

An aerial mosaic of a coastal area, showing a mix of green forest, yellow and orange agricultural fields, a winding river or road, and a sandy beach meeting the ocean. The mosaic is composed of many small rectangular images.

Volume 2

The Glades Estate Lots 1 & 2 DP 725785 Pacific Highway, Moonee

Environmental Assessment

for Rothwell Boys Pty Ltd

November 2007

0037659

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Lots 1 & 2 DP 725785
Pacific Highway, Moonee**

Environmental Assessment

for
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Project No. 0037659

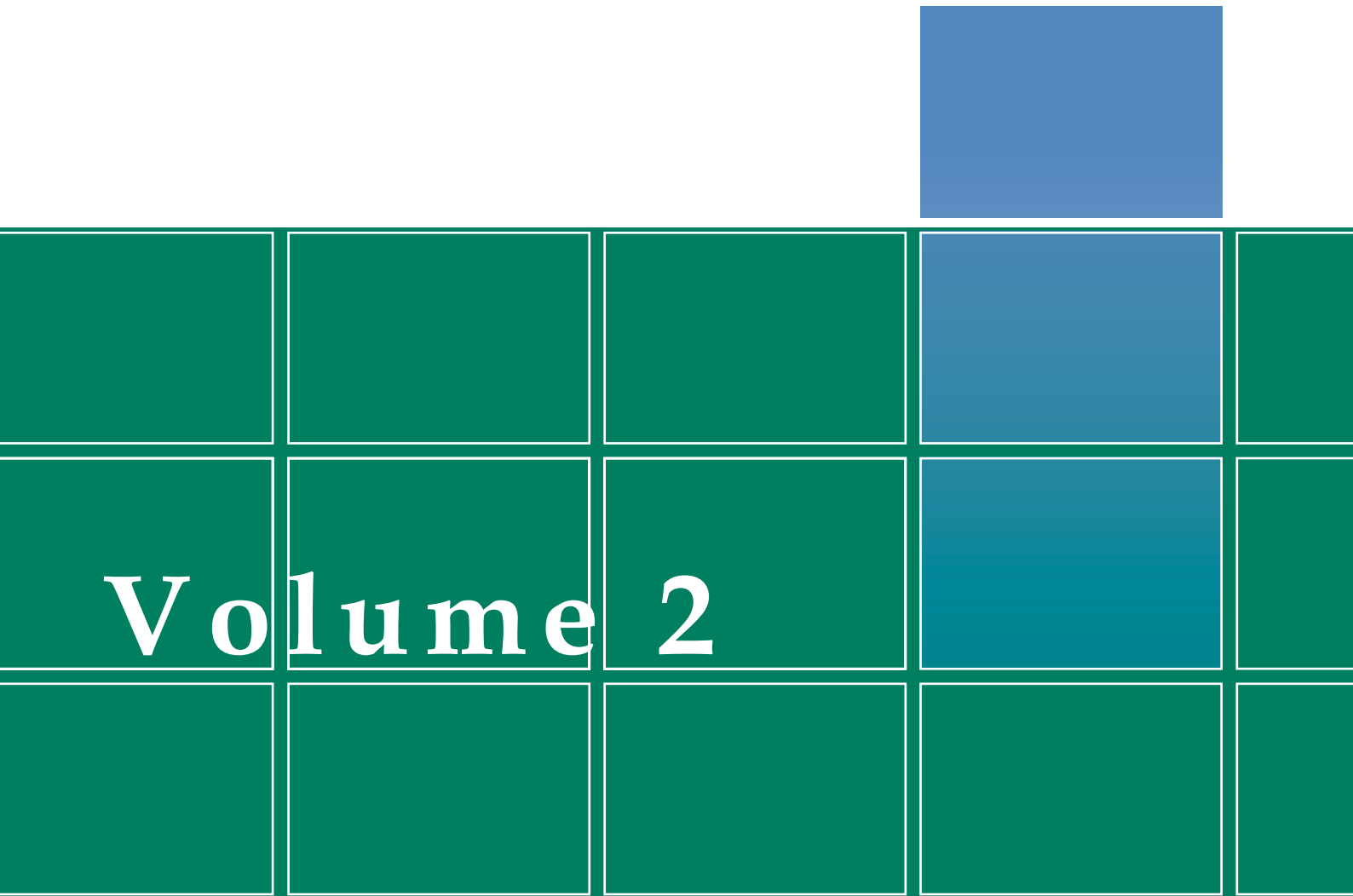
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Environmental Resources Management Australia Pty Ltd Quality System

This report has been prepared in accordance with the scope of services described in the contract or agreement between Environmental Resources Management Australia Pty Ltd ABN 12 002 773 248 (ERM) and the Client. The report relies upon data, surveys, measurements and results taken at or under the particular times and conditions specified herein. Any findings, conclusions or recommendations only apply to the aforementioned circumstances and no greater reliance should be assumed or drawn by the Client. Furthermore, the report has been prepared solely for use by the Client and ERM accepts no responsibility for its use by other parties.

Volume 2





**Bushfire Risk
Assessment**

Bushfire Risk Assessment

PROPOSED RESIDENTIAL SUBDIVISION “THE GLADES ESTATE”

**LOTS 1& 2 IN DP725785
PACIFIC HIGHWAY, MOONEE BEACH**

September, 2007



**BUSHFIRE RISK ASSESSMENT OF
PROPOSED RESIDENTIAL SUBDIVISION**

**LOTS 1& 2 IN DP725785
PACIFIC HIGHWAY, MOONEE BEACH**

PREPARED SEPTEMBER 2007

FOR

ROTHWELL BOYS PTY LTD

(WINTEN PROPERTY GROUP)

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1.0 INTRODUCTION AND BACKGROUND

Rothwell Boys Pty Ltd commissioned Resource Design & Management Pty Ltd (RDM) to prepare a Bushfire Risk Assessment over land described as Lots 1 & 2 in DP 725785, Parish of Moonee, and County of Fitzroy.

