DAVID PENSINI
Building Certification and
Environmental Services

BUSHFIRE HAZARD ASSESSMENT

PROPOSED REZONING AND TORRENS TITLE SUBDIVISION

LOT 1 DP 11117908 & LOT 10 DP 615775 19 HOUSTON MITCHELL DRIVE, BONNY HILLS

CLIENT: A MIFSUD

JANUARY 2018

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This report has been prepared by David Pensini – Building Certification and Environmental Services with all reasonable skill, care and diligence for A Mifsud.

The information contained in this report has been gathered from discussions with representatives of A Mifsud, a review of the plans provided on behalf of A Mifsud and experience.

No inspection or assessment has been undertaken on other aspects of the proposed development outside the scope of this report.

This report does not imply, nor should it be implied, that the proposed development will comply fully with relevant legislation.

The report shall not be construed as relieving any other party of their responsibilities or obligations.

David Pensini – Building Certification and Environmental Services disclaims any responsibility A Mifsud and others in respect of any matters outside the scope of this report.

The report is confidential, and the writer accepts no responsibility of whatsoever nature, to third parties who use this report, or part thereof is made known. Any such party relies on this report at their own risk.

For and on behalf of David Pensini – Building Certification and Environmental Services.

Prepared by: *David Pensini*

Signed: 

Dated: *27th January 2018*

Version	**Date**	**Information relating to report**			
		Reason for issue			
1.0	20th January 2018		Draft		
2.0	27th January 2018		Issued to Client		
3.0	17th February 2018		Report updated to reflect requirements for industrial development		
			Prepared by	**Verified by**	**Approved by**
		Name	David Pensini		David Pensini
		Signature			

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1.0 INTRODUCTION

The land which comprises the subject site is known as Lot 1 DP 11117908 and Lot 10 DP 615775, 19 Houston Mitchell Drive, Bonny Hills.

It is proposed to rezone the subject site so as to support the Torrens Title industrial subdivision of the subject site. The rezoning of the land is required in order to provide for twenty-seven (27) separate Torrens Title lots together with residual lots which would be rezoned to an Environmental Management (E3) land use zone.

This report is based on site assessments carried out on 25th January 2018.

The purpose of this report is to demonstrate that the bushfire risk is manageable for the proposed rezoning and associated Torrens Title industrial subdivision of the subject site and to determine the bushfire protection management measures which are applicable to the development of the subject site.

The development is not an integrated development and has no requirement for a Bush Fire Safety Authority under Section 100B of the *Rural Fires Act 1997*.

NOTE

The report has been prepared with all reasonable skill, care and diligence.

The information contained in this report has been gathered from field survey, experience and has been completed in consideration of the following legislation.

1. Rural Fires Act 1997.
2. Environmental Planning and Assessment Act 1979.
3. Building Code of Australia.
4. Council Local Environment Plans and Development Control Plans where applicable.
5. NSW Rural Fire Services, Planning for Bushfire Protection, 2006.
6. AS 3959 - 2009 Construction of Buildings in Bushfire Prone Areas.

The report recognizes the fact that no property and lives can be guaranteed to survive a bushfire attack. The report examines ways the risk of bushfire attack can be reduced where the site falls within the scope of the legislation.

The report is confidential, and the writer accepts no responsibility of whatsoever nature, to third parties who use this report or part thereof is made known. Any such party relies on this report at their own risk.

This report has been based upon the vegetation characteristics observed at the time of site inspection. No responsibility is taken where the vegetation characteristics of the subject site or surrounding areas is changed or modified beyond that which is presented within this report.

1.1 Objectives

The objectives of this report are to:

- Ensure that the proposed rezoning of the land has measures sufficient to minimize the impact of bushfires; and
- Ensure that the proposed Torrens Title industrial subdivision of the land has measures sufficient to minimize the impact of bushfires; and
- Reduce the risk to property and the community from bushfire.

1.2 Legislative Framework

On 1st August 2002, the Environmental Planning and Assessment Act 1979 and the Rural Fires Act 1997 were both amended to enhance bush fire protection through the development assessment process.

In broad terms, the planning considerations provide two main steps. These involve:

(a) Strategic Planning through;

• the mapping of bush fire prone;
• determining suitable bush fire requirements during the preparation of a Local Environmental Plan and/or Development Control Plan; and
• the identification of the extent to which land is bushfire prone.

(b) Development assessment through;

• obtaining a bush fire safety authority for residential or rural-residential subdivision and special fire protection purpose developments in bushfire prone areas from the Rural Fire Service (RFS);

• seeking advice from the RFS in relation to infill and other developments in bushfire prone areas that cannot comply with the requirements of NSW Rural Fire Service**, *Planning for Bushfire Protection***, 2006; and

• the application of additional requirements of the Building Code of Australia (BCA) in relation to construction standards for Class 1, 2, 3, 4 and some Class 9 buildings in bushfire prone areas.

It is noted that this report focuses upon the strategic planning processes associated with the proposed rezoning of the subject site in the context of the proposed industrial subdivision concept for the subject site.

1.2.1 Strategic Planning Considerations

Local Environmental Plans, (LEP's), and Development Control Plans, (DCP's), are the best way of strategically achieving bush fire protection objectives. Inclusion of bush fire planning provisions in an LEP:

• gives weight to bush fire management planning principles, ensuring they are considered at subdivision and construction stages;

• can allow for sufficient space to be incorporated into land use zones for setbacks and adequate access for firefighting and evacuation; and

• controls inappropriate land uses in Bushfire Prone Areas.

LEP amendments that affect Bushfire Prone Areas are required to address the planning principles of NSW Rural Fire Service, ***Planning for Bushfire Protection***, 2006. Where appropriate the proposed land uses must be considered with respect to bush fire protection, (including appropriate setbacks).

If a proposed amendment to land use zoning or land use affects a designated Bushfire Prone Area, then the Section 117(2) Direction No 19 must be applied, (Section 117 of the Environmental Planning and Assessment Act, 1979) provides for the Minister for Planning to direct a council, in relation to the preparation of a draft LEP, to apply the planning principles specified in that direction. The Section 117 Direction No 19 requires councils to:

• *consult with the Commissioner of the Rural Fire Service (RFS) under section 62 of the Environmental Planning and Assessment Act, 1979, and to take into account any comments by the Commissioner; and*

• *have regard to the relevant planning principles of NSW Rural Fire Service, **Planning for Bushfire Protection**, 2006.*

If a council proceeds with a draft LEP that does not comply with the provisions in the Section 117 Direction, the council must obtain written advice from the Commissioner of the Rural Fire Service to the effect that the RFS does not object to that non-compliance.

The requirement to review LEP's in accordance with the Standard LEP is an opportunity to consider appropriate uses on Bush Fire Prone Land as well as exempt and complying development provisions.

1.2.2 Objectives for Industrial Subdivision Developments

It is noted that all classes of development, (including industrial subdivision), within bushfire prone areas are required to meet the general aims and objectives of NSW Rural Fire Services, ***Planning for Bushfire Protection***, 2006 rather than meeting the specific bushfire threat management objectives which are relevant to residential subdivision, Special Fire Protection developments and infill developments. In this regard NSW Rural Fire Services, ***Planning for Bushfire Protection***, 2006 states;

*'for other classes of building, (such as factories, shops and warehouses), bushfire protection measures will only apply at the Development Application stage. Consent will be developed on a case by case basis without the need to refer the development application to the RFS. However, if the council is concerned that the development does not meet the aim and objectives of NSW Rural Fire Services, **Planning for Bushfire Protection**, 2006, then the matter may be referred to the RFS for advice. The provisions under the Building Code of Australia for fire safety will be accepted for bushfire purposes where the aims and objectives of NSW Rural Fire Services, **Planning for Bushfire Protection**, 2006 can be met'.*

The general aims and objectives of NSW Rural Fire Services, ***Planning for Bushfire Protection***, 2006 which are therefore relevant to industrial subdivision development are as follows;

(i) afford occupants of any building adequate protection from exposure to a bush fire;
(ii) provide for a defendable space to be located around buildings;
(iii) provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent direct flame contact and material ignition;
(iv) ensure that safe operational access and egress for emergency service personnel and residents is available;
(v) provide for ongoing management and maintenance of bush fire protection measures, including fuel loads in the asset protection zone (APZ); and
(vi) ensure that utility services are adequate to meet the needs of firefighters (and others assisting in bush firefighting).

The proposed industrial subdivision of the subject site and any future industrial development of the areas of land which are the subject of this report must meet the above objectives together with the relevant acceptable solutions/standards which are applicable to the industrial subdivision development.

As the proposed development does not involve the residential subdivision of the subject site nor does it involve Special Protection Purpose development, the development of the subject site for the purposes of an industrial subdivision is not considered to be an integrated development and does not have a requirement for a Bush Fire Safety Authority under Section 100B of the *Rural Fires Act 1997*.

