DAVID PENSINI
Building Certification and
Environmental Services

25th January 2021

Land Dynamics Australia
PO Box 2459
PORT MACQUARIE NSW 2444

Attention: Graham Burns

Dear Sir,

Re: Strategic Bushfire Study – Proposed Rezoning Lot 1 DP 776681, Lots 3 – 48 DP 776681 and Lot 50 DP 776681 Le Clos Sancrox Road, Sancrox

It is proposed to rezone land, which is known as Lot 1 DP 776681, Lots 3 – 48 DP 776681 and Lot 50 DP 776681 Le Clos Sancrox Road, Sancrox so as to provide for the following land use zonings;

- General Residential (R1); and
- Medium Density (R3); and
- Environmental Living (E4); and
- Village Centre (B2); and
- Environmental Conservation (E2); and
- Environmental Management (E3).

A concept plan for the proposed rezoning and its future development is provided as **Appendix 1**.

It is noted that NSW Rural Fire Service, ***Planning for Bushfire Protection***, 2019 provides that for strategic development proposals in bush fire prone areas a Strategic Bush Fire Study is to be prepared.

The level of information required within such a study is dependent upon the nature of the LEP amendment, scale of the proposal, the bush fire risk and its potential impact upon the wider infrastructure network. The Strategic Bush Fire Study provides the opportunity to assess whether new development is appropriate in the bush fire hazard context. It also provides the ability to assess the strategic implications of future development for bush fire mitigation and management.

In accordance with Table 4.2.1 of NSW Rural Fire Service, ***Planning for Bushfire Protection***, 2019 the following Strategic Bushfire Study is provided in relation to the proposed rezoning. It is noted that this Study is additional and complementary to the Preliminary Draft Bushfire Hazard Assessment Report prepared by David Pensini – Building Certification and Environmental Services dated October 2019.

1.0 LANDSCAPE ASSESSMENT

In order to determine 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 following methodology was taken.

1.1 Assessment Methodology

(i) Stage 1 - Desktop Survey

The identification and assessment of existing and historic information pertaining to the subject site in relation to;

- Weather
- Vegetation.
- Topographic features.

(ii) Stage 2 - Field Survey.

Detailed inspections of the subject site were undertaken by David Pensini - Building Certification and Environmental Services in April 2019, 8th October 2019 and the 20th January 2021 in order to identify relevant bushfire hazard factors and characteristics such as;

- Topographic conditions.
- Vegetation characteristics.
- Weather
- Fire Danger

Each of the above factors need to be considered in determining the bushfire hazard for the subject site and proposed rezoning. These factors must be reviewed in determining the bushfire protection measures which are applicable to the subject site and the proposed rezoning of the areas of land which are the subject of this report.

The assessment of slope and vegetation characteristics has been carried out in accordance with Appendix 1 of NSW Rural Fire Service, ***Planning for Bushfire Protection***, 2019.

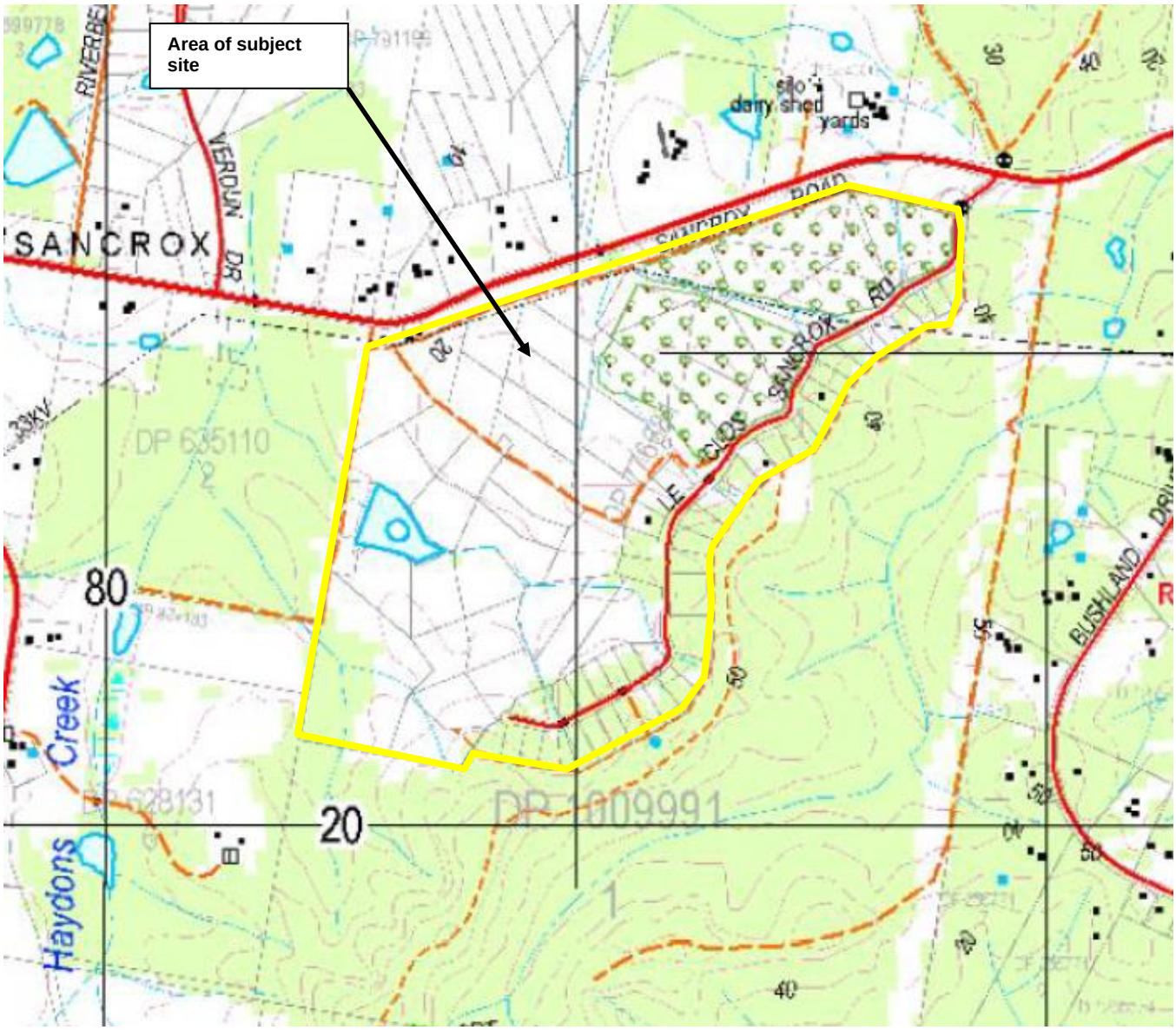
1.2 Topography

Topography 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***, 2019. 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 topography of the subject site and the immediate area is influenced by an east to west hill/ridgeline the crest of which is located to the south of the subject site. Consequently, slope conditions are, in the main, gentle to moderate south to north downslopes towards the meander of the Hastings River which is located at distance to the north of the subject site. It is however noted that a number of small south to north flowing intermittently flowing creek/gullies are present on the subject site with these features providing for undulating slope conditions over the subject site albeit that slope conditions remain gentle with slopes becoming steeper with distance towards the south. Slope conditions on adjoining and adjacent land are similar to the subject site although slopes on land to the south become steeper and transition to southerly downslopes.

Slope conditions over the subject site and on adjoining and adjacent land can be seen in **Figure 1** below;

Figure 1 – Topographic Conditions



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

Table 1 - Slope Assessment Results

DIRECTION OF HAZARD	SLOPE	UPSLOPE/DOWN SLOPE
Within the subject site	4˚ - 5˚	Down slope
North	2˚ - 3˚	Down slope
South	4˚ - 5˚ (0˚)	Down slope
East	4˚ - 5˚	Down slope
West	4˚ - 5˚	Down slope

Having regards to the above the topography of the subject site and surrounds does not represent any major constraints in terms of bushfire behaviour.

1.3 Vegetation Assessment

The vegetation on and surrounding the area of the subject site which is proposed to be rezoned 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 1 of NSW Rural Fire Service, ***Planning for Bushfire Protection***, 2019.

The following information is provided in relation to the floristic characteristics of the subject site and adjoining and adjacent land in the area which is the subject of the rezoning proposal as relevant to bushfire hazard assessment.

In adopting a conservative approach to bushfire hazard assessment, worst case vegetation characteristics have been identified.

1.3.1 Vegetation within Development Site

The subject site contains a number of vegetation communities with grasslands with scattered and small clusters of trees predominating over the majority of the subject site.

Areas of Dry Sclerophyll Forest are present in the southern portion of the subject site with a number of narrow bands of remnant highly disturbed of Wet Sclerophyll Forest retained adjacent to the north flowing intermittently flowing creek/gullies which are present on the subject site. A small area of Forested Wetland is located in the far southwestern portion of the subject site in conjunction with areas of Dry Sclerophyll Forest.

A narrow band of remnant highly disturbed area of Dry Sclerophyll Forest has been retained immediately adjacent to the Sancrox Road reserve which adjoins the subject site along its northern boundary. It is also noted that a small area of Forested Wetland vegetation is present adjacent to the northern boundary of the subject site roughly in the area of the mid-point of the boundary.

It is noted that the development concept for the subject site provides for the modification of vegetation so as to provide for managed land within the proposed residential and village centre lots and associated infrastructure such as roads and active use open public spaces. It is however noted that areas of unmanaged hazard vegetation will be retained within the proposed 'green corridors', environmental living lots and the areas of bushland which are proposed to be retained along the southern portion of the subject site and within proposed offset areas. Having regards to the above in adopting a conservative approach to bushfire hazard assessment the following vegetation classifications have been adopted for the purposes of this report;

- 'Green Corridors' within the subject site – Wet Sclerophyll Forest. It is noted that whilst width and riparian context of some of the proposed corridors could support a remnant vegetation classification, (i.e. specification similar to Rainforest), in adopting a conservative approach to hazard assessment a Forest classification has been adopted.

- 'Green Corridor' adjacent to the western portion of northern boundary of the subject site – Specification similar to Rainforest. This classification has been adopted on the basis of the narrow width, (<30m), of this area of vegetation and the fragmentation of continuity of vegetation which will result due to the presence of Sancrox Road and managed vegetation to the north and the predominance of managed vegetation to the south. Additionally, the proposed public road intersections will further fragment this narrow band of vegetation.

- ‘Green Corridor’ adjacent to the eastern portion of northern boundary of the subject site – Dry Sclerophyll Forest.

- Retained Forest vegetation within environmental living lots – Wet Sclerophyll Forest.

- Vegetation within offset public reserve - Wet Sclerophyll Forest.

- Vegetation within unmanaged bushland within residual lot/public reserve – Wet Sclerophyll Forest.

1.3.2 Vegetation on Adjoining and Adjacent Land to Development Site

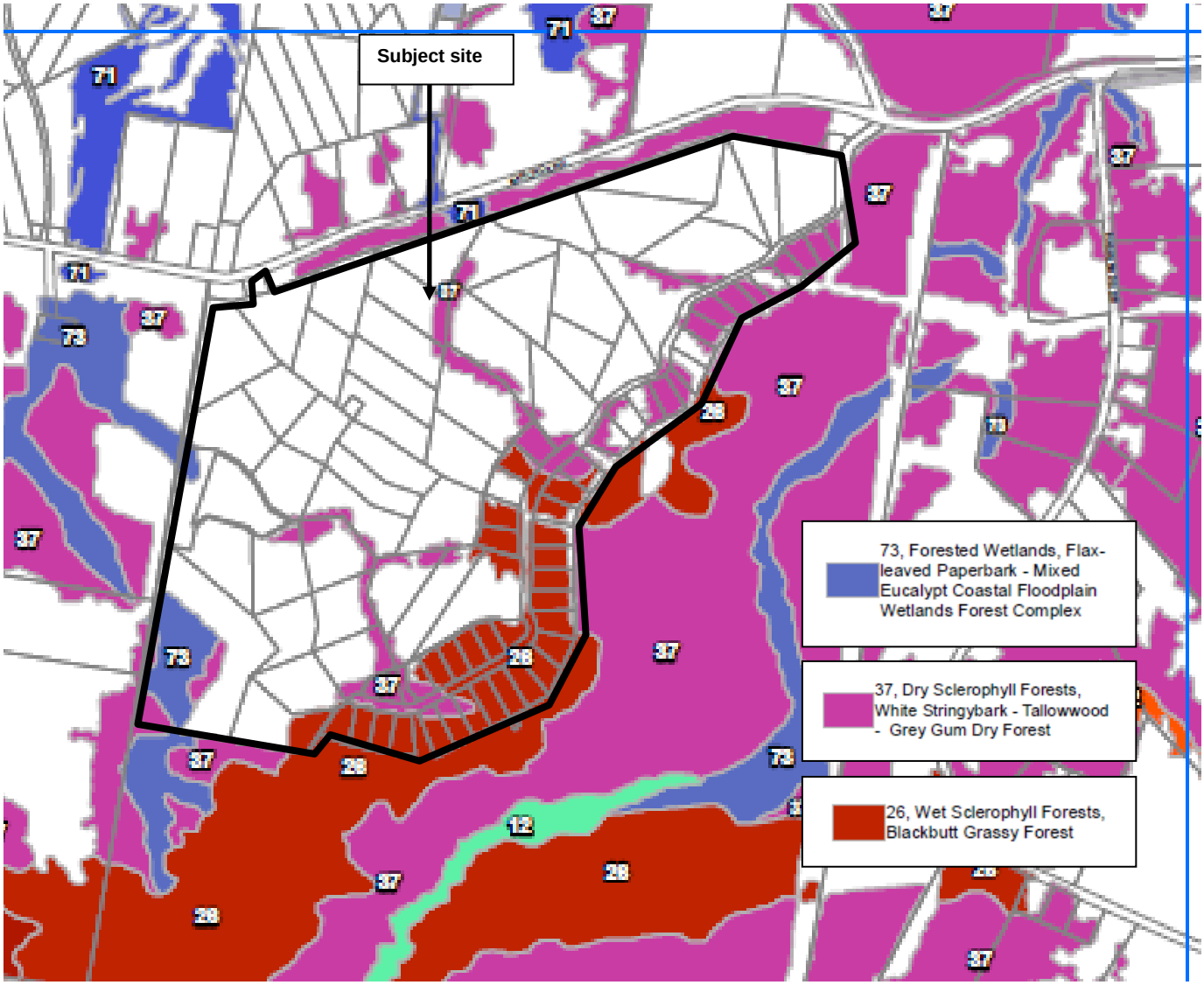
The following vegetation characteristics were identified as being relevant to the proposed rezoning of the subject site having regard to the vegetation characteristics of adjoining and adjacent land.

