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BUSHFIRE ASSESSMENT
FOR PLANNING PROPOSAL

Lot 7 DP 555490
148-158 Gaudrons Road, Sapphire Beach, NSW

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Land & Fire Assessments Pty Ltd

For: Kerrie Hunter
Report No: LFA20041
Date: 1 April 2021

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Revision List

Revision No.	Revision Date	Report Title	Report Author	Field Survey By	Status
00	19.01.21	Bushfire Assessment For Planning Proposal, Lot 7 DP555490, 148-158 Gaudrons Road, Sapphire Beach, NSW	Main Author: Paola Rickard (LFA - Senior Environmental Planner & BPAD – Level 3 Accredited Practitioner –no. BPAD 21855)	Paola Rickard undertaken on the 04.11.20	Draft
01	03.02.21				Final
02	01.04.21				Final

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Site Details	Lot 7 DP555490, 148-158 Gaudrons Road, Sapphire Beach, NSW 2450; Coffs Harbour City Council LGA
Proposal	Rezone the subject land from Zone RU2 Rural Landscape to Zone R5 Large Lot Residential. Change for the new R5 zoned land from the current 40 Ha Minimum Lot Size to 1 Ha
Bushfire Prone Land Map	Vegetation Category 1 & Category 3 - see Fig. 1
Planning context	s. 4.46 of the *Environmental Planning and Assessment Act 1979* and s. 100B of the *Rural Fires Act 1997;* section 9.1(2) of the *Environmental Planning and Assessment Act 1979 - Directions* (specifically Direction 4.4 Planning for Bushfire Protection)
Bushfire planning guideline and relevant chapter	Planning for Bushfire Protection 2019 (PBP) Chapter 5 - Residential and Rural Subdivision; s. 4.4.1 Consideration of bush fire issues; Appendix 1
Application complies with 'Deemed - to Satisfy' (DtS) provisions	Yes, all DtS provisions can generally be met by a future residential subdivision
Consultation with RFS Commissioner	Required under s.9.1(2) Directions of the *Environmental Planning and Assessment Act 1979*; specifically, Direction 4.4 Planning for Bushfire Protection
Compliance statement	This Assessment has duly considered the bushfire issues identified in s 4.4.1 of PBP 2019. Accordingly, it has found that the proposed Planning Proposal to amend LEP 2013 to allow large lot residential development on Lot 7 DP555490 can generally comply with s.9.1(2) Directions (specifically Direction 4.4 Planning for Bushfire Protection), with the specific objectives for the development type, and the performance criteria for the various proposed Bushfire Protection Measures in accordance with PBP 2019, but only because the existing dwellings are already approved and no further intensification of landuse is proposed.
Full Name of Accredited Practitioner	Paola Rickard - Land & Fire Assessments Pty Ltd
Qualification	BPAD – Level 3 Accredited Practitioner - Accreditation no. BPAD-21855, valid to 2/08/2021
Date	01 April 2021
Signature	

1. Introduction

1.1 Background & Planning Context

This Bushfire Assessment report has been prepared by Land & Fire Assessments Pty Ltd (LFA) in accordance with the relevant provisions of Planning for Bushfire Protection (PBP) 2019 in its entirety and future residential development can comply with all relevant Acceptable Solutions in this version of PBP. This assessment has been prepared to support the **Planning Proposal for Lot 7 DP555490, 148-158 Gaudrons Road, Sapphire Beach, NSW**. The Site is shown on Figs. 1, 2 & 3. Sapphire Beach is located in the Coffs Harbour City Council (CHCC) Local Government Area (LGA) approximately 10 km north of Coffs Harbour.

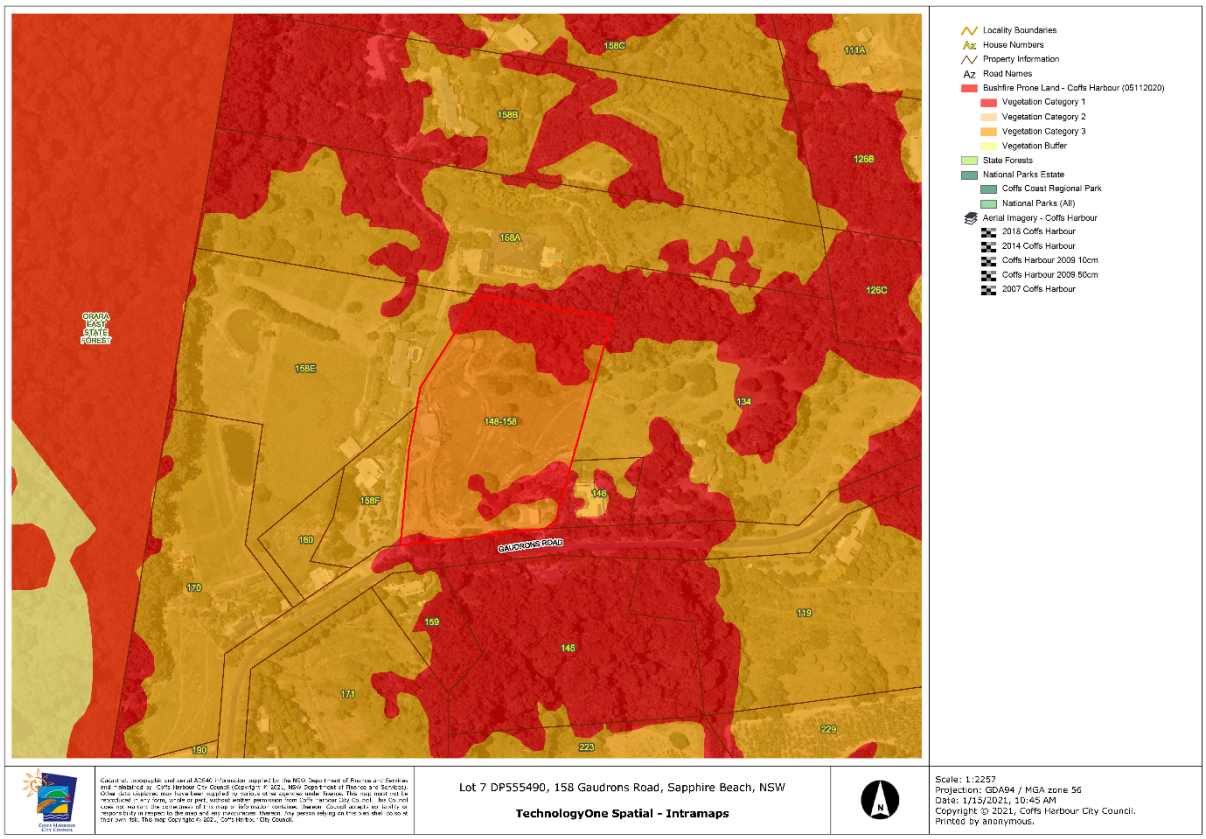

Figure 1. The Site (red boundary) & Bush Fire Prone Land as applicable to Site (i.e. 148-158 Gaudrons Rd; Lot 7 DP555490). Source: CHCC Intramaps

This Planning Proposal applies to Lot 7 DP555490 (the Site), which is zoned RU2 Rural Landscape under the Coffs Harbour Local Environmental Plan (LEP) 2013 (refer to Fig. 4). The purpose of this Planning Proposal is to amend LEP 2013 to allow large lot residential development. The proposal area is wholly affected by the Bush Fire Prone Land mapping, as shown on Fig. 1. Accordingly, the proposal triggers the need to address the bushfire planning provisions.

Section 4.4.1 of PBP 2019 requires consideration of bushfire issues when preparing a draft LEP or planning proposal. The emphasis is on early consultation and inclusion of a bushfire assessment that demonstrate compliance with the s.9.1(2) Directions (specifically Direction 4.4 Planning for Bushfire Protection) and PBP.

The Minister for Planning, under section 9.1(2) of the *Environmental Planning and Assessment Act 1979* (EP&A Act) issues directions that relevant planning authorities (such as local councils) must follow when preparing planning proposals for new Local Environmental Plans (LEP) and amending LEPs.

Direction 4.4 Planning for Bushfire Protection identifies matters for consideration for rezoning that will affect, or are in proximity to land mapped as bush fire prone.

The key principle is to ensure that future development is capable of complying with PBP. To achieve this, it is necessary to undertake a constraint assessment of the Site to identify potential bush fire risks to the individual site and proposed forms of development. The assessment requirements are detailed in s. 4.4.1 of PBP 2019. These measures, summarised below, will be evaluated for compliance in this assessment:

1. Assessment of the suitability of the land for the proposed development given the bush fire risk and existing land uses
2. The proposal must demonstrate that the required APZs can be met on the development site and that the road network can support evacuation demands numbers in the event of an emergency.
3. It is important that new development does not increase the level of bush fire risk to the existing community. A traffic report prepared by a suitably qualified traffic consultant may be required in circumstances where issues relating to access/egress are identified.
4. In addition to the review of any layout designs, consideration must also be given to the LEP provisions relating to minimum lot sizes to ensure appropriate APZs can be accommodated within future subdivisions.

Under s. 4.46 of the *Environmental Planning and Assessment Act 1979* and s. 100B of the *Rural Fires Act 1997* a Bushfire Safety Authority (BFSA) will be required from the Commissioner of the NSW Rural Fire Service (RFS) for the future subdivision of the land. Clause 44 of the *Rural Fires Regulation 2013* specifies the points to be considered in preparing an application for a Bush Fire Safety Authority (BFSA). In addition, PBP 2019 states that it must be demonstrated that the proposal satisfies the broad aim and objective of PBP, the specific objectives for the development type, and the performance criteria for the various proposed Bushfire Protection Measures (BPMs).

Chapter 5 of PBP sets out the specific objectives, and the specifications and requirements for Bushfire Protection Measures for Residential and Rural Subdivision Development. These measures, summarised below, will be assessed for compliance in this assessment:

- Asset Protection Zones/Bushfire Attack Level;
- Access;
- Services; and
- Landscaping and Maintenance

Furthermore, address of Direction 4.4 Planning for Bushfire Protection is undertaken in s.3 of this report.

