

Bushfire Protection Assessment Proposed Subdivision

**Vacenta Pty Ltd,
Lot 682 DP 568678, Lot 705 DP 61385
and Lot 810 DP 247285,
Manyana Drive,
Manyana.**

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Executive Summary

This Bushfire Protection Assessment considers the subdivision of Lots 682, 705 and 810 Manyana Drive, Manyana. A residential subdivision is proposed for portions of the land zoned as residential under the Shoalhaven City Council LEP. The proposal will accord to the provisions outlined in the Bushfire Guidelines.

Field surveys were conducted on the 7th and 17th of December 2004 and between the 17th and 21st January 2005. The environmental features of the land surrounding the development, with respect to bushfire protection, are summarised below:

- Access to the site can currently be gained from the eastern end of The Bounty, Manyana Drive, Sunset Strip and The Bulwark;
- Natural vegetation ranging from Group 1 to Group 2 is found across the site. This vegetation extends south and east beyond the boundary;
- Elsewhere, cleared land containing manicured gardens, buildings, bitumen and grassland occurs. This style of vegetation is often considered a buffer from bushfire hazards. Generally evergreen plantings and lawns dominate this vegetation profile; and
- In this case, the slope most significantly influencing fire behaviour with regard to surrounding vegetation is 0-5° up to the south.

Subsequently, the Bushfire Hazard Assessment undertaken for the development is summarised below, as detailed in Table 1 (Appendix 3):

- The bushfire hazard (Group 1 and Group 2) vegetation located on site and to the east and south of the site has the potential to impact upon the subdivision from the south or east. To successfully combat this threat a 30 m perimeter APZ (IPA 20 m + OPA 10 m) is proposed for the south and east of the residential subdivision, this is clearly shown on the Post Development Site Plan in Appendix 5;
- The bushfire attack category assigned to the building envelopes will vary from *High* to *Low* based on their proximity to the bushfire hazard following the implementation of the perimeter APZ. Hence, the construction requirements for each proposed dwelling will vary from the maximum requirement of Level 2 construction to no construction requirement in accordance with AS 3959:1999. The Construction Requirements Map found in Appendix 6, best depicts the construction requirement for each proposed allotment;
- A fire hydrant must be accessible and located such that a tanker can park within a distance serviceable by a 20 m hose and attack a fire originating in the east using a 60 m hose and 10 m jet of water; and
- Public access roads will be provided adjacent to each proposed allotment. It is proposed to position a perimeter fire trail on the Association Property, defining the edge of the IPA and bordering the OPA.

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1 Introduction

This Bushfire Protection Assessment was prepared by PMA Consulting (Engineering & Environmental) and was commissioned by Watkinson Apperley Pty Ltd on behalf of our client, Vacenta Pty Ltd, the owners of Lot 682 DP 568678, Lot 705 DP 61385 and Lot 810 DP 247285, Manyana Drive, Manyana. A residential subdivision is proposed for the site.

The assessment of the site is based on the results of field surveys conducted on the 7th and 17th of December 2004 and the 17th to 21st of January 2005. A Site Plan illustrating the location of the site with respect to access roads, vegetation, slope and neighbouring allotments is included in Appendix 1.

The following pieces of current legislation and guidelines were referred to when preparing this report:

- *NSW Rural Fire Service (RFS) and Planning NSW (2001), 'Planning for Bushfire Protection, A Guide for Councils, Planners, Fire Authorities, Developers and Home Owners';*
- *'Australian Standard 3959-1999 Construction of Buildings in Bushfire Prone Areas';*
- *'Rural Fires and Environmental Assessment Amendment Act 2002'; and*
- *'Rural Fires Amendment Regulation 2002'.*

Please note, that the 'Planning for Bushfire Protection Guidelines' (RFS & Planning NSW 2001) mentioned above, will herein be referred to as the Bushfire Guidelines.

1.1 Description of Proposal

The subject land forms an irregular shaped parcel of land adjacent to the southern edge of the existing residential area of Manyana. The thick line on the accompanying site plans in the appendices designates the boundary of the site. Parts of the subject land are zoned Residential 2a under the Shoalhaven City Council LEP, and it is proposed to form residential allotments within these areas, adjacent to the existing residential area.