Vegetation to the north of the subject site is dominated by Grasslands with scattered and clusters of trees although some areas of Wet Sclerophyll Forest are located at distance to the north of the subject site.

A mix of grasslands with scattered and clusters of trees and areas of Dry Sclerophyll Forest and Forested Wetland are present to the west of the subject site. In adopting a conservative approach to hazard management, a Wet Sclerophyll Forest classification was adopted for the land to the west of the subject site.

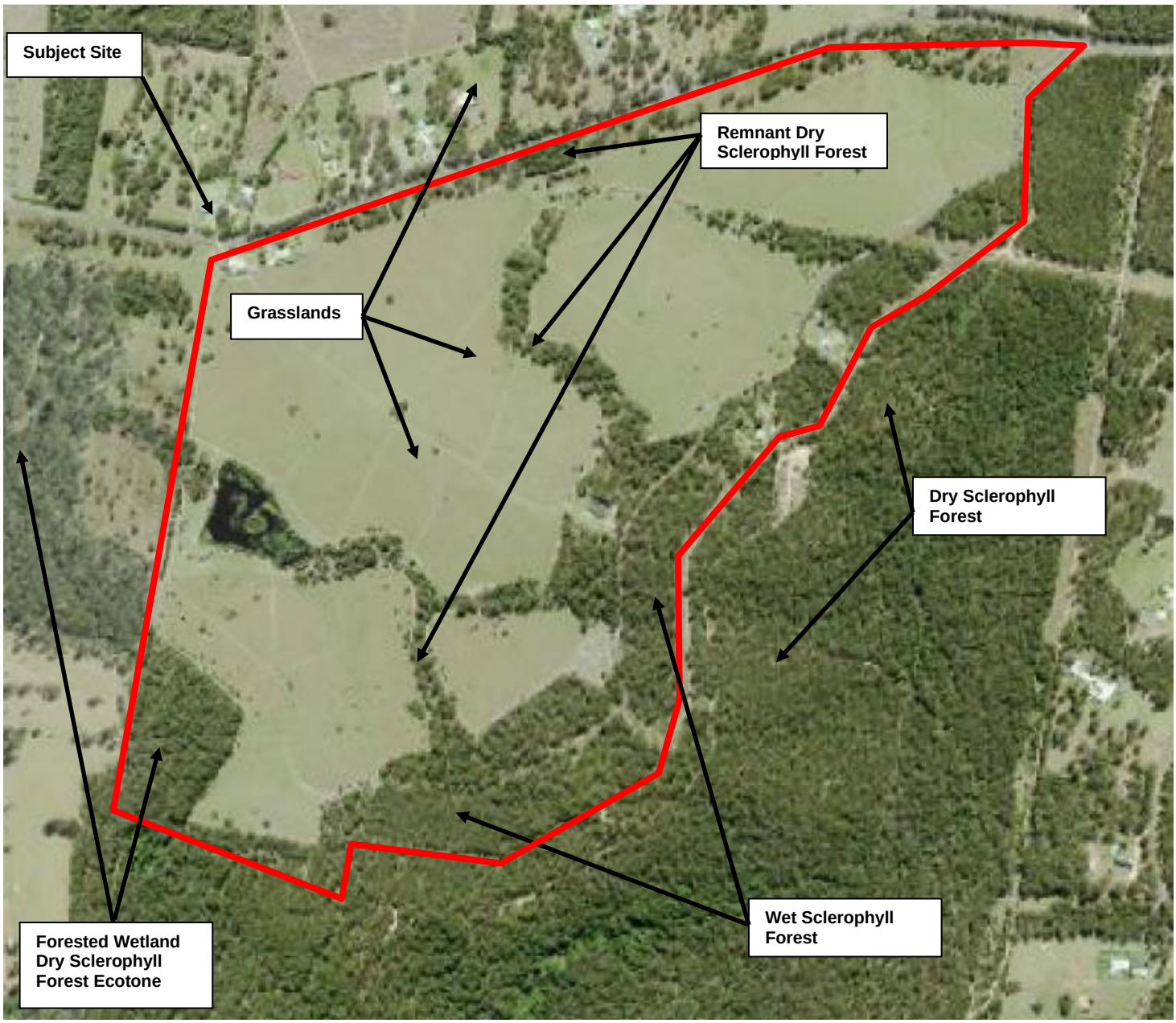
The aforementioned assessment of vegetation is consistent with vegetation mapping of the area conducted by Port Macquarie-Hastings Council in 2013, refer to **Figure 2** below;

Figure 2 - Vegetation Characteristics of Area



An indication of the relationship of the vegetation of bushfire significance to the area of land which are proposed to be rezoned is presented in **Figure 3** below.

Figure 3 - Vegetation Relationships to the Subject Land



The following table summarizes the worst-case vegetation structures which are of bushfire significance to the proposed rezoning and consequential development allotments.

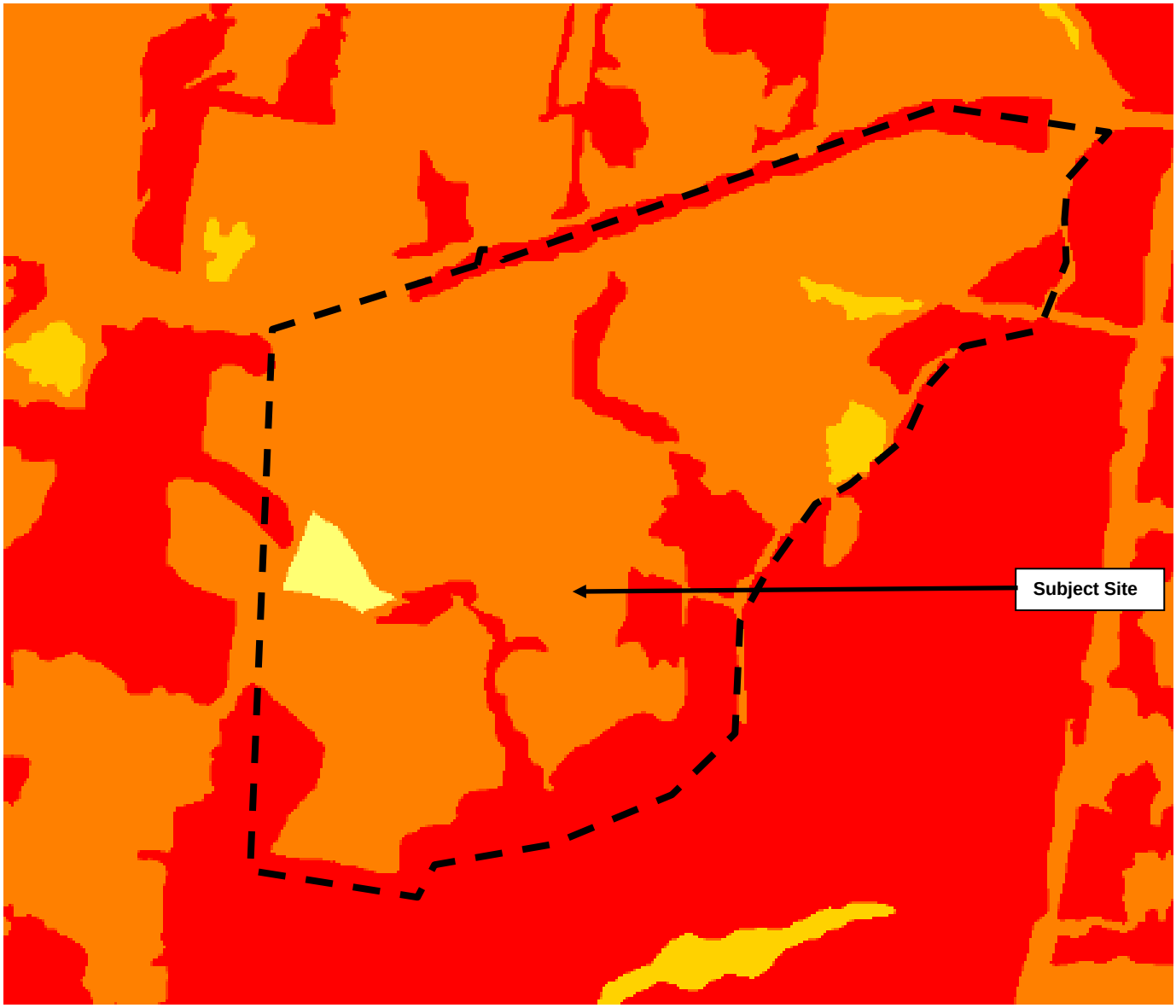
Table 2 – Summary of Vegetation Characteristics

ASPECT	VEGETATION DESCRIPTION	VEGETATION CLASSIFICATION – (Keith, 2004)
Within the subject site	Wet and Dry Sclerophyll Forest within the proposed 'Green Corridors', environmental living lots and bushland areas which are not subject to development.	Wet and Dry Sclerophyll Forest

	Specification similar to Rainforest within proposed 'Green Corridor' along the western portion of the northern property boundary of the subject site	Rainforest Specification
	Grasslands within undeveloped stages of the proposed subdivision	Grasslands
North	Grasslands within developed rural/rural residential lots	Grasslands
South	Wet Sclerophyll Forest on adjoining land.	Wet Sclerophyll Forest
East	Dry Sclerophyll Forest on adjoining land.	Dry Sclerophyll Forest
West	Grasslands with scattered trees and areas of Wet Sclerophyll Forest and Forested Wetland on adjoining land.	Wet Sclerophyll Forest

It is noted that the identification of areas of bushfire hazard vegetation is generally consistent with the bushfire risk mapping for the area, refer to **Figure 4**, however the characteristics of the vegetation which is proposed to be retained within the 'green corridors' within the subject site would suggest a Category 2 classification rather than a Category 1 classification as provided for in the following figure.

Figure 4 – Extract from Bushfire Risk Mapping



1.4 Climate/Weather

The typical/average climate of the Port Macquarie area is a humid subtropical climate characterised by warm humid summers and mild winters. The average daily maximum temperature is around 21.5^{0}C, while the average daily minimum temperature is around 10^{0}C - 11^{0}C.

Long-term average annual rainfall is around 1,500mm whilst annual pan evaporation is estimated to be approximately 1,400mm.

Based on long-term, (1910–2011), observations, temperatures have been increasing in the North Coast Region since about 1970, with higher temperatures experienced in recent decades. This warming trend is expected to continue, with anticipated considerable rainfall variability across seasons and from year to year. These projected changes include increasing maximum and minimum temperatures, increasing number of hot days, decreasing number of cold nights together with winter rainfall and increasing autumn and spring rainfall. Average fire weather and severe fire weather days are projected to increase in summer and spring.

The bush fire season for the Port Macquarie area generally runs from July to November, however, can extend into December or January with low rainfalls. Strong northwest to southwest winds often prevail within that time of year. Longer bush fire seasons occur when summer rainfall is lower than normal, with the bush fire season extending through summer to early autumn. Serious fires have occurred late in the season under dry summer conditions.

Prevailing weather conditions associated with the bush fire season are characterised by dry north-westerly winds, usually associated with high pressure systems and the passage of cold fronts. Extended periods of low rainfall, and the resultant fuel moisture deficiencies, combined with summer temperatures and hot dry westerly winds form the circumstances for high intensity fires to develop. Although summer rains generally bring an end to the fire season, short dry spells can create extensive wildfires in the area as late as April. Generally, these fires have proved to be less damaging than those occurring in spring/early summer. The climate projections indicate that there is a likelihood of more frequent and higher intensity bushfires occurring when low seasonal rainfall occurs.

Notwithstanding the above, it is noted bushfires do not always conform to widely accepted characteristics. Other fire weather conditions must also be contemplated such as preceding weather conditions, (such as low rainfall or drought), air temperature and relative humidity. If the area has been subject to drought or low rainfall for a period of time, vegetation health tends to deteriorate with increased leaf drop, curing and drying. This contributes to increased ground fuel loads and general ignition susceptibility. Prolonged dry periods also reduce soil moisture content.

