Bushfire Threat Assessment

Lot 5 DP 823737, 257 Hermitage Road, Pokolbin NSW

Prepared by:

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Document Status

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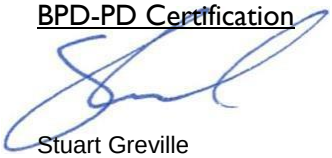
Approval for Issue

Name	Signature	Date
Matt Doherty		8-12-2014

BPD-PD Certification



Stuart Greville
BPD-PD-26202

Summary

RPS Australia East Pty Ltd (RPS) has been commissioned by Belford Land Corporation Pty Ltd to undertake a Bushfire Threat Assessment (BTA) to inform a Planning Proposal over land at Lot 5 DP 823737, 257 Hermitage Road, Pokolbin NSW.

The assessment aims to consider and assess the bushfire hazard and associated potential threats relevant to such a proposal, and to outline the minimum mitigative measures which would be required in accordance with the provisions of the *Planning for Bush Fire Protection, 2006* that has been released and adopted through the *Environmental Planning & Assessment Amendment* (Planning for Bush Fire Protection) *Regulation 2007 &* the *Rural Fires Amendment Regulation 2007.*

In order to determine whether the proposed development is bushfire-prone, and if so