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Council Ref: PEX2013/0003 & 2016/274281
RFS REF: LEP/0129

9 December 2016

The General Manager
Northern Beaches Council Civic Centre
725 Pittwater Road
DEE WHY NSW 2099

Attention: Mr M Ferguson

Dear Mark

Re: Response to *Blackash* Bushfire Consulting Report

Travers bushfire & ecology (TBE) has undertaken a review of a bushfire report initiated by Warringah Council entitled *Peer Review of Ralston Avenue Planning Proposal – Bushfire Planning* (4/16) prepared by *Blackash Bushfire Consulting* (*Blackash*).

Blackash advises that the methodology used by TBE fails to address the suitability of the site for residential development and they argue that strategic planning and site suitability for the site has not been addressed. As a result, *Blackash* is of the belief the site is not suitable for the type of development proposed and they go further and advise that no development of any type should occur because of the potential bushfire risk.

TBE has responded to the NSW Rural Fire Service (RFS) comments on the planning proposal and that response dated 4 November 2016 is attached to this response at Appendix 3. The amendment response to the RFS has the effect of making the *Blackash* report redundant.

In our response to the RFS we provided clarity on a number of matters and to that end we undertook amendments to the proposal. We also acknowledged that there was a need for those amendments to better represent the intended hazard management measures. These measures are graphically represented on Figure 2 and include;

1. Increased asset protection zones (APZs) reflecting smoother boundaries, increased depth on the southern aspect and the provision of APZs on the *TransGrid* electrical easements, lands adjacent to Ralston Avenue and Wyatt Avenue and owned by MLALC.
2. A reduction of the reserve (E3 Zone) has occurred (0.90ha to 0.66ha). This is necessary given the need to deny potential for fire entering the site from the north-west aspect; and the need to impose a degree of common sense in respect of protecting the current land owner's responsibilities (re; Section 63 of the *Rural Fires Act*) in respect of the *TransGrid* asset.



3. Improved road alignment in the north east to Wyatt Avenue with larger APZs.
4. Notation of the available fire trails in the vicinity of the *TransGrid* easement zones and beyond.
5. Consideration of a community title approach to APZ management.

The above changes and revised approach were not reviewed by Blackash, and while making the Blackash report already out of date, we have provided a detailed response to the matters raised in the Blackash report.

Firstly, though it is important to respond to the threshold matter raised by *Blackash* in relation to strategic planning and site suitability.

There appears, in the *Blackash* comments, to be a mistaken understanding of strategic planning and site suitability in the discipline of bushfire planning. Since the 1980's bushfire planning for 'residential subdivisions' has been regulated via the Ministerial Direction G20 and to a lesser extent by Circular C10 issued by the Department of Planning.

In 2002 that early regulatory approach took a step forward when the development of 'residential subdivisions' became an Integrated Development for the purposes of Section 91 of the *EPA Act*.

The integration linked such development with the *Rural Fires Act* S100B and the subsequent need to assess all development that occurred on a bushfire prone land as mapped by Council/s and certified by the Commissioner of the RFS. The method of assessment is the RFS policy document entitled '*Planning for Bush Fire Protection*' 2006 (*PBP*).

The last step to complete regulation came in 2006 when NSW agreed to make *AS3959 Construction of buildings in bushfire prone areas* part of the development control process by linking development in bushfire prone areas with the Building Code of Australia (BCA).

The significance of this created a framework for assessing all development through the RFS policy *PBP* and also being mindful of their Development Control Note 2/12 which provides advice in regard to development control matters to be considered within an LEP.

These measures encapsulate planning, design and control measures; and can be provided into the Area Plan. Appendix 2 within the DCN 2/12 provides clarity of the intent required by the RFS and the assessment has been undertaken within this document.

In regard to land suitability, the process remains the same as it is has been for over 25 years. It is firstly a matter to consider the S117 Ministerial Direction (2) S4.4 *Planning in bushfire prone areas*. This assessment informs the making of an LEP when and if the matters that must be addressed are acceptable.

The S117 Direction requires consideration of the following;

- I. *To protect life, property and the environment from bushfire hazards, by discouraging the establishment of incompatible land uses in bushfire prone areas.*
- II. *To encourage sound management of bushfire prone areas.*

In response to Item (i) above, the planning proposal seeks to zone residential R2 land for low density residential development; and create E3 Environmental Management.

In response to Item (ii) the sound management of the bushfire prone areas is manifested within our comprehensive draft fuel management plan (FMP), which Council requested the applicant satisfactorily complete prior to exhibition.

- This plan provides an integrated approach to the management of the hazardous fuels on this landscape both within the APZs and the roadside APZs required for evacuation safety.
- We acknowledge that the draft FMP will require amendments given the recent plan amendments such as the proposed community title management.
- The plan also provides recommendations for the implementation of strategic fire advantage zones (SFAZ) to provide additional long term protection through ecological burning regimes in accord with the Bushfire and Environmental Assessment Code. This is similar to that which the RFS currently undertakes.

The S117 Direction further extends its planning guise at the planning proposal stage to ensure that the planning proposal adheres to the RFS planning policy entitled *PBP*, and the Direction further requires that the intended LEP;

- *introduce(s) controls that avoid placing inappropriate development in hazardous areas; and;*
- *ensure(s) that bushfire hazard reduction is not prohibited within the APZ.*

The planning proposal attends to and addresses all these requirements and the other matters listed in Items 6 and 7 of the Direction.

We can therefore advise that the proposed development does comply with the legislative requirements of *Section 117 Direction (2) s 4.4 Planning for Bushfire Protection 2006* and the policy matters referred to by the RFS within *DCN 2/12* which provides advice in regard to development control matters to be considered within an LEP. Appendix 2 within the *DCN 2/12* provides clarity of the intent required by the RFS.

Following the implementation of the LEP any subsequent development application would then comply, again, with the specific matters required by *PBP*; and then the *Building Code of Australia* and *AS3959 Construction in bushfire prone areas*.

There can be no doubt that the Rawson Avenue planning proposal has been subjected to comprehensive bushfire assessment and fuel management planning initiatives. Coupled with the proposed community association management approach the planning proposal fulfils all the requirements of the *Section 117 Direction*, *PBP*, *DCN 2/12* and *AS3959*. These measures will encapsulate all the required planning, design and control (measures) for safe residential living and can be provided within the Area Plan for the precinct.

By way of comparison we are aware of the development precinct being proposed by the Department of Planning at Ingleside. This plan proposes 3,400 new dwellings. The proponent's bushfire consultant EcoLogical Aust has advised that the rezoning has been based on advice and constraints within the relevant bushfire planning controls (e.g. *PBP* and *AS3959*).

The consultancy also advises that more detailed assessment and consideration of the relevant bushfire protection strategies should be undertaken at the development application stage and should include a more comprehensive review of the road and lot layout and

subsequent planning controls to ensure they are well designed in terms of bushfire protection outcomes (Source: Pp 24).

Of particular interest in this proposal is the approach taken in dealing with hazard management and bushfire protection which relies on future assessments being undertaken. Yet given the extent of hazardous vegetation proposed to be retained, then this approach will require significantly more detail to enable the plan to be in accordance with the Section 117 Direction and PBP.

The figure below has been extracted from the Ingleside EcoLogical Aust. report (Fig 5). This shows the extensive hazard landscape created by Kuringai National Park and the new conservation reserves in the development precinct (see green colouring in the legend).

The planned conservation areas will require peripheral hazard management in order to protect nearby communities and those areas will require ongoing management in accord with a comprehensive fuel management plan and no doubt the apparent pinch points of the plan will be rectified in the detail to follow.

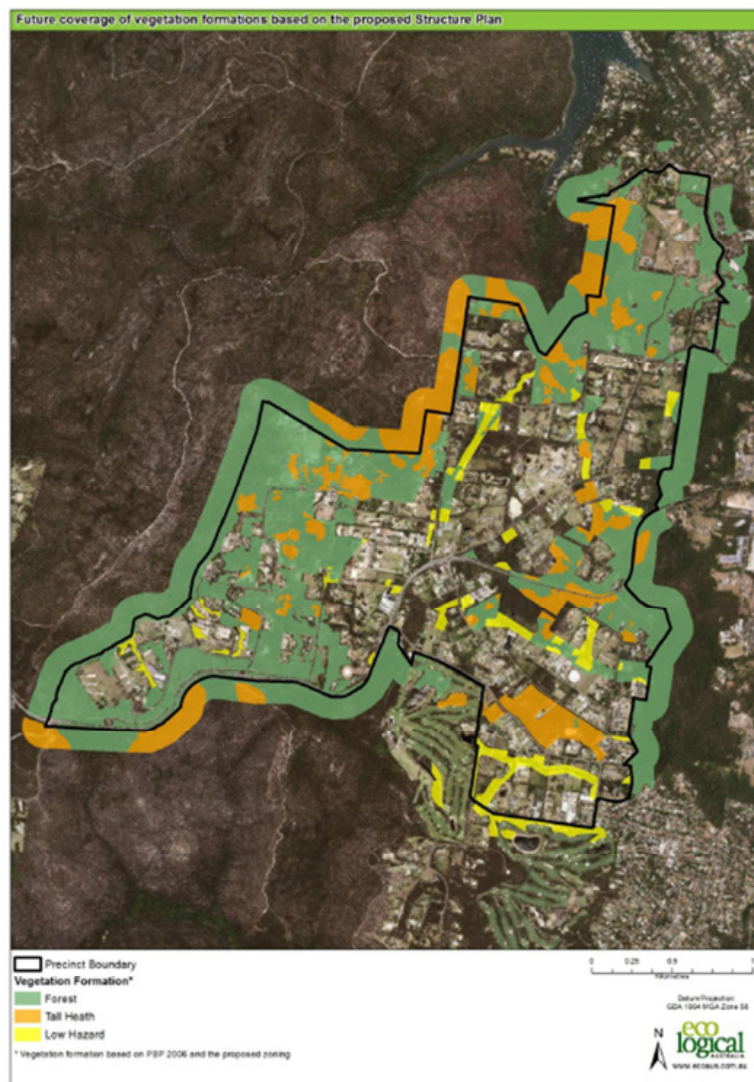


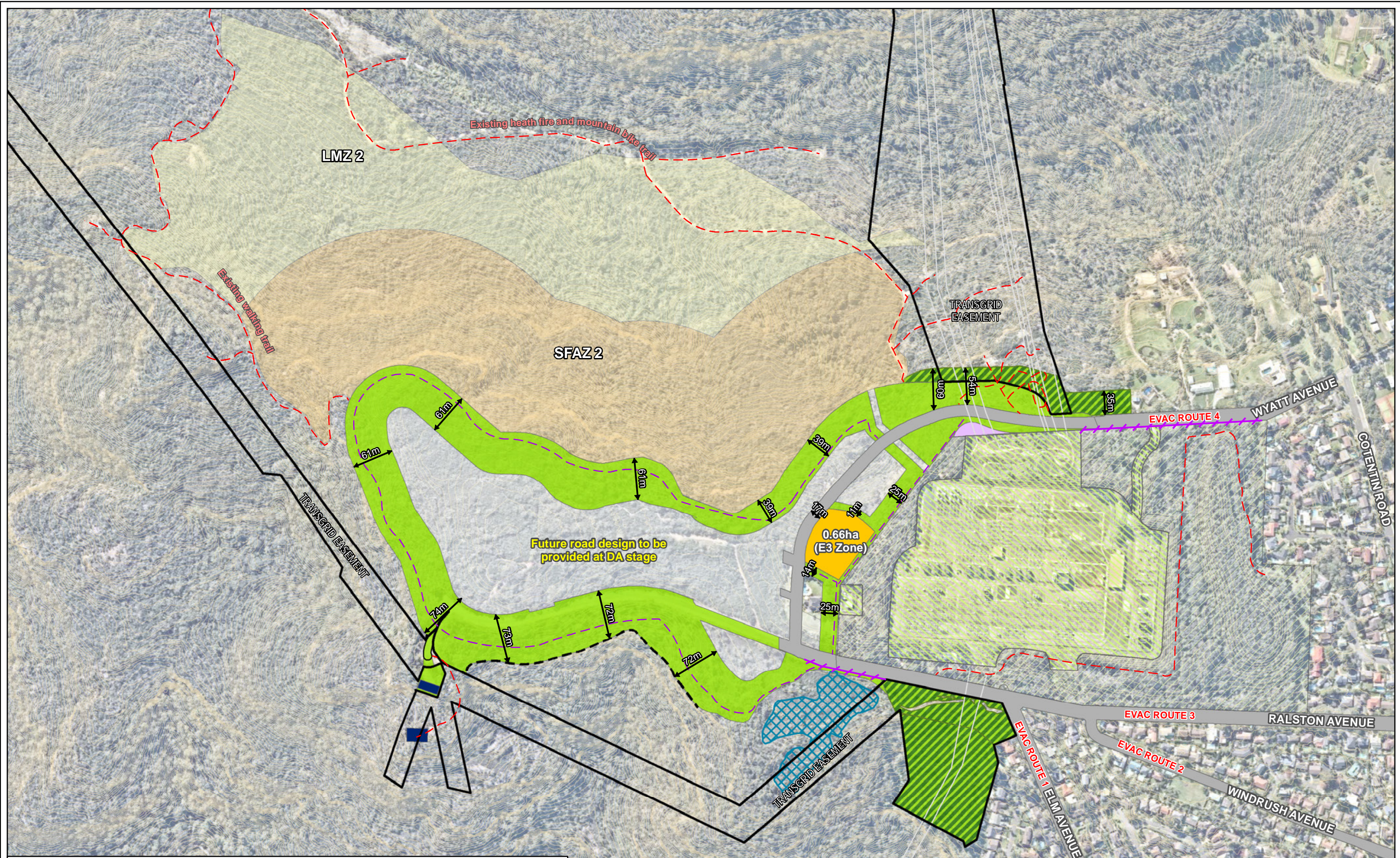
Figure 1 - Extract from Ingleside planning proposal's bushfire report Figure 5 (*EcoLogical Aust.*)

The Ingleside planning proposal will eventuate into a thriving location and expand the urban footprint once again into bushfire prone lands. Equally the Rawson Avenue planning proposal will do the same.

Yours sincerely

A handwritten signature in black ink, appearing to read 'John Travers', written in a cursive style.

John Travers
Director – ***Travers bushfire & ecology***



Legend			
	Evacuation route		Existing fire / walking trail
	Transgrid assets		3m radiant heat barrier
	Ecological protection area		Creek line
	Area of <i>G.caleyi</i> specimens (August, 2015)		Ephemeral line
	Coastal Upland Swamp (low fire hazard)		Contour (1m) (source: LiDAR)
	Proposed track		Transgrid managed land
	Land subject to Transgrid Bushfire Management Plan (BMP)		Previous Asset Protection Zone (APZ)
	Revised Asset Protection Zone (APZ)		Strategic Fire Advantage Zone
	Additional APZs for electrical easements		

Aerial source: Nearmap

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
 Ralston Avenue, Belrose
 A15056B2_BF006

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 Issue 1

SCALE & COORDINATE SYSTEM
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 GDA 1994 MGA Zone 56

TITLE
Figure 2 - Revisions to Planning Proposal (Bushfire)



Response to Blackash Review of Ralston Avenue Planning proposal

TBE has undertaken amendments to the planning proposal which better illustrate that the development site is suitable for a R2 residential development and responds positively to the *S117 (2) S4.4 Direction for Planning for Bushfire Protection*.