In total 71 residential allotments are proposed for the site, 51 allotments will be Torrens Title, while the remaining 20 allotments will be Community Title Neighbourhood Allotments attached to an association property. The Association Property will contain the Endangered Ecological Community 'Swamp Sclerophyll Forest on Coastal Floodplains' as well as a perimeter APZ and fire trail protecting the subdivision. The 20 Community Title Neighbourhood Allotments will be responsible for maintaining the portion of the proposed perimeter APZ occurring on the Association Property as well as implementing a proposed vegetation management plan for the endangered community. In addition a small portion of land is to be allocated to Shoalhaven Water for a sewer pumping station, which will service the region. A Proposed Property Title Map clearly outlining the development has been included in Appendix 2.

This report is primarily concerned with the bushfire protection of the proposed residential development. These proposed allotments are likely to be entirely cleared for building envelopes, access roads and the proposed Asset Protection Zones (APZ's).

2 Environmental Setting

2.1 Location

The property is located at the southern extent of Manyana at its boundary with Cunjurong Point, approximately 11 km by air north of Ulladulla on the South Coast of NSW. The subject land lies approximately 300 m west of Manyana Beach.

The topography of the site is essentially flat. A drainage line is situated along the northeast side of the property. The land is low-lying (below 20 m above sea level), with significant portions of the site exposed to erosion and degradation.

2.2 Vegetation Classification

An assessment of the predominant vegetation within a distance of at least 140 m from the site boundary has been considered in each direction and is depicted on the Site Plan (see Appendix 1). Conjola National Park almost surrounds the township of Manyana. Eucalypt forests are present surrounding the villages to the north and west, with coastal heath woodlands and forest present along the hind dunes behind the beaches. Much of the vegetation in the local area has a history of logging, with Conjola National Park created in 1994.

A number of vegetation types have been identified within 140 m from the site. Each has been classified using the descriptions contained in the Bushfire Guidelines. Of these the most significant to the development is the Endangered Ecological Community 'Swamp Sclerophyll Forest on Coastal Floodplains'. This community is best classified as Group 2 vegetation in accordance with the Bushfire Guidelines, it occupies the majority of the eastern portion of the site extending slightly off the site to the southeast. Adjacent to this community a clearing containing remnant tress, which could be considered Group 3 vegetation is found. The centre of the site contains Low Open Scrub / Low Open Woodland, Group 2 vegetation which extends beyond the sites boundary 200 m to the south. While the most hazardous vegetation with respect to bushfire is the Open Forest, Group 1 vegetation, which is found on the most western portion of the site. This vegetation extends beyond the sites boundary 200 m to the south. The attached Site Plan clearly illustrates the extent of each vegetation group with respect to the site, see Appendix 1.

The predominant vegetation type in each direction is shown in Table 1 (Appendix 3).

2.3 Topography and Effective Slope

The site is best described as being flat, while the contours do indicate a slight gradient up to the south. In accordance with the Bushfire Guidelines, the gradient 'which will most significantly influence the fire behaviour of the site having regard to vegetation found' (Section A2.3.3, pp. 44) within a distance of at least 100 m from the proposed building line has been divided into the appropriate slope classes, which is listed in Table 1 (see Appendix 3).

In this case, the slope most significantly influencing fire behaviour with regard to surrounding vegetation is 0-5° up to the south in the direction of the forest.

2.4 Significant Environmental Features

All clearing required for the development of endemic vegetation should be subject to the *Threatened Species Conservation Act 1995* or the *National Parks Act 1974*. A Flora and Fauna Assessment has being produced for the same development by PMA Consulting (2005) in accordance with the *TSC Act 1995*.

No Aboriginal relicts identified under the *Threatened Species Conservation Act 1995* or the *National Parks Act 1974* have presently been identified.

2.5 Recent Bushfire History

Anecdotal evidence suggests that fire has not affected the site within the last 10 years. No damage to neighbouring dwellings has been reported.

3 Bushfire Hazard Assessment

3.1 Assessing Bushfire Risk

The main factors directly affecting the behaviour of fire are:

- Wind (strength and direction);
- Fuel moisture and content (how dry it is, relative humidity);
- Type quantity and arrangement of the fuel (vegetation density); and
- Slope (fire spreads quicker upslope due to fuel preheating).