This report has been prepared to accompany the Environmental Assessment made in respect to a Concept Plan Application and Project Application made under Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act 1979).

This report acknowledges the Director General's Environmental Assessment Requirements issued in respect of the proposed development (letter dated 25 October 2006) having been prepared cognisant of the following statutory documents;

- The Environmental Planning and Assessment Act 1979 No. 203;
- The Environmental Planning and Assessment Regulation 2000;
- The Rural Fires Act 1997 No. 65;
- The Rural Fires Regulation 2002; and
- The NSW Rural Fire Service (2006) *Planning for Bushfire Protection: A Guide for Council's, Planners, Fire Authorities, and Developers*

1.1 Aim of Report

This report aims address bushfire protection and management issues relative to the future development of Lots 1 & 2 in DP 725785 (hereafter referred to as the subject land). Specifications and requirements specific to bushfire protection are detailed in "*Planning for Bushfire Protection*" (PfBP) published by the NSW Rural Fire Service (RFS).

PfBP has been introduced to provide effective planning guidelines to Councils, Planners, Fire Authorities, Developers and Home Owners.

This document describes the necessary planning considerations when developing areas for residential use in close proximity to lands affected by bushfire events.

The Bushfire Risk Assessment detailed herein is an assessment of the site relative to its further development for residential purposes.

1.2 Site Location and Description

The subject land is positioned approximately fourteen (14) kilometres north of Coffs Harbour's central business district and is directly accessible from the Pacific Highway. The land is formerly described as Lots 1 & 2 in DP 725785, Parish of Moonee, County of Fitzroy.

The land is approximately ninety six (96) hectares in area, it is mostly cleared and is currently used for cattle grazing. Significant areas of grassland and scattered trees dominate the land with denser vegetation aligning the northern, eastern and southern property boundaries.

The northern and eastern boundaries are formed by Skinners and Moonee Creek alignments, farmland adjoins the southern boundary and the Pacific Highway fronts the western property boundary.

Please refer to Figure 1 for further clarification in this regard.

1.3 Report Figures

The following report figures are provided to assist the bushfire risk to the subject land.

- *Annexure A – Landscape Visual Assessment*
The attached plan completed by Anne Harrison, Landscape Architect provides a visual assessment of the site. Numerous photographs are provided taken at various locations around the site.
- *Annexure B – Vegetation Management Plan*
The attached plan completed by Anne Harrison, Landscape Architect identifies the location of open spaces and management intent of vegetation throughout the site.
- *Annexure C – Preliminary Lot Layout*
The Project Plan identifies allotment configurations, road alignments, open space and community areas.. It is intended that the development of the land occur in a logical and progressive sequence which is cognisant of the plan provided herein.
- *Annexure D – Vegetation Classification Map*
The plan identifies the forms and structures of the vegetation on the land according to Table A2.1 of Planning for Bushfire Protection 2006.
- *Annexure E – Bushfire Risk Assessment Map*
This plan prescribes the appropriate asset protection distances which are to be provided in order to retain an acceptable level of bushfire protection for all residential lands.
- *Annexure F– Survey Plan DP 725785*

1.4 Proposed Development

It is proposed to develop the land in accordance with the Preliminary Lot Layout included as Annexure C to this report.

The development of the land is to include:

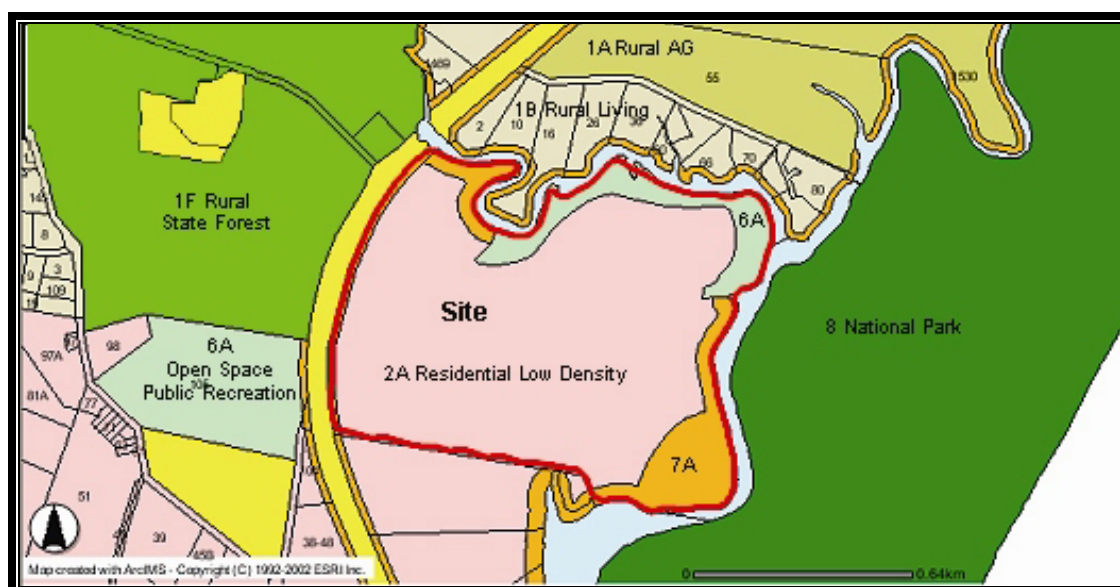
- Approximately five hundred and twenty three (523) residential allotments,
- An internal public road network with direct access to the Pacific Highway and connection to land adjoining the southern boundary;
- Recreation areas maintained primarily for recreation use and hazard reduction purposes;
- Natural areas retained primarily for environmental protection and rehabilitation purposes;
- Scenic Environmental areas to provide visual screening from the Pacific Highway;
- Electricity and water services; and
- Pedestrian and cycle ways.