Air temperatures of above 30 degrees Celsius are typically conducive to more severe fire weather, as are extended periods of higher-than-average air temperatures. In conjunction, low relative humidity, (i.e. low air moisture content), is also a contributing factor to increased fire weather.

In concert, all of the above factors can impact on the ability for fire to propagate, and alter behaviour and intensity characteristics and as such, fire weather is a significant component of bushfire hazard. Whilst an assessment of vegetation types, fuel loads, effective slope and other factors can be readily undertaken, fire weather can fluctuate across days, weeks and seasons and can have a significant impact on the potential for bushfire threat as well as influence bushfire behaviour and intensity.

In accordance with NSW Rural Fire Services, ***Planning for Bushfire Protection***, 2019, NSW Rural Fire Service, ***NSW Local Government Areas FDI*****,** May 2017 and Table 2.1 of AS 3959 - 2018, the fire weather for the subject site is based upon the 1:50 year fire weather scenario and has a Fire Danger Index (FDI) of 80.

Based upon the above it is considered that climatic conditions are at times conducive to supporting bushfire, with the subject site containing and being located adjacent to areas of vegetation which provide for fuel loads sufficient to support and promote bushfires.

2.0 BUSHFIRE RISK ASSESSMENT

2.1 Overview of Bushfire Attack Mechanisms

Bushfires have long remained a fundamental characteristic of the Australian bush landscape, and likewise Australians have long retained a strong affinity with bush environments.

There remain a number of common factors which are associated with bushfire hazard and events and these include the incidence of fire weather, availability of fuel along with its type, structure and continuity or fragmentation, and the context of development at the urban / bushland interface.

Bushfire attack refers to the various methods in which bushfire may impact upon life and property and principally encompass the following modes of attack:

(i) Direct flame contact

Direct flame attack refers to flame contact from the main fire front, where the flame which engulfs burning vegetation is one and the same as that which assumes contact with the building. It is estimated that only 10 to 20 per cent of buildings lost to bushfire occur as a direct result of flame attack.

(ii) Ember and firebrand attack

The convective forces of bushfire raise burning embers into the atmosphere on prevailing winds and deposit them to the ground ahead of the fire front.

Typically, ember attack occurs approximately 30 minutes prior to the arrival of the fire front and continues during the impact of the fire front and for several hours afterwards, thus it is the longest lasting impact of bushfire attack. Firebrands occur in a very similar manner but relate to larger items of debris that may still be carried by the wind when alight, such as candle and ribbon barks. In essence, building loss via ember attack relates largely to the vulnerabilities and peculiarities of each building, its distance from hazardous vegetation and whether an occupant (or the like) is present to actively defend it. It is estimated by the CSIRO that approximately 80 to 90 per cent of buildings lost by bushfire are lost as a result of ember attack either in isolation or in combination with radiant heat impact.

(iii) Radiant heat flux

Exposure to radiant heat remains one of the leading causes of fatalities associated with bushfire events. Measured in kilowatts per m2, radiant heat is the heat energy released from the fire front which radiates to the surrounding environment, deteriorating rapidly over distance. In terms of impact on buildings, radiant heat can pre-heat materials making them more susceptible to ignition or can cause non-piloted ignition of certain materials if the energy transmitted reaches a threshold level. Radiant heat can also damage building materials such as window glazing, allowing openings into a building through which embers may enter. Radiant heat impact is an especially important factor in building-to-building ignition.

In terms of radiant heat exposure for humans, it can cause pain to unprotected skin in milder situations or life threatening and fatal injury in higher exposure thresholds.

(iv) Fire-driven wind

The convective forces of bushfire typically result in strong to gale force fire-driven winds which in itself, can lead to building damage. The typical effects of fire driven wind include the conveyance of embers, damage from branches and debris hitting the building, as well as direct damage to vulnerable building components such as lifting roofs or roof materials and the damage / breakage of windows.

(v) Smoke

Smoke emission remains a secondary effect of bushfire and is one which is typically not addressed by bushfire assessments. Irrespective, it is important to note the potentially severe impact of smoke emission on the human respiratory system. It can lead to difficulties in breathing, severe coughing, blurred or otherwise compromised vision, and can prove fatal. It is also important to note that toxic

smoke can occur during bushfire, particularly where buildings or materials are ignited. With regard to evacuation, it can reduce visibility and create difficulties for particularly vulnerable persons.

In the progression of a bushfire event, the above five methods interact either exclusively or in concert. It is estimated that approximately 80 to 90 per cent of buildings lost to bushfire are located within 100m of the bushland interface, hence the relevance of statutory provisions and recommendations implemented across Australia which respond to various types of buildings within 100m of adjacent classifiable vegetation.

2.2 Bushfire Activity History

The Mid Coast Bush Fire Risk Management Plan, (BFMP 2019), identifies that the main sources of ignition in mid coast area, (includes the subject site), are:

- Escapes from Legal Burning off
- Incendiarism/arson
- Re ignition of previous wildfire or hazard reduction
- Illegal burning off
- Lightning

Many of the abovementioned fires occur as a result of private 'Hazard Reduction' burns by private landowners, which by act or omission have escaped into forested areas requiring major suppression efforts.

Incendiarism/arson commonly occurs in both grassland and forested areas across the Midcoast area. Increased visitation is thought to be a contributing factor to increased incidence of incendiarism.

Lightning activity in the area is mainly associated with late spring and summer thunderstorm activity, which is normally, (but not always), accompanied by rainfall.

The subject site and surrounds are not known to have an extensive history of bushfire.

Recent bushfire activity was not detected on or immediately adjacent to the subject site despite bushfires to the northwest, south and west of Port Macquarie during November and December 2019 and January 2020.

It is noted that the bushfire activity around Port Macquarie in November/December 2019 and January 2020 was predominately to the east of the Pacific Highway with the closest area of bushfire activity to the subject site being approximately 1.5km to the east of the subject site.

The Mid Coast BFMC Bush Fire Risk Management Plan 2019 does not identify any particular 'at risk' assets on or adjacent to the subject site nor does it identify any specific bushfire threat management actions for the locality.

2.3 Potential Bush Fire Behaviour

Whilst each bushfire event is different, fire spreads by responding to changes in fuel, terrain, and weather conditions. Therefore, based on landscape conditions and fire history, potential fire behaviour can be determined.

It is generally anticipated that a potential fire within the locality and surrounds, would spread more quickly and have the potential for higher intensities when burning under the influence of southerly winds, particularly during warmer summer months.

In this regard the most likely bushfire risk scenario would be a fire moving from the south towards the north within the Forest vegetation contained within the undeveloped areas of land in the southern, eastern and western aspects of the subject site. This risk is however tempered by the generally upslope topography within the hazard vegetation to the south of the subject site and the reduced and fragmented fuel loads which are present on adjoining land to the west of the subject site. The south to north fire spread scenario was demonstrated in the November/December 2019 bushfires to the south and west of Port Macquarie.

Additionally, it is possible that bushfires may also move from adjoining and adjacent land to the north towards the south under the influence of northerly wind conditions. This risk is however tempered by the reduced fuel loads associated with the residentially occupied areas of land which extend to the north of Sancrox Road.

The proposed presence of vegetated 'green corridors' and remnant areas of vegetation within the development site do present as a bushfire risk to the future development of the subject site however the generally narrow width of the corridors and the fragmentation of connectivity of vegetation does significantly reduce the risk of bushfire risk and impact associated with fire within these areas. It is noted that the bushfire risk posed by the vegetation which is to be retained onsite could be reduced via its removal/modification however this needs to be balanced against the environmental and aesthetic values of the vegetation, the risk posed to assets and life safety of a bushfire within the 'green corridors' and remnant areas of bushland together with opportunities to reduce risk via the implementation of bushfire threat management measures.

Not withstanding the above the subject site does have the potential to be exposed to landscape scale bushfires due to the extent of bushland which extends to the south and east of the subject site.

The bushfire risk which is relevant to the subject site and proposed rezoning is summarized as follows;

Table 3 – Summary of Bushfire Behaviour Risk Summary

ASPECT	VEGETATION DESCRIPTION	SLOPE CONDITION	WORST CASE WIND INFLUENCE
Within the subject site	Wet and Dry Sclerophyll Forest within the proposed 'Green Corridors', environmental living lots and bushland areas which are not subject to development.	4˚ - 5˚ Downslope	Northerly
	Wet and Dry Sclerophyll Forest within the proposed 'Green Corridors' along the western portion of the northern property boundary of the subject site		Northerly
	Grasslands within undeveloped stages of the proposed subdivision		Variable – depending on staging
North	Grasslands within developed rural/rural residential lots	2˚ - 3˚ Downslope	Northerly

South	Wet Sclerophyll Forest on adjoining land.	4˚ - 5˚ (0˚) Upslope	Southerly and northerly
East	Dry Sclerophyll Forest on adjoining land.	4˚ - 5˚ Downslope	Southerly and northerly
West	Grasslands with scattered trees and areas of Wet Sclerophyll Forest and Forested Wetland on adjoining land.	4˚ - 5˚ Downslope	Southerly and northerly

2.4 Impacts of Climate Change

Climate change influences bushfires in the following four ways:

- **A longer fire season.** Hotter conditions mean a longer fire season, leading to more dangerous bushfires and leaving less time for hazard reduction.
- **Hotter temperatures.** Australia is getting hotter, with more extreme hot days and longer, hotter heatwaves. These conditions are increasing the risk of bushfires in many areas.
- **Drier vegetation & 'fuel'.** Hotter conditions and periods of low rainfall dry out soil and vegetation, increasing fire risk.
- **More lightning.** A warmer climate increases the chance of lightning, which is a key factor in starting fires.

The climate projections indicate that there is a likelihood of more frequent and higher intensity bushfires occurring when low seasonal rainfall occurs.

2.5 Summary of Landscape Bushfire Risk Assessment

The landscape assessment indicates the potential for bushfire attack of the subject site given the presence of bushfire hazard vegetation within the subject site and on adjoining and adjacent lands.

Available information indicates a limited fire history for the subject site and within the immediately surrounding area.

The risk of bushfire impact can however be reduced in terms of the future development of the subject site through the integration of appropriate fire mitigation via the provision of appropriate bushfire protection measures within the subject site as part of its future development. In particular, the subject site can facilitate APZ's without extensive vegetation clearing whilst other design mechanisms including perimeter roads and a connected public road network can be integrated into the future development of the subject site.

The landscape assessment indicates that it is feasible to design and build resilience into the planned community that matches or exceeds the bushfire protection requirements provided for by NSW Rural Fire Service, ***Planning for Bushfire Protection***, 2019.

3.0 LAND USE ASSESSMENT

3.1 Existing Land Use Context

Being located at distance to the northwest of the developed areas of Port Macquarie land uses within the locality, including the subject site, have until recently been dominated by rural and bushland activities.

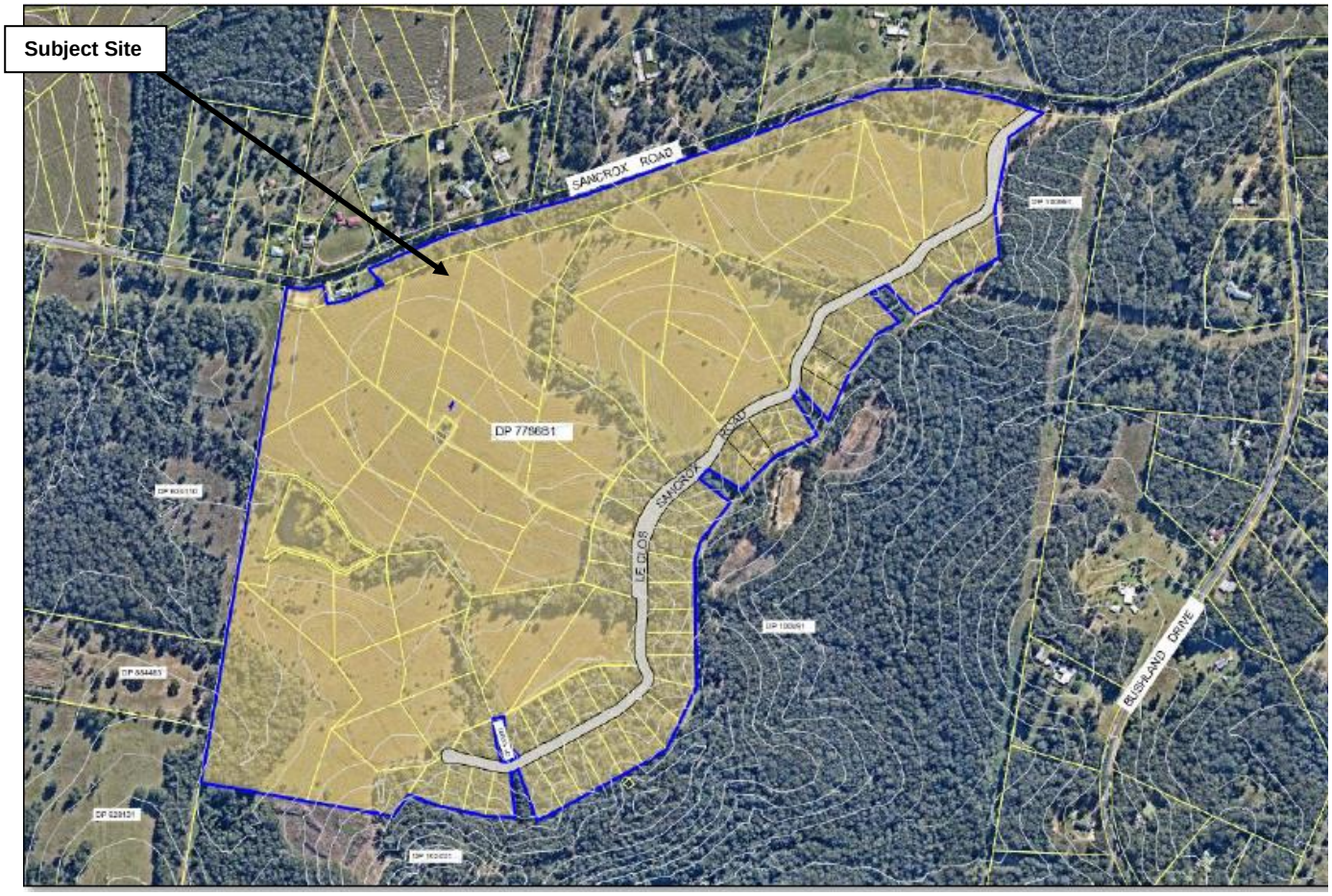
In this regard, the area of the subject site which is proposed to be developed has a history of use for viticulture associated with the operation of Cassegrain Wines. However, in more recent times the land has been used for cattle grazing purposes following the decommissioning of grape growing activities on the subject site.