In this case the greatest risk would be posed if the vegetation found on the site or the south of the site ignited. In this scenario, flames could approach the proposed building envelopes.

When subjectively determined, the bushfire risk to the proposed development could be described as moderate, based on the following:

- Group 1 and 2 vegetation exists on and to the south of the site;
- The major bushfire hazard (forest) found to the south is accompanied by slight slopes;
- To the north, west and beyond the vegetation to the south of the site residential developments exist. These areas provide substantial bushfire buffer in these directions. This is clearly shown on the attached Aerial Photo of Manyana (2002) in Appendix 4. The residential areas contain manicured gardens, buildings, bitumen and lawns;
- To the east, Manyana Beach exists; and
- Access to most allotments can be gained using link roads or by a path less than 200 m in length.

3.2 Assessment Methodology

A site inspection was conducted over the site to determine the direction and scale of any potential bush fire hazard based on an analysis of slope, aspect, vegetation type and density, current fuel loading and evidence of past fire history.

The information contained in the appendices of the Bushfire Guidelines have been used to categorise vegetation and slope in the locality, which was discussed in Sections 2.2 and 2.3 of this report. Following on from this, appropriate setbacks (in metres) from hazardous vegetation to the proposed building line of the development can be established, based on Table A2.2 (pp. 48) in the Bushfire Guidelines. These setbacks are known as Asset Protection Zones (APZ's), which aim to ensure that there is a progressive reduction in flammable material towards any building.

These APZ's may have two components, an Outer Protection Area (OPA) and an Inner Protection Area (IPA). Both may include a perimeter road or access track.

3.3 Asset Protection Zone (APZ) Requirements

Recommendations for APZ's and their calculations are shown in Table 1 (Appendix 3). In this case the main objective in ensuring safety to dwellings will be to remove the connectivity to the major bushfire hazard found on-site, to the south and east. This will be best performed by the implementation of a perimeter APZ in these directions.

To successfully combat this threat a 30 m APZ (IPA 20 m + OPA 10 m) perimeter APZ is recommended around the proposed residential development to the south and east. See Appendix 5 for a depiction of the vegetation extent post-development.

A large portion of the perimeter APZ will be position across the proposed access roads of 'The Bounty' and the new road proposed for the subdivision. These areas will be entirely void of vegetation following their construction and should require no further vegetation management hence they provide an excellent buffer in their proposed state. The reaming perimeter APZ will be positioned on the Association Property, which also will contain the Endangered Ecological Community 'Swamp Sclerophyll Forest on Coastal Floodplains'. The 20 Community Title Neighbourhood Allotments will be responsible for maintaining the portion of the proposed APZ on the Association Property as well as implementing a proposed vegetation management plan for the endangered community. Additionally a perimeter fire trail defining the edge of the IPA and bordering the OPA is recommended. The maintenance of the fire trail will also be a responsibility of the 20 Community Title Neighbourhood Allotments.

No formal APZ's will be required in other directions, as clearing for residential development, lawns and gardens currently provides these setbacks. Nevertheless a 20 m fuel free zone is recommended adjacent to each proposed dwelling.

3.3.1 Fuel Management and Landscaping Within APZ's

The fuel management and landscaping requirements within each of the proposed APZ's are to be as follows:

- A minimal ground fuel consisting of a well-maintained lawn, landscaping, paving, concrete or earth should be in existence;
- Please note, that existing larger trees (i.e. greater than 150 mm diameter at breast height (dbh)) may remain, provided that no part of their crown touches or overhangs the building;
- Smaller trees of less than 150 mm dbh and shrubs should be removed within the APZ and replaced with endemic evergreen species of low flammability, such that residual vegetation does not constitute more than 5% of the total APZ area. Plantings should be well spread out and should not form a continuous pathway to the buildings;
- Species that retain dead material or deposit excessive quantities of ground fuel in a short period should not be used for landscaping. Trees should be smooth barked rather than rough barked and should not accumulate ex-foliated bark that provides a ladder to canopy fuel; and
- The gutters, rooves and roof gullies of the buildings shall be kept free of leaves and other debris at all times and plant debris should be raked and disposed of regularly.

