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BUSH FIRE ASSESSMENT REPORT

PROPOSED REZONING

Lot 831, 832 & 833 DP 847683

395 Reardons Lane, Swan Bay

Prepared for: Mr Noel Newman

Date: 8 December 2021

Reference: 21/231 amended

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DOCUMENT				
Revision	**Date**	**Description**	**Prepared**	**Authorised**
A	01.12.2021	Draft rezoning report	Peter Thornton	Peter Thornton
B	08.12.2021	Final rezoning report	Peter Thornton	Peter Thornton
C	12.02.2022	Slight plan amendment.	Peter Thornton	Peter Thornton

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EXECUTIVE SUMMARY

Bushfire Certifiers have been engaged to prepare a bushfire assessment report for the proposed rezoning of existing agricultural land at Lot 831, 832 and 833 DP 847683, 395 Reardons Lane, Swan Bay for purposes of a future residential subdivision.

The assessment has been undertaken in accordance with Planning for Bushfire Protection 2019 (PBP2019). The study will be used to establish the site is suitable for residential rezoning, and has been prepared for referral and consultation with the NSW Rural Fire Service as a means of demonstrating compliance with the *Environment Planning and Assessment Act 1979* Section 9.1, Ministerial Direction 4.4, and Planning for Bush Fire Protection 2019.

The Study has determined the proposed rezoning is appropriate in the bush fire hazard context. Bush fire mitigation and management measures for the future development can be adequately addressed, subject to the recommendations within this report, with the proposal having the ability to comply with PBP2019.

The indicative allotment layout with proposed minimum lot sizes are considered appropriate to accommodate the required Asset Protection Zones (APZ's) and access requirements subject to the performance solutions within this report for residential dwellings within the future subdivision.

The assessment of the existing public road network for emergency access and egress from the subdivision does not form part of our professional expertise, as this information would be provided via a traffic report. In this regard a recommendation has been made for a qualified and experienced person to assess the capabilities of the existing public road network (traffic report), it being noted that an additional emergency access/egress point will be required onto Reardons Lane with the alternate emergency route to be via Darkes Lane or another alternate egress/access route.

The indicative subdivision layout provides for 43 residential lots ranging from 7500m^2 and a large residual lot currently supporting sugar cane plantation.

A number of bushfire planning controls have been recommended to reduce the risk from bushfire attack to an appropriate level having regard to the proposed development and the nature of the locality. The bushfire assessment assumes the Fire Danger Rating (FDI) of 80 for the subject property in accordance with PBP 2019 and AS 3959-2018 for future non-special fire protection development with exception to some variations in Table 6.8b PBP2019 e.g. B&B's. The rezoning report provides recommendations to demonstrate the

land can meet the bushfire prevention measures of PBP 2019 and Ministerial Direction 4.4, with recommendations including-

- Setbacks from bushfire hazard vegetation (Asset Protection Zones).
- Fuel management within APZ's.
- Access and egress from the proposed allotments via an appropriate well designed road system to support evacuation and fire fighting demands.
- Underground electricity and gas services.
- Compliant water supplies.

Further bushfire assessment will be required at the time of development application for subdivision to accurately determine required APZ's, road requirements, and landscaping provisions to achieve compliance with standards for subdivisions in NSW given there may be opportunities to provide performance solutions to arrive at varied acceptable outcomes. A summary of the strategic bushfire study is provided in Table 1.

Table 1: Summary Strategic Bush Fire Study (Table 4.2.1 PBP 2019).

ISSUE	DETAIL	ASSESSMENT CONSIDERATIONS	COMMENT
Bush fire landscape assessment	Considers the likelihood of a bush fire, its potential severity and intensity and the potential impact on life and property in the context of the broader surrounding landscape.	The bush fire hazard in the surrounding area, including vegetation, topography and weather.	Addressed in bushfire report. Minimum required APZ setbacks capable of complying with PBP2019. Rezoning suitable.
		The potential fire behaviour that might be generated based on the above.	Addressed in bushfire report. Rezoning suitable.
		History of bush fire in the area.	The area has a history of bushfires although specific information not available at the time of reporting. Rezoning suitable.
		Potential fire runs into the site and the intensity of such fire runs.	The fire runs from the west and south through forest are extensive. Existing public roads act like perimeter roads for access to the hazard. Intermittent sugar cane growth and some minor land use conflict planting proposed

			having minimum fire runs to the east and north. Fire intensity will not be as significant as from the potential forest fires from the west and south. Adequate setbacks and access have been demonstrated in the report to comply with the performance criteria of PBP2019. Rezoning suitable.
		The difficulty in accessing and suppressing a fire, the continuity of bush fire hazards or the fragmentation of landscape fuels and the complexity of the associated terrain.	Existing public roads provide access to the forest bushfire hazard allowing to opportunity to back burn if safe to do so. Rezoning suitable.
Land use assessment	The land use assessment will identify the most appropriate locations within the masterplan area or site layout for the proposed land uses.	The risk profile of different areas of the development layout based on the above landscape study.	Rezoning suitable.
		The proposed land use zones and permitted uses.	Rezoning suitable.
		The most appropriate siting of different land uses based on risk profiles within the site (i.e. not locating development on ridge tops, SFPP development located in lower risk areas of the site).	Rezoning suitable.
		The impact of the siting of these uses on APZ provision.	Rezoning suitable.
Access and egress	A study of the existing and proposed road networks both within and external to the masterplan area or site layout.	The capacity for the proposed road network to deal with evacuating residents and responding emergency services, based on the existing and proposed community profile.	Traffic engineer or statement of environmental effects required to demonstrate compliance of the existing public road network – alternate emergency egress required.
		The location of key access routes and direction of travel.	As above re: traffic engineer.
		The potential for development to be isolated in the event of a bush fire.	Based on a satisfactory traffic report confirming two egress/access routes, the development will not be considered

			'isolated'. The rezoning will create a continuation of previous subdivisions to the north. Rezoning suitable.
Emergency services	An assessment of the future impact of new development on emergency services.	Consideration of the increase in demand for emergency services responding to a bush fire emergency including the need for new stations/brigades.	NSW RFS and NSW Fire and Rescue to comment with Integrated development referral.
		Impact on the ability of emergency services to carry out fire suppression in a bush fire emergency.	Rezoning suitable based on water supply complying with PBP2019 for future dwellings.
Infra-structure	An assessment of the issues associated with infrastructure and utilities.	The ability of the reticulated water system to deal with a major bush fire event in terms of pressures, flows, and spacing of hydrants.	No reticulated supply.
		Life safety issues associated with fire and proximity to high voltage power lines, natural gas lines etc.	Rezoning suitable
Adjoining land	The impact of new development on adjoining landowners and their ability to undertake bush fire management.	Consideration of the implications of a change in land use on adjoining land including increased pressure on BPMs through the implementation of Bush Fire Management Plans.	Proposal will result in a reduction of the current bushfire hazard to adjoining properties.

1.0 INTRODUCTION

1.1 Purpose

This Strategic Bush Fire Report has been prepared to address bushfire risk and mitigation measures in relation to the proposed rezoning for residential purposes. The report makes comment on areas relating to Planning for Bushfire Protection 2019 and further comment where there may be a need for other suitably qualified professionals or organisations to assess and comment. The proposal has been assessed against the requirements of Planning for Bushfire Protection Guidelines (NSW RFS 2019).

The purpose of the strategic bush fire study is to avoid high risk areas, ensure that zoning is appropriate to allow for adequate emergency access, egress, and water supplies, and to ensure future compliance with this PBP is achievable. The Study provides an assessment as

to whether new development is appropriate in the bush fire hazard context, and the implications of future development for bush fire mitigation and management.

1.2 Location

The site incorporates Lots 831, 832 and 833 DP 847683, 395 Reardons Lane, Swan Bay. Lot 833 currently supports an existing dwelling. The site is located within a rural locality approximately 10km to the south-west of the village of Woodburn located on the NSW North Coast at an approximate AHD of 10m.

The Richmond River flood plain adjoins the site to the north and east. Extensive upslope forest vegetation is located to the west of the site beyond Reardons Lane, including Noonimba Ridge at an approximate AHD of 180m. The existing property being subject to the re-zoning application is predominantly cleared gently undulating horticultural cropping land.

The development site is bounded by Darke Lane and agricultural land to the south connecting to Swan Bay New Italy Road further to the east, Reardons Lane and forest vegetation to the west, and an unformed road reserve and horticultural land to the north as shown in Figures 1 and 2. Public access to the site is proposed via the existing road network via Reardons Lane from the north and from the south via Swan Bay New Italy Road/Darkes Lane. Table 2 provides a summary of the existing site and bushfire hazard.

Table 2 - Existing site description

Parameter	**Description**
Local Gov. area	Richmond Valley Council.
Property Description	Lots 831, 832 & 833 DP 847683, 395 Reardons Lane, Swan Bay.
Proposal	Rezoning – Existing zoning RU1 primary production, proposed zoning RU5 large residential lots.
Drawings	Newton Denny Chapelle, Plan 4 – Conceptual Subdivision Plan, Ref. 14/227, Rev H dated 11.11.2021.
Site area	Total site area approx. 129ha, approximately 44ha subject to rezoning.
Water supply	On-site static water supply proposed, no reticulated supply.
Designated Bushfire Prone Land	Hazard to the proposed residential rezoned land is existing forest to the west of Reardons Lane, grassland and forest to the south of Darke Lane. Proposed revegetation buffer on-site. The existing horticultural use on the residual allotment has been assessed as hazard vegetation. No designated mapped bushfire hazard within the site.
Rural Fire Service	Woodburn RFS located within 10km by road from the subject site. Lower River RFS located within 11km by road from the subject site. West Coraki RFS located within 15km by road from the subject site. Coraki RFS located within 15km by road from the subject site.

