Travers

bushfire & ecology

bushfire protection assessment

Rezoning Application
Lot 612 DP 1160096
166 Blackhead Road, Hallidays Point

Under Section 117(2) Direction No 4.4
of the *EP&A Act*

February 2017
(REF: A16066)

Bushfire Protection Assessment

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166 Blackhead Road, Hallidays Point

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The mapping is indicative of available space and location of features which may prove critical in assessing the viability of the proposed works. Mapping has been produced on a map base with an inherent level of inaccuracy, the location of all mapped features are to be confirmed by a registered surveyor.

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EXECUTIVE SUMMARY

This revised bushfire protection assessment has been undertaken for the proposed rezoning located at Lot 612 DP 1160096, 166 Blackhead Road, Hallidays Point. This report has been prepared as a response to the NSW RFS letter (dated 29 November 2016) which states that;

'The NSW RFS cannot support the Planning Proposal in its current form. Council would need to provide the following information to permit the NSW RFS to re-assess the Planning Proposal;

- *A traffic Masterplan for the locality identifying all current and future road systems within and servicing the Tallwoods Village including Lot 612.*
- *A concept subdivision plan identifying the proposed residential road layout within Lot 612.*
- *A traffic management study on the proposed road layout plan for the site including all access points to Blackhead Road, Diamond Beach and The Lakes Way. The study shall incorporate all current and future traffic flows through the identified access routes.*
- ***A revised Bushfire Protection report based on the recommendations of the traffic management study for vehicle access to the site. The NSW RFS notes that residents egressing the site to the north via The Pulpit, will be travelling towards a significant bush fire threat. As such, the current NSW RFS position is that any future residential subdivision of Lot 612 shall include direct public road access to Blackhead Road.***

TBE have provided a direct response to point 4 above within Appendix 2 of this report. In addition this report has been updated to reflect the proposed rezoning from RU1 Primary Production to R1 – General Residential and E2 – Environmental Conservation (as opposed to E3– Environmental Management) and takes into account the proposed revegetation of the E2 zone land to a forest / woodland structure.

This report identifies matters for consideration for the planning proposal and highlights the required bushfire protection measures, including asset protection zones (APZs), for future development under the *Environmental Planning and Assessment Act 1979 (EP&A Act), Section 117 Direction 4.4 and* in accordance *Planning for Bush Fire Protection 2006* (*PBP*) and *Community Resilience Practice Note 2/12 Planning Instruments and Policies*.

The key principle for the proposal is to ensure that future development is capable of complying with *PBP*. Planning principles for the proposal include the provision of adequate access including perimeter roads, establishment of adequate APZs for future housing, specifying minimum lot depths to accommodate APZs and the introduction of controls which avoid placing inappropriate developments in hazardous areas and placement of combustible material in APZs.

Our assessment found that bushfire can potentially affect the site from the proposed forest vegetation located within the E2 zone as well as external to the site's north-western and north-eastern boundary. Bushfire threat also exists from the pockets of remnant vegetation located to the west and east resulting in possible ember attack, radiant heat and potentially flame attack. The risk posed by the unmanaged grassland vegetation surrounding the site has also been assessed.

The assessment has concluded that future development on site is capable of providing compliance with the planning principles of *PBP* and *Community Resilience Practice Note 2/12 – Planning Instruments and Policies*.

GLOSSARY OF TERMS

AHIMS	Aboriginal Heritage Information System
APZ	Asset protection zone
AS1596	*Australian Standard – The storage and handling of LP Gas*
AS2419	*Australian Standard – Fire hydrant installations*
AS3745	*Australian Standard – Planning for emergencies in facilities*
AS3959	*Australian Standard – Construction of buildings in bushfire-prone areas 2009*
BAL	*Bushfire attack level*
BCA	*Building Code of Australia*
BSA	Bushfire safety authority
EEC	Endangered ecological community
FDI	Fire danger index
IPA	Inner protection area
LEP	*Local environmental plan*
OPA	Outer protection area
PBP	*Planning for bush fire protection 2006*
RFS	NSW Rural Fire Service
SFPP	Special fire protection purpose

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Introduction 1

Travers bushfire & ecology has been requested by *Coastplan Group Pty Ltd to* undertake a bushfire protection assessment for the proposed rezoning located at Lot 612 DP 1160096, 166 Blackhead Road, Hallidays Point.

The proposal is located on land mapped by *Greater Taree City Council* as being bushfire prone. *Direction 4.4, Planning for Bush Fire Protection 2006 (PBP)* identifies matters for consideration for planning proposals that will affect, or are in proximity to land mapped as bushfire prone.

As such, the proposal is subject to the requirements of Section 117(2) of *the Environmental Planning and Assessment Act 1979 (EP&A Act)* which requires Council to consult with the Commissioner of the NSW Rural Fire Service (RFS) and to take into account any comments by the Commissioner.

1.1 Aims of the assessment

The aims of the bushfire protection assessment are to:

- Review the bushfire threat to the landscape
- Undertake a bushfire attack assessment in accordance with *PBP*
- Provide advice on planning principles, including the provision of perimeter roads, asset protection zones (APZs) and other specific fire management issues
- Review the potential to carry out hazard management over the landscape, taking into consideration the proposed retention of trees within the final development plans.

1.2 Project synopsis

The proposal is to rezone approximately 17 hectares of land at 166 Blackhead Road, Hallidays Point from RU1 Primary Production to R1 – General Residential and E2 – Environmental Conservation to facilitate the proposed expansion of the Tallwood village.

The rezoning seeks to convert 15.8ha of land into general residential (R1) and a further 1.2ha into environmental conservation, which will be placed within the north-eastern corner of the site to include the small wetland area identified as an endangered ecological community (EEC) in the ecological assessment for the site.

The E2 zone will consist of a small area of wetland (along the drainage corridor) as well as the planting of native trees to create a forest / woodland area (as an off set to the central woodland which is to be removed).

The proposal at this stage does not involve a concept plan and as such the bushfire constraints have been highlighted and minimum APZs have been recommended from the site boundary and E2 zone boundary. It should be noted that the further retention and/or rehabilitation of vegetation within the site may trigger the requirement for additional APZs beyond those

recommend within this report. Recommendations have also been made for future road design, building construction, water supply and utilities.

1.3 Information collation

To achieve the aims of this report, a review of the information relevant to the property was undertaken prior to the initiation of field surveys. Information sources reviewed include the following:

- Greater Taree Local Environmental Plan 2010
- Statutory Ecological Assessment , 2015 prepared by *Naturecall Environmental*
- Greater Taree City Council, Planning Proposal, January 2016
- *Google* aerial photography
- Topographical maps *DLPI of NSW* 1:25,000
- *Australian Standard 3959 Construction of buildings in bushfire-prone areas*
- *Planning for Bush Fire Protection 2006 (PBP)*
- *Community Resilience Practice Notes 2/12 Planning Instruments and Policies.*

An inspection of the proposed development site and surrounds was undertaken by Nicole van Dorst on 29 July 2016 to assess the topography, slopes, aspect, drainage, vegetation and adjoining land use. The identification of existing bushfire measures and a visual appraisal of bushfire hazard and risk were also undertaken.

1.4 Site description

The site is located at Lot 612 DP 1160096, 166 Blackhead Road, Hallidays Point (refer Figure 1.1). It is situated to the north of Blackhead Road and approximately 500m south-west of Tallwoods Village, a larger developing residential estate (approximately 150ha) which comprises a golf course and club.

The site is bounded to the north by general residential development and by further primary production land to the south, east and west.

Figure 1.1 – Aerial appraisal

1.5 Legislation and planning instruments

1.5.1 Environmental Planning and Assessment Act 1979 (EP&A Act) and bushfire prone land

The *EP&A Act* governs environmental and land use planning and assessment within New South Wales. It provides for the establishment of environmental planning instruments, development controls and the operation of construction controls through the *Building Code of Australia (BCA).* The identification of bushfire prone land is required under Section 146 of the *EP&A Act*.

Bushfire prone land maps provide a trigger for the development assessment provisions. The proposed rezoning is located on land that is mapped by *Greater Taree City Council* as being bushfire prone (refer Figure 1.2).