2.0 LAND USE ZONING AND DEVELOPMENT CONTROLS

The subject land comprising Lots 1 & 2 in DP 725785 is currently zoned as 2A - Residential Low Density under the zoning provisions of the Coffs Harbour City Local Environmental Plan 2000 (LEP 2000). The subject land also contains two other land zonings described as;

- 7A - Environmental Protection Habitat and Catchment Zone; and
- 6A - Open Space Public Recreation Zone.

The diagram provided below is an extract from Coffs Harbour City Council's Local Environmental Plan 2000, the land zonings relevant to the subject land are identified accordingly.



Source: Extract from Coffs Harbour City Council Local Environment Plan – November 2006

2.1 Coffs Harbour Local Environmental Plan 2000

The LEP 2000 lists a number of development types that are considered compatible under the Residential 2A Zone. It is noted that the further development of the land for residential purposes in accordance with the Project Plan, is consistent with the intent of this zone.

2.2 Moonee Development Control Plan 2004

The Moonee Development Control Plan 2004 (DCP) applies to the subject land, incorporated under the Coffs Harbour City Local Environmental Plan 2000.

The DCP seeks to achieve the objectives of economic, social and environmental sustainability through the implementation of site specific development controls.

More specifically, the DCP contains numerous strategies and controls to be applied to the area in addition to identifying potential development constraints, site limitations, proposed target densities and community facilities.

The DCP identifies the greater portion of the subject land suitable for urban development having an estimated target density of approximately four hundred and eighty six dwellings. It has been the development of the DCP and associated studies and investigations undertaken by the developer in cooperation with Coffs Harbour City Council, and numerous Government Departments (including the Department of Fisheries, the NSW Marine Parks

Authority, and the Department of Environment and Conservation), which has informed the conceptual design to which this report relates.

In consideration of other lands, it is noted that the land to the south, (immediately adjoining the site) is also regarded by Council as being suitable for residential development and has an anticipated target density of seventy five dwellings. It is expected that this land will also be developed for residential purposes at some future point in time.

3.0 FUTURE DEVELOPMENT ZONES AND BUSHFIRE PLANNING

To understand the potential bushfire risk to future residential development, it is important to consider the relationship between intended areas for open space and residential occupation.

The proposed open space network will be established according to three broad categories; i.e. Natural Areas, Residential & Recreation Areas, and Scenic Environmental Areas.

It is intended that each area will be managed according to its primary function and in accordance with the Vegetation Management Plan adopted for the site. Maintenance works will be undertaken by the developer for the duration of the project up until civil construction activities cease. Upon completion of the project, the Developer will dedicate all areas of open space to Coffs Harbour City Council.

In determining the level of bushfire risk to future residential development it is necessary to understand the intent of each open space area. For this reason the intent of each zone has been provided below.

Open Space and Natural Areas

The intent of this zone is to provide an open space area that is;

“Natural in character and will be maintained chiefly for environmental protection and rehabilitation purposes”

These areas comprise buffer zones that adjoin Moonee Creek ultimately becoming part of a Council reserve system that includes the Solitary Islands Coastal Walk. These areas contain low impact recreation facilities such as pathways or no facilities where access is actively discouraged.

Open Space – Residential and Recreation Areas

The intent of this zone is to provide an open space area that;

“will be park like in character within developed areas and maintained primarily for recreation use and hazard reduction purposes”

Native vegetation within creek buffers will be strengthened and management directed at providing controlled access. Planting within these areas fulfils a variety of roles; shade, colour, screening, accentuating arrival and place, storm water filtering, aesthetic improvement etc.

The majority of planting will utilise plants grown from seed collected on site or source plants that have a local provenance (refer Appendix for species list). Management in these areas is directed at maintaining cared for landscapes i.e. grassed areas are mown, planted areas are watered at the establishment phase and weed presence is monitored.

Specifically these areas include;

- Streetscape (street trees and grassed road easements)
- Median strip/swales, roundabouts
- The asset protection zone in the form of grouped tree planting within mown grassed areas and stormwater filtering swales. Typically this area is a 20m wide zone extending from the road that surrounds the building envelope.
- Two major recreation nodes
- Bands of rehabilitated native vegetation

Open Space – Environmental Scenic Highway Buffer

The intent of this zone is to provide an open space area that;

“Will be planted and maintained to best provide visual screening from the highway. A twenty metre buffer will be planted where possible (having regard to existing and proposed service locations) with mid and over storey native plant. . Noise attenuation barriers that combine earth mounding and fencing will also feature in this zone”.

4.0 IDENTIFICATION OF BUSHFIRE PRONE AREAS

Each local council is required to produce a Bush Fire Risk Management Plan (BFRMP) under the Rural Fires Act 1997. The plan is to include a bushfire hazard map identifying areas of high, medium, low and no hazard.

The identification of Bushfire Prone Areas (BPA's) is required under section 146 of the EP& A Act. The commissioner of the NSW RFS designates through the guideline *Bushfire Prone Land Mapping* what constitutes a BPA and how it is to be mapped.

Section 5 of the guideline describes the methodology / criteria for the designation and determination of bushfire prone land, and bushfire vegetation datasets.

Section 5.2 of the guideline identifies the various vegetation groups which are used to determine the areas of high, medium and no hazard. The category of vegetation to which the guideline refers is as follows;

- Vegetation Group 1 – Forest;
- Vegetation Group 2 – Woodlands, heaths, and wetlands;
- Vegetation Group 3 – Moist rainforests, shrubland, open woodlands, mallee and grasslands.