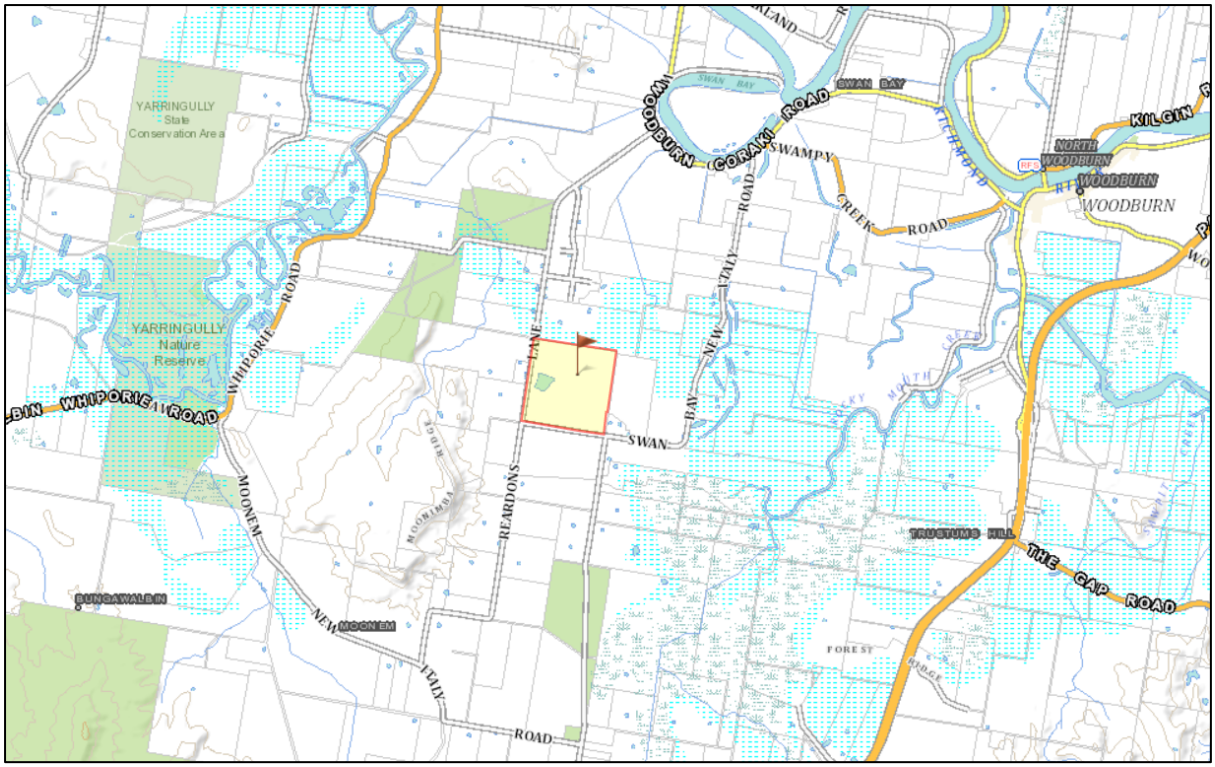


Figure 1 - Location of the subject site. Source: NSW Gov Six maps

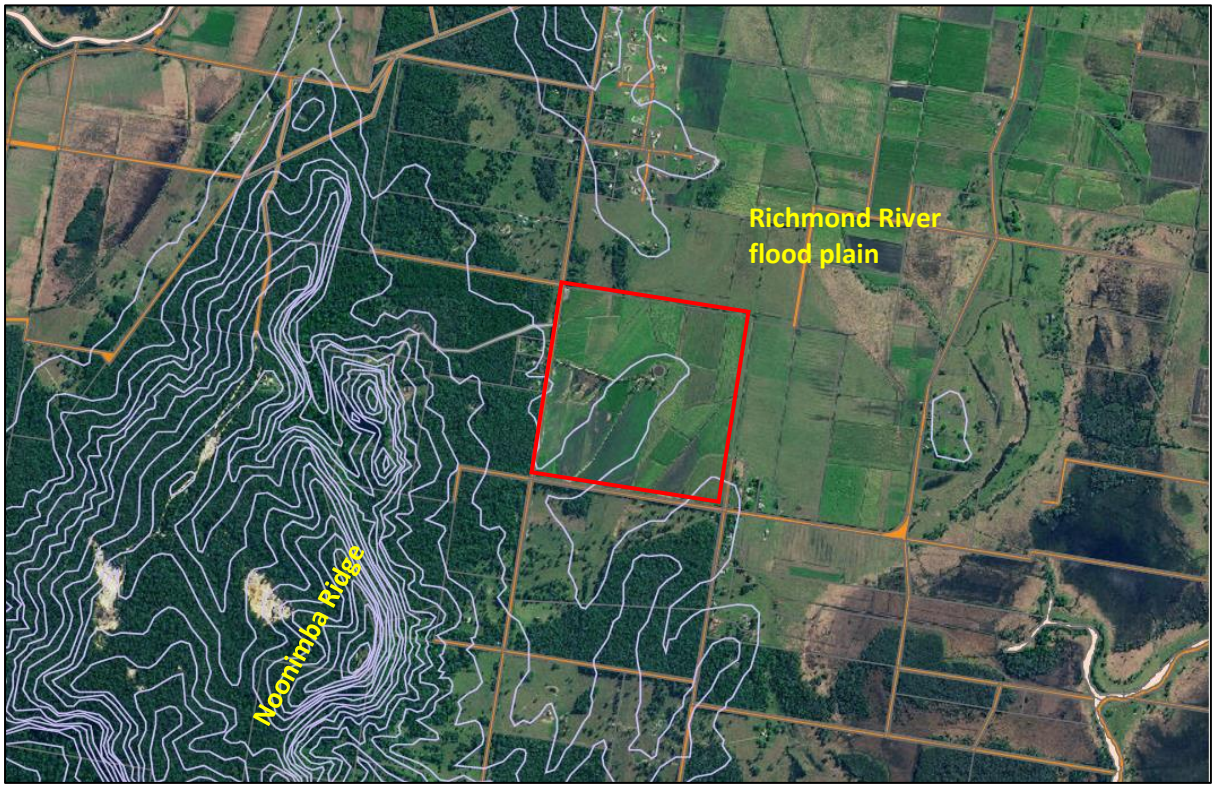


Figure 2 - Aerial view of the site and surrounding area. Source: NSW Gov. spatial map viewer

1.3 Legislation

1.3.1 Environmental Planning and Assessment Act

Appropriate consideration of bush fire hazards for the proposed rezoning is required by the *Environmental Planning and Assessment Act 1979* Section 9.1(2), and Direction 4.4 Planning for Bushfire Protection. Clause 4.4.1 of PBP 2019 requires consideration of Direction 4.4 in the Strategic Bush Fire Study at the initial planning stage in accordance with Clause 4.2 of PBP. Consultation with the RFS will require consideration of a bush fire assessment to demonstrate compliance with the Direction and PBP2019. The broad principles which apply to the strategic analysis include-

- Ensuring land is suitable for development in the context of bush fire risk;
- Ensuring new development on bushfire prone land will comply with PBP;
- Minimising reliance on performance-based solutions;
- Providing adequate infrastructure associated with emergency evacuation and firefighting operations; and Facilitating appropriate ongoing land management practices.

The applicant has advised the wish to provide this study with the development application for complete assessment via an integrated referral.

1.3.2 Rural Fires Act

Future residential subdivision will be assessed under Section 100B of the *Rural Fires Act 1997*, and a Bush Fire Safety Authority (BFSA) must be obtained from the NSW Rural Fire Service (RFS). In this regard a Bushfire Assessment Report will be required when an application for subdivision is proposed, indicating compliance with Planning for Bushfire Protection 2019, in accordance with the requirements of Clause 44 of the Rural Fires Regulation. This report has assessed the indicative subdivision layout, and provided recommendations, in order to demonstrate a configuration of the rezoned land has the capability of complying with PBP2019.

This report does not consider the following legislation. In this regard this report should be read in conjunction with the Statement of Environmental Effects submitted with the development application to ensure full compliance has been adequately demonstrated.

- State Environmental Planning Policy (Koala Habitat Protection) 2019;
- Biodiversity Conservation Act 2016 (NSW);
- Local Land Services Act 2013 (NSW);
- Land Management (Native Vegetation) Code 2017 (NSW);
- National Parks and Wildlife Act 1974 (NSW);
- Environmental Protection and Biodiversity Conservation Act 1999 (Cwlth).

1.3.3 Planning for Bushfire Protection Guidelines 2019

The objectives of PBP are to-

a. Afford buildings and their occupants protection from exposure to a bush fire;
b. Provide for a defendable space to be located around buildings;
c. Provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent the likely fire spread to buildings;
d. Ensure that appropriate operational access and egress for emergency service personnel and occupants is available;
e. Provide for ongoing management and maintenance of bush fire protection measures;
f. Ensure that utility services are adequate to meet the needs of firefighters.

The relevant bush fire protection measures outlined in chapters 5-8 of PBP 2019 have been considered to ensure future development can comply with PBP where appropriate. An indicative development layout has been provided to allow assessment of the suitability of the land for the proposed residential development and to demonstrate required APZs can be met on site. The indicative allotment layout with proposed minimum lot sizes is considered appropriate to accommodate the APZs within the future residential subdivision.

Having regard to public road access via the existing public road network, a traffic report will be required to assess the capacity of the alternate egress routes north and south along Reardons Lane and then to the east to Swan Bay New Italy Road. A satisfactory assessment and consideration of any recommendations will be required by NSW Rural Fire Service prior to issue of a Bush Fire Safety Authority or RFS advice to the consent authority.

The proposed access roads within the site are understood to be future public roads. In this regard a performance solution has been applied to demonstrate a perimeter road is not required to the north and east of the proposed rezoning site. The existing public roads of Reardons Lane and Darke Lane will form defacto perimeter roads allow access for emergency service to the primary bushfire hazards (forest) where actions such as back burning etc are more likely.

A performance solution is also applied to the internal roads exceeding 200m in length and being dead end roads. The site is shown to be accessed though a single access point from Reardons Lane however a secondary access (or emergency access at the least) will be required to Reardons Lane or at other locations to address the scenario of the current indicative access being cut in a bushfire event e.g. car crash, falling tree, bottlenecking or other obstruction hindering access and egress to and from the locality.

The aim of PBP is to provide for the protection of human life and minimise impacts on property from the threat of bush fire, while having due regard to development potential, site characteristics and protection of the environment.

2.0 PROPOSED REZONING

The purpose of the Planning Proposal is to change the town planning provisions applying to Lots 831, 832, 833 DP 847683 to rezone part of the land presently zoned RU1 – Primary Production to R5 – Large Lot Residential in accordance with the provisions of the Richmond Valley Local Environmental Plan 2012.

The Planning Proposal also seeks to amend the minimum lot size map to permit the creation of lots with minimum lot sizes of 7 500m^2 within the area to be rezoned.

