

BUSHFIRE ASSESSMENT REPORT

ALTITUDE ASPIRE

TERRANORA URBAN RELEASE

AREA E

FRASER DRIVE, TERRANORA

PREPARED BY

BUSHFIRESAFE

(AUST) PTY LTD

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EXECUTIVE SUMMARY

Bushfiresafe (Aust) P/L has been engaged by Newland Developments P/L to undertake a complete Bushfire Assessment for Altitude Aspire within the Tweed Urban Release Area E at Terranora of Planning Director General's environmental assessment requirements which state:

For the 09_0166 Altitude 1 development, the Director General (Department of Planning) environmental assessment requirements (Item 6.3) state that the applicant must:

"Address the requirements of Planning for Bushfire Protection 2006 (RFS) and ensure that any proposed Asset Protection Zones do not adversely effect environmental objectives (e.g. buffers) and provision is made for their appropriate management into the future."

Following public exhibition of the Environmental Assessment Report a number of submissions were received from members of the public, Tweed Shire Council and State Government agencies. As a result of those submissions a number of amendments to the Subdivision Layout have been made. This amended Bushfire Assessment Report addresses the amended Subdivision Layout and in particular the submission from the NSW Rural Fire Service which raised particular issues in relation to asset protection zone requirements on the western boundary of the property. This issue has largely been resolved by the amended layout which provides for a public road on the common boundary between the development site and the adjoining land to the west. The public road will provide an asset protection zone of at least 15m in width. The following Bushfire Assessment Report shall demonstrate that the Major Project application is consistent with the Tweed LEP and DCP and complies with Planning for Bushfire Protection (2006) and AS3959-2009.

PROPERTY DESCRIPTION

The site is located on the Far North Coast Region of NSW within the Tweed Shire Council area. It is situated within the Terranora Area E Urban Release Area approximately 8km west of Tweed Heads / Coolangatta Town Centre and is zoned 2(c) Urban Expansion under the Tweed Shire Council LEP (Tweed Shire Council, 2000). The property is surrounded by developed and/or future residential areas to the south and west; to the north, the land slopes moderately to gently towards the Terranora Broadwater (zone 7(a) Environmental Protection 'wetland and littoral rainforest') with Fraser Drive forming the eastern boundary. A power line transmission corridor is designated along the northern boundary of the subject land coincident with the zone 7(a) area boundary. The developable land covers an area of 35.1Ha and has been cleared with isolated areas of retained native vegetation as a result of previous land uses that include dairying and livestock grazing operations.

Newland Developments propose to develop the Altitude Aspire estate as a mix of urban land uses integrated with open space and environmental protection areas in eleven (11) stages. Altitude Aspire shall comprise 261 residential Lots, 8 open space lots, 1 drainage lot and 1 community lot on Lot 1 DP 304649, Lot 1 DP 175235, Lot 1 DP 781687, Lot 2 DP 778727, Lot 1 DP 781697, Lot 1 DP 169490, Lots 40 and 43 DP 254416 and is the subject of the Major Project application. The Major Project Application includes the provision for underground services (power and telephone, reticulated water, reticulated storm water and reticulated sewerage) with a temporary access to Fraser Drive. The preferred access involves the alignment of Broadwater Parkway as a major collector road for the Altitude

Aspire residential areas with connection to Fraser Drive opposite the intersection with Amaroo Drive.

Tweed Shire Council has adopted the Tweed Development Control Plan, Section B24 – Area E Urban Release Development Code which includes a proposed alignment for Broadwater Parkway. The amended Project Application Layout is generally consistent with the DCP alignment. A Voluntary Planning Agreement has been negotiated between Council and Newland which provides that Broadwater Parkway shall be constructed by Newland from Fraser Drive to the Stage 7 entry roundabout prior to release of Stage 7 of the project.

PRECINCT 1 & 2 – RESIDENTIAL DEVELOPMENT

Due to the large area proposed for the development and for easier comprehension of the bushfire assessment, the subdivision will be divided into two (2) precincts for this report. Precinct 1 will consist of stages 6 – 10 and occurs to the west of the central drainage area. Development of Precinct 1 is dependent on the construction of the Broadwater Parkway. Precinct 2 will consist of the development of the land between the central drainage area and Fraser Drive and will be developed in Stages 1-5 & 11.

Precinct 1 (Stages 6-10) is located to the west of the proposed drainage reserve in the cleared portion of the property (Lot 1 DP 304649 and Lot 1 DP 175235) (Attachment 1). This will comprise residential Lots, public reserves, the Drainage Reserve and a community lot and include internal roads connecting with either the proposed Broadwater Parkway collector road that forms the northern boundary or with Parkes Lane and Market Place to the south. This area is separated from Precinct 2 by a north-south trending green belt of open space, landscaped areas and the stormwater detention area.

Precinct 2 (Stages 1-5, 11) is located between the proposed drainage reserve and Fraser Drive and includes Lot 1 DP 781687, Lot 2 DP 778727, Lot 1 DP 781697, Lot 1 169490 and Lots 40 and 43 DP 254416. This shall comprise residential Lots, public reserves and an internal road network connecting to Broadwater Parkway or Market Parade.

Asset Protection Zones (APZ)

Based on the assessment of the vegetation communities and slopes present on and adjacent to Precincts 1 & 2, and in accordance with Appendix 2 Table A2.5, Planning for Bushfire Protection 2006, this Bushfire Assessment recommends that Asset Protection Zones (APZ), Inner Protection Area (IPA) and Outer Protection Area (OPA) should be established as listed in the table below.