In addition, documentation herein shows that the peripheral slopes are not as steep as suggested and the vegetation communities are not all forest. This combination means that fire behaviour potential will be significantly lower than what is being portrayed in the *Blackash* commentary.

Context

By way of contrast the broader Sydney region between the Nepean and Hawkesbury Rivers and out to Blackheath are set amidst vast bushfire prone areas with regular mid to large scale bushfire events occurring between July and February in most years.

The sheer extent and scale of the national park systems that fringe the Sydney environ from the south to the north e.g. Moreton, Blue Mountains, Wollemi, Yengo, Dharug, Popran and Brisbane Water National Parks total some 1.155 million hectares of unmanaged natural landscapes and these contribute to at times long running campaign bushfire events of which the general public would be mostly unaware.

Within the central Sydney zone are many other national parks that fringe river systems such as Ku-ring-gai Chase, Davidson, Lane Cove, Georges River and Cattai. In addition, local government bushland reserves create additional linkages to those national parks and ultimately create a significant fire prone landscape in which millions of residents live, work and play.

A recent analysis undertaken by Macquarie University-affiliated *Risk Frontiers group*¹ (2016) reveals that more than 100,000 households in Sydney and surrounds are exposed to high bushfire risks because they live within 100 metres of bushland. Notably;

- Gosford has 26,595 households
- Blue Mountains regions has 23,068 households
- Hornsby has 19,983 households
- Ku-ring-gai has 15,719 households
- Warringah has 6,592 households

For the existing communities of Warringah fringing the national park and / or Council lands the risk remains continually present and every summer brings with it the potential for dry weather and strong winds which can lead to fire events and community disruption.

The fact that the broader Sydney region is located amidst such a vast bushfire prone landscape is also not lost on the resources applied to protect the communities from that ever present risk. Funding for protective and preventative measures is provided, in the main, from insurance levies and these in turn fund the operation of the two fire services i.e. Fire & Rescue NSW and the NSW Rural Fire Service.

In light of regulatory approach applied to development control in bushfire prone areas then the proposed R2 use of the land is quite appropriate.

¹ *Risk Frontiers and MapData Sciences* (Address Risk Rating) <https://www.riskfrontiers.com/arr.htm>

Minimising the risk when building in bushfire prone areas

In terms of 'acceptable risk' the RFS approach is based on an expansive set of criteria provided within their planning doctrine '*Planning for Bush Fire Protection*' (*PBP*). This document addresses residential and rural residential development protection suitability through the process of applying appropriate 'bushfire protection measures' and using those 'measures in combination' to arrive at an informed determination of development protection. These measures include the following elements as depicted in the graphic below sourced from *PBP*.

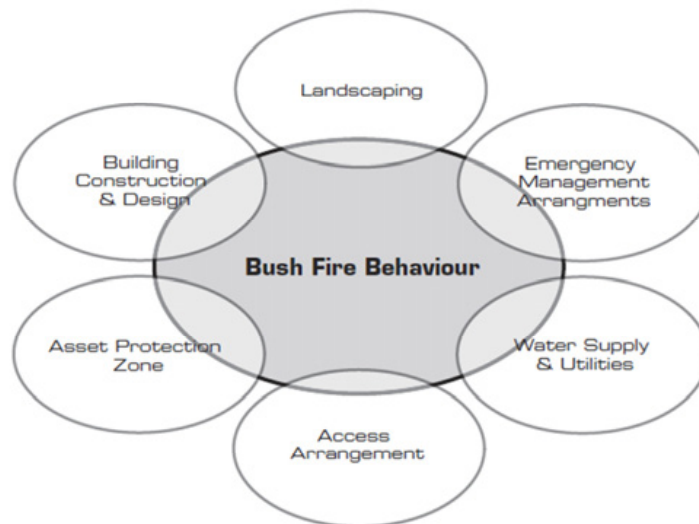


Figure 3 – RFS measures in combination

The measures are those that have an impact upon the resultant fire behaviour affecting a site and the ability to enable safe evacuation should it be necessary. The key ingredients are therefore the proposed asset protection zones, the safety of the access routes and emergency management arrangements; followed by the building construction / design, landscaping design, water and utilities. These layers of measures will stop fire from occurring and or threatening but they will provide acceptable risk to a locality. This begs the question 'what is acceptable risk?'

In the determination of acceptable risk the RFS require adherence to the general principles of *PBP* (pp1);

- Protection measures are governed by the degree of threat posed to a development.
- A minimum setback in the form of a defensible space between the dwelling and the hazard is always required.
- The greater the setback from the hazard, the lower the subsequent bush fire protection construction standards required.
- The smaller the interface a development has fronting the bush fire threat, the less the opportunity for bush fire to threaten the development.
- Bush fire protection measures (BPMs) are contained within the 'overall' development and not on adjoining lands, other than in exceptional circumstances (see Section 3.3).

In addition, there are the stated objectives for residential subdivision which include the need in *PBP* to (p17);

1. Minimise perimeters of the subdivision exposed to the bush fire hazard. Hourglass shapes, which maximise perimeters and create bottlenecks, should be avoided.
2. Minimise bushland corridors that permit the passage of bush fire.
3. Provide for the siting of future dwellings away from ridge-tops and steep slopes - particularly up-slopes, within saddles and narrow ridge crests.
4. Ensure that separation distances (APZ) between a bush fire hazard and future dwellings enable conformity with the deemed-to-satisfy requirements of the BCA. In a staged development, the APZ may be absorbed by future stages.
5. Provide and locate, where the scale of development permits, open space and public recreation areas as accessible public refuge areas or buffers (APZs)
6. Ensure the ongoing maintenance of asset protection zones
7. Provide clear and ready access from all properties to the public road system for residents and emergency services
8. Ensure the provision of an adequate supply of water and other services to facilitate effective firefighting.

The Belrose planning proposal fully adheres to these principles and objectives – see Figure 1. Notwithstanding that, the Belrose planning proposal will retain a bushfire risk commensurate with RFS expectations and that currently insitu with the neighbouring community. The RFS expectations are explained in that the;

- Level of defensible space provided is above that specified within *PBP*.
- Road network design can effectively deal with mass evacuation should it need to occur without affectation from high levels of radiant heat or flame attack.
- Hazard management proposal will ensure sound hazard management across the whole landscape by one integrated entity. As a result of those specific concerns raised by the RFS, the planning proposal will now utilise a community title approach.

Strategic risk assessment and suitability of the site for development

One of the main contentions outlined in the *Blackash* report is based on the alleged failure to adequately address the fundamental principle of suitability of the site for development.

This suggestion is without foundation. Since 2002 the mapping of bushfire prone lands has been a regulatory requirement of Section 146 of the *EPA Act* for local government to map these areas inclusive of a peripheral buffer.

The maps are based on the type of fire behaviour expected using two classifications of hazard (forest / woodland and rainforest) to which a buffer of 100m or 30m respectively is applied.

All land caught in the mapping including the buffer automatically triggers any development on those lands to be then subject to formal assessment procedures including development suitability of;

1. The type of development proposed e.g. a car park or an aged care facility.
2. The permissibility in the Zone e.g. An aged care facility is not permitted in R2 Low Density Residential Zone.

The S.117 Direction requires that the objectives of planning for bushfire protection be applied. These include;

- I. *To protect life, property and the environment from bushfire hazards, by discouraging the establishment of incompatible land uses in bushfire prone areas.*
- II. *To encourage sound management of bushfire prone areas.*

In response to Item (i) above the planning proposal seeks to zone (residential) R2 land for *low density residential* development.

In response to Item (ii) the sound management of the bushfire prone areas is manifested within our comprehensive and integrated draft fuel management plan.

The S117 Direction requires that the planning proposal adheres to the RFS planning policy entitled *Planning for Bush Fire Protection*. The planning proposal adheres to the RFS planning policy *PBP*. Following rezoning being approved any future land development is then subject to further regulatory requirements which review the type of development possible. Those regulations include;

- Section 91 of the *EP&A Act* in combination with the *Rural Fires Act 1997 (RF Act)* requirements for a Section 100B Bush Fire Safety Authority (BFSA) for varying classes of integrated development (but only where they are permissible within the zone).
- Section 79BA of the *EP&A Act* requiring compliance with *PBP* for infill development and construction (but only where they are permissible within the zone).
- Section 100B of the *RF Act* for the provision of bushfire safety authorities for subdivisions and special fire protection purpose developments (but only where they are permissible within the zone).
- Complying development under the *State Environmental Planning Policy (Exempt and Complying Development Codes) 2008* (the Code's SEPP) requires compliance with specific bushfire development standards when located on bushfire prone land (but only where they are permissible within the zone).
- Residential development also requires adherence to national codes such as the *Building Code of Australia* and Australian Standard *AS3959 Construction of Buildings in Bushfire Prone Areas*.

It is the above 'combined regulatory approaches' that defines a site as being suitable to the risk and / or unsuitable to that risk.

This 'layered approach' to regulatory assessment is fundamental to determining suitability at an early stage. The layered approach also enables a review process that not only responds

to the LEP S117 (2) requirements but also the application of common sense when one reviews a locality by investigating whether or not a locality is suitable for an aged care facility where there is a high chance of evacuation requiring the assistance of emergency services enmasse. These development types obviously trigger a forensic approach by the RFS to their suitability in a particular area.

This same approach enables a locality that is initially a mapped bushfire prone area to change and potentially may, over time, become unmapped as bushfire prone lands due to the ever increasing housing pressures that face the community. This is how Sydney grew – one street at a time.

Therefore, in consideration of any strategic assessment procedures that should be applied then the mapping of bushfire prone areas together with the *S117 (2) S4.4 Direction* provides the necessary strategic procedures to validate both suitability and permissibility.

In regard to the planning proposal, the determination of a low density residential land use i.e. within an R2 zone is the most preferred zoning class. The alternatives such as R1 General Residential (if it were permitted in the LEP), R3 Medium Density Residential, R4 High Density Residential, SP3 Tourism and most importantly and E4 Environmental Living are not possible. In bushfire terms each of those zonings brings with it a higher level of complexity and is regarded as unsuitable.

Blackash argue that inappropriate land uses will be permissible within the R2 zone. They advise that the proposed residential zoning of R2 could lead to incompatible land uses such as child care centres, community facilities, educational establishments, group homes, health consulting rooms, hospitals, places of public worship, respite day care centres and / or veterinary hospitals.

We can advise the above uses are not proposed or considered in the planning proposal and more importantly any such development can only proceed with Council consent. Again it is because of the bush fire prone mapping that causes those type of land uses to be reviewed in accord with Section 79BA of the *EPA Act*; and if they are a *special protection purpose development* then they also require (Section 91 *EPA Act*) integrated approval from the RFS in accord with Section 100B of the *Rural Fires Act*.

Council will be required to prepare an 'Area Plan' for the planning proposal area. This will formalise both a strategic and a coordinated approach to the development of the Belrose planning proposal area. The Area Plan will identify the objectives and the development controls and it is via the latter that will expand on the development controls relative to permissibility and development character.

In this regard it is helpful that the RFS Development Control Note 2/12 provides advice in regard to development control matters to be considered within an LEP. These measures encapsulate planning, design and control measures; and can be provided into the Area Plan. Appendix 2 within the DCN 2/12 provides clarity of the intent required by the RFS.

For the purposes of applying the requirements of DCN 2/12 this information is provided in Appendix 2, and suffice to say that compliance with the requirements are being met by the planning proposal.

Perceptions of the risk by *Blackash*

TBE acknowledge that the existing Belrose suburban community is exposed to a high / very high risk. However, *Blackash* rely heavily on the perceived risk to the surrounding site based on the current circumstances of undeveloped land. *Blackash* do not acknowledge that the

risk can be reduced by implementing measures within the site to transform this risk. This suggests that an alarmist approach has been formed by *Blackash* as opposed to an objective assessment of the planning proposal.

Quite importantly the *Blackash* report does not acknowledge that the risk will be reduced by implementing measures within the site to transform this risk - nor does *Blackash* portray a true position of the development post construction and the instigation of fuel management routines.

TBE accept that it is not the role of *Blackash* to redesign the planning proposal but it is the job of *Blackash* to advise its client, Northern Beaches Council, with correct and proper advice. This has not been provided.

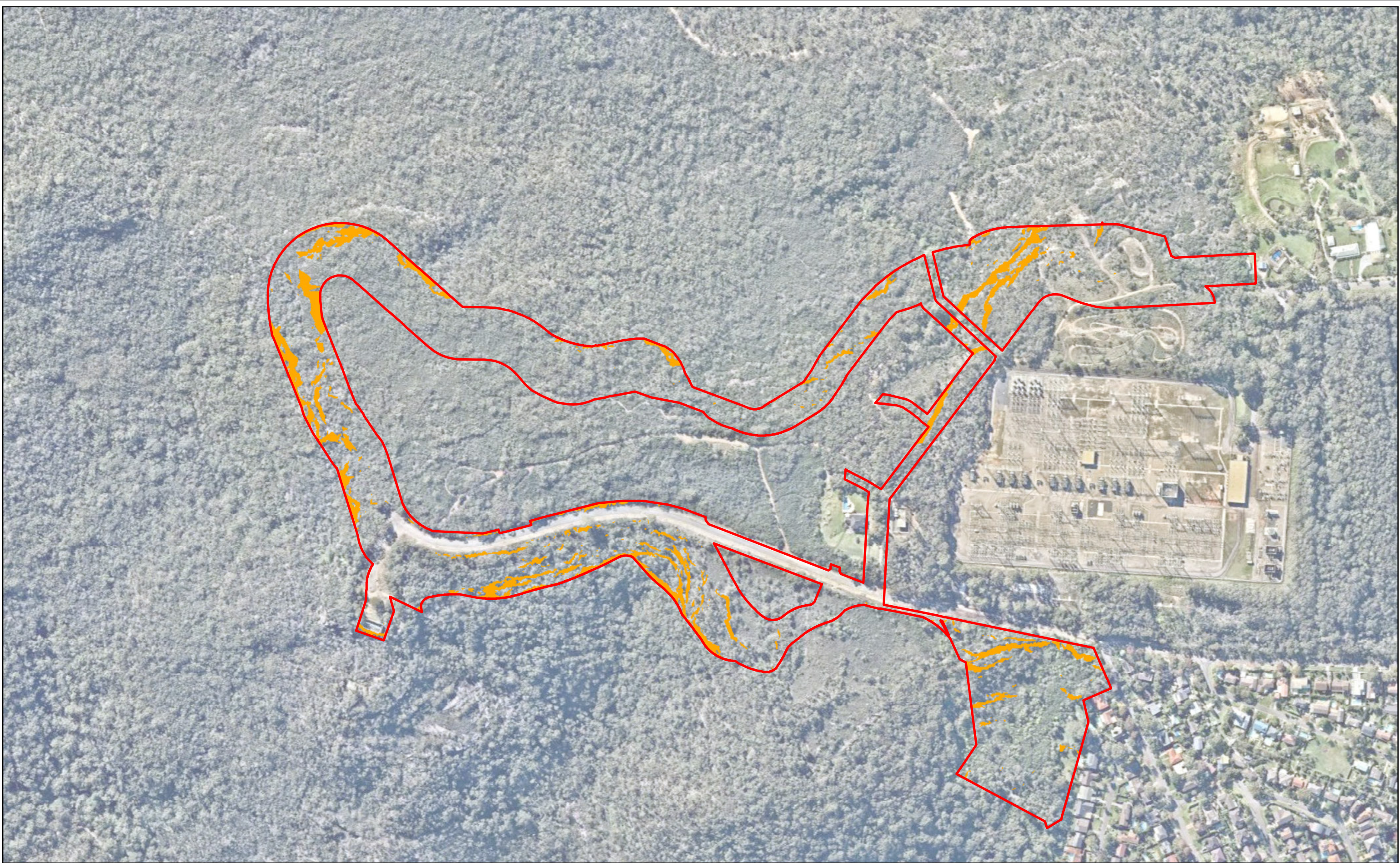
It is fact that the proposed development will result in the removal / modification of approximately 24ha of vegetation and the future subdivision of the site will comply with the BAL 29 provisions of *AS3959 Construction of Buildings in Bushfire Prone Areas* and *PBP* with the implementation of APZs, that exceed the minimum dimensions required by *PBP*, as well as compliant access and dwelling construction in accordance with *AS3959*.