The character of the area is predominately rural although the construction of a number of separate residential dwellings on land within the subject site provides for a rural residential feel within the subject site.

Large rural sized allotments adjoin the subject site to the south, east and west whilst a number of smaller rural sized lots of land are present to the north. Rural residential lots are present at distance to the northwest and southeast of the subject site whilst the Pacific Highway is located approximately 1.4km to the east of the subject site with industrial land use present adjacent to the highway.

It is noted that the subject site currently comprises forty-eight (48) separate allotments of land which reflects the co-operative viticulture venture which was intended for the land within the subject site. This approach provided for Torrens title house lots and an attached land lot which was to be used as part of the viticulture activities on the subject site. The current lot configuration reflects the original co-operative approach to the productive utilization of the land, refer to **Figure 5**.

Figure 5 – Subject Site

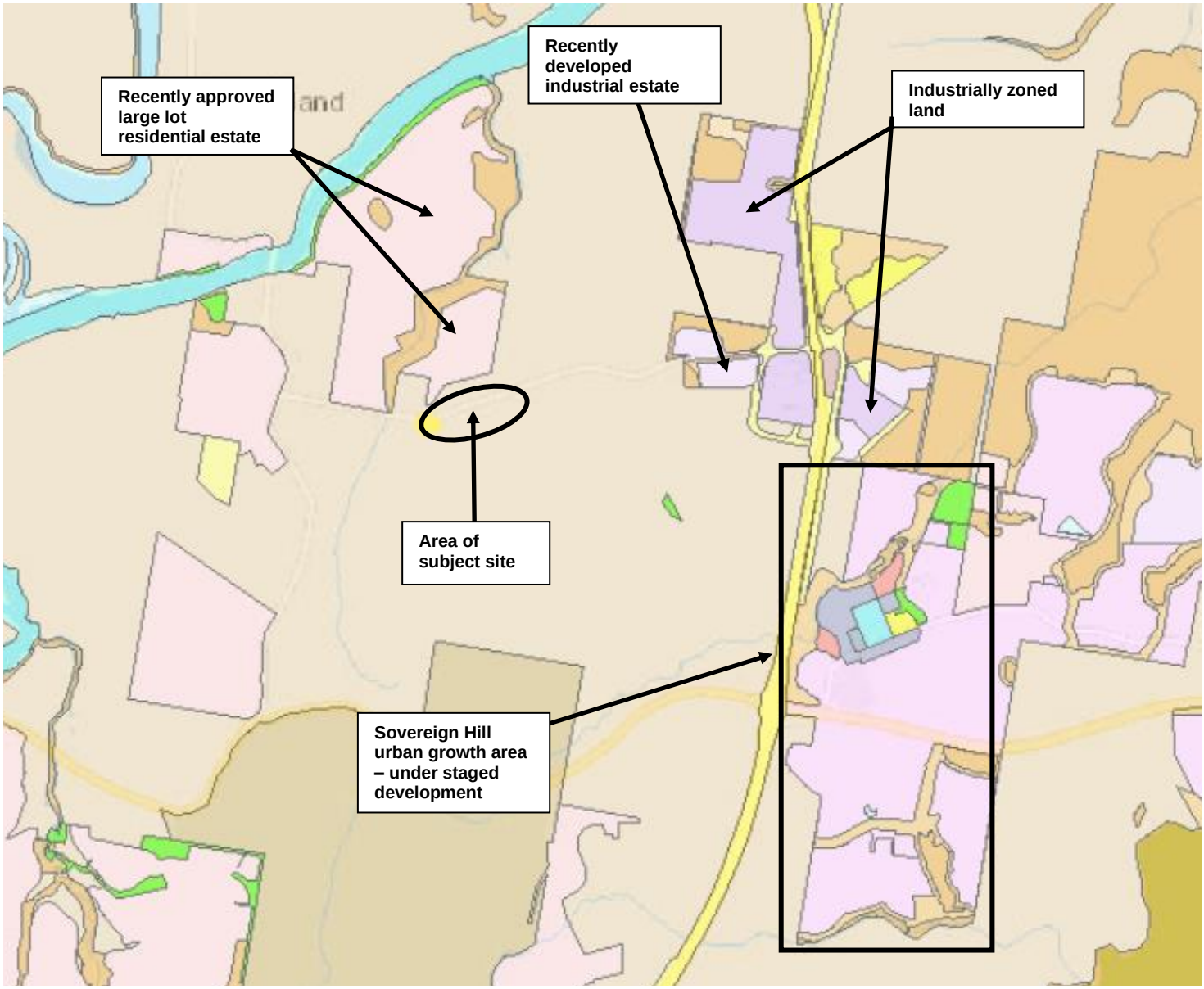


The original development concept for the subject site envisaged a higher level of residential occupancy than that which currently exists. At present there are three (3) separate residential dwellings within the subject site however the original development concept for the site provided for a significantly greater number of dwellings each of which was to be linked to a designated grape growing area within Le Clos Estate. The original development concept did not however proceed beyond the building infrastructure which is currently present in the southern portion of the subject site.

Being located approximately 2.5km to the northwest of the Sovereign Hills urban growth area, (which is located to the west of the urbanized area of Port Macquarie and known as Area 13), the land within the area has recently and will continue to experience significant land use change with residential and industrial development expanding into undeveloped land with a rural/rural residential land use history.

The area of land which is proposed to be rezoned does not currently have a direct context and relationship with existing or approved residential areas however the subject site is within an area which is identified as being potentially suitable to accommodate the westerly expansion of Port Macquarie. In this regard a recently approved industrial subdivision is located approximately 700m to the east of the subject site. Additionally, a large lot residential subdivision has been constructed on land approximately 450m to the west of the subject site. These two recent developments highlight the changing nature of land use within the locality, refer to **Figure 6** below.

Figure 6 – Existing Land Use Context



3.2 Future land use context

Whilst the subject site does not form part of an existing urban growth area, the Hastings Urban Growth Strategy, (HUGS), 2017 identifies the subject site as forming part of an area of land which maybe suitable as a potential long term growth area as modelled in hypothetical future growth scenarios.