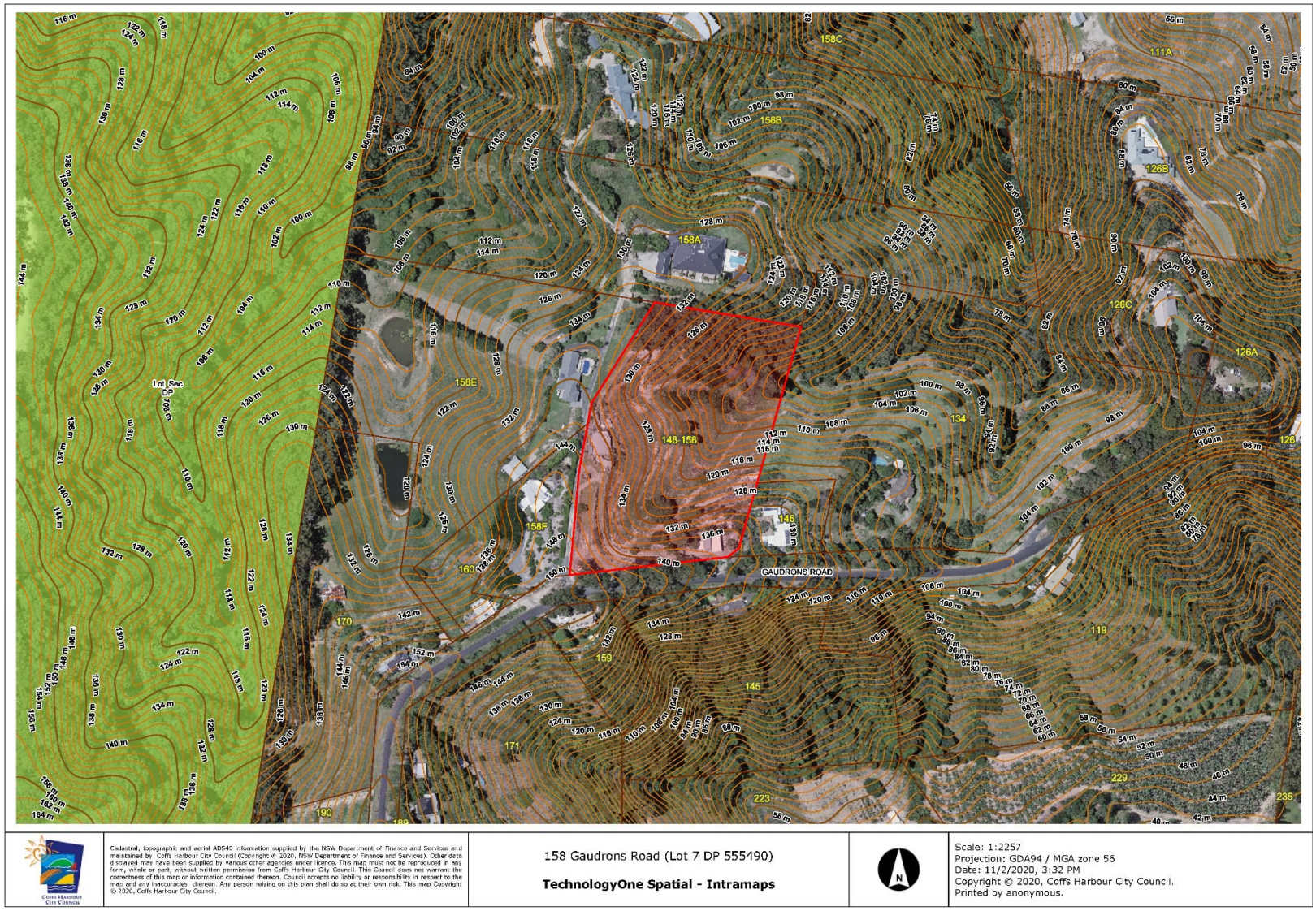

Figure 2. The Site (red boundary) within the locality context. Source: CHCC Intramaps

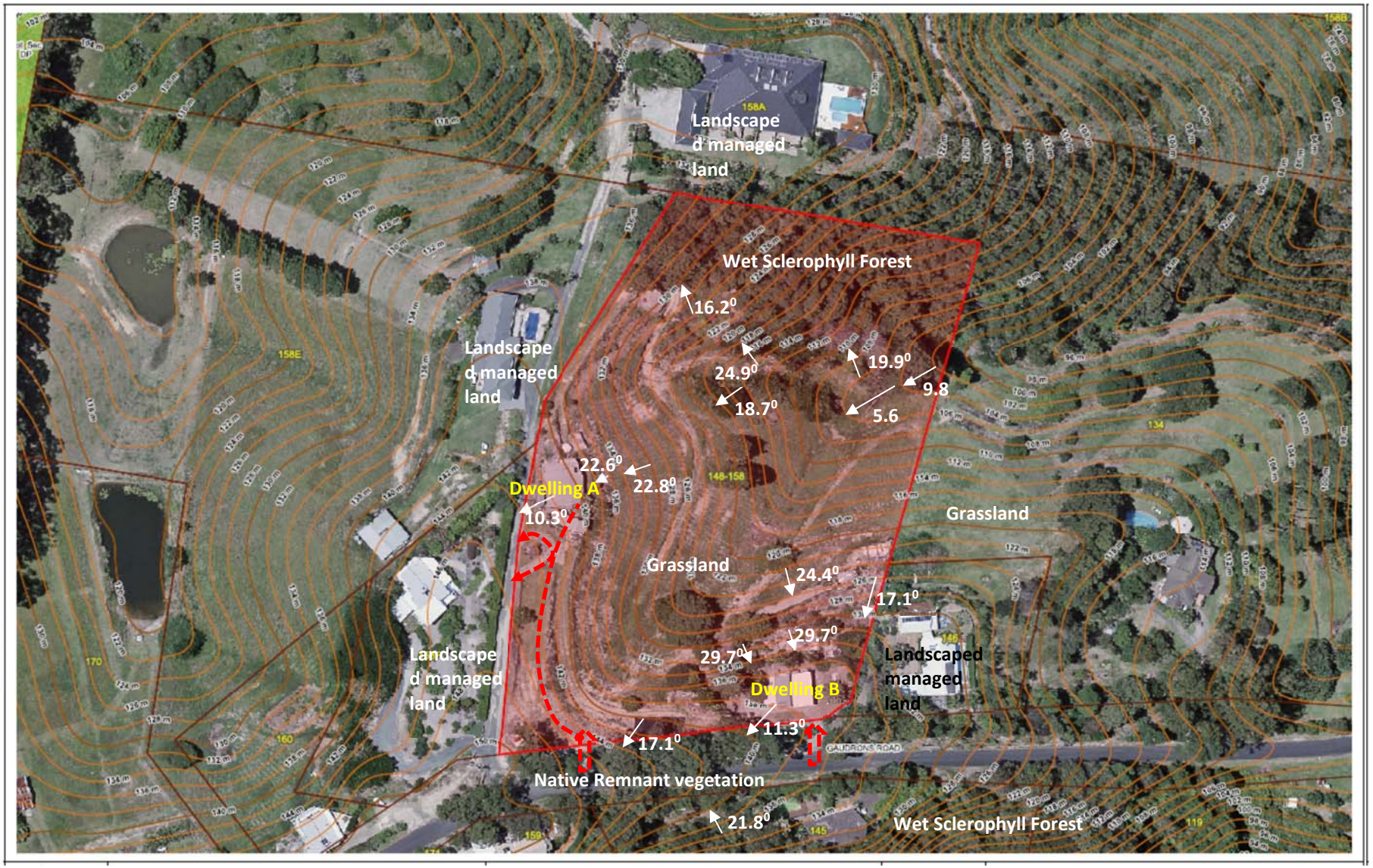

Figure 3. 148-158 Gaudrons Road (Lot 7 DP 555490) - Site assessment area, Vegetation, Slope analysis (arrows point up the slope) using 1-2m contours intervals (slopes also verified using Nikon Laser Rangefinder) - site assessment 04/11/20. Also showing current access (red dashed line) to each dwelling (A & B). Source: CHCC Intramaps

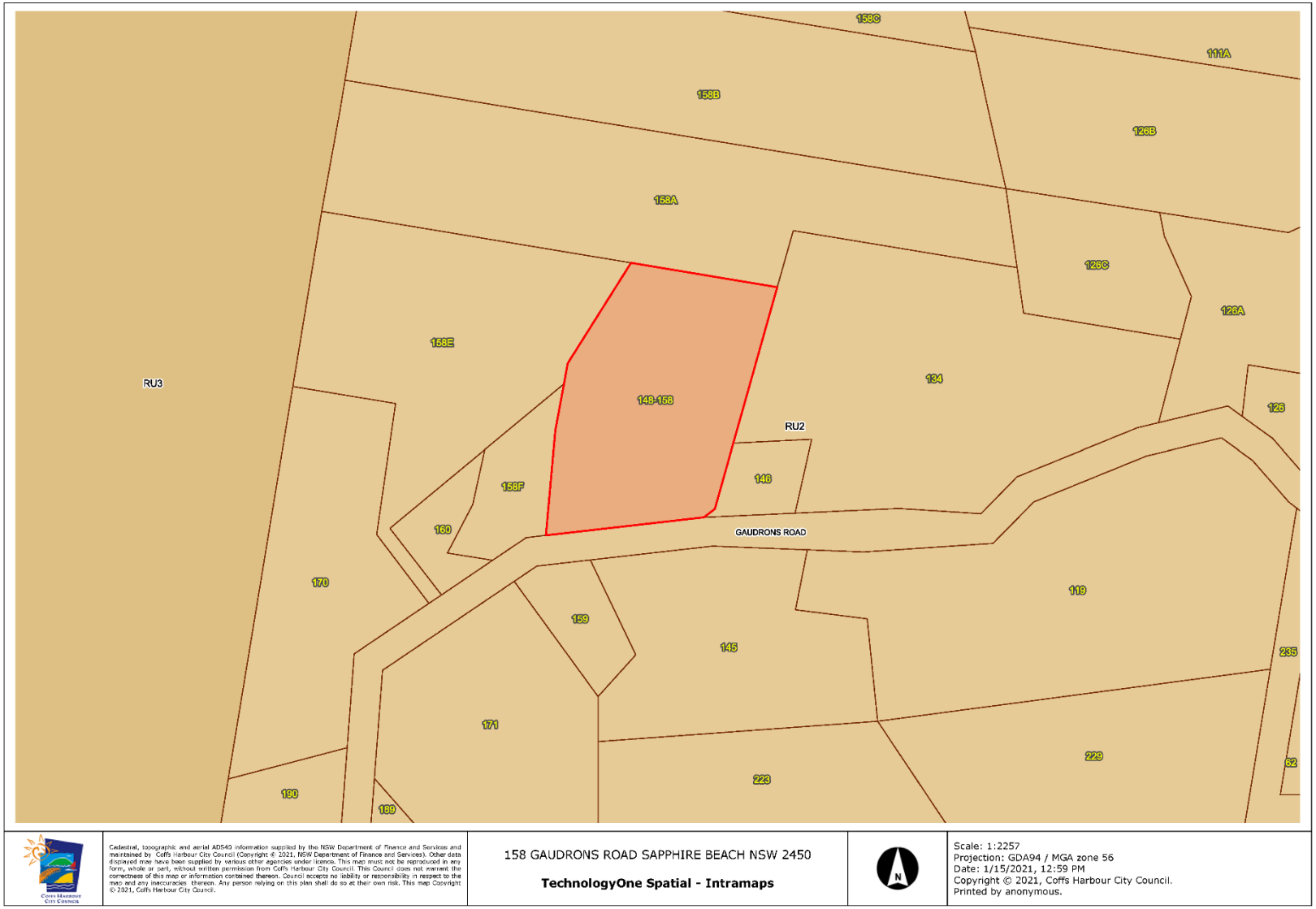

Figure 4. Land zoning applicable to the Site (red boundary). Source CHCC (2019)