Blackash has an apparent misunderstanding of the hazards affecting the development site. Our mapping shows the true bushfire behaviour potential via the slope gradients that occur and the type of hazardous vegetation that occurs. Indeed our report provides compliance with *PBP* requirements for slopes within APZs and slopes external to APZs in the hazard environment. In that regard we can advise;

- All asset protection zones are located on lands with a slope gradient predominantly less than 18 degrees – see Figure 4 '*Slope classification >18 degrees within the APZ*'.
- All hazardous lands, out to 100m, are less than 20 degrees. See Figure 5 '*Forest vegetation located on slopes >20 degrees*'.

LiDAR mapping has been used to validate the slopes gradients.

The implementation of the measures outlined in the bushfire protection assessment report prepared by this firm, the works required to be undertaken on the *Transgrid* easements, along with the bushfire planning amendments will result in an overall decrease in risk to the surrounding residential communities. Thus, the risk posed to the existing assets can be reduced by allowing the planning proposal to proceed.



Legend

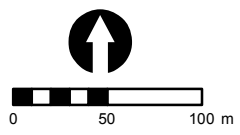
Entire APZ

Slope classification (source: LiDAR)

0 - 18°

>18°

Aerial source: Nearmap



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
 Belrose
 A15056B2_BF002

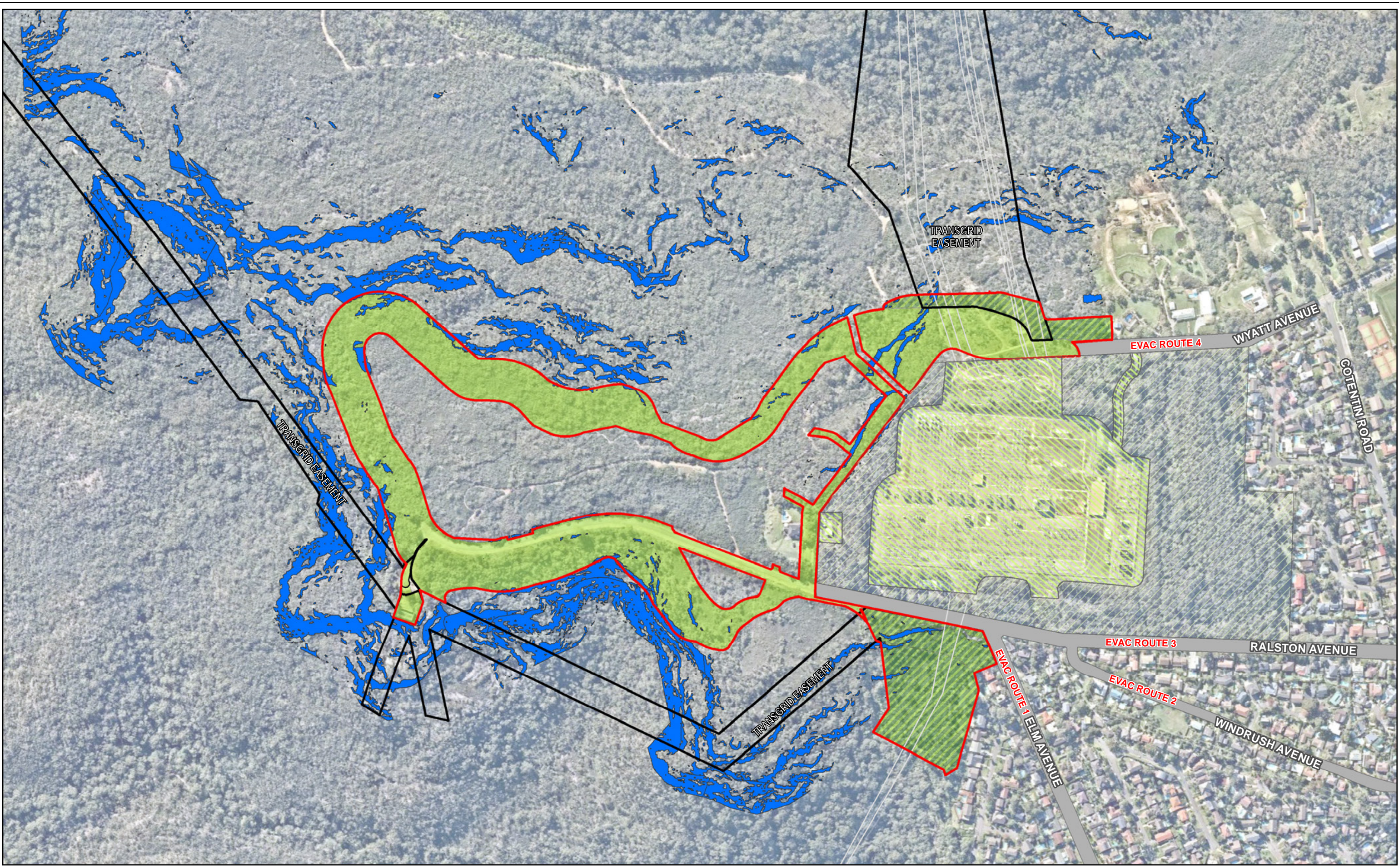
DATE & ISSUE NUMBER
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 Issue 1

SCALE & COORDINATE SYSTEM
 1:4,000 @A3
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TITLE
Figure 4 - Slope classification >18 degrees within the APZ

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Legend

- Entire APZ
- Revised Asset Protection Zone (APZ)
- Transgrid managed land
- Additional APZs for electrical easements
- Land subject to Transgrid Bushfire Management Plan (BMP)
- Forest vegetation located on slopes greater than 20° (Source : TBE ,2015)

Aerial source: Nearmap

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
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SCALE & COORDINATE SYSTEM
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TITLE
Figure 5 - Forest vegetation located on slopes >20 degrees



Retained risk in the Sydney region

Belrose is no different to other residential communities abutting bushland which rely upon the local bushfire protection committee to manage the bushland under their area of responsibility.

An example of this is the hazard reduction burns recently undertaken on the Belrose planning proposal landscape (2016) and this action is but one example of how our integrated approach to fire management occurs in the greater Sydney region. The action has a marked benefit to the residential communities that live adjacent to Wyatt Avenue, Ralston Avenue and Elm Avenue.

It is these comprehensive and integrated measures in combination that deliver an effective response to living in bushfire prone areas.

Risk Assessment

The *Blackash* report references *ISO3100 Risk Management – Principles and Guidelines*.

We have prepared the risk assessment in accordance with *ISO3100 Risk Management* (as required under *ISO3100*) and this is located in Appendix 1 to this response. This includes evaluating egress capacity for fire fighters, evacuation capacity of the future residents as well as provision of safe refuges within the site.

As outlined in this report the provision of additional APZs adjacent to access roads, ensuring ongoing maintenance of vegetation below power lines and provision of a safe refuge within the planning proposal boundary will support the risk rating of Medium to High. The risk rating confirms that risk levels identified within the risk analysis process are appropriate.

Managing the risk

In response to the RFS position on who should manage the fuels it has been decided to change from the land owner undertaking that role to a community title development model whereby land owners would manage the fuels in an integrated manner.

The fuel management plan prepared by this firm provides a comprehensive approach to the management of the hazardous fuels on this landscape both in asset protection zones to protect dwellings and also for roadside protection during evacuation. Amendments will be required to the 2016 FMP to reflect recent changes and likely approval conditions from the RFS and Council.

The FMP also provided recommendations for the implementation of strategic fire advantage zones (SFAZ) to provide additional long term protection through ecological burning regimes and overall reduction of fuels. It is important to note that it is rare for a development to have control over the wider landscape influencing bushfire risk in order to have the ability to manage that risk.

The planning proposal presents the unique opportunity to manage SFAZ's surrounding the development site on top of the usual array of protection measures limited to PBP such as asset protection zones and compliant access.

Comparisons with Victoria

The *Blackash* report draws on examples from Victoria and the outcomes of the 2009 Victorian Bushfires Royal Commission (VBRC). *Blackash* then states that NSW has a long

history of catastrophic bushfires and then proceeds to report on available examples of lives and assets lost in the Victorian fires. This is an alarmist view and evidence suggest otherwise, given that:

- (1) NSW has not been a recipient of catastrophic fires since 1939 where the seasonal climate saw fires still burning toward the end of autumn during a time when NSW had no formal fire management system in position. In 1968 and 1994 NSW also had bad fire seasons with many fires over a large area (850 fires) but they were not catastrophic events.

One fire event at Como / Jannali could be regarded as close to that term but not by the extent of the fire travel length or the width of the fire front. It was because of the fire behaviour on the day that saw a fire ball seemingly fly across the river some 200m and light up an 80m slope of bushland with the loss of many houses and one fatality.

- (2) Victoria has been affected by at least two major events such as Ash Wednesday in 1983 (31 fatalities) and Black Friday in 2009 (173 fatalities). The topographic features of Victoria are vastly different to NSW in that the contiguous undulating landscapes and lack of large river systems enable fire to run long distances when fanned by strong winds. Thus less fires but with greater impact.
- (3) Prior to the Coronial Inquiry into the 2009 Victorian bushfires that state had a poor fire response operation / coordination system that lead to that state having appalling statistics for bushfire fatalities (492 lives lost since 1851). Source; (*Wikipedia* with sourced and / or validated records for most). NSW on the other hand has lost just on 45 lives.

There is no doubt that the fire management system that began in NSW following the 1939 fire season has developed into an international leader of cooperative and coordinated fire service/s (RFS, NPWS, Forestry) whom work together to achieve both community and environmental protection.

- (4) Importantly there are climatic differences between the two states. Victoria has long hot dry spells due to high pressure systems trapped over lower SE Australia creating the perfect environment for fire to continue across the landscape for a week or longer.

On the other hand NSW, particularly Sydney experiences such conditions for shorter periods and often provided with relief by the southerly changes and summer rainfall. Significant research has proven these occurrences over many years resulting in a degree of predictability through the bushfire danger alert system and associated drought indexes used.

- (5) Given the above then the results of research by *Risk Frontiers PerilAus² database* (2013) reveals that Victoria is significantly (65.7%) more prone to bushfire 'house loss' affectation than NSW.

The table below portrays 'house equivalent losses' for bushfire (3rd Row) are 6,445.80 in Victoria and 2,214.76 for NSW.

² *Risk Frontiers PerilAus* database - https://www.riskfrontiers.com/general_info.htm

Table 1: House equivalent losses for all states in Australia for nine different natural hazard categories from 1900-1999 – classified according to the consequential natural hazard. (Source: Risk Frontiers' PerilAUS database)²

	New South Wales	Victoria	Queensland	South Australia	Western Australia	Northern Territory	Tasmania	ACT	Australia
Tropical Cyclone	570.84	0.00	3,462.14	0.00	1,326.64	4,825.74	0.00	0.00	10,185.36
Flood	3,256.44	1,706.34	4,084.19	10.00	799.24	2,267.52	107.20	4.00	12,234.93
Bushfire	2,214.76	6,445.80	25.00	733.63	233.03	0.00	1,648.36	1,108.15	12,408.72
Gust	1,010.46	558.91	1,267.12	133.98	66.45	15.17	0.00	0.00	3,052.09
Tomado	1,189.81	152.84	169.09	13.75	111.52	0.00	0.00	6.00	1,643.01
Hail	815.14	136.21	530.89	3.59	8.88	0.00	0.00	182.73	1,677.43
Landslide	60.02	1.00	9.28	0.00	0.00	0.00	51.31	0.00	121.61
Tsunami	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Earthquake	2,146.83	7.44	8.70	625.23	247.77	18.72	0.00	7.68	3,062.36
Total	11,264.30	9,008.54	9,556.41	1,520.18	2,793.52	7,127.15	1,806.87	1,308.56	44,385.52

SITE ACCESS

(a) The Blackash report states that the proposal while providing perimeter roads, fails to provide safe access without direct contact with unmanaged bushland areas. The reports do not address or consider the suitability of wider access issues (pg 30)

Proposed access to the site is by the extension of two existing roads through areas of unmanaged and highly bushfire prone vegetation. A number of pinch points within and leading to the site that would compromise access and egress during an emergency. The access roads have the potential to be cut (multiple times) at the pinch points. The number of proposed lots west from the pinch points presents a particular concern.

All access and egress points could be immersed in flame and will at some point have radiant heat levels that will be life threatening to people exposed in the open or in vehicles attempting to flee the site.

The planning proposal complies with the principles for rezoning of residential land as well as the acceptable solutions outlined in *PBP* for subdivision developments.

PBP requires the perimeter road to form part of the APZ (refer page 20 of *PBP*). *PBP* does not provide any recommendations for APZs adjacent to those perimeter roads. As outlined in *PBP* the purpose of the road system is to provide:

- Fire fighters with easier access to structures, allowing more efficient use of firefighting resources.
- A safe retreat for fire fighters; and
- A clear control line from which to conduct hazard reduction burning.

The planning proposal complies with the purpose of the road system and in fact provides a safer outcome than required by *PBP* due to the size of the APZ's required by *PBP*. In addition the design for the planning proposal draws on an internal 'spine' road system that enables all residents, fire fighters and others to move freely on roads not affected by flames and / or severe radiant heat; that could be occurring on the periphery.

Wyatt Avenue and Ralston Avenue are now shown to be protected by the amendments where the high voltage power lines cross. APZs provided in these circumstances have been designed to avoid flame contact to the road even though *PBP* does not require this.

In conclusion, *TBE* can confirm that the planning proposal provides compliance with the requirements for access beyond the acceptable solutions provided with *PBP* (see Figure 2).

(b) Super Lot 3 is bound to the south by a 10m wide road. However, the perimeter road will be cut by fire on the south-east aspect. The perimeter road is above threshold points for life safety.