Aspect	Vegetation	APZ (m)	IPA (m)	OPA (m)	Compliance with PBP
Precinct 1					
North	Forested Wetland (Forest in AS3959)	21	21	0	Yes, included in Broadwater Parkway road reserve
East	Not bushfire prone veg	-	-	-	Yes
South	Existing Residences	-	-	-	Yes
West	Grassy Woodland	17	17	0	Yes, provided by perimeter road
Precinct 2					
North	Forested Wetland (Forest in AS3959)	21	21	0	Yes, included in Broadwater Parkway road reserve
East	Not bushfire prone veg	-	-	-	Yes
South	Existing Residences	-	-	-	Yes
West	Not bushfire prone veg	-	-	-	Yes

The APZ required from the Forested Wetland along the northern boundary is achieved by the road reserve for the Broadwater Parkway collector road.

The drainage reserves will have a rock lined watercourse down the middle with a concrete bicycle path down one side and low vegetation within the remainder of the reserves; the assessment concluded that the drainage reserves shall comply with the standards as required in Planning for Bushfire Protection 2006; therefore, asset protection zones would not be required along these areas.

Assessed Bushfire Attack Level

An assessment of the bushfire attack level applicable to the proposed Major Project Application was carried out using the methodology detailed in Appendix 3 of Planning for Bushfire Protection 2006 and Appendix B of AS 3959-2009 to ascertain the viability of the development in the protection of life and property in a bush fire situation. This bushfire assessment concluded the following Bushfire Attack Levels will apply to the proposed allotments in relation to the separation distances from the bushfire prone vegetation as outlined and refers to any allotment partially or completely within the higher category.

Precinct 1

Attack Category		BAL-FZ	BAL-40	BAL-29	BAL-19	BAL-12.5	LOW
		Distance (m) from the dominant vegetation					
Aspect	Vegetation Type	All upslope and flat land					
North Elevation	Forest	< 16	19-<21	21-<31	31-<42	42-<100	>100
		Down slope 0 to 5 degrees					
West Elevation	Grassy Woodland	<13	13-<17	17-<25	25-<35	35-<100	>100

Precinct 2

Attack Category		BAL-FZ	BAL-40	BAL-29	BAL-19	BAL-12.5	LOW
		Distance (m) from the dominant vegetation					
Aspect	Vegetation Type	All upslope and flat land					
North Elevation	Forest	< 16	19-<21	21-<31	31-<42	42-<100	>100

ACCESS

Access to the proposed Precincts will be via Market Parade or Parkes Lane. Once the Broadwater Parkway is available, both Precincts will feed into this road with an upgraded connection to Fraser Drive opposite Amaroo Drive.

SERVICES

There will be a reticulated water supply to the property. The water supply to this subdivision must use a ring main system with the perimeter road. The fire hydrant spacing, sizing and pressure of this reticulated water supply must comply with AS 2419.1 (2005). Fire hydrants are not located on any carriage way and shall be delineated with blue pavement markers. All above ground water and gas service pipes are metal, including and up to any outside taps. Electrical transmission lines will be underground.

CONSTRUCTION STANDARDS

The Bushfire Assessment undertaken in relation to the proposed subdivision concluded that the construction standard in accordance with AS 3959 (2009) Construction of Buildings in Bushfire Prone Areas (Standards Australia, 2009) will be assessed and nominated when development applications are submitted for the construction of dwellings on the approved allotments.

Fence construction for the created allotments should be from non-combustible materials.

CONCLUSION

The proposed development will comply with the minimum requirements for:

- 1). Asset Protection Zones detailed in Table A2.5 Minimum Specifications for Asset Protection Zones for Residential and Rural Residential Subdivision Purposes (for class 1 & 2 buildings) in FDI 80 Fire Areas in the Planning for Bushfire Protection manual (RFS, 2006);*
- 2) Access in accordance with section 4.1.3-2 (Property Access) in the Planning for Bushfire Protection manual (RFS, 2006); and*
- 3) Development of the Residential Precincts satisfies the aims of PBP 2006 and will therefore comply with the provisions for Fire Safety under the Building Code of Australia.*

GLOSSARY

APZ	Asset Protection Zone
BFRMP	Bushfire Risk Management Plan
EEC	Endangered Ecological Community
EP&A	Environmental Planning and Assessment Act
IPA	Inner Protection Area
KPoM	Koala Plan of Management
LEP	Local Environment Plan
LGA	Local Government Area
OPA	Outer Protection Area
PBP	Planning for Bushfire Protection manual
RFS	Rural Fire Service of New South Wales
SEPP	State Environmental Planning Policy
TOBAN	Total Fire Ban
TSBPL	Tweed Shire Bush Fire Prone Lands map
TSC Act	Threatened Species Conservation Act (1995)
TSCA Act	Threatened Species Conservation Amendment Act (2002)

BUSH FIRE ASSESSMENT REPORT

1.0 SCOPE OF THE REPORT

The Bushfire Assessment Report is a strategic document which provides detailed information in compliance with Section 44 of the Rural Fires Regulations to enable a determination of integrated development applications under section 100B of the *Rural Fires Act* and section 91A of the *Environmental Planning & Assessment Act*.

Following public exhibition of the Environmental Assessment Report a number of submissions were received from members of the public, Tweed Shire Council and State Government agencies. As a result of those submissions a number of amendments to the Subdivision Layout have been made. This amended Bushfire Assessment Report addresses the amended Subdivision Layout and in particular the submission from the NSW Rural Fire Service which raised particular issues in relation to asset protection zone requirements on the western boundary of the property. This issue has largely been resolved by the amended layout which provides for a public road on the common boundary between the development site and the adjoining land to the west. The public road will provide an asset protection zone of at least 15m in width.

