul>
<b>Infrastructure</b>	An assessment of the issues associated with infrastructure and utilities.	<ul style="list-style-type: none"> <li>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</li> <li>Life safety issues associated with fire and proximity to high voltage power lines, natural gas supply lines etc.</li> </ul>
<b>Adjoining land</b>	The impact of new development on adjoining landowners and their ability to undertake bush fire management	<ul style="list-style-type: none"> <li>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.</li> </ul>

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

**PROPOSAL REVIEW**

- Review of the proposed additional permitted land usage 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 additional permitted land usage 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 works 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 known as *Bayside Gardens Lifestyle Village* and is located at 7 Pomona Road, Empire Bay (Lot 1 in DP 610629). The site is in the Local Government Area (LGA) of Central Coast Council (Fire Danger Index-100).



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

The site is a large parcel of land that provides the following land conditions within its boundaries:

- Office Building, Amenities and sixty-two [62] movable dwellings on the northern portions
- Movable dwellings and a cottage on the southern portions
- Hardstand areas and internal roads
- Predominantly managed lands throughout the remaining portions of the site

The site is connected to the town-reticulated supply of water with an internal water hydrant/fire hose reel network currently existing. The park is connected to the mains electrical grid.



The property is provided main access via Wards Hill Road to the west (entry point of the park) and is provided with additional access via Pomona Road to the south.

The subject site is currently zoned under the Gosford Local Environmental Plan (LEP) as DM: Deferred Matter e (See Figure 2).

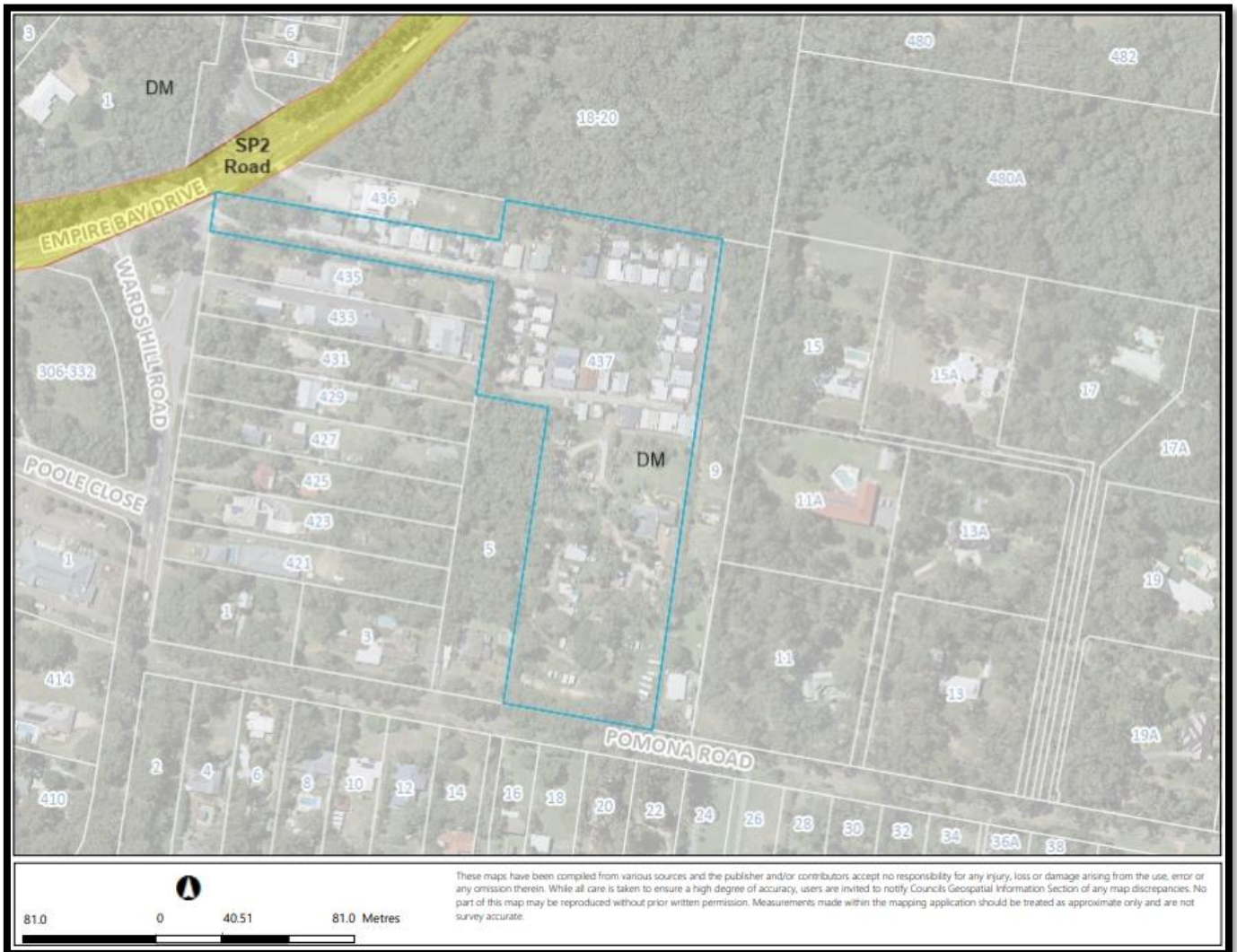


Figure 2: Current Land Zoning (subject site bordered in blue)  
Source: Central Coast Council, 2022

## 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) of Category 1 (red) vegetation and therefore the planning requirements of PBP are applicable.