Figure 7 – Urban Growth Investigation Opportunities

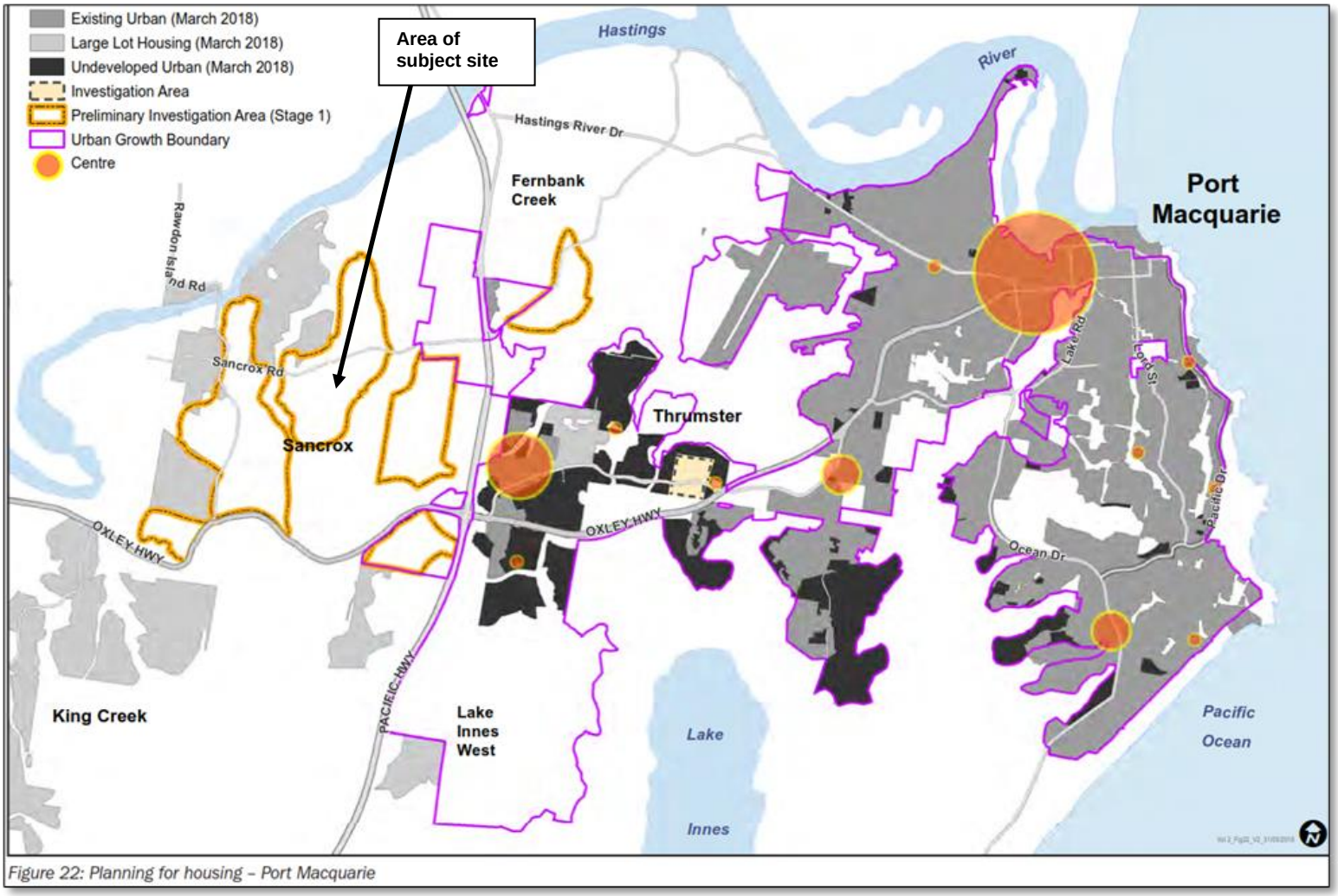


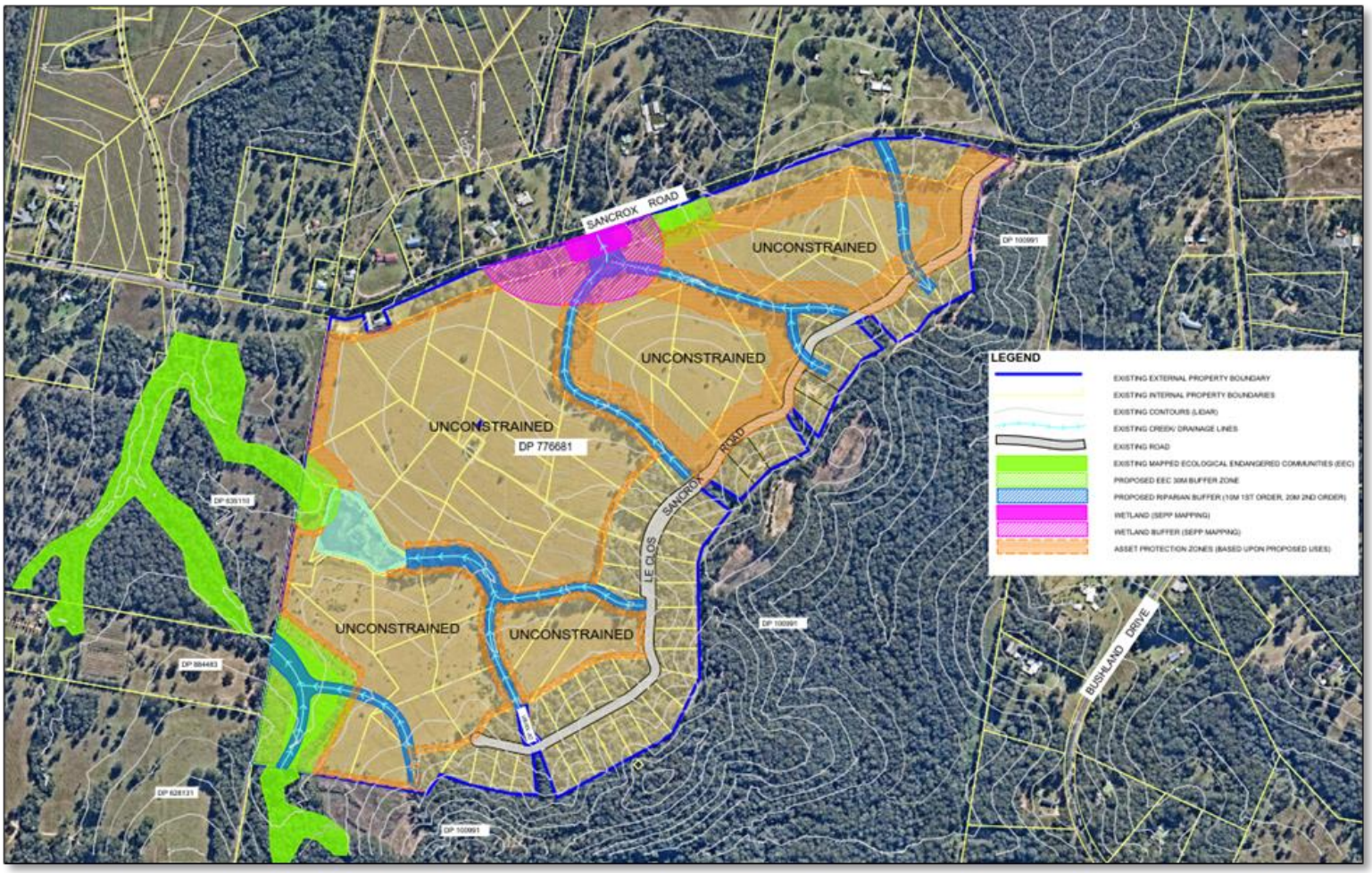
Figure 22: Planning for housing – Port Macquarie

Additionally, North Coast Regional Plan 2036 has been prepared to guide land use planning priorities and decisions to 2036 and has identified "*The regional cities of Tweed Heads, Lismore, Coffs Harbour and Port Macquarie are the primary growth anchors, delivering new jobs, and more diverse housing as well as high quality essential services*".

Whilst the subject site is located outside of the urban investigation area boundaries identified in the plan, in response to the need for additional housing stock identified in the Regional Strategy, the subject site provides a prime opportunity to accommodate additional housing without adverse environmental impacts or loss of agricultural land given that the site has not been utilized as a vineyard for approximately 30 years.

The use of cleared land, as is the case with the subject site, adopts the sustainable land use principles, rather than utilizing land which is currently used for agricultural purposes or contains ecological features. This is supported via the following constraints mapping for the subject site. It is noted that the following mapping includes the provision of the minimum required APZ's (as per NSW Rural Fire Services, ***Planning for Bushfire Protection***, 2019), in order to reflect the constraints to development posed by the areas of bushfire prone vegetation on and adjacent to the subject site;

Figure 8 – Land Use Constraints Mapping



Notwithstanding the proposed rezoning, areas of bushland will continue to adjoin the subject site to the south, east and west whilst residentially occupied rural residential lots will continue to be present to the north of the subject site. Accordingly, the subject area of land does and will continue to have an interface with areas of land containing bushfire hazard vegetation. In this regard the ongoing presence of the bushfire hazard vegetation on adjoining and adjacent land needs to be taken into consideration in the identification of bushfire threat mitigation and management responses which are relevant to the future residential and commercial development of the area of land which is the subject of this report.

However, the generally cleared nature of the land which is the subject of this report and the absence of major constraints in terms of landform and topography to the future development of the subject land suggests that the proposed rezoning of the land is consistent with sound town planning outcomes.

3.3 Proposed Land Uses and Occupant Characteristics.

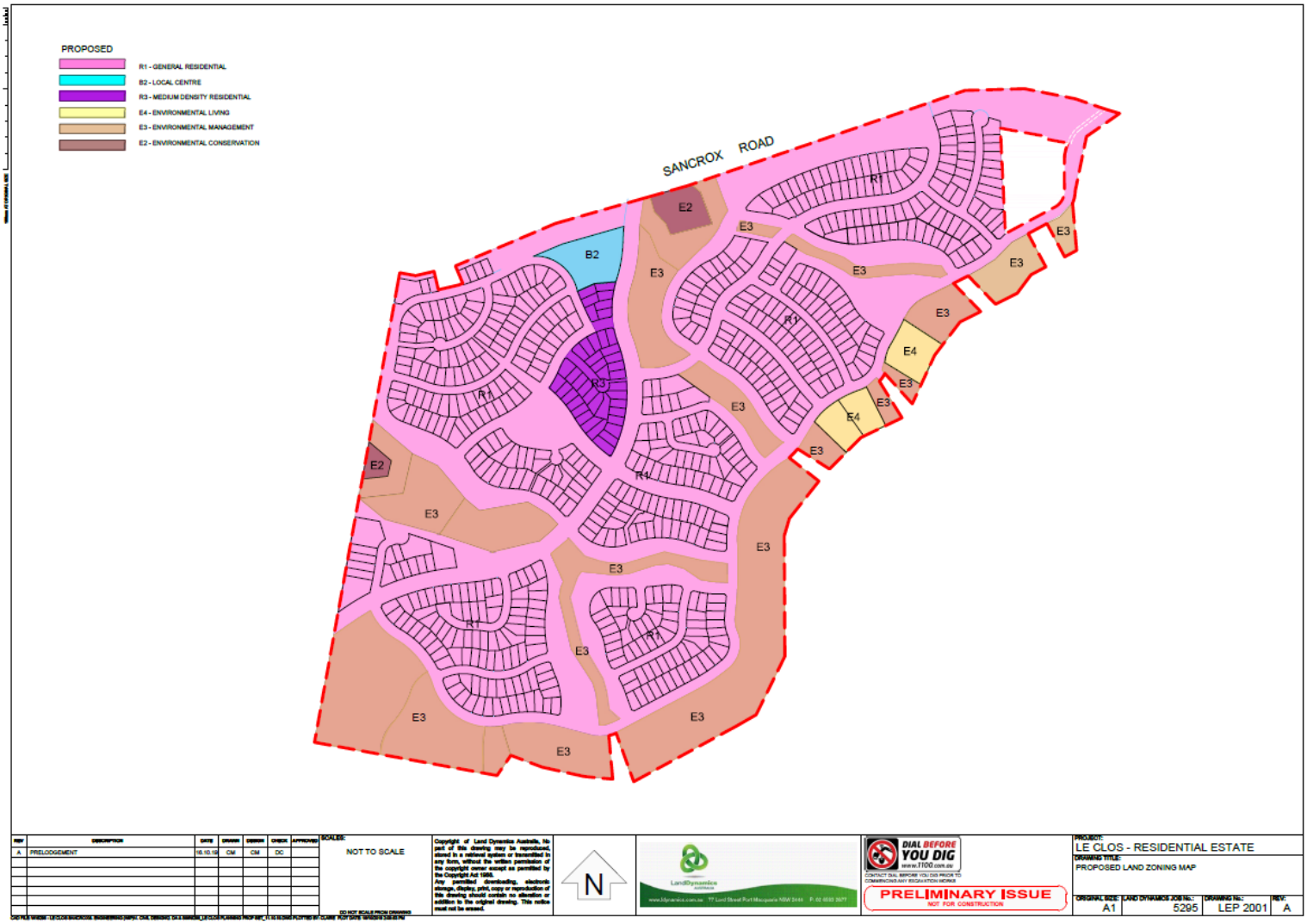
The proposed rezoning proposes the following land use zones;

- General Residential (R1); and
- Medium Density (R3); and
- Environmental Living (E4); and
- Village Centre (B2); and

- Environmental Conservation (E2); and
- Environmental Management (E3).

The proposed zones are shown in **Figure 9** below;

Figure 9 – Proposed Land Use Zones



It is noted that the rezoning is proposed to facilitate the development of the subject area of land for residential dwelling and commercial (Business) development via separate Torrens Title lots. It would therefore be expected that the density of future development and the characteristics of occupants would be entirely consistent with that expected within urban residential and associated business areas.

The typical permitted land uses associated with the proposed rezoning are summarized as follows;

Table 4 – Permitted Uses

	Residential (R1) Zone	Medium Density Residential (R3) Zone	Business - Local Centre (B2) Zone	Environmental Living (E4) Zone
Objectives of Zone	• *To provide for the housing needs of the community.* • *To provide for a variety of housing types and densities.* • *To enable other land uses that provide facilities or services to meet the day to day needs of residents.*	• *To provide for the housing needs of the community within a medium density residential environment.* • *To provide a variety of housing types within a medium density residential environment.* • *To enable other land uses that provide facilities or services to meet the day to day needs of residents.*	• *To provide a range of retail, business, entertainment and community uses that serve the needs of people who live in, work in and visit the local area.* • *To encourage employment opportunities in accessible locations.* • *To maximise public transport patronage and encourage walking and cycling.* • *To ensure that new developments make a positive contribution to the streetscape and contribute to a safe public environment.*	• *To provide for low impact residential development in areas with special ecological, scientific or aesthetic values.* • *To ensure that residential development does not have an adverse effect on those values.*
Permitted without consent	*Home-based child care; Home occupations*	*Home occupations*	*Home occupations*	*Home occupations*
Permitted with consent	*Attached dwellings; Boarding houses; Business identification signs; Child care centres; Community facilities; Dwelling houses; Group homes; Home industries; Hostels; Multi dwelling housing; Neighbourhood shops; Places of public worship; Residential flat buildings; Respite day care centres; Roads; Semi-detached dwellings; Seniors housing; Shop top housing; Any other development not specified in item 2 or 4.*	*Attached dwellings; Boarding houses; Building identification signs; Business identification signs; Centre-based child care facilities; Community facilities; Group homes; Multi dwelling housing; Neighbourhood shops; Oyster aquaculture; Places of public worship; Respite day care centres; Roads; Seniors housing; Tank-based aquaculture; Any other development not specified in item 2 or 4*	*Boarding houses; Centre-based child care facilities; Commercial premises; Community facilities; Educational establishments; Entertainment facilities; Function centres; Hostels; Information and education facilities; Medical centres; Oyster aquaculture; Passenger transport facilities; Recreation facilities (indoor); Registered clubs; Respite day care centres; Restricted premises; Roads; Service stations; Shop top housing; Tank-based aquaculture; Tourist*	*Backpackers' accommodation; Bed and breakfast accommodation; Building identification signs; Business identification signs; Centre-based child care facilities; Community facilities; Dual occupancies (attached); Dwelling houses; Eco-tourist facilities; Educational establishments; Emergency services facilities; Environmental facilities; Environmental protection works;*

			and visitor accommodation; Any other development not specified in item 2 or 4.	*Home-based child care; Home businesses; Horticulture; Information and education facilities; Oyster aquaculture; Places of public worship; Pond-based aquaculture; Recreation areas; Research stations; Respite day care centres; Roads; Tank-based aquaculture; Water recreation structures*
Prohibited	*Agriculture; Air transport facilities; Airstrips; Amusement centres; Animal boarding or training establishments; Backpackers' accommodation; Boat building and repair facilities; Charter and tourism boating facilities; Commercial premises; Correctional centres; Crematoria; Depots; Electricity generating works; Entertainment facilities; Extractive industries; Farm buildings; Farm stay accommodation; Forestry; Freight transport facilities; Function centres; Heavy industrial storage establishments; Helipads; Highway service centres; Home occupations (sex services); Industrial retail outlets; Industrial training facilities; Industries; Marinas; Mooring pens; Mortuaries; Open cut*	*Agriculture; Air transport facilities; Airstrips; Amusement centres; Animal boarding or training establishments; Boat building and repair facilities; Car parks; Cemeteries; Charter and tourism boating facilities; Commercial premises; Correctional centres; Crematoria; Depots; Dual occupancies; Eco-tourist facilities; Electricity generating works; Entertainment facilities; Extractive industries; Farm buildings; Farm stay accommodation; Forestry; Freight transport facilities; Function centres; Heavy industrial storage establishments; Helipads; Highway service centres; Home occupations (sex services); Industrial retail outlets; Industrial training*	*Agriculture; Air transport facilities; Airstrips; Animal boarding or training establishments; Boat building and repair facilities; Camping grounds; Caravan parks; Cemeteries; Correctional centres; Crematoria; Eco-tourist facilities; Electricity generating works; Exhibition homes; Exhibition villages; Extractive industries; Farm buildings; Forestry; Freight transport facilities; Heavy industrial storage establishments; Helipads; Highway service centres; Home occupations (sex services); Industrial retail outlets; Industrial training facilities; Industries; Marinas; Mooring pens; Mortuaries; Open cut mining; Pond-based aquaculture Research stations; Residential accommodation; Rural*	*Industries; Service stations; Warehouse or distribution centres; Any other development not specified in item 2 or 3*

	mining; Passenger transport facilities; Port facilities; Public administration buildings; Recreation facilities (indoor); Recreation facilities (major); Recreation facilities (outdoor); Registered clubs; Research stations; Restricted premises; Rural industries; Rural workers' dwellings; Service stations; Sewerage systems; Sex services premises; Signage; Storage premises; Transport depots; Truck depots; Vehicle body repair workshops; Vehicle repair stations; Veterinary hospitals; Warehouse or distribution centres; Waste or resource management facilities; Water storage facilities; Water treatment facilities; Wharf or boating facilities; Wholesale supplies	*facilities; Industries; Marinas; Mooring pens; Mortuaries; Open cut mining; Passenger transport facilities; Pond-based aquaculture Port facilities; Public administration buildings; Recreation facilities (indoor); Recreation facilities (major); Recreation facilities (outdoor); Registered clubs; Research stations; Restricted premises; Rural industries; Rural workers' dwellings; Semi-detached dwellings; Service stations; Sewerage systems; Sex services premises; Signage; Storage premises; Transport depots; Truck depots; Vehicle body repair workshops; Vehicle repair stations; Veterinary hospitals; Warehouse or distribution centres; Waste or resource management facilities; Wharf or boating facilities; Wholesale supplies*	*industries; Sewerage systems; Sex services premises; Storage premises; Transport depots; Truck depots; Vehicle body repair workshops; Vehicle repair stations; Warehouse or distribution centres; Waste or resource management facilities; Wharf or boating facilities; Wholesale supplies*	

In addition to the proposed residential dwelling and commercial (Business) land use zonings, the 'green corridors' and remnant bushland areas which are proposed to be retained on the subject site will be protected from development via Environmental Conservation (E2) and Environmental Management (E3) land use zonings.