1.1 Area

This report covers the proposed residential development of the Altitude Aspire residential development. The Altitude Aspire Major Project application comprises a 271-Lot subdivision and is situated to the west of Fraser Drive, Terranora within the Area E Urban Release future development precinct of the Tweed Shire Council Local Government Area

1.2 Aim and objectives of the Report

The aim of this report is to demonstrate how the proposed residential subdivision complies with the aims and objectives of *Planning for Bushfire Protection* (2006). To achieve this aim, the Bushfire Assessment Report must address a number of specific objectives.

- i. Provide a description of the property;
- ii. Classify the vegetation for a distance of 140m from the proposed development
- iii. Assess the effective slope for a distance of 100m from the development
- iv. Identify any significant environmental features impacting upon the proposed development
- v. Describe any threatened species, populations, endangered ecological communities and critical habitats known to the applicant
- vi. Detail any Aboriginal heritage known to the applicant

- vii. Prepare a bushfire assessment using the methodology described in *Planning for Bushfire Protection* (2006)
- viii. Assess how the development complies with the acceptable solutions, performance requirements and relevant specific objectives within Chapter 4 of *Planning for Bushfire Protection* (2006).

1.3 Bushfire Risk Management Strategies

This report outlines a number of strategies that are directed at addressing the risk to residential development from bushfire emergencies. This is achieved through addressing and managing fuel loads, separation distances from the assessed dominant bushfire vegetation, and recommending appropriate bushfire building standards.

1.4 Implementation

Implementation of the recommendations in this report is the responsibility of the developer and shall be undertaken as part of the development infrastructure. The ongoing maintenance shall be the responsibility of the owner/occupiers of each proposed residential allotments to the limit of their property boundaries. Finally, the local authority, or their delegated authority, shall monitor the works for the life of the development.

2.0 LEGISLATIVE BUSHFIRE HAZARD MANAGEMENT RESPONSIBILITIES

2.1 Tweed Shire Council

The Tweed Shire Council has responsibility, under Section 66 of the Rural Fires Act, to issue a notice in writing requiring an owner / occupier of any land within the LGA to carry out bushfire hazard reduction works on that land. Section 100E of the Rural Fires Act requires the council to issue bushfire hazard reduction certificates for hazard reduction to be undertaken on private lands.

2.2 New South Wales Rural Fire Service

The NSW Rural Fire Service (RFS) has the responsibility for undertaking fire suppression activities, hazard management activities and other functions relative to emergency management, within its areas of operation. Section 73 of the Rural Fires Act (1997) enables the Commissioner to carry out bush fire hazard reduction works on any land as required by a bush fire risk management plan if the work has not been carried out satisfactorily. Incurred costs can be recovered as a debt owed to the Crown.

2.3 NSW Fire Brigade

The NSW Fire Brigade has the responsibility for undertaking fire suppression activities, and other functions relative to emergency management, within its area of operation. Through

mutual aid agreements, the NSW Fire Brigade can provide assistance to the NSW Rural Fire Service, particularly for structural fire operations within the NSW Rural Fire Brigade Districts. Furthermore, Hazmat operations within New South Wales are the responsibility of the NSW Fire Brigade.

2.4 Far North Coast Bush Fire Management Committee

The Far North Coast Bushfire Management Committee has the responsibility for planning for co-ordinated fire fighting activities / hazard management activities on a local government level. It is not an operational organisation, a fire fighting organisation or a funding source for fire management activities. The Bush Fire Management Committee is supported by the following provisions of the Rural Fires Act (1997).

Section 50 of the Act requires the Bush Fire Co-ordinating Committee to constitute a Bush Fire Management Committee for the whole of the area of any local Council area for which a rural fire district is constituted.

Section 51(1A) requires a Bush Fire Management Committee to report to the Bush Fire Coordinating Committee on the implementation of the requirements of the Bushfire Risk Management Plan.

Section 52 requires each Bush Fire Management Committee to prepare a draft bush fire management plan for their local areas which includes a plan of operations and a bush fire risk management plan.

Section 54 of the Act specifies that a draft bush fire risk management plan is to 'set out schemes for the reduction of bush fire hazards in the rural fire district or other part of the State'. A draft bush fire risk management plan may also restrict or prohibit the use of fire or other fire hazard reduction activities in all or specified circumstances or places to which the plan applies.

2.5 Private Land Owners / Occupiers

The Rural Fires Act, 1997 provides several legislative opportunities to require land owners and occupiers to manage hazardous fuels. These are listed below:

Section 63(2) states that 'it is the duty of the owner or occupier of land to take the notified steps (if any) and any other practicable steps to prevent the occurrence of fires on, and to minimise the danger of the spread of fires on or from that land'. In this section; 'notified steps' means any steps that:

- (a) A bushfire risk management plan (or the Co-ordinating Committee) advises a person to take;
- (b) Are included in a bush fire risk management plan that applies to that land.

Section 87 allows the removal of hazards in the bush fire danger period by the provision of a permit system. The permits are valid for 21 days, excluding total fire ban (TOBAN) days. Section 10 permits are not required to adhere to Part V provisions of the Environmental Planning & Assessment Act (1979) (EP&A Act) in any assessment of impact, except for public authorities. An owner/occupier of private land must obtain from the NSW Rural Fire Service, a bushfire hazard reduction certificate before undertaking hazard reduction works on that land (see Section 100E of the Rural Fires Act (1997)).