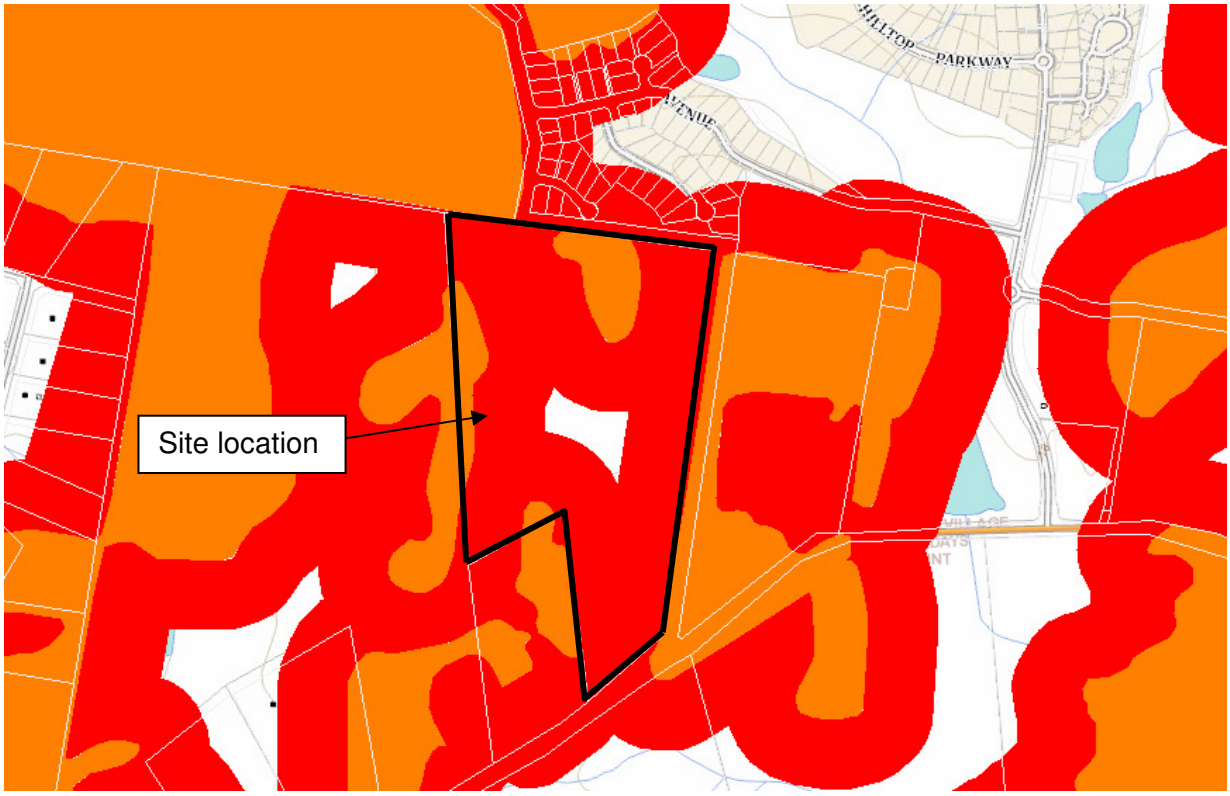

Figure 1.2 – Bushfire prone land map
(Source: Greater Taree City Council)

PBP (pg 4) stipulates that if a proposed amendment to land use zoning or land use affects a designated bushfire prone area then the Section 117(2) Direction No 4.4 of the *EP&A Act* must be applied. This requires Council to consult with the Commissioner of the RFS and to take into account any comments by the Commissioner and to have regard to the planning principles of *PBP* (detailed within Section 1.5.3).

1.5.2 Local Environmental Plan (LEP)

A LEP provides for a range of zonings which list development that is permissible or not permissible, as well as the objectives for development within a zone.

The proposal is to proceed as an amendment to the current *Greater Taree LEP 2010* as outlined below.

Greater Taree Local Environmental Plan 2010

The site is currently zoned under the *Greater Taree LEP 2010* as RU1 – Primary Production (refer Figure 1.3). The land surrounding the property to the east, south and west is also RU1, with the land to the north zoned as R1 – General Residential.

The proposal seeks to amend the LEP to rezone the land to R1 – General Residential and E2 Environmental Conservation (Figure 1.4).

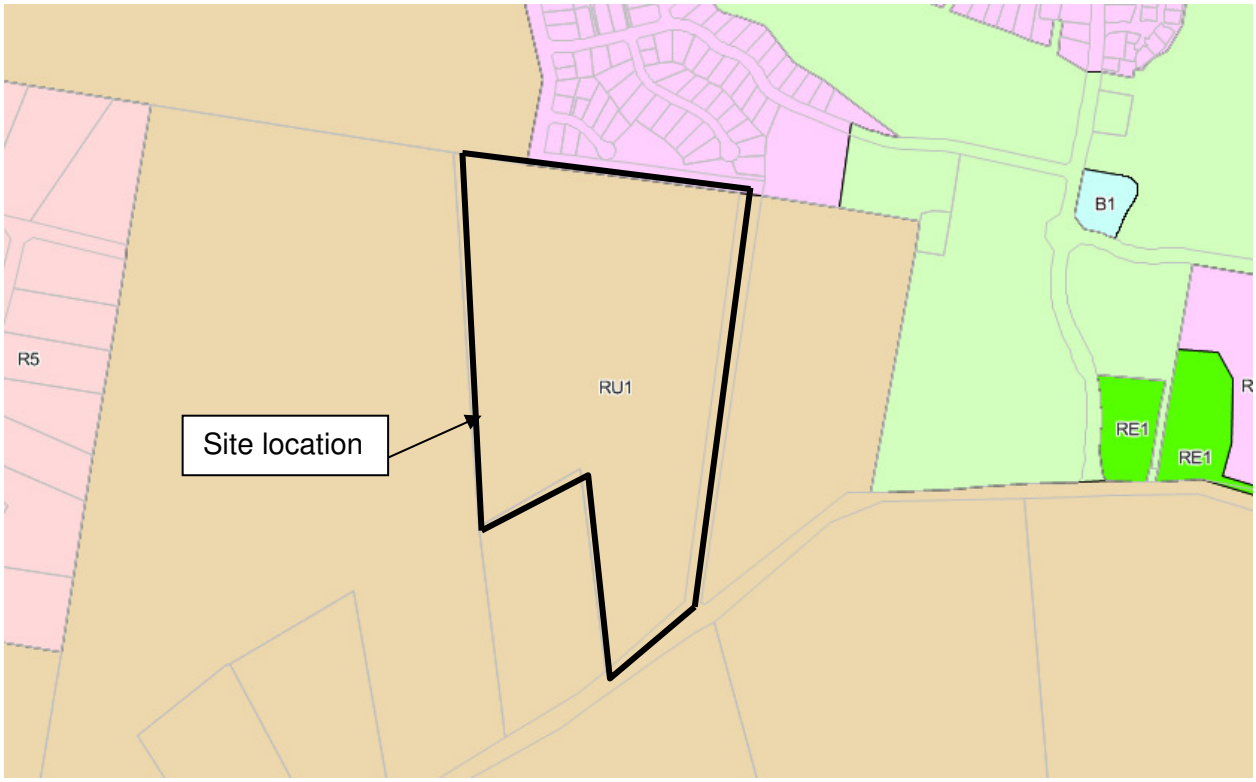

Figure 1.3 – Greater Taree LEP 2010
(Source: Greater Taree Shire Council website)

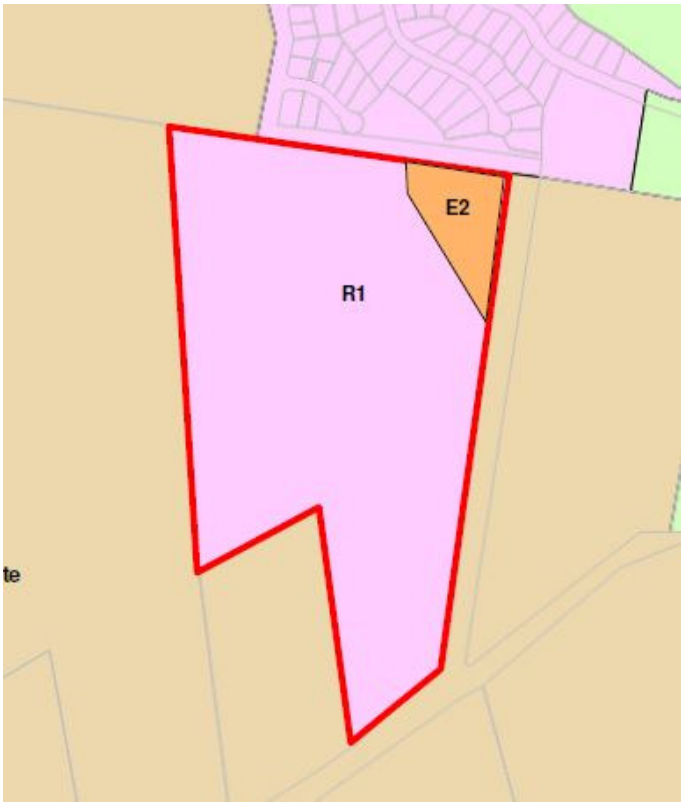

Figure 1.4 – Proposed zoning changes
(Source: Planning Proposal, 2016)

The proposal, including the provision of APZs, would seek to comply with the objectives of the proposed rezoning.