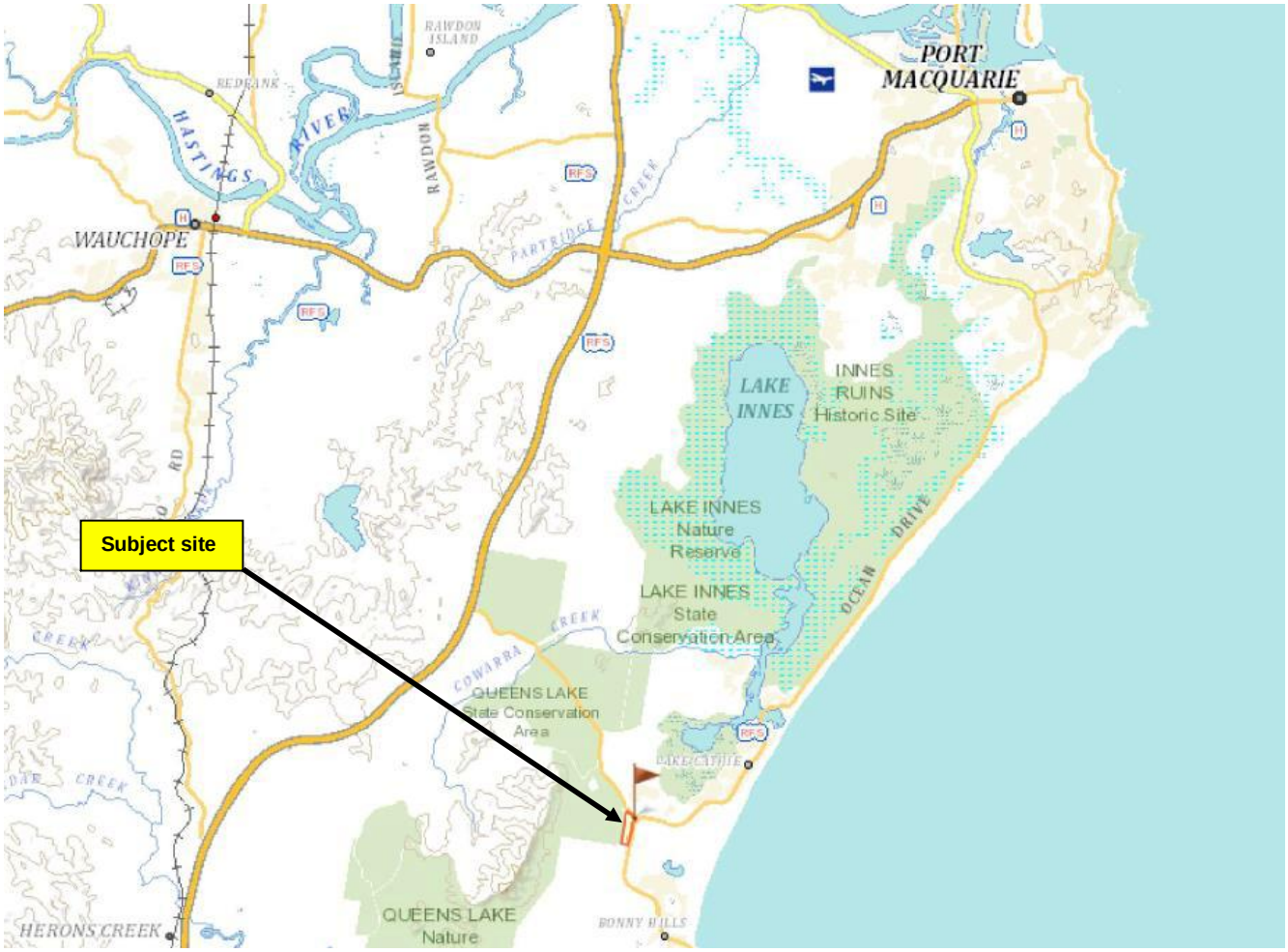
1.3 Location Description

The subject site is known as Lot 1 DP 11117908 and Lot 10 DP 615775, 19 Houston Mitchell Drive, Bonny Hills and is situated within the Port Macquarie-Hastings local government area.

The subject site is located approximately 17km to the southwest of Port Macquarie Central Business District (CBD) and approximately 700m to the southwest of the coastal village of Lake Cathie and approximately 700m to the northwest of the coastal village of Bonny Hills.

The general location of the area that is the subject of this report can be seen in **Figure 1** below.

Figure 1 - Site Location



Forming part of the Area 14 Urban Growth Precinct, (which is located between the existing urbanized areas of Lake Cathie and Bonny Hills), the land within this area has recently and will continue to experience significant urban expansion with residential development expanding into residentially zoned but undeveloped land with a rural/rural residential land use history and character.

Therefore, the character of the locality is that of an urban fringe area with residential development expanding into undeveloped residentially zoned parcels of land. The subject site is located to the southwest of the southernmost extent of the urban footprint of Lake Cathie.

Rural/rural residential development is present to the south and southeast of the subject site with the Lake Cathie Public School on adjacent land to the east. The recent construction of the school in this aspect reinforces the transition in land use which is occurring in the locality. Extensive areas of bushland are present to the west of the subject site, (Queens Lake State Conservation Area). Larger residential sized allotments of land are present at distance to the north of the subject site although a large area of residentially zoned land separates the subject site from the developed larger residential lots. The residentially zoned land to the north of the subject site has been approved for residential subdivision with the first stages of the subdivision present to the northeast of the subject site.

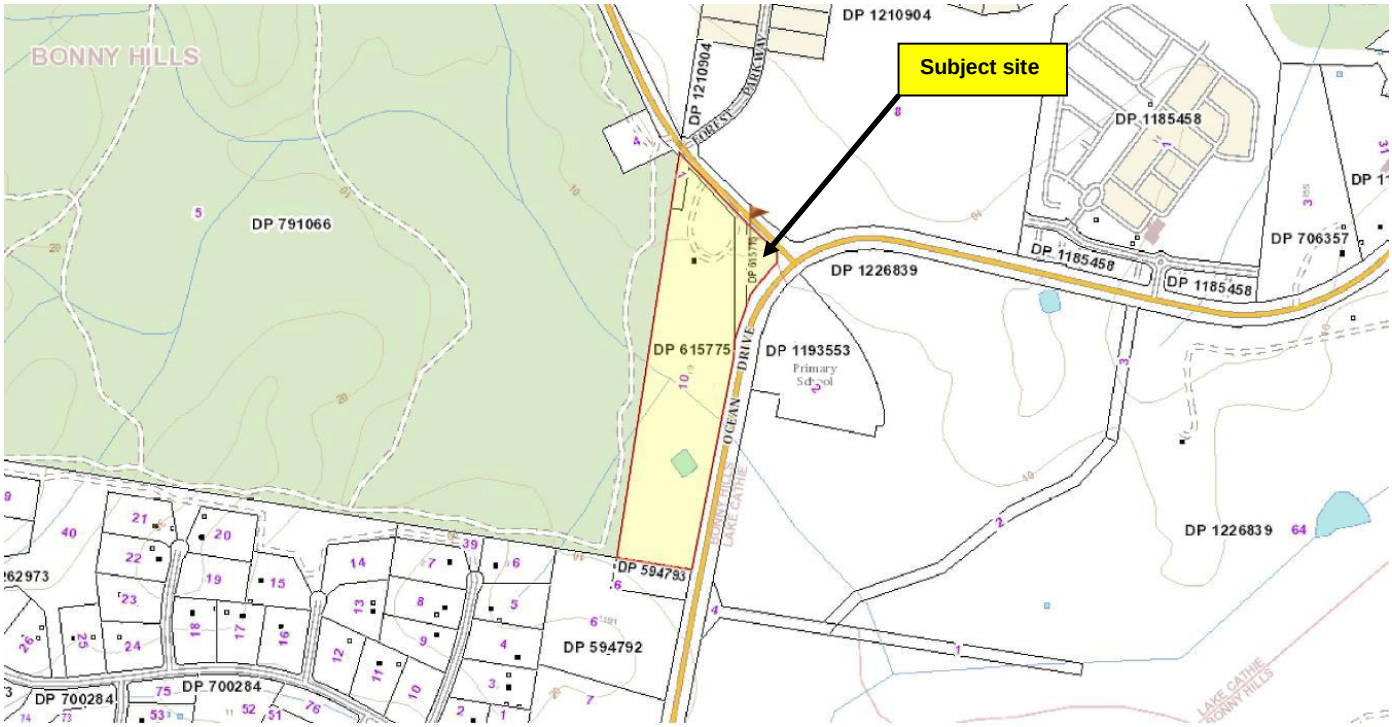
At distance to the northeast of the subject site is the 'Ocean Club Resort' Manufactured Housing Estate (MHE). This complex encompasses detached residential dwellings within a managed community environment, refer to **Figure 2** below.

The closest Rural Fire Service, (Lake Cathie Rural Fire Service), is located approximately 2.3km to the northeast of the subject site and the closest fire control centre is located at Wauchope.

1.4 Site Description and History

The subject site is irregular in shape and currently comprises two (2) separate Torrens Title lots with a site area of approximately 9.54 hectares, refer to **Figure 2**.

Figure 2 – Subject Site



The subject site currently contains a residential dwelling and a large detached shed with these improvements being located in the northern portion of the subject site. Other improvements onsite include access roads and property fencing.

Existing dwelling in far northern portion of the subject site

Existing shed in far northern portion of the subject site

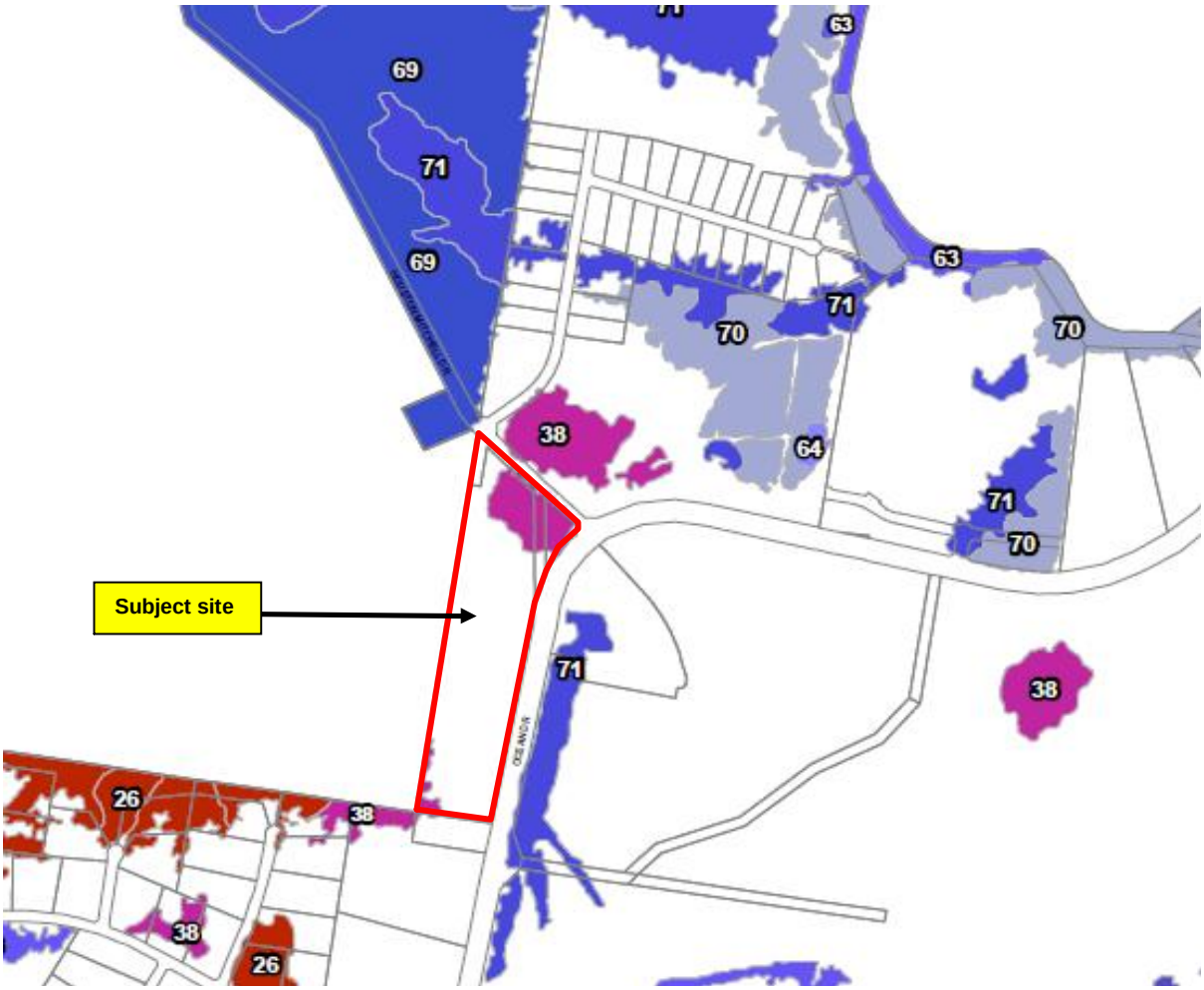
The topography of the subject site and the immediate area is influenced by a northwest to southeast ridgeline the crest of which is roughly defined by the east west alignment of the Houston Mitchell Drive road reserve. Being located on the southern foot slopes of the ridgeline the subject site and surrounding land contains gentle north to south downslopes. The presence of a small intermittently easterly flowing creek in the southern central portion of the subject site defines a transition in slope conditions to upslopes.