2.6 NSW Rural Fire District BFRMP

The Tweed Shire Council's Bushfire Management Options are to:

- (a) **Reduce the hazard** - encourages the development of asset protection zones along the settlement area - bushland interface.
- (b) **Reduce vulnerability** - maintain development and building controls and standards appropriate to the level of hazard.

3.0 INTRODUCTION

Development Applications on bushfire prone land must be accompanied by a Bush Fire Safety Authority (BFSA) provided by the Rural Fire Service. Application for a BFSA should follow the requirements of Clause 44, Rural Fires Act, listed as Appendix 4 of the Planning for Bushfire Protection 2006 guidelines (RFS, 2006).

For major projects, such as the Newland Development's Altitude Aspire residential development, the requirements for environmental assessment are provided by the Director General, Planning with approval granted by the Minister, Planning. This overrules the need to obtain a BSFA, or address section 100B of the Rural Fires Act specifically.

For the 09_0166 Altitude Aspire development, the Director General (Department of Planning) environmental assessment requirements (Item 6.3) state that the applicant must:

"Address the requirements of Planning for Bushfire Protection 2006 (RFS) and ensure that any proposed Asset Protection Zones do not adversely effect environmental objectives (e.g. buffers) and provision is made for their appropriate management into the future."

The following bushfire assessment report therefore outlines the bushfire protection measures necessary for the residential development to comply with *Planning for Bushfire Protection*, 2006 and to ensure that any created Lots are able to achieve the deemed-to-satisfy provisions of the Building Code of Australia by addressing AS3959-2009 *Construction of building in bushfire prone areas*. This assessment is achieved through reference to the methodology outlined in Appendix 4 of the *Planning for Bushfire Protection* (2006) and AS3959-2009 and involved the following activities:

- i. Verifying of terrain attributes in relation to the assessed bushfire vegetation.
- ii. Identification of the appropriate bushfire protection for any identified environmental assets.
- iii. Determination of the location of adequate water supplies for fire fighting purposes.

- iv. Identifying the capacity of public roads to handle increased volumes of traffic in a bushfire situation.
- v. Identification of adequacies for implementation of fire trails which link to Public roads in the vicinity.
- vi. Identification of adequacy of arrangements for access and egress from the development for the purposes of an emergency response.
- vii. Identification of construction standards to be used for building elements in the development.
- viii. Identification of adequacy of bushfire maintenance plans and fire emergency procedures for the development.
- ix. Identification of additional bushfire protection measures.

3.1 Description of property

The site is located on the Far North Coast Region of NSW within the Tweed Shire Council area. It is situated within the Terranora Area E Urban Release Area approximately 8km west of Tweed Heads / Coolangatta Town Centre and is zoned 2(c) Urban Expansion under the Tweed Shire Council LEP (Tweed Shire Council, 2000). The property is surrounded by developed and/or future residential areas to the south and west; to the north, the land slopes moderately to gently towards the Terranora Broadwater (zone 7(a) Environmental Protection 'wetland and littoral rainforest') with Fraser Drive forming the eastern boundary. A power line transmission corridor is designated along the northern boundary of the subject land coincident with the zone 7(a) area. The developable land covers an area of 35.1Ha and has been cleared with isolated areas of retained native vegetation as a result of previous land uses that include dairying and livestock grazing operations.

3.2 Proposal

Newland Development propose to develop the Altitude Aspire residential estate as a mix of urban land uses integrated with open space and environmental protection areas in ten (11) stages. Altitude Aspire shall comprise Public Reserves, a drainage reserve, a community lot, and a mixture of transitional, large and suburban detached dwellings, terrace and zero-lot residential lots on Lot 1 DP 304649, Lot 1 DP 175235, Lot 1 DP 781687, Lot 2 DP 778727, Lot 1 DP 781697, Lot 1 DP 169490, Lots 40 and 43 DP 254416. The Major Project Application includes the provision for underground services (power and telephone, reticulated water, reticulated storm water and reticulated sewerage) and occurs within the Terranora Urban Release Area E.

The preferred access for the proposed development of Altitude Aspire involves the alignment of Broadwater Parkway as a major collector road for the Terranora Urban Release Area E

with connection between Fraser Drive and Maher's Lane. Secondary egress is available to Market Place and Parkes Lane to the south of the development.

Tweed Shire Council has adopted the Tweed Development Control Plan, Section B24 – Area E Urban Release Development Code which includes a proposed alignment for Broadwater Parkway. The amended Project Application Layout is generally consistent with the DCP alignment. A Voluntary Planning Agreement has been negotiated between Council and Newland which provides that Broadwater Parkway shall be constructed by Newland from Fraser Drive to the Stage 7 entry roundabout prior to release of Stage 7 of the project.

4.0 PRECINCTS 1 & 2 RESIDENTIAL DEVELOPMENT

Due to the large area proposed for the development and for easier comprehension of the bushfire assessment, the subdivision will be divided into two (2) precincts for this report; Precinct 1 will consist of stages 6 – 10 and occurs to the west of the central drainage area. Development of Precinct 1 is dependent on the construction of the Broadwater Parkway. Precinct 2 will consist of the development of the land between the central drainage area and Fraser Drive and will be developed in Stages 1-5 & 11.

Precinct 1 (Stages 6-10) is located to the west of the proposed drainage reserve in the cleared portion of the property (Lot 1 DP 304649 and Lot 1 DP 175235) (Attachment 1). This will comprise residential Lots, Public reserves, and a Residents / Community Association Lot and include internal roads connecting with either the proposed Broadwater Parkway collector road that forms the northern boundary or with Parkes Lane and Market Place to the south. This area is separated from Precinct 2 by a north-south trending green belt of open space, landscaped areas and the stormwater detention area.