The APZ to the south-east of Super Lot 3 is based on a tall heath community with a slope of 0–5 degrees. PBP requires an APZ of 15m however an APZ of 17m has been provided (including perimeter road) to any future dwelling on site. The extension of the APZ beyond the road is unnecessary due to the presence of lower hazards within the Coastal Upland Swamp (EEC). The revised APZ to the south-east of Super Lot 3 supports a variable APZ of > 27m abutting the Coastal Upland Swamp.

(c) Super Lot 7 has significant issues with a “cookie cut” to the APZ ... An internal linking road has been provided to the west of the pinch point, which provides an option for people. However, the internal roads where they link to Wyatt Ave and Ralston Ave are pinch points that present life safety issues. pg 39.

The APZ to the north of Super Lot 7 (adjacent to the ‘cookie cut’ is based on a forest community with a slope of 0–5 degrees and reflects the ‘lesser’ threat associated with the lower slopes. The ‘cookie cut’ is the result of a radiant heat line that does not exceed 29 kw/M² determined by vegetation and slope variables, meaning the radiant heat at the building interface does not increase. Notwithstanding this the ‘cookie cut’ constriction has been removed in the amended plan. The APZ to the north of Super Lot 7 within the pinch point is 32m based on a forest community with a slope of 0-5 degrees.

EMERGENCY AND EVACUATION PLANNING

Page 36 of the Blackash report details options regarding evacuation.

The *Blackash* report incorrectly asserts that the site is an isolated rural development. This is not the case as the site is adjacent to the existing Belrose suburb and a major electrical facility. The site is also, as indicated on Figure 6 below, situated less than 2 minutes’ drive to the RFS *neighbourhood safer place/s*. The NSP is a place of safety for a person to shelter during the passage of a bushfire. Currently, the nearest NSPs are located at;

- Belrose Public School on the north eastern corner of Ralston Avenue and Contentin Road, Belrose. This is a direct 2 minute drive in an easterly direction along Ralston Avenue or a 4 minute drive if an alternate route is taken in the event that a bushfire is impacting upon the remnant vegetation within *TransGrid* land.

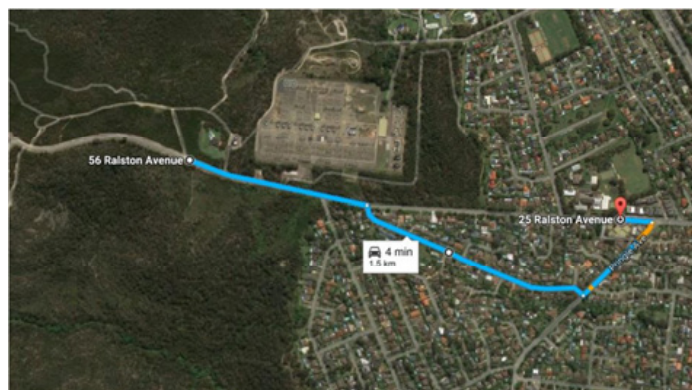


Figure 6 – Neighbourhood Safer Place – Belrose Public School

- Bambara Reserve (Belrose Oval) and Belrose Community Centre on Forest Way (Near Bambara Road), Belrose. This is a 3 minute drive in a southerly drive from Ralston Avenue (refer Figure 7).

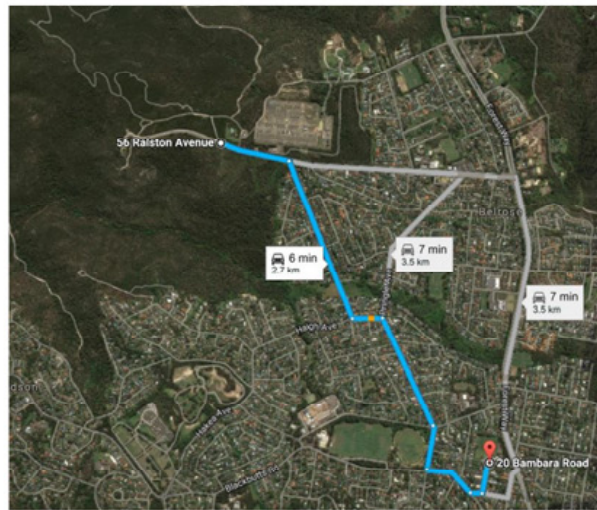


Figure 7 – Neighbourhood Safer Place – Belrose Community Centre

It should be noted that the NSP program is primarily designed for the existing wider community who reside in areas and residential developments that pre-date modern day bushfire development controls and are subject to a higher level of risk mainly due to inadequate asset protection zones, poor access design and no dwelling construction standards. Future development within the planning proposal area will have a level of bushfire protection that exceeds PBP and hence reliance upon NSP would be less so.

Notwithstanding that there is potential for a NSP location within the planning proposal area as a site is available that can comply with the acceptable solutions (based on an FDI 120) identified in the NSW RFS document entitled '*Neighbourhood Safer Places - Places of Last Resort Guidelines 2012/13 Bush Fire Season*'. See Figure 8 below and Appendix 2 attached. This area meets the FDI requirements of the program.

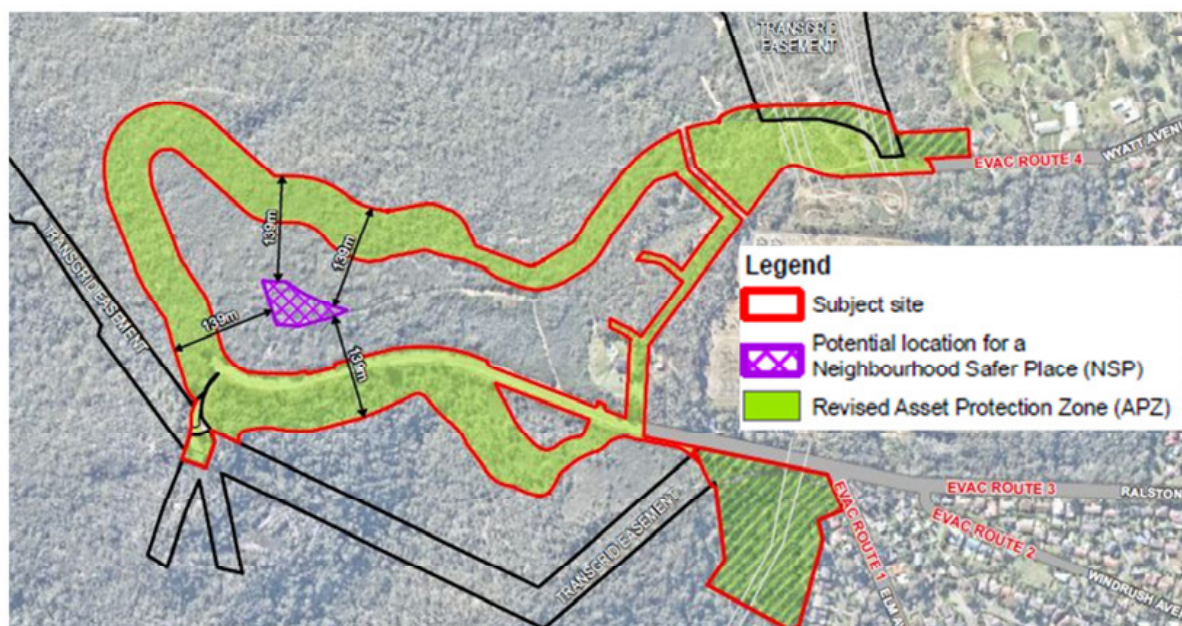


Figure 8 – possible location for NSP

Fire trails

The reports do not show the location of proposed new fire trails with the existing fire trail network within the adjoining Garigal National. This is a particularly relevant matter as the boundary between the APZ, SFAZ and Land Management Zones (LMZ) will need to be delineated to facilitate ongoing management. The boundary between the LMZ and SFAZ will require a fire trail to provide access for fire fighters to undertake strategic planned burning in a safe way. Clarification of this should be sought from the applicant regarding intended locations of fire trails, construction implications, maintenance and agreement from adjoining managers of linkages. pg 33.

A fire trail system design was recommended to link with existing peripheral trails to ensure the ongoing management of the peripheral landscape in both fire management terms and environmental protection terms.

The surrounding land has been subject to a number of hazard reduction burns undertaken by the local fire authorities, most recently within and external to MLALC land in 2009/10, 2012/13 and 2016. These burns have been undertaken in a safe manner based on the current circumstances on ground using existing fire trails and walking tracks.

This planning proposal seeks to work with the existing infrastructure and to provide new linkages to improve the overall bushfire outcome for both the site and the existing adjoining residential lands. These linkages will be discussed with the relevant fire authorities prior to any DA submission for subdivision to determine best use of resources.

Fire trail works will be undertaken in accordance with the design specifications outlined in PBP and in accordance with construction standards set by the RFS and / or Warringah Pittwater bushfire management committee.

These guidelines (as outlined in the FMP) include construction of fire trails with a minimum trafficable width of 4m with an additional 1m wide strip on each side of the road kept clear of bushes and long grass, a maximum grade of 15° (preferably 10°) and a minimum clearance of 4m to any overhanging obstructions, including tree branches.

The boundaries of the SFAZ and LMZ have been designed based on the site features. Boundaries include walking tracks fire trails and easements to ensure strategic planned burning can be undertaken in a safe way.

ASSET PROTECTION ZONES

- (a) The Blackash report states that the TBE Bushfire Report (in general) does offer compliant APZs where they are provided in full. However, there are a number of areas where APZs are not provided that result in pinch points and non-compliant APZs throughout the site. (pg 35)***

The bushfire report provided APZs for all aspects of the development which exceed the minimum requirements of PBP. The resulting APZ line was variable in width due to the varying parameters that give rise to APZ dimension, vegetation classification and slope. The resulting radiant heat is always 29 k/wm² therefore there were no 'pinch points' proposed. These areas represent the lower threat vegetation community or slope profile.

PBP does not require APZs to be measured from the edge of the road. (Importantly the purpose of the APZ is to provide sufficient defensible space in order to protect a building and to provide a workable area in which firefighters and residents can undertake property protection after the passage of a bushfire). Thus the protection of a road enables safe evacuation from at least one of three evacuation routes (via Rawson onto Elm Ave, Rawson onto Windrush Ave and via Wyatt Ave into safe residential zone).

The intent of the performance criteria outlined in *PBP* is to ensure radiant heat levels at any point on a proposed dwelling will not exceed 29kW/m². The acceptable solution to achieve the criteria is to provide minimum APZs in accordance with the relevant tables / figures in Appendix 2 of that document.

The APZs provided within our bushfire report exceed the requirements as outlined within Appendix 2 of *PBP*. The following table provides further evidence of this.

Table 2 – Asset protection zones

Aspect	Hazard / slope	APZ required (Appendix 2 of <i>PBP</i>)	APZ recommended (<i>TBE</i> report)	Amended APZs
North-west, west, south-west	Forest / 18° ^D	60	61	61-74 (including <i>Transgrid</i> assets)
North	Forest / 0-5° ^D	25	32	61
North-east	Tall Heath / 18° ^D	20	23	39
North-east	Forest / 5-10° ^D	35	39	39
East	Forest / Level	20	25	25
East (north of E3 zone)	Remnant vegetation / upslope	10	11	11
East (south of E3 zone)	Remnant vegetation / 0-5° ^D	10	14	14
North-east (adjacent to internal drainage line)	Tall Heath / 0-5° ^D	15	17	17

Table 3 – Additional APZs for electrical easements (*Transgrid*)

Aspect	Hazard / slope	APZ required (Appendix 2 of <i>PBP</i>)	APZ recommended (<i>TBE</i> report)	Amended APZs
North-east	Forest / 5-10° ^D	35	39	35-60
South-east	Forest / 5-10° ^D	35	N/A	>200

The APZs recommended in our report exceed those required under *PBP*, particularly in association with the forest communities. This is based on the fuel loads that were used in our assessment. *PBP* calculations allow for a forest fuel load of 20/25 t/ha, *TBE* has used a worst case scenario of 25/35t/ha.

As a result, *TBE* can confirm that the APZs provided in our report are compliant and exceed the minimum requirement of *AS3959*.

(b) The Blackash report identifies the following anomalies which they find are evident from the APZ configuration.

1) Super Lot 1 provides a Duffys Forest Pocket Park. This remnant area of open forest has direct linkage with unmanaged vegetation from the north-west and should not be classified as remnant with reduced APZ requirements.

The Blackash report states that a detailed assessment of slope and APZs should be undertaken as a range of slopes are located within this area and recommends an APZ of at least 25m in this area. Alternatively this Pocket Park should be managed as an Open Space area to remove the pinch point.

Significant environmental studies have been undertaken in support of the planning proposal and APZs have been designed to minimise the impacts on environmental features. The purpose of the park is for the protection of the local Duffys Forest endangered ecological community. As a result, the pocket park cannot be managed as an Open Space area. Notwithstanding that this E3 area has been reduced in area – see Figure 2.

2) Super Lot 7 has significant issues with a “cookie cut” to the APZ ... which will most likely result in Lots 90-94 and potentially 80-87 being above 29kWm minimum of PBP. This presents significant safety issues

The plan has been amended – see Figure 2.

The TBE Fuel Management Plan does not address the likely external drivers for additional areas to be established and maintained as APZs (pg 41). The Blackash report outlines the likelihood of additional APZ clearance being undertaken after development consent is issued via the following process

- **Hazard complaint process under the RF Act**
- **10/50 Vegetation Clearing Code of Practice**

The purpose of the FMP was to guide future management of the development site and the broader MLALC land. It did not require any further assessment regarding the ‘possibility’ of further clearance after development consent as the hazard complaint scenario is not applicable due to the ‘one entity of management’ i.e. the community association. In addition the 10/50 rule is not applicable after development consent.

HIGH VOLTAGE POWER LINES

The Blackash report identifies the land to the east of the site as supporting TransGrid asset, Sydney East Sub Station and associated infrastructure such as high voltage powerlines and a communications tower. Wyatt Avenue and Ralston Avenue each have three 330kva high voltage power lines above them. The Blackash report identifies the potential for arcing to ground. The following issues have been raised:

- **Fire fighting and power companies have guidelines that prohibit operation under high voltage power lines and require extensive exclusion zones to be enforced**

- ***The location of the power lines above the two access points into and out of the site will required access to be cut which will prevent fire fighter access and resident evacuation***

The land under the power lines has been identified on the amended planning proposal plans as an APZ. This action is within the power of the electrical authority and the land owner / applicant to manage that land accordingly.

Notwithstanding those plan changes the *CFU – Safe work Information Sheet for Power Lines* states that during a bushfire incident, there is a high risk that smoke can cause electricity from high voltage 330 kV power lines to flow to the ground similar to a lightning strike. When fire and smoke is underneath, or within 25 metres of high voltage power lines, the risk of plasma strike is greatly increased.

Whist adequate APZs (i.e. exceeding 25m) can be applied on either side of the power lines the potential impact is suitably mitigated and ongoing maintenance of the APZ under the easement can occur to ensure the conductors are sufficiently high above the vegetation so it is not significantly affected by bushfire.

Tower bases and poles will have *additional clearing to further reduce the bushfire risk*. This maintenance can be undertaken on a regular basis which can exceed the standard schedules maintenance undertaken by *TransGrid* in accordance with their standard comprehensive management plan.