The development concept for the subject site provides, in the main, for typically sized residential lots which would support a density of occupation which would be expected for an urban residential area. Accordingly, the future population demographics for the area would not present as being particularly 'vulnerable' in the context of socio-economic, mobility or emergency response factors.

Other future land use factors which are considered to be relevant to the proposed development are;

- The bushfire risk associated with the proposed commercial (Business) B2 land use zoning is reduced in the context of life safety due to the non-residential activities associated with this use. This is acknowledged in the nature and extent of bushfire threat management measures which are required by NSW Rural Fire Service, ***Planning for Bushfire Protection***, 2019 for commercial developments. Additionally, the location of the proposed business zone on the subject site and its spatial relationships to and the characteristics of the areas of the hazard vegetation provide for a reduced risk of bushfire threat to this proposed land use area.

- The development concept for the subject site does provide for a higher density of development via the Medium Density Residential (R3) zoning however apart for the potential increase in occupant numbers the future population demographics for this zone would not present as being particularly 'vulnerable' in the context of socio-economic, mobility or emergency response factors.

  As with the Business land use zoning the location of the proposed Medium Density Residential zone on the subject site and its spatial relationships to and the characteristics of the areas of hazard vegetation provide for a reduced risk of bushfire threat to this land use area.

- It is noted that the proposed Environmental Living (E4) zoning is centred upon the existing developed and residentially occupied lots within the subject site. In this regard the proposed zoning reflects the environmental values and lifestyle expectations which are provided for by existing residential development.

  Accordingly, the level of risk associated with the proposed E4 land use zone for residential occupancy is unchanged from that which currently exists. In this regard the proposed rezoning of the subject site would potentially provide for improved bushfire threat management outcomes for the occupants of assets within this land use area via the improvements to access and egress, services, emergency response and evacuation which would accompany the development of the subject site as proposed via the rezoning.

- It is acknowledged that the permitted land uses as provided for by the proposed zonings could support higher densities of occupation and involve occupants with characteristics which increase their level of vulnerability to emergency events such as bushfire and may reduce their abilities to respond in an emergency. In the context of bushfire risk these vulnerabilities are reflected in the Special Fire Protection Purpose development types, (NSW Rural Fire Service, ***Planning for Bushfire Protection***, 2019).

  It is however noted that the form of development contemplated by the concept plan for the subject site would not be expected to support these forms of development. Notwithstanding this, future development proposals which contemplate Special Fire Protection Purpose developments would need to be assessed on their own merits in terms of responding to bushfire threat and management.

3.4 Defining 'Acceptable' Land Use Planning Risk

With respect to land use planning for natural hazards, defining exactly what represents 'acceptable' risk can be a difficult task. Understanding community expectation of what represents acceptable risk versus unacceptable risk is the basis of much research both in Australia and internationally.

It is noted that in NSW, NSW Rural Fire Service, ***Planning for Bushfire Protection***, 2019 has been adopted as the appropriate risk management standard in relation to land use planning and development

control in relation to property and life safety albeit that there remains an understanding that despite this combination of planning, building and other bushfire protection measures provided for in NSW Rural Fire Service, ***Planning for Bushfire Protection***, 2019, asset loss may still occur in more extreme events.

Having regard to the above, the bushfire risk to assets can be minimized through compliance with the relevant threat management measures contained within NSW Rural Fire Service, ***Planning for Bushfire Protection***, 2019 as this represents the appropriate land use planning and development control standards albeit that a level of property loss is 'accepted' to a degree by existing land use planning and building construction frameworks.

Property and infrastructure may be lost in a catastrophic event, but the key determinate of 'acceptable' risk is life safety risk, and whether the proposed land use rationale, density and settlement pattern supports and enables life safety, including safe evacuation.

In analysing the question of life safety, the following key points are considered to be relevant as to the suitability of the subject site for rezoning:

- the nature of urban growth is such that in regional coastal locations the rezoning of land will inevitably provide for a bushland interface. On a local level this is evident in existing urban growth Areas 13 (west of Port Macquarie), 14 (Lake Cathie/Bonny Hills) and 15 (West Haven), whereby new major population centres have an interface with areas of bushfire hazard vegetation. Accordingly, the issue for consideration is whether the bushfire risk posed to new development is consistent with community expectation and reflects the relevant bushfire threat management requirements which are provided for by current development standards.

  As provided for in the landscape assessment there are no major constraints to the proposed residential occupation of the subject site as proposed via the rezoning as it is feasible to design and build resilience into the planned community that matches or exceeds the bushfire protection requirements provided for by NSW Rural Fire Service, ***Planning for Bushfire Protection***, 2019.

  The landscape characteristics of the subject site and surrounding land are entirely consistent with that contemplated by NSW Rural Fire Service, ***Planning for Bushfire Protection***, 2019 for new development.

- the current and future population demographics for the area does not present as particularly 'vulnerable';

- the limited fire history within the subject site and surrounding areas;

- the generally cleared nature of the land which is the subject of this report and the absence of major constraints in terms of landform and topography to the development of the subject site;

- the risk benefit in relation to existing development in the area. The majority of historical residential development on the subject site has occurred without the benefit of more recent land use planning consideration from a bushfire perspective. In this regard the rezoning of the subject site and its future residential subdivision development provides an opportunity to provide for improved bushfire threat management outcomes for historical residential development on the subject site, in particular access and egress, the provision of services and emergency response and evacuation;

- the proposed evacuation options provide for high levels of movement to and from the subject site with alternative means of access to and egress from the subject site available via existing and proposed public road infrastructure. This issue is further discussed in **Section 3.0** of this report;

  It is also noted that given the size of the subject site opportunities will exist for future occupants to remain onsite and be protected from the impacts of bushfire;

- the opportunities to reduce life safety risk through the application of accepted and tested bushfire threat management measures which respond to the level of bushfire threat; and

- the close proximity of existing emergency services. This issue is further discussed in **Section 4.0** of this report;

Having regards to the above it is considered that the level of asset and life safety risk associated with the proposed rezoning of the subject site is consistent with the relevant community expectations and the relevant land use planning and development control standards.

Based upon the above information there would appear to be no major land use planning constraints to the proposed rezoning of the land and its future development as residential and business lots.

3.0 ACCESS AND EGRESS

The development concept for the subject site provides that access to future development would be via a new public road system which will connect with Sancrox Road which adjoins the subject site along the northern property boundary of the subject site.

The road hierarchy which has been adopted for the future development of the subject site provides for an efficient and effective movement of vehicles with a variety of access and egress opportunities available through the interconnection of the proposed public road network. This is important from an evacuation perspective whereby the proposed road system will provide for capacity of use, alternatives for travel and the minimization of conflict between residents and emergency services.

In this regard the design concept for the future subdivision of the subject site provides for at least two (2) separate intersections with Sancrox Road, one in the western portion of the northern property boundary whilst the other will be located in the eastern portion of the northern property boundary. The new public road system has been designed so as to form a series of connecting perimeter roads which will separate the developed areas of the subject site from those areas which are proposed to contain areas of bushfire hazard vegetation. This network of perimeter roads will separate the development areas from unmanaged bushfire prone vegetation. This approach is entirely consistent with best practice bushfire threat management with the perimeter roads providing for safe access and egress for firefighting vehicles while residents are evacuating as well as providing a safe operational environment for emergency service personnel during firefighting and emergency management on the interface.

Additionally, the perimeter road approach which has been taken to the design of the public road infrastructure provides for high levels of access to the areas of hazard vegetation which are to be retained within the subject site and on adjoining land to the south, east and west. This is important not only from the perspective of providing suitable asset protection zones for future assets but also for the purposes of mounting bushfire control/suppression activities. As can be seen in the development

concept for the subject site, the creation of lots with a direct interface with bushfire prone vegetation has been minimized with the use of perimeter roads maximized.

Access to future lots would also be via the network of new public roads which will provide, in conjunction with the main connecting perimeter public roads, direct public road frontage to each of the proposed lots. It is also noted that the design of the proposed subdivision provides for the integration of some of the proposed public roads with future public roads which will service future development to the southwest of the subject development site.

The access and egress design for the proposed future development of the subject site provides that the number of 'no through' roads have been minimized with the length of any 'no through' roads being generally less than 200m.

The design of the public road system not only provides for alternatives for travel to and from the subject site but also within the subject site with at least two alternatives for travel available from the majority of the proposed lots. This is particularly relevant to the vegetated 'green corridor' areas which are proposed to be retained within the subject site. In this regard the concept design provides for at least two routes across these unmanaged areas which not only provides for alternatives in access and egress but also provides for fire spread containment opportunities as well as fire suppression activities.

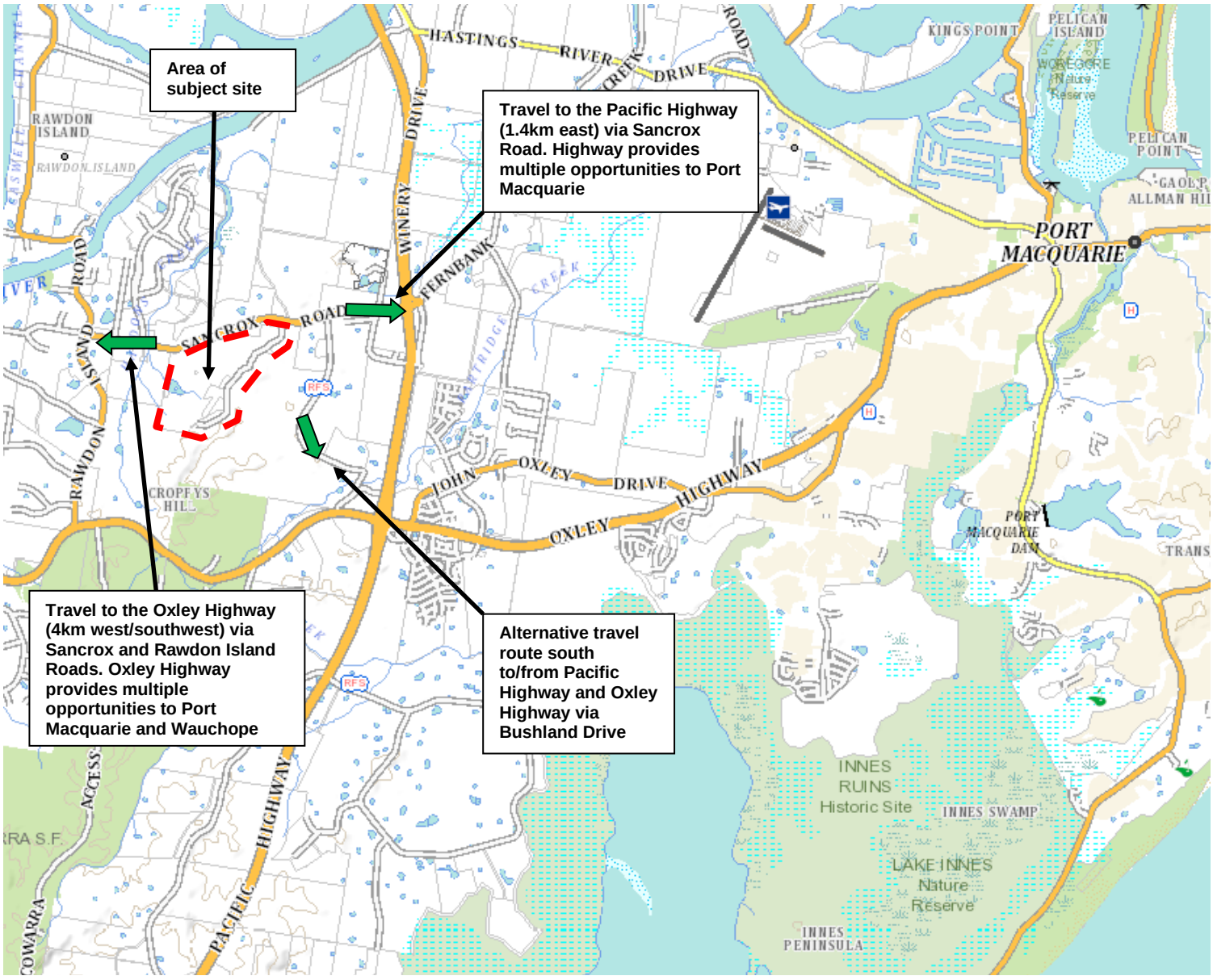
It is understood that all new roads within the future subdivision will be two-way and will be constructed to normal residential street standards. It is noted that the development concept will need to provide for temporary turning heads to some public roads until such times as the staged residential development of land within the subject site.