The determination of vegetation classes allows the subsequent application of bushfire categories. Bushfire prone land is categorised as either 1 or 2 according to the following criteria;

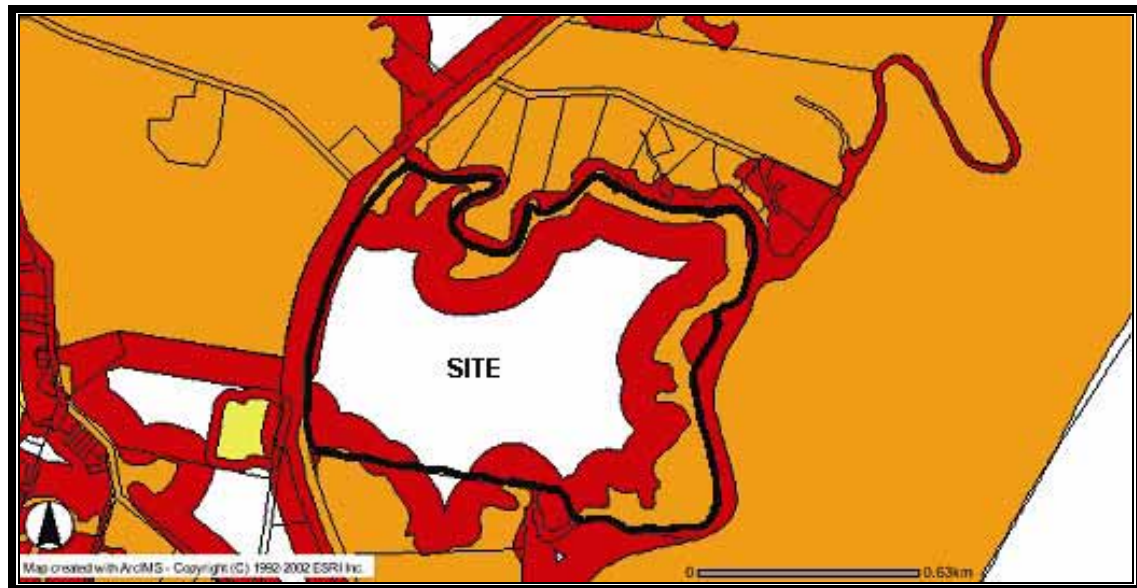
- Vegetation Groups 1 & 2, greater than 1 hectare – Veg. Category 1.
- Vegetation Group 3, greater than 1 hectare – Veg. Category 2.

Notwithstanding the above the following qualifications are made with respect to categories 1,2 & 3.

- Areas of vegetation groups 1,2 & 3 less than 1 hectare in area and not less than 100m lateral separation from a Bushfire Vegetation Category 1, or not less than 30m lateral separation from a bushfire Vegetation Category 2, are excluded; or
- Areas of managed grasslands including grassland on, but not limited to, grazing land, recreational areas, commercial / industrial land, residential land, airports/airstrips and the like are excluded; or
- Areas of managed gardens and lawns within curtilage of buildings; or
- Managed botanical gardens; or
- Agricultural lands used for perennial cropping, orchard, market gardens, nurseries and the likes are excluded; or
- Mangroves.

The diagram provided on the following page is an extract from Coffs Harbour City Council's Bushfire Prone Land Map. The subject land is identified in part as bushfire prone land, vegetation groups around the sites peripheries considered as Category 1 bushfire prone land.

Bushfire Prone Land Map – Lots 1 & 2 725785



Source: Coffs Harbour City Council Bushfire Mapping – November 2006

5.0 GENERAL BACKGROUND

The climate of the Coffs Harbour Region area is classified a humid sub tropical with relatively mild winters and summers. In the coastal areas of the shire the average maximum temperature ranges between 25 to 27 degrees Celsius in summer and 19 to 20 degrees Celsius in winter. Rainfall is generally higher in the coastal areas due to the orographic effect of moist air rising over the land. The mean monthly rainfall ranges from about 65 millimetres in September to 240 millimetres in March.

The topography of the region is varied resulting in a contrasting landform which has many scenic qualities of regional and local significance. This has also resulted in the region supporting a broad range of vegetation communities and fauna species, some of which are listed as endangered or vulnerable. The majority of remaining vegetation therefore has some conservation significance and various policies and legislation from all levels of government have been introduced with the aim of protecting such areas. This presents a range of bushfire management issues as the relative bushfire hazards compete against the environmental and economic values of the forested lands. Arising from the protection of such areas is the need to manage the bushfire risks to property, habitat and people.

6.0 BUSHFIRE ASSESSMENT REQUIREMENTS

This report has been prepared to respond to the Director-General's requirements, issued in respect of the proposed development on the 25th of October 2006.

The Director-General in the statement of keys issues requires an assessment of the site according to the requirements of *Planning for Bushfire Protection 2001* (RFS). It was also requested that bushfire asset protection zones be located outside proposed conservation areas and buffer zones.

On March 1 2007 a new version of Planning for Bushfire Protection was released and adopted through the Environmental Planning and Assessment Amendment Act (Planning for Bushfire Protection) Regulation 2007 and the Rural Fires Amendment Regulation 2007. This new version details the current requirements for Bushfire Protection in NSW.

Responding to the Director General's requirements and the recent changes to *Planning for Bushfire Protection*, 2001, the assessment provided herein has been completed in accordance with the current document - *Planning for Bushfire Protection*, 2006.

Whilst it is acknowledged that an application under Part 3A of the EP& A Act will not require a Bushfire Safety Authority issued under section 100B of the Rural Fires Act 1997, this assessment remains consistent with requirements of the appropriate legislation and policy documents to ensure that an appropriate measure of bushfire protection is achieved.

Legislation and policy documents relevant to this assessment include;

- Environmental Planning and Assessment Act 1979
- Rural Fires Act 1997
- Rural Fires Regulation 2002; and
- Planning for Bushfire Protection 2006 (RFS)

7.0 CLAUSE 46 MATTERS

The following matters address the issues requiring consideration under Clause 46 of the Rural Fires Regulation 2002. More specifically, the matters addressed below correspond to those described under sub-clauses 1(a) – 1(f).

7.1 Description

The subject land is formally described as Lots 1 & 2 in DP 725785, Parish of Moonee, and County Fitzroy.

The land is located approximately fourteen kilometres north of Coffs Harbour and is easily accessed from the Pacific Highway.

Coffs Harbour City Council's Bushfire Prone Land Map identifies part of the subject land as bushfire prone land.

A plan identifying the location of bushfire prone land is provided on page 7.