1.2 The Subject Site

The Subject Site (i.e. Lot 7 DP555490), which is 2.05 Ha in size, is directly accessed from Gaudrons Road, as shown on Figs. 1-4. The land in context with the locality is shown on Fig. 2. It entails a developed property utilised for rural residential landuse and low-level grazing by goats, as shown on Plates 1-13. Two approved dwellings, one to the west (Dwelling A at 158 Gaudrons Rd) and one to the south (Dwelling B at 148 Gaudrons Rd), and associated sheds and water tanks are present on the Site (Fig. 3 & Plates 1, 2, 6, 7 & 9). Each dwelling has separate access to Gaudrons Road (see Fig. 3 & Plates 4, 5, 10 to 13). In addition, a right of carriageway along the western boundary provides alternative access to Dwelling A (Plate 13). Terracing and retaining walls are found on the sloping side of each dwelling (Plates 12, 6, 6 to 8). The Site is bounded by Gaudrons Road to the south and surrounded by lifestyle residential lots.

The Site is located ~1.6km west of the established residential areas of Sapphire Beach. Whilst the property and its immediate surrounds are zoned RU2 Rural landscape (see Fig. 4), the Site is identified in the 'Korora' potential Large Lot Residential (Zone R5) Candidate Areas in the Coffs Harbour LGA. The Site does not contain Biodiversity Values land and it is not located near High Values Habitats.

The Site, which consists of steep north east to east facing slope draining to the north east, is predominantly cleared with scattered trees and landscaping. Upslope to the north of the Site is a forested area consisting of Wet Sclerophyll Forest (i.e. Forest vegetation formation), as shown on Fig. 3. This vegetation is mapped as Tertiary Koala Habitat in CHCC GIS mapping. Along Gaudrons Road to the south is also predominantly Wet Sclerophyll Forest and Remnant vegetation.

Plate 1. Looking north towards the existing residential Dwelling A found along the western boundary. Note existing farm access tracks

Plate 2. Looking north west from the western Dwelling A towards the Forest vegetation on an upslope. Note terracing and retaining wall

Plate 3 (left). Looking south across the access point onto Gaudrons Rd for Dwelling A. Note existing concrete water tank

Plate 4 (right). Looking south along the access for Dwelling A

Plate 5 (left). Looking north further along across access to Dwelling A. Note second concrete water tank and turning area around tank (see Fig. 3)

Plate 6 (top). Looking east, south east towards Dwelling B to the right of photo. Note extensive terracing and ~4-5m high retaining wall

Plate 7. Dwelling B, retaining wall & terracing

Plate 8. Looking westward from Dwelling B terrace towards Dwelling A left and Forest on upslope (right)

Plate 9 (top - photo collage). Dwelling B and surrounding grounds

Plate 10 (left). Looking westward along Gaudrons Rd, access point to Dwelling A to the right. Note concrete tank shown on Plate 3

Plate 11 (right). Looking eastward along Gaudrons Rd towards access point to Dwelling B

Plate 12 (left). Access to Dwelling B (148 Gaudrons Rd)

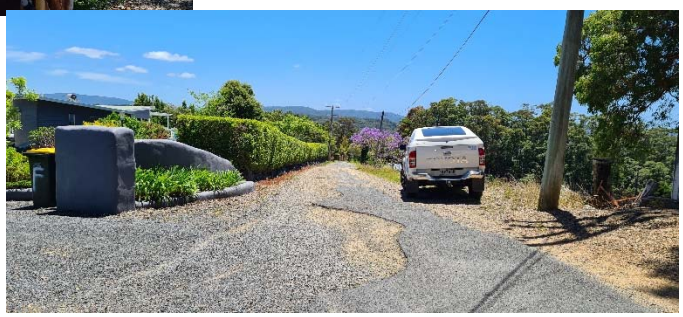

Plate 13 (right). Right of carriageway along western boundary to Site providing access to neighbouring land as well as alternative access to Dwelling A

1.3 Proposed Development

The purpose of this Planning Proposal is to amend LEP 2013 to allow large lot residential development on Lot 7 DP555490. The Planning Proposal will:

- Rezone the subject land from Zone RU2 Rural Landscape to Zone R5 Large Lot Residential; and
- Change to the Minimum Lot Size (MLS) for the new R5 zoned land from the current 40 hectares. A new MLS of 1 Ha is sought for this precinct.

The proposed concept layout is shown as Fig. 5.

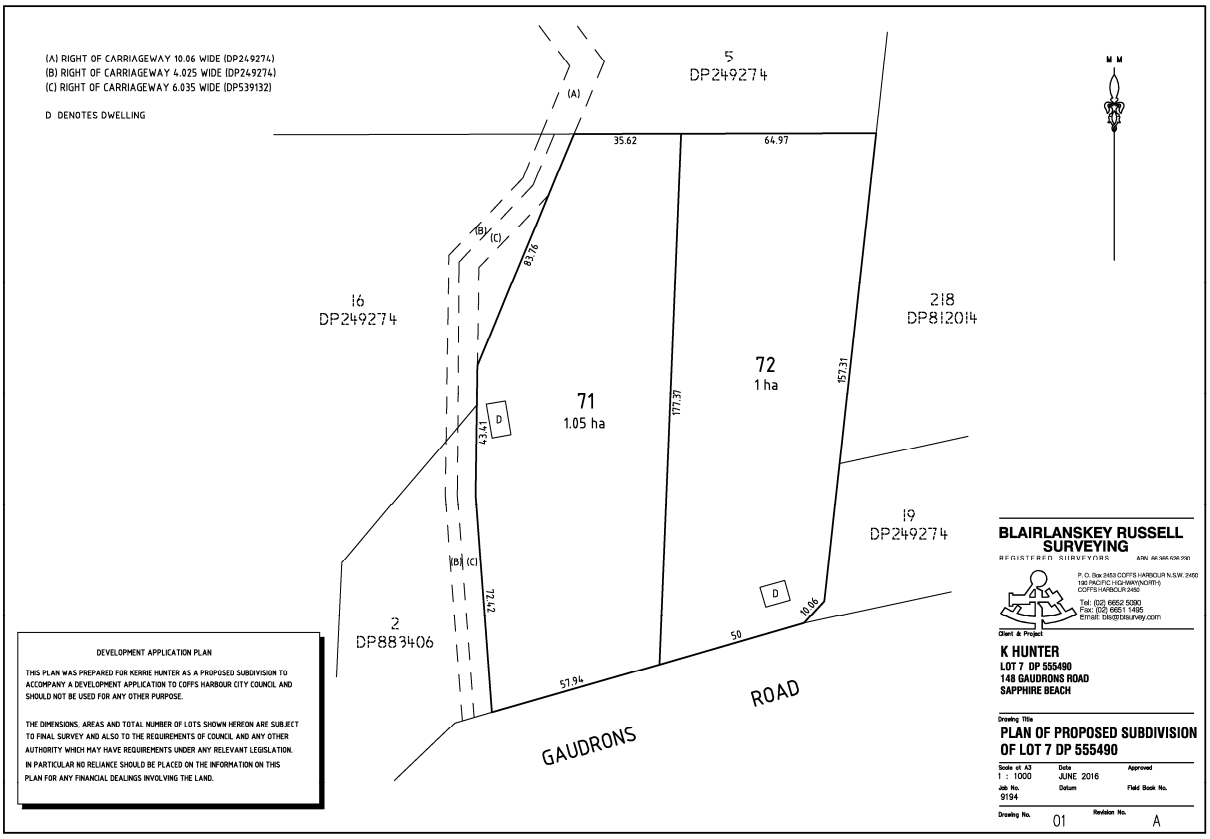

Figure 5. Proposed concept layout

1.4 Site & Surrounding Vegetation, Topography and Slope

As noted in s. 1.2 and shown on Figs. 2 & 3, the Planning Proposal area is predominantly cleared with scattered trees and landscaping. The Site is located on a steep north-east to east facing slope and is currently utilised as a farm property/goat paddock. Elevation ranges from 150m AHD to the south west corner to 103m AHD to the north east of the Site. The upper slopes have been previously terraced to assist with agricultural practices and numerous access tracks associated with a former banana plantation crisscross the property. Upslope to the north of the Site is a forested area consisting of Wet Sclerophyll Forest (i.e. Forest vegetation formation), as shown on Fig. 3. This vegetation is mapped as Tertiary Koala Habitat in CHCC GIS mapping. Along Gaudrons Road to the south is predominantly Wet Sclerophyll Forest (i.e. Forest vegetation formation) and Remnant vegetation. The majority of the Site is dominated by Grassland with scattered trees.

The surrounding vegetation includes the Wet Sclerophyll Forest to the north, north east and Wet Sclerophyll Forest to the south. Otherwise, the predominant vegetation surrounding the Site is Grassland and landscaped/managed land as shown on Fig. 3.