1.5.3 Planning for Bush Fire Protection 2006 (PBP)

Bushfire protection planning requires the consideration of the RFS planning document entitled *PBP. PBP* provides planning principles for rezoning to residential land as well as guidance on effective bushfire protection measures.

The policy aims to provide for the protection of human life (including fire fighters) and to minimise impacts on property and the environment from the threat of bushfire, while having due regard to development potential, on site amenity and protection of the environment.

PBP outlines the following planning principles that must be achieved for all rezoning proposals:

1. Provision of a perimeter road with two way access which delineates the extent of the intended development.

2. Provision, at the urban interface, for the establishment of adequate APZs for future housing.

3. Specifying minimum residential lot depths to accommodate APZs for lots on perimeter roads.

4. Minimising the perimeter of the area of land interfacing the hazard, which may be developed.

5. Introduction of controls which avoid placing inappropriate developments in hazardous areas, and

6. Introduction of controls on the placement of combustible materials in APZs.

In addition to the above, *PBP* outlines the bushfire protection measures required to be assessed for new development in bushfire prone areas.

The proposed rezoning has been assessed in compliance with the following measures to ensure that future development is capable of complying with *PBP*:

- asset protection zones
- building construction and design
- access arrangements
- water supply and utilities
- landscaping
- emergency arrangements

1.5.4 Building Code of Australia (BCA) and the Australian Standard AS3959 Construction in bushfire-prone areas 2009 (AS3959)

The *BCA* is given effect through the *EP&A Act* and forms part of the regulatory environment of construction standards and building controls. The *BCA* outlines objectives, functional statements, performance requirements and deemed to satisfy provisions. For residential dwellings these include Classes 1, 2 and 3 buildings. The construction manual for the deemed to satisfy requirements is *AS3959.*

1.6 Environmental and cultural constraints

1.6.1 Environmental constraints

Naturecall Environmental Consultants prepared a Statutory Ecological Assessment for the property which has identified the following ecological features within the site;

- Freshwater Wetlands on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions; and
- Presence of one (1) threatened fauna species - Grey-headed flying fox

The EEC vegetation occurs within a small remnant patch in the north-eastern corner of the site. This vegetation will be retained and protected (within the E2 zone) within the final design of the future residential development.

1.6.2 Cultural constraints

A basic search was conducted on the Aboriginal Heritage Information System (AHIMS). The results show that there are no identified Aboriginal sites of significance within Lot 612 DP 1160096 or within 50m of the site.

Bushfire Threat Assessment

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To assess the bushfire threat and to determine the required width of an APZ for a development, a review of the elements that comprise the overall threat needs to be completed.

PBP provides a methodology to determine the size of any APZ that may be required to offset possible bushfire attack. These elements include the potential hazardous landscape that may affect the site and the effective slope within that hazardous vegetation.

2.1 Hazardous fuels

PBP guidelines require the identification of the predominant vegetation formation in accordance with David Keith (2004) to determine APZ distances for subdivision developments.

The hazardous vegetation is calculated for a distance of at least 140m from a proposed site boundary and can be summarised as:

- Forest vegetation to the north-west and north-east.

Photo 1: Forest vegetation located to the north-west

- Patches of remnant forest within the rural residential grazing lands to the west and within the unmade road reserve to the east. *PBP* describes remnant vegetation as a parcel of vegetation with a size of less than 1ha or a shape that provides a potential fire run directly towards a building not exceeding 50m. The vegetation exhibits these

qualities (i.e. <30m) and therefore the threat posed is considered low and APZ setbacks for this aspect are the same as for the rainforest category outlined in *PBP*.

Photo 2: Remnant forest vegetation located west of the site boundary

Photo 3: Remnant forest vegetation (<30m width) adjoining the eastern boundary

- Unmanaged grassland (i.e. exceeding a height of 10cm) to the west.

Photo 4: Grassland vegetation to the west

- The proposed creation and rehabilitation of the 1.2ha environmental conservation land within the north-eastern corner of the site to include a small area of wetland (along the drainage corridor) as well as the planting of native trees to create a forest / woodland area will create a future bushfire risk to the site.

2.2 Effective slope

The effective slope is assessed for a distance of up to 100m. Effective slope refers to that slope which provides the most effect upon likely fire behaviour. A mean average slope may not in all cases provide sufficient information such that an appropriate assessment can be determined.

The effective slope within the hazardous vegetation is provided in detail in Table 2.1 but can be summarised as:

- 6^0 downslope within the forest vegetation to the north-west
- $0\text{-}4^0$ downslope within the grassland / remnant vegetation to the west (northern portion of western boundary)
- level to 5^0 upslope within the grassland / remnant vegetation to the west (southern portion of western boundary)
- $0\text{-}3^0$ upslope within the remnant forest to the east (southern portion of eastern boundary)
- $0\text{-}3^0$ downslope within the remnant forest to the east (northern portion of eastern boundary)

- level to upslope within the proposed E2 zoned land in the north-east

2.3 Bushfire attack assessment

A fire danger index (FDI) of 80 has been used to calculate bushfire behaviour on the site using forest vegetation located within the Greater Taree region.

Table 2.1 provides a summary of the bushfire attack assessment, the minimum required APZs in compliance with Appendix 2 (*PBP*).

Table 2.1 – Bushfire attack assessment

Aspect	Vegetation within 140m of development	Effective slope of land	Minimum APZ required (based on BAL 29 construction)
North-west	Forest	6^{oD}	30m
West (northern portion of western boundary)	Grassland	0-4^{oD}	9m
	Remnant Forest (Note 1)		10m (83m separation provided)
West (southern portion of western boundary)	Grassland	0-5 ^{oU}	8m
	Remnant Forest (Note 1)		10m (25-45m separation provided)
East	Remnant forest (Note 1)	0-3 ^{oU}	10m
		0-3 ^{oD}	10m
North-east (E2 zone land)	Forest	Level	20m
North	Managed land	N/A	N/A

*Notes: * Slope is either 'U' meaning up slope or 'C' meaning cross slope or 'D' meaning down slope*

Note 1: *PBP* describes remnant vegetation as a parcel of vegetation with a size of less than 1ha or a shape that provides a potential fire run directly towards a building not exceeding 50m. The vegetation to these aspects exhibits these qualities and therefore the threat posed is considered low and APZ setbacks for this aspect are the same as for the rainforest category outlined in *PBP*.

Specific Protection Issues

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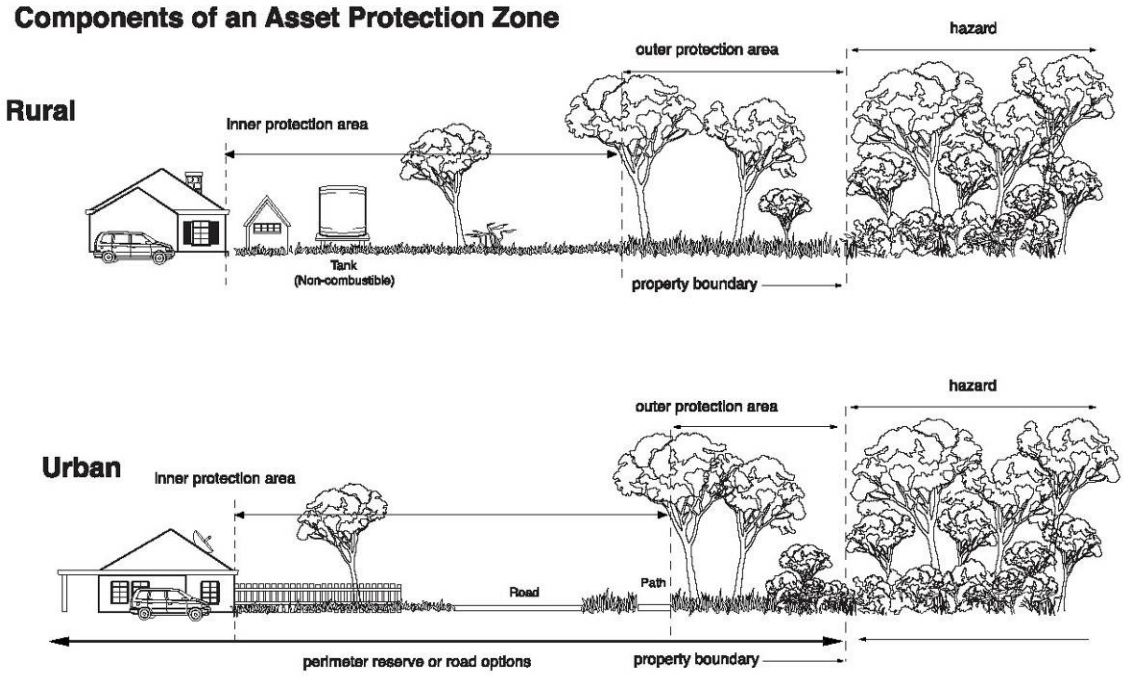
3.1 Asset protection zones (APZs)