Precinct 2 (Stages 1-5 & 11) is located between the proposed drainage reserve and Fraser Drive and includes Lot 1 DP 781687, Lot 2 DP 778727, Lot 1 DP 781697, Lot 1 169490 and Lots 40 and 43 DP 254416. This shall comprise of residential Lots, a Public reserves with an internal road network connecting to Broadwater Parkway or Market Parade.

4.1 Vegetation classification

The vegetation for Precincts 1 & 2 and adjacent properties up to 140m (where practicable) from the proposed development were assessed during a site visit on 8th of December, 2009. The vegetation communities present were identified and classified into formations as described in Keith (2004). Appendix A2.3 of *Planning for Bushfire Protection* outlines the methodology for determining the predominant bushfire prone vegetation to the distance of at least 140 metres in all directions from the future development on the site. Vegetation is

classified using Table A2.1 of *Planning for Bushfire Protection*, which classifies vegetation types into the following groups:

- | | |
|--|----------------------------|
| (a) Forests [wet & dry sclerophyll forests]; | (g) Freshwater Wetlands; |
| (b) Woodlands; | (h) Saline Wetlands |
| (c) Plantations – being pine plantations not native plantations; | (i) Alpine Complex; |
| (d) Forested Wetlands; | (j) Semi – arid Woodlands; |
| (e) Tall Heath lands; | (k) Arid Woodlands; and |
| (f) Short Heath lands; | (l) Rainforests |

4.2 Vegetation communities present on the subject land

Community 1 Managed Grassland: The majority of the developable land has been cleared for previous land uses and is presently managed as grazing land (Figure 1)



Figure 1: View from south boundary towards Fraser Drive showing grazing lands to be developed as Precinct 1 & 2 (Photographs, S. Cotter).

Community 2 Rainforest: A riparian rainforest vegetation community is present either side of a small creek flowing through the property. This community represents a remnant of less than 1Ha in size that consists of mainly Camphor Laurel regrowth with limited native species present (Figure 2). The existing watercourse carries surface water from adjoining residential areas towards two constructed farm dams and ultimately towards Terranora Broadwater; separating Precinct 1 from Precinct 2. The concept plan for Altitude Aspire designates a green spine or open space drainage reserve along this area towards the stormwater detention basin. The existing vegetation shall be modified as part of any landscaping / revegetation works along the watercourse with planting of native species and areas of managed grassland. The Drainage Reserve shall be managed to the standard of an Asset Protection Zone.



Figure 2: Left: Constructed dam along small creek, Right: Riparian vegetation (mainly Camphor Laurel and wattle regrowth) upstream of the constructed dams (Photographs, S. Cotter).

Community 3 Riparian (Lowland Rainforest equivalent): A narrow strip of rainforest vegetation occurs on moderately sloping land along the northwest boundary of the precinct (Figure 3). This vegetation comprises Camphor Laurel, Bangalow Palm, Wattle, Creek Sandpaper Fig with isolated mature Blackbutt and White Mahogany and merges into the zone 7(a) wetlands down slope.

Community 4 Forested Wetland: Broad-leaved Paperbark forms a narrow elongated stand of semi-mature trees along the northern boundary of the Precinct. This vegetation merges into a Freshwater Wetland approaching Terranora Broadwater (Figure 4). Forested Wetland is considered as a subset of the Forest classification in AS3959-2009. In consideration of the need to ensure future dwellings can be constructed on the created allotments in compliance with the Deemed-to-satisfy provisions of the Building Code of Australia and enhance adopt the vegetation groups in AS3959, the Forest vegetation classification is applied in this assessment for this vegetation community.



Figure 3: Rainforest vegetation on moderately sloping land, northwest boundary of Precinct 1 intersected by a vehicle track. Vegetation merges into Community 4 Forested Wetland to right (Photograph, S. Cotter).



Figure 3: Broad-leaved Paperbark forested wetland merging into freshwater wetland is part of the zone 7(a) land to the north of the subject site (Photographs, S. Cotter)

4.3 Vegetation communities present on and adjacent to Precinct 1 (Stages 6 – 10)

The entire developable area of Precinct 1 is managed grassland as described above (Community 1). Developed residences with managed gardens occur to the south along Parkes Lane and Market Parade. Along the northern boundary of the Precinct there is a

continuation of the Forested Wetland and Freshwater Wetland described as Community 4 above.

The western boundary adjoining managed grazing land with occasional shade trees. This area is identified for future residential development as part of the Terranora Urban Release Area 3. At present this land is infrequently managed. In agreement with the NSW Rural Fire Service, the vegetation is classified as Grassy Woodland until development of this land proceeds.

4.4 Vegetation communities present on and adjacent to Precinct 2 (Stages 1 – 5, 11)

The entire developable area of Precinct 2 is managed grassland as described above (Community 1). Developed residences with managed gardens occur to the east after Fraser Drive and south along Parkes Lane. Along the northern boundary of the Precinct there is a continuation of the Forested Wetland and Freshwater Wetland described as Community 4 above.

4.5 Assessed Dominant Bushfire Vegetation in Relation to the Precincts

The Forested Wetland vegetation along the northern boundary of Precincts 1 & 2 and adjacent Lowland Rainforest equivalent vegetation is assessed as Category 1 bushfire prone vegetation, according to the *Tweed Shire Bush Fire Prone Lands* (TSBPL) map (Tweed Shire Council, 2004). This vegetation shall be retained within the environmental protection zone.