Access to the subject site is available via Houston Mitchell Drive which adjoins the subject site along its northern property boundary. Houston Mitchell Drive is the main connecting road between the Pacific Highway in the west and Ocean Drive in the east. It is noted that whilst the subject site has frontage to Ocean Drive along its eastern property boundary although no vehicle access is available to the subject site from the Ocean Drive road reserve.

Grasslands with scattered trees occupy the majority of the subject site whilst a remnant area of highly disturbed Dry Sclerophyll Forest is present in the far central northern portion of the site. Grasslands with scattered and small clusters of trees are present to the south although some isolated remnants of Forest vegetation are present to the southwest. A narrow area of Forested Wetland vegetation amongst grasslands is present to the east of the subject site with extensive areas of Wet Sclerophyll Forest and Forested Wetland present to the west of the subject site. A remnant area of highly disturbed Dry Sclerophyll Forest is present to the north of the subject site, (to the north of the Houston Mitchell Drive road reserve), which is surrounded by Grasslands.

The vegetation characteristics of the subject site and adjoining and adjacent land are shown in **Figure 3** below;

Figure 3 – Vegetation Characteristics

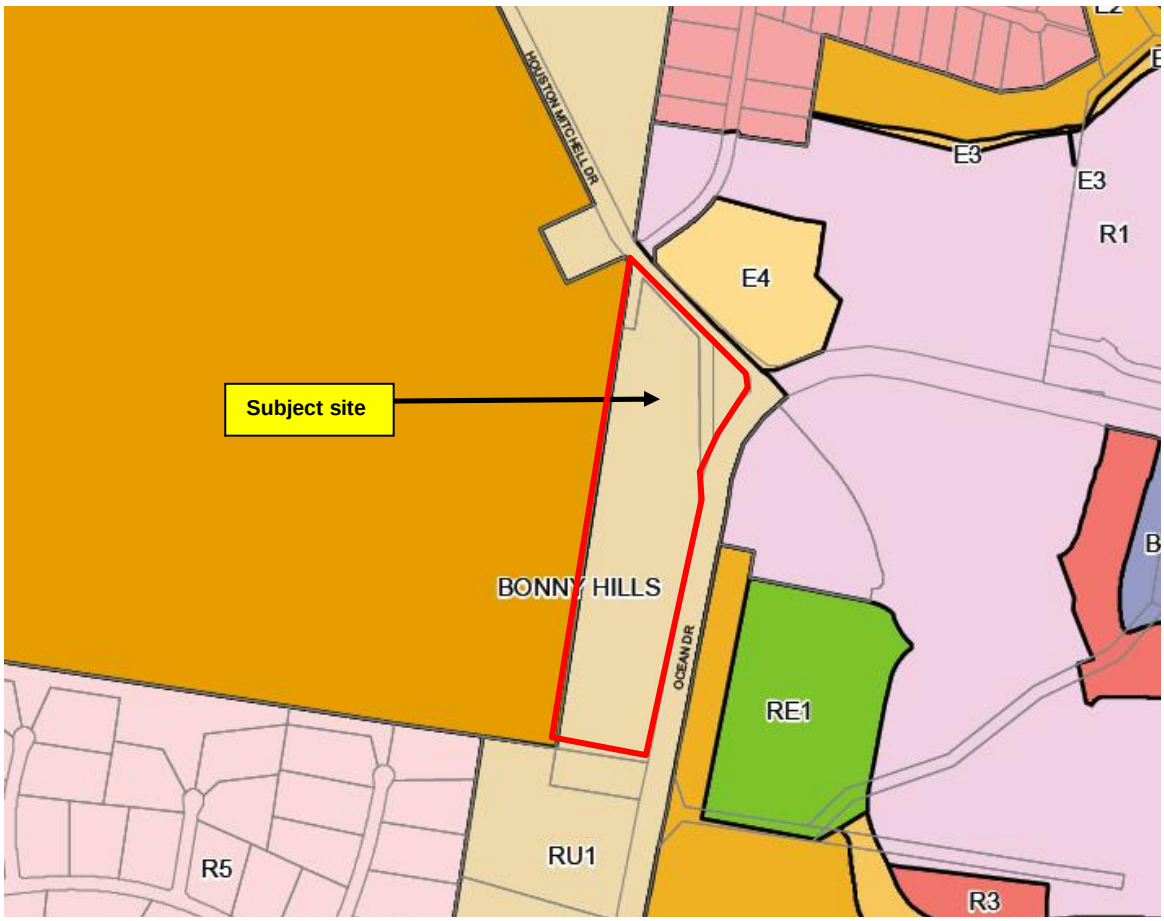


Being located within the Area 14 Urban Growth Area, (which is located between the urbanized areas of the Lake Cathie and Bonny Hill villages), the land within this area has recently and will continue to experience significant urban expansion with residential development expanding into residentially zoned but undeveloped land with a rural/rural residential land use history up until more recent times. It is noted that the residential subdivision, (151 residential lots), of the land to the north/northeast of the subject site has recently been approved by Port Macquarie Hastings Council with Stage 1 of the approved development having been completed.

Recently completed stage of approved residential subdivision to the north of the subject site

The area of land within the subject site has a current land use zoning of Rural (RU1) with a similar land use zone applying to the adjoining land to the south. It is noted that land with an Environmental Living land use zoning (E4) is present to the north of the subject site together with land zoned for Residential (R1) development. Land with an Environmental Conservation Zoning, (E3), is present to the west whilst there is a mixture of land use in the eastern aspect which includes Residential (R1), Environmental Management (E2) and Public Recreation (RE1), refer to **Figure 4** below.

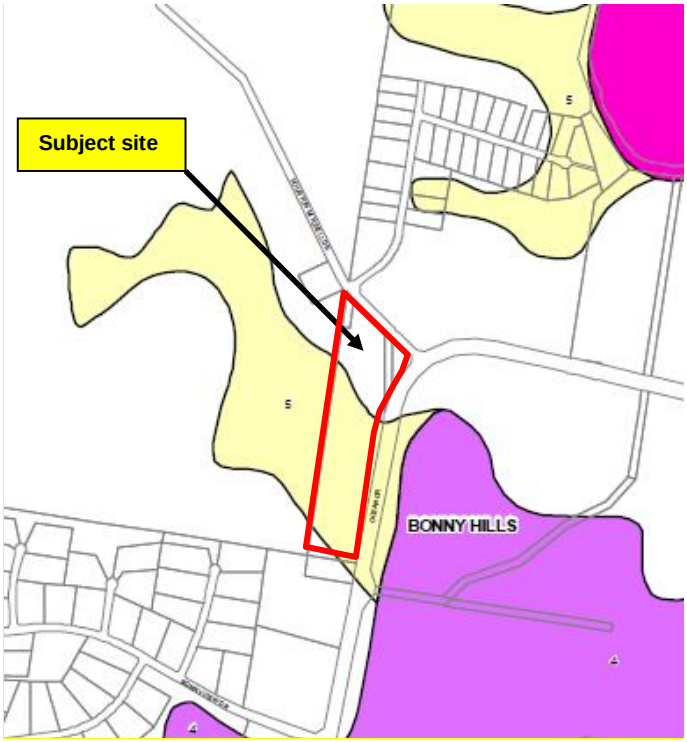
Figure 4 – Landuse Zoning



Fire has not recently occurred on the subject site or on adjoining and adjacent land.

The environmental and heritage features of the area of the subject site which forms the basis of this report are summarized as follows;

Table 1 – Environmental and Heritage Features

ENVIRONMENTAL/HERITAGE FEATURE	COMMENT
Riparian Corridors	The subject site does not contain any identified riparian corridors.
SEPP 14 – Coastal Wetland	The subject site is not identified as being subject to SEPP 14 – Coastal Wetlands in the area of the proposed development.
SEPP 26 – Littoral Rainforest	The subject site is not identified as being subject to SEPP 26 – Littoral Rainforest.
SEPP 44 – Koala Habitat	The application of SEPP 44 to the subject site requires assessment. For the purposes of this report it has been assumed that the provisions of SEPP 44 are not applicable in relation to the proposed development given the highly disturbed and modified floristic characteristics which are present.
Areas of geological interest	The central and southern portions of the subject site is identified as potentially containing Class 5 Acid Sulphate Soils in accordance with Port Macquarie - Hastings Local Environmental Plan, 2011.  Given the nature of the proposed development the presence of Acid Sulphate Soils is not expected to be of any significance to the proposed development. Based upon previous land use it is expected that no land contamination issues will be relevant to the subject site.

Environmental Protection Zones	The subject site is currently zoned Rural (RU1), refer to **Figure 3** above.
Land slip	Given the topography of the subject site and surrounding areas land slip is not considered to be an issue for the subject site.
Flood prone land	The subject site is not identified as being flood prone land and as such the land is not affected by the probable maximum flood level. As such the flood planning provisions of Port Macquarie-Hastings Councils LEP, 2011 are not applicable to the subject site.
National Park Estate or other Reserves	The subject land does not form part of the National Park Estate or other Reserves.
Threatened species, populations, endangered ecological communities and critical habitat	Given the level of historic disturbance of the subject site no threatened flora or fauna species are expected to be present on the subject site. The presence of threatened species, populations, endangered ecological communities and critical habitat on the subject site requires specific assessment.
Ecologically Endangered Communities (EEC's)	Given the level of historic disturbance of the subject site it is unlikely to contain or support EEC's. The presence of EEC's on the subject site requires specific assessment.
OEH Key Habitats and Corridors	The subject site is unlikely to form part of OEH key habitats and corridors.
Aboriginal Heritage	Items of aboriginal heritage are unlikely to be present given the active vegetation modification and management which has occurred on the subject site and the level of site disturbance which is likely to have occurred over the years.

1.5 Development Proposal

It is proposed to rezone the subject site as part of the ongoing urban development of the general area.

The proposed rezoning reflects the Area 14 Employment Lands Structure Plan which identifies the subject site as being potentially suitable for industrial subdivision. In this regard, the proposed rezoning is required in order to support twenty-seven (27) Torrens Title industrial lots, refer to **Appendix 2**.

The proposed rezoning also proposes two (2) residual areas which will be zoned for Environmental Management (E3) purposes.

The areas to be rezoned are;

- Light Industrial (IN2) Zone – 5.81 hectares;
- Environmental Management (E3) Zone – 3.73 hectares

The proposed industrial lots range in size from 1043m^2 to 4108m^2.

Access to proposed industrial lots will be via new public road infrastructure which will connect with Houston Mitchell Drive which is an existing bitumen sealed two way all weather public road which services as a main connecting road within the area.

All new roads within the proposed development will be two-way and will be constructed to normal public road standards.

The design of the proposed subdivision layout provides for a perimeter road approach to areas of bushfire hazard vegetation. The utilization of a perimeter road approach provides for the utilization of the road reserve as part of meeting the minimum APZ requirements for the majority of lots. In this regard it is noted that the main perimeter road reserve is typically 20m in width which provides for compliance with the worst case APZ requirement for the proposed development of 20m.