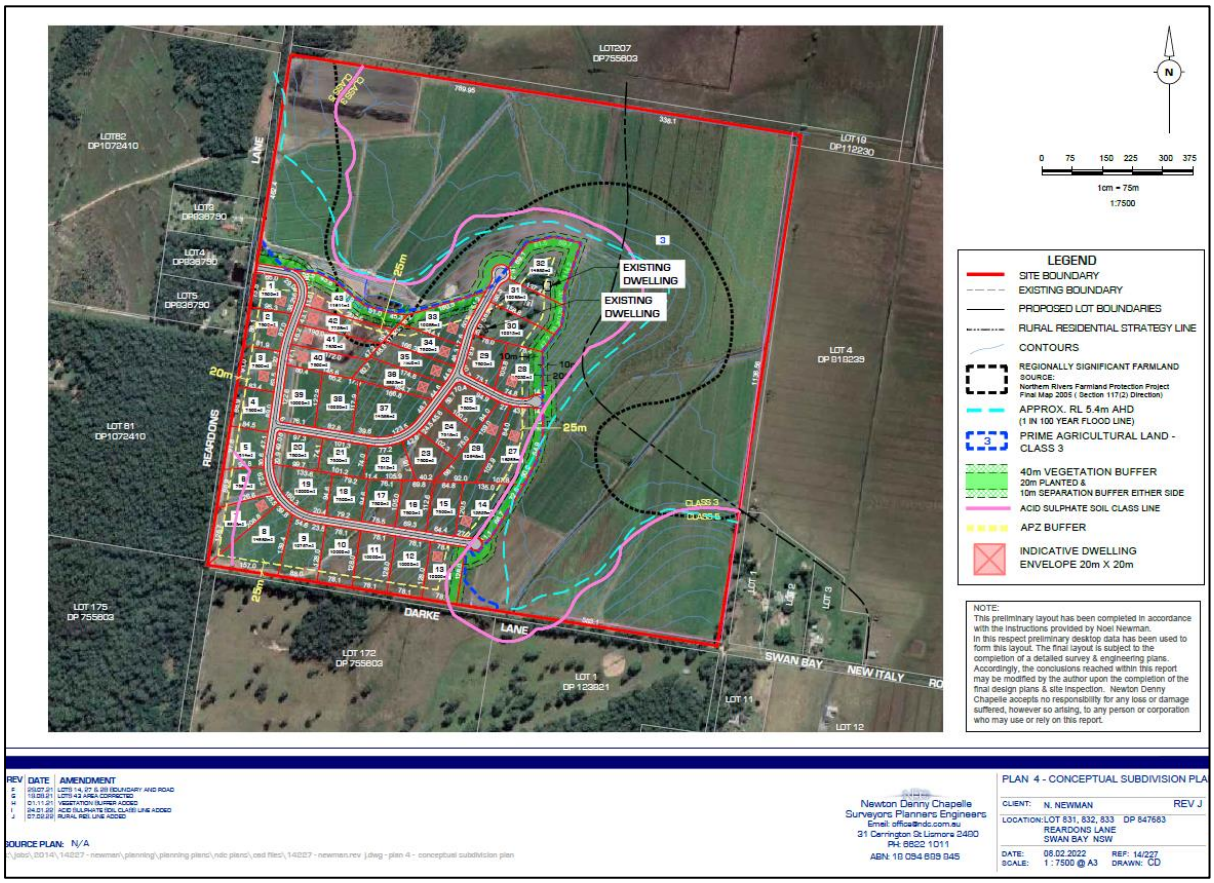


Figure 3 – Indicative subdivision rezoning demonstrating adequacy of land for rezoning.

3.0 STRATEGIC BUSH FIRE STUDY (TABLE 4.2.1 PBP 2019)

3.1 Bush fire landscape assessment

A bush fire landscape assessment has been undertaken to consider 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.

3.1.1 *The bush fire hazard in the surrounding area, including vegetation, topography and weather.*

Topography

The proposed rezoning for rural residential purposes is located on a gently undulating site dominated by a low central ridge (10 AHD) falling to the Richmond River flood plains to the north and east. The flood plain is dominated by sugar cane cropping. Beyond the site to the west is a forested range rising to approximately 180m AHD forming the dominate bushfire hazard impacting the site, together with grasslands to the south of the site on the adjoining agricultural grazed land.

Hazard vegetation

The bushfire prone mapping in Figure 4 identifies the subject site as being bushfire prone. Aerial mapping and inspection of the site reveals that the bushfire prone land map is considered reasonably accurate with respect to the current bushfire hazard off-site, except for the grassland hazard to the south which is unmapped, and the sugar cane cropping to the north and east which is unmapped. Table 3 and Figure 6 summarises the bushfire hazard assessment.

The forest vegetation to the west is located on an upslope and is located on the western side of Reardons Lane. There are minimal trees on the eastern side of the Reardons Lane road reserve which would not be a continuation of the primary bushfire hazard. As such, when a future dwelling is specifically assessed pursuant to s4.14 or s4.15 of the Environmental Planning and Assessment Act 1979, the hazard is likely to be assessed from the western side of Reardons Lane road reserve.

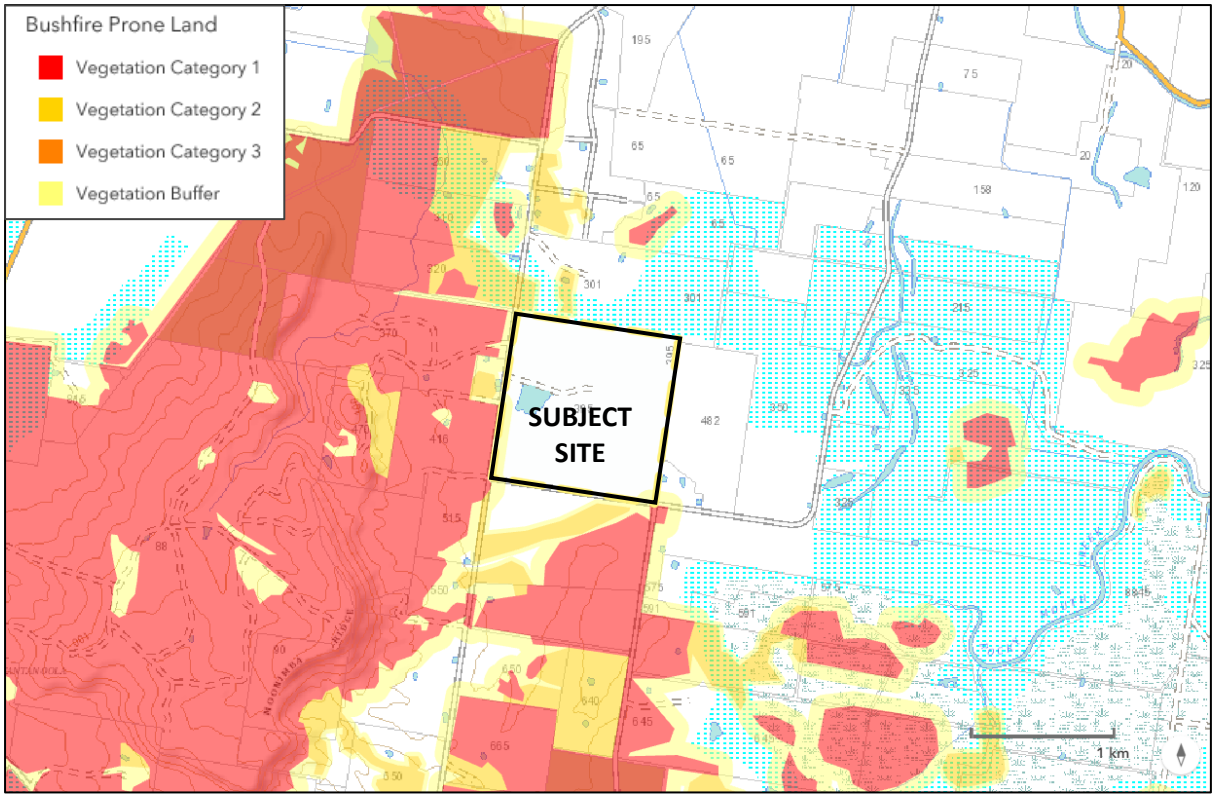


Figure 4 - Bushfire Prone Land Map Source: NSW planning portal 27.11.21

Photo 2 - Forest vegetation to the west of Reardons Lane

To the north and east of the proposed rezoning are areas to be replanted as an agriculture buffer (LUCRA). The plantings will be 20 metres wide with a 10 metre non-vegetated buffer each side of the plantings, marked in green on the indicative subdivision plan.

Existing sugar cane is located to the north and east of the vegetative and non-vegetative buffer. The plantings will be various species consistent with forest classification as no short fire run is possible given that it is considered continuous with the sugar cane despite the 10-metre buffer.

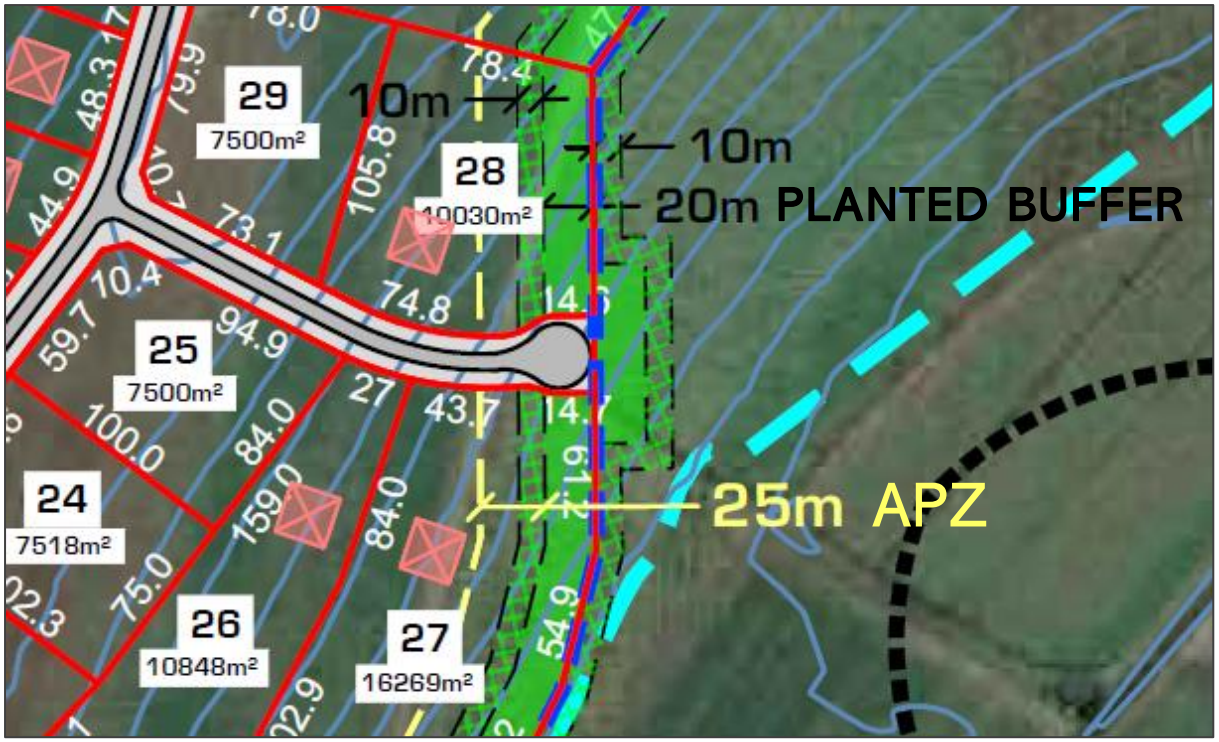


Figure 5: Example of agricultural buffer with 10m either side of proposed plantings

To the south of the site is forest vegetation located on a slight downslope. The small, isolated stand of forest has an area of approximately 2ha and is separated from the western forest by 200m.