BURDEN ON EMERGENCY SERVICES

During significant fire events the potential for the site to be exposed to multiple fire fronts, emergency services are likely to be stretched beyond reasonable limits and, more likely than not, services would not be able to be tendered to all of these new developments.

The planning proposal requires most careful consideration, both in terms of the capacity of emergency services to serve these communities during significant events and, indeed, for these communities themselves to understand risk and to cope with significant events.

The planning proposal will be provided with the full suite of bushfire protection measures to ensure compliance with *PBP* in terms of access, asset protection zones, water supply, building construction and utilities.

In addition, compliant APZs will also be provided to the main access routes. These measures have been designed to improve the existing situation for the surrounding community and to support fire fighting operations.

Should the fire authorities deem additional fire fighting resources are required then that application can be brought forward in the appropriate manner during the process of exhibition (e.g. Section 94 Contributions).

A PLAN FOR GROWING SYDNEY

The Blackash report states that the proposal does not examine the strategic planning requirements of Plan Sydney, particularly as it relates to evacuation.

A Plan for Growing Sydney recognizes the need for a risk-based approach to planning and considering development and ensuring that new developments will not be placed in harm's way and will not increase risk (p103).

The planning proposal sets out consistency with the *NSW Department of Planning and Environments (DoPE) guideline A Plan for Growing Sydney (DoPE 2014)* is a requirement specifically identified in the DoPE Gateway Determination for the planning proposal.

TBE acknowledge the risk of bushfire to the planning proposal. The amended plan provides the planning and controls such that the development can provide for safe evacuation beyond the acceptable solutions provided with *PBP*.

This can be provided with the provision of asset protection zones adjacent to the main entry and exit points as displayed on the attached plans – see Figure 2.

S.177 DIRECTION 4.4 PLANNING FOR BUSHFIRE PROTECTION 2006.

Direction 4.4, *Planning for Bushfire Protection* identifies matters for consideration for planning proposals that will affect, or are in proximity to land mapped as bushfire prone.

The Blackash report states that the controls have been outlined in the TBE report, however do not adequately discuss or determine s.177 Direction 4.4 Planning for Bushfire Protection 2006 to ensure that rezoning of an area is appropriate for future development and that inappropriate development is not facilitated in hazardous areas.

In response, TBE provide the following summary response in Table 4. This outlines the requirements that are to be considered as well as a statement (by TBE) responding to compliance or not with the requirements.

TBE dealt with this matter in the response to the RFS (November 2016) and that should be read in conjunction with the information provided here.

Table 4 – Direction 4.4 compliance

Direction 4.4	Compliance statement
In the preparation of a planning proposal the relevant planning authority must consult with the Commissioner of the NSW Rural Fire Service	Yes. The NSW RFS has been consulted with correspondence from the RFS dated 25/2/2015, 26/6/2015, 9/7/2015 and most recently (undated) but received by this firm in September 2016.
A planning proposal must:	
(a) have regard to <i>Planning for Bushfire Protection 2006</i> ,	Yes. A bushfire protection assessment report and fuel management plan were prepared in 2015 along with addendum advice in November 2016 in accordance with <i>PBP</i> .
(b) introduce controls that avoid placing inappropriate developments in hazardous areas, and	Yes. The response to the NSW RFS on November 4 2016 advised of additional bushfire protection measures beyond those required in <i>PBP</i> . Those measures will form the development control measures and be provided within the Area Plan thus designing future residential development appropriate for the level of risk.

Direction 4.4	Compliance statement
	Importantly the development is not deemed inappropriate) i.e. not a school or retirement village) and the proposed controls are in accordance with PBP to address the level of hazard.
(c) ensure that bushfire hazard reduction is not prohibited within the APZ.	Yes. Significant environmental studies have been undertaken to ensure APZs have been excluded from environmentally significant land.
A planning proposal must, where development is proposed, comply with the following provisions, as appropriate:	
(a) provide an Asset Protection Zone (APZ) incorporating at a minimum: (i) an Inner Protection Area bounded by a perimeter road or reserve which circumscribes the hazard side of the land intended for development and has a building line consistent with the incorporation of an APZ, within the property, and (ii) an Outer Protection Area managed for hazard reduction and located on the bushland side of the perimeter road,	Yes. The APZs recommended exceed the minimum requirements outlined in <i>PBP</i> for subdivision development (i.e. Appendix 2 of <i>PBP</i>).
(c) contain provisions for two-way access roads which links to perimeter roads and/or to fire trail networks	Yes.
(d) contain provisions for adequate water supply for firefighting purposes	Yes. Water supply will comply with <i>PBP</i> .
(e) minimise the perimeter of the area of land interfacing the hazard which may be developed	Yes. The perimeter is located on a level terrace and circumscribes the edge of the downslopes resulting in the best design possible. Intrusions of bushland into the development have been removed and minimised to allow safe evacuation.
(f) introduce controls on the placement of combustible materials in the Inner Protection Area.	Yes – can be a condition of consent at DA stage.

RFS PRACTICE NOTE 2/12 – PLANNING INSTRUMENTS AND POLICIES

The Blackash report states that the planning proposal does not consider or address the appropriateness of the development in relation to the RFS Practice Note 2/12.

The RFS Development Control Note 2/12 provides advice in regard to development control matters to be considered within an LEP where development occurs on bushfire prone lands. Appendix 2 within the DCN 2/12 provides clarity of the intent required by the RFS.

For the purposes of applying the requirements of DCN 2/12 this information is provided below. Compliance with the requirements has been achieved and responded to in the amendments made to the planning proposal and the comprehensive documentation that is attached to the proposal.

Table 5 – RFS Practice Note 2/13 objectives

Objectives to clause	Travers bushfire & ecology response
1. The objectives of this clause are as follows:	
<p>(b) to minimise the bush fire risk to life, property, heritage values and the natural environment associated with the use of land consistent with the principles of ecologically sustainable development, and</p> <p>(c) to allow development on land that is compatible with the land's bush fire risk, and</p> <p>(d) to ensure ongoing maintenance of bush fire protection measures will be feasible, and</p> <p>(e) to avoid significant environmental and visual impacts of the clearing of vegetation for hazard reduction activities related to the development, and</p> <p>(f) to avoid significant adverse impacts on the availability of emergency services to effectively control major bush fires, and</p>	<p>(b) The planning proposal responds to the requirements of the Ministerial Direction Section 117(2) Planning for Bushfire Protection, the Rural Fire Service Planning for Bushfire Protection (2006). All environmental and ecological protection has been undertaken in accord with the Environmental planning and Assessment Act and the Threatened Species Conservation Act.</p> <p>Development areas have be identified on the basis of applying RFS PBP criteria and validating against slope and vegetation parameters and then applying suitable access criteria to achieve acceptable risk.</p> <p>A comprehensive fuel management plan has been prepared along with a method of funding for the ongoing maintenance of bush fire protection measures.</p> <p>No significant visual impacts will occur.</p> <p>The perimeter road system along with the central spine road design and multiple evacuation routes enable safe operational capability.</p>
2. This clause applies to land identified as bush fire prone land (*see note)	
3. Development consent must not be granted to development on land, to which this cause applies unless, in the opinion of the consent authority the development:	
<p>(a) does not result in the location of increased development or infrastructure in areas exposed to unreasonable bush fire risk, or require an increase in measures to manage bush fire risk by other land owners / managers, and</p> <p>(b) will achieve an appropriate balance between the conservation of the natural environment and the provision of appropriate bush fire protection measures, taking into account the significance of the vegetation and biodiversity corridors, and</p> <p>(c) will include adequate measures to enable the safe evacuation of people from the locality during a bushfire, and</p>	<p>The development design does not increase the development to increased bushfire fire risk as the design measures are in accord with bushfire planning guidelines and risk is appropriate. As such bushfire protection measures will be increased in accord with those guidelines.</p> <p>The appropriate balance has been achieved with significant conservation lands retained and balances by additional offset lands which are adjacent and not off site.</p> <p>Three access routes are available.</p>

Objectives to clause	<i>Travers bushfire & ecology response</i>
<p>(d) will enable adequate access to that locality by emergency services, during a bush fire including the provision of fire trails where necessary, and</p> <p>(e) is unlikely to result in unsustainable social and economic costs to the community as a consequence of managing bush fire risk, and</p> <p>(f) will ensure the ongoing provision and maintenance of the full suite of bush fire protection measures without unreasonable cost to the community, and neighbouring properties, and</p> <p>(g) will ensure the ongoing maintenance of the suite of bush fire protection measures to be carried out, and</p> <p>(h) conforms with the aims and objectives set out in the document entitled Planning for Bush Fire Protection, ISBN 0 9751033 2 6, prepared by the NSW Rural Fire Service in cooperation with the Department of Planning, dated December 2006, or any document/s that supersedes this.</p>	<p>Access roads have been designed to create safe egress along three (3) evacuation routes.</p> <p>The community title association will fund all ongoing fire protection works after construction works.</p> <p>The construction works will apply all RFS PBB bushfire protection measures and home owners will build in accord with AS3959 and the additional requirements of PBP Appendix 3.</p> <p>The community title association and or home owners will fund all ongoing fire protection works after construction works.</p> <p>The planning proposal responds to the requirements of Rural Fire Service Planning for Bushfire Protection (2006).</p>

The Blackash reports says it will be necessary to undertake a risk assessment of the area in respect to bushfire to identify potential bushfire risks to individual sites, localities and proposed forms of development. A constraint assessment will identify elements which may restrict development or that will be impacted upon by development such as water supply, access and evacuation.

TBE have also undertaken a risk assessment (refer Appendix 1) of the post development site. This assessment includes evaluating egress capacity for fire fighters, evacuation capacity of the future residents. As outlined in this report, the provision of additional asset protection zones adjacent to access roads, ensuring ongoing maintenance of vegetation below power lines will support the overall risk rating of Medium to High.

Conclusion

In conclusion we can advise that;

- The R2 low density residential zoning is a suitable development class and is unremarkable in comparison to other similar topographical developments.
- The requirements established in *s.177 Direction 4.4 Planning for Bushfire Protection and Plan Sydney* have been satisfied.

- Safe evacuation can be provided through three evacuation routes leading through established residential areas and away from the hazard.
- APZs can be provided that exceed the minimum requirements of PBP 2006 and AS3959.
- The wider landscape beyond the APZ will be managed by Strategic Fire Advantage Zones.
- Adequate APZ's adjacent to power lines will be implemented to ensure access is not affected by unmanaged lands.
- The planning proposal will improve bushfire protection measures afforded to existing development through the removal of hazardous vegetation and improved access for firefighting suppression.
- Costs for the development and implementation of bushfire protection measures will be imposed on the landowner and the developer.
- There have been no additional burdens on emergency services demonstrated.
- Environmental constraints have been minimised

Therefore there can be no doubt that the Rawson Avenue planning proposal has been subjected to comprehensive bushfire assessment and fuel management planning initiatives. Coupled with the proposed community association management approach the planning proposal fulfils all the requirements of the Section 117 Direction, PBP, DCN 2/12 and AS3959.

The detailed measures outlined within the planning proposal encapsulates the planning, design and control specifications for safe residential occupation.

We therefore advise that in regard to bushfire planning the planning proposal should proceed.

END

Appendix 1

Risk assessment (post development) in accordance with ISO31000 Risk Management – Principles and Guidelines

In response, *TBE* has undertaken a further review of the overall risk posed to the planning proposal (post development) in accordance with ISO31000 Risk Management – Principles and Guidelines.

Risk assessment

The following risk analysis has been undertaken based on consequence and likelihood ratings to then apply the relevant risk category (Extreme – Low).

The risk assessment has been undertaken for residential dwelling assets (i.e. human settlement assets). It is not envisioned that special fire protection purpose development (SFPP) (i.e. childcare, educational establishment or hospital) will be developed on site. Any such development would require a separate development application with no guarantee of approval. Again, it is acknowledged that home based child care can occur without Council consent.

Consequence

Consequence is the outcome or impact of a bushfire event. The identified assets have been assessed in terms of the consequence of a bushfire impacting on these assets.

There are four (4) possible consequence ratings: minor, moderate, major and catastrophic.

The assessment process for consequence is determined using a potential fire behaviour model (i.e. vegetation, slope, fire run distance and separation distance).

The vulnerability and preparedness of the asset / occupant to a bushfire was also assessed and a rating assigned. These ratings are then used to assess the consequence of a bushfire impacting upon a human settlement asset.

Based on a forest fuel load, slopes of greater than 15 degrees and fire run distances of greater than 200m a 'very high' hazard rating is applied.

Based on the fact that any future development will comply with *PBP* the preparedness of the community is considered either 'proactive' or at worst case 'aware' (i.e. buildings and occupants are well prepared, APZs are maintained and building construction standards apply).

As a result a 'moderate' to 'major' consequence rating can be applied.

Likelihood

The likelihood of a fire occurring and impacting on each of the above mentioned assets was assessed. This process involves the consideration of fire history, sources of ignitions, known fire paths, access, containment potential and potential fire run.

There are four (4) possible likelihood ratings: unlikely, possible, likely and almost certain – see explanation below.

Table A1.1- Explanation of Likelihood

	Fires are expected to spread and reach assets	Fires are not expected to spread and reach assets
Fires occur frequently	Almost certain	Possible
Fires occur infrequently	Likely	Unlikely

The ‘**likely**’ rating has been applied which is consistent with the Bushfire Risk Management Plan. This assumes that a fire will probably occur or be exceeded once in every 10 years.

Identifying the level of risk

The consequence and likelihood ratings were then used to identify the level of risk.

There are five (5) risk levels - insignificant, low, medium, high and extreme.

As outlined in the following table based on a likelihood of ‘likely’ and a consequence rating of ‘major’ to ‘moderate’ the risk rating applied to the site is considered Medium to High.

Table A1.2 – Determining level of risk

Consequence \ Likelihood	Minor	Moderate	Major	Catastrophic
Almost certain	Medium	High	Extreme	Extreme
Likely	Low	Medium	High	Extreme
Possible	Insignificant	Low	Medium	High
Unlikely	Insignificant	Insignificant	Low	Medium

Evaluating the bushfire risk

The identified risk rating has been evaluated to confirm that risk levels identified within the risk analysis process are appropriate and reflect the possible bushfire risk.

This includes evaluating egress capacity for fire fighters, evacuation capacity of the future residents as well as provision of safe refuges within the site.

As outlined in this report, the provision of additional APZs adjacent to access roads ensuring ongoing maintenance of vegetation below power lines and provision of a safe

refuge within the planning proposal boundary will support the risk rating of Medium to High.

Conclusion

Based on the overall risk mitigation measures that will be applied to the development the suitability of the site (under the current planning proposal) for a R2 low density residential zoning and E3 environmental management can be supported.

Appendix 2

Neighbourhood Safer Place

The provision of community centres and/or associated buildings within the development area will allow for a centralised place of safety for future occupants of the site. This refuge building will comply with the same guidelines as those provided for Neighbourhood Safer Place's (NSP). This can be funded through a voluntary planning agreement (VPA).

The function of the building will be to provide a place of last resort for a person to shelter at during the passage of a bushfire front and will be utilised should their personal Bush Fire Survival Plan be unable to be implemented or have failed.