A small pocket of vegetation occurs near the southern boundary and along the small drainage channel. This is also assessed as category 1 bushfire prone vegetation or within the 100m buffer to Category 1 vegetation, but shall be modified through removal of the Camphor Laurel regrowth. The area shall form open space parkland and handed to Tweed Shire Council for ongoing management as part of their Parks and Gardens program. The remaining areas of the land are not classified as containing bushfire prone vegetation.

The onsite assessment identified the Forested Wetland and the remnant area of Lowland Rainforest vegetation are the dominant bushfire prone vegetation in relation to the northern and north/western aspects of Precinct 1 and Forested Wetland vegetation as the dominant bushfire prone vegetation in relation to the northern aspect of Precinct 2. Until the land to the west of the subject land is developed, the Grassy Woodland is assessed as bushfire prone vegetation along the western boundary

5.0 LANDFORM ASSESSMENT

Inspection of published topographic maps and an on-site assessment using a clinometer verified the following land forms were present over the subject land. The land comprises alluvial flats and drainage channels along the northern boundary adjacent to Terranora Broadwater; rising moderately towards the boundaries in the south and west of the Precinct areas.

5.1 Assessed Dominant Slope in relation to identified bushfire prone vegetation

Appendix 2 of *Planning for Bushfire Protection* 2006 recommends that slopes should be assessed, over a distance of at least 100m from a development site and that the dominant gradient of the land should be determined on the basis of which will most significantly influence the fire behaviour at the site. The following terrain parameters were determined during the on-site inspection:

Table 1 Terrain attributes affecting the proposed development.

Aspect	Slope	Vegetation	Comments
<i>Precinct 1 (Stages 6 – 10)</i>			
N	Flat	Forested Wetland / Rainforest	Bushfire prone veg.
E	5-<10° down	Managed Grassland / Open Space	Not bushfire prone veg. (Proposed Precinct 2)
S	upslope	Existing Residences	Not bushfire prone veg.
W	0-<5° down	Grassland / Grassy Woodland	Bushfire prone veg. ¹
<i>Precinct 2 (Stages 1 – 5, 11)</i>			
N	Flat	Forested Wetland	Bushfire prone veg.
E	upslope	Residences / Managed Grassland	Not bushfire prone veg.
S	0-<5° down	Residences / Managed Grassland	Not bushfire prone veg.
W	upslope	Managed Grassland / Open Space	Not bushfire prone veg. (Proposed Precinct 1)

6.0. ENVIRONMENTAL CONSIDERATIONS

The zone 7(a) Freshwater Wetland adjoining the northern boundary of the subject land is protected under *State Environmental Planning Policy No. 14 'Coastal Wetlands'*; no development is proposed that will impact upon this area. A detailed flora and fauna assessment of the subject land has been prepared. No existing native vegetation shall be removed for the development and hence the environmental implications for the development are negligible. The alignment of Broadwater Parkway is subject to further studies on the impact on the SEPP 14 wetland and extent of removal of any Endangered Ecological Community vegetation.

¹ This vegetation is presently managed as grassland, such actions cannot be guaranteed into the future and hence the vegetation is considered to be bushfire prone vegetation with a likely Grassy Woodland structure as the land is zoned for future residential living and likely to be developed. A temporary APZ is recommended until future development to the west occurs.

7.0 BUSHFIRE ASSESSMENT FOR PROPOSED DEVELOPMENT

7.1 Asset Protection Zones

Based on the assessment of the vegetation communities and slopes present on and adjacent to Precincts 1 & 2, and in accordance with Appendix 2 Table A2.5, *Planning for Bushfire Protection* 2006, this bushfire risk assessment recommends that Asset Protection Zones (APZ), Inner Protection Area (IPA) and Outer Protection Area (OPA) should be established as listed in Table 2.

Table 2 Asset Protection Zones for Precinct 1 & 2

Aspect	Vegetation	APZ (m)	IPA (m)	OPA (m)	Compliance with PBP
Precinct 1 (Stages 6 – 10)					
North	Forested Wetland (Forest in AS3959)	21	21	0	Yes, included in Broadwater Parkway road reserve
East	Not bushfire prone veg	-	-	-	Yes
South	Existing Residences	-	-	-	Yes
West	Grassy Woodland	17	17	0	Yes, provided by perimeter road
Precinct 2 (Stages 1 – 5, 11)					
North	Forested Wetland (Forest in AS3959)	21	21	0	Yes, included in Broadwater Parkway road reserve
East	Not bushfire prone veg	-	-	-	Yes
South	Existing Residences	-	-	-	Yes
West	Not bushfire prone veg	-	-	-	Yes

The APZ required from the Forested Wetland (Forest) along the northern boundary is achieved by the road reserve for the Broadwater Parkway collector road. In the absence of this road being constructed as part of the Major Project Application, the APZ is positioned on the development side of the zone 7(a) Environmental Protection boundary (Attachment 1).

The drainage reserves will have a rock lined watercourse down the middle with a concrete bicycle path down one side and low vegetation within the remainder of the reserves; the assessment concluded that the drainage reserves shall comply with the standards as required in *Planning for Bushfire Protection* 2006; therefore, asset protection zones would not be required along these areas.

The temporary APZ along the western boundary is provided by the proposed perimeter road and is not required once land to the west of the subject property is developed.