1.6 Fauna and Flora Issues

A fauna and flora evaluation has not been undertaken in conjunction with this bushfire hazard assessment and as such issues pertaining to fauna and flora are outside the scope of this report.

2.0 BUSHFIRE HAZARD ASSESSMENT

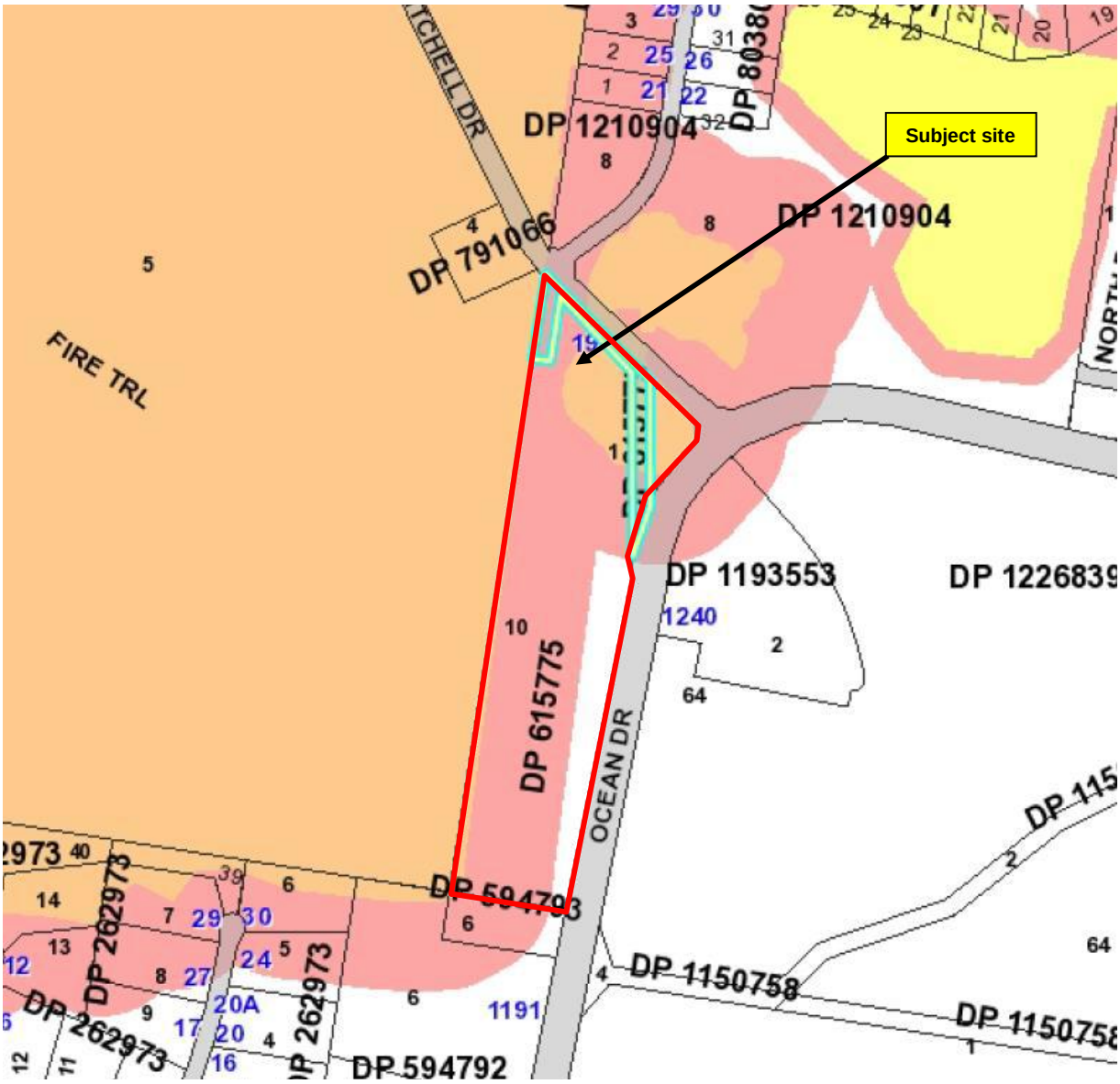
2.1 Procedure

Several factors need to be considered in determining the bushfire hazard for the proposed rezoning and lots being slope, vegetation type, distance from vegetation and access/egress. Each of these factors has been reviewed in determining a bushfire hazard rating for the subject site and proposed development.

2.2 Hazard Vegetation

Port Macquarie-Hastings Councils Bushfire Prone Land Risk Mapping provides that areas of Category 1 bushfire hazard vegetation are located on adjoining and adjacent land to the north and west of the subject site with a small area of Category 1 bushfire hazard vegetation located in the far northern portion of the subject site. The majority of the subject site is affected by the 100m buffer zone which has been applied to the identified areas of Category 1 hazard vegetation; refer to **Figure 5**.

Figure 5 – Extract from Port Macquarie – Hastings Bushfire Risk Mapping



It is however noted that the above bushfire prone land mapping does not indicate the presence of Grasslands which are now considered to be bushfire hazard vegetation by virtue of amendments to AS3959 – 2009. In this regard, the adjoining and adjacent land to the south and east of the subject site contains areas of Grassland.

2.3 Slope Assessment

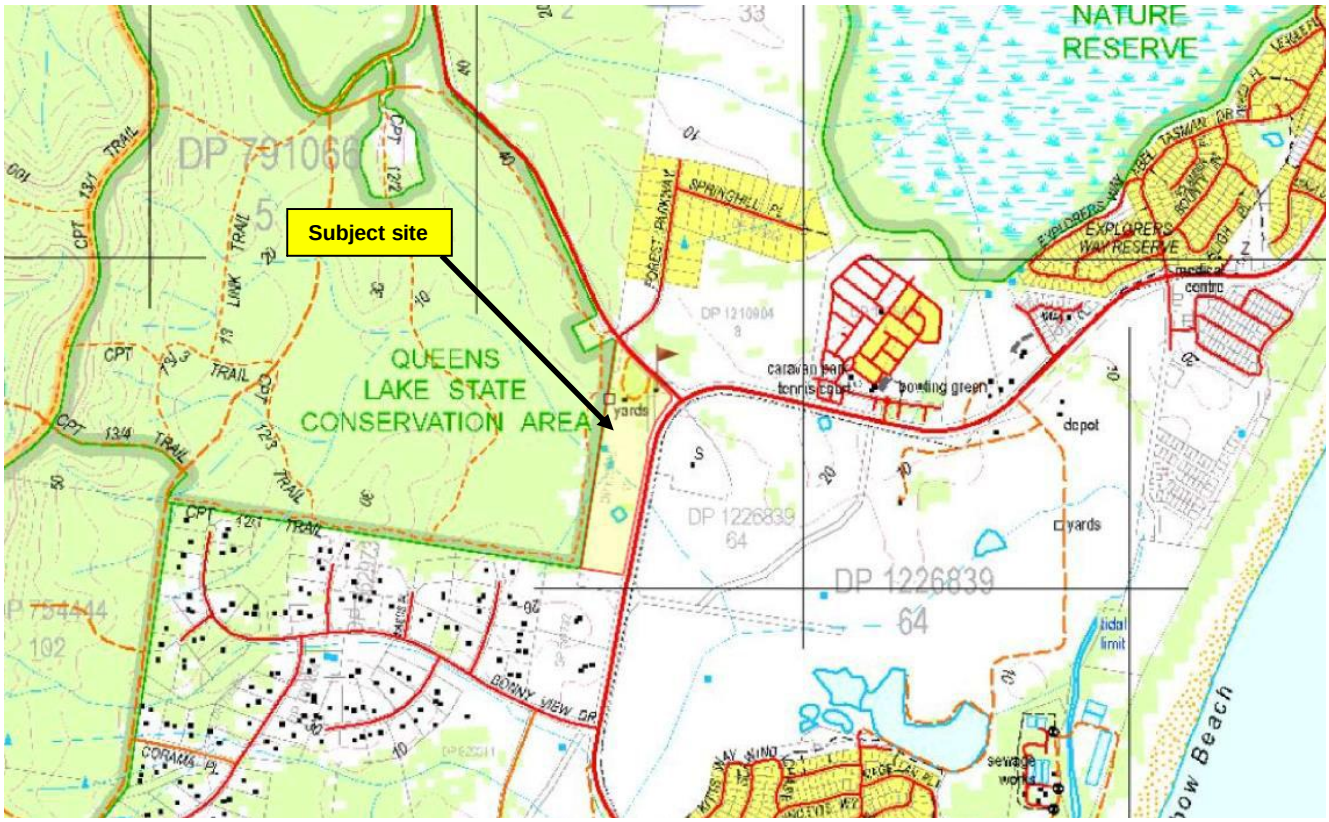
Slope is a major factor to consider when assessing the bushfire risk of any development which is subject to compliance with the requirements of NSW Rural Fire Service, ***Planning for Bushfire Protection***, 2006. Therefore, the slope of the subject site and surrounding area, (to a distance of 100m), was measured using a Suunto PM-5/360 PC Clinometer.

The following information is provided in relation to the topographic characteristics of the subject site and adjoining and adjacent land. In adopting a conservative approach to bushfire hazard assessment worst case slope conditions have been identified.

The topography of the subject site and the immediate area is influenced by a northwest to southeast ridgeline the crest of which is roughly defined by the east west alignment of the Houston Mitchell Drive road reserve. Being located on the southern foot slopes of the ridgeline the subject site and surrounding land contains gentle north to south downslopes. The presence of a small intermittently easterly flowing creek in the southern central portion of the subject site defines a transition in slope conditions to upslopes.

The topographic features of the subject site and adjoining and adjacent land can be seen in **Figure 6** below;

Figure 6 – Topographic Conditions



The following table indicates the slopes measured within the vegetation affecting the site.

Table 2 - Slope Assessment Results

DIRECTION OF HAZARD	SLOPE degrees)	UPSLOPE/DOWN SLOPE
North	2˚ - 3˚	Down slope
South	0˚ - 1˚	Down slope
East	0˚ - 1˚	Down slope
West	4˚ - 5˚	Down slope

Note: In accordance with NSW Rural Fire Services, Planning for Bushfire Protection, 2006 and AS3959 – 2009 all upslope vegetation is considered to be 0˚.

The above slopes were considered when assessing the required defendable spaces and indicative Bushfire Attack Levels, (BAL's), for any future development/s.

2.4 Vegetation Assessment

The vegetation on and surrounding the subject site was assessed over a distance of 140m from the proposed development.

The vegetation formations were classified using the system adopted as per Keith (2004) and in accordance with Appendix 3 of NSW Rural Fire Service, ***Planning for Bushfire Protection***, 2006 and Table 2.3 of AS 3959 - 2009.

The following information is provided in relation to the floristic characteristics of the subject site and adjoining and adjacent land. In adopting a conservative approach to bushfire hazard assessment worst case vegetation characteristics have been identified.

2.4.1 Vegetation within Subject Site

The subject site currently contains a mix of grasslands and areas of remnant Forest. A small area remnant Dry Sclerophyll Forest occupies the far northern central portion of the subject site whilst grasslands are present over the remaining areas of the site.