7.2 Existing Vegetation

According to the requirements of Planning for Bushfire Protection 2006 (Section A2.3) vegetation groups have been determined at least 140m in all directions from the development site.

Further clarification in this regard is provided under examination of the Vegetation Assessment Map included as Annexure D to this report.

Subject Land

For the most part vegetation is restricted to the properties perimeter, aligning the Skinner and Moonee Creek Reserves and the southern property boundary. Vegetation borders the western property boundary, however it is mostly restricted to the sites south western corner. It is noted that recent vegetation clearing works have significantly reduced the bushfire risk to the subject land and now differs considerably to that which appears on the aerial photography contained herein.

Vegetation within the property boundaries is predominantly open grassland with individual trees dispersed throughout. A portion of the land however contains a concentrated corridor of vegetation central to the site which is to be retained.

Existing forest, heath, swamp and mangrove communities adjoin the southern property boundary, Skinners and Moonee Creek alignments. Vegetation along these peripheries will be retained and managed in accordance with an open space management plan developed for this site.

Development of the site will require removal of some vegetation species where these are located within proposed road reserves, where they conflict with infrastructure services or the construction of residential dwellings.

The site is currently used for stock grazing and is periodically slashed. It is intended that this management regime will continue until the site is fully developed.

Photographs taken of the subject land have been provided for further clarification of site conditions and are included as Annexure A to this report.

Adjoining Land

Vegetation north of the subject land is separated by Skinners Creek which is a tidal tributary of Moonee Creek. Vegetation in this locale is consistent with the Open Forest (Dry Sclerophyll) structural form as described in Appendix 2 - Table A2.1 of *Planning for Bushfire Protection, 2006*.

Vegetation directly west of the subject land, between the highway pavement and the site boundary is mostly grassland. Vegetation west of the road pavement however is consistent with the Open Forest (Dry Sclerophyll) structural form.

Vegetation south of the subject land is consistent with the Grassy Woodland structural form. Recent vegetation clearing in this locale has reduced the effect bushfire risk to the subject land.

Vegetation east of the subject land is generally consistent with the Open Forest (Dry Sclerophyll) structural form. It is noted that the land is separated by the tidal waters of Moonee Creek and in some locations tidal flats.

7.3 Slope and Topography

The topography of the subject land is best described as gently undulating having existing levels relative to the Australian Height Datum across the land between 2 and 16 metres.

Existing contour information indicates that gradients across the site range between 0 and 5 degrees. Gradients are detailed under Section 9 of this report.

7.4 Significant Environmental Features

The subject land contains a number of features which are considered as environmentally significant. The land is host to a number of endangered ecological communities, some wetland features and is opposite the Moonee Beach Nature Reserve.

In recognition of these features the development of the land will be restricted to areas of low environmental significance, separating land of greater significance into natural or recreational areas.

Recreational areas will incorporate asset protection zones (APZ) and will be managed to ensure that appropriate buffer distances exist between residential housing and bushfire prone vegetation. Beyond the proposed APZ however rehabilitation and revegetation works are intended and will further enhance the environmental features on the land.

Natural areas will be responsible for providing environmental protection, vegetation rehabilitation and improving habitat ecology. The allocation of these areas corresponds with areas considered to be most environmentally significant.

In summary, the further development of the site having been informed by numerous environmental investigations represents an informed approach to the management of environmental features on the site.

7.5 Details of Threatened Species

Subsequent to the preparation of a Fauna and Flora Assessment completed by James Warren and Associates, a Section 5A Environmental Assessment was completed by same in recognition of the twenty three (23) threatened fauna species considered a possible occurrence at the subject site and several Endangered Ecological Communities (EEC's) recorded on the land.

The report considered that the impacts of the proposed development would be unlikely to result in the local extinction of any threatened fauna species and that there would be no significant impact on any of the EEC's occurring on the site.

7.6 Location of Aboriginal Relic or Place

Environment Resources Management Australia (ERM) has assessed the potential impacts of the proposed development on Aboriginal Cultural Heritage. ERM's Cultural Heritage Assessment is detailed in Volume 2 of the Environmental Assessment Report.

ERM reports that as of May 2006 there were no indigenous sites within the study area listed on the State Heritage Register, State Heritage Inventory, Register of the National Estate or Coffs Harbour Council Local Environmental Plan 2000.

ERM also reports that previous archaeological assessments completed by others identify seven sites located on the northerly slope above Skinners Creek and along the banks of Moonee and Skinners Creeks. ERM's own survey investigations support the findings of the previous assessments which conclude that the use of the area was not extensive or concentrated.

ERM having completed their assessment of the site consider that the impacts of the proposed development will be largely confined to cleared and or disturbed areas and that the areas of cultural importance and potential archaeological deposits will be left largely undisturbed.

8.0 BUSHFIRE RISK ASSESSMENT

The following matters address the issues requiring consideration under Clause 46 of the Rural Fires Regulation 2002. More specifically, the matters addressed below correspond to those described under sub-clauses 1(g)

8.1 Asset Protection Zone

In consideration of the slope across the site; the classification of vegetation affecting proposed allotments; the proposed recreation and environmental areas; and the minimum specifications for asset protection zones; asset protection buffers have been provided and are detailed on the Bushfire Risk Assessment Map provided as Annexure E.

8.2 Water Supply

As a consequence of the further development of the land, mains water will be provided to the proposed development at the appropriate time.

8.3 Property Access

Vehicular access to and from the site will be provided with a Type C – Seagull intersection. The proposed intersection will serve as an interim access until such time as a grade separated interchange is provided at the intersection of the Pacific Highway and Moonee Beach Road.

The proposed access has been designed and accepted by the RTA and is considered appropriate to the level of development proposed. The intersection will provide dedicated turning lanes for traffic entering and leaving the land with significant distances provided to assist with the integration of passing traffic.

The proposed access is appropriately located, distant from bushfire prone land north and south, and suitably located at the southern extents of bushfire prone land west of the Pacific Highway. Access to residential lands will be further assisted by a proposed roundabout positioned within the site which is also expected to assist traffic leaving the land.