APZs are areas of defendable space separating hazardous vegetation from buildings. The APZ generally consists of two subordinate areas, an inner protection area (IPA) and an outer protection area (OPA). The OPA is closest to the bush and the IPA is closest to the dwellings. The IPA cannot be used for habitable dwellings but can be used for all external non-habitable structures such as pools, sheds, non-attached garages, cabanas, etc. A typical APZ and therefore defendable space is graphically represented below:



APZs and progressive reduction in fuel loads (Source: RFS, 2006)

Note: Vegetation management as shown is for illustrative purposes only. Specific advice is to be sought in regard to vegetation removal and retention from a qualified and experienced expert to ensure APZs comply with the *RFS* performance criteria.

PBP dictates that the subsequent extent of bushfire attack that can potentially emanate from a bushfire must not exceed a radiant heat flux of 29*kW/m*^{2} for residential subdivision developments. This rating assists in determining the size of the APZ in compliance with *PBP* to provide the necessary defendable space between hazardous vegetation and a building. Table 3.1 outlines the proposals compliance with the performance criteria for APZs.

Table 3.1 – Performance criteria for asset protection zones (*PBP* guidelines pg. 19)

Performance criteria	Acceptable solutions	Complies
Radiant heat levels at any point on a proposed building will not exceed 29kW/m^2.	APZs are provided in accordance with Appendix 2. APZs are wholly within the boundary of the development site.	Yes - refer Table 2.1.
APZs are managed and maintained to prevent the spread of fire towards the building.	In accordance with the requirements of *Standards for Asset Protection Zones* (*NSW RFS* 2005).	Yes - to be made a condition of consent.
APZ maintenance is practical , soil stability is not compromised and the potential for crown fires is negated.	The APZ is located on lands with a slope of less than 18^o.	Yes - Slopes are less than 18^o.

3.2 Building protection

The construction classification system is based on five (5) bushfire attack levels (BAL). These are BAL – Flame Zone (FZ), BAL 40, BAL 29, BAL 19 and BAL 12.5 AS3959 – *Construction of buildings in bushfire-prone areas*. The lowest level, BAL 12.5, has the longest APZ distance while BAL – FZ has the shortest APZ distance. These allow for varying levels of building design and use of appropriate materials.

The minimum asset protection zones outlined in Table 2.1 and depicted in Schedule 1 attached are based on a BAL 29 construction standard.

Future applications for dwelling construction (Class 1, 2 & 3 buildings as identified by the *Building Code of Australia*) for lots located on bushfire prone land will be subject to a separate application either under section 79BA of the *EP&A Act* or as complying development under the Codes SEPP.

3.3 Hazard management

The APZs are to be managed in accordance with the RFS guidelines *Standards for Asset Protection Zones (RFS, 2005),* with landscaping to comply with Appendix 5 of *PBP.* APZs are to be confined within the development lots to ensure ongoing management of the APZ.

A summary of the guidelines for managing APZs is attached as Appendix 1 to this report.

3.4 Access for fire fighting operations

Future residential development within the site will be accessed via Pulpit Road in the north. Access to Blackhead Road in the south will be available for emergency vehicles only.

Table 3.2 outlines the performance criteria and acceptable solutions for public roads within the future subdivision design. Appendix 2 provides further detail regarding the safety of Pulpit Road as the primary evacuation route (to address NSW RFS additional information request).

Table 3.2 – Performance criteria for public roads (*PBP* guidelines pg. 20)

Performance criteria	Acceptable solutions
Fire fighters are provided with safe all weather access to structures (thus allowing more efficient use of fire fighting resources).	Public roads are two-wheel drive, all weather roads.
Public road widths and design that allow safe access for fire fighters while residents are evacuating an area.	Urban perimeter roads are two way, that is, at least two traffic lane widths (carriageway 8m minimum kerb to kerb) allowing traffic to pass in opposite directions. Non perimeter roads comply with Table 3.3 below. Perimeter road is linked with the internal road system at an interval of no greater than 500m in urban areas. Traffic management devices are constructed to facilitate access by emergency services. Public roads have a cross fall not exceeding 3^{o}. All roads are through roads. If unavoidable, dead end roads are not more than 200m in length, incorporate a minimum 12m outer radius turning circle, sign posted dead end and direct traffic away from the hazard. Curves of roads (other than perimeter) 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. Maximum grades for sealed roads do not exceed 15^{o} and an average grade of not more than 10^{o}. Minimum vertical clearance of 4m above the road at all times.
The capacity of road surfaces and bridges is sufficient to carry fully loaded fire fighting vehicles	The capacity of road surfaces and bridges is sufficient to carry fully loaded fire fighting vehicles (15 tonnes for reticulated water and 28 tonnes for all other areas). Bridges clearly indicate load rating.
Roads that are clearly sign posted (with easily distinguishable names) and buildings / properties that are clearly numbered.	Public roads >6.5m wide to locate hydrants outside of parking reserves to ensure accessibility to reticulated water. Public roads 6.5-8m wide are No Parking on one side with the hydrant located on this side to ensure accessibility to reticulated water. Public roads <6.5m wide provide parking within parking bays and locate services outside of parking bays to ensure accessibility to reticulated water. One way only public access are no less than 3.5m wide and provide parking within parking bays and locate services outside of parking bays to ensure accessibility to reticulated water.

Performance criteria	Acceptable solutions
There is clear access to reticulated water supply. Parking does not obstruct the minimum paved width	Parking bays are a minimum of 2.6m wide from kerb edge to road pavement. No services or hydrants are located within parking bays. Public roads directly interfacing the bushfire hazard are to provide roll top kerbing to the hazard side of the road.

Table 3.3 – Minimum widths for public roads that are not perimeter roads

Curve radius (inside edge) (metres width)	Swept path (metres width)	Single lane (metres width)	Two way (metres width)
<40	3.5	4.5	8.0
40-69	3.0	3.9	7.5
70-100	2.7	3.6	6.9
>100	2.5	3.5	6.5

3.5 Water supplies

Town reticulated water supply is available to the property in the form of an underground reticulated water system.

Table 3.4 outlines the performance criteria and acceptable solutions for reticulated water supply.

Table 3.4 – Performance criteria for reticulated water supplies (*PBP* guidelines pg. 27)

Performance criteria	Acceptable solutions
Water supplies are easily accessible and located at regular intervals.	Reticulated water supply to urban subdivision uses a ring main system for areas with perimeter roads. Fire hydrant spacing, sizing and pressures comply with AS2419.1 - 2005. Where this cannot be met, the RFS will require a test report of the water pressures anticipated by the relevant water supply authority. In such cases, the location, number and sizing of hydrants shall be determined using fire engineering principles. Hydrants are not placed within any road carriageway. All above ground water and gas pipes external to the building are metal, including and up to taps. The provisions for parking on public roads are met.

3.6 Gas

Table 3.5 outlines the required performance criteria for the gas supply.

Table 3.5 – Performance criteria for gas supplies (*PBP* guidelines pg. 27)

Performance criteria	Acceptable solutions
Location of gas services will not lead to the ignition of surrounding bushland land or the fabric of buildings	Reticulated or bottled gas bottles are to be installed and maintained in accordance with AS1596 (2002) and the requirements of relevant authorities. Metal piping is to be used. All fixed gas cylinders are to be kept clear of flammable materials to a distance of 10m and shielded on the hazard side of the installation. If gas cylinders are to be kept close to the building the release valves must be directed away from the building and at least 2m away from any combustible material, so that they do not act as a catalyst to combustion. Connections to and from gas cylinders are metal. Polymer sheathed flexible gas supply lines to gas meters adjacent to buildings are not to be used.

3.7 Electricity

Table 3.6 outlines the required performance criteria for electricity supply.

Table 3.6 – Performance criteria for electricity services (*PBP* guidelines pg. 27)

Performance criteria	Acceptable solutions
Location of electricity services limit the possibility of ignition of surrounding bushland or the fabric of buildings Regular inspection of lines in undertaken to ensure they are not fouled by branches.	Where practicable, electrical transmission lines are underground Where overhead electrical transmission lines are proposed: • Lines are installed with short pole spacing (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 specification in *Vegetation Safety Clearances* issued by *Energy Australia* (NS179, April 2002).