Currently the nearest NSP's are located at;

- Belrose Public School on the corner of Ralston Avenue and Contentin Road, Belrose. This is a direct 2 minute drive in an easterly direction along Ralston Avenue or a 4 minute drive if an alternate route is taken in the event that a bushfire is impacting upon the remnant vegetation within TransGrid land (refer Figure A2.1).
- Bambara Reserve (Belrose Oval) & Belrose Community Centre on Forest Way (Near Bambara Road), Belrose. This is a 6 minute drive in a southerly drive from Ralston Avenue (refer Figure A2.2).



Figure A2.1 – Neighbourhood Safer Place – Belrose Public School

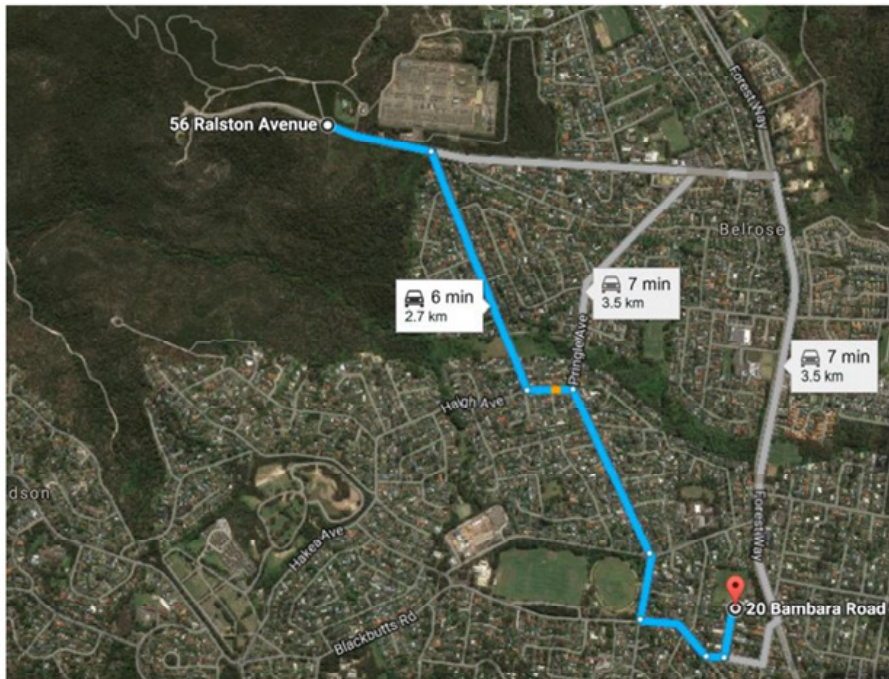


Figure A2.2 – Neighbourhood Safer Place – Belrose Community Centre

The provision of a new NSP, as part of this planning proposal, will provide improved protection for new residents in the event that there is not sufficient time or it is unsafe to travel to the existing NSP's.

The potential NSP location, as identified in Figure A2.3, complies with the acceptable solutions (based on an FDI 120) identified in the NSW RFS document entitled 'Neighbourhood Safer Places - Places of Last Resort Guidelines 2012/13 Bush Fire Season'. The area identified in yellow is provided with a distance of between 40 - 111 from any hazard vegetation in accordance with the acceptable solutions (refer Table A2.1).

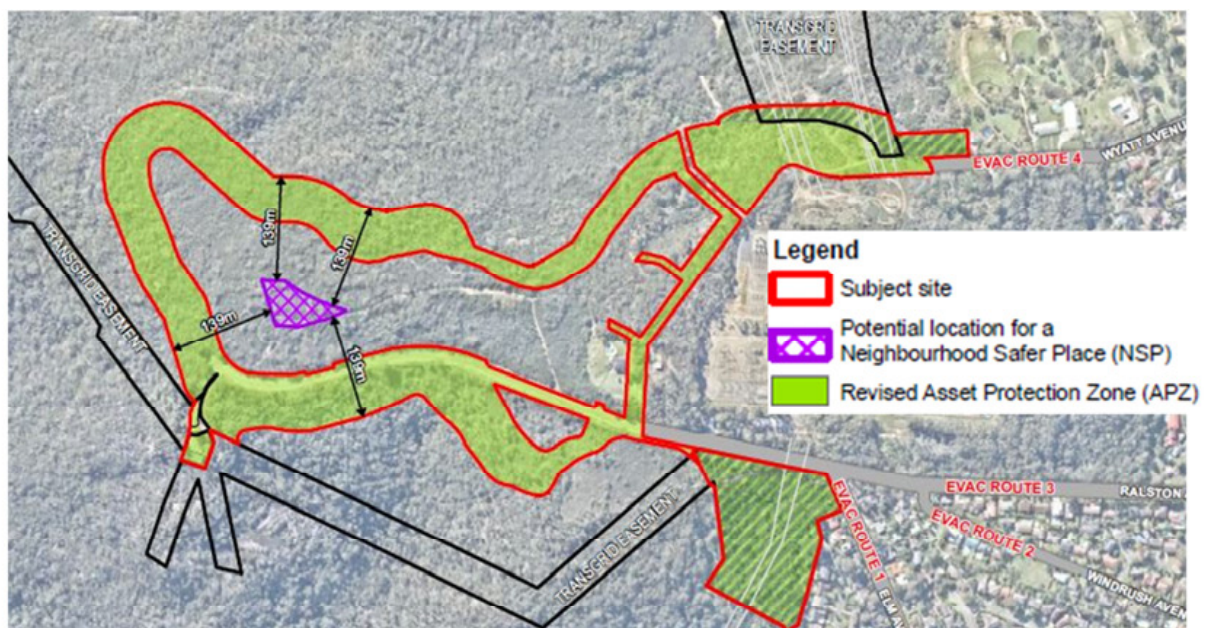


Figure A2.3 – Possible location for Neighbourhood Safer Place Table A2.1 outlines the required performance criteria for the creation of a NSP.

Table A2.1 – Performance criteria for Neighbourhood Safer Place (buildings).

Performance criteria (based on a FDI of 120)	Acceptable solutions (based on a FDI of 120)
Building is located and designed to enhance the chance for survival for humans when impacted by bush fire.	<p>Building is situated to prevent direct flame contact, material ignition and radiant heat levels of:</p> <ul style="list-style-type: none"> • 10kW/m²; or • provide 139 metres separation distance from a hazard
Building is accessible for occupants during a bush fire incident	<p>Arrangements are in place for the building to be accessed 24 hours, seven days a week during the Bush Fire Danger Period.</p> <p>Potential NSPs that have been assessed should be identified in consultation with Local Emergency Management Committees. Notification of their establishment shall be provided to the local Bush Fire Management Committee and Local Emergency Management Committee for inclusion in the local Disaster Management Plan (DISPLAN) and Bush Fire Risk Management Plan (BFRMP).</p>
Integrity of the Neighbourhood Safer Place is not compromised by surrounding vegetation	Maintenance of fuel loads (where appropriate) to the level of an asset protection zone is essential. Maintenance of fuel loads is to be undertaken by the property owner. Inclusion of NSPs in the BFRMP will provide a mechanism to trigger the ongoing maintenance of fuel loads surrounding NSPs.
Provide a valuable community asset as a last resort option for shelter when faced with the immediate threat of a bush fire.	Stakeholders are to be consulted when creating altering and/or inspecting each NSP

Appendix 3

Response to NSW RFS

Our Ref: A15056B2: JT
Council Ref: PEX2013/0003 & 2016/274281
RFS REF: LEP/0129



4 November 2016

The General Manager
Northern Beaches Council
Civic Centre, 725 Pittwater Road
DEE WHY NSW 2259

Attention: Mr M Ferguson

Dear Mark

**Re: Ralston Avenue Planning Proposal
Response to the NSW Rural Fire Service (RFS)**

Travers Bushfire & Ecology ("TBE") has been requested to provide a response to the issues raised by NSW Rural Fire Service ("RFS") in their second round of correspondence regarding the Planning Proposal (PP) for Ralston Avenue, Belrose following the gateway determination. The RFS advise that the Planning Proposal does not conform to the *S117 Direction* and the RFS planning policy entitled *Planning for Bush Fire Protection 2006* ("PBP").

We can advise that the proposed development does comply with the Section 117 Direction, PBP 2006 and AS3959 '*Construction of bushfire prone areas*'. We do note some inconsistencies and amendments have been made to the bushfire protection measures and they are shown on Figure 1.

The Planning Proposal amendments include;

1. Increased APZ's reflecting smoother boundaries, increased depth on the southern aspect and the provision of APZ's on the TransGrid electrical easements lands adjacent to Ralston Avenue and Wyatt Avenue.
2. A reduction of the reserve (E3 Zone) has occurred (0.90ha to 0.66 ha). This is provided given the need to deny fire entering the site from the northwest aspect; and the need to impose a degree of common sense in respect of protecting the land owner's responsibilities (re; Section 63 of the Rural Fires Act) in respect of the TransGrid asset.
3. Improved road alignment in the north east to Wyatt Avenue.
4. Provision of several new fire trails in the vicinity of the TransGrid electrical facility and easement zones; and the landscape west of the Duffys Forest community.

We also note the primary concern raised by the RFS was in relation to the slope gradient within the APZ and external to the APZ. We can advise these concerns are incorrect. Figure 2 shows the true extent of forested lands located on slopes >20 degrees.

No changes have occurred to the sensitive habits features and vegetation systems as recommended by the three (3) ecological expert reports i.e. no additional APZ's extend into these areas. Slight changes to offset values will result from the above changes. This revised plan remains consistent with the *Section 117 Direction* and the specifications and requirements required by *Planning for Bushfire Protection* (2006).

By way of comparison to the Planning Proposal locality the Sydney basin consists of topography and fuel conditions that contribute to an ever present bushfire potential. The ever expanding urban fringe will in most cases be located adjacent to bushland or grassland and with that comes the likely impact of bush or grass fires. One only needs to look at the existing residential development peripheral to Garigal National Park. Whilst these areas were mostly predominantly developed before the advent of contemporary bushfire planning, it is nonetheless apparent that communities can live in a bushfire prone environment when location suitability work in harmony with effective design solutions.

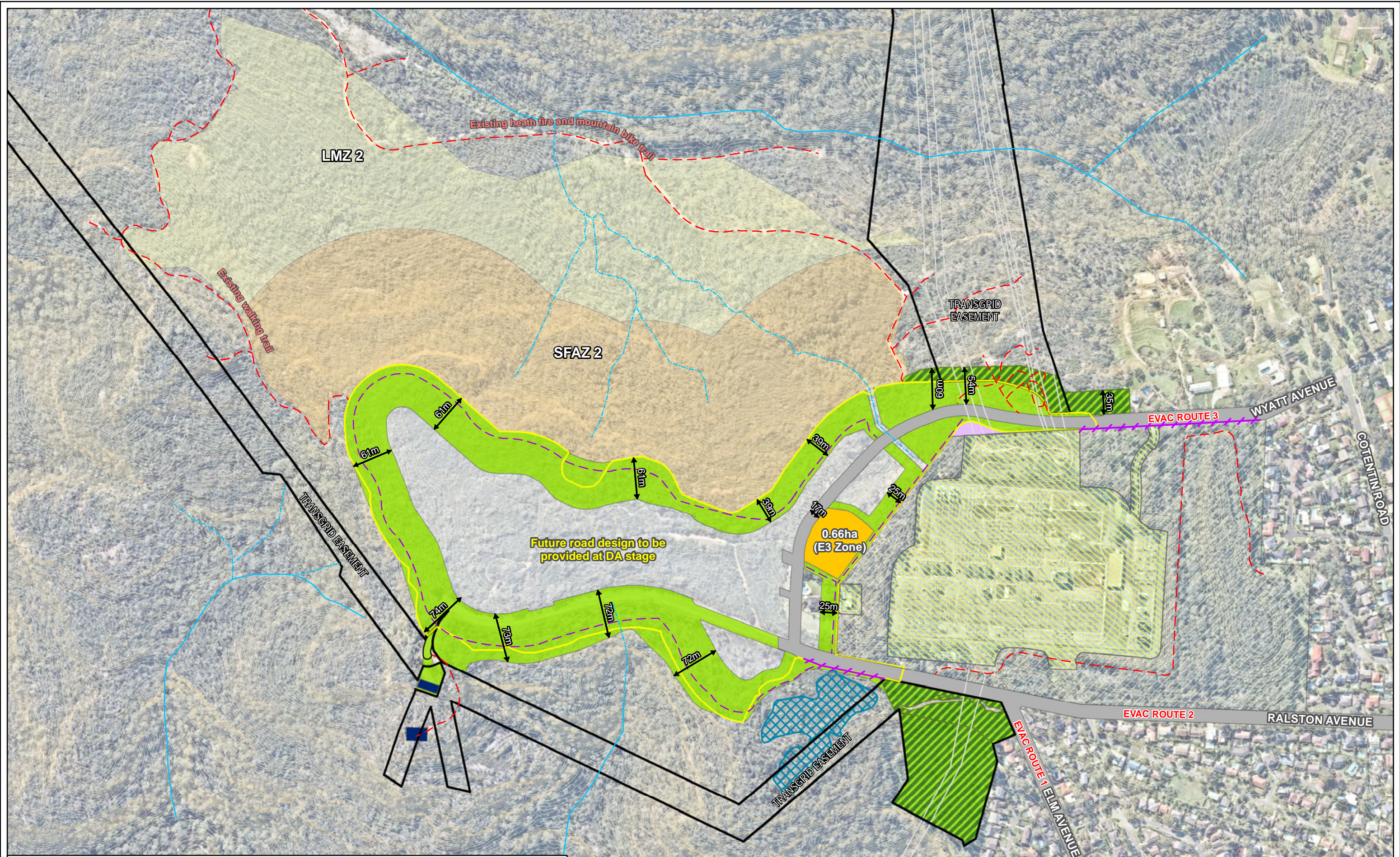
This Planning Proposal is no different in topography to many nearby residential communities, and significant bushfire planning design measures have been implemented in regard to asset protection zones, road access design as well as the ongoing fuel management of nearby hazards. Notwithstanding the extent of planning undertaken to date is compliant with PBP, it is clearly understood that the RFS require additional defendable space in the form of broader asset protection zones and that has been provided.

A more detailed response to the matters raised by the RFS has been prepared and is attached. We look forward to meeting with the RFS to discuss this project in detail.

Yours sincerely

A handwritten signature in black ink, appearing to read 'John Travers', with a large loop at the end of the name.