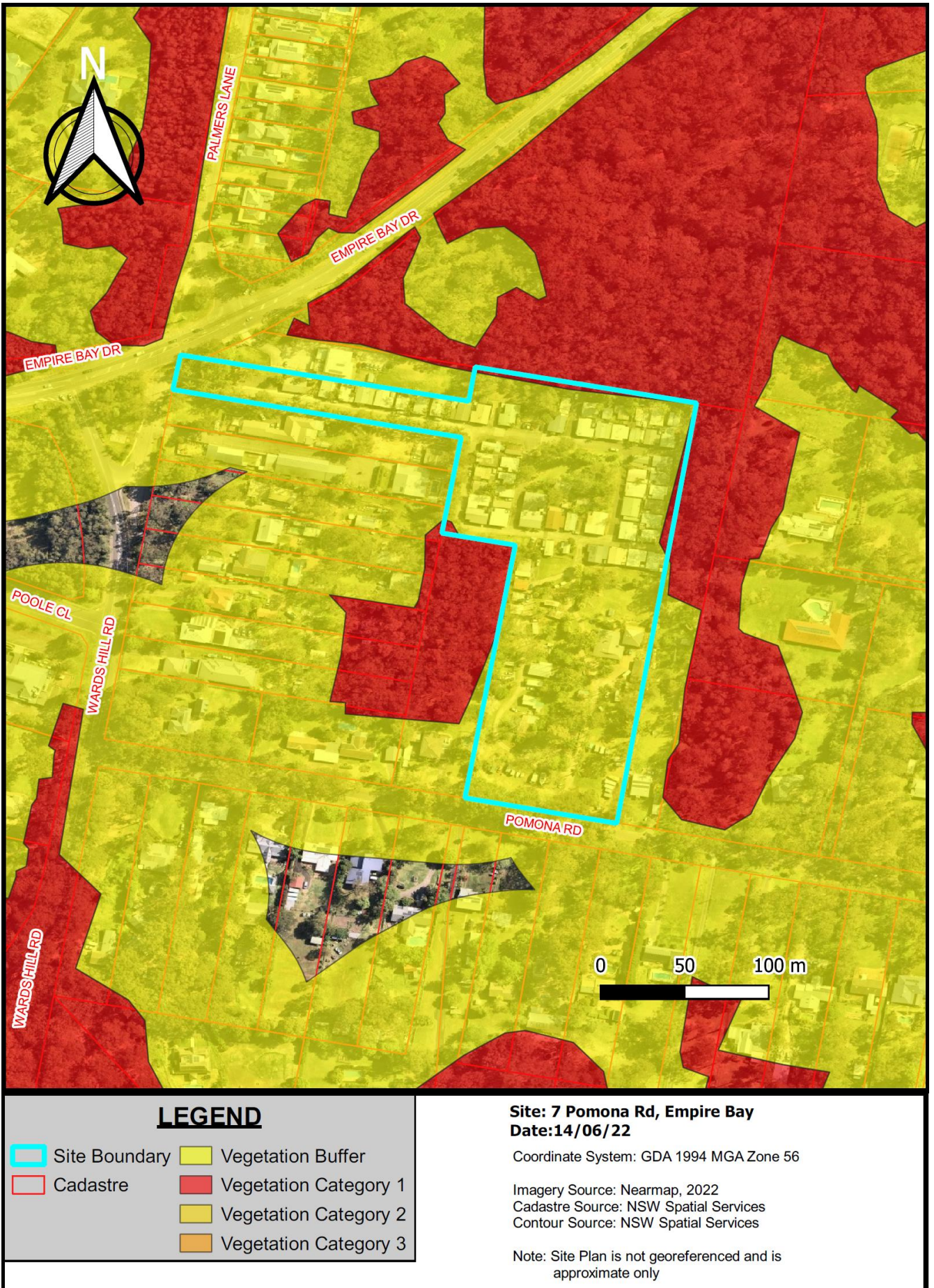


Figure 3: Bushfire Prone Mapping

### **4.3 Proposal**

The property contains an existing mobile home park of which is known as *Bayside Gardens Lifestyle Village*. The Planning Proposal relates to the amendment Schedule 1 of Gosford *Local Environmental Plan* (LEP) 2014 to include an additional permitted use of a caravan park on the subject site.

The proposed land-use change will allow for short-term and long-term accommodation and this assessment will provide requirements for both forms of land usage with reference to PBP. Figure 4 provides a site plan of the existing land usage and the potential future land usage areas on the southern portions.



Figure 4: Proposed Amended Land use 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

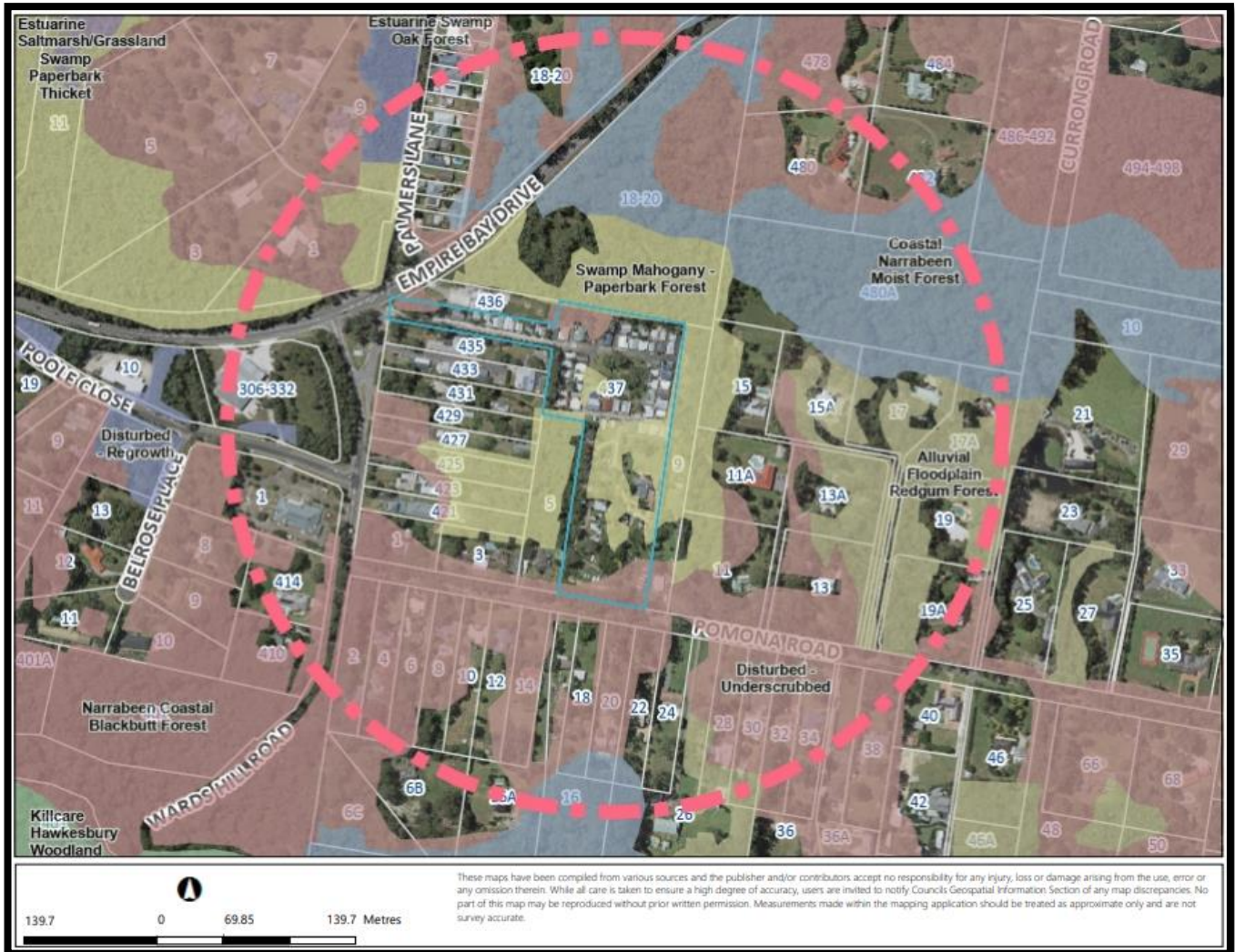
The predominant vegetation communities known to occur within and surrounding the site to a distance of no less than 200m are listed in Table 2 below and mapped on Figure 5. The communities have been categorised into vegetation structural formations according to Keith (2004) and then converted under Appendix 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 Narrabeen Moist Forest	North Coast Wet Sclerophyll Forests	Forest
Swamp Mahogany – Paperbark Forest	Coastal Swamp Forests	Forest
Alluvial Floodplain Redgum Forest	Coastal Swamp Forests	Forest
Estuarine Swamp Oak Forest	Coastal Floodplain Wetlands	Forested Wetland