The internal road alignments are arranged to provide a number of alternate routes for traffic moving about the site. It is noted that all residential allotments are provided with at least one alternate access to the perimeter road reserve. Where residential lands are subjected to a bushfire event the proposed road design would provide at least one alternate evacuation route to the perimeter road reserve.

In addition to the proposed highway access a secondary connection is also intended, connecting the subject land with the southern boundary alignment. It is anticipated that the future development of lands to the south will provide an alternate connection to Moonee Beach Road.

8.4 Public Roads and Fire Trail Network

The internal roads are cognisant of the design criteria for public roads as defined by clause 4.1.3 of *Planning for Bushfire Protection 2006*. An evaluation of the proposed road design against section 4.1.3 is provided on the following page.

| SECTION 4.1.3 - PUBLIC ROADS | | | | | | |
|---|---------------------------|--------------------------|--|--|----------------------------|------------------------|
| Design Requirement | | Assessment of Compliance | Comment | | | |
| Roads should be two-wheel drive, all weather roads | | Yes | Internal public roads will be constructed in accordance with Coffs Harbour City Council's specifications. | | | |
| Urban perimeter roads are two-way, that is at least two traffic lane widths (8m minimum) with shoulders on each side, allowing traffic to pass in opposite directions; | | Yes | Internal public roads are two lanes and a minimum of eight metres in width. | | | |
| Non perimeter roads comply with Table 4.1 – Road widths for Category 1 Tanker. | | Yes | Internal non perimeter roads accord with the requirements of table 4.1. | | | |
| Curve Radius (Inside Edge) | Swept Path (metres width) | | | | Single Lane (metres width) | Two way (metres width) |
| <40 | 3.5 | | | | 4.5 | 8.0 |
| 40-69 | 3.0 | | | | 3.9 | 7.5 |
| 70-100 | 2.7 | | | | 3.6 | 6.9 |
| >100 | 2.5 | | | | 3.5 | 6.5 |
| Table 4.1 | | | | | | |
| The perimeter road should be linked to the internal road system at an interval of no greater than 500 metres in urban areas; | | Yes | Internal public roads connect with the perimeter road at regular intervals. It is noted that where this interval is exceeded access will be available to the perimeter road via pathways. Access for emergency vehicles at such locations will accord with the requirements of Section 4.1.3. | | | |
| Traffic management devices are constructed to facilitate access by emergency services vehicles. | | Yes | The proposed road design is of a sufficient width to ensure safe access for fire-fighters and evacuating residents. | | | |
| Public roads have a cross fall not exceeding 3 degrees | | Yes | Internal public roads do not exceed this criteria. | | | |
| All roads are through roads. Dead end roads are not recommended, but if unavoidable, dead ends should not be more than 200m in length, incorporate a minimum 12 metre radius turning circle, and are clearly sign posted as a dead end and direct traffic away from the hazard; | | Yes | Where a dead end results due to the staging of construction or arises due to un-constructed road connections, appropriate measures will be provided as required. | | | |
| Curves should have a minimum inner radius of 6m and be minimal in number to allow for rapid access | | Yes | All internal public roads exceed the minimum curve radii. | | | |

| | | |
|--|-----|---|
| and egress; | | |
| The minimum distance between inner and outer curves should be 6m; | Yes | All internal public roads exceed the minimum separation required. |
| Maximum grades should not exceed 15 degrees and preferably not more than 10 degrees or gradient specified by road design standards, whichever is the lesser gradient; | Yes | The subject land is not subjected to significant land gradients. The conceptual subdivision is compliant with road gradient requirements. |
| There is a minimum vertical clearance to a height of four metres above the road at all times; | Yes | Where structures encroach in this regard these will be appropriately dealt with during the construction phase. |
| The capacity of road surfaces and bridges should be sufficient to carry fully loaded firefighting vehicles (approximately 28 tonnes or 9 tonnes per axle); | Yes | Road surfaces will be constructed in accordance with Council's road construction standards and will be capable of accommodating fire fighting vehicles as required. |
| Public Roads greater than 6.5 metres wide to locate hydrants outside of parking reserves to ensure accessibility to reticulated water for suppression. | Yes | Where road exceeds 6.5m in hydrants will be located outside of parking reserves. |
| Public roads between 6.5m and 8m wide are No Parking on one side with the services (hydrants) located on this side to ensure accessibility to reticulated water for fire suppression. | Yes | Parking will be restricted to protect access needs for connection to reticulated water. |
| Public roads up to 6.5m wide provide parking within parking bays and locate services outside of the parking bays to ensure accessibility to reticulated water for fire suppression. | Yes | Where roads are 6.5m wide or less appropriate measures will be provided to ensure accessibility to reticulated water supplies for fire suppression. |
| One way public road access roads are no less than 3.5m wide and provide parking within parking bays and locate services outside of the parking bays to ensure accessibility to reticulated water for fire suppression. | Yes | There are no one way public access roads proposed within this development. |
| Parking bays are a minimum of 2.6m wide from kerb edge to road pavement. No services or hydrants are located within the parking bays. | Yes | Where parking bays are proposed in this way, minimum distances and service locations will be adhered to. |
| Public roads directly interfacing the bush fire hazard vegetation provide roll top kerbing to the hazard side of the road | Yes | Road kerbs adjacent to the hazard side design will provide an appropriate kerb treatment. |

8.5 Bushfire Maintenance

Proposed open space areas and undeveloped lands will be managed by the developer for the duration of the project. These areas will be managed in accordance with an approved Property Vegetation Plan.

Upon completion of all civil construction activities, land intended for open space purposes will be dedicated as public land and will be managed by Coffs Harbour City Council.

To ensure than an acceptable level of safety is provided, it is intended that asset protection zones be incorporated within the road reserve and adjoining public open space. These areas will be responsibly managed consistent with the requirements for inner protection areas.