Grasslands with scattered trees over the majority of the subject site

Small remnant of Dry Sclerophyll Forest in far northern central portion of subject site

It is noted that the development concept for the subject site involves the retention and possible embellishment of vegetation within the proposed residual undeveloped areas of the site which are located in the far northern and southern areas of the subject sites. On the basis that the revegetation of the residual areas will involve the establishment of trees in an unmanaged understorey the following assessment of hazard vegetation has been determined as being applicable to this report;

- Northern portion of subject site – it is noted that the size of the proposed residual revegetation area is in the order of 7000m^2 which is less than the 1-hectare size criteria which is used to determine the relevance of a remnant vegetation classification. Therefore, based upon the revegetation area being less than 1 hectare

and the disconnection which will be available between other areas of hazard vegetation to the north and west a specification similar to Rainforest has been adopted for the purposes of this report.

- Southern portion of the subject site – given the size of this residual undeveloped area and its connectivity with hazard vegetation to the west a specification similar to Wet Sclerophyll Forest has been adopted for the purposes of this report.

As a result of proposed vegetation removal and modification in order to provide for the construction of the proposed industrial lots no areas of hazard vegetation will remain on the proposed industrial lots or with in supporting infrastructure such as roads.

2.4.2 Vegetation on Adjoining and Adjacent Land to Subject Site

The following vegetation characteristics were identified as being relevant to the proposed industrial subdivision having regard to the vegetation characteristics of adjoining and adjacent land.

To the north of the subject site is an area of remnant Dry Sclerophyll Forest which has been retained within a recently approved residential subdivision. It is noted that this area of vegetation has been approved for substantial modification in order to accommodate the building envelopes which are required within the residential lots which will occupy the land to the north of the Houston Mitchell Drive road reserve, refer to **Appendix 3**. Given the relatively small size of this area of vegetation, the absence of shrub and understorey vegetation and the level of fragmentation which will be created through the integration of building envelopes into this area of vegetation, a specification similar to Rainforest has been adopted for the purposes of this report as it reflects its remnant context and characteristics.

Remnant of Dry Sclerophyll Forest on adjacent land to the north of the subject site

To the south of the subject site are extensive areas of Grasslands with scattered and clusters of trees within the rural residential lots which are present in this aspect.

Grasslands with scattered trees on adjoining and adjacent lots to the south of the subject site

The eastern aspect comprises managed vegetation within the developed footprint of the recently constructed Lake Cathie Public School, grasslands to the northeast and areas of remnant Forested Wetland to the southeast. In adopting a conservative approach to bushfire hazard assessment, a Forested Wetland classification has been adopted for this aspect.

Managed land within the grounds of Lake Cathie Public School

Grasslands to the northeast of the subject site

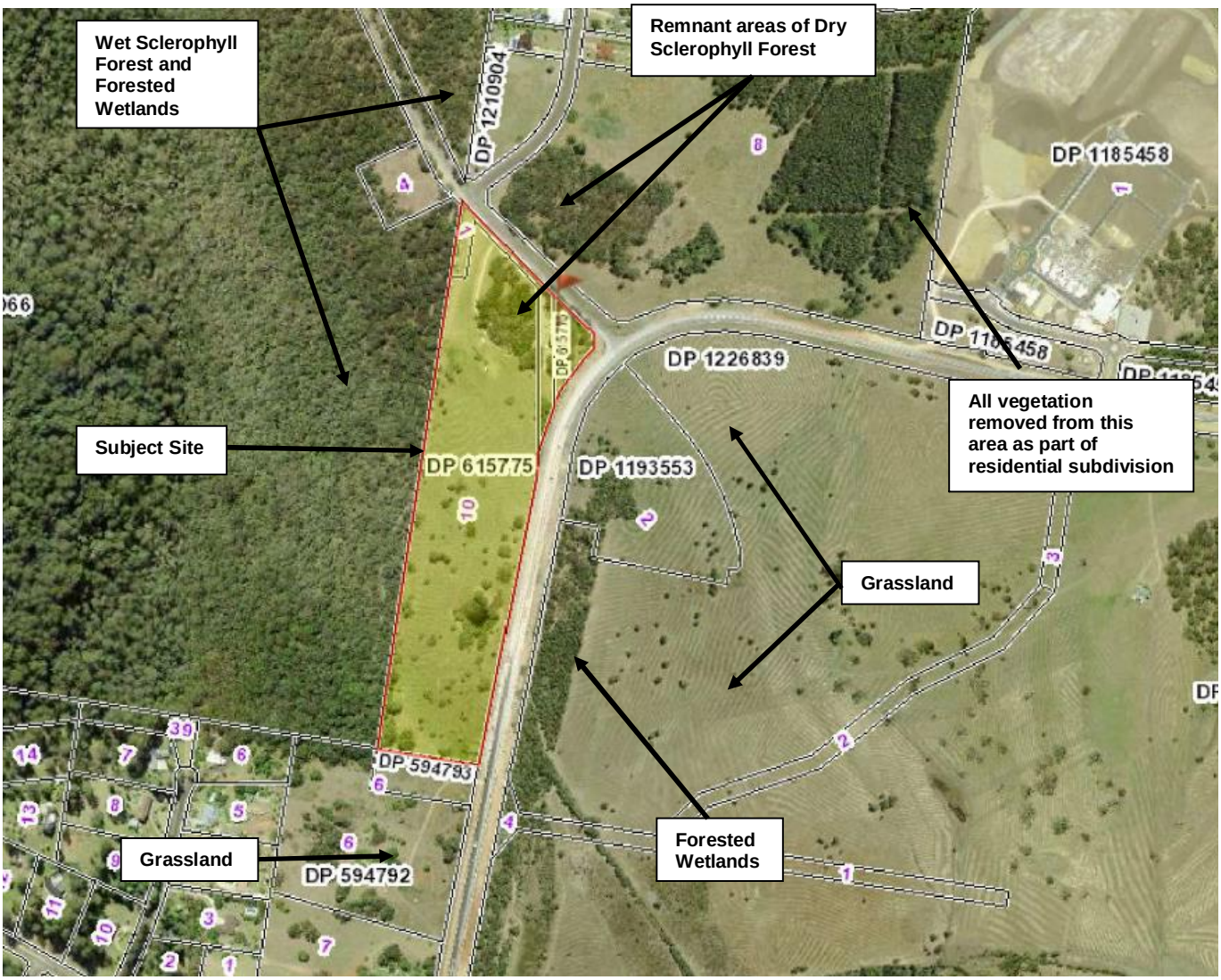
Forested Wetland to the east and southeast of the subject site

Areas of Wet Sclerophyll Forest and Forested Wetland are present to the west of the subject site. A Wet Sclerophyll Forest classification has therefore been adopted for the western aspect.

Wet Sclerophyll Forest to the west of the subject site

An indication of the relationship of the vegetation of bushfire significance to the proposed development is presented in **Figure 7** below.

Figure 7 - Vegetation Relationships to the Subject Land



The following table summarizes the various vegetation structures which are of bushfire significance to the proposed rezoning and proposed industrial allotments.

Table 3 – Summary of Vegetation Characteristics

ASPECT	VEGETATION DESCRIPTION	VEGETATION CLASSIFICATION – (Keith, 2004)
North	Isolated area of revegetation in the residual area of the subject site (area proposed to be rezoned Environmental Management (E3))	Similar in specification to Rainforest
South	Revegetation in the residual area of the subject site (area proposed to be rezoned Environmental Management (E3))	Similar in specification to Wet Sclerophyll Forest
East	Grasslands and remnant areas of Forested Wetland vegetation on land to the east of the Ocean Drive road reserve	Forested Wetland
West	Wet Sclerophyll Forest and Forested Wetland within the Queens Lake State Conservation Area.	Wet Sclerophyll Forest

2.5 Fire Danger Index

The fire weather for the site is assumed on the worst-case scenario. In accordance with NSW Rural Fire Services, ***Planning for Bushfire Protection***, 2006 and Table 2.1 of AS 3959 - 2009, the fire weather for the site is based upon the 1:50 year fire weather scenario and has a Fire Danger Index (FDI) of 80.

3.0 BUSHFIRE THREAT REDUCTION MEASURES

3.1 NSW Rural Fire Services, *Planning for Bushfire Protection*, 2006

The following issues and constraints have been identified through considering the requirements of NSW Rural Fire Service, ***Planning for Bushfire Protection***, 2006 as they apply to the rezoning of the subject site and future industrial development of the proposed industrial lots.

3.1.1 Defendable Space/Asset Protection Zone

To ensure that the aims and objectives of NSW Rural Fire Service, ***Planning for Bushfire Protection***, 2006 are achieved for the proposed Torrens Title industrial subdivision, a defendable space between the asset and the hazard should be provided. NSW Rural Fire Service**,** ***Planning for Bushfire Protection*****,** 2006 provides that a defendable space is;

'an area within the asset protection zone that provides an environment in which a person can undertake property protection after the passage of a bush fire with some level of safety'.

It is noted that NSW Rural Fire Service, ***Planning for Bushfire Protection***, 2006 does not prescribe an acceptable solution for the provision of a defendable space/asset protection zone with the acceptable solutions provided for by Section 4.1.3 of NSW Rural Fire Service**,** ***Planning for Bushfire Protection*****,** 2006 applying the residential and Special Fire Protection Purpose developments. Accordingly, the provision of a defendable space/asset protection zone for the proposed development must satisfy the general objectives of NSW Rural Fire Service, ***Planning for Bushfire Protection***, 2006.

The following objectives are therefore relevant to the provision of a defendable space/asset protection zone to the proposed development;

- *afford occupants of any building adequate protection from exposure to a bush fire;*
- *provide for a defendable space to be located around buildings;*
- *provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent direct flame contact and material ignition;*

- *provide for ongoing management and maintenance of bush fire protection measures, including fuel loads in the asset protection zone (APZ);*

It is noted that NSW Rural Fire Service, ***Planning for Bushfire Protection***, 2006, provides for no methodology as to how a performance-based approach to meeting the above objectives is to be determined nor assessed. Therefore in adopting a conservative approach to bushfire threat management the asset protection zone acceptable solutions for residential development have been adopted for the purposes of this report as;

- NSW Rural Fire Service, ***Planning for Bushfire Protection***, 2006 provides that industrial subdivision should take into consideration the potential for residential dwellings, (managers residences – BCA Class 4), to be incorporated into any future industrial developments on the proposed lots; and

- The APZ 'Acceptable Solution' requirements which would typically apply to residential subdivisions incorporate the concept of a defendable space and as such compliance with the APZ standard will ensure compliance with the concept for the provision of a defendable space albeit that compliance with the minimum APZ requirements may potentially exceed the site based requirements for a defendable space; and

- The adoption of the APZ 'Acceptable Solution' requirements which would typically apply to residential subdivisions represents a worst case scenario to the identification of an appropriate Defendable Space for the future development of the proposed industrial lots.