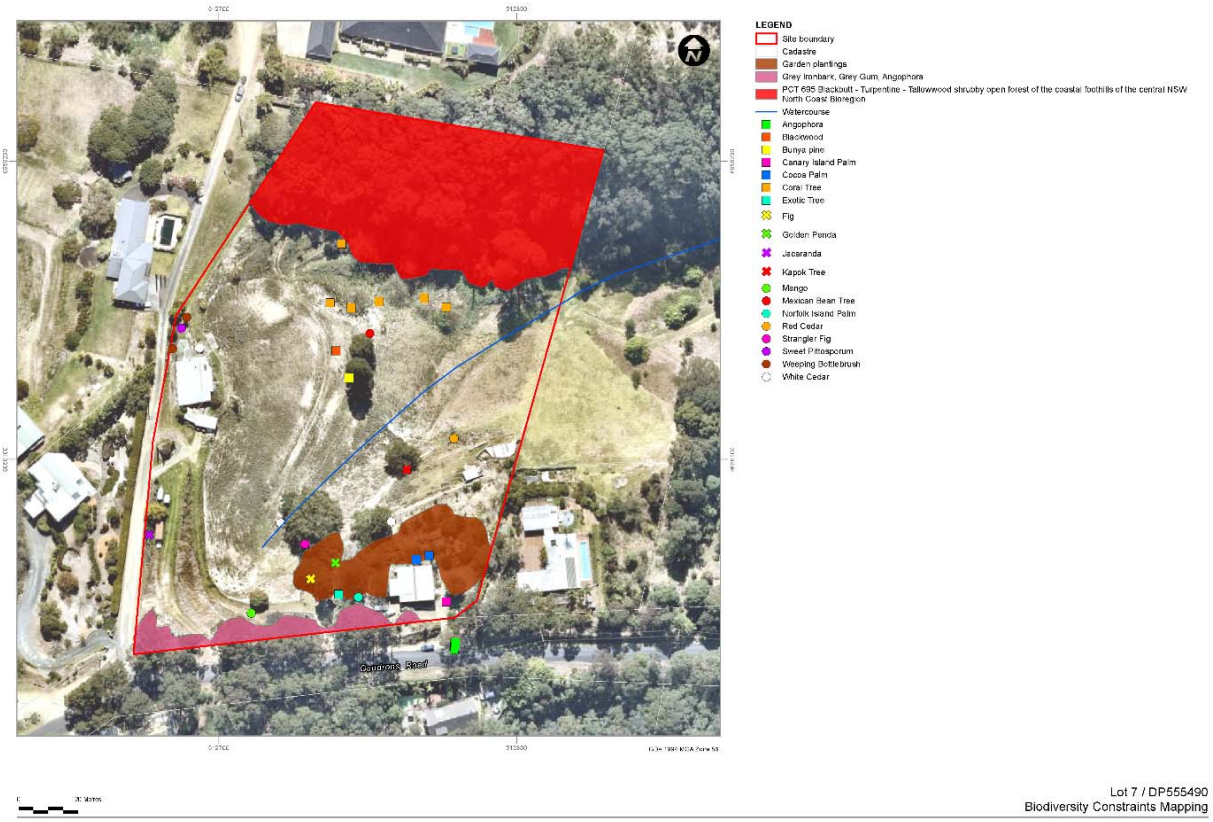

Figure 6. Vegetation mapping for the Site. Source: GeoLINK 2020 - Biodiversity Constraints Mapping

The classified Forest vegetation matches the findings of the preliminary ecological assessment undertaken by GeoLINK, as reproduced in Fig. 6. Thus, the potential bushfire hazard vegetation within the assessment area includes the Forest vegetation formation and Grassland (see Fig. 3).

Accordingly, the Classified vegetation is Forest predominantly to the north on an upslope and Grassland surrounding the existing approved dwellings on downslope ranges exceeding 20^0 (see Fig. 3). Forest vegetation is found beyond Gaudrons Rd to the south.

Normally, the Forest vegetation would be considered the Classified vegetation and the slope under the classified vegetation would be used to determined required Asset protection Zones (APZs) or setbacks. However, in this case the Forest vegetation to the north of the Site entails a small portion of the assessment area (approximately 66m and 110m away from each respective dwelling) and on an upslope. However, the vegetation, which will most significantly influence the bushfire behaviour, is the Grassland vegetation. Similarly, the effective slope is that under the vegetation, which will most significantly influence the bushfire behaviour. In this case, the steep land under the Grassland vegetation.

Thus, the classified vegetation and the applicable slope, as shown on Fig. 3, are as detailed on Table 1.

Table 1. Classified vegetation and slope applicable to the vegetation surrounding each of the exiting dwellings

Dwelling	Aspect	Vegetation	Slope	Comments
Dwelling A - 158 Gaudrons Rd	North, north east & south	Grassland	Downslope 22.8^0	Steep land, currently managed in a fuel reduced condition by virtue of retaining wall, terracing, maintained farm access tracks, goat grazing and slashing
	West	Right of Carriageway & Landscaped Managed Land	Upslope 10.3^0	Right of Carriageway is found along western boundary and beyond it are lifestyle residential dwellings surrounded by landscaped garden

Dwelling	Aspect	Vegetation	Slope	Comments
Dwelling B - 148 Gaudrons Rd	North & West	Grassland	Downslope 29.7^0	Steep land, currently managed in a fuel reduced condition by virtue of ~4-5m high retaining wall, terracing, maintained farm access tracks, goat grazing and slashing
	East	Landscaped Managed Land	Downslope greater than 20^0	Garden and hard landscaping and beyond it, lifestyle residential dwelling surrounded by landscaped garden
	South	Public Road, Landscaped Managed Land & Forest	Upslope then, beyond Gaudrons Rd downslope greater than 20^0	Gaudrons Road is found upslope of the dwelling, then further south is neighbouring residential dwelling surrounded by landscaped gardens and then Forest is found on steep downslope

In term of biodiversity, the Site is not mapped or is in proximity to Biodiversity Values land and it is not located near any sensitive ecosystems. The preliminary biodiversity mapping by GeoLINK indicate that no threatened plant species were recorded for the Site, as shown on Fig. 6. GeoLINK identify one Plant Community Types (PCT) as occurring at the Site namely, PCT 695 Blackbutt - Turpentine - Tallowwood shrubby open forest of the coastal foothills of the central North Coast, as shown on Fig. 6. This PCT is not identified as a Threatened Ecological Community (TEC). In any case, it is not proposed to impact on the Forest vegetation occurring along the northern portion of the Site.

An Aboriginal Cultural Heritage Assessment (ACHA) has been undertaken by Everick Heritage Pty Ltd (2020). The ACHA findings regarding the Site indicate that considerable soil disturbance has occurred historically due cut and fill earthworks associated with the terracing and driveway entrance to the adjoining property. The ACHA concluded that that subdivision works within 148 Gaudrons Road are unlikely to impact on Aboriginal objects and will not impact on any known places or sites of cultural significance to the Aboriginal community. As such additional consultation and archaeological investigation is not required for this Site.

1.5. Risk Assessment and Consultant Qualifications

The proposed development Site is surrounded by predominantly rural residential development and public roads. However, Forest vegetation is found to the north on an upslope and further south beyond Gaudrons Rod on a steep downslope. Regardless, the two exiting and approved residential dwellings are surrounded by Grassland on a steep downslope, which will most significantly influence the bushfire behaviour. Therefore, the potential bushfire hazard is considered to be a medium bushfire risk.

This report has been prepared by Paola Rickard.

The Fire Protection Association Australia (FPA) has in place the Bushfire Planning and Design Accreditation Scheme (BPAD), which is recognised by the NSW Rural Fires Services (RFS). Paola Rickard is a **BPAD - Level 3 Accredited Practitioner** (Accreditation no. BPAD 21855) and is listed on the FPA Australia web site register.

BPAD- Level 3 Accredited Practitioner can perform the following:

- *BPAD- Level 3 Accredited Practitioner meet specific requirements in relation to identifying bushfire prone land, assessing potential bushfire impact, and submitting designs and plans, both deemed to satisfy and alternate solution, to meet the performance requirements of the Building Code of Australia and the specific state or territory legislation, for subdivisions, new*

buildings or modification to existing buildings aiming to minimise the risk to future developments, their occupants and responding emergency services from a bushfire event.

Paola holds a **Graduate Diploma in Design for Bush Fire Prone Areas with Distinction** from the University of Western Sydney and is a **bronze corporate member of the Fire Protection Association Australia (FPA Australia)**. She is a participating **member of the FPA Technical Advisory Committee (TAC) /20 Bushfire Safety**. The TAC provides a nationally focussed forum for discussion between practitioners, fire services and regulators on the design and construction of property in areas prone to bushfires.

From 2015 to 2019, Paola was appointed as a **BPAD member to the NSW Bushfire Working Group (NSWBWG)** set up by FPA Australia. The NSWBWG provide a forum to discuss the application, interpretation and periodic review of NSW Government-based bushfire related regulatory requirements governing land use planning and building construction in areas subject to bushfire impact.

Paola also holds a **Bachelor Degree in Applied Science, a Certificate in Bushland Regeneration**, and is a member of the **Australian Association Bush Regenerators**. She has over 18 years of experience in flora surveys and vegetation management issues, and **has been undertaking bushfire assessments since 2003.**

Paola has attended the "NSW Consulting Planners Bushfire Training Course" in Sydney in 2003 and has attended the "Planning for Bushfire Protection Short Course" held by the University of Technologies (UTS) Sydney in 2007. She has obtained certification for the short course. In November 2010, Paola attended the "One-day Planning for Bushfire Prone Areas Update Course" conducted by the Centre for Local Government UTS, Sydney. Additionally, Paola has a 'Basic Bush Fire Awareness' certificate and has experience in fire control and planning while living on a rural land sharing community.

2. Bushfire Protection Measures for Residential Subdivision

2.1 Introduction

Bushfire Protection Measures for Residential and Rural Subdivision are detailed in Chapter 5 of PBP 2019. The specific objectives for 'residential and rural residential subdivision development' are:

- *Minimise perimeters of the subdivision exposed to the bush fire hazard (hourglass shapes, which maximise perimeters and create bottlenecks, should be avoided);*
- *Minimise vegetated corridors that permit the passage of bush fire towards buildings;*
- *Provide for the siting of future dwellings away from ridge-tops and steep slopes, within saddles and narrow ridge crests;*
- *Ensure that APZs between a bush fire hazard and future dwellings are effectively designed to address the relevant bushfire attack mechanism;*
- *Ensure the ongoing maintenance of APZs;*
- *provide adequate access from all properties to the wider road network for residents and emergency services;*
- *provide access to hazard vegetation to facilitate bush fire mitigation works and fire suppression; and*
- *Ensure the provision of an adequate supply of water and other services to facilitate effective firefighting.*

Additionally, PBP identifies the performance criteria and acceptable solutions for the various proposed Bushfire Protection Measures (BPMs). The relevant BPMs criteria and acceptable solutions with regard to residential and rural residential subdivision development are outlined in Sections 2.2 to 2.4 of this report.

2.2 Asset Protection Zones/Bushfire Attack Level

Asset Protection Zones (APZs) are buffer areas between development and a fire hazard, which aim to protect human life and property. The APZ comprises an Inner Protection Area (IPA) and an Outer Protection Area (OPA). These areas are to be managed to reduce the bushfire hazard. Appendix A provides guidance concerning the general requirements for APZs and appropriate landscaping and property maintenance.