John Travers
Director – ***Travers bushfire & ecology***



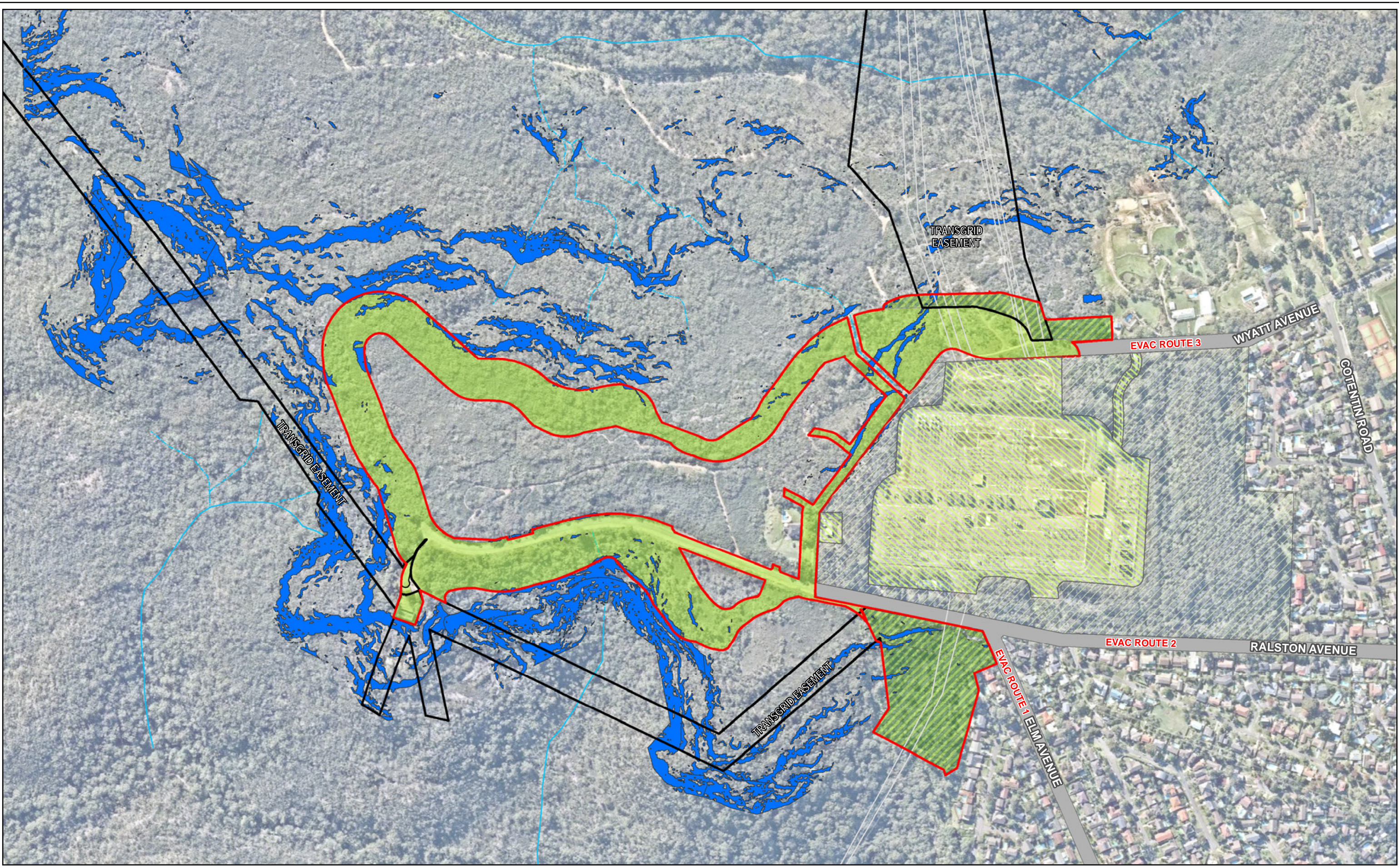
Legend			
	Evacuation route		Existing fire / walking trail
	Transgrid assets		3m radiant heat barrier
	Ecological protection area		Creek line
	Area of <i>G.caleyi</i> specimens (August, 2015)		Ephemeral line
	Coastal Upland Swamp (low fire hazard)		Contour (1m) (source: LiDAR)
	Proposed track		Transgrid managed land
	Land subject to Transgrid Bushfire Management Plan (BMP)		Previous Asset Protection Zone (APZ)
	Revised Asset Protection Zone (APZ)		Additional APZs for electrical easements
	Land Management Zone		Strategic Fire Advantage Zone

Aerial source: Nearmap

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 Ralston Avenue, Belrose A15056B2_BF006	DATE & ISSUE NUMBER 3/11/2016 Issue 1	SCALE & COORDINATE SYSTEM 1:5,000 @A3 GDA 1994 MGA Zone 56
TITLE Figure 1 - Revisions to Planning Proposal (Bushfire)		
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Legend

- Entire APZ
- Revised Asset Protection Zone (APZ)
- Transgrid managed land
- Land subject to Transgrid Bushfire Management Plan (BMP)
- Forest vegetation located on slopes greater than 20° (Source : TBE ,2015)

Aerial source: Nearmap





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
 Ralston Avenue, Belrose
 A15056B2_BF008

DATE & ISSUE NUMBER
 3/11/2016
 Issue 1

SCALE & COORDINATE SYSTEM
 1:5,000 @A3
 GDA 1994 MGA Zone 56

TITLE
Figure 2 - Forest vegetation located on slopes >20 degrees

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Response to the NSW Rural Fire Service Correspondence September 2016

The RFS correspondence received September 2016 raised concerns regarding the consistency of the Proposal in its current form with the *S117 Direction* and the RFS planning policy entitled *Planning for Bush Fire Protection 2006 (PBP)*.

The Section 117 Direction permits development within bushfire prone areas but importantly it requires any such development to *'protect life, property and the environment from bush fire hazards by discouraging the establishment of incompatible land uses in bush fire prone areas and to encourage sound management of bush fire prone areas'*

Section 4.4 of the Direction establishes the bushfire planning criteria for the compilation of any planning proposal. Subsections 1, 5 & 6 deal with actual criteria whilst Sections 2, 3, 4 & 7 are procedural matters for Council and or the RFS.

Objectives

(1) *The objectives of this direction are:*

- (a) to protect life, property and the environment from bush fire hazards, by discouraging the establishment of incompatible land uses in bush fire prone areas, and*
- (b) to encourage sound management of bush fire prone areas.*

(5) A planning proposal must:

- (a) have regard to Planning for Bushfire Protection 2006*
- (b) introduce controls that avoid placing inappropriate developments in hazardous areas, and*
- (c) ensure that bushfire hazard reduction is not prohibited within the APZ.*

(6) *A planning proposal must, where development is proposed, comply with the following provisions, as appropriate:*

(a) provide an Asset Protection Zone (APZ) incorporating at a minimum:

(i) an Inner Protection Area bounded by a perimeter road or reserve which circumscribes the hazard side of the land intended for development and has a building line consistent with the incorporation of an APZ, within the property, and

(ii) an Outer Protection Area managed for hazard reduction and located on the bushland side of the perimeter road,

(b) for infill development (that is development within an already subdivided area), where an appropriate APZ cannot be achieved, provide for an appropriate performance standard, in consultation with the NSW Rural Fire Service. If the provisions of the

planning proposal permit Special Fire Protection Purposes (as defined under section 100B of the Rural Fires Act 1997), the APZ provisions must be complied with,

(c) contain provisions for two - way access roads which links to perimeter roads and/or to fire trail networks,

Response to the Section 117 (2) Direction

1. (a) *to protect life, property and the environment from bush fire hazards, by discouraging the establishment of incompatible land uses in bush fire prone areas, and*

Response – Paragraph 2 RFS Letter

The Planning Proposal has been designed to provide a safe place to live, and along with that objective, a comprehensive hazard management plan has been prepared and this accompanies the Planning Proposal.

In regard to concern regarding incompatible land uses such as child care centres, educational establishments, group homes, hospitals, nursing homes, boarding houses and or bed and breakfast accommodation etc, such uses are not proposed by the Planning Proposal.

The RFS advise that the proposed residential zoning of R2 could lead to incompatible land uses such as child care centres, community facilities, educational establishments, group homes, health consulting rooms, hospitals, places of public worship, respite day care centres and or veterinary hospitals.

Indeed all of these require Consent by Council in accord with Section 79BA of the *EPA Act* or S90 of the *EPA Act* and if they are a *special protection purpose* then they also require approval from the RFS in accordance with Section 100B of the Rural Fires Act.

The applicant has indicated its willingness to agree as part of any development consent to any necessary conditions of consent, covenants or agreements as part of a Planning Agreement to limit any land uses other than dwelling houses as proposed. The community management statement for the community title development may also assist this through restrictions on incompatible land uses as a guiding influence.

Residential development, on the other hand, is not regarded as incompatible as residential communities are regarded as being able to self-evacuate without the assistance of emergency services.

(b) *to encourage sound management of bush fire prone areas.*

Response

The Planning Proposal provides for the effective management of all asset protection zones through an integrated, contiguous and professional approach by the landowner, the Metropolitan Local Aboriginal Land Council. The proposal will provide for a formal structure to manage the bushland and decrease any current risk to existing, future residences and public assets.

This means that the land to which the hazard management would occur was not owned by the future residents but rather the existing adjoining landowner to whom the residents would rely upon to manage the hazards.

The RFS correspondence is not entirely clear on this point but it has been assumed they require that ownership of the hazard management zone should rest with the residents. In this regard the Planning Proposal can be changed so that the residents form a community association under the provision of Community Title with funding of all ongoing works by those residents. We seek the advice of RFS as to whether this position is required.

Initial works to form the APZ will be undertaken by the developer in accordance with the fuel management plan already prepared for the site, and be carried out to the satisfaction of the RFS all prior to lot registration and any build form being located on the development.

Auditing of the works will occur twice per year by an independent arrangement; and respond to the fuel management works outlined in the final fuel management plan approved through the development application processes.

This will see management of all the hazards undertaken to comply with the requirements of *Planning for Bush Fire Protection* and their accompanying document that deals with managing APZ's entitled *Standards for Asset Protection Zones* (2006).

2. (a) *have regard to Planning for Bushfire Protection 2006*
(b) *introduce controls that avoid placing inappropriate developments in hazardous areas, and*
(c) *ensure that bushfire hazard reduction is not prohibited within the APZ.*

Response

The Planning Proposal including the revised plan depicted at Figure 1 complies with *Planning for Bush Fire Protection*.

As previously stated, the Planning Proposal only proposes appropriate dwelling house development, and will restrict other uses in line with previous comments, and will be assisted by the community management statement for the community title development.

Similarly, the hazard reduction needs can be articulated in the community management statement which refers to the formally approved fuel management plan, which ensures that bushfire hazard reduction is not prohibited within the APZ.

6. *A planning proposal must, where development is proposed, comply with the following provisions, as appropriate:*

- (a) *provide an Asset Protection Zone (APZ) incorporating at a minimum:*
 - (i) *an Inner Protection Area bounded by a perimeter road or reserve which circumscribes the hazard side of the land intended for development and has a building line consistent with the incorporation of an APZ, within the property, and*
 - (ii) *an Outer Protection Area managed for hazard reduction and located on the bushland side of the perimeter road,*

Response

The proposed APZ's comply with AS3959 and are based on AS3959 fuel loads for the varying vegetation communities. A perimeter road has been provided.

- (b) *for infill development (that is development within an already subdivided area), where an appropriate APZ cannot be achieved, provide for an appropriate performance standard, in consultation with the NSW Rural Fire Service. If the provisions of the planning proposal permit Special Fire Protection Purposes (as defined under section 100B of the Rural Fires Act 1997), the APZ provisions must be complied with,*

Response

This section is not applicable to the planning proposal.

- (c) *contain provisions for two-way access roads which links to perimeter roads and/or to fire trail networks,*

Response Paragraph 9 RFS Letter

The proposal is compliant with PBP. The primary aim of the proposal was to provide internal 'spine' road design that enabled evacuation to occur through the middle of the site and not via the perimeter roads. Perimeter roads were designed in accord with the PBP.

Typically housing is located on the internal edge of the perimeter road but set back sufficiently to be complying with, or less than, BAL 29 AS3959. This is the typical design feature for residential estates and is replicated in Figure 3 below (Extract from Figure 4.1 of PBP on page 16). The figure depicts the perimeter on the bottom of the diagram and illustrates that flame will engulf the perimeter road.

The APZ is located on slopes generally no steeper than 18 degrees in order to ensure land stability following the removal of vegetation. The exception is where there is insitu stable rock and the RFS recognise this substrate will not lead to soil erosion or other environmental damage. This is a common position of the RFS and is not at all remarkable.

Importantly there has been a revised focus on the asset protection zones to eliminate pinch points adjacent to the electrical easement zones. In that regard these electrical easement are now shown as APZ's but mindful that they are not required to be assessed for the Planning Proposal.

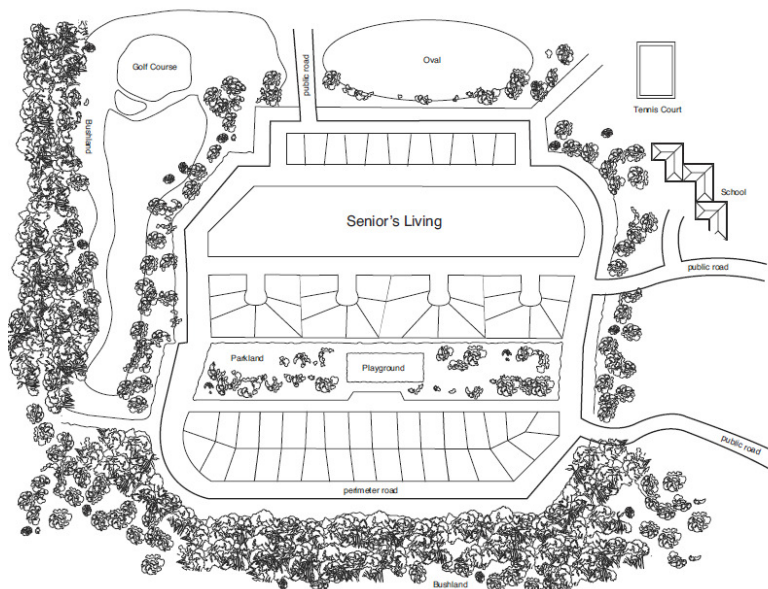


Figure 3 - Extract from Figure 4.1 of PBP on page 16

Comments by the RFS in their September 2016 correspondence

The site is mapped as bushfire prone and is located on an isolated peninsula

Response: Paragraph 3 RFS Letter

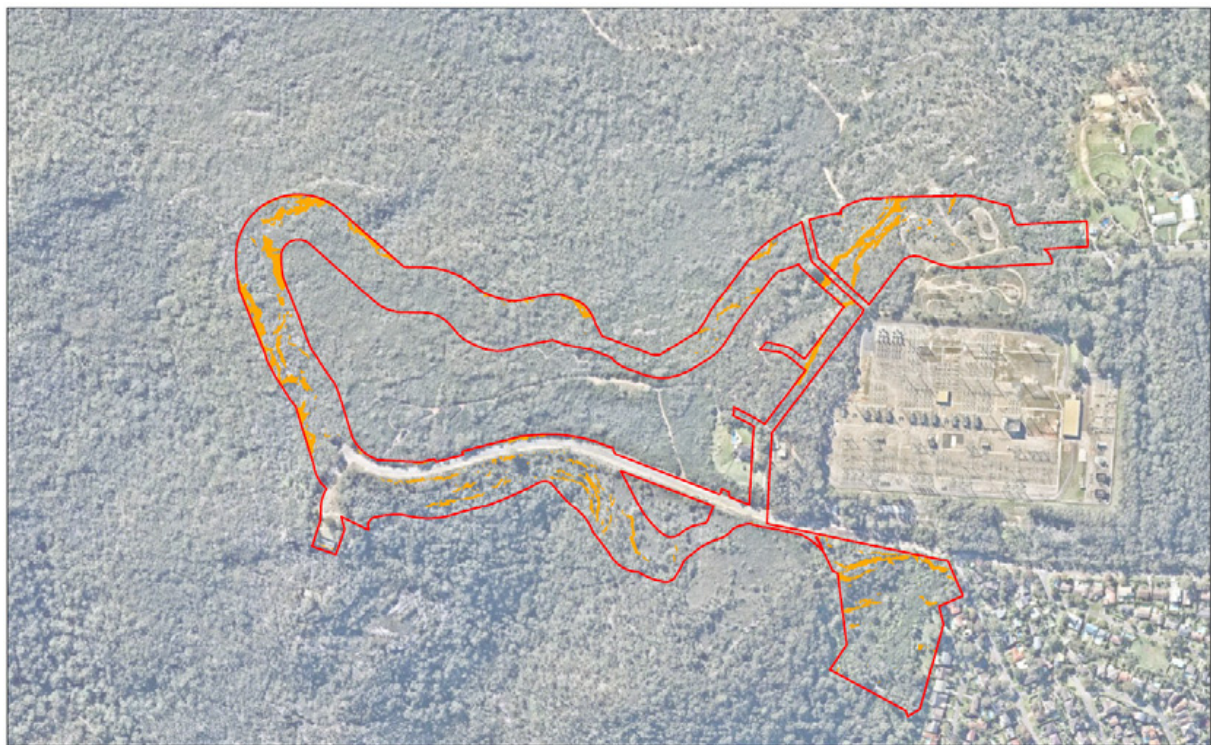
Upon completion the development will provide adjacency to the suburb of Belrose either through development of dwellings/roads or asset protection zones – see Figure 1.