The predominant pattern of vegetation across the landscape is low-lying land that contains predominantly coastal swamp forests and wet sclerophyll forests on the higher topography to the south and north-east. 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 low-lying lands with a predominately flat grade.

## 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.

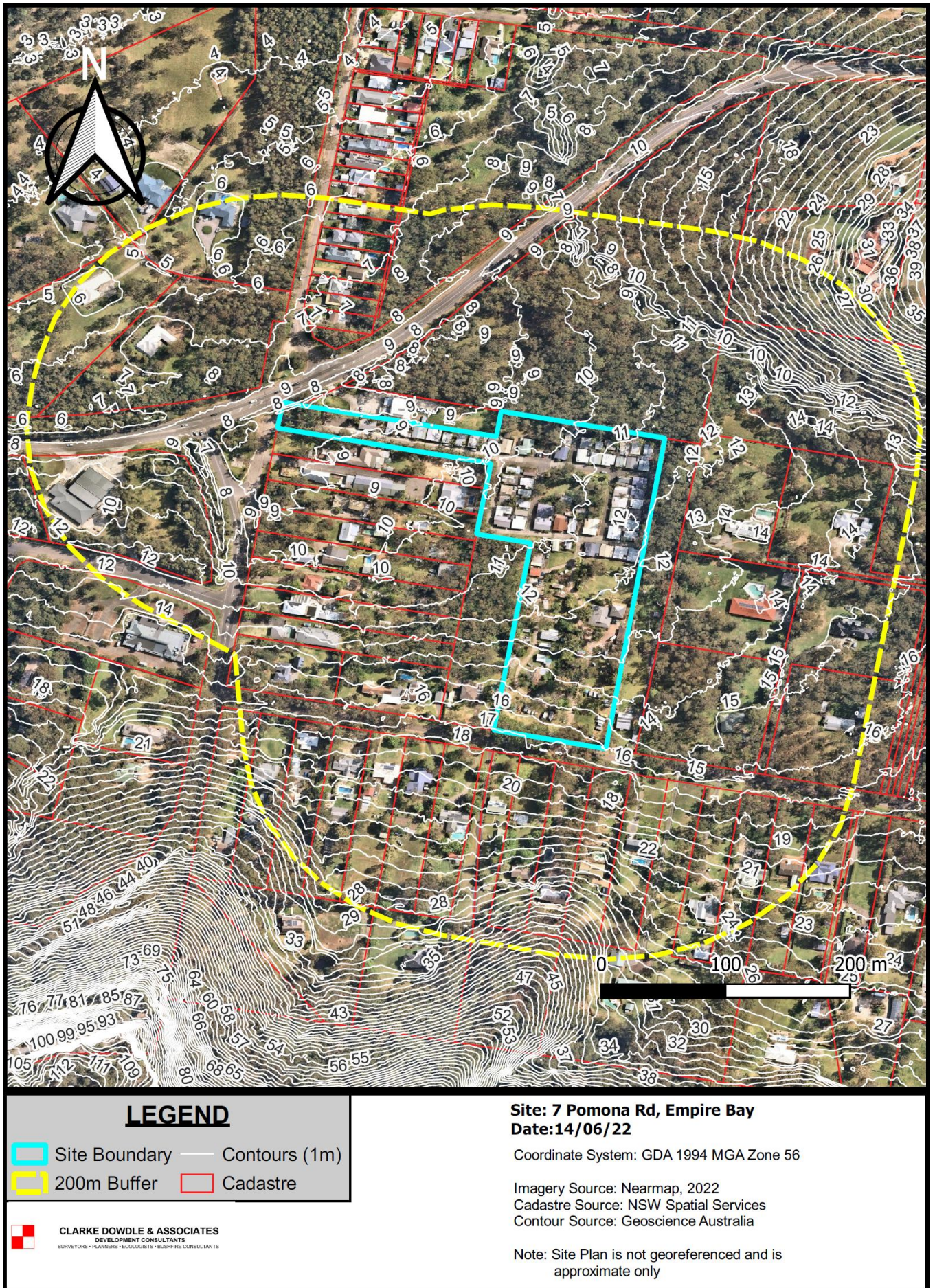


Figure 6: Topographic mapping

### **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 wildfires that have occurred within a 1km radius of the subject site (prescribed burn not displayed).

Several fires can be seen however these fires have not directly impacted the subject site but have occurred mostly to the south 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 north/north-west or human-induced ignition from the road corridors/arson creating the potential for a bushfire to spread from the north to potentially impact the northern section of the subject site. It is noted that the adjoining lands immediately adjoining, appears to be undergoing some land and fuel reduction works and also are approved for a rural residential subdivision which would reduce the potential bushfire threat.