The Inner Protection Area (IPA) shall be maintained in such a manner that;

- minimal fire fuel that could be set alight by bushfire (e.g. long grass, tree branches etc.) is present at ground level;
- vegetation does not provide a path for the transfer of fire to the development;
- trees are a minimum of 5 metres away from any building, measured from the edge of the foliage to the roof line or any open balconies;
- bark chips and the like are not present within 5 metres of any building;
- any trees present have a minimum canopy separation of 2 metres; and
- any trees present are not species that retain dead material or deposit excessive amounts of ground fuel in a short time

7.2 Assessed Bushfire Attack Level

An assessment of the bushfire attack level applicable to the proposed development was carried out using the methodology detailed in Appendix 3 of *Planning for Bushfire Protection* 2006 and Appendix B of AS 3959-2009 to ascertain the viability of the development in the protection of life and property in a bush fire situation. This bushfire assessment concluded the following Bushfire Attack Levels will apply to the proposed allotments in relation to the separation distances from the bushfire prone vegetation as outlined and refers to any allotment partially or completely within the higher category.

Precinct 1

Attack Category		BAL-FZ	BAL-40	BAL-29	BAL-19	BAL-12.5	LOW
		Distance (m) from the dominant vegetation					
Aspect	Vegetation Type	All upslope and flat land					
North Elevation	Forest	< 16 ²	19-<21 ²	21-<31	31-<42	42-<100	>100
		Down slope 0 to 5 degrees					
West Elevation	Grassy Woodland	<13 ²	13-<17 ²	17-<25	25-<35	35-<100	>100

Precinct 2

Attack Category		BAL-FZ	BAL-40	BAL-29	BAL-19	BAL-12.5	LOW
		Distance (m) from the dominant vegetation					
Aspect	Vegetation Type	All upslope and flat land					
North Elevation	Forest	< 16 ²	19-<21 ²	21-<31	31-<42	42-<100	>100

² BAL-FZ and BAL-40 are NOT allowable for Subdivision purposes

8.0 SERVICES (ELECTRICITY SUPPLY, WATER, GAS)

All services shall be installed underground.

Reticulated water is available to the development and will be supplied to each allotment through the town mains system in accordance with local water authority, council development control plans (DCPs) or any other policies and procedures.

- a) External fire hydrants will be installed and located in accordance with Australian Standard 2419-1, the hydrants shall be installed so as a clear unobstructed path to each designated building envelope, and
- b) The fire hydrants shall be installed at a maximum distance of 80m from the furthest extremity of the building/s, and
- c) The location of fire hydrants shall be delineated by blue pavement markers in the centre of the road, and
- d) All delivery water lines shall be installed underground to a minimum depth of three hundred millimetres (300mm), with all points above ground using metal pipes or raisers with a minimum internal diameter of nineteen millimetres (19mm).

8.1 Public Road Capacity to Handle Increased Volumes of Traffic in a Bushfire Emergency

The public roads (Fraser Drive, Market Parade and Parkes Lane) in the vicinity of the subject property are adequate to handle increased volumes of traffic in a bushfire emergency. These roads;

- have a bitumen surface;
- are two-way, allowing traffic to pass in opposite directions; and
- have the capacity to carry fully loaded fire fighting vehicles

Access to the proposed Precincts will be via Market Parade or Parkes Lane. Once the Broadwater Parkway is available, both Precincts will feed into this road with an upgraded connection to Fraser Drive opposite Amaroo Drive.

Consideration should be given to the following requirements for access roads to the proposed development as outlined in the Planning for Bushfire Protection manual (RFS, 2006).

- (a) Access roads should have a minimum trafficable width of 4 metres with a metre on each side, maintained as a bushfire fuel free area;
- (b) Roads should be through roads. Dead end roads are not recommended, but if unavoidable, dead ends should not be more than 200m in length, incorporate a minimum 12m radius turning circle, and should be clearly sign posted as dead end;
- (c) The capacity of road surfaces and bridges should be sufficient to carry fully loaded fire-fighting vehicles (approximately 27 tonnes or 9 tonnes per axle);
- (d) Curves should have a minimum inner radius of 6m and be minimal in number to allow for rapid access and escape;
- (e) The minimum distance between inner and outer curves should be 6m;
- (f) Maximum grades should not exceed 15° and preferably not more than 10° or gradient specified by road design standards, whichever is the lesser gradient;
- (g) There must be a minimum vertical clearance to a height of 4 metres above the road at all times;
- (h) Roads should not traverse a wetland or other land potentially subject to periodic inundation (other than flood or storm surge);
- (i) Roads should be clearly sign-posted (with easily distinguished names) and buildings should be clearly numbered. Bridges should clearly indicate load rating;

8.2 Fence Construction

The subject land is identified as containing bushfire prone vegetation. With the areas of vegetation to be retained along the northern boundary (zone 7(a) land and environmental buffers), there is the potential for bushfires to impact on the development and is considered in this assessment.

It is recommended that all fencing for the proposed allotments be construction in non-combustible materials.

9.0 BUSHFIRE CONSTRUCTION STANDARDS

The bushfire assessment undertaken in relation to the proposed subdivision concluded that the construction standard in accordance with AS 3959 (2009) Construction of Buildings in Bushfire Prone Areas (Standards Australia, 2009) will be assessed and nominated when development applications are submitted for the construction of dwellings on the approved allotments.

10.0 LANDSCAPING AND PROPERTY MAINTENANCE – BUSHFIRE PROVISIONS

According to the PBP manual, the principles of landscaping for bush fire protection are to: prevent flame impingement on the dwelling; provide a defensible space for property protection; reduce fire spread; deflect and filter embers; provide shelter from radiant heat; and reduce wind speed. Careful consideration of the species selection, their location relative to their flammability, and on-going maintenance to readily remove flammable fuels (leaf litter, twigs and debris) is critical to providing for bushfire protection (RFS, 2006).