Conclusion & Recommendations

4

4.1 Conclusion

A bushfire protection assessment has been undertaken for the proposed rezoning located at Lot 612 DP 1160096, 166 Blackhead Road, Hallidays Point. The proposal is to rezone the land from RU1 Primary Production to R1 – General Residential and E2 – Environmental Conservation.

Our assessment found that bushfire can potentially affect the site from the proposed forest vegetation located within the E2 zone as well as external to the site's north-western and north-eastern boundary. Bushfire threat also exists from the pockets of remnant vegetation located to the west and east resulting in possible ember attack, radiant heat and potentially flame attack. The risk posed by the unmanaged grassland vegetation surrounding the site has also been assessed.

The assessment has concluded that future development on site (including access) is capable of providing compliance with the planning principles of *PBP* and *Community Resilience Practice Note 2/12 – Planning Instruments and Policies*.

Future development on site is to comply with the following planning principles.

Table 4.1 – Planning principles

Planning principles	Recommendations
Provision of a perimeter road with two way access which delineates the extent of the intended development.	Future subdivision design should consider the provision of perimeter roads to provide clear access for firefighting operations to the remnant vegetation in the east and forest vegetation to the north-west.
Provision, at the urban interface, for the establishment of adequate APZs for future housing.	APZs have been recommended in compliance with BAL 29 (AS3959, 2009).
Specifying minimum residential lot depths to accommodate APZs for lots on perimeter roads.	Future subdivision design is to allow for the minimum APZs as recommended within Table 2.1 and as depicted within Schedule 1 attached.
Minimising the perimeter of the area of land interfacing the hazard, which may be developed.	Compliant.
Introduction of controls which avoid placing inappropriate developments in hazardous areas.	Future development consists of residential dwellings and is appropriate for the level of bushfire risk.
Introduction of controls on the placement of combustible materials in APZs.	Compliant – can be made a condition of consent.

The following recommendations are provided to ensure that future residential development is in accordance with, or greater than, the requirements of *PBP.*

4.2 Recommendations

Recommendation 1 - APZs are to be provided to the future residential development. APZs are to be measured from the exposed wall of any dwelling toward the hazardous vegetation. The minimum APZ must be achievable within all lots fronting the bushfire hazard as nominated in Table 2.1 and also as generally depicted in Schedule 1.

Recommendation 2 - Fuel management within the APZs is to be maintained by regular maintenance of the landscaped areas, mowing of lawns in accordance with the guidelines provided in Appendix 1, and as advised by the RFS in their publications.

Recommendation 3 - Building construction standards are to be applied for future residential dwellings in accordance with *Australian Standard AS3959 Construction of buildings in bushfire-prone areas (2009)* with additional construction requirements as listed within Section A3.7 of Addendum Appendix 3 of *PBP.*

Recommendation 4 - Public access roads are to comply with the acceptable solutions provided within Section 4.1.3 of *PBP* (refer Section 3.4 of this report).

Recommendation 5 - Water, electricity and gas supply are to comply with the acceptable solutions as provided within Section 4.1.3 of *PBP* (refer Sections 3.5, 3.6 and 3.7 of this report).

REFERENCES

Australian Building Codes Board (2010) – *Building Code of Australia*, Class 1 and Class 10 Buildings Housing Provisions Volume 2.

Chan, K.W. (2001) – *The suitability of the use of various treated timbers for building constructions in bushfire prone areas*. Warrington Fire Research.

Councils of Standards Australia AS3959 (2009) – *Australian Standard Construction of buildings in bush fire-prone areas.*

Hon Brad Hazzard (7 June 2012) – *Planning proposal to rezone land at Boundary Road, Medowie from 1 (c1) Rural Small Holdings Zone to 1(c5) Rural Small Holdings, 1(c4) Rural Small Holdings and 7(a) Environmental Protection.*

Keith, David (2004) – *Ocean Shores to Desert Dunes – The Native Vegetation of New South Wales and the ACT*. The Department of Environment and Climate Change.

Rural Fire Service (2006) - *Planning for bushfire protection– a guide for councils, planners, fire authorities and developers*. NSW Rural Fire Service.

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Tan, B., Midgley, S., Douglas, G. and Short (2004) - *A methodology for assessing bushfire attack.* RFS Development Control Service.

Travers, J. (2003) *The Ecological Management of Asset Protection Zones at Wallarah Peninsula – A Case Study*.

Umwelt, 2012. *Ecological Assessment for Rezoning Application Lots 93 – 96 Boundary Road, Medowie.*

Plan of Bushfire Protection Measures

S1

Legend

- Lot Boundary
- Contours (1m)
- Asset Protection Zone (Based on BAL 29 construction)
- Proposed E3 zone boundary

Aerial source: NearMap (05.08.2015)

Travers bushfire & ecology
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PROJECT & MXD REFERENCE	DATE & ISSUE NUMBER	SCALE & COORDINATE SYSTEM
Blackhead Road, Tallwoods A16066_BF001	9/02/2017 Issue 1	1:3,000 @ A3 GDA 1994 MGA Zone 56

TITLE

Schedule 1 - Bushfire Protection Measures

0 50 100 m

Disclaimer: The mapping is indicative of available space and location of features which may prove critical in assessing the viability of the proposed works. Mapping has been produced on a map base with an inherent level of inaccuracy, the location of all mapped features are to be confirmed by a registered surveyor.

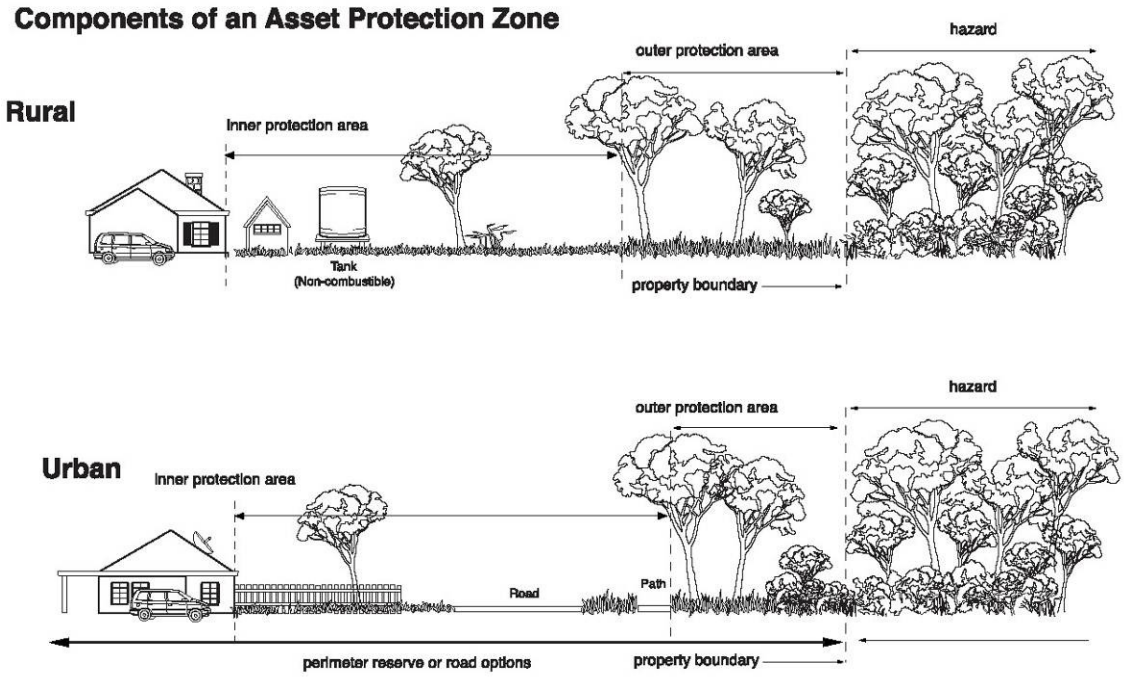
Document Path: N:\GIS STORAGE\N Drive\A16066_BlackheadRd_Tallwoods\MXDs\A16066_BF001.mxd

Management of Asset Protection Zones

A1

The RFS provides basic advice in respect of managing APZs through documents such as, *Standards for Asset Protection Zones* (RFS, 2005), with landscaping to comply with Appendix 5 of *PBP*.

The APZ generally consists of two subordinate areas, an inner protection area (IPA) and an outer protection area (OPA). The OPA is closest to the bush and the IPA is closest to the dwellings. A typical APZ is graphically represented below:



APZs and progressive reduction in fuel loads (Source: RFS, 2006)

Note: Vegetation management as shown is for illustrative purposes only. Specific advice is to be sought in regard to vegetation removal and retention from a qualified and experienced expert to ensure APZs comply with the RFS performance criteria.