Section 4.1.3 of NSW Rural Fire Service**,** ***Planning for Bushfire Protection*****,** 2006 provides the acceptable solutions that have been applied to the proposed development in relation to the provision of APZ's to each of the proposed industrial lots in order to demonstrate compliance with the defendable space requirements. The following table indicates the minimum APZ's between the various hazards and the proposed industrial lots which have been adopted for the purposes of demonstrating compliance with the performance objectives of NSW Rural Fire Service**,** ***Planning for Bushfire Protection*****,** 2006.

Table 4 –Asset Protection Zone/Defendable Space Requirements (PfBP 2006)

DIRECTION OF HAZARD	VEGETATION TYPE	SLOPE	IPA	OPA	TOTAL REQUIRED APZ	MINIMUM APZ ACHIEVABLE (to development within Lots)	COMPLIANCE (with Minimum APZ Requirements)
North	Similar in specification to Rainforest	2˚ - 3˚ Down slope	10m	-	10m	Minimum 10m	✔
South	Similar in specification to Wet Sclerophyll Forest	0˚ - 1˚ Down slope	15m	5m	20m	Minimum 20m	✔
East	Forested Wetland	0˚ - 1˚ Down slope	20m	-	20m	>30m	✔
West	Wet Sclerophyll Forest	4˚ - 5˚ Down slope	15m	5m	20m	Minimum 20m	✔

Having regard to the above it is noted that the minimum 'acceptable solution' Asset Protection Zones **can** be provided for any future industrial development within the boundaries of the proposed industrial lots in compliance with the performance objectives of NSW Rural Fire Service**,** ***Planning for Bushfire Protection*****,** 2006 and summarized as follows**;**

Table 6 - Asset Protection Zone Acceptable Solutions

PERFORMANCE CRITERIA	ACCEPTABLE SOLUTIONS
The intent may be achieved where **in relation to Asset Protection Zones:** • a defendable space is provided onsite. • an asset protection zone is provided and maintained for the life of the development.	An APZ is provided in accordance with the relevant tables/figures in Appendix 2 of NSW Rural Fire Services, ***Planning for Bushfire Protection***, 2006

A concept plan for the provision of Defendable Spaces/APZ's to the proposed industrial lots is included as **Appendix 3**.

It is however noted that lessor Defendable Spaces than that adopted in **Table** 4 above could be justified for specific development proposals for each of the proposed industrial lots as the approach taken in this report in demonstrating compliance with NSW Rural Fire Service**,** ***Planning for Bushfire Protection*****,** 2006 is highly conservative.

In this regard the objectives based approach to the determination of an appropriate Defendable Space for future industrial developments provides for flexibility in design and construction being used in combination to meet the relevant performance objectives of NSW Rural Fire Service**,** ***Planning for Bushfire Protection*****,** 2006.

3.1.2 Defendable Space/Asset Protection Zone Management

Areas identified as forming part of the Defendable Space/APZ requirements for any future industrial subdivision development must be created and managed so as to be consistent with the standards which are applicable to Inner Protection Areas as follows;

(i) Inner Protection Area (IPA)

An IPA should provide a tree canopy cover of less than 15% and should be located greater than 2 metres from any part of the roofline of a building.

Garden beds of flammable shrubs are not to be located under trees and should be no closer than 10m from an exposed window or door.

Trees should have lower limbs removed up to a height of 2 metres above the ground.

3.1.3 Operational Access and Egress

Access to the proposed industrial subdivision will be via new public road infrastructure which will connect with Houston Mitchell Drive which is an existing bitumen sealed two way all weather public road which services as a major connecting road between the Pacific Highway to the west and the Bonny Hills/Lake Cathie residential areas to the northeast and southeast. Houston Mitchell Drive adjoins the subject site along its northern property boundary.

Houston Mitchell Drive to the north of the subject site

Ocean Drive to the east of the subject site

It is noted that whilst Ocean Drive adjoins the subject site to the east it is not proposed to gain access to the proposed subdivision from this existing public road infrastructure.

All new roads within the proposed subdivision will be two-way and will be constructed to normal public road standards.

The design of the proposed subdivision layout provides for a perimeter road approach to most areas of bushfire hazard vegetation with the road design providing for alternative means of movement to and from the subdivision via the loop road approach which is proposed for the subdivision. The utilization of a perimeter road approach provides for the utilization of the road reserve as part of meeting the minimum defendable space/APZ requirements for the majority of lots. In this regard it is noted that the main perimeter road reserve is typically 20m – 23m in width which provides for compliance with the worst case APZ requirement which has been applied to the proposed subdivision development of 20m.

In order to provide for compliant access and egress to the proposed industrial lots it will be necessary to provide for new public road infrastructure/systems which comply with Section

4.1.3 of NSW Rural Fire Services**, *Planning for Bushfire Protection***, 2006 and summarized as follows;

Table 7 - Public Road Requirements (PfBP 2006)

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**	**Compliance Comment**
The intent may be achieved where:		
• firefighters are provided with safe all-weather access to structures (thus allowing more efficient use of firefighting resources)	• public roads are two-wheel drive, all weather roads.	✔ Design of road infrastructure complies
• public road widths and design that allow safe access for firefighters while residents are evacuating an area.	• urban perimeter roads are two-way, that is, at least two traffic lane widths (carriageway 8 metres minimum kerb to kerb), allowing traffic to pass in opposite directions. Non-perimeter roads comply with Table 4.1 – Road widths for Category 1 Tanker (Medium Rigid Vehicle). • the perimeter road is linked to the internal road system at an interval of no greater than 500 metres in urban areas. • traffic management devices are constructed to facilitate access by emergency services vehicles. • public roads have a cross fall not exceeding 3 degrees. • all roads are through roads. Dead end roads are not recommended, but if unavoidable, dead ends 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 and direct traffic away from the hazard. • curves of roads (other than perimeter roads) are a minimum inner radius of six metres and minimal in number, to allow for rapid access and egress. • the minimum distance between inner and outer curves is six metres. • 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. • there is a minimum vertical clearance to a height of four metres above the road at all times.	✔ Design of all road infrastructure to comply
• the capacity of road surfaces and bridges is	• the capacity of road surfaces and bridges is sufficient to carry fully loaded	✔ Design of road

sufficient to carry fully loaded fire fighting vehicles.	firefighting vehicles (approximately 15 tonnes for areas with reticulated water, 28 tonnes or 9 tonnes per axle for all other areas). Bridges clearly indicate load rating.	infrastructure to comply
• roads that are clearly sign- posted (with easily distinguishable names) and buildings/properties that are clearly numbered.	• public roads greater than 6.5 metres wide to locate hydrants outside of parking reserves to ensure accessibility to reticulated water for fire suppression. • public roads between 6.5 metres and 8 metres wide are No Parking on one side with the services (hydrants) located on this side to ensure accessibility to reticulated water for fire suppression.	✔ Design of road infrastructure to comply
• there is clear access to reticulated water supply	• public roads up to 6.5 metres wide provide parking within parking bays and locate services outside of the parking bays to ensure accessibility to reticulated water for fire suppression. • one way only public access roads are no less than 3.5 metres wide and provide parking within parking bays and locate services outside of the parking bays to ensure accessibility to reticulated water for fire suppression.	✔ Design of road infrastructure to comply

Subject to compliance with the requirements of **Table 7** above in relation to the design and construction of new public roads, it is considered that future access and egress arrangements will be acceptable for the proposed development of the subject land having regard to the nature, construction and extent of the existing road infrastructure which is present and the new public road system which is required to be provided to serve the future industrial subdivision development of the subject site.

3.1.4 Services - Water, Gas and Electricity

As set out in Section 4.1.3 of NSW Rural Fire Services**, *Planning for Bushfire Protection***, 2006, industrial developments in bushfire prone areas must maintain a water supply reserve dedicated to firefighting purposes.

Given that the proposed rezoning and associated Torrens Title subdivision provides for industrial allotments, all proposed lots will have access to the reticulated water supply, the extension of which will be required by Port Macquarie-Hastings Council to service the proposed industrial subdivision. It is however noted that in accordance with NSW Rural Fire Services**, *Planning for Bushfire Protection***, 2006 the determination of a guaranteed water supply is to be made by the water supply authority where mains water supply is available.

Electricity supply is available and will be accessible to the proposed subdivision of the land.

Reticulated gas services are not available in the locality and are therefore not available to the subject site.

The incorporation into the industrial subdivision of the subject site of the relevant provisions of the following acceptable solutions as provided for by Section 4.1.3 of NSW Rural Fire Services**, *Planning for Bushfire Protection***, 2006 will ensure compliance with the intent for the provision of services to the proposed development of the subject site.

Table 8 – Service Provision Requirements

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**	**Compliance Comment**
The intent may be achieved where:		
Reticulated water supplies • water supplies are easily accessible and located at regular intervals	• reticulated water supply to urban subdivisions uses a ring main system for areas with perimeter roads. • fire hydrant spacing, sizing and pressures 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. • hydrants are not located within any road carriageway • all above ground water and gas service pipes external to the building are metal, including and up to any taps. • the provisions of parking on public roads are met.	✔ To comply
Electricity Services • location of electricity services limits the possibility of ignition of surrounding bush land or the fabric of buildings • regular inspection of lines is undertaken to ensure they are not fouled by branches.	• where practicable, electrical transmission lines are underground. • where overhead electrical transmission lines are proposed: - lines are installed with short pole spacing (30 metres), 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 accordance with the specifications in 'Vegetation Safety Clearances' issued by Energy Australia (NS179, April 2002).	✔ To comply
Gas services • location of gas services will not lead to ignition of surrounding bush land or the fabric of buildings	• reticulated or bottled gas is installed and maintained in accordance with AS 1596 and the requirements of relevant authorities. Metal piping is to be used. • all fixed gas cylinders are kept clear of all flammable materials to a distance of 10 metres and shielded on the hazard side of the installation. • if gas cylinders need to be kept close to the building, the release valves are directed away from the building and at least 2 metres away from any combustible material, so that they do not act as a catalyst to combustion. Connections to and from gas cylinders are metal. • polymer sheathed flexible gas supply lines to gas meters adjacent to buildings are not used.	✔ To comply (where applicable)

3.1.5 Landscaping

Landscaping is a major cause of fire spreading to buildings, and therefore any landscaping on the proposed new lots and throughout the industrial subdivision will need consideration when planning, to produce gardens that do not contribute to the spread of a bushfire.

When planning any future landscaping surrounding the future industrial buildings, consideration should be given to the following:

- The choice of vegetation – consideration should be given to the flammability of the plant and the relation of their location to their flammability and ongoing maintenance to remove flammable fuels.
- Trees as windbreaks/firebreaks – Trees in the landscaping can be used as windbreaks and also firebreaks by trapping embers and flying debris.
- Vegetation management – Maintain a garden that does not contribute to the spread of bushfire.
- Maintenance of property – Maintenance of the property is an important factor in the prevention of losses from bushfire.

Appendix 5 of NSW Rural Fire Service, ***Planning for Bushfire Protection***, 2006, contains standards that are applicable to the provision and maintenance of landscaping. Any landscaping proposed to be undertaken in conjunction with the proposed development concept to comply with the principles contained in Appendix 5 of NSW Rural Fire Service, ***Planning for Bushfire Protection***, 2006**.**

Compliance with Appendix 5 of NSW Rural Fire Services, NSW Rural Fire Service, ***Planning for Bushfire Protection***, 2006, will satisfy the intent of the bush fire protection measures that are applicable to the provision of landscaping.