The site has steep down slopes

Response: Paragraph 7 RFS Letter

The matter of slope assessment has been well researched and provided to the RFS.

In addition, a site inspection occurred on 1 October 2015 with the RFS whereby the slopes occurring within the APZ were visually confirmed as being <18 degrees. Figure 4 below depicts the slopes within the APZ. Only a small area of 18 degree land is affected and these areas are sandstone rock shelves.



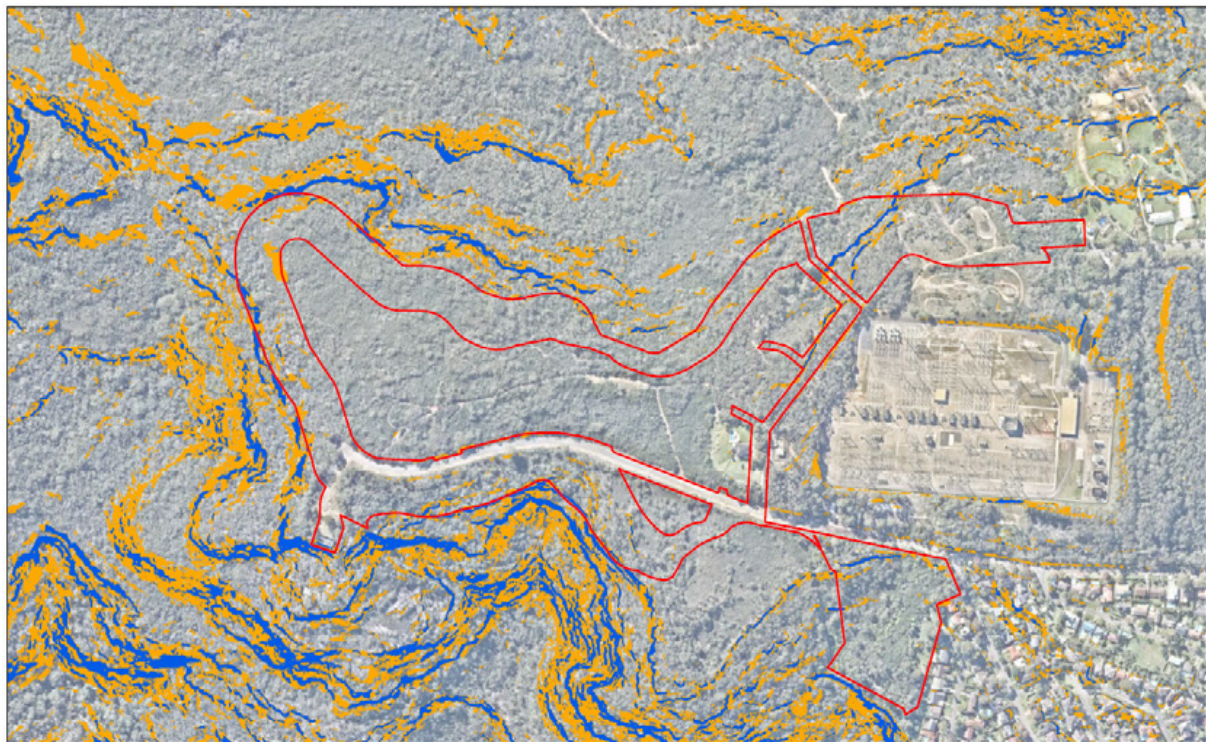
Slope classification (source: LiDAR)

- 0 - 18°
- >18°

Figure 4 – Slopes analysis within the proposed APZ's

Figure 5 shows the bushfire hazards external to the Planning Proposal area.

This shows the majority of the hazards to the north occur on land less than 20 degrees. There are copious sandstone escarpments making up the yellow and blue coloured lands.



Slope classification (source: LiDAR)
□ 0 - 20°
■ 20-30°
■ >30°

Figure 5 – Slope Analysis external to the APZ

Vehicular access to and from the site is problematic due to unmanaged vegetation along Ralston and Wyatt Avenues, with no measures proposed to ensure these evacuation routes remain accessible during a bush fire. The design and layout of the proposal also means that the perimeter road is likely to be cut off in several places during a bush fire, endangering both residents and emergency workers

Response: Paragraph 4, 9 RFS Letter

Several areas located under electrical easements were not identified to contain APZs. These areas are already permitted to be cleared under the provisions of the electrical easement and therefore do not require rezoning and or approval through the Planning Proposal process.

To resolve any confusion these areas are now mapped as APZ's and resolve the pinch points noted by the RFS.

The pinch points are not being affected by sensitive vegetation communities and or sensitive habitat features.

A plan is provided at Figure 1 illustrative of the changes.

The internal road network has been re-designed to ensure evacuation may also occur through the central portions of the development.

The width of the APZ's has been determined using *Lidar* data. Vegetation identification has been confirmed by this firm and a third party ecological firm (EcoLogical). The vegetation communities informed the bushfire attack level and thus the APZ dimension accordingly.

Ralston Avenue

Part of the area south of the Ralston Avenue landscape is classified as 'coastal upland swamp' which is a wet swamp with vegetation rarely exceeding 1.5 metres and mostly between 1.0-1.5m. This is clearly an area of low hazard and subsequently allows for a reduced asset protection zone. Figure 1 depicts this landscape and its extent.

A small area of heath (20m in width) is adjacent to the swamp and will remain. A small APZ will be located between the heath and the road corridor.

The vegetation within the electrical easement south of Ralston Avenue is a transition from heath to forest and a large part of that area will be managed as an APZ.

This means the whole of the southern edge of Ralston Avenue will be managed as an APZ.

The vegetation on the *TransGrid* side of Ralston Avenue is a narrow vestige of uphill slope (up from the road) and is mostly less than 10-12m in width. Only small portions are greater widths and again these are upslope i.e. up from the road.

There is a wider portion at the eastern end of the *TransGrid* land and that land is 180m in length. The evacuation route no 2 does not require passage along that most eastern 180m portion of *TransGrid* vegetation. Rather the evacuation route turns south onto Elm Avenue, midway along the narrow portion of the vegetation, and heads through the suburban area of Belrose – see Figure 1.

Wyatt Avenue

The hazardous vegetation north of Wyatt Avenue is affected by heath vegetation (not Forest) and the slopes are predominantly <18 degrees apart from several small sandstone escarpments which are less than 2m in height (field verified by TBE).

Figure 5 above depicts the slopes. The <18 degrees are the uncoloured areas whilst the >18 degrees are the orange coloured areas. The >18 degree slopes are sandstone escarpments.

The proposed APZ areas are shown as a red polygon.

The result is that the APZ for the eastern section of the development have slopes less than 18 degrees in the APZ. The area that depicts slope in excess of 18 degrees in the most northern red polygon will contain the new public road and thus the land will be reshaped.

Photo 1 below depicts Wyatt Avenue (facing west towards the beginning of the Planning Proposal land). The mown land to the left is part *TransGrid* land and part Wyatt Avenue verge.

Photo 2 depicts the reverse angle looking east and shows the residential nature of the street.



Photo 1 – Looking west along Wyatt Avenue



Photo 2 - Looking east along Wyatt Avenue

Future intensive development will exacerbate concerns.

In addition to the 159 residential lots the following uses may be permitted under the R2 zone – secondary dwellings, bed and breakfast accommodation, boarding houses, childcare centres, educational establishments, group homes, hospitals – all of which will significantly increase occupation of the site. Many of these uses are Special Fire Protection Purpose and are therefore vulnerable to the effects of fire, often difficult to evacuate and more susceptible to smoke impacts.

Response: Paragraph 5 RFS Letter

As previously stated, the Planning Proposal considers the provision of dwelling house development only. While other uses are permitted, they are not proposed and would need to satisfy the requirements pertaining to development assessment (79BA) and or RFS approval (S100B). As indicated, the applicant is willing to restrict uses other than dwelling houses.

The proposal will result in dwellings being located on the interface with slopes exceeding 20 degrees. Current building standards do not provide deemed to satisfy provision for determination of the maximum desired bushfire attack level (BAL 29) in these situations

Response: Paragraph 10 RFS Letter

This is not the case and is dealt with above.

All dwellings will be set well back from the slopes on a level terrace landscape similar to the RFS recommended design below in Figure 6 which is an extract from PBP.

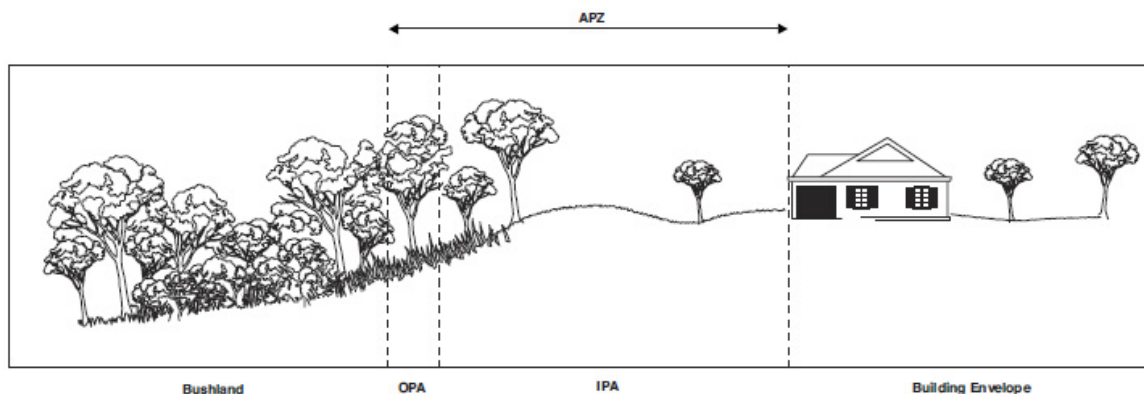


Figure 6 – Extract from the RFS regarding dwelling on hill tops.

AS3959 provides bushfire attack advice in respect of slopes up to 20 degrees. The extent of slopes exceeding 20 degrees is provided in Figure 2 above and do not predominate across the landscape. The fact that some areas are in excess of 20 degrees has in the past not been an impediment to the RFS approving developments.

The proposal involves the location of APZs on adjoining non-residential land. Where an APZ is proposed on adjoining land the consent authority must ensure that a suitable mechanism is established for ongoing maintenance of the APZ for the life of the development.

Response: Paragraph 8 RFS Letter

A community title approach appears to be the favoured approach by the RFS. The community association would be bound under a positive covenant to manage the APZ on an ongoing basis as outlined in the fuel management plan and the community management statement with the terms being agreed during the subdivision development application.

Funding will be via a special fund set aside to support integrated fuel management by professional fuel management staff. Similar arrangements have been successfully implemented within the LGA for bush fire prone areas.

Consultation with the TransGrid asset manager team is also intended to effectively manage the surrounding asset protection zones within the TransGrid land. TranGrid currently undertake hazard management at regular periods to protect their major asset in accord with their comprehensive fire management plan.

The proposed mitigation works to reduce bush fire risk are also not acceptable as they would place increased demand on resources and would not be sustainable.

Similarly, the proposed construction of new fire trails linking with existing fire trails is not supported as the engineering works required would further impact the environment.

Response: Paragraph 11 RFS Letter

Fuel management in the form of APZ maintenance will be undertaken in accordance with the fuel management plan and at the cost of the residents. There would be no burden upon RFS or other government resources services. The fuel management plan issued with the Planning Proposal confirms this approach and confirms appropriate controls can be implemented.

APZs will also be provided to the main access routes and over portions of the transmission line easements – see Figure 1.

The surrounding land has been subject to a number of hazard reduction burns undertaken by the local fire authorities most recently in 2009/10, 2012/13 and 2016. These burns have been undertaken in a safe manner using existing fire trails and walking tracks similar to the way the national parks service manage their adjoining lands.

Indeed the Planning Proposal seeks to work with the existing infrastructure and to provide new linkages to improve the overall bushfire outcome for both the site and the adjoining residential lands. These linkages, through the full extent of the applicants land ownership, will strengthen bush fire preparedness and response for surrounding homes; and will be discussed with the relevant fire authorities prior to any DA submission for subdivision to determine best use of resources.

Fire trail works if required will be undertaken in accordance with the design specifications outlined in *PBP 2006* and in accordance with construction standards set by the RFS and or Warringah-Pittwater Bushfire Management Committee.

Response: Paragraph 12 RFS Letter.

These guidelines (as outlined in the FMP) include construction of fire trails with a minimum trafficable width of 4m with an additional 1m wide strip on each side of the road kept clear of bushes and long grass, a maximum grade of 15° (preferably 10°) and a minimum clearance of 4m to any overhanging obstructions, including tree branches.

These additional fire trails can be located within APZ and existing easement zones to ensure no detrimental impact on the environment. The voluntary planning agreement has been drafted to include for the provision of perimeter walking, running and mountain bike trails around the development area, all generally within the APZ areas. Similar to the existing Heath Fire Trail that is an operating RFS fire trail and is also promoted by Northern Beach Council as part of their mountain bike trail network, both on public and private land.

The boundaries of the SFAZ and LMZ have been designed as a response to terrain features. Boundaries include walking tracks fire trails and easements to ensure strategic planned burning can be undertaken in a safe way, as per the resent bush hazard reduction on the 4 & 5 March 2016.

SUMMARY

In summary, the Planning Proposal is consistent with the objectives set out in the *s.117 Direction*, as well as the planning policy *Planning for Bush Fire Protection*.

The development on completion provides for the effective funding and ongoing management of APZ's and the surrounding strategic fire advantage zone all within the 134 hectare of land that is currently managed by RFS and National Parks.

The development on completion provides for compliance APZ area for the protection of persons, properties and safe evacuation paths.