Another potential fire pathway is from the small area of vegetation adjoining the site to the west. This area is small in area and has a mixture of managed and unmanaged understorey, coupled with the small area and short potential fire run, which would significantly inhibit the ability for the development of a full canopy fire event to occur.



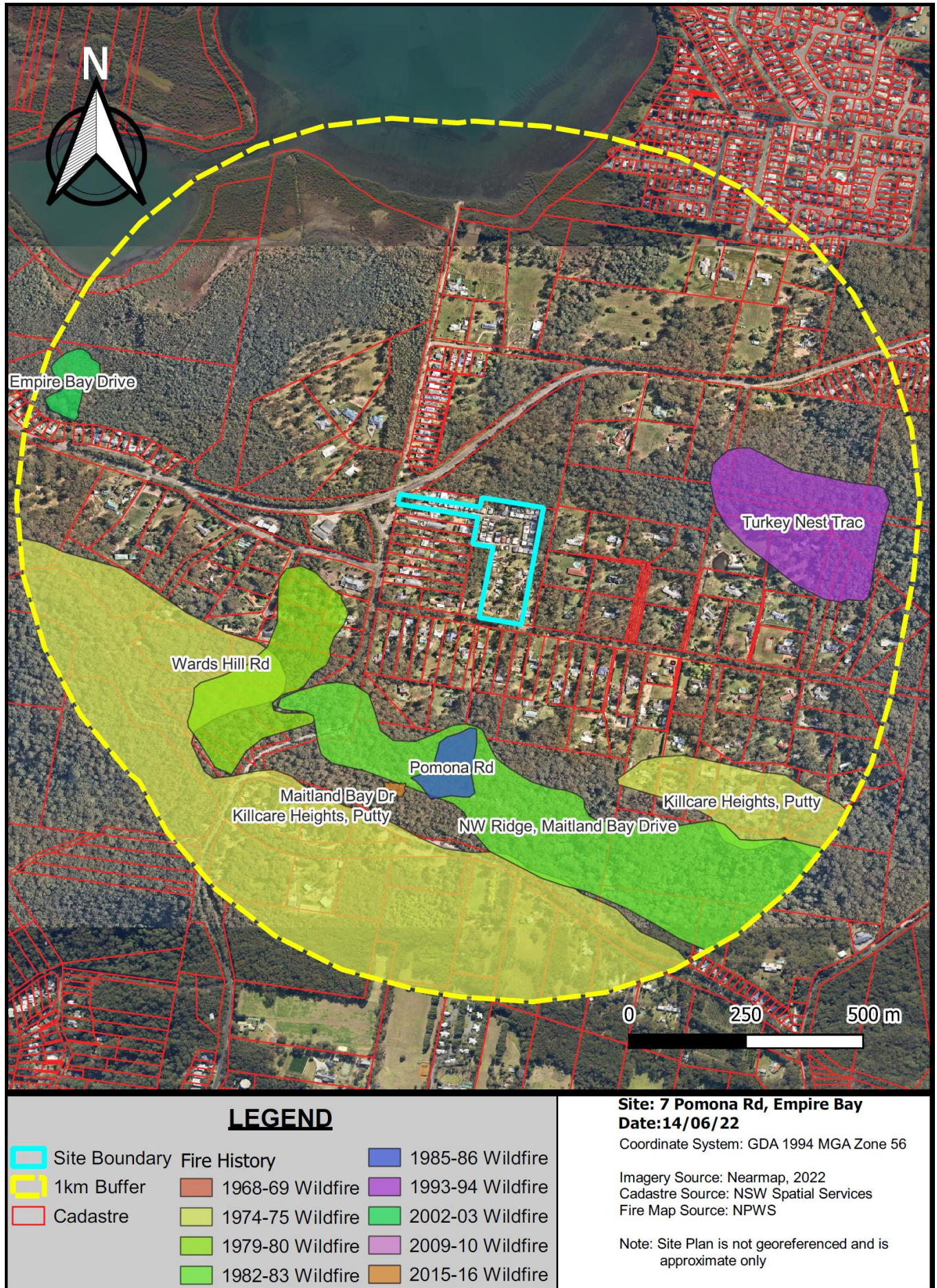


Figure 7: Fire History

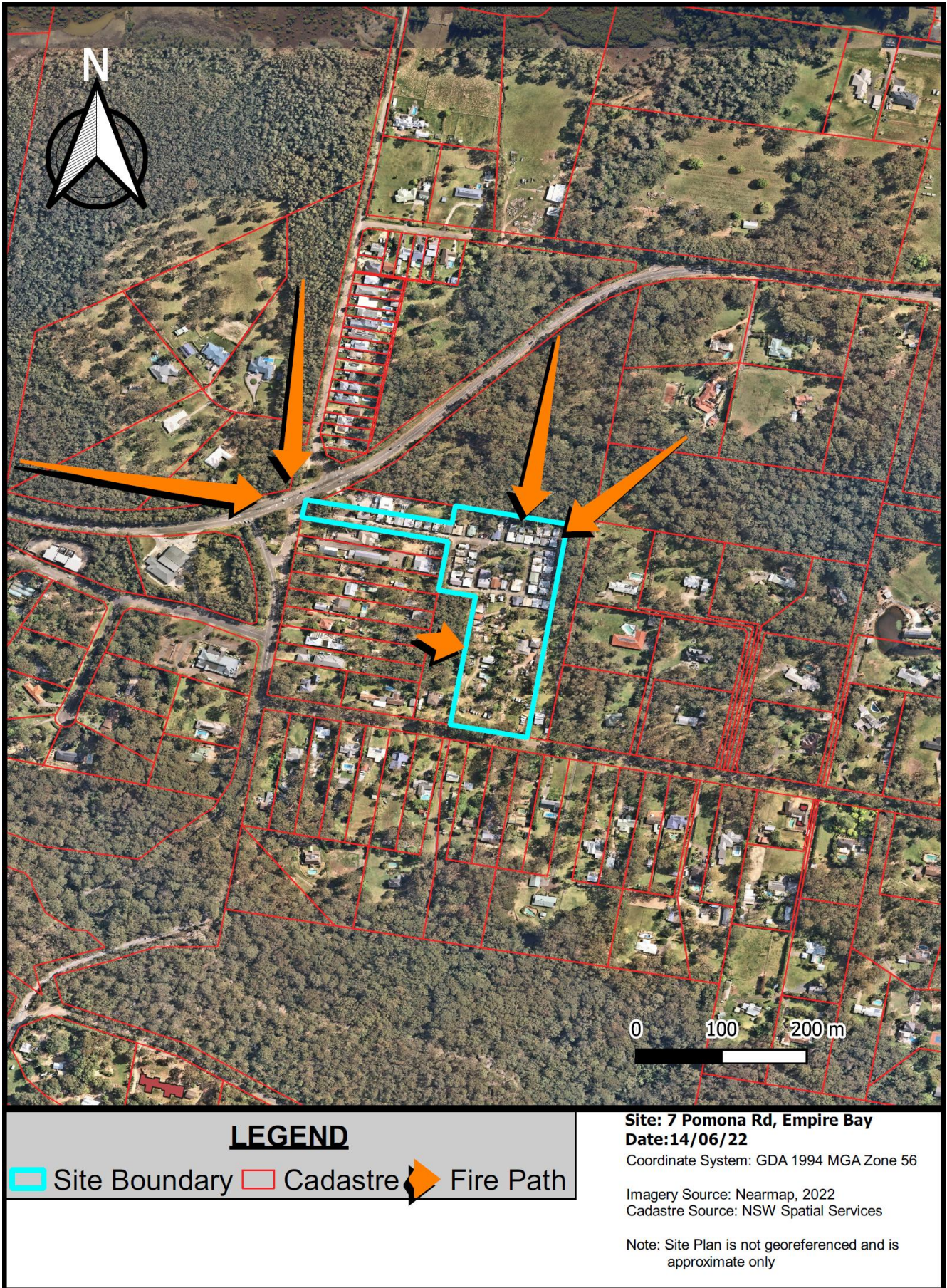


Figure 8: Potential Fire Pathways

## 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 additional permitted land usage 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 additional permitted land usage 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 compliant roads with PBP 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 dependent upon the intended land usage. APZ's describes the distance between the proposed development (the asset) and the hazard (the bushland) and varies 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.

In relation to the site, and the potential mixed land usages, the following performance criteria as outlined within PBP are relevant.

#### **Short-term/Caravan Sites**

*'radiant heat levels of greater than 10kW/m<sup>2</sup> (calculated at 1200K) will not be experienced on any part of the building.'*

#### **Long-term sites (> 6 weeks occupation)**

*'long-term accommodation may be treated as standard residential development and therefore needs to meet a radiant heat threshold of 29kW/m<sup>2</sup>'*

Based upon the above performance requirements of PBP, a summary of the APZ's required for each aspect of the site is provided in Table 1. Table 1 provides a summary of both long-term and short-term accommodation as defined in Section 6.3.1 PBP.

**Table 3: APZ Summary**

Aspect	Vegetation <sup>1</sup> within 140m of development	Effective Slope of Land	APZ required for short-term/caravan sites <sup>2</sup>	APZ required for long-term sites <sup>3</sup>