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

At the subdivision level it is required to demonstrate that proposed dwellings can be accommodated so that potential building footprint is not exposed to radiant heat levels exceeding 29kW/m^2 for each proposed lot.

Table A1.12.3 of Planning for Bushfire Protection 2019 (PBP) prescribes the minimum APZ distances for residential subdivisions. The setback is calculated using the slope of the classified vegetation to achieve no more than 29kW/m^2. Slope grades over 20 degrees (as in this case) are outside of slope ranges specified in Table A1.12.3. This means that BAL 29 cannot be achieved as an acceptable solution.

The APZ area is the managed land setback distance required to be implemented from the classified vegetation to the proposed dwelling walls. Importantly, at the subdivision stage, the APZ needs to be located on lands with a slope less than 18 degrees. No dwellings can be built within the APZ area, but roads, effluent disposal areas, pools etc can be located within the APZ.

As discussed in s.1.4, the Forest vegetation would normally be considered the Classified vegetation and the slope under the classified vegetation would be used to determined required APZ or setbacks. However, in this case the Forest vegetation to the north of the Site entails a small portion of the assessment area (approximately 66m and 110m away from each respective dwelling) and on an upslope. However, the vegetation, which will most significantly influence the bushfire behaviour, is the Grassland vegetation. Similarly, the effective slope is that under the vegetation, which will most significantly influence the bushfire behaviour. In this case, the steep land under the Grassland vegetation.

The Grassland classified vegetation (or potential bushfire hazard) surrounding the dwellings occurs on slopes over 20 degrees. Furthermore, the slope of the land in the immediate proximity of the dwellings is also over 18 degrees and the APZ needs to be located on lands with a slope less than 18 degrees. If the dwellings had not been already approved, this would have been considered an impediment to the rezoning potential.

However, the dwellings are approved (this occurred before the current construction standards applied) and the land is being effectively managed as an APZ by a number of means. Specifically, by using goats, retaining walls, terracing, regular four-wheel drive slashing, etc. In fact, it is possible to have an APZ over 18 degrees provided it can be demonstrated that effective management can occur. Accordingly, an APZ plan of management would need to be submitted with the DA at the subdivision stage to further ratify the current measures being implemented in perpetuity.

Importantly, the proposed rezoning and future subdivision is only contemplating the creation of two lots, each containing one of the existing approved dwelling. So, in this case, it can be argued that no further intensification of landuse is proposed and that basically the status quo will remain and, if subdivided, further improvements can be implemented to increase the resilience for each of the two lots created.

Concerning the existing dwellings, s. 5.1.3 of PBP notes that existing dwellings located on the land would benefit from improved bushfire protection measures. The existing approved dwellings where not constructed to a specific BAL construction requirement. Thus, at the subdivision DA stage they would not be required to be upgraded to BAL 29 for instance. However, each dwelling may require some upgrades to improve protection, such as including non-combustible screens to all openable windows, enclosing the underfloor where less than 400m above finished ground level with non-combustible material or the like. Static water supply will also need to be provided. In any case, any upgrades would be conditionals to receiving approval for the subdivision and would not be required to be implement until that stage.

In summary, the land surrounding each dwelling is being effectively managed as an APZ by a number of means. Thus, the proposed development (i.e. future two lots subdivisions) is capable of complying with the APZ requirements set out in Appendix 4 of PBP 2019. Guidance concerning the general requirements for APZs and appropriate landscaping and property maintenance is provided in Appendix A of this report.

Consideration of specific construction standards applicable to the proposal are not required at the planning proposal stage. As noted, the existing approved dwellings where not constructed to a specific BAL construction requirement. However, each dwelling may require some upgrades to improve protection. In any case, any upgrades would be conditionals on receiving approval for the subdivision.

2.3 Access

The provision of PBP 2019 specify the following criteria concerning access provisions, namely:

- Performance Criteria: to provide safe operational access to structures and water supply for emergency services, while residents are seeking to evacuate from an area

The proposed rezoning will need to demonstrate that the future residential subdivision layouts can comply with the PBP access requirements.

Perimeter roads are not mandated for rural subdivisions; however, all subdivisions of more than 3 allotments need to have more than one access in and out of the development. In addition, a development comprising more than three dwellings needs to provide dedication of road access to council and not by right of way. These provisions will not apply to this proposed rezoning as only two lots are proposed and each has already lawful access to Gaudrons Rd. Nevertheless, there are other access provisions to be complied with at the subdivision stage, which means the current property accesses are likely to require some upgrades. Namely:

- 4m carriageway minimum for property access driveways and suitable turning area is provided for each dwelling
- Two-wheeled drive and all-weather roads
- Suitable access for category 1 fire appliance within 4m of static water supply (more on this below)
- Minimum vertical clearance of 4 m to any overhanging obstructions

Concerning the existing public road system, the PBP requirements are that all roads are through roads. It is noted that Gaudrons Road is not a through road, is more than 200m in length and does not have complying turning circle. Accordingly, PBP requires '*that new development does not increase the level of bush fire risk to the existing community. A traffic report prepared by a suitably qualified traffic consultant may be required in circumstances where issues relating to access/egress are identified.*'

Investigation of traffic matters associated with the proposal has been undertaken by Weavers Consulting Group (2020). The full investigation report is reproduced in Appendix B.

According to Weavers Consulting Group (2020) the following was found:

- Both lots will have more than 50 m of frontage to Gaudrons Road.
- The existing lot contains two dwellings. There will be a nil increase in daily vehicle trips created by the subdivision as there are already two dwellings on the lot.
- Proposed Lot 1 on the western side currently has vehicular access via the existing ROC along the western side boundary. The terms of the instrument for access via the ROC have not been disclosed to the writer. An alternative access direct to Gaudrons Road is located 30 m east of the ROC. An existing access to proposed lot 2 is located at the eastern corner of the lot.
- Sight distance requirements of AS2890 were found to be satisfied for all the current accesses to the two dwellings present on Site.
- Gaudrons Road - At the Site the existing central seal range from 5.6 to 6.5 m wide. As there is no increase in dwellings resulting from the subdivision there is definitely no nexus on which to It is require upgrading of Gaudrons Road.
- Conclusion – '*This investigation has proven that the existing points of access to Gaudrons Road for proposed Lots 1 and 2 are suitable for access from each lot to Gaudrons Road. As there are already two dwellings, one on each proposed lot, there will be no increase in traffic generation from the subdivision and no decrease in the amenity of the existing access along Gaudrons Road. As there is no current EPA Act Section 7.11 Infrastructure Contributions plan for Gaudrons Road Council can not require the applicant to contribute toward upgrading of Gaudrons Road. Consideration of the mountainous nature of the existing road environment indicates that general upgrading of Gaudrons Road in accordance with Specification 0041 may not produce desirable outcomes and a more targeted approach to safety improvements, funded through Council's normal channels, may be more suited to the locality'.*

In summary, the fact that the future potential two lots at this Site are already legally accessed separately and directly from Gaudrons Rd, and that no increase in residential density is proposed, indicate that rezoning of this Site would not increase the level of bush fire risk to the existing community. This is because firefighting access to this Site, as it is currently with a few improvements, would be deemed to be designed to provide safe access for evacuation and firefighting operations.

2.4 Water, Gas and Electricity Supply

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.

The Site is not serviced by reticulated water. Accordingly, provision of water supply for a proposed future subdivision will need to comply with the acceptable solution detailed on Table 2 applicable to non-reticulated developments. It is noted however that several non-combustible water tanks are already present on Site and are accessible from the respective internal accesses. In terms of electrical transmission lines, existing supply is overhead, and if reticulated or bottled gas is provided it will comply with the relevant requirements stated in Table 2.

Table 2. Performance criteria and Acceptable Solutions for water, gas and electricity supply (as per Table 5.3c PBP 2019)

Performance Criteria	Acceptable Solutions
• Adequate water supply is provided for firefighting purposes • water supplies are located at regular intervals • the water supply is accessible and reliable for firefighting operations • flows and pressure are appropriate • the integrity of the water supply is maintained	• reticulated water is to be provided to the development where available. • A static water and hydrant supply is provided for non- reticulated development or where reticulated water supply cannot be guaranteed; and • Static water supply shall comply with table 5.3d. *Note: for this proposal it will entails provision of 10,000 L SWS per lot including the existing dwellings* • fire hydrant spacing, design and sizing comply with the relevant clauses of Australian Standard AS 2419.1:2005; • hydrants are not located within any road carriageway; • reticulated water supply to urban subdivisions uses a ring main system for areas with perimeter roads. • fire hydrant flows and pressures comply with the relevant clauses of AS 2419.1:2005 • all above-ground water service pipes are metal, including and up to any taps.
Electricity Services Location of electricity services limits the possibility of ignition of surrounding bushland or the fabric of buildings.	• Where practicable, electrical transmission lines are underground. • Where overhead electrical transmission lines are proposed: o lines are installed with short pole spacing (30 metres), unless crossing gullies, gorges or riparian areas; o no part of a tree is closer to a power line than the distance set out in accordance with the specifications in ISSC3 *Guideline for Managing Vegetation Near Power Lines*.
Gas Services Location of gas services will not lead to ignition of surrounding bushland or the fabric of buildings.	• Reticulated or bottled is installed and maintained in accordance with AS/NZS 1596:2014 *-the storage and handling of LP Gas*, the requirements of relevant authorities, and metal piping is used; • All fixed gas cylinders are kept clear of all flammable materials to a distance of 10 metres and shielded on the hazard side; • connections to and from gas cylinders are metal; • polymer-sheathed flexible gas supply lines are not used; and • above-ground gas service pipes are metal, including and up to any outlets.

3. Address of Direction 4.4 Planning for Bushfire Protection

The RFS practice note '2/12 - Planning Instruments and Policies' requires that the following be addressed to support a Planning Proposal.

Part 1 – Objectives or Intended Outcomes relating to bush fire prone land that is:
Protect life, property and the environment from bush fire hazards, by discouraging the establishment of incompatible land uses in bush fire prone areas, and encourage sound management of bush fire prone areas.

Response: The Site is identified in the 'Korora' potential Large Lot Residential (Zone R5) Candidate Areas in the Coffs Harbour LGA. The proposed rezoning is a compatible landuse on this land as the Site occurs in proximity to similar rural lifestyle residential development, and it is serviced by capable road infrastructure and electricity services. The proposed development Site is surrounded by predominantly rural residential development and a public road. Importantly, the proposed rezoning and future subdivision is only contemplating the creation of two lots, each containing an existing approved dwelling serviced by separate access driveways. So, in this case, it can be argued that no further intensification of landuse is proposed and that basically the status quo will remain. However, if subdivided, further improvements can be implemented to increase the resilience for each of the two lots created; therefore, the potential bushfire risk could actually be reduced.