The sequence of staging of the proposed development can also provide for the maximization of perimeter road access whilst minimizing the length and extent of temporary 'no through' roads. Any staging of future development should provide for the movement of vehicles away from areas of bushfire hazard with movement into the centre of the development site provided for. This approach would provide for movement to and from areas of the subject site which would be sheltered from the impacts of bushfire.

Connection of the proposed new public road infrastructure which will service the future development of the subject site will be principally from the east and west using Sancrox Road which adjoins the northern boundary of the subject site. Travel via Sancrox Road to the east provides for connection with the Pacific Highway which is located approximately 1.4km from the subject site whilst travel to the west of the subject site for a distance of approximately 4km provides for connection to the Oxley Highway. It is noted that the relationship of the subject site to and its connection with major road infrastructure, (Pacific Highway and Oxley Highway), supports the suitability of the subject site for rezoning from an access and egress perspective.

It is also noted that there a number of other public roads which connect with Sancrox Road in proximity to the subject site thereby providing for a range of access and egress options to and from the subject site. It is also noted that areas which would be protected from the impacts of bushfire are located within 1.5km to the east and west of the subject site with the availability of these areas significant in the context of emergency evacuation, refer to **Figure 10** below;

Figure 10 – Access and Egress Opportunities

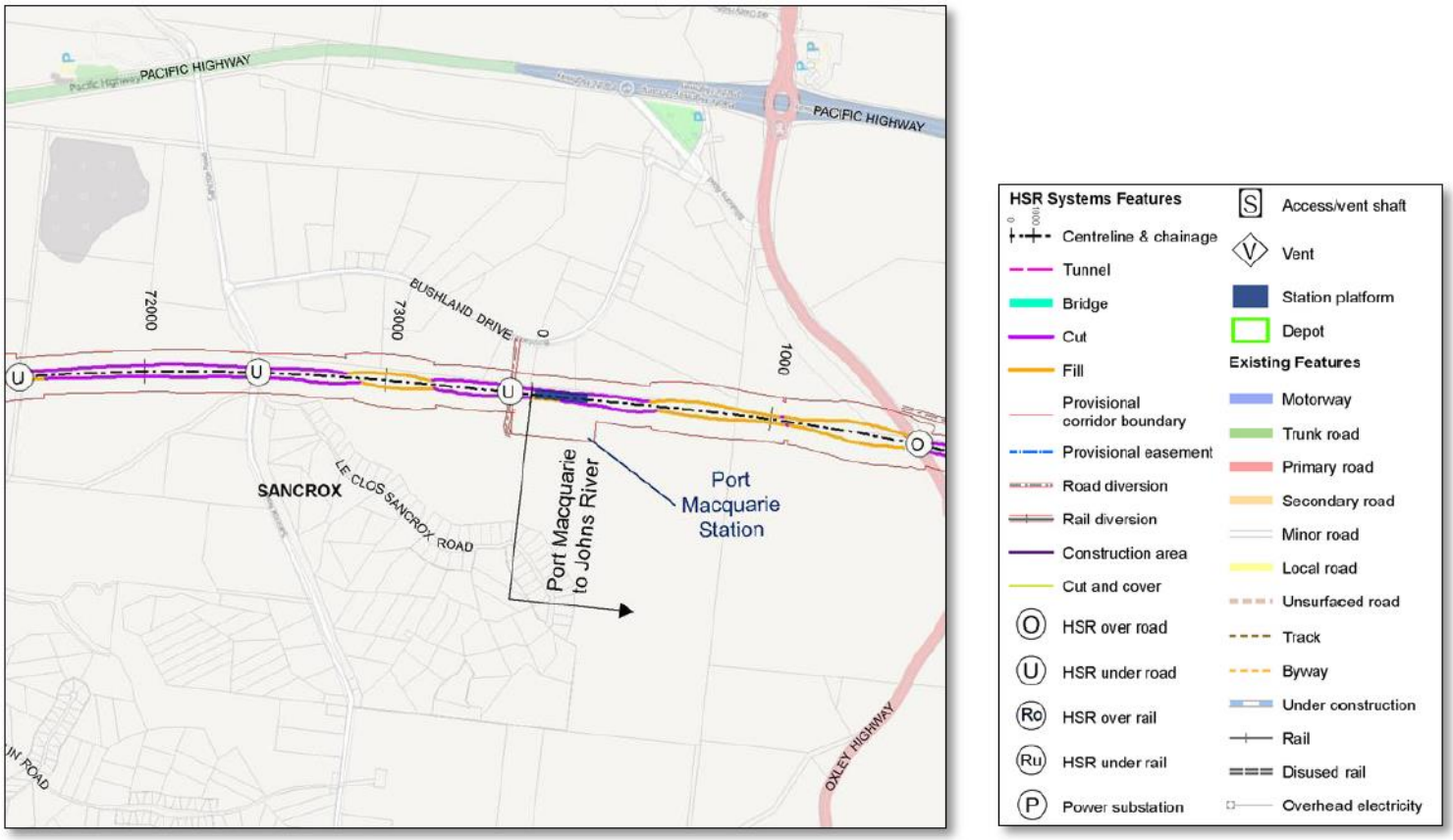


Having regards to the above, the access and egress strategy for the subject site takes advantage of existing public road infrastructure which, in the main, provides for access to and egress from areas which would be protected from the impacts of bushfire.

It is noted that the future development of the subject site would be subject to compliance with Chapter 5 of NSW Rural Fire Service***, Planning for Bushfire Protection,*** 2019 which provides the relevant access and egress bushfire threat management outcomes which are relevant to new residential subdivision development.

It is also noted that a provisional rail corridor has been identified adjacent to the eastern boundary of the subject site with this corridor supporting the proposed high speed rail network connecting Brisbane to Melbourne, refer to **Figure 11** below. The development of t high-speed rail infrastructure not only has strategic local and regional transportation implications but would also assist as a threat management measure in terms of bushfire risk in the eastern aspect of the subject site.

Figure 11 – High Speed Rail Corridor



4.0 EMERGENCY SERVICES

The question of increased demand for emergency services is a difficult one in a strategic land use planning context. On the one hand, the proposed development increases exposure of people, property and infrastructure, including increased exposure of firefighting personnel. However, the intent of this risk assessment process seeks to rationalise the strategic land use planning approach to mitigate this extent of risk exposure, acknowledging that not all risk can be avoided, and thus residual risk will remain and be transferred to others, (emergency services, the community, insurers, etc.).

At present emergency services are centred predominately upon resources from Port Macquarie, with Wauchope also supporting a range of emergency services which can respond to any incidents. Port Macquarie is located approximately 12.5km by road from the subject site whilst Wauchope is located approximately 8.5km by road from the subject site. Travel distances and times to and for emergency services are considered to be appropriate for residential development and importantly the location of the subject site provides for a range of emergency service options and opportunities, refer to **Table 5** below.

Table 5 – Emergency Services Locations

EMERGENCY SERVICE	LOCATION	ROAD TRAVEL DISTANCE TO SUBJECT SITE	ROUTE TO SUBJECT SITE
State Emergency Service	Port Macquarie – Central Road	Approximately 12km	Central Road/Lake Road/Oxley Highway/Pacific Highway/Sancrox Road
Police Service	Port Macquarie – Hay Street	Approximately 12km	Hay Street/Clarence Street/Horton Street/Gordon Street/ Oxley Highway/Pacific Highway/Sancrox Road
	Wauchope- Young Street	Approximately 9km	Young Street/Hastings Street/High Street/Oxley Highway/Rawdon Island Road/Sancrox Road
Ambulance Service	Port Macquarie – Central Road	Approximately 12km	Central Road/Lake Road/Oxley Highway/Pacific Highway/Sancrox Road
	Wauchope – High Street	Approximately 9.2km	High Street/Oxley Highway/Rawdon Island Road/Sancrox Road
Hospitals	Port Macquarie – Wrights Road	Approximately 9.5km	Wrights Road/Oxley Highway/Pacific Highway/Sancrox Road
	Wauchope – High Street	Approximately 9.2km	High Street/Oxley Highway/Rawdon Island Road/Sancrox Road
NSW Fire and Rescue	Port Macquarie – Central Road	Approximately 12km	Central Road/Lake Road/Oxley Highway/Pacific Highway/Sancrox Road
	Wauchope - Campbell	Approximately 9km	Campbell Street/High Street/Oxley Highway/Rawdon Island Road/Sancrox Road
NSW RFS	Fire Control Centre – Cameron Street	Approximately 9.1km	Cameron Street/High Street/Oxley Highway/Rawdon Island Road/Sancrox Road
	Sancrox-Thrumster Brigade – Bushland Drive	Approximately 1.7km	Bushland Drive/Sancrox Road
	Lake Innes – Lake Innes Drive	Approximately 6km	Lake Innes Drive/Pacific Highway/Sancrox Road
	Hastings-Wauchope – Cameron Street	Approximately 9.1km	Cameron Street/High Street/Oxley Highway/Rawdon Island Road/Sancrox Road
	Telegraph Point – Mooney Street	Approximately 14.5km	Mooney Street/Telegraph Point Road/ Pacific Highway/Sancrox Road
Airport	Port Macquarie – Boundary Street	Approximately 6km (direct air travel distance) Approximately 9.2km (by road)	Boundary Street/Hastings River Drive/Fernbank Creek Road/Wamuyan Drive/Frogs Road/Sancrox Road

Specifically, in relation to bushfire, it is noted that the Sancrox-Thrumster RFS brigade is located within 1.7km of the subject site whilst the Lake Innes and King Creek services are located within 6km of the subject site. In addition, the NSW Fire Brigades at Port Macquarie and Wauchope provide for additional firefighting resources in reasonable proximity to the subject site.

The proposed rezoning of the land will however increase the demand for emergency services on the basis that the proposed rezoning of land does;

- increase the interface between residential and business development and areas of bushfire hazard vegetation when considered in the context of the nature and extent of the existing land use; and

- change the nature and density of development from that which already exists.

Notwithstanding the above, any increase in demand for emergency services associated with the proposed rezoning of land, (and its subsequent development), needs to be balanced against the fact that the nature of urban expansion which is associated with the rezoning and subsequent development of land for residential purposes is such that increases in demand for emergency services is inevitable as emergency services are required for a range of population safety and health protection issues associated with population growth. For example, in an urban context firefighting resources are required not only to respond to bushfire incidents but also in relation to responding to a range of building fire scenarios and causes.

Any increase in demand for services needs to be considered in relation to the needs for urban expansion in order to support local population growth.

An important consideration in relation to emergency services is the options and opportunities for evacuation. Having regards to the information contained in **Section 3** of this report the following factors are considered to be relevant to the issue of evacuation;

- the current and future population demographics for the area does not present as particularly 'vulnerable' in terms of evacuation responsiveness and ability;

- the concept design for road infrastructure provides for multiple evacuation travel options for any future residential subdivision development of the subject site;

- travel distances to areas of safety will be relatively short with alternative means of access to and egress from the subject site and future development available;

- the proposed road hierarchy and the interconnection of the proposed public road infrastructure will provide for safe access and egress for firefighting vehicles while residents are evacuating as well as providing a safe operational environment for emergency service personnel during firefighting and emergency management on the interface with hazard vegetation.

- Sancrox Road has connection with major road infrastructure to the east (Pacific Highway – approximately 1.5km) and west (Oxley Highway – approximately 4km) with this road infrastructure providing for high levels of emergency access to and egress from the subject site.

- a number of other public roads which connect with Sancrox Road in proximity to the subject site provide for a range of access and egress options to and from the subject site.

- areas which would be protected from the impacts of bushfire are located within 1.5km to the east and west of the subject site with the availability of these areas significant in the context of emergency evacuation;

- given the size of the subject site areas which would be protected from the impacts of bushfire will be available within the future development areas.

Having regards to the above, the risk for occupants and emergency service personnel of becoming isolated and at risk of harm is reduced significantly reduced by the availability of a range of emergency evacuation features and opportunities.

It is also considered that there is substantial opportunity to reduce life safety risk through the application of accepted and tested bushfire threat management measures which respond to the level of bushfire threat.