North	Forest	Flat	67m	24m
South	Managed Lands	Not Required	-	-
East	Managed Lands	Not Required	-	-
West	Remnant <sup>4</sup> (Rainforest)	Flat	38m	11m

**Notes for Table 3:**

- (1) Refer to Keith (2004) and Appendix 1 in *PBP*
- (2) Refer to A1.12.1 in PBP for SFPP Development
- (3) Refer to A1.12.2 in PBP for long-term sites
- (4) See comments Below

To the west of the site is a small of vegetation located within the adjoining property. Land management consists of a mixture of managed and unmanaged understorey beneath a tree layer and as a result, is deemed to be a bushfire hazard. It is noted that as the area of the vegetation is less than 1 Hectare in area, it meets with Section A1.11.1 *Simplified Approach* for assessing remnant bushland and narrow vegetation under PBP. Therefore, this small area can be considered a low hazard and therefore has been assessed as equivalent to a rainforest.

As summarised in Table 1, the following APZ's are required (Figure 5);

- For any proposed short-term/caravan sites, a minimum APZ of 67m is required from the vegetation to the north;
- For any proposed long-term sites a minimum APZ of 24m is required from the vegetation to the north;
- For any proposed short-term/caravan sites, a minimum APZ of 38m is required from the vegetation to the west; and
- For any proposed long-term sites, a minimum APZ of 11m is required from the vegetation to the west.

### **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 and an independent assessment will be required under 100B of the *Rural Fires Act, 1997* at the time of any future application usage of the land for short-term and/or long-term sites with the property.

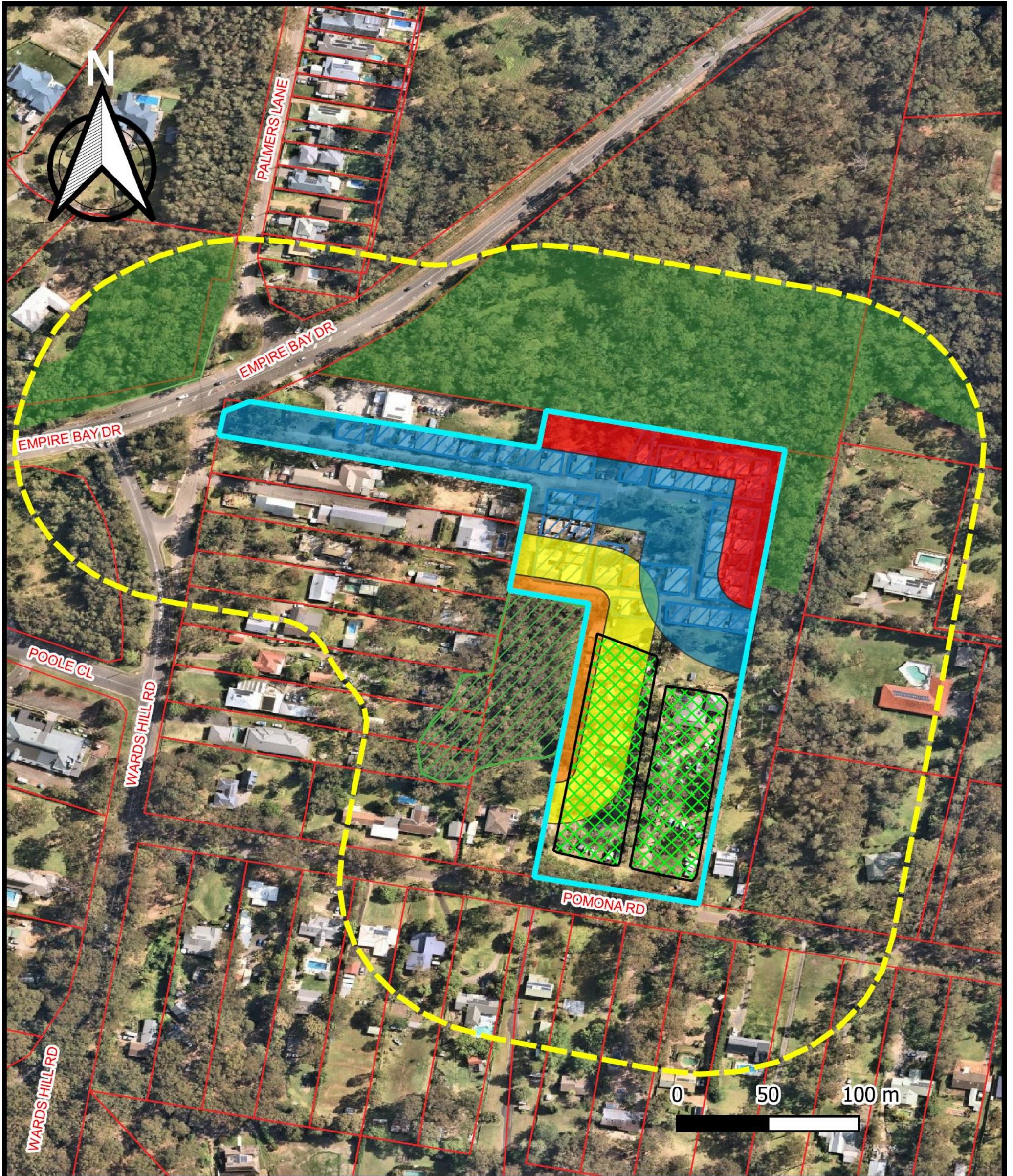
Based on the minimum APZ dimensions listed in Table 3 for any new long-term site, those buildings closest to the hazard will have a maximum rating of BAL-29. The rating reduces to BAL-19, BAL-12.5 and BAL-LOW (no requirements) the further a building is located from a hazard.