3.4 Bushfire Attack Category & Construction

Table A3.3 'Determination Of Category Of Bushfire Attack For A Site' of the '*Planning for Bushfire Protection Guidelines (2001)*' was used to determine the appropriate construction level required for each proposed allotment. Distances to the edge of the vegetation line from the potential building line on each allotment where calculated. Where the vegetation line existed as part of the OPA, this was considered the extent of the vegetation. While in many

circumstances a road reserve will be positioned in the proposed APZ hence no OPA will exist and the vegetation line was considered to begin beyond the proposed road reserve.

In accordance with the Bushfire Guidelines and based on the proximity of hazardous vegetation post-development and the effective slope (as shown in Table 1, Appendix 3) the bushfire attack category assigned to the building envelopes will vary from *High* to *Low*. Hence, the construction requirements for each proposed dwelling will vary from the maximum requirement of Level 2 construction to no construction requirements in accordance with AS 3959:1999.

A Construction Requirements Map in Appendix 6 clearly illustrates the required construction level considered appropriate for each proposed allotment.

3.5 Water Supply

The water supply on this site will be reticulated, appropriate fittings and water outlets accessible to fire vehicles will be required with all subsequently approved industrial structures.

A fire hydrant must be accessible and located such that a tanker can park within a distance serviceable by a 20 m hose and the buildings must be located such that a fire at the furthest extreme can be attacked by the tanker using a 60 m hose and 10 m jet of water.

3.6 Site Access Requirements

3.6.1 Capacity of Public Road System

The increased traffic resulting from the development will affect Manyana Drive and The Palisade. These roads are capable of servicing reasonable traffic volumes. It is not envisaged that the development will significantly impact upon the capacity of public roads in the vicinity in the event of a bushfire emergency.

3.6.2 Access and Egress

Public access roads will be provided adjacent to each proposed allotment. Access and egress from each of the proposed allotments during times of emergency response is adequate, considering:

- Access to all allotments can be gained using link roads;
- The proposed dual lane access roads are sufficiently wide, which satisfy the Bushfire Guidelines; and
- The public roads surrounding the site are well maintained and provide adequate access and egress for emergency response vehicles.

3.6.3 Perimeter Roads and Fire Trails

It is proposed to position a perimeter fire trail on the Association Property, defining the edge of the IPA and bordering the OPA. The maintenance of the fire trail will be a responsibility of the 20 Community Title Neighbourhood Allotments.

The fire trail will extend from The Bounty to the proposed sewerage pumping station, which connects to Sunset Strip. A 10 m wide access will be provided from The Bounty while a 6 m sealed access road of the proposed sewerage pumping station will connect to Sunset Strip. The access through the sewer pumping station will be closed to the public by locked gates. Keys for the use of the gates will be provided to the local RFS as part of the development proposal. The location of the proposed fire trail can be clearly seen on the Proposed Property Title Map and Post Development Site Plan in Appendices 2 and 5 respectively.

3.7 Fire Response Services

The NSW Rural Fire Service is the combat authority for the subject site and all surrounding areas. The closest fire control centre is the Shoalhaven Rural Fire District located at 92 Albatross Road, PO Box 372, Nowra, 2541 (Phone 4429 3467, Fax 4421 7576). The closest Fire Station is located nearby in, Cunjurong Point approximately 1 km by road from the site.

Legislation requires occupants of land to immediately extinguish fires or notify fire-fighting authorities, on becoming aware of fire during a bush fire danger period. The most appropriate course of action is to telephone "000" and report the fire.

3.8 Bushfire Protection Compliance

The bushfire protection measures discussed throughout this report are based on those strategies outlined in the Bushfire Guidelines. This development will accord to the Bushfire Guidelines based on the following:

- Buffer distances to the bushfire hazard can be met;
- An appropriate construction requirement has been recommended;
- Adequate access will be available to each dwelling; and
- The requirements for water supply to the development have been outlined.

3.9 Additional Bushfire Protection Measures

No additional bushfire protection measures are necessary for this development above the implementation of the aforementioned perimeter APZ's, fire trail and construction levels, as well as other recommendations discussed throughout.