Part 2 – Explanation of the Provisions - The identified objectives can be achieved by ensuring that new controls imposed on development will:

- *not increase the risk to life from bush fire,*
  Response: The proposal will not increase the risk to life from bushfire as adequate controls can be implemented in the future subdivision design to minimise such risk. For instance, an APZ plan of management would need to be submitted with the DA at the subdivision stage to further ratify the current measures being implemented to manage the land surrounding the dwellings in perpetuity.

- *not introduce controls that place inappropriate developments in areas exposed to unacceptable bush fire hazard,*
  Response: As noted previously, the proposed rezoning and future subdivision is only contemplating the creation of two lots, each containing one of the existing approved dwellings serviced by separate access driveways. Therefore, no further intensification of landuse is proposed; however, if subdivided, further improvements can be implemented to increase the resilience for each of the two lots created. Therefore, the potential bushfire risk would actually be reduced. Accordingly, the development will not be exposed to unacceptable bush fire hazard.

- *ensure that appropriate bush fire protection measures can be afforded to property at risk of bushfire,*
  Response: Appropriate improved bushfire protection measures can be accommodated at the proposal Site as demonstrated in s. 2.

- *minimise negative impacts on the surrounding environment,*
  Response: The preliminary biodiversity mapping by GeoLINK indicate that no threatened plant species were found at the Site, as shown on Fig. 6. GeoLINK identified one Plant Community Type (PCT) as occurring at the Site. The PCT is not identified as a Threatened Ecological

Community (TEC). In any case, it is not proposed to impact on the Forest vegetation occurring along the northern portion of the Site.

An Aboriginal Cultural Heritage Assessment (ACHA) has been undertaken by Everick Heritage Pty Ltd (2020). The ACHA concluded that that subdivision works within 148 Gaudrons Road are unlikely to impact on Aboriginal objects and will not impact on any known places or sites of cultural significance to the Aboriginal community. As such additional consultation and archaeological investigation is not required for this Site.

- *ensure that provision is made for adequate evacuation/shelter options for the community,*
  Response: The proposed rezoning and future subdivision is only contemplating the creation of two lots, each containing one of the existing approved dwellings serviced by separate access driveways. Accordingly, the rezoning does not increase the potential bushfire risk and existing measures are already in place at the locality level.

- *and ensure that development is capable of complying with Planning for Bush Fire Protection 2006 (PBP).*
  Response: The development is capable of complying with the relevant Residential and Rural Residential provisions detailed in Chapter 5 of PBP 2019 as demonstrated in s. 2. Notably, PBP 2019 is the currently legislated document, and it provides updated and more robust provisions than those detailed in PBP 2006.

Part 3 – Justification - The level of justification should be proportionate to the impact that the planning proposal will have.

Response: The proposed rezoning will not have an undue impact on the locality in terms of bushfire risk. This assessment has found that the proposal can comply with the Direction 4.4 Planning for Bushfire Protection and is capable of complying with PBP.

4. Conclusion & Recommendations

This Bushfire Assessment report has been prepared by LFA in accordance with the relevant provisions of PBP 2019 to support the Planning Proposal for Lot 7 DP555490, 148-158 Gaudrons Road, Sapphire Beach, NSW. The Site is zoned RU2 Rural Landscape under the Coffs Harbour LEP 2013. The purpose of this Planning Proposal is to amend LEP 2013 to rezone the subject land from Zone RU2 Rural Landscape to Zone R5 Large Lot Residential. The proposal area is wholly affected by the Bush Fire Prone Land mapping.

Specifically, this assessment reviewed suitability of the Site for landuse intensification. Direction 4.4 Planning for Bushfire Protection identifies matters for consideration for landuse intensification proposals that will affect, or are in proximity to land mapped as bush fire prone.

A key principle should be to ensure that future development is capable of complying with PBP. To achieve this, it is necessary to undertake a constraint assessment of the Site in respect to bushfire to identify potential bush fire risks to the proposed forms of development (i.e. amend LEP 2013 to allow change to Minimum Lot Size from 40 ha to 1 Ha or less on Lot 7 DP555490).

Thus, this bushfire assessment found that the proposal:

- will not increase the risk to life from bush fire;
- will not introduce controls that place inappropriate developments in areas exposed to unacceptable bush fire hazard;
- can provide for appropriate bush fire protection measures to properties at risk of bushfire;
- does not have adverse impacts on the surrounding environment;
- does not place additional burden to current evacuation/shelter options for the community; and
- the proposed development is capable of complying with Planning for Bush Fire Protection.

This bushfire assessment has been undertaken in accordance with the relevant provisions of PBP 2019 in its entirety and the future residential development can comply with all relevant Acceptable Solutions in this version of PBP.

The assessment found that the applicable bushfire protection measures and acceptable solutions as they would apply to future residential subdivision can be met and the following is noted:

- According to Table A1.12.3 of PBP 2019 for residential subdivisions the minimum APZ distances are calculated to achieve a radiant heat of no more than 29kW/m^2 (i.e. BAL- 29).
- The Grassland classified vegetation (or potential bushfire hazard) surrounding the approved dwellings occurs on slopes over 20 degrees. Slope grades over 20 degrees are outside of slope ranges specified in Table A1.12.3 of PBP. Nevertheless, the existing approved dwellings where not constructed to specific BAL construction requirements. Thus, at the subdivision DA stage they would not be required to be upgraded to BAL 29 for instance. However, each dwelling may require some upgrades.
- The slope of the land in the immediate proximity of the dwellings is also over 18 degrees and the APZ needs to be located on lands with a slope less than 18 degrees. If the dwellings had not been already approved, this would have been considered an impediment to the rezoning potential.
- However, the dwellings are approved and the land is being effectively managed as an APZ by a number of means. Thus, it is possible to have an APZ over 18 degrees provided it can be demonstrated that effective management can occur. Accordingly, an APZ plan of management would need to be submitted with the DA at the subdivision stage to further ratify in perpetuity the current measures being implemented.
- Importantly, the proposed rezoning and future subdivision is only contemplating two lots, each with one of the existing approved dwelling. Therefore, no further intensification of

landuse is proposed and the status quo will remain and, if subdivided, further improvements can be implemented to increase the resilience for each of the two lots created.

- Investigation of traffic matters associated with the proposal has been undertaken by Weavers Consulting Group (2020). The full investigation report is reproduced in Appendix B. This investigation has found that the existing points of access to Gaudrons Road are suitable for access. As there are already two dwellings, one on each proposed future lot, there will be no increase in traffic generation from the subdivision and no decrease in the amenity of the existing access along Gaudrons Road. In summary, the rezoning of this Site would not increase the level of bush fire risk to the existing community. This is because firefighting access to this Site, as it is currently with a few improvements, would be deemed to be designed to provide safe access for evacuation and firefighting operations.
- The Site is not serviced by reticulated water. Accordingly, provision of water supply for a proposed future two-lots subdivision will need to comply with the acceptable solution detailed on Table 2 applicable to non-reticulated developments.
- In terms of electrical transmission lines, existing supply is overhead, and if reticulated or bottled gas is provided it will comply with the relevant requirements stated in Table 2.

In conclusion, this Assessment has duly considered the bushfire issues identified in s. 4.4.1 of PBP 2019. Accordingly, it has found that the proposed Planning Proposal to amend LEP 2013 to allow large lot residential development on Lot 7 DP555490 generally comply with s.9.1(2) Directions (specifically Direction 4.4 Planning for Bushfire Protection), and with the specific objectives for the development type and the performance criteria for the various proposed Bushfire Protection Measures in accordance with PBP 2019, but only because the existing dwellings are already approved and no further intensification of landuse is proposed.

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Appendices

APPENDICES 23

APPENDIX A - APZS REQUIREMENTS AND LANDSCAPING 24

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Appendix A - APZs Requirements and Landscaping

A.1 General Requirement for Asset Protection Zones

Asset Protection Zones (APZs) are buffer areas between development and a fire hazard, which aim to protect human life and property. The APZ comprises an Inner Protection Area (IPA) and an Outer Protection Area (OPA). These areas are to be managed to reduce the bushfire hazard. The general requirements for APZs are described in Tables 1A and 2A.

Table 1A. Inner Protection Area (IPA) General Requirements

Specifications and Management	
Location	The IPA extends from the edge of the OPA to the development.
Purpose	Ensures that the presence of fuel, which could become involved in fire, is minimised.
Depth	Varies from 10 to 100 metres.
Fuel Loading	Minimum fine fuel at ground level, which could be set alight by bushfire.
Vegetation Requirements	Do not touch or overhang the building; Are well spread out and do not form a continuous canopy; Are not species that retain dead material or deposit excessive quantities of ground fuel in a short period; and Are located far enough away from the house so that they will not ignite the house by direct flame contact or radiated heat emissions.
Uses Within the Area	Tennis courts, swimming pools and gardens are permitted. Woodpiles, wooden sheds, combustive material storage areas, large quantities of garden mulch, stacked flammable building materials are not permitted.
Maintenance	This Area should be regularly mowed and all fuel removed e.g. fallen branches, leaf build-up.

Table 2A. Outer Protection Area (OPA) General Requirements

Specifications and Management	
Location	Located adjacent to the hazard. Originally the OPA would have formed part of the bushfire hazard but becomes an area where the fuel loadings are reduced.
Purpose	Reduction of fuel in this area substantially decreases the intensity of an approaching fire and restricts the pathway of crown fuels; reducing the level of direct flame, radiant heat and ember attack on the IPA.
Depth	Varies from 0 to 25 metres.
Fuel Loading	Fine fuel loads should be kept to a level where the fire intensity expected will not impact on adjacent developments. In the absence of any policy to the contrary, 8 tonnes per hectare of fuel is commonly used. In grasslands, fuel height should be maintained below 10 centimetres.
Vegetation Requirements	Any trees and shrubs should be maintained in such a manner that the vegetation is not continuous.
Maintenance	This Area should be regularly mowed and all excess fuels should be removed e.g. fallen branches, leaf build-up.