The minimum APZ dimension listed in Table 3 for any new short-term site, those buildings closest to the hazard will have a maximum rating of BAL-12.5

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 <sup>2</sup> ). 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 <sup>2</sup> ) 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 <sup>2</sup> ) 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  | Forest     | 24m APZ  |
| Existing Sites | Rainforest | 67m APZ  |
| Future Sites   | 11m APZ    | Cadastre |
| 100m Buffer    | 38m APZ    |          |

**Site: 7 Pomona Rd, Empire Bay**

**Date: 14/06/22**

Coordinate System: GDA 1994 MGA Zone 56

Imagery Source: Nearmap, 2022

Cadastre Source: NSW Spatial Services

Note: Site Plan is not georeferenced and is approximate only

Figure 10: APZ Site Plan

## 7.0 ACCESS AND EGRESS

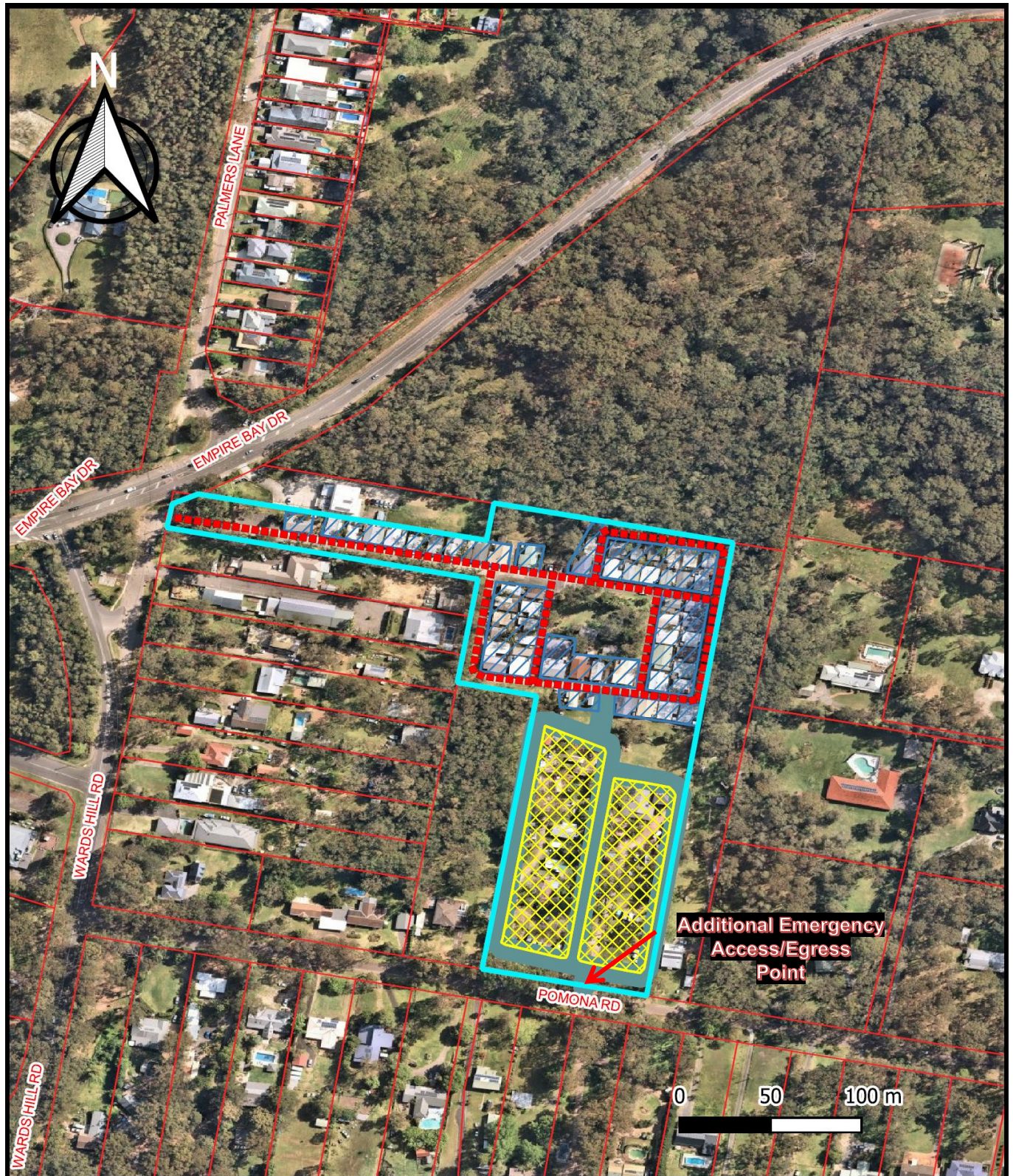
The main access into and egress out of the subject site is currently available from a single point from Wards Hill Road to the west. Any future development will involve additional roads connecting to the existing internal road network inside the park grounds. In addition, the proposed development on the southern areas of the site will include an emergency secondary access/egress point onto/from Pomona Road to the south (See Figure 11).