Large areas of grazed grassland surround the forest on the southern side of Darke Lane. The forest vegetation on the northern side of Darke Lane has been included in the assessment given there are some trees on the northern side of the road reserve however some areas on the northern side of the road reserve could be assessed as non-hazard. As such, when a dwelling is specifically assessed pursuant to s4.14 or s4.15 of the *EP&A Act,* the hazard may, in areas, be assessed from the southern side of Darke Lane.

It is noted, this assessment is considered conservative and there may be opportunity with the preparation of a development application for subdivision to provide performance solutions or qualification of fire behaviour to reduce the asset protection zones subject to NSW RFS concurrence.

Photo 3 – Single row of trees along Darke Lane to the south.

Photo 4 – Grassland and forest vegetation to the south of Darke Lane.

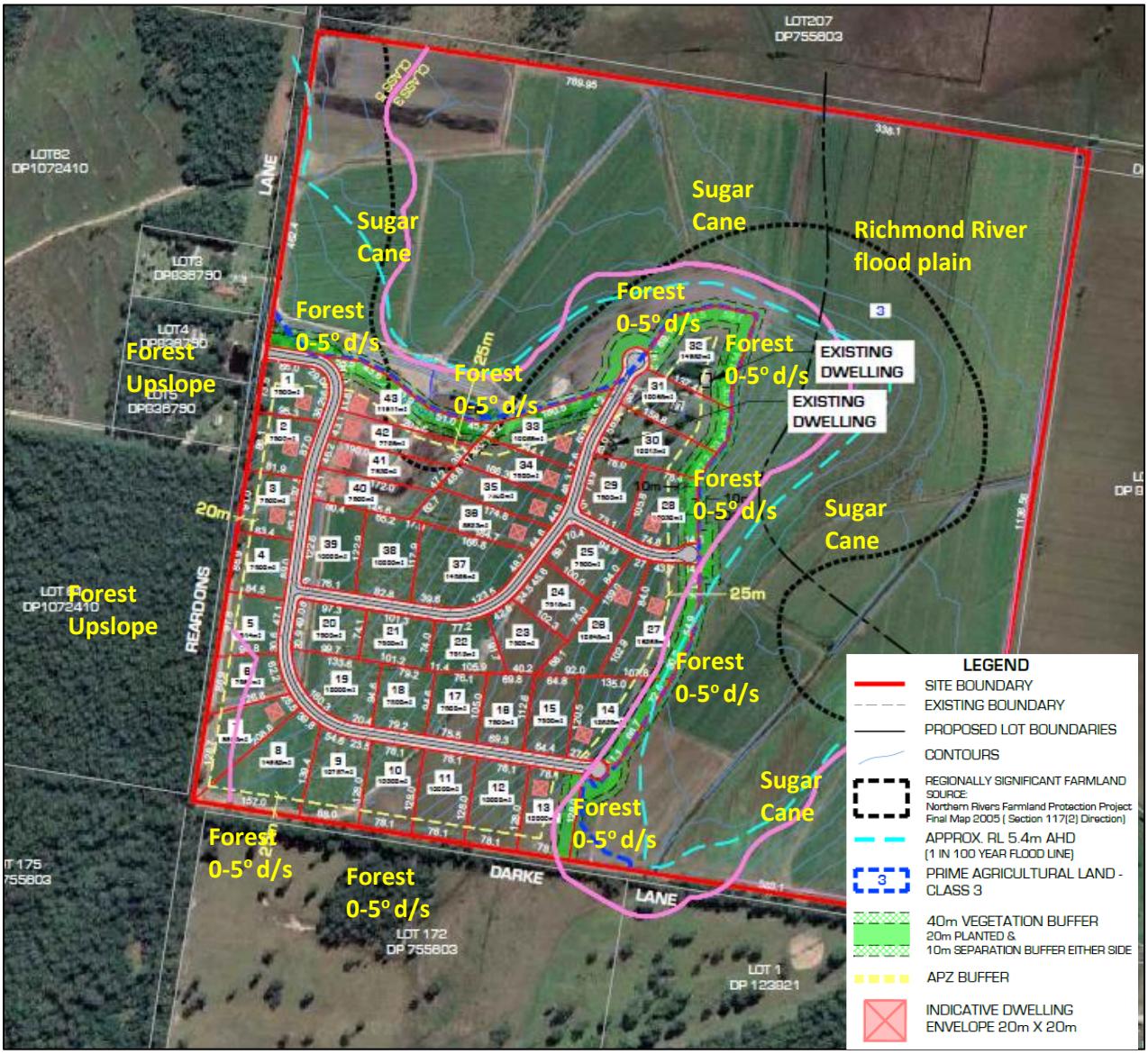


Figure 6 - Bushfire threat analysis and indicative subdivision layout.

The slope and vegetation analysis are summarised in Table 3 based on the proposed lot configuration. There are no building envelopes shown on the plan apart from those shown on the bushfire hazard interface to demonstrate a future subdivision can adequately support the minimum required asset protection zones. It is noted there is scope for future performance solutions to reduce the asset protection zones in some locations at subdivision stage and with NSW RFS concurrence.

The bushfire prone land mapping (Figure 4) does not map the existing sugar cane cropping or future replanting buffer. These areas have been considered with the APZ's as described in Table 2. The APZs in Table 3 are considered conservative purely to demonstrate in the worse-case scenario that the indicative subdivision layout is adequate for rezoning purposes.

Weather
Bushfire weather indicates and FDI of 80 which is considered appropriate.

3.1.2 *The potential fire behaviour that might be generated based on the above.*

The assessment assumes the bushfire attack scenario on a day a Fire Danger Rating (FDI) of 80 in accordance with PBP 2019. The bushfire prone land mapping is not completely accurate in that the mapping does not capture the horticultural cropping areas or grassland hazard, both on the site and adjoining the site, although the mapping appears to be recently completed and these areas have not been mapped as a bushfire hazard. The narrow 20m wide replanting buffer also requires consideration.

The site inspection however identified the vegetation most impacting the site to be forest vegetation. In this regard given the application is for rezoning a conservative assessment has been undertaken on the basis this vegetation along the perimeter of the site is taken as forest vegetation. The principal forest hazard to the west being on an upslope with added disconnection from the existing public road will result in a conservative approach.

3.1.3 *Any history of bushfire in the area.*

The area has a history of fires although there was no evidence found of localised bushfire information at the time of report. The site however is subject to a credible bushfire event particularly from the west, southwest and northwest separated by Reardons Lane and Darke Lane.

3.1.4 *Potential fire runs into the site and the intensity of such fire runs.*

Extensive fire runs from the west, southwest, northwest, and south have the potential to impact the subject rezoning area it being noted that Reardons Lane and Darke Lane are located between the subject property and the primary hazards. The road reserve currently support negligible fuels loads and would not be inconsistent with inner and outer protection zone specifications.

To the north and east there is annual cropping of sugar cane will limit the potential fire run from the north and east, together with the narrow fire run from the 20m wide proposed replanted buffer. The bushfire risk from the north and east is not as significant as that from the west and south.

3.1.5 *The difficulty in accessing and suppressing a fire, the continuity of bush fire hazards or the fragmentation of landscape fuels and the complexity of the associated terrain.*

Reardons Lane and Darke Lane will act like a perimeter road allowing fire fighters access to the western and southern bushfire hazards. The lower bushfire fire hazard from the north and east do not warrant dedicated perimeter roads with access available through the large residential allotments which are required to have an accessible static water supply when a dwelling is proposed and assessed pursuant to s4.14 or s4.15 EP&A Act 1979. The terrain does not present any specific limitations to bushfire suppression. Static water supply will be provided on each allotment.

3.2 Land use assessment

The land use assessment will identify the most appropriate locations within the site layout for the proposed land uses.

3.2.1 *The risk profile of different areas of the development layout based on the above landscape study.*

The subject property has a similar bushfire risk to previously approved subdivisions to the north along Reardons Lane. The perimeter allotments have sufficient area to incorporate on-site APZ's commensurate to the risk. All allotments will be required to be managed as APZ's.

A primary consideration relates to the adequacy of the existing public road network having capacity to provide access for emergency services whilst occupants are potentially evacuating in the opposite direction. In this regard a traffic report will be required as part of the survey and RFS considerations.

3.2.2 *The proposed land use zones and permitted uses.*

The permitted uses of the R5 Large Lot Residential Zone are:

> *Bed and breakfast accommodation, Boat launching ramps, Boat Shed, Community facilities, Dual occupancies, Dwelling houses, Emergency services facilities, Environmental protection works, Exhibition homes, Farm buildings, Flood mitigation works, Group homes, Home-based child care, Home businesses, Home industries, Information and education facilities, Jetties, Kiosks, Oyster aquaculture, Pond-based aquaculture, Recreation areas, Roads, Roadside stalls, Signage, Tank-based aquaculture, Water recreation structures.*

It is the intent following rezoning to subdivide the site into 43 rural residential lots with an additional residual allotment to remain as primary production.

The sites are considered suitable for single or multi dwelling housing, however some Special Fire Protection Purpose development such as Group homes and educational facilities will need to be capable of achieving sufficient asset protection zone widths within the allotments as required by Table A.1.12.1 of PBP 2019 generally being 67m without the use of performance solutions which may reduce this distance. There are several sites where compliance is capable of being achieved if such uses were proposed at subdivision stage.

Table A1.12.1

Minimum distances for APZs – SFPP developments (≤10kW/m², 1200K)

KEITH VEGETATION FORMATION	EFFECTIVE SLOPE				
	Up slopes and flat	>0°-5°	>5°-10°	>10°-15°	>15°-20°
	Distance (m) from the asset to the predominant vegetation formation				
Rainforest	38	47	57	69	81
Forest (wet and dry sclerophyll) including Coastal Swamp Forest, Pine Plantations and Sub-Alpine Woodland	67	79	93	100	100
Grassy and Semi-Arid Woodland (including Mallee)	42	50	60	72	85
Forested Wetland (excluding Coastal Swamp Forest)	34	42	51	62	73
Tall Heath	50	56	61	67	72
Short Heath	33	37	41	45	49
Arid-Shrublands (acacia and chenopod)	24	27	30	34	37
Freshwater Wetlands	19	22	25	28	30
Grassland	36	40	45	50	55

Figure 7 – Table A 1.12.1 PBP2019 (Special Fire Protection Purpose developments).