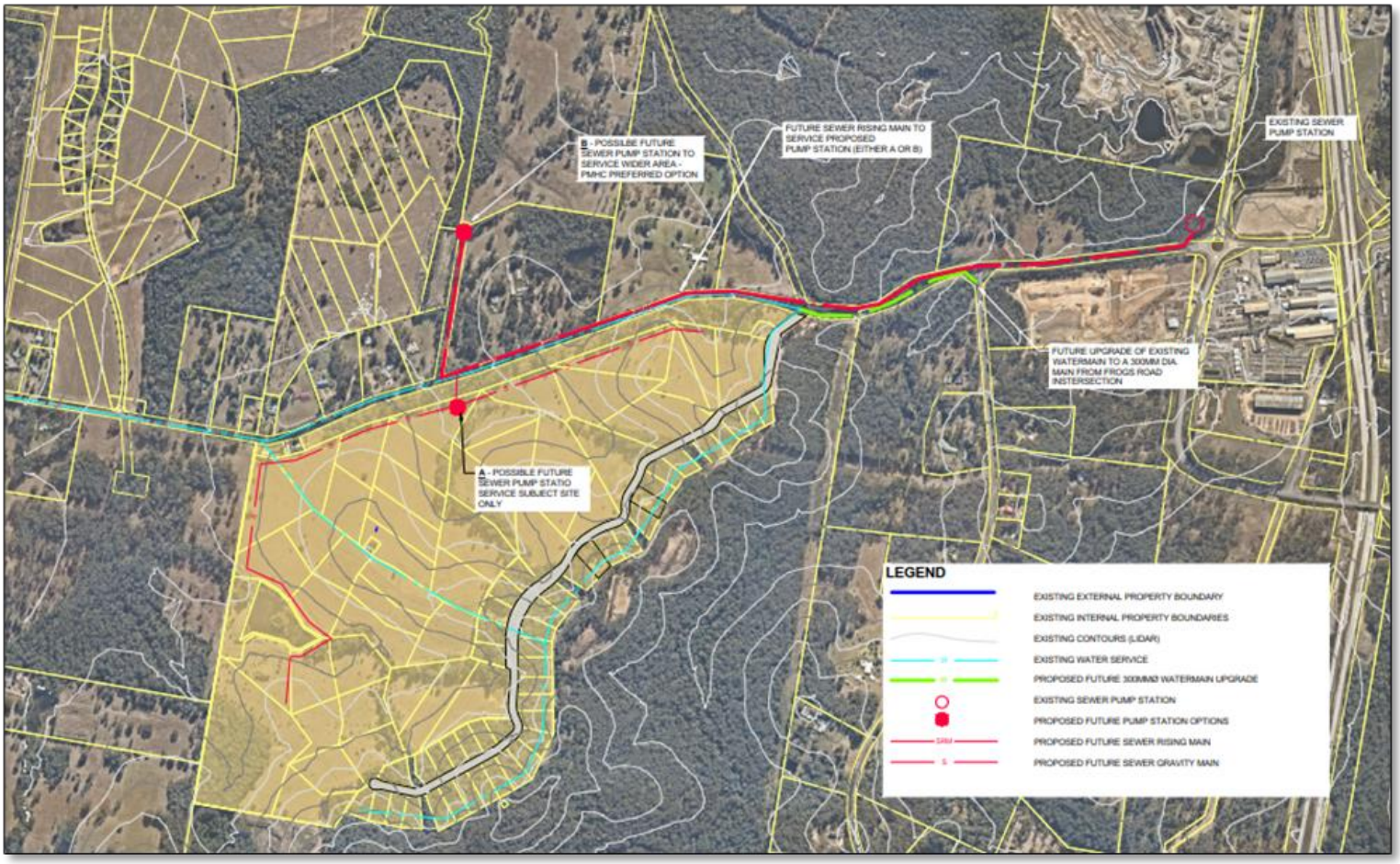
5.0 INFRASTRUCTURE

5.1 Servicing

Essential infrastructure currently available to the subject site is water, electricity and telecommunications.

A number of the services may need to be upgraded to ensure capacity is met and this will require further investigation. Discussions have been held with Council officers in August 2018 in regard to future sewer and water servicing requirements and it was confirmed that the site 'is unconstrained' in relation to servicing. The figure below shows preliminary future servicing concepts for the subject site.

Figure 12 – Preliminary Servicing Plan Extract



5.2 Water Supply

The current water supply network to the site is shown in the diagram below. The existing 100mm diameter and 150mm diameter watermains are located along Sancrox Road and within the development site. It is envisaged however that the 300mm water main near to Expressway Spares to the east will need to be upgraded in the future along Sancrox Road to the subject site.

A new 20 mega litre reservoir has been constructed to cater for the current and future demands of urban development and urban growth areas including the Sancrox area.

Given that the proposed rezoning and future development of land provides for residential and business allotments, all future lots will have access to the reticulated water supply, the extension of which will be required by Port Macquarie-Hastings Council to service future subdivisions.

There are no apparent water servicing issues which would preclude the proposed rezoning of land and subsequent development of land particularly when considered in the context of the recent changes in land use and population densities to the east, (industrial subdivision), and west, (large lot residential estate), of the subject site.

5.3 Sewerage Infrastructure

Sewer is not currently available to the site but is located to the eastern end of Sancrox Road, adjoining Expressway Spares. A new sewer pump station will be required to service the site. The preferred option would be to provide a 'centralised' sewer pump station to the north of the site allowing greater flexibility to service a larger surrounding area.

A rising main would be required along Sancrox Road feeding back into the existing sewer pump station located at the intersection of Sancrox Rd and the Pacific Highway. This would then discharge into the existing gravity fed network.

Sewer servicing of the subject site can alternatively be managed by way of a 'self-servicing' sewer pump station upon the site itself with a sewer rising main leading back to the existing SPS at Pacific Highway intersection. Although not the preferred option it would be considered if time and landowner consent issues delayed or prevented the 'centralised' option from occurring within a reasonable timeframe.

5.4 Electricity and Communications Infrastructure

Electricity supply and communications infrastructure is available in the locality and will be accessible for extension to the future development of the subject areas of land albeit that the augmentation of the existing infrastructure will be required in order to cater for the demands of future development.

It is however noted that an overhead electricity transmission powerline transects the eastern, (north to south), and northern, (east to west), portions of the subject with the presence of this infrastructure being a risk in terms of bushfire ignition and spread not only to the subject site but adjoining and adjacent land.

It is also noted that an electivity transmission powerline is located adjacent to the southern boundary of the subject site with this infrastructure being present in order to service the historical residential occupation and viticultural development of the subject site.

Electricity can start bushfires when infrastructure is damaged or foreign objects contact powerlines. This can cause arcing and generate sparks that can ignite dry vegetation. While the number of bushfires ignited by electricity is very low, (<3% of bushfires), once started they have the potential to burn large areas.

Whilst the risks posed to future development in the area from bushfires associated with the overhead electricity transmission powerlines will be reduced via reduced areas of unmanaged vegetation in the locality it is acknowledge that the presence of the overhead electricity transmission powerlines is an issue in terms of bushfire threat management albeit that the bushfire risk associated with the power line is considered to be low by virtue of the history of fire ignition associated with power lines in the area, the nature and extent of fuel loads adjacent to the route of the line and the high levels of access to the power line route. Notwithstanding this, the rezoning and future development of the subject site provides an opportunity to reduce the bushfire risk via relocation and/or provision of replacement underground services. This is particularly the case for the higher bushfire risk infrastructure which is located immediately adjacent to the southern boundary of the subject site and appears to only service assets within the subject site. This infrastructure is located adjacent to forest vegetation and represents a higher risk of bushfire ignition than the electivity supply infrastructure which transects the subject site.

It is noted that the proposed rezoning of the subject site and its residential occupation would provide for increased surveillance of bushfire ignition at a local level which in combination with the integration of the minimum bushfire threat management strategies which are relevant to new residential subdivision would assist in reducing the risk associated with vegetation ignition by electricity supply infrastructure.

Reticulated gas services are not available in the locality and are therefore not available to the subject areas of land.

6.0 ADJOINING LAND

It is noted that the rezoning of land will not change or alter the ability of adjoining and adjacent landowners to carry out bushfire threat management activities nor will the proposed rezoning of the subject land place increased pressure on adjoining landowners to introduce or implement Bushfire Management Plans as a result of the proposed rezoning.

The rezoning of the subject site will provide for managed vegetation to be present within the majority of the subject site whilst Forest and Forested Wetland vegetation will be present to the south, east and west of the subject site with managed vegetation associated with historic rural residential lots extending to the north of the subject site.

In this regard the proposed rezoning and future development of the subject land will impose no additional bushfire threat management obligations or responsibilities on adjoining land managers from that which currently exists.

It is noted that the rezoning of the land and its subsequent development for residential and business uses does not change or alter the ability of adjoining land to carry a bushfire as vegetation characteristics will remain relatively unchanged from the existing assessed level of bushfire threat.

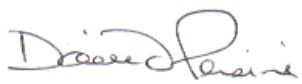
Importantly the proposed rezoning of the subject site provides for opportunities to implement improved vegetation management practices within the subject site thereby reducing the existing level of bushfire threat posed by the subject site to adjoining and adjacent land holdings. Additionally, the rezoning and future development of the subject site will provide for improved access to areas of hazard vegetation on adjoining and adjacent land which will be of benefit to the adjoining and adjacent land manager in terms of responding to bushfire threat management associated with their land.

7.0 CCONCLUSION

Based upon the information provided above the proposed rezoning of land does not pose any bushfire threat management risks which could not be resolved through the development planning process with development able to be accommodated and comply with the relevant and applicable bushfire threat management standards.

Should I be able to provide any further assistance please do not hesitate to contact me on 0434 166 150.

Yours Faithfully,



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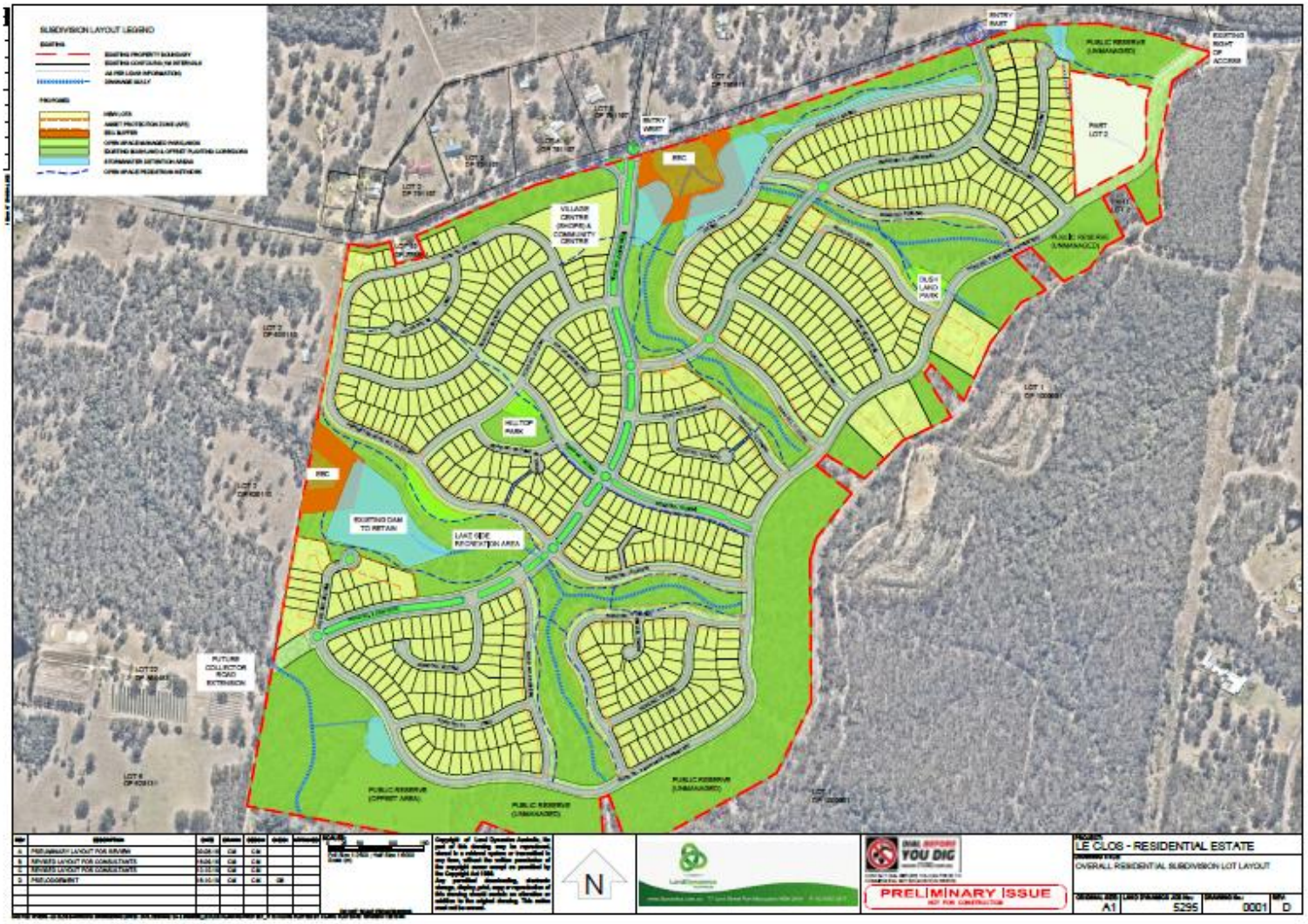
APPENDIX 1 – REZONING AREA AND DEVELOPMENT CONCEPT



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