Where new residential allotments adjoin future stages of development, asset protection zones will be provided and sized to provide an acceptable level of protection. In the interests of addressing bushfire protection issues and building construction standards, it is recommended that interim asset protection zones in the order of 80m be established where possible.

Where residential allotments along the southern property boundary adjoin undeveloped lands interim asset protection zones will also be required until such time as the bushfire risk ceases to exist. Interim asset protection zones will be required according to those identified on the Bushfire Risk Assessment Map attached as Annexure E.

8.6 Construction Standards

The level of construction to which residential buildings must comply should be determined at such time a building application is prepared for Council. Section 9 of this report identifies probable construction levels for the site in consideration of the allotment layout, vegetation perimeters and slope of the land.

8.7 Fire Protection Measures

Recommendations for appropriate fire protection measures are provided under Section 10 of this report.

8.8 Chapter 4 Planning for Bushfire Protection

An assessment of the site in this regard is provided under Section 9 of this report.

9.0 BUSHFIRE HAZARD DETERMINATION

The following matters address the issues requiring consideration under Clause 46 of the Rural Fires Regulation 2002. More specifically, the matters addressed below correspond to those described in Chapter 4 (Bushfire Provisions – Development Stage) of *Planning for Bushfire Protection 2006*.

9.1 Bushfire Hazard Assessment

The bushfire hazard assessment has regard to six distinct zones within the subject site, each being appropriately identified on the Bushfire Risk Assessment Map.

The provision of asset protection zones has also given consideration to the further development of the site, in particular to the re-vegetation works proposed by the site based vegetation management plan.

Zone 1

- Classification of Development nearest to risk – Residential Development;
- Dominant Vegetation Class - Open Forest;
- Slope Range – variations of 0-5 degrees (Downslope);
- NSW Fire Area – North Coast (80 FDI)
- Inner Asset Protection zone – 30m (IPA)
- Outer Asset Protection zone – 10m (OPA)

Zone 2

- Classification of Development nearest to risk – Residential Development;
- Dominant Vegetation Class - Open Forest
- Slope Range – variations of 0-5 degrees (Downslope);
- NSW Fire Area – North Coast (80 FDI)
- Inner Asset Protection zone – 30m (IPA)
- Outer Asset Protection zone – 10m (OPA)

Zone 3

- Classification of Development nearest to risk – Residential Development;
- Dominant Vegetation Class - Woodland;
- Slope Range – variations of 5-0 degrees (Upslope);
- NSW Fire Area – North Coast (80 FDI)
- Minimum Asset Protection zone – 10m
- Proposed Asset Protection zones – 25m
(Refer to Note provided below)

Zone 4

- Classification of Development nearest to risk – Residential Development;
- Dominant Vegetation Class - Open Forest;
- Slope Range – variations of 5-0 degrees (Upslope);
- NSW Fire Area – North Coast (80 FDI)
- Inner Asset Protection zone – 20m (IPA)
- Outer Asset Protection zone – 10m (OPA)

Zone 5

- Classification of Development nearest to risk – Residential Development;
- Dominant Vegetation Class – Heathlands (Tall Heath);
- Slope Range – variations of 0-5 degrees (Downslope);
- NSW Fire Area – North Coast (80 FDI)
- Minimum Asset Protection zone – 15m
- Proposed Asset Protection zones – 31 & 40m

Zone 6

- Classification of Development nearest to risk – Residential Development;
- Dominant Vegetation Class – Refer to note provided below;
- Slope Range – variations of 5-0 degrees (Upslope);
- NSW Fire Area – North Coast (80 FDI)
- Proposed Asset Protection zones – 20m (Refer to Note provided below)

Notes:**Zones 3 & 5**

The asset protection zone proposed for Zones 3 & 5 varies and exceeds what is required by Planning for Bushfire Protection. To provide a consistent approach to the provision of such these have assumed the distances required for other sections of the site.

Zone 6

The land identified as Zone 6 will be subject to landscaping treatments and revegetation works where such does not conflict with existing and proposed service utilities. The Vegetation Plan of Management included as Annexure B indicates that revegetation works will accord to the requirements of the zone provided.

Reviewing Table A3.4 (Appendix 3) and assuming that a Level 1 Construction Standard will be applied to all lots adjacent to this zone, revegetation works may be undertaken consistent with the following vegetation formations;

- Woodlands
- Short Heath
- Low Woodland
- Arid Shrubland

Reduced APZ (increased building construction standards)

Lots identified in red shading on the Bushfire Assessment Risk Map are to be subject to Level 3 Construction (A.S. 3959). Level 3 construction will reduce the necessary APZ to 22m in these locations. This will ensure there is no conflict with creek buffer areas and recreational and stormwater management facilities that may be located between the development footprint and the adjacent hazard.

9.2 Category of Bushfire Attack and Construction Requirements (FDI 80)

The category of bushfire attack is determined by the separation of dwellings to vegetation regarded as bushfire prone land. Where the further development of the site involves building construction, the level of construction will be required to conform to the category of bushfire attack defined in the table below.

| CATEGORIES OF BUSHFIRE ATTACK FOR LAND ADJACENT TO FOREST – UPSLOPE & FLAT LAND | | |
|---|-----------------------------|--|
| Distance of site from Vegetation | Category of Bushfire Attack | Level of Construction Required |
| <17 metres | Flame Zone | Alternative solution required Subject to merit based assessment |
| 17-<25 metres | Extreme | Level 3 (As 3959-1999) |
| 25-<35 metres | High | Level 2 (AS 3959-1999) |
| 35-100 metres | Medium | Level 1 (AS 3959-1999) |
| >100 metres | Low | No Construction Requirements |