Single or multi dwelling (Class 1a – BCA) development must be capable of having the asset protection zone widths required by Table A1.12.3 PBP2019. In this regard the indicative subdivision plan provided in this report has demonstrate with the most conservative assessment the rezoning can support development in accordance with PBP 2019.

It is noted however there is considered merit to reduce the demonstrate asset protection zones in some areas with a performance solution report at subdivision application stage.

Table A1.12.3

Minimum distances for APZs – residential development, FFDI 80 areas (≤29kW/m², 1090K)

KEITH VEGETATION FORMATION	EFFECTIVE SLOPE				
	Up slopes and flat	>0°-5°	>5°-10°	>10°-15°	>15°-20°
	Distance (m) from the asset to the predominant vegetation formation				
Rainforest	9	12	15	20	25
Forest (wet and dry sclerophyll) including Coastal Swamp Forest, Pine Plantations and Sub-Alpine Woodland	20	25	31	39	48
Grassy and Semi-Arid Woodland (including Mallee)	11	13	17	21	27
Forested Wetland (excluding Coastal Swamp Forest)	8	10	13	17	22
Tall Heath	16	18	20	22	25
Short Heath	9	10	12	13	15
Arid-Shrublands (acacia and chenopod)	6	7	8	9	10
Freshwater Wetlands	5	6	6	7	8
Grassland	10	11	12	14	16

Figure 8 – Table A1.12.3 PBP2019 residential development.

3.2.3 *The most appropriate siting of different land uses based on risk profiles within the site (i.e. not locating development on ridge tops, SFPP development to be located in lower risk areas of the site. Not locating high risk development in hazardous areas of the site.*

There are no areas of the site at significantly higher risk from bushfire due to topography or access arrangements. The required APZ's will be an appropriate risk mitigation measure to address the proximity to the bushfire hazard for the proposed rezoning.

3.2.4 *The impact of the siting of these uses on APZ provision.*

The limited site area and proximity to the bushfire hazard may limit some SFPP uses due to the APZ requirements although most will be capable of complying. The proposed allotment layout provides for sufficient lot size for required APZ's for single dwellings on individual allotments.

3.3 Access and Egress

This section provides comment on the existing and proposed road networks both within and external to the masterplan area or site layout.

3.3.1 *The capacity for the proposed road network to deal with evacuating residents and responding emergency services, based on the existing and proposed community profile.*

The existing public road network in the vicinity of the site is to be assessed by a competent person and confirmation provided via a traffic report demonstrating the existing public road network, based on the potential volumes of traffic, can support the increased volumes of traffic in the event of a bush fire emergency.

The new internal public access road network is required to comply with PBP2019. The following matters have been identified as requiring further design consideration at subdivision stage to meet the requirements of PBP2019 for rural residential subdivisions.

- Perimeter roads are required for residential subdivisions of three or more allotments. Perimeter roads are required to be through roads, and these are required to be linked to the internal road system at an interval of no greater than 500m. Performance solution proposed.

- Subdivisions of three or more allotments are required to have more than one access in and out of the development. An additional access road is required into and out of the development. Amended plans required.

- All roads are required to be through roads. Dead end roads are not recommended, but if unavoidable, are not more than 200m in length, incorporate a minimum 12m outer radius turning circle, and are clearly sign posted as a dead end. Performance solution proposed for dead end road greater than 200m in length.

- Non-perimeter roads are required to be through roads, and these are required to be linked to the internal road system at an interval of no greater than 500m. Performance solution and amended plans required.

A detailed assessment against PBP2019 is provided in Section 7 of this report.
Some variations may be appropriate and will be assessed via performance assessment at subdivision stage.

Property access roads will be required to comply with PBP2019 with turning head requirements to be assessed at DA stage for future dwelling construction. Each proposed allotment has sufficient area for turning head requirements.

3.3.2 *The location of key access routes and direction of travel.*

There are a number of access and egress routes available which include traveling north and south along Reardons Lane, and east along Darke Lane and Swan Bay New Italy Road. The

existing public road network is to be assessed by a competent person and confirmation provided via a traffic report that the existing and proposed road network, based on the potential volumes of traffic, are capable of supporting the increased volumes of traffic in the event of a bush fire emergency.

3.3.3 *The potential for the development to be isolated in the event of a bushfire.*

The development is located in a rural area, and there is potential for the egress route to be impacted by fire. A second egress route from the proposed subdivision to the existing public road system is required to ensure access/egress is always available away from the existing bushfire hazard. Existing access road Reardons Lane is a through road.

3.4 Emergency Services

This section provides an assessment of the future impact of new development on emergency services.

3.4.1 *Consideration of the increase in demand for emergency services responding to a bush fire emergency including the need for new stations/brigades.*

The proposed development is within 15km by road of four NSW Rural Fire Service Brigades. The increase in population is consistent with rural residential development in the area. Future Rural Fire Service Brigades to be assessed where necessary at subdivision stage.

3.4.2 *Impact on the ability of emergency services to carry out fire suppression in a bush fire emergency.*

The proposal is considered to have negligible impact for emergency services to carry out fire suppression in a bush fire emergency. The existing public roads will act as perimeter roads providing a defendable space between the subdivision and the off-site hazards.

3.5 Infrastructure

This section provides an assessment of the issues associated with infrastructure and utilities.

3.5.1 *The ability of the reticulated water system to deal with a major bush fire event in terms of pressures, flows, and spacing of hydrants.*

Reticulated town water supply is not available. On-site static supplies will be available once dwellings are constructed.

3.5.2 *Life safety issues associated with fire and proximity to high voltage power lines, natural gas lines etc.*

Underground power transmission lines proposed. All new power lines should be located underground in accordance with PBP2019. The site is understood not to be serviced by reticulated natural gas.

3.6 Adjoining land

This section provides comment on the impact of new development on adjoining landowners and their ability to undertake bush fire management.

3.6.1 *Consideration of the implications of a change in land use on adjoining land including increased pressure on BPMs through the implementation of Bush Fire Management Plans.*

It is considered by developing the land for residential purposes and applying compliant asset protection zones and landscaping requirement together with construction standards to the buildings, the development will decrease the fuel loads currently impacting adjacent development.

4.0 PLANNING FOR BUSHFIRE PROTECTION 2019

4.1 Asset Protection Zones

Aerial mapping and inspection of the site reveals the bushfire prone land map is not completely accurate in respect to the current bushfire hazard. Inspection of the subject property was undertaken and bushfire assessment conducted within 140m beyond the boundary of the development area with a detailed assessment in Section 3 of this report.

Asset Protection Zones are areas established and maintained to ensure that bushfire fuels are progressively reduced between the development and the bushfire hazard. An asset protection zone incorporates an Inner Protection Area (IPA) having reduced fuel loadings of approximately 3t/ha.

The assessment establishes that future residential development will require asset protection zones. The proposed future residential subdivision must comply with the APZ criteria for infill developments Section 5.3.1 and Table 5.3a of PBP2019 which states:

- APZs are provided in accordance with Table A1.12.2 or A1.12.3 PBP 2019 based on the FFDI.
- APZs are to be managed in accordance with Appendix 4 (of PBP 2019).
- APZs are wholly within the boundaries of the development site.
- APZ are located on lands with a slope less than 18 degrees.

A future dwelling on the proposed lots is capable of being sited to receive ≤29kW/m^2 and is to be assessed in accordance with s4.14 at Development Application stage. Table 3 provides a summary of Asset Protection Zone requirements with plans provided in Appendix A providing a visual representation of required APZ's within the rezoning site.

Table 3: Summary of Preliminary Asset Protection Zones required

Lot nos.	Aspect	Vegetation	Slope	APZ for 29kW/m^2
1-8	West	Forest	upslope	20 metres – contained within the property
7-13	South	Forest	0-5° downslope	25 metres – Contained within the property
13-14, 27-28 & 30-32	East	Forest	0-5° downslope	25 metres – Contained within the property
1, 43, 33, 31 & 32	North	Forest	0-5° downslope	25 metres – Contained within the property
Lots 1-43	Overall	Overall	Overall	All Lots 1-43 are to be managed as asset protection zones

All Lots 1-43 are to be managed as asset protection zones

The plans show compliant building envelopes can be supported on the future allotments in conjunction with the recommended asset protection zones based on the worst-case scenario and without performance solution reporting. It is noted temporary APZ's may be required should the future subdivision be staged.

Existing Dwelling - Upgrade Assessment

The existing dwelling is not located on bushfire prone land, however, as there are revegetation works within 100 metres of the dwelling, it will be required to be upgraded to improve ember protection. This is to be achieved by enclosing or covering all openings with a non-corrosive metal screen mesh with a maximum aperture of 2mm. Where applicable, this includes openable windows, vents, weepholes (excluding under window weepholes) and eaves. External doors are to be fitted with draft excluders. These upgrade measures are

capable of being included in the bushfire report at the time of subdivision. The lot will be maintained as an IPA except for the revegetation works onsite.

5.0 CONSTRUCTION STANDARDS AND OTHER PLANNING CONTROLS

The land available for the required asset protection zones can be applied to future dwellings demonstrating the 29kW/m^2 threshold is not exceeded as required by Table A1.12.3 PBP2019. The APZs shown will ensure that the future dwellings will not be within the forecast flame zone.

Future use of the rezoned land for residential purposes will require approval of an 'integrated' development application for subdivision under Section 91 of the *EP&A Act* requiring the issue of a s.100B Rural Fires Act bushfire safety authority, and development application/s for any dwellings under Section 4.14 of the *EP&A Act* requiring referral to the NSW Rural Fire Service. The indicative site plan may need to be amended at subdivision stage.

6.0 WATER AND UTILITY SERVICES PBP2019

6.1 Water Supply

Given a reticulated fire hydrant system is not proposed, a static water supply will be required for future dwellings. The static water supply will need to comply with Section 5.3.3 and Table 5.3c and 5.3d of Planning for Bushfire Protection 2019 at development application stage for a new dwelling as follows-

- static water and hydrant supply is to be provided for non-reticulated developments or where reticulated water supply cannot be guaranteed;
- static water supplies shall comply with Table 5.3d PBP2019;
- all above-ground water service pipes are metal, including and up to any taps; and
- above-ground water storage tanks shall be of concrete or metal.

On-site static water supply volume requirements for future dwellings are indicated in Table 4.