3.2 Construction of Buildings in Bushfire Prone Areas

3.2.1 General

The construction requirements of AS3959 – 2009, (Construction of Buildings in Bushfire Prone Areas), are unlikely to be relevant to future development as these provisions are not considered to be applicable by virtue of the buildings assumed intended uses, (not being a residential/accommodation or Special Fire Protection Purpose development), and the Building Code of Australia classification as Class 8 industrial buildings.

In this regard it is noted that the application of Part G5, (Construction Requirements in Bushfire Prone Areas), of the BCA in NSW only applies to;

- a Class 2 or 3 building;
- a Class 4 part of a building;
- a Class 9 building that is a Special Fire Protection Purpose; or
- a Class 10a building or deck associated with a building referred to in the above dot points.

Accordingly, the determination of Bushfire Attack Levels, (BAL's), in accordance with AS3959 – 2009 has not been undertaken as Part G5 of the BCA and hence AS3959 – 2009 are not considered to be applicable in this instance.

Any future industrial building constructed on the proposed industrial lots will be required to comply with the relevant fire safety requirements of the Building Code of Australia which will be accepted for bushfire purposes where the aim and objectives of NSW Rural Fire Services, ***Planning for Bushfire Protection*****,** 2006.

Notwithstanding the above the following Bushfire Attack Levels (BAL's) would be applicable to any industrial building developments which incorporate BCA Class 4 residential dwellings;

Table 9 – BAL Provisions

VEGETATION (AS PER SPECHT)	SLOPE	DISTANCE TO HAZARD VEGETATION	AS 3959-2009 BUSHFIRE ATTACK LEVEL (BAL) METHOD 1
Southern, Eastern and Western Aspects			
Forest	<5º Down slope	<20m	Flame Zone
	<5º Down slope	20m – <27m	BAL 40
	<5º Down slope	27m – <37m	BAL 29
	<5º Down slope	37m - <50m	BAL 19
	<5º Down slope	50m - <100m	BAL 12.5
Northern Aspect			
Rainforest Specification	<5º Down slope	<8m	Flame Zone
	<5º Down slope	8m - <11m	BAL 40
	<5º Down slope	11m – <17	BAL 29
	<5º Down slope	17m - <24m	BAL 19
	<5º Down slope	24m - <100m	BAL 12.5

Having regard to the above the size of the proposed industrial lots is such that the any future industrial buildings which incorporate residential dwellings can be designed in such a way so as to provide for a worst-case BAL 29 outcome for the residential component of any future development.

4.0 SUMMARY OF FINDINGS

The following recommendations are provided in response to the proposed rezoning and associated Torrens Title industrial subdivision layout provided as **Appendix 2**.

(i) Adopt Landscaping principals in accordance with Section 3.1.5 of this report.

(ii) The determination of Defendable Spaces which will be relevant to the development of each industrial lot is to be the subject of individual lot based assessments which reflect individual development proposals for each lot.

(iii) Water and other services are to be provided to proposed industrial subdivision in accordance with the requirements detailed in Section 3.1.3 of this report.

(iv) The design and construction of all public roads within the proposed industrial subdivision layout are to comply with the acceptable solutions provided for in Section 4.1.3 of NSW Rural Fire Services**,** ***Planning for Bushfire Protection*****,** 2006.

5.0 CONCLUSION

It is considered that the proposed rezoning and associated Torrens Title industrial subdivision of land known as Lot 1 DP 11117908 and Lot 10 DP 615775, 19 Houston Mitchell Drive, Bonny Hills is at risk of bushfire attack; however, it is in our opinion that with the implementation of the bushfire threat reduction measures and consideration of the recommendations in this report, the bushfire risk is manageable for the proposed rezoning and associated subdivision.

With the implementation of the recommendations it is considered that it will be possible for the proposed industrial subdivision layout to meet the applicable acceptable solutions as provided for in NSW Rural Fire Service**,** ***Planning for Bushfire Protection*****,** 2006**.**

This report is however contingent upon the following assumptions and limitations.

Assumptions

(i) For a satisfactory level of bushfire safety to be achieved regular inspection and testing of proposed measures, building elements and methods of construction, specifically nominated in this report, is essential and is assumed in the conclusion of this assessment.

(ii) There are no re-vegetation plans in respect to hazard vegetation and therefore the assumed fuel loading will not alter.

(iii) It is assumed that the building works will comply with the DTS provisions of the BCA including the relevant requirements of Australian Standard 3959 – 2009.

(iv) Any future industrial subdivision developments are constructed and maintained in accordance with the risk reduction strategy in this report.

(v) The vegetation characteristics of the subject site and surrounding land remains unchanged from that observed at the time of inspection or from that specified within this report.

(vi) The information contained in this report is based upon the information provided for review, refer to **Appendix 2.**

No responsibility is accepted for the accuracy of the information contained within the above plans.

Limitations

(i) The data, methodologies, calculations and conclusions documented within this report specifically relate to the building and must not be used for any other purpose.

(ii) A reassessment will be required to verify consistency with this assessment if there is building alterations and/or additions, change in use, or changes to the risk reduction strategy contained in this report

6.0 REFERENCES

NSW Rural Fire Services, ***Planning for Bushfire Protection***, 2006

AS 3959-2009, ***Construction of Buildings in Bushfire Prone Areas***

Keith David 2004, Ocean ***Shores to Desert Dunes, The Native Vegetation of New South Wales and the ACT***, Department of Environment and Conservation

NSW State Government***, Rural Fires Act***, 1997

Port Macquarie-Hastings Councils, ***Bushfire Prone Land Mapping***

NSW Rural Fire Service, ***Guideline for Bushfire Prone Land Mapping***, 2002

Australian Building Codes Board, ***Building Code of Australia***, 2011
NSW Rural Fire Service – *Guideline for Bushfire Prone Land Mapping 2002*

Disclaimer

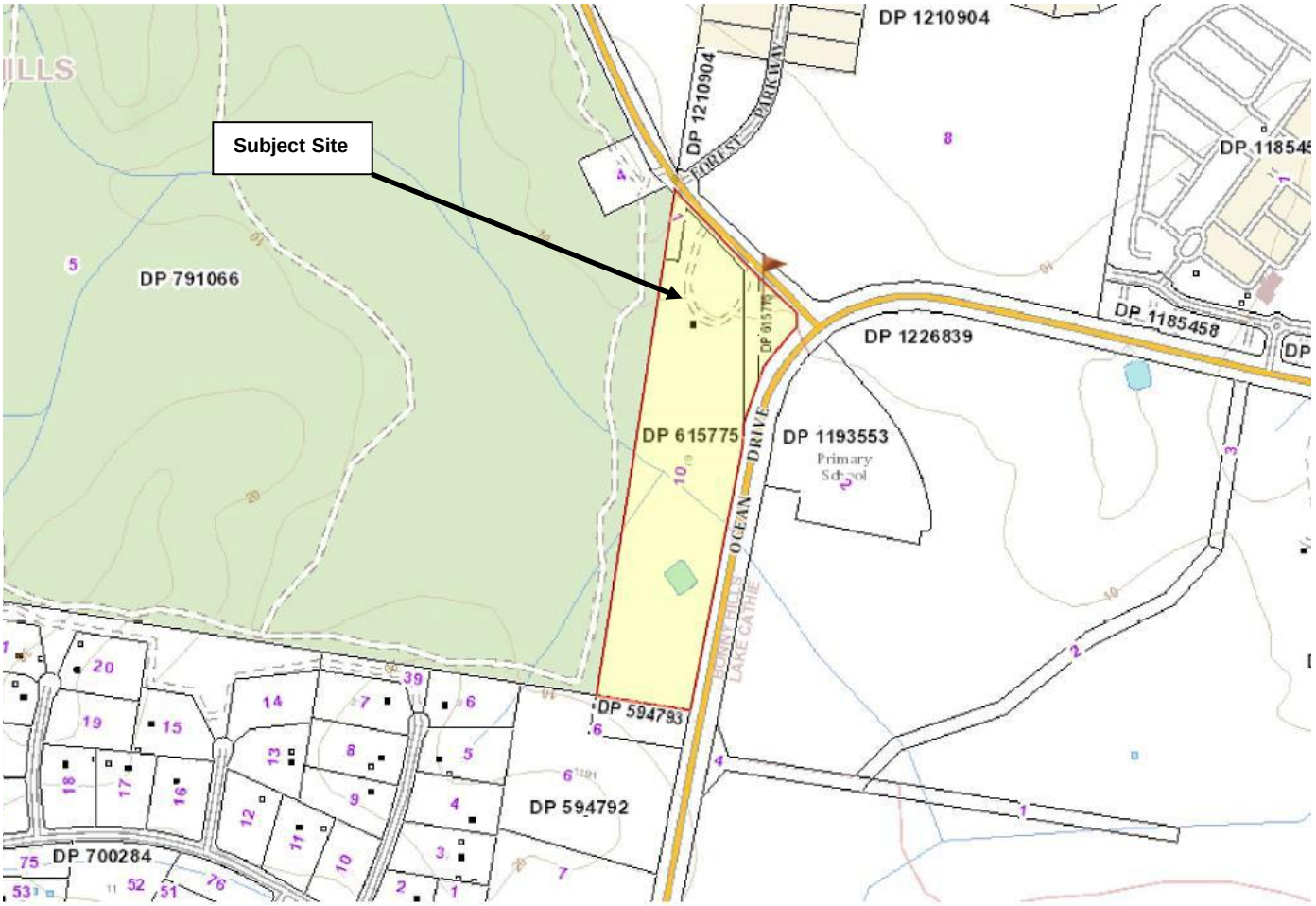
The findings referred to in this report are those which, in the opinion of the author, are required to meet the requirements of NSW Rural Fire Service, ***Planning for Bushfire Protection***, 2006. It should be noted that the Local Authority having jurisdiction for the area in which the property is located may, within their statutory powers, require different, additional or alternative works/requirements to be carried out other than those referred to in this report.

This report has been prepared partially on information provided by the client. Information provided by the client in respect of details of construction.