11.0 EXTENT OF COMPLIANCE AND/OR DEVIATION FROM SPECIFICATIONS

The proposed development will comply with the minimum requirements for:

- 1). Asset Protection Zones detailed in Table A2.5 (Minimum Specifications for Asset Protection Zones (APZ) for Residential and Rural Residential Subdivision Purposes (for class 1 & 2 buildings) in FDI 80 Fire Areas); and
- 2) Access in accordance with section 4.1.3-2 (Property Access) in the manual for Planning for Bushfire Protection (RFS, 2006).
- 3) Development of the Residential Precincts satisfies the aims of PBP 2006 and will therefore comply with the provisions for Fire Safety under the Building Code of Australia.

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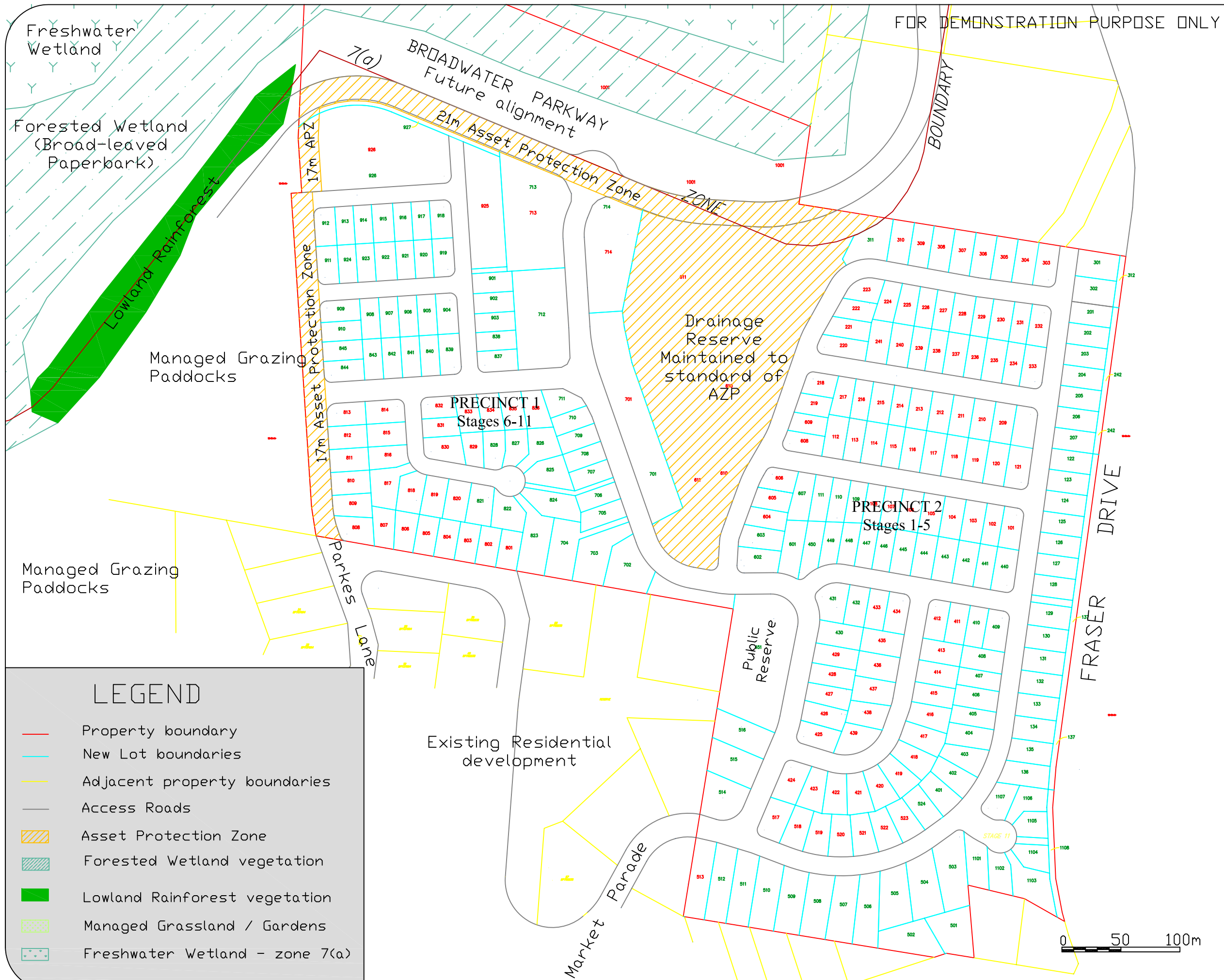
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FOR DEMONSTRATION PURPOSE ONLY

General Notes

This drawing was prepared by Bushfiresafe (Aust) P/L to illustrate the Bushfire protection measures and retained vegetation.

ATTACHMENT 1

ASSET PROTECTION ZONES

Bushfiresafe (Aust)
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CLIENT:
NEWLAND DEVELOPMENTS
P/L

PROJECT:
Bushfire Assessment
Altitude Aspire
Urban Development,
Area E Release
Terranora

DATE: MARCH 2012	Reference Number:
SCALE: @A3	12015

LEGEND

- Property boundary
- New Lot boundaries
- Adjacent property boundaries
- Access Roads
- Asset Protection Zone
- Forested Wetland vegetation
- Lowland Rainforest vegetation
- Managed Grassland / Gardens
- Freshwater Wetland - zone 7(a)