Table 4: Water supply for non-reticulated developments (Table 5.3d PBP2019)

Water supply requirements for non-reticulated developments (Table 5.3d PBP2019)	
Development type	**Water requirements**
Residential lots (<1000m^2)	5000L/lot
Rural residential lots (1000m^2 – 10000m^2)	10000L/lot
Large rural/lifestyle lots (>10000m^2)	20000L/lot
Multi-dwelling housing (including dual occupancies)	5000L/dwelling

6.2 Electricity Supply

New electrical transmission lines if required are to comply with Section 5.3.3 and Table 5.3c of Planning for Bushfire Protection 2019 as follows:

- where practicable, electrical transmission lines are underground; and
- where overhead, electrical transmission lines are proposed as follows:
  - lines are installed with short pole spacing of 30m, unless crossing gullies, gorges or riparian areas; and
  - no part of a tree is closer to a power line than the distance set out in accordance with the specifications in ISSC3 *Guideline for Managing Vegetation Near Power Lines*.

6.3 Gas Services

Reticulated gas is not proposed. The development applications for future dwellings will provide details of the storage of gas to comply with Section 7.4 and Table 7.4a of Planning for Bushfire Protection 2019. Additional requirements of AS 3959-2018 will be addressed at DA stage for a future dwelling.

7.0 ACCESS Table 5.3b PBP 2019

7.1 General

The proposed public and property access roads will be required to comply with Table 5.3b Planning for Bushfire Protection 2019. It is noted temporary turnaround areas may be required to serve public roads should future subdivision be staged. In this regard any temporary turnaround will be required to comply with Table 5.3b of PBP2019.

Civil engineering plans will be required with a future development application for subdivision demonstrating turn around for a medium rigid vehicle can be achieved. Access requirements are discussed in Table 5. Items subject to a proposed performance solution are discussed in Section 7.2 of this report. These performance solutions are only one solution available for NSW RFS consideration of the rezoning however a future bushfire report accompanying a development application for subdivision will require a separate performance solution demonstrating compliance with the legislation and policy requirements at the time of application.

Table 5: Access table 5.3b PBP 2019 rural residential subdivisions

Performance criteria	**Acceptable solution - Access**	**Capable of compliance**
Access – General Requirements		
Firefighting vehicles are provided with safe, all-weather access to structures.	Property access roads are two-wheel drive, all-weather roads.	Capable of achieving compliance.
	Perimeter roads are provided for residential subdivisions of three or more allotments.	No perimeter roads to the north and east. Performance solution required.
	Subdivisions of three or more allotments have more than one access in and out of the development.	Additional emergency access road required into and out of the development. Amended plans required.
	Traffic management devices are constructed to not prohibit access by emergency services vehicles.	Capable of achieving compliance. To be addressed at subdivision stage.
	Maximum grades for sealed roads do not exceed 15^{o} and an average grade of not more than 10^{o} or other gradient specified by road design standards, whichever is the lesser gradient.	Capable of achieving compliance. Road design required at subdivision stage.
	All roads are through roads.	Performance Solution provided.
	Dead end roads are not recommended, but if unavoidable, are not more than 200m in length, incorporate a minimum 12m outer radius turning circle, and are clearly sign posted as a dead end.	Some roads greater than 200m in length. Performance Solution provided.
	Where kerb and guttering is provided on perimeter roads, roll top kerbing should be used to the hazard side of the road.	No perimeter roads proposed – see performance solution.
	Where access/egress can only be achieved through forest, woodland and heath vegetation, secondary access shall be provided to an alternate point on the existing public road system.	Second emergency access will be required from the subdivision. Reardons Lane passes by forest hazard to the west.
	One way only public access roads are no less than 3.5 metres wide and have designated parking bays with hydrants located outside of these areas to ensure accessibility to reticulated water for fire suppression.	N/A

The capacity of access roads is adequate for firefighting vehicles.	The capacity of perimeter and non-perimeter road surfaces and any bridges/causeways is sufficient to carry fully loaded firefighting vehicles (up to 23 tonnes); bridges/causeways are to clearly indicate load rating.	Capable of achieving compliance. Road design required at subdivision stage.
There is appropriate access to water supply.	Hydrants are located outside of parking reserves and road carriageways to ensure accessibility to reticulated water for fire suppression.	Street hydrants not proposed.
	Hydrants are provided in accordance with the relevant clauses of AS 2419.1:2005 - *Fire hydrant installations System design, installation and commissioning.*	Street hydrants not proposed.
	There is suitable access for a Category 1 fire appliance to within 4m of the static water supply where no reticulated supply is available.	Capable of achieving compliance. To be assessed at DA stage for dwelling construction.
Perimeter Roads		
Perimeter access roads are designed to allow safe access and egress for firefighting vehicles while residents are evacuating as well as providing a safe operational environment for emergency service personnel during firefighting and emergency management on the interface.	Perimeter roads are two way sealed roads.	Performance solution proposed. Existing public roads act as perimeter roads.
	Perimeter roads minimum 8m carriageway width kerb to kerb.	Traffic Engineer to comment on existing public roads serving as perimeter evacuation roads. No internal perimeter roads proposed. Performance solution prepared.
	Parking is provided outside of the carriageway width.	Road design to be assessed at subdivision stage.
	Hydrants are located clear of parking areas.	N/A
	Perimeter roads are through roads, and these are linked to the internal road system at an interval of no greater than 500m.	Performance solution
	Curves of roads have a minimum inner radius of 6m.	Road design to be assessed at subdivision stage.
	The maximum grade road is 15^{o} and average grade of not more than 10^{o}.	Road design to be assessed at subdivision stage.
	Road crossfall does not exceed 3 degrees.	
	A minimum vertical clearance of 4m to any overhanging obstructions, including tree branches, is provided.	Road design to be assessed at subdivision stage.
Non-perimeter roads		
Non-perimeter access roads are designed to allow safe access and egress for firefighting vehicles while residents are evacuating.	Minimum 5.5m carriageway width kerb to kerb.	Capable of achieving compliance. Road design to be assessed at subdivision stage.
	Parking is provided outside of the carriageway width.	Capable of achieving compliance. Road design to be assessed at subdivision stage.
	Hydrants are located clear of parking areas.	N/A

	Non-perimeter roads are through roads, and these are linked to the internal road system at an interval of no greater than 500m.	Performance solution provided.
	Curves of roads have a minimum inner radius of 6m.	Capable of achieving compliance. Road design to be assessed at subdivision stage.
	The road crossfall does not exceed 3 degrees.	Capable of achieving compliance. Road design to be assessed at subdivision stage.
	A minimum vertical clearance of 4m to any overhanging obstructions, including tree branches, is provided.	Capable of achieving compliance. Road design to be assessed at subdivision stage.
Property access roads		
Firefighting vehicles can access the dwelling and exit the property safely.	Street hydrants are not proposed. The following requirements apply.	
	Minimum 4m carriageway width.	Capable of achieving compliance.
	In forest, woodland and heath situations, rural property access roads have passing bays every 200m that are 20m long by 2m wide, making a minimum trafficable width of 6m at the passing bay.	N/A
	A minimum vertical clearance of 4m to any overhanging obstructions, including tree branches.	Capable of achieving compliance.
	Provide a suitable turning area in accordance with Appendix 3 PBP2019.	Capable of achieving compliance.
	Curves have a minimum inner radius of 6m and are minimal in number to allow for rapid access and egress.	Capable of achieving compliance.
	The minimum distance between inner and outer curves is 6m.	Capable of achieving compliance.
	The crossfall is not more than 10 degrees.	Capable of achieving compliance.
	Maximum grades for sealed roads do not exceed 15^{o} and not more than 10^{o} for unsealed roads.	Capable of achieving compliance.
	Development comprising more than three dwellings has access by dedication of a road and not by right of way.	N/A
	Note: Some short constrictions in the access may be accepted where they are not less than 3.5m wide, extend for no more than 30m and where the obstruction cannot be reasonably avoided or removed. The gradients applicable to public roads also apply to community style development property access roads in addition to the above.	

The property access to the proposed subdivision will be provided by way of a proposed new public road network off Reardons Lane. The subdivision is located in a rural residential area with Reardons Lane, and Darkes Road effectively given direct access to the bushfire hazard for firefighting services similar to that of a perimeter road.

The 20m deep vegetation planting to the north and east for the purpose of addressing Land Use Conflict is not a significant hazard and access to the hazard will be available through the properties and via the road system. A perimeter road is not considered to be required given the minor nature of the hazard, conservative asset protection zones available and intermittent growth of the sugar cane plantations. A 10m wide non-vegetated buffer is provided on both sides of the 20m wide screen planting. A performance solution is provided for this component.

The subdivision is access via a single access point from Reardons Lane into the proposed subdivision. In this regard a performance solution has been prepared for the property and public road access to address the following four items of non-compliance with the following acceptable solutions of Table 5.3b of Planning for Bushfire Protection 2019.

1. *Perimeter roads are provided for residential subdivisions of three or more allotments;*

2. *All roads are through roads;*

3. *Dead end roads are not recommended, but if unavoidable, are not more than 200 metres in length.*

4. *Non-perimeter roads are through roads, and these are linked to the internal road system at an interval of no greater than 500m.*

An amended indicative subdivision layout will be required showing an alternate emergency access compliant with the internal road requirements of Table 5.3b of Planning for Bushfire Protection 2019 in relation to the following item.

5. *Subdivisions of three or more allotments have more than one access in and out of the development.*

7.2 Performance Solution No.1 – Access

The performance solution applied to the proposed public road network is due to several site specific and strategic factors being –

Acceptable Solution

- *Perimeter roads are provided for residential subdivisions of three or more allotments;*
- *All roads are through roads;*
- *Dead end roads are not recommended, but if unavoidable, are not more than 200 metres in length.*

- *Non-perimeter roads are through roads, and these are linked to the internal road system at an interval of no greater than 500m.*

Performance Solution

Firefighting vehicles are provided with safe, all-weather access to structures.

Trial Design

The new public road is to comply with Section 5.3.2 and Table 5.3b of Planning for Bushfire Protection 2019 except no perimeter roads are required, dead-end road permitted being greater than 200 metres in length with connective intervals greater than 500m as shown in Figure 3. Details of compliance will need to be provided with the bushfire report for a development application for subdivision.

Methodology and Discussion

The following methodology is both qualified and quantified based on the trial design to demonstrate compliance with the nominated performance criteria. In this regard the public road is located a sufficient distance to potentially receive lower levels of radiant heat on most of the roads to allow safe egress and staging for fire fighting. The following points are made to demonstrate compliance with the performance criteria.

- The indicative internal public roads will not be directly impacted by forest vegetation or travel by or through a bushfire hazard i.e. in close proximity to the road, thereby negating pinch point caused by falling trees etc however a second emergency access/exit point compliant with the internal road specifications of Table 5.3b PBP2019 will be required.