The RFS has also developed "Standards for Asset Protection Zones" which should be consulted for APZ specifications. Standards for Asset Protection Zones can be downloaded from <https://www.rfs.nsw.gov.au/__data/assets/pdf_file/0010/13321/Standards-for-Asset-Protection-Zones.pdf>

A.2 Landscaping and Property Maintenance

A.2.1 Landscaping Features & Principles

Bushland vegetation provides the fuel which feeds wildfires; however, by providing adequate separation distance between the bush and buildings will effectively prevent the spread of bushfire. Still vegetation is not always the foe when it comes to bushfires and it is possible to use managed vegetation as a tool to reduce fire risk. According to many practitioners and researchers (Ramsay & Rudolph 2006; CFA 2004; RFS 2006; Queensland Government 2000; RFS undated), a well-designed garden can reduce bushfire hazard near buildings. In summary, homes and garden can blend with the natural environment and be landscaped to minimise the impact of fire at the same time.

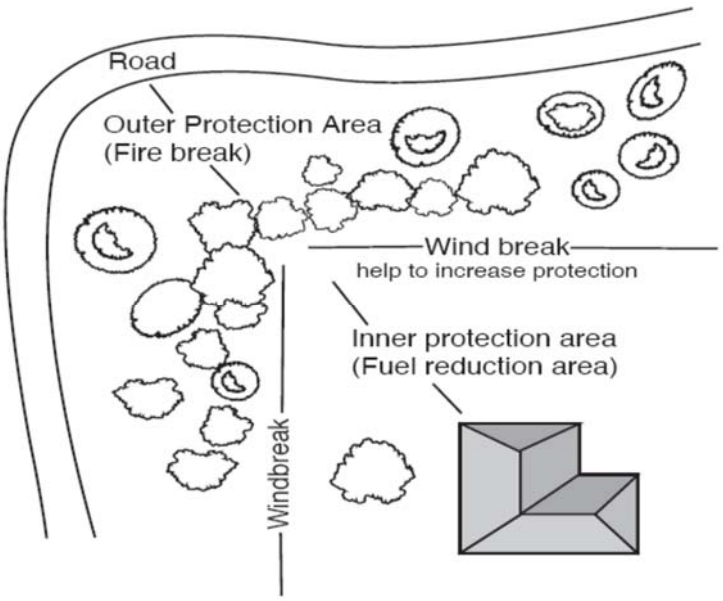

Figure 1A. Example of landscaped design aimed at minimising the impact of fire. Source RFS (undated)

According to the RFS (undated), this can be achieved by providing an effective Asset Protection Zone (APZ), which incorporates features such as fire-resistant plants, radiant heat barriers and windbreaks in the landscape layout as shown on Fig. 1A. The key features required when using landscaping as tool to reduce bushfire risk are summarised as follows (Ramsay & Rudolph 2006; RFS undated; RFS 2006):

- Plants with low flammability are selected (eg. broad leaves with high moisture and mineral content, smooth-trunk species with high branches, etc.)
- Vegetation does not provide a continuous path to the house
- Vegetation is located far enough away from the asset so that plants will not ignite the asset by direct flame contact or radiant heat emission
- Planted (or cleared) vegetation is into clumps rather than continuous rows
- Planted or retained species possesses attributes which makes them a good barrier against bushfire and wind attack
- Low branches are pruned two metres from the ground to prevent a ground fire from spreading into trees
- Lawn is planted and maintained around the future dwellings as this will slow the fire and reduce fire intensity. Alternatively, non-flammable pathways directly around the dwelling are provided
- Shrubs and other plants do not directly abut the dwelling. Where this does occur, gardens should contain low-flammability plants and non-flammable ground cover such as pebbles and crush tile
- Brush type fencing and planting “pencil pine” type trees next to buildings are avoided, as these are highly flammable.

Therefore, the features noted above and the principles listed in the following section should be applied to the landscaping and property maintenance for future dwellings.

A.2.2 Vegetation Management

Vegetation management is the responsibility of individual landowners and should, as per PBP, include:

- *Maintaining a low cut lawn;*
- *Keeping areas around the garden free of fuel;*
- *Utilising non-combustible fencing materials;*
- *Breaking up tree and shrub canopies by defining garden beds;*
- *Using non-flammable mulch;*
- *Ensuring tree branches do not overhang roofs;*
- *Ensuring tree canopies are not continuous; and*
- *Installing windbreaks in the direction from which fires are likely to approach.*

A.2.3 Property Maintenance

Property maintenance should, as per PBP, include:

- *Removal of material such as litter from the roof and gutters;*
- *Ensure painted surfaces are in good condition with decaying timbers being given particular attention to prevent the lodging of embers within gaps;*
- *Check pumps and water supplies are available and in working order;*
- *Driveways are in good condition with trees not being too close and forming an obstacle during smoky conditions;*
- *Check tiles and roof lines for broken tiles or dislodged roofing materials;*
- *Screens on windows and doors are in good condition without breaks or holes in flyscreen material and frames are well fitting into sills and window frames;*
- *Drenching or spray systems are regularly tested before the commencement of the fire season;*
- *Hoses and hose reels are not perished and fittings are tight and in good order;*
- *Doors are fitted with draught seals and well maintained;*
- *Mats are of non-combustible material or in areas of low potential exposure; Woodpiles, garden sheds and other combustible materials are located downslope and well away from the house; and*
- *Trees and other vegetation in the vicinity of power lines and tower lines should be managed and trimmed in accordance with the specifications in "Vegetation Safety Clearances" issued by Energy Australia (NS179 April 2002).*

Appendix B – Traffic Impact Investigation

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30 November 2020

Mr Stephen Sawtell
Stephen Sawtell Consultants
78 Fairview Road
SAPPHIRE BEACH, NSW, 2450

Our ref: 20-205
Your ref:

Dear Stephen,

Investigation of Traffic Related Matters Associated with Proposed Subdivision of 148 Gaudrons Road

1 Background

A proposed plan of subdivision has been submitted to Coffs Harbour City Council to subdivide Lot 7 DP 555490 into 2 lots to separate the two existing dwellings on the property.

Coffs Harbour City Council has provided a list of road and access related issues to be addressed resulting from the TLC meeting notes of 17 June 2020. The matters include:

1. Upgrading of Gaudrons Road in accordance with the Coffs Harbour City Council Development Design Specification, particularly Section 3.6
2. Sight distances to be verified for access onto Gaudrons Road

Figure 1 - The site.

2 This Review

This review will address relevant matters relating to vehicular access to Lot 7 and the need to upgrade Gaudrons Road.

3 Site Inspection

An inspection of the site was carried out on 24 November 2020. The weather was fine.

4 Subdivision

It is proposed to subdivide the existing lot with an area of 2.05 ha into lots of 1.0 and 1.05 ha area. Both lots will have more than 50 m of frontage to Gaudrons Road.

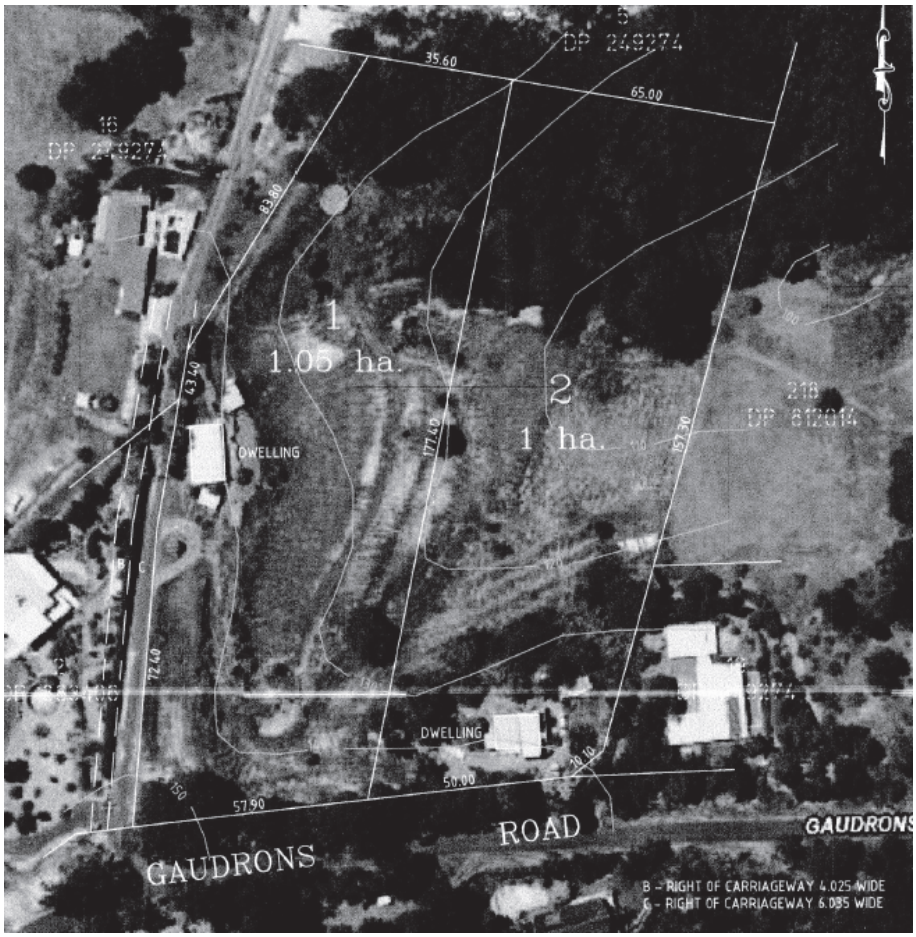


Figure 2 – Proposed subdivision layout.

5 Traffic Generation

From the RMS Technical Direction TDT 2013/04a, Guide to Traffic Generating Developments – Updated Traffic Surveys the traffic generation from Low Density Residential Dwellings in regional areas is:

- 7.4 trips per day per dwelling
- Weekday average evening peak hour vehicle trips 0.78

- Weekday average morning peak hour vehicle trips 0.71

The existing lot contains two dwellings. There will be a nil increase in daily vehicle trips created by the subdivision as there are already two dwellings on the lot.

The current contribution to traffic on Gaudrons Road is:

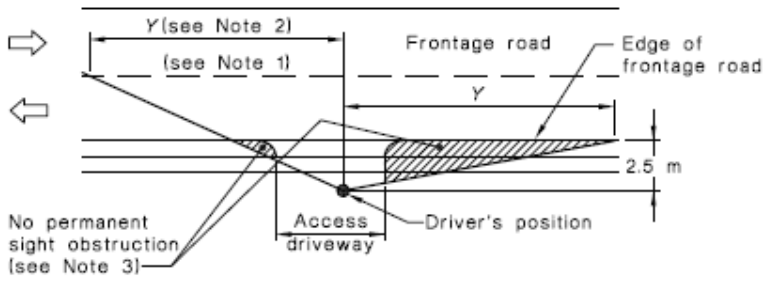
- 14.8 trips per day
- Weekday average evening peak hour vehicle trips 1.56
- Weekday average morning peak hour vehicle trips 1.42

6 Sight Distance Assessment

Proposed Lot 1 on the western side currently has vehicular access via the existing ROC along the western side boundary. The terms of the instrument for access via the ROC have not been disclosed to the writer. An alternative access direct to Gaudrons Road is located 30 m east of the ROC. An existing access to proposed lot 2 is located at the eastern corner of the lot.