The following provides maintenance advice for vegetation within the IPA and OPA.

Inner Protection Area (IPA)
Fuel loads within the IPA are to be maintained so it does not exceed 4t/ha.

Trees are to be maintained to ensure;

- Canopy cover does not exceed 15%
- Trees (at maturity) do not touch or overhang the building
- Tree canopies (at maturity) should be well spread out and not form a continuous canopy

- There should be no unmanaged vegetation within 10m of windows, doorways, eaves and gutters
- Lower limbs should be removed up to a height of 2m above ground

Shrubs are to be maintained to ensure;
- Large discontinuities or gaps in vegetation
- Shrubs should not be located under trees
- Shrubs should be in clumps no greater than $5m^2$
- Shrubs should be no closer than 10 metres from an exposed window or door.

Grass is to be maintained to ensure:
- A height of 10cm or less
- Leaves and debris is removed.

Outer Protection Area (OPA)
Fuel loads within the OPA are to be maintained so it does not exceed 8t/ha.

Trees are to be maintained to ensure;
- Canopy cover does not exceed 30% (trees may touch each other, however a separation is to be provided between the hazard the APZ)

Shrubs are to be maintained to ensure;
- They do not form a continuous canopy
- Shrubs should be in clumps no greater than $10m^2$
- Clumps of shrubs should be separated from each other by 10m

Grass is to be maintained to ensure:
- A height of 10cm or less
- Leaves and debris is removed.

Landscaping to the site is to comply with the principles of Appendix 5 of PBP. In this regard the following landscaping principles are to be incorporated into the development:

- Suitable impervious areas being provided immediately surrounding the building such as courtyards, paths and driveways;
- Restrict planting in the immediate vicinity of the building which may over time and if not properly maintained come in contact with the building;
- When considering landscape species consideration needs to be given to estimated size of the plant at maturity;
- Avoid species with rough fibrous bark, or which retain/shed bark in long strips or retain dead material in their canopies;
- Use smooth bark species of trees species which generally do not carry a fire up the bark into the crown;
- Avoid planting of deciduous species that may increase fuel at surface/ ground level (i.e. leaf litter);
- Avoid climbing species to walls and pergolas;
- Locate combustible materials such as woodchips/mulch, flammable fuel stores away from the building;
- Locate combustible structures such as garden sheds, pergolas and materials such timber garden furniture way from the building; and
- Use of low flammability vegetation species.

Response to RFS additional information request

A2

Our Ref: A16066B2: NVD/JT
Council Ref: PP_2016_GTARE
RFS REF: L08/0054

Monday 23rd January, 2017

Coastplan Group Pty Ltd
PO Box 568
FORSTER NSW 2428

Attention: Mr Gavin Maberly-Smith

Dear Gavin

Re: Response for Additional Information Request
Planning Proposal – Rezoning 166 Blackhead Road, Hallidays Point

Travers bushfire & ecology (TBE) has been engaged to provide a response to the NSW RFS letter (dated 29 November 2016) which states that;

'The NSW RFS cannot support the Planning Proposal in its current form. Council would need to provide the following information to permit the NSW RFS to re-assess the Planning Proposal;

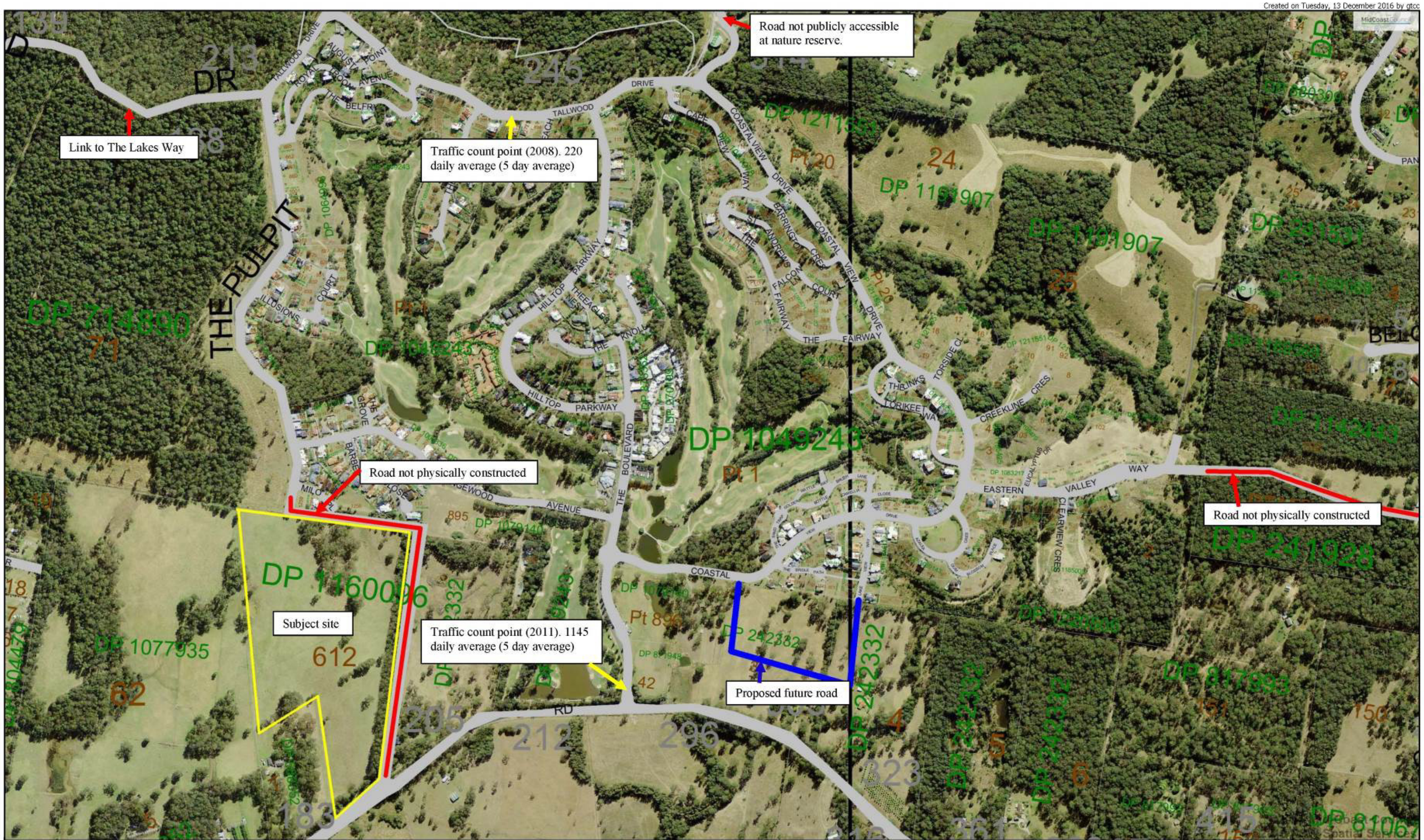
- *A traffic Masterplan for the locality identifying all current and future road systems within and servicing the Tallwoods Village including Lot 612.*
- *A concept subdivision plan identifying the proposed residential road layout within Lot 612.*
- *A traffic management study on the proposed road layout plan for the site including all access points to Blackhead Road, Diamond Beach and The Lakes Way. The study shall incorporate all current and future traffic flows through the identified access routes.*
- ***A revised Bushfire Protection report based on the recommendations of the traffic management study for vehicle access to the site. The NSW RFS notes that residents egressing the site to the north via The Pulpit, will be travelling towards a significant bush fire threat. As such, the current NSW RFS position is that any future residential subdivision of Lot 612 shall include direct public road access to Blackhead Road.***

In response to dot points 1 & 2 above Council have supplied the following overview map and concept plan which shows traffic counts at various points throughout the Tallwoods Village and golf course.

Mid Coast Council have advised that their engineers are opposed to having direct access to Blackhead Road for safety reasons. As a result access to Blackhead Road is to be limited to emergency services only.