  The second emergency egress point is to allow access/egress to and from the future subdivision should the primary access be blocked in a bushfire event. The second can occur out to Reardons Lane however it would need to be located at the southern end of the rezoning land.

- The proposed allotments adjacent to the hazard are large, consistent with the zoning and will allow for fire fighters to access all elevations of future dwellings and the hazard through the proposed allotments. Given there is no reticulated water supply and no existing or proposed street hydrants, the fire fighting appliances will have

access to a static water supply adjacent to each dwelling when dwellings are constructed.

To the north and east of the land to be rezoned is a minor 20m deep replanted buffer zone to address Land Use Conflict requirements. Each side of the 20m planting is a 10m cleared buffer area which can form part of the required asset protection zones. The bushfire hazard further to the north and east is sugar cane plantations and whilst potentially a bushfire hazard, will be planted and harvested seasonally thereby reducing the overall bushfire risk should a risk matrix be applied.

There are potentially 9 properties interfacing this lesser bushfire hazard with three cul-der-sacs providing access to points along the interface and the opportunity given the large lots, for emergency services to access the property by compliance property access roads to a static water supply required once dwellings are approved. It is unlikely back burning or the like will be undertaken in these locations unlike that which may occur to the south and west. In turn, perimeter roads without street hydrants to the north and east are not considered essential for adequate bushfire interventions and the indicative internal road layout is considered to adequately meet the nominated performance criteria.

The existing public roads being Reardons Lane and Darke Lane are located directly adjacent to the primary bushfire hazards to the west and south of the subject property. The location of these public roads will act like a perimeter road particularly to the west, allowing fire brigade access directly to the hazard. Static water supplies will be available once the subdivision application has been approved with dwellings assessed pursuant to s4.14 and s4.15 PBP2019.

- The assessment considers the potential radiant heat received at the location of the internal public roads will be less than 10kW/m^2 which will allow fully protected firefighting personnel to withstand the radiant heat for short periods as shown in Figure 9. The public roads are mostly 100m from the primary hazard to the west and south and will essentially not be located on defined bushfire prone land.

  The internal public roads will only be passing by managed large residential allotments which are unlikely to be cut in a bushfire event when evacuation is undertaken early. Vast areas within the subdivision will be located well beyond defined bushfire prone land.

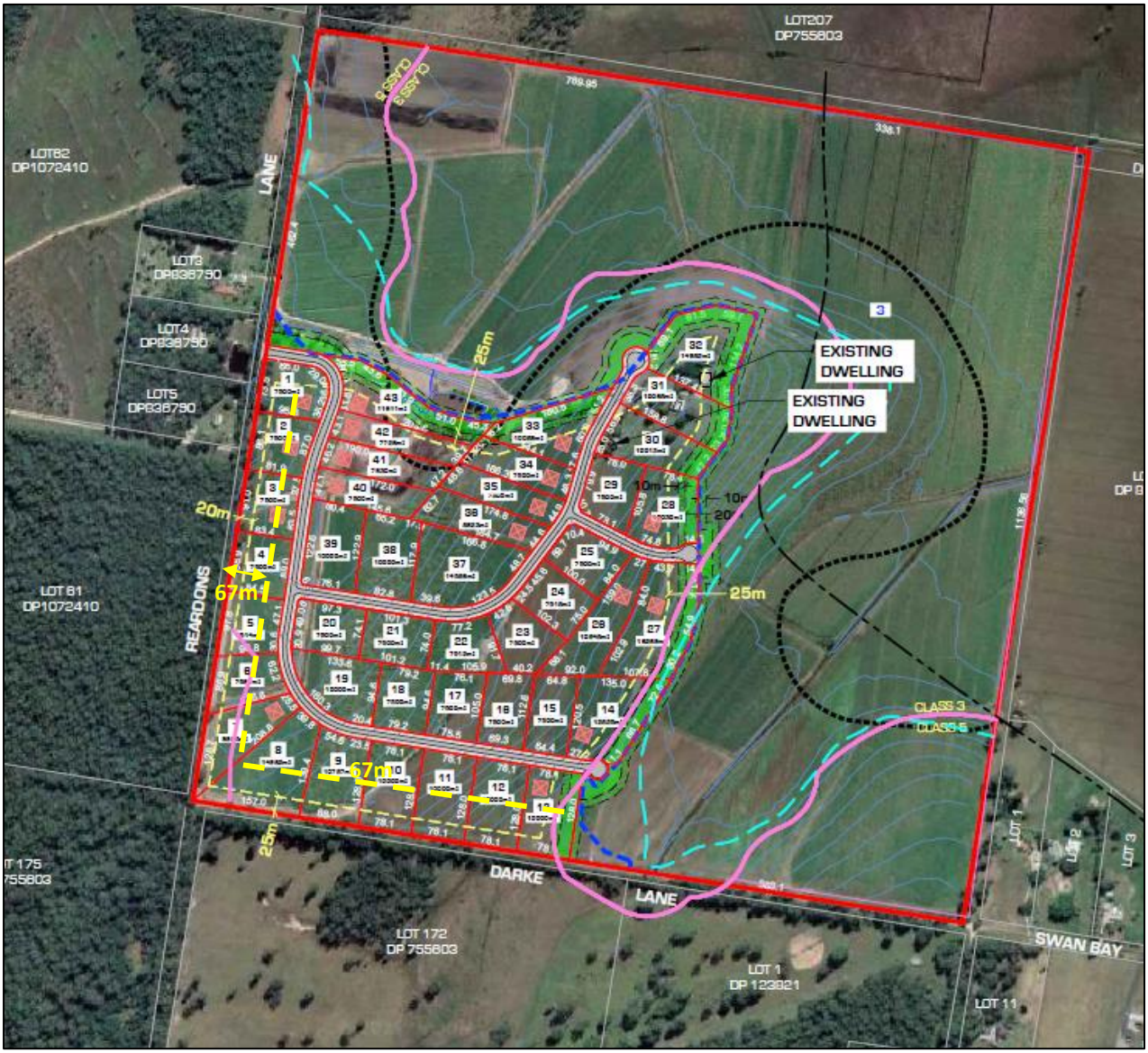


Figure 9: Thick yellow broken line indicates the internal roads are located outside the approximately 10kW/m^2 line pursuant to Table A1.12.1 where fire fighters in protective clothing can withstand radiant heat for short period of time.

The new public road is to comply with Section 5.3.2 and Table 5.3b of Planning for Bushfire Protection 2019 except no perimeter roads are required, and the dead-end road being greater than 200 metres in length are permissible. Details of compliance will need to be provided with the civil plans and approved by the consent authority prior to construction.

Performance solution conclusion

The study establishes that the public road will receive lower levels of radiant heat due to the distance from the bushfire hazard and due to the type of hazard being predominantly grassland and a small section of remnant. Fire fighters on the internal public roads will receive well below a forecast radiant heat level of 10kW/m^2 and likely to be closer to 2kW/m^2. The future dwellings will provide added shielding to further reduce the levels of radiant heat exposure.

The absence of the hazard adjacent to the public access road will also limit the risk of pinch points being created, adversely impacting the access/egress of residents and emergency services. Further, consideration has been given to the structure plan and the potential to have a second link road to Reardons Lane to the southwest.

The study concludes that the proposed public access road, subject to the recommendations in Section 1 of this report and commensurate to the bushfire risk will allow *'firefighting vehicles are provided with safe, all-weather access to structures'* and thereby satisfies the nominated performance criteria.

8.0 CONCLUSION

The study has determined the proposed rezoning is appropriate in the bush fire hazard context. Bush fire mitigation and management measures for the future development can be adequately addressed with the proposal having the ability to comply with PBP2019 subject to the recommendations within this report and proposed performance solutions to be prepared and assessed at subdivision development application stage. The indicative allotment layout with proposed minimum lot sizes are considered appropriate to accommodate the APZs within future subdivisions.

This report has been prepared for referral and consultation with the NSW Rural Fire Service as a means of demonstrating compliance with the EP&A Act 1979 s 9.1 and Ministerial Direction 4.4, and PBP 2019 as applicable to the proposed rezoning.

Disclaimer

This bushfire assessment report was prepared for the purposes of a submission with a rezoning development application to Richmond Valley Council relating to the R5 large residential lots zoning, as outlined in this report only and is not to be used for any other purpose or by any other person or Corporation. The report is not to be construed as a complete assessment of civil, hydraulic, ecological, traffic report or landscape plans but has been prepared to provide recommendations to inform a Bush Fire Safety Authority application only. BCA Check Pty Ltd accepts no responsibility for any loss or damage suffered howsoever arising to any person or Corporation who may use or rely on this report in contravention of the terms of this clause. The report is not to be used as an assessment tool for individual dwellings and is only to be used for the purpose of this subdivision and compliance with PBP2019. The report is to be referred to NSW RFS for the issue of a Bush Fire Safety Authority.

As identified in Planning for Bushfire Protection 2019 and the Building Code of Australia the report is to provide recommendations to reduce the risk of ignition and does not guarantee the complete protection of the building in the event of bush fire or that the building will not be adversely impacted upon.

Reporting has been based on the relevant Council and Rural Fire Service Guidelines however recommendations or suggestions given in this report are based on our site investigation at the time of reporting. In some cases site conditions may change dramatically within a few years due to rapid vegetation re-growth and invading weed species.

References

NSW Rural Fire Service and Planning NSW (2019), *Planning for bushfire protection, A guide for councils planners fire authorities developers and homeowners.* Rural Fire Service NSW Australia.

Standards Australia, (2018), AS3959 *Construction of buildings in bushfire prone areas,* Australian Standards, Sydney.