In the unlikely event that access to the west is cut and roads are impassable, the proposed road connecting to Pomona Road to the south, 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 land usage.

With regards to the future development 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



**LEGEND**

Site Boundary	Future Sites
Existing Sites	Proposed Road/s
Existing Road/s	Cadastre

**Site: 7 Pomona Rd, Empire Bay**  
**Date: 14/06/22**  
 Coordinate System: GDA 1994 MGA Zone 56  
 Imagery Source: Nearmap, 2022  
 Cadastre Source: NSW Spatial Services  
 Note: Site Plan is not georeferenced and is approximate only

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;

- Empire Bay RFS (~3km to the north-west);

Additional NSW Fire and Rescue resources stationed at Kincumber and Woy Woy would also attend any emergency and of which are both located approximately 7km from the site to the east and west respectively. 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 additional permitted land usage 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:

- Public Wharf - Killcare (Open Space), ~3.5km south, located at Araluen Drive, Killcare

## 9.0 INFRASTRUCTURE

### 9.1 Water

Any future works 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 Table 6.8c of PBP. The PBP acceptable solution requirements for water is achievable.

### 9.2 Electricity and gas

Any future works 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 7 Pomona Road, Empire Bay. The assessment was performed in June 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 Table 6.8 of PBP for any future Special Fire Protection Purpose development compliance.

**Asset Protection Zones and Building Construction**

***Intent of measures:*** to provide suitable building design, construction and sufficient space to ensure that radiant heat levels do not exceed critical limits for firefighters and other emergency services personnel undertaking operations, including supporting or evacuating occupants.

	PERFORMANCE CRITERIA	ACCEPTABLE SOLUTIONS	COMMENTS
ASSET PROTECTION ZONES	<p><b><u>Short-Term/Caravan Sites</u></b> radiant heat levels of greater than 10kW/ m<sup>2</sup> (calculated at 1200K) will not be experienced on any part of the building</p>	<ul style="list-style-type: none"> <li>the building is provided with an APZ in accordance with Table A1.12.1 in Appendix 1</li> </ul>	APZ's have been recommended and can be accommodated complying with Table A1.12.1 in Appendix 1.
	<p><b><u>Long-Term Sites</u></b> The building will not be exposed to radiant heat levels exceeding 29kW/m<sup>2</sup> (1090K).</p>	<ul style="list-style-type: none"> <li>the building is provided with an APZ in accordance with Table A1.12.2 in Appendix 1</li> </ul>	APZ's have been recommended and can be accommodated complying with Table A1.12.2 in Appendix 1.
	<p>APZ maintenance is practical, soil stability is not compromised and the potential for crown fires is minimised.</p>	<ul style="list-style-type: none"> <li>APZs are located on lands with a slope less than 18 degrees</li> </ul>	APZ's will occur on lands that a relatively flat
	<p>APZs are managed and maintained to prevent the spread of a fire towards the building.  the APZ is provided in perpetuity</p>	<ul style="list-style-type: none"> <li>the APZ is managed in accordance with the requirements of Appendix 4 of this document, and is wholly within the boundaries of the development site;</li> <li>APZ are wholly within the boundaries of the development site; and</li> <li>other structures located within the APZ need to be located further than 6m from the refuge building.</li> </ul>	Any future development upon the site will be required to comply with this acceptable solution.
LANDSCAPING	<p>landscaping is designed and managed to minimise flame contact and radiant heat to buildings, and the potential for wind-driven embers to cause ignitions</p>	<ul style="list-style-type: none"> <li>landscaping is in accordance with Appendix 4; and</li> <li>fencing is constructed in accordance with section 7.6.</li> </ul>	Any future development upon the site will be required to comply with this acceptable solution.
CONSTRUCTION STANDARDS	<p><b><u>Short-Term/Caravan Sites</u></b> the proposed building can withstand bush fire attack in the form of wind, embers, radiant heat and flame contact</p>	<ul style="list-style-type: none"> <li>a construction level of BAL-12.5 under AS 3959 or NASH Standard and section 7.5 of PBP is applied.</li> </ul>	APZ's have been recommended and can be accommodated complying with Table A1.12.1 in Appendix 1 and therefore BAL 12.5 will not be exceeded
	<p><b><u>Long Term Sites</u></b> the proposed manufactured home can withstand bush fire attack in the form of wind, embers, radiant heat and flame contact.</p>	<ul style="list-style-type: none"> <li>Where an APZ is provided in accordance with Table A1.12.2 or A1.12.3 in Appendix 1 of this document the construction standards for BAL-29 shall apply.</li> </ul>	APZ's have been recommended and can be accommodated complying with Table A1.12.2 in Appendix 1 and therefore BAL 29 will not be exceeded

### Access

***Intent of measures:*** to provide safe operational access for emergency services personnel in suppressing a bush fire, while residents are accessing or egressing an area.