As a result *TBE* can confirm that primary evacuation route for residents of Lot 612 will result in egress via The Pulpit to the north over a distance of 160m before continuing east along Grangewood Avenue and then south on the Boulevard onto Blackhead road away from the direct threat of bushfire. Alternatively a further two potential egress points east of the development will be provided (as depicted in the concept plan). The majority of these egress routes are well over 100m from any bushfire prone vegetation, therefore clearly complying with the requirements outlined in the planning document *Planning for Bushfire Protection 2006 (PBP).*

Created on Tuesday, 13 December 2016 by gtcc



MidCoast Council

Mid-Coast Council
2 Pulteney Street
PO Box 482
TAREE NSW 2430
Ph: (02) 6592 5399
Fax: (02) 6592 5311
Email: tareecouncil@gtcc.nsw.gov.au

Important Notice!
This map is not a precise survey document. Accurate locations can only be determined by a survey on the ground.
This information is provided for the convenience of the user only. No statement is made about the accuracy or suitability of the information for use for any purpose (whether the purpose has been notified to Council or not). While every care is taken to ensure the accuracy of this data, neither the Mid-Coast Council nor Land and Property Information (LPI) makes any representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaims all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damage) and costs which you might incur as a result of the data being inaccurate or incomplete in any way and for any reason.

Imagery:

Contour Interval:

Projection: MGA Zone 56 (GDA94)

Cost:

Date: Tuesday, 13 December 2016

Drawn By: gtcc

Map Scale: 1:7,750 at A3
Map Zoom: 3174 m


PROPOSED ROAD
(DEDICATE BUT NOT CONSTRUCT
PUBLIC RESERVE
20 WIDE AND VAR WIDTH
ROAD
THE PULPIT
WILD PLACE
DRAINAGE RESERVE
ROAD 20.115 WIDE (NOT FORMED)
BLACKHEAD
FUTURE WATER QUALITY DETENTION PONDS
PUBLIC RESERVE
ROAD 13.5 WIDE
EASEMENT 5 WIDE AND VARIABLE WIDTH FOR PIPELINE VIDE R906736 (DP640763)
EMERGENCY VEHICLE ACCESS / FIRETRAIL ONLY AND ACCESS TO PONDS
PROPOSED ROAD RESERVE
ROAD 30.175 WIDE (NOT FORMED)
ROAD
DP1088935
DP588352
DP714890
DP1021047
DP242332
SCALE 1:1250
PROPOSED SUBDIVISION OF
LOT 612
BLACKHEAD ROAD
HALLIDAYS POINT.
LSW LIDBURY, SUMMERS & WHITEMAN
CONSULTING SURVEYORS, PLANNERS & ENGINEERS
GREATER TAREE
31/07/06
6003

In response to dot point 4 of the *RFS* letter which states;

A revised Bushfire Protection report based on the recommendations of the traffic management study for vehicle access to the site. The NSW RFS notes that residents egressing the site to the north via The Pulpit, will be travelling towards a significant bush fire threat. As such, the current NSW RFS position is that any future residential subdivision of Lot 612 shall include direct public road access to Blackhead Road.

TBE provide the following response.

Although a traffic management study has not been completed *TBE* can confirm that the primary egress route to the north clearly complies with the requirements of *PBP*. In addition, the concept subdivision plan shown above depicts an additional two (2) egress routes via the land to the east. These routes link to Grangewood Avenue in the north and well away from the direct threat of bushfire.

The intent of measures outlined in PBP, for public roads, is to provide safe operational access to structures and water supply for emergency services, while residents are seeking to evacuate from an area.

The performance criterion for these public roads is that roads and access to the site must enable safe access for emergency services and allow fire and emergency service crews to work with equipment about the emergency vehicles.

The primary egress route via the Pulpit, Grangewood Avenue and The Boulevard will provide safe egress for residents evacuating without direct contact with unmanaged bushland areas and outside of the flame contact zone. As depicted in Schedule 2 attached the nearest bushfire prone vegetation is located 76 – 100 to the west of The Pulpit (refer photo 1), 80m to the north and 95m to the south of Grangewood Avenue.

Photo 1 – Managed land between The Pulpit and forest vegetation in the west.

The carriageway widths of the evacuation route varies between 7.5 – 10m which provides ample space for evacuating residents while emergency services crews work about their vehicles. This width and design complies with the performance requirements.

Whilst the adjoining vegetated areas do have the potential to carry fire the separation distances provided by the adjoining managed land will reduce potential radiant heat impacts to <6.21kW/m^2 at the road surface. This is within the life safety threshold given that people evacuating will have the radiant heat protection offered by their car over a short time period (refer Table 1 below).

Table 1 – Radiant heat flus and effects on buildings and people for a modelled forest fire (FDI 100 on flat ground).

Radiant Heat Flux	Likely Effects	Approx. Distances
2.1 kW/m^2	Unprotected person will suffer pain after 1 minute exposure – non fatal.	140 metres
3 kW/m^2	Hazardous conditions. Firefighters expected to operate for a short period (10 minutes)	100 metres
4.7 kW/m^2	Extreme conditions. Firefighter in protective clothing will feel pain. (60 seconds exposure)	70 metres
7 kW/m^2	Likely fatal to unprotected person after exposure for several minutes	55 metres
10 kW/m^2	Critical conditions. Firefighters not expected to operate in these conditions although they may be encountered. Considered to be life threatening < 1 minute in protective equipment. Fabrics inside a building could ignite spontaneously with long exposures.	45 metres
12.5 kW/m^2	Standard float glass could fail (BAL-12.5 construction) during the passage of a bush fire. Some timbers can ignite with prolonged exposure and with piloted ignition source (e.g. embers).	40 metres
19 kW/m^2	Screened float glass could fail (BAL-19 construction) during the passage of a bush fire.	27 metres
29 kW/m^2	Ignition of most timbers without piloted ignition (3 minutes exposure) (BAL-29 construction) during the passage of a bush fire. Toughened glass could fail.	20 metres
>29 – 40 kW/m^2	*Potential flame contact and increased radiant heat and ember attack.*	15 - 20 metres
>40 – 110 kW/m^2	*Significant higher likelihood of flame contact. Coupled with the radiant heat and increased ember attack is a significant risk to most structures and building materials.*	0 - 15 metres

Note: Assumes flame temperature of 1090K for all scenarios.

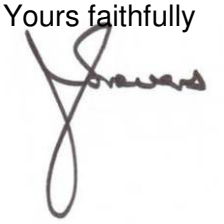
Attachment 2 provides the modelled results from the forest vegetation to the west of The Pulpit and to the north and south of Grangewood Avenue, based on the separations provided, the effective slope and maximum forest fuel loads of (25/35t/ha). The remainder of the evacuation route is surrounded by managed golf course lands.

Based on the modelled outputs which show radiant heat impacts of less than 6.21kW/m^2 impacting a relatively small proportion of the primary evacuation route, an alternative means of egressing the site in the event of a bushfire emergency is not required. However as depicted in the concept subdivision plan two (2) additional evacuation routes will be provided in the future via the adjoining land in the east.

As a result the planning proposal clearly complies with the requirements outlined in the planning document *Planning for Bushfire Protection 2006 (PBP).*

Should you require further information, please do not hesitate to contact Nicole van Dorst or the undersigned on 4340 5331 or info@traversecology.com.au.