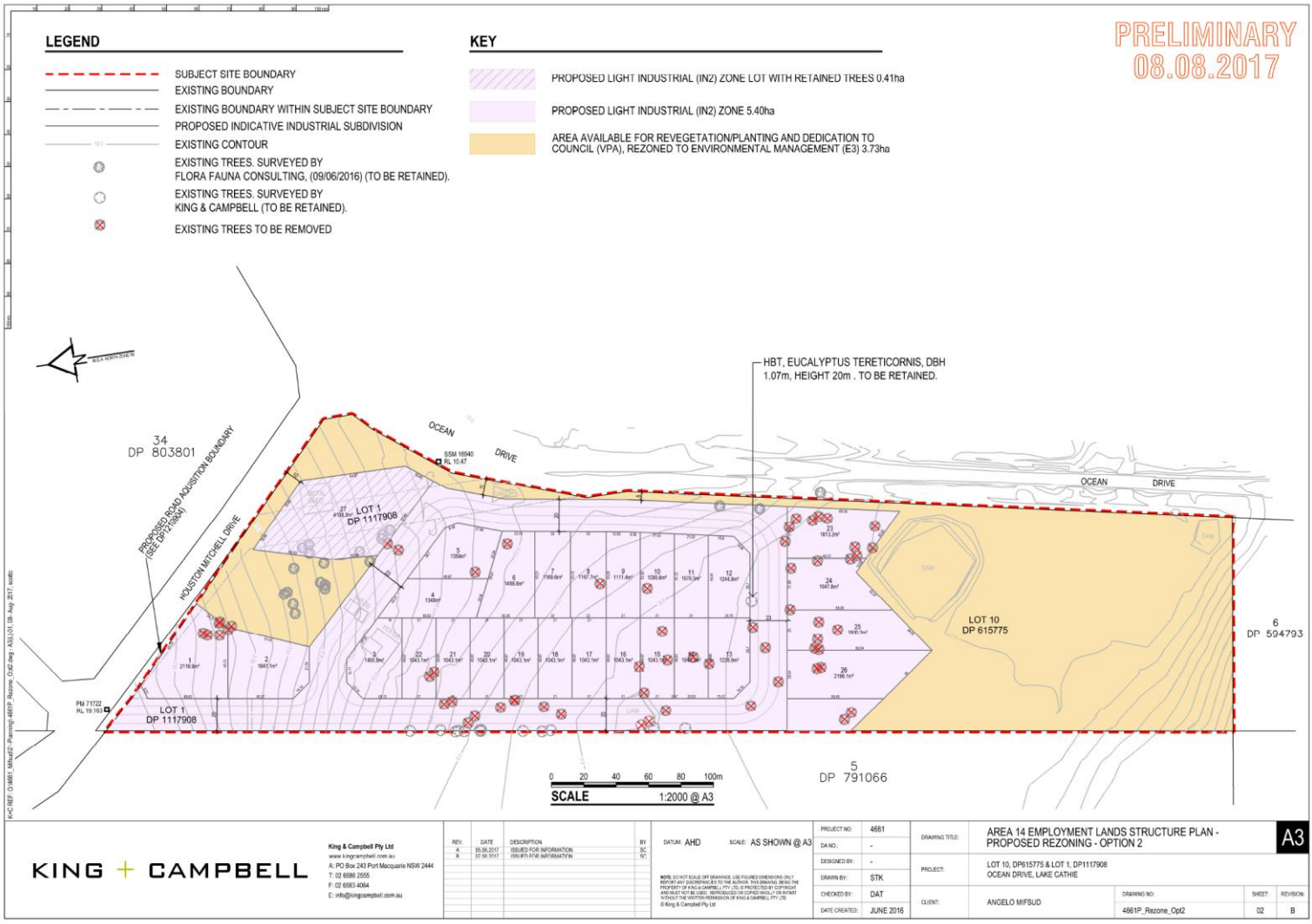
The author denies any legal liability for action taken as a consequence of the following:

- The Local Authority requiring alternative or additional requirements to those proposed or recommended in this report.
- Incorrect information, or mis-information, provided by the client with regard the proposed development which is in good faith included in the strategies proposed in this report and later found to be false.

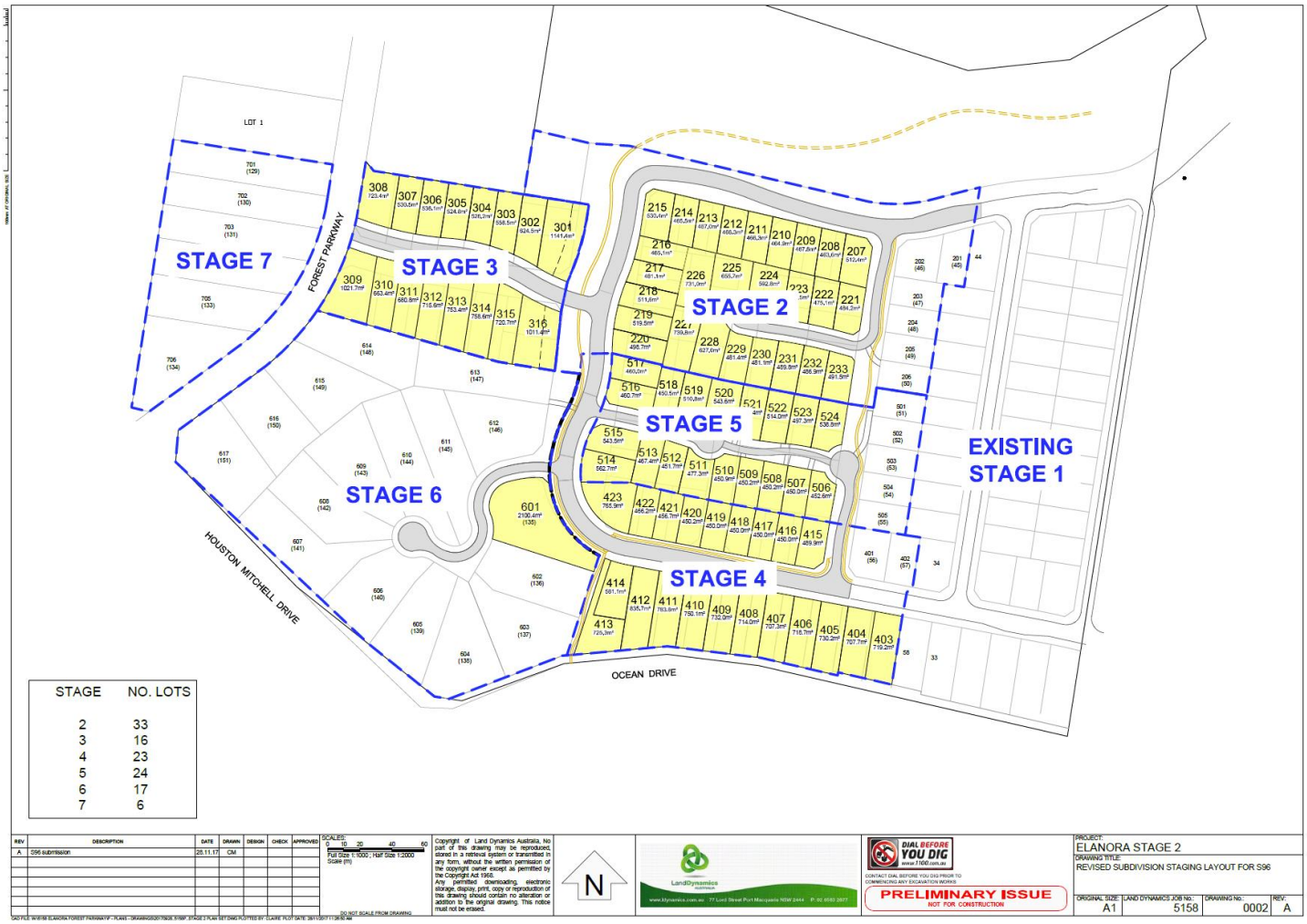
APPENDIX 1
Subject Site



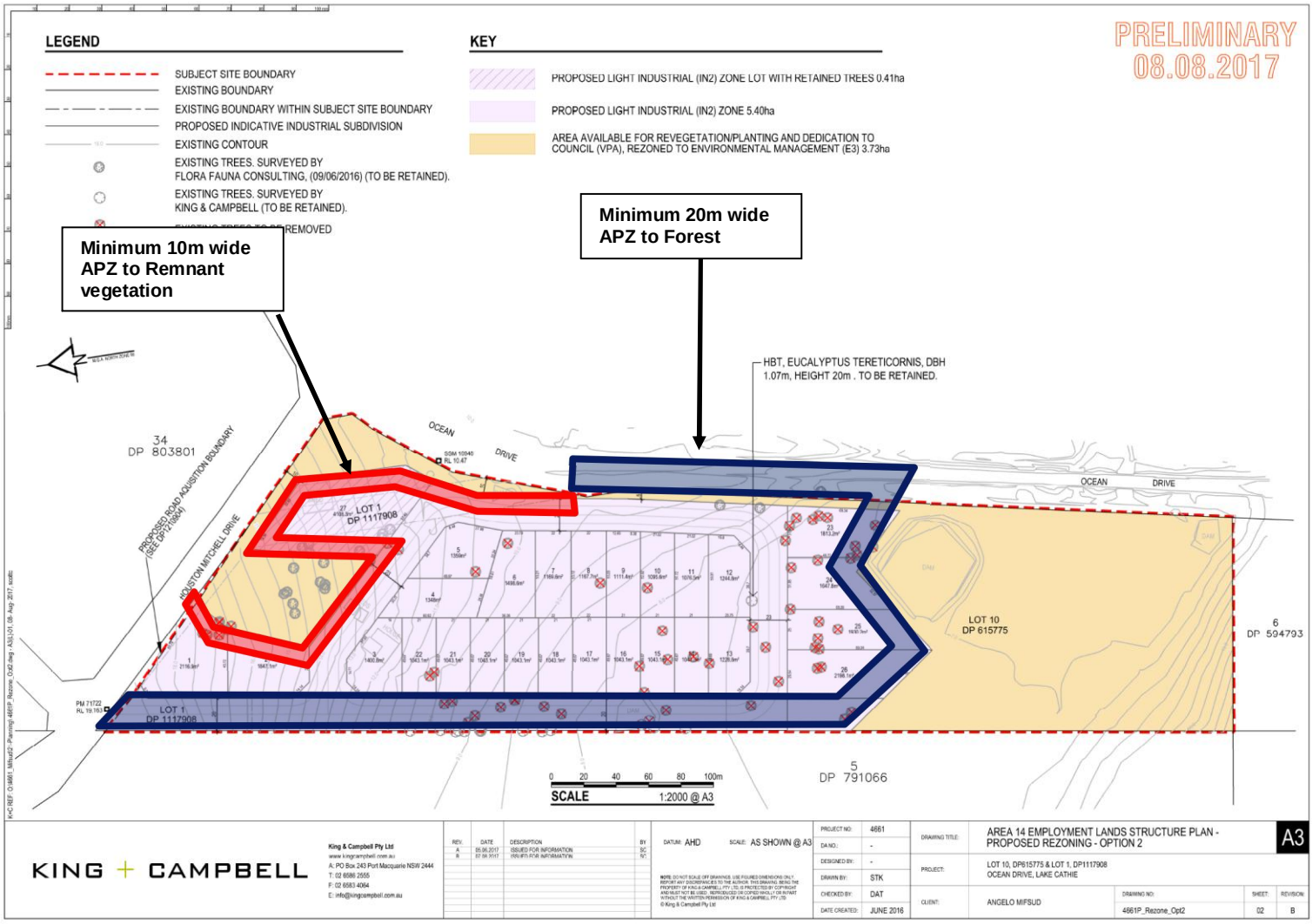
APPENDIX 2
Proposed Development



APPENDIX 3
Approved Residential Development (Northern Aspect)



APPENDIX 4
Worst Case Defendable Space/APZ Compliance Concept



INDICATIVE ONLY

NOT TO SCALE