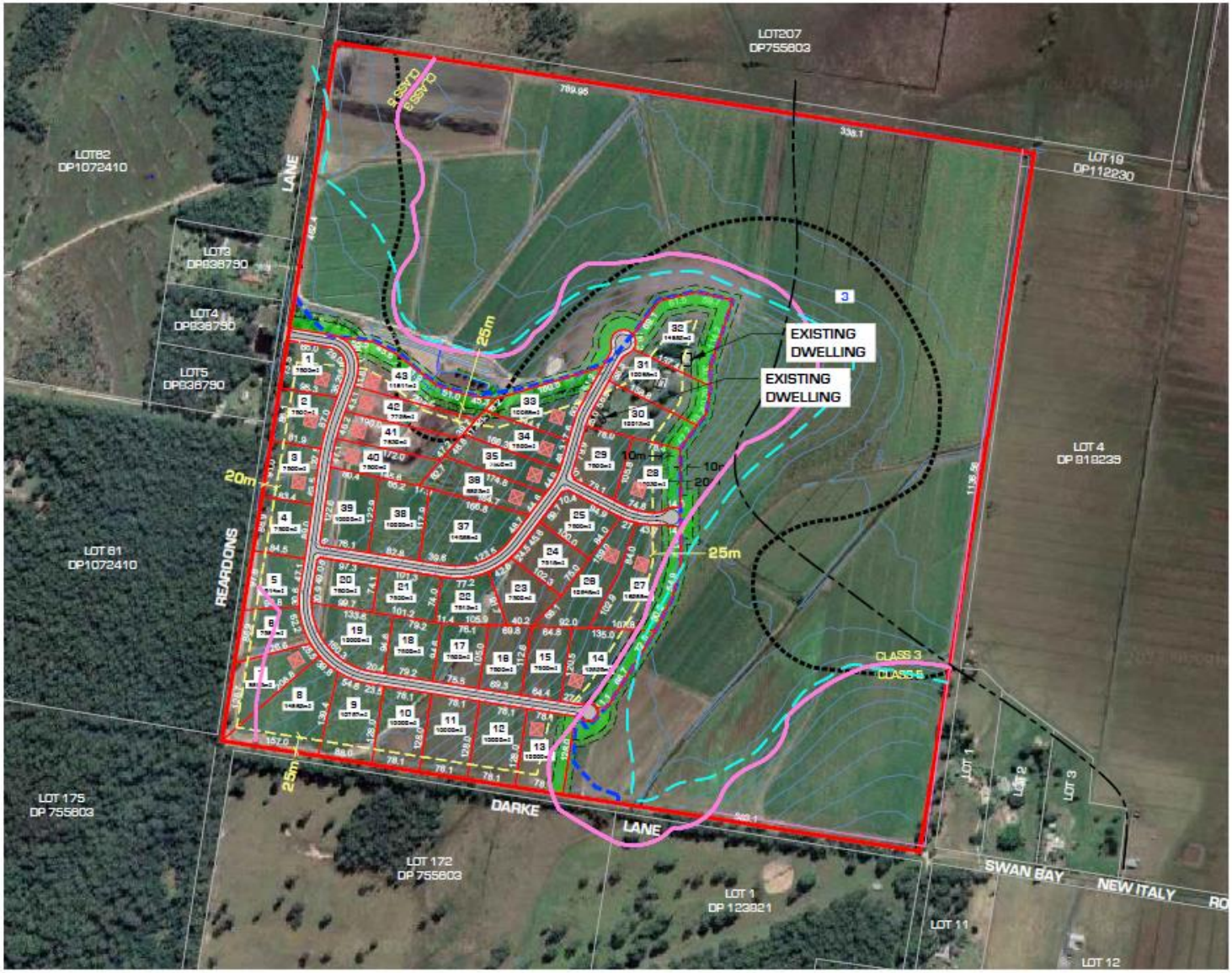
Cheney P and Sullivan A (2008), *Grassfires. Fuel, weather and fire behaviour* CSIRO.

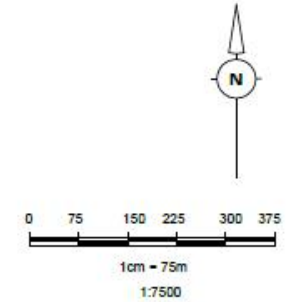
Legislation

Environmental Planning and Assessment Act 1979 and Regulations 2000. *New South Wales.* Parliamentary Counsel's Office, NSW Government Information Service.

Rural Fires Act 1997. *New South Wales.* Parliamentary Counsel's Office, NSW Government Information Service.

Rural Fires Regulation. *New South Wales.* Parliamentary Counsel's Office, NSW Government Information Service.





LEGEND

- SITE BOUNDARY
- EXISTING BOUNDARY
- PROPOSED LOT BOUNDARIES
- RURAL RESIDENTIAL STRATEGY LINE
- CONTOURS
- REGIONALLY SIGNIFICANT FARMLAND
  SOURCE:
  Northern Rivers Farmland Protection Project
  Final Map 2005 (Section 117(2) Direction)
- APPROX. RL 5.4m AHD
  (1 IN 100 YEAR FLOOD LINE)
- PRIME AGRICULTURAL LAND - CLASS 3
- 40m VEGETATION BUFFER
  20m PLANTED &
  10m SEPARATION BUFFER EITHER SIDE
- ACID SULPHATE SOIL CLASS LINE
- APZ BUFFER
- INDICATIVE DWELLING ENVELOPE 20m X 20m

NOTE:
This preliminary layout has been completed in accordance with the instructions provided by Noel Newman.
In this respect preliminary desktop data has been used to form this layout. The final layout is subject to the completion of a detailed survey & engineering plans.
Accordingly, the conclusions reached within this report may be modified by the author upon the completion of the final design plans & site inspection. Newton Denny Chapelle accepts no responsibility for any loss or damage suffered, however so arising, to any person or corporation who may use or rely on this report.

REV	DATE	AMENDMENT
F	29.07.21	LOTS 14, 27 & 28 BOUNDARY AND ROAD
G	19.08.21	LOT 43 AREA CORRECTED
H	01.11.21	VEGETATION BUFFER ADDED
I	24.01.22	ACID SULPHATE SOIL CLASS LINE ADDED
J	07.02.22	RURAL RES. LINE ADDED

SOURCE PLAN: N/A

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Newton Denny Chapelle
Surveyors Planners Engineers
Email: office@ndc.com.au
31 Carrington St Lismore 2480
PH: 6622 1011
ABN: 19 094 889 845

PLAN 4 - CONCEPTUAL SUBDIVISION PLAN

CLIENT: N. NEWMAN REV J

LOCATION: LOT 831, 832, 833 DP 847683
REARDONS LANE
SWAN BAY NSW

DATE: 08.02.2022 REF: 14/227
SCALE: 1 : 7500 @ A3 DRAWN: CD

Appendix B

Access Road Requirements PBP2019

5.3.2 Access

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

Table 5.3b

Performance criteria and acceptable solutions for access for residential and rural residential subdivisions.

	PERFORMANCE CRITERIA	ACCEPTABLE SOLUTIONS
	The intent may be achieved where:	
ACCESS (GENERAL REQUIREMENTS)	› firefighting vehicles are provided with safe, all-weather access to structures.	› property access roads are two-wheel drive, all-weather roads; › perimeter roads are provided for residential subdivisions of three or more allotments; › subdivisions of three or more allotments have more than one access in and out of the development; › traffic management devices are constructed to not prohibit access by emergency services vehicles; › maximum grades for sealed roads do not exceed 15 degrees and an average grade of not more than 10 degrees or other gradient specified by road design standards, whichever is the lesser gradient; › all roads are through roads; › dead end roads are not recommended, but if unavoidable, are not more than 200 metres in length, incorporate a minimum 12 metres outer radius turning circle, and are clearly sign posted as a dead end; › where kerb and guttering is provided on perimeter roads, roll top kerbing should be used to the hazard side of the road; › where access/egress can only be achieved through forest, woodland and heath vegetation, secondary access shall be provided to an alternate point on the existing public road system; and › one way only public access roads are no less than 3.5 metres wide and have designated parking bays with hydrants located outside of these areas to ensure accessibility to reticulated water for fire suppression.
	› the capacity of access roads is adequate for firefighting vehicles.	› the capacity of perimeter and non-perimeter road surfaces and any bridges/causeways is sufficient to carry fully loaded firefighting vehicles (up to 23 tonnes); bridges/ causeways are to clearly indicate load rating.
	› there is appropriate access to water supply.	› hydrants are located outside of parking reserves and road carriageways to ensure accessibility to reticulated water for fire suppression; › hydrants are provided in accordance with the relevant clauses of AS 2419.1:2005 - *Fire hydrant installations System design, installation and commissioning*; and › there is suitable access for a Category 1 fire appliance to within 4m of the static water supply where no reticulated supply is available.

Table 5.3b *Continued*

	PERFORMANCE CRITERIA	ACCEPTABLE SOLUTIONS
	The intent may be achieved where:	
PERIMETER ROADS	› access roads are designed to allow safe access and egress for firefighting vehicles while residents are evacuating as well as providing a safe operational environment for emergency service personnel during firefighting and emergency management on the interface.	› are two-way sealed roads; › minimum 8m carriageway width kerb to kerb; › parking is provided outside of the carriageway width; › hydrants are located clear of parking areas; › are through roads, and these are linked to the internal road system at an interval of no greater than 500m; › curves of roads have a minimum inner radius of 6m; › the maximum grade road is 15 degrees and average grade of not more than 10 degrees; › the road crossfall does not exceed 3 degrees; and › a minimum vertical clearance of 4m to any overhanging obstructions, including tree branches, is provided.
NON-PERIMETER ROADS	› access roads are designed to allow safe access and egress for firefighting vehicles while residents are evacuating.	› minimum 5.5m carriageway width kerb to kerb; › parking is provided outside of the carriageway width; › hydrants are located clear of parking areas; › roads are through roads, and these are linked to the internal road system at an interval of no greater than 500m; › curves of roads have a minimum inner radius of 6m; › the road crossfall does not exceed 3 degrees; and › a minimum vertical clearance of 4m to any overhanging obstructions, including tree branches, is provided.

Table 5.3b *Continued*

	PERFORMANCE CRITERIA	ACCEPTABLE SOLUTIONS
	The intent may be achieved where:	
PROPERTY ACCESS	❯ firefighting vehicles can access the dwelling and exit the property safely.	❯ There are no specific access requirements in an urban area where an unobstructed path (no greater than 70m) is provided between the most distant external part of the proposed dwelling and the nearest part of the public access road (where the road speed limit is not greater than 70kph) that supports the operational use of emergency firefighting vehicles. In circumstances where this cannot occur, the following requirements apply: ❯ minimum 4m carriageway width; ❯ in forest, woodland and heath situations, rural property access roads have passing bays every 200m that are 20m long by 2m wide, making a minimum trafficable width of 6m at the passing bay; ❯ a minimum vertical clearance of 4m to any overhanging obstructions, including tree branches; ❯ provide a suitable turning area in accordance with Appendix 3; ❯ curves have a minimum inner radius of 6m and are minimal in number to allow for rapid access and egress; ❯ the minimum distance between inner and outer curves is 6m; ❯ the crossfall is not more than 10 degrees; ❯ maximum grades for sealed roads do not exceed 15 degrees and not more than 10 degrees for unsealed roads; and ❯ a development comprising more than three dwellings has access by dedication of a road and not by right of way. Note: Some short constrictions in the access may be accepted where they are not less than 3.5m wide, extend for no more than 30m and where the obstruction cannot be reasonably avoided or removed. The gradients applicable to public roads also apply to community style development property access roads in addition to the above.