	PERFORMANCE CRITERIA	ACCEPTABLE SOLUTIONS	COMMENTS
<b>ACCESS</b>	firefighting vehicles are provided with safe, all-weather access to structures and hazard vegetation	<ul style="list-style-type: none"> <li>• SFPP access roads are two-wheel drive, all-weather roads;</li> <li>• access is provided to all structures;</li> <li>• traffic management devices are constructed to not prohibit access by emergency services vehicles;</li> <li>• access roads must provide suitable turning areas in accordance with Appendix 3; and</li> <li>• 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</li> </ul>	Any future development upon the site will be required to comply with this acceptable solution
	the capacity of access roads is adequate for firefighting vehicles	<ul style="list-style-type: none"> <li>• 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</li> </ul>	Any future development upon the site will be required to comply with this acceptable solution
	there is appropriate access to water supply.	<ul style="list-style-type: none"> <li>• hydrants are located outside of parking reserves and road carriageways to ensure accessibility to reticulated water for fire suppression;</li> <li>• hydrants are provided in accordance with the relevant clauses of AS 2419.1:2005; and there is suitable access for a Category 1 fire appliances to within 4m of the static water supply where no reticulated supply is available</li> </ul>	Any future development upon the site will be required to comply with this acceptable solution
<b>PERIMETER ROAD</b>	perimeter access roads are designed to allow safe access and egress for firefighting vehicles while occupants 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"> <li>• there are two-way sealed roads;</li> <li>• minimum 8m carriageway width kerb to kerb;</li> <li>• parking is provided outside of the carriageway width;</li> <li>• hydrants are to be located clear of parking areas;</li> <li>• there are through roads, and these are linked to the internal road system at an interval of no greater than 500m;</li> <li>• curves of roads have a minimum inner radius of 6m;</li> <li>• the maximum grade road is 15 degrees and average grade of not more than 10 degrees;</li> <li>• the road crossfall does not exceed 3 degrees; and</li> <li>• a minimum vertical clearance of 4m to any overhanging obstructions, including tree branches, is provided</li> </ul>	No perimeter roads are applicable
<b>NON-PERIMETER ROAD</b>	non-perimeter access roads are designed to allow safe access and egress for firefighting vehicles while occupants are evacuating	<ul style="list-style-type: none"> <li>• minimum 5.5m carriageway width kerb to kerb;</li> <li>• parking is provided outside of the carriageway width;</li> <li>• hydrants are located clear of parking areas;</li> <li>• there are through roads, and these are linked to the internal road system at an interval of no greater than 500m;</li> <li>• curves of roads have a minimum inner radius of 6m;</li> <li>• the maximum grade road is 15 degrees and average grade of not more than 10 degrees;</li> <li>• the road crossfall does not exceed 3 degrees; and</li> <li>• a minimum vertical clearance of 4m to any overhanging obstructions, including tree branches, is provided.</li> </ul>	<p>Any future development upon the site will be required to comply with this acceptable solution.</p> <p>In addition, an emergency access road can/will be provided for the internal road network linking the site to Pomona Road to the south (See Figure 1)</p>

### 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	COMMENTS
<b>WATER SUPPLY</b>	an adequate water supply for firefighting purposes is installed and maintained.	<ul style="list-style-type: none"> <li>reticulated water is to be provided to the development, where available</li> </ul>	A Reticulated supply of water is provided to the property and any future development.
	Water supplies are located at regular intervals, the water supply is accessible and reliable for firefighting operations	<ul style="list-style-type: none"> <li>fire hydrant spacing, design and sizing comply with the relevant clauses of AS 2419.1:2005;</li> <li>hydrants are not located within any road carriageway; and</li> <li>reticulated water supply to SFPPs uses a ring main system for areas with perimeter roads.</li> </ul>	Any future development upon the site will be required to comply with this condition
	flows and pressure are appropriate	<ul style="list-style-type: none"> <li>fire hydrant flows and pressures comply with the relevant clauses of AS 2419.1:2005.</li> </ul>	Any future development upon the site will be required to comply with this condition
	the integrity of the water supply is maintained.	<ul style="list-style-type: none"> <li>all above-ground water service pipes external to the building are metal, including and up to any taps</li> </ul>	Any future development upon the site will be required to comply with this condition
<b>ELECTRICAL SERVICES</b>	location of electricity services limits the possibility of ignition of surrounding bush land or the fabric of buildings	<ul style="list-style-type: none"> <li>where practicable, electrical transmission lines are underground;</li> <li>where overhead, electrical transmission lines are proposed as follow:</li> <li>lines are installed with short pole spacing (30m),</li> <li>unless crossing gullies, gorges or riparian areas; and</li> <li>no part of a tree is closer to a power line than the distance set out in accordance with the specifications in ISSC3 Guideline for Managing Vegetation Near Power Line</li> </ul>	Any future development upon the site will be required to comply with this condition
<b>GAS SERVICES</b>	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"> <li>reticulated or bottled gas is installed and maintained in accordance with AS/NZS 1596:2014</li> <li>and the requirements of relevant authorities, and</li> <li>metal piping is used;</li> <li>all fixed gas cylinders are kept clear of all flammable materials to a distance of 10m and shielded on the hazard side;</li> <li>connections to and from gas cylinders are metal;</li> <li>if gas cylinders need to be kept close to the building, safety valves are directed away from the building and at least 2m away from any combustible material, so they do not act as a catalyst to combustion;</li> <li>polymer-sheathed flexible gas supply lines to gas meters adjacent to buildings are not to be used; and</li> <li>above-ground gas service pipes external to the building are metal, including and up to any outlets</li> </ul>	Any future development upon the site will be required to comply with this condition



### Emergency management planning

**Intent of measures:** to provide suitable emergency and evacuation arrangements for occupants of SFPP developments.

	PERFORMANCE CRITERIA	ACCEPTABLE SOLUTIONS	COMMENTS
<b>EMERGENCY MANAGEMENT</b>	a Bush Fire Emergency Management and Evacuation Plan is prepared	Bush Fire Emergency Management and Evacuation Plan is prepared consistent with the: <ul style="list-style-type: none"> <li>The NSW RFS document: <i>A Guide to Developing a Bush Fire Emergency Management and Evacuation Plan</i>;</li> <li>NSW RFS Schools Program Guide;</li> <li>Australian Standard AS 3745:2010 Planning for emergencies in facilities; and</li> <li>Australian Standard AS 4083:2010 Planning for emergencies – Health care facilities (where applicable).</li> </ul> • the Bush Fire Emergency Management and Evacuation Plan should include planning for the early relocation of occupants. • Note: A copy of the Bush Fire Emergency Management and Evacuation Plan should be provided to the Local Emergency Management Committee for its information prior to occupation of the development	Any future development upon the site will be required to comply with this condition
	appropriate and adequate management arrangements are established for consultation and implementation of the Bush Fire Emergency Management and Evacuation Plan	<ul style="list-style-type: none"> <li>an Emergency Planning Committee is established to consult with residents (and their families in the case of aged care accommodation and schools) and staff in developing and implementing an Emergency Procedures Manual; and</li> <li>detailed plans of all emergency assembly areas including on-site and off-site arrangements as stated in AS 3745:2010 are clearly displayed, and an annually emergency evacuation is conducted</li> </ul>	Any future development upon the site will be required to comply with this condition