4 Conclusion

The proposed subdivision at Lots 682, 705 and 810 Manyana Drive, Manyana, will be allowable within the constraints provided in Planning for Bushfire Protection (NSW RFS and NSW Planning 2001). The Construction Requirements Map found in Appendix 6, best depicts the construction requirement for each proposed allotment in accordance with AS 3959:1999. Suitable perimeter setbacks are available to problematic vegetation and adequate emergency access and egress is available to each proposed allotment, hence it is considered that the development is consistent with the Bushfire Guidelines.

This Bushfire Protection Assessment should remain current for a period of five years, until 2010, at which time it should be subject to review to take account of changing land use and vegetation patterns. Any major bush fire event which affects the subject site should also trigger a review in order to determine the effectiveness of protection measures and annual hazard reduction activities.

The findings contained within this report are the result of discrete/specific methodologies used in accordance with recognised practices. To the best of our knowledge they represent a reasonable interpretation of the general conditions of the site.

5 Bibliography

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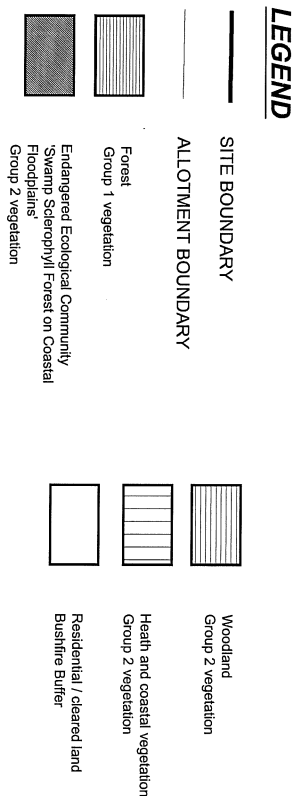
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Appendix 1

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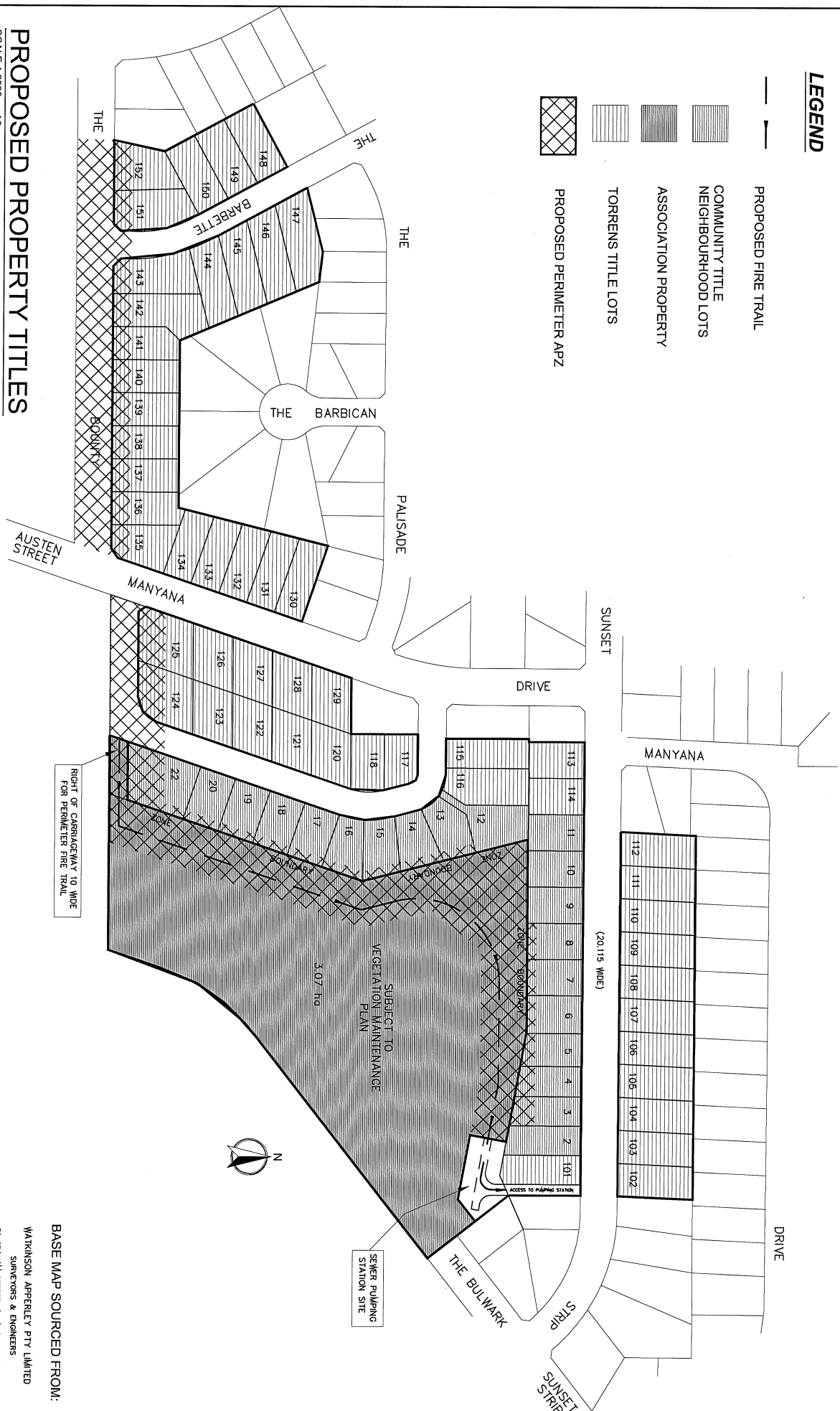