Yours faithfully

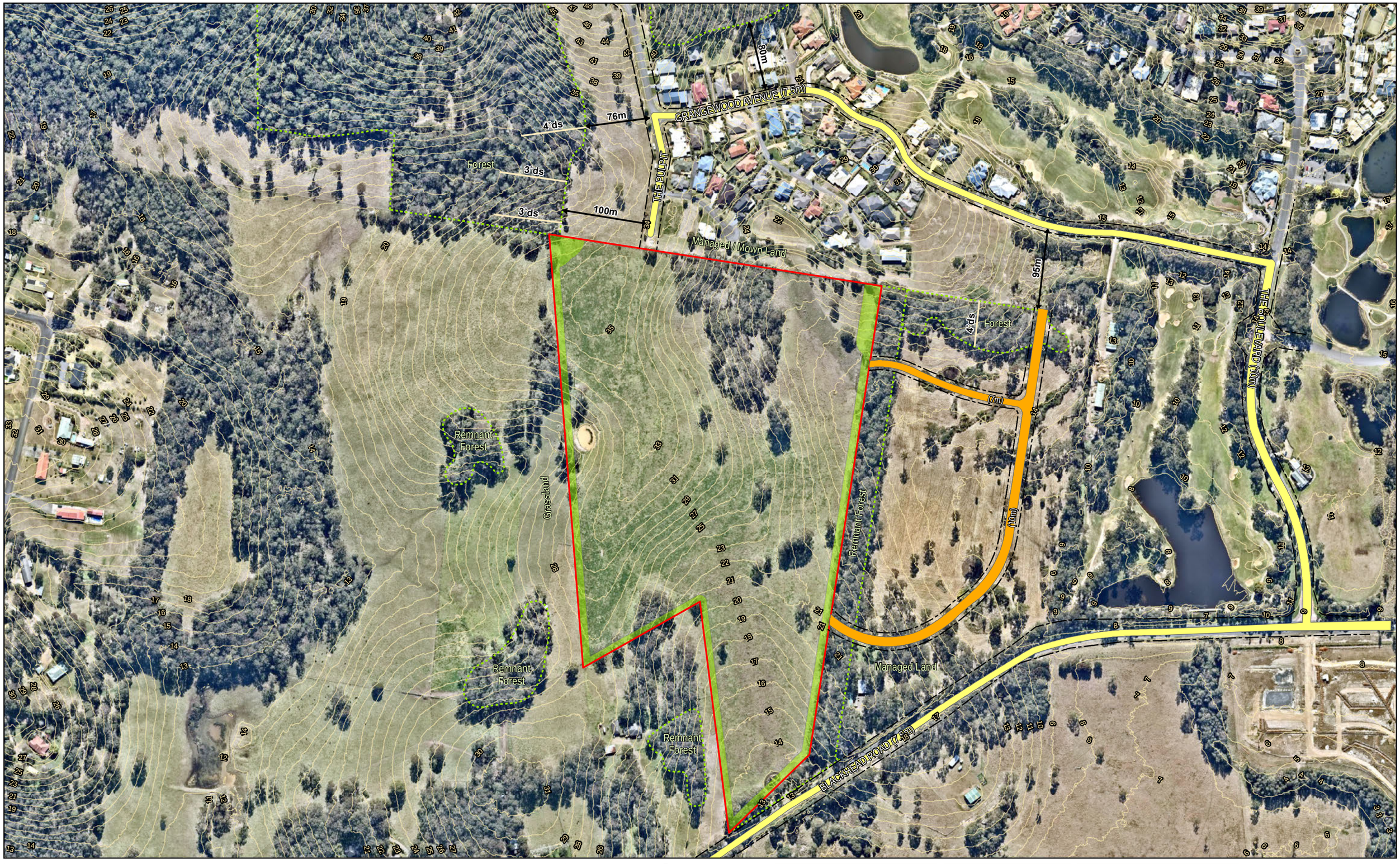


John Travers
BA Sc. / Ass Dip / Grad Dip / BPAD-Level 3-15195 (FPA)
Managing Director **– *Travers bushfire & ecology***

Attachment 1 – Schedule 2 - Evacuation Route
Attachment 2 – Modelled results

Travers bushfire & ecology employs a
Bushfire Planning and Design (BPAD) Accredited Practitioner

John Travers and Nicole van Dorst are BPAD consultants. Both are certified by the Fire Protection Association. FPA Australia administers the Bushfire Planning and Design (BPAD) Accreditation Scheme. The Scheme accredits consultants who offer bushfire assessment, planning, design and advice services. It accredits practitioners who meet criteria based on specific accreditation and competency requirements, including a detailed knowledge of the relevant planning, development and building legislation for each State and Territory. Through the Accreditation Scheme, BPAD Accredited Practitioners are recognised by industry, regulators, fire agencies, end-users and the community as providers of professional bushfire assessment, planning, design and advice services. The Scheme provides an enhanced level of confidence for government and the community that practitioners are accredited by a suitably robust scheme that is administered by the peak national body for fire safety. Note: L3 is the highest level and L1 is the lowest level.



Legend

- Lot Boundary
- Contours (1m)
- Asset Protection Zone
- Road corridor (source: LPI)
- Primary evacuation routes
- Additional evactuation routes

Aerial source: Nearmap

0 100 200 m

Disclaimer: The mapping is indicative of available space and location of features which may prove critical in assessing the viability of the proposed works. Mapping has been produced on a map base with an inherent level of inaccuracy, the location of all mapped features are to be confirmed by a registered surveyor.

PROJECT & MXD REFERENCE	DATE & ISSUE NUMBER	SCALE & COORDINATE SYSTEM
Blackhead Road, Tallwoods A16066_BF002	9/02/2017 Issue 1	1:4,000 @A3 GDA 1994 MGA Zone 56

TITLE

Schedule 2 - Primary Evacuation Route

Document Path: N:\GIS STORAGE\N Drive\A16066_BlackheadRd_Tallwoods\MXDs\A16066_BF002.mxd

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Attachment 2 – Modelled Results

NBC Bushfire Attack Assessment Report V2.1

AS3959 (2009) Appendix B - Detailed Method 2

Printed: 20/01/2017 **Assessment Date:** 20/01/2017

Site Street Address: 166 Blackhead Road, Hallidays Point

Assessor: Mr Admin; admin

Local Government Area: Greater Taree **Alpine Area:** No

Equations Used

Transmissivity: Fuss and Hammins, 2002
Flame Length: RFS PBP, 2001
Rate of Fire Spread: Noble et al., 1980
Radiant Heat: Drysdale, 1985; Sullivan et al., 2003; Tan et al., 2005
Peak Elevation of Receiver: Tan et al., 2005
Peak Flame Angle: Tan et al., 2005

Run Description: North - Grangewood Avenue

Vegetation Information

Vegetation Type:	Forest	**Vegetation Group:**	Forest and Woodland
Vegetation Slope:	0 Degrees	**Vegetation Slope Type:**	Level
Surface Fuel Load(t/ha):	25	**Overall Fuel Load(t/ha):**	35

Site Information

Site Slope	0 Degrees	**Site Slope Type:**	Level
Elevation of Receiver(m)	Default	**APZ/Separation(m):**	80

Fire Inputs

Veg./Flame Width(m):	100	**Flame Temp(K)**	1090

Calculation Parameters

Flame Emissivity:	95	**Relative Humidity(%):**	25
Heat of Combustion(kJ/kg	18600	**Ambient Temp(K):**	308
Moisture Factor:	5	**FDI:**	80

Program Outputs

Category of Attack:	LOW	**Peak Elevation of Receiver(m):**	9.68
Level of Construction:	BAL 12.5	**Fire Intensity(kW/m):**	43400
Radiant Heat(kW/m2):	4.51	**Flame Angle (degrees):**	78
Flame Length(m):	19.8	**Maximum View Factor:**	0.08
Rate Of Spread (km/h):	2.4	**Inner Protection Area(m):**	60
Transmissivity:	0.738	**Outer Protection Area(m):**	20

Run Description:	South - Grangewood Avenue		
Vegetation Information			
Vegetation Type:	Forest	Vegetation Group:	Forest and Woodland
Vegetation Slope:	4 Degrees	Vegetation Slope Type:	Downslope
Surface Fuel Load(t/ha):	25	Overall Fuel Load(t/ha):	35
Site Information			
Site Slope	0 Degrees	Site Slope Type:	Downslope
Elevation of Receiver(m)	Default	APZ/Separation(m):	95
Fire Inputs			
Veg./Flame Width(m):	100	Flame Temp(K)	1090
Calculation Parameters			
Flame Emissivity:	95	Relative Humidity(%):	25
Heat of Combustion(kJ/kg	18600	Ambient Temp(K):	308
Moisture Factor:	5	FDI:	80
Program Outputs			
Category of Attack:	LOW	Peak Elevation of Receiver(m):	12.06
Level of Construction:	BAL 12.5	Fire Intensity(kW/m):	57195
Radiant Heat(kW/m2):	4.18	Flame Angle (degrees):	77
Flame Length(m):	24.76	Maximum View Factor:	0.075
Rate Of Spread (km/h):	3.16	Inner Protection Area(m):	72
Transmissivity:	0.728	Outer Protection Area(m):	23

Run Description:	West - The Pulpit		
Vegetation Information			
Vegetation Type:	Forest	Vegetation Group:	Forest and Woodland
Vegetation Slope:	4 Degrees	Vegetation Slope Type:	Downslope
Surface Fuel Load(t/ha):	25	Overall Fuel Load(t/ha):	35
Site Information			
Site Slope	0 Degrees	Site Slope Type:	Downslope
Elevation of Receiver(m)	Default	APZ/Separation(m):	76
Fire Inputs			
Veg./Flame Width(m):	100	Flame Temp(K)	1090
Calculation Parameters			
Flame Emissivity:	95	Relative Humidity(%):	25
Heat of Combustion(kJ/kg	18600	Ambient Temp(K):	308
Moisture Factor:	5	FDI:	80
Program Outputs			
Category of Attack:	LOW	Peak Elevation of Receiver(m):	11.96
Level of Construction:	BAL 12.5	Fire Intensity(kW/m):	57195
Radiant Heat(kW/m2):	6.21	Flame Angle (degrees):	75
Flame Length(m):	24.76	Maximum View Factor:	0.11
Rate Of Spread (km/h):	3.16	Inner Protection Area(m):	56
Transmissivity:	0.742	Outer Protection Area(m):	20