6.1 Sight Distance Requirements

Sight distance requirements are documented in AS/NZS 2890.1 Parking Facilities Part 1: Off-street car parking.



Frontage road speed (Note 4) km/h	Distance (Y) along frontage road m		
	Access driveways other than domestic (Note 5)		Domestic property access (Note 6)
	Desirable 5 s gap	Minimum SSD	
40	55	35	30
50	69	45	40
60	83	65	55
70	97	85	70
80	111	105	95
90	125	130	Use values from 2nd and 3rd columns
100	139	160	
110	153	190	

Figure 3 – AS 2890.1 Figure 3.2 Sight Distance Requirements at Access Driveways

The Minimum SSD in the figure above is Stopping Sight Distance as contained in Austroads Guide to Road Design – Part 3 Geometric Design, 2017. Stopping Sight Distance (SSD) is the

distance to enable a normally alert driver, travelling at the design speed on wet pavement, to perceive, react and brake to a stop before reaching a hazard on the road ahead. The reaction time is taken as 2.0 seconds and the values above have been rounded to the nearest 5 m.

The driver's sight line is taken to be from eye height at 1.1 m to an approaching vehicle also at 1.1 m. It is noted that more recent Austroads sightline criterial adopt a vehicle height of 1.25 m which will result in greater sight line lengths when sighting over a crest.

$$SSD = \frac{R_T V}{3.6} + \frac{V^2}{254(d + 0.01a)}$$

where

R_T = reaction time (sec)

V = operating speed (km/h)

d = coefficient of deceleration (longitudinal friction factor)

a = longitudinal grade (%, + for upgrades and – for downgrades)

6.2 Access to Lot 1 Via ROC

The existing ROC appears to provide access to at least 7 lots.

Available sight distances at the access are as follows:

- The available sight distance to eastbound traffic is 152 m
- The available sight distance to westbound traffic is 130 m
- The grade of Gaudrons Road at the ROC is 9% and 3% down 30 m west of the ROC.

Figure 4 - Intersection of ROC with Gaudrons Road

Figure 5 – Sight line from ROC to westbound traffic.

Figure 6 – Sight line from ROC to eastbound traffic.

For traffic travelling west uphill to the point of impact at the ROC a sight distance of 130 m equates to an approach speed of more than 100 km/h. It is expected that the approach speed would be less than 60 km/h due to the mountainous terrain and uphill grade.

For traffic travelling east downhill to the point of impact at the ROC a sight distance of 152 m equates to an approach speed of 96 km/h. It is expected that the approach speed would be less than 60 km/h due to the mountainous terrain and undulating grade for which a sight distance of 70 m would be required.

6.3 Access to Lot 1 Via Existing Access 30 m from ROC

Available sight distances at the access are as follows:

- The available sight distance to eastbound traffic is 75 m
- The available sight distance to westbound traffic is 126 m
- The grade of Gaudrons Road at the access is 13%.

Figure 7

Figure 8 – Sight line from Lot 1 access to westbound traffic.

Figure 9 – Sight line from Lot 1 to eastbound traffic.

For traffic travelling west uphill to the point of impact at the existing access a sight distance of 126 m equates to an approach speed of more than 100 km/h. It is expected that the approach speed would be less than 60 km/h due to the mountainous terrain and uphill grade.

For traffic travelling east downhill to the point of impact at the existing access a sight distance of 75 m equates to an approach speed of 60 km/h. It is expected that the approach speed would be less than 60 km/h due to the mountainous terrain and undulating grade. A horizontal curve located approximately 135 m west of the ROC was assessed to have a radius of approximately 65 m which equates to a travel speed of 47 km/h.

Therefore, the sight distance requirements of AS 2890.1 are considered to be satisfied for proposed Lot 1.

6.4 Access to Lot 2 Via Existing Access at the Eastern End of the Site

Available sight distances at the access are as follows:

- The available sight distance to eastbound traffic is 125 m
- The available sight distance to westbound traffic is 180 m
- The grade of Gaudrons Road at the access is 15%.

Figure 10 - Existing Access to Lot 2

Figure 11 – Sight line from Lot 2 access to westbound traffic.

Figure 12 – Sight line from Lot 2 to eastbound traffic,

For traffic travelling west uphill to the point of impact at the existing access a sight distance of 180 m equates to an approach speed of more than 100 km/h. It is expected that the approach speed would be less than 60 km/h due to the mountainous terrain and uphill grade.

For traffic travelling east downhill to the point of impact at the existing access a sight distance of 125 m equates to an approach speed of 80 km/h. It is expected that the approach speed would be less than 60 km/h due to the mountainous terrain and undulating grade.

Therefore, the sight distance requirements of AS 2890.1 are considered to be satisfied for proposed Lot 2.

7 Upgrading of Gaudrons Road

Previous advice of Coffs Harbour City Council has been that upgrading of Gaudrons Road in accordance with the Coffs Harbour City Council Development Design Specification 0041 Geometric Road Layout Section 3.6 would be required. Section 3.6 contains the following table.

3.6 CARRIAGEWAYS

Carriageway widths for rural roads should comply with Table 3.2.

Table 3.2 Carriageway widths

Road type	Max traffic volume (vpd)	Max speed (1) (km/h)	Carriageway width (m)(2)	Shoulder (3) (4)	Reserve width
Local Minor	<200	60	6.0 (sealed)	1.0	20
Local Major	>200	80	6.0 (sealed)	1.0	20
Collector	>2000	80(8)	7.0 (sealed)	1.0 (sealed)	20
Arterial Road	NA	100(11)	7.0 (sealed)	1.0 (sealed)	30
Rural Residential	400	60	6 (sealed)	(kerb)	20

The table indicates that the requirements for rural local roads include a sealed pavement 6.0 m wide and 1.0 m shoulders. The provision of a table drain would be outside the 8 m wide formation. Normally a 1.5 m slope at 1 in 4 into the invert of the drain is the standard requirement.

The width of Gaudrons Road was measured at uniform intervals from the end of the concrete pavement at the Solitary Islands Way roundabout as shown in the table below.

It is apparent that the road is not constructed with a uniform minimum sealed width of 6.0 m, nor does it have clearly defined separate shoulders and table drains at many locations. It is obvious that the road has been shaped into the steep mountainous terrain and given the apparent age of the road, standard 1.5 m wide table drains with a 1 in 4 lead in grade can not be achieved due to the constraints on the overall width of the road formation due to the terrain.

Due to the mountainous terrain, it is apparent that a "run off road" type crash would have a high probability of resulting in fatalities. The road has a posted speed limit of 60 km/h and many curves with a safe travel speed less than the speed limit. There are no curve warning signs, delineation is sporadic, there are many trees in the clear zone and no safety barriers in high risk areas.

Widening of the shoulders in various locations would no doubt result in massive earthworks and potential environmental impacts. As there is no apparent damage to roadsides resulting from insufficient table drain capacity it must be assumed that stormwater drainage is currently adequately catered for.

Table 1 – Gaudrons Road widths.

Distance from Concrete pavement (km)	Left shoulder width (m)	Central seal width (m)	Right shoulder width (m)	Comment
0.2	1.5	6.0	3.0	In cutting
0.4	3.0	5.9	1.5	Cutting LHS
0.5	1.5	6.8	1.5	Cutting LHS
0.6	2.5	6.2	3.5	
0.81	1.3	5.6	1.2	Cutting RHS
1.0	1.5	6.0	1.1	Cutting RHS
1.1	2.0	5.5	2.5	Fill embankment
1.2	2.0	5.6	1.1	Cutting RHS
1.4	Driveway	6.5	Driveway	
1.6	1.0	6.1	3.0	
1.7	1.2	5.2	1.0	

From the table above it can be seen that the seal width varies from 5.5 to 6.8 m. The wider seal would include some widening of curves. The arithmetic mean of the seal width is 5.95 m.

Previous indications from Council have been that development along the length of Gaudrons Road would result in the need to widen the seal and shoulders in accordance with Council's Development Specification for greenfield sites. An obvious benefit of the road in its current form is that drivers generally travel at lower speeds and with attention to the road alignment which would probably result in lower reaction times, probably 1.5 seconds would be the norm.

Widening of the road may result in higher operational traffic speeds which without upgrading horizontal curves and reducing grades could result in more traffic accidents on the road. Instead, it may be more appropriate to take a road safety approach in accordance with the "safe system" to carry out safety works which would reduce potential crash severity, serious injuries and possible deaths.

No 148 Gaudrons Road is located between cross sections at 1.2 and 1.4 km in the table above.

It is apparent that a blanket application of Council's rural road standard to the road would not be an efficient expenditure as any incremental improvement would be at enormous cost. Also, it is understood that there are currently 67 dwellings which gain access via Gaudrons Road. If the subdivision resulted in one additional dwelling the impact of the traffic increase would be only 1.5% and it would be difficult to attribute the need for any upgrading works to the resulting increase in traffic from the subdivision. As there is no increase in dwellings resulting

from the subdivision there is definitely no nexus on which to require upgrading of Gaudrons Road.

It is noted that Council does not have a Section 7.11 Infrastructure Contributions plan for Gaudrons Road. Therefore, Council is not legally entitled to require the developer to contribute to works at other locations along the length of the road.

8 Conclusion

This investigation has proven that the existing points of access to Gaudrons Road for proposed Lots 1 and 2 are suitable for access from each lot to Gaudrons Road.

As there are already two dwellings, one on each proposed lot, there will be no increase in traffic generation from the subdivision and no decrease in the amenity of the existing access along Gaudrons Road.

As there is no current EPA Act Section 7.11 Infrastructure Contributions plan for Gaudrons Road Council can not require the applicant to contribute toward upgrading of Gaudrons Road.

Consideration of the mountainous nature of the existing road environment indicates that general upgrading of Gaudrons Road in accordance with Specification 0041 may not produce desirable outcomes and a more targeted approach to safety improvements, funded through Council's normal channels, may be more suited to the locality.

If any of these issues need clarification please contact me on 0432 016 490.

Yours sincerely

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