| CATEGORIES OF BUSHFIRE ATTACK FOR LAND ADJACENT TO FOREST – SLOPE 0 TO 5 DEGREES | | |
|--|-----------------------------|--|
| Distance of site from Vegetation | Category of Bushfire Attack | Level of Construction Required |
| <22 metres | Flame Zone | Alternative solution required Subject to merit based assessment |
| 22<31 metres | Extreme | Level 3 (As 3959-1999) |
| 31-<42 metres | High | Level 2 (AS 3959-1999) |
| 42-100 metres | Medium | Level 1 (AS 3959-1999) |
| >100 metres | Low | No Construction Requirements |

| CATEGORIES OF BUSHFIRE ATTACK FOR LAND ADJACENT TO WOODLAND – SLOPE 0 TO 5 DEGREES | | |
|--|-----------------------------|--|
| Distance of site from Vegetation | Category of Bushfire Attack | Level of Construction Required |
| <12 metres | Flame Zone | Alternative solution required Subject to merit based assessment |
| 12<17 metres | Extreme | Level 3 (As 3959-1999) |
| 17-<25 metres | High | Level 2 (AS 3959-1999) |
| 25-100 metres | Medium | Level 1 (AS 3959-1999) |
| >100 metres | Low | No Construction Requirements |

| CATEGORIES OF BUSHFIRE ATTACK FOR LAND ADJACENT TO HEATHLAND – SLOPE 0 TO 5 DEGREES | | |
|---|-----------------------------|--|
| Distance of site from Vegetation | Category of Bushfire Attack | Level of Construction Required |
| <15 metres | Flame Zone | Alternative solution required Subject to merit based assessment |
| 15<22 metres | Extreme | Level 3 (As 3959-1999) |

| | | |
|---------------|--------|------------------------------|
| 22-31 metres | High | Level 2 (AS 3959-1999) |
| 31-100 metres | Medium | Level 1 (AS 3959-1999) |
| >100 metres | Low | No Construction Requirements |

Note: The above determinations are provided as a guide only and are based upon vegetation being cleared in accordance with those distances shown on the Bushfire Risk Assessment Map. Appropriate levels of building construction will therefore be dependant upon the locations of future dwelling construction relative to bushfire prone land. The determination of construction requirements would be most appropriate at the building design phase and prior to the submission of a development application to Council.

10.0 BUSHFIRE HAZARD ASSESSMENT RECOMMENDATIONS

Having regard to the Rural Fire Service's document "Planning for Bushfire Protection – 2006" and the requirement for a site specific bushfire hazard determination, it is the recommendations of this report that the following measures be considered as a means of providing adequate bushfire protection to the further development of the land for residential purposes.

10.1 Asset Protection Zone and Grounds

Establish an Inner Protection Area (IPA) in accordance with the Bushfire Risk Assessment Map provided as Annexure E.

Introduce a maintenance regime within the IPA which complies with the following performance criteria;

- Ensure minimal fine fuel exists at ground level;
- Where landscaping treatments are proposed, ensure that these do not provide a path for the transfer of fire;
- Ensure that vegetation is well dispersed and does not form a continuous canopy.
- Ensure that landscaping treatments do not incorporate species which retain dead material or deposit excessive quantities of ground fuel;
- Ensure landscaping treatments are not located near to buildings/structures where potential exists for direct flame contact.
- Site in appropriate locations static water supply for fire fighting purposes.

Establish an Outer Protection Area (OPA) in accordance with the abovementioned plan.

Introduce a maintenance regime within the OPA which complies with the following performance criteria:-

- Reduce fuel loadings through under scrubbing and ongoing maintenance works;
- Ensure that trees and shrubs are maintained such that vegetation is not continuous; and
- Ensure that ground cover/fuel does not exceed 10 centimetres in height.

10.2 Construction Requirements

Construction requirements be given due consideration to at the building design and application stage in accordance with table A3.4 - Appendix 3 of Planning for Bushfire Protection 2006.

10.3 Road Construction

The internal road servicing proposed residential lots is to be constructed in accordance with the requirements Section 4.1.3 of Planning for Bushfire Protection 2006.

10.4 Water Supply

Provide a water supply which accords with the acceptable solutions detailed in section 4.1.3 of Planning for Bushfire Protection 2006.

10.5 Service Supply

Where practical, electricity supplies are to be placed underground. Where impractical, overhead lines are to be provided in accordance with the performance criteria detailed in Section 4.1.3 of Planning for Bushfire Protection 2006.

11.0 CONCLUSION

The subject property is identified as containing bushfire prone land in Coffs Harbour City Council's Bushfire Prone Land Map.

The preceding assessment has been undertaken in accordance with the relevant sections of the Environmental Planning Act 1979, the Rural Fires Regulation and the NSW Planning for Bushfire Protection 2006.

In consideration of the bushfire safety recommendations detailed herein, it is Resource Design and Management's opinion that these will provide a reasonable and satisfactory level of bushfire protection to the further development of the site.

Accordingly, Resource Design and Management support the issue of a Bushfire Safety Authority.

REFERENCE DOCUMENTS

Environmental Resources Management Australia, *The Glades Environmental Assessment Report*, January 2007.

Coffs Harbour City Council (2000) *Coffs Harbour Local Environmental Plan 2000*

Coffs Harbour City Council (2004) *Moonee Development Control Plan 2004*

Harrison, Anne & Environmental Design Group NSW, (2005) *Landscape Concept Plan & Open Space Management Plan*, Anne Harrison & Environmental Design Group NSW Pty Ltd.

James Warren & Associates (2005), *Fauna and Flora Assessment Lots 1 & 2 in DP 725785 Pacific Highway, Moonee*, James Warren & Associates, Alstonville

NSW Rural Fire Service, (June 2006) *Guideline for Bushfire Prone Land Mapping - Version 3*, <http://www.rfs.nsw.gov.au>

NSW Rural Fire Service & Planning NSW (2006), *Planning for Bushfire Protection Draft Guideline: A Guide for Council's, Planners, Fire Authorities and Developers*. Australian Government Publishing Service, Canberra.

LEGISLATION

Environmental Planning and Assessment Act 1979
Environmental Planning and Assessment Regulation 2000
Rural Fires Act 1997
Rural Fires Regulation 2002