Appendix 2

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PROPOSED PROPERTY TITLES



BASE MAP SOURCED FROM:

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Appendix 3

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Table 1 Slope and Vegetation Classification – Perimeter Asset Protection Zones (APZ's) and Bushfire Attack Category for the subdivision.

Direction ^A	Slope Class ^B	Vegetation Class ^C	APZ Required ^D	Proposed/ Available APZ ^E	Category of Bushfire Attack ^F	Construction Level ^G	Comments
North	0-5° (downslope)	Gardens, lawns, dwellings and bitumen (Group 3)	20 m	20 m	Low	NA	No bushfire hazard exists within 100m of the proposed building line in this direction. Cleared lands consisting of gardens, lawns, dwellings and bitumen can be found in this direction to greater than 20m.
East	0-5° (upslope)	Group 2	30m (IPA 20m + OPA 10m) Perimeter APZ	30m (IPA 20m + OPA 10m) Perimeter APZ	Low to Medium	None to Level 1	A 30 m perimeter APZ will be required, separating the proposed residential development from the bushfire hazard. A proposed fire trail will be positioned within the APZ immediately beyond the allotment boundaries.
South	0-5° (upslope)	Group 1 & 2	30m (IPA 20m + OPA 10m) Perimeter APZ	30m (IPA 20m + OPA 10m) Perimeter APZ	Low to High	None to Level 2	A 30 m perimeter APZ will be required, separating the proposed residential development from the bushfire hazard. 'The Bounty' access road forms the majority of the proposed APZ in this direction. Once the road is established, no vegetation management will be required in this direction.
West	0-5° (downslope)	Gardens, lawns, dwellings and bitumen (Group 3)	20 m	20 m	Low	NA	No bushfire hazard exists within 100m of the proposed building line in this direction. Cleared lands consisting of gardens, lawns, dwellings and bitumen can be found in this direction to greater than 20m.
NOTES ^A Direction from building line of proposed dwelling ^B Slope class which will most significantly influence the fire behaviour of the site having regard to vegetation found' (Section A2.3.3, pp. 44) within a distance of at least 100 m from the proposed building line ^C Predominant vegetation class within a distance of at least 140 m from the proposed building line ^D APZ required based on the Bushfire Guidelines ^E Proposed APZ in light of ^D and/or distance to unmanaged vegetation ^F Assuming worst case scenario, based on Table A3.3 in the Bushfire Guidelines ^G Corresponding construction level based on Category of Bushfire Attack							

Appendix 4

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AERIAL PHOTO OF MANYANA (JAN 2002)

Appendix 5

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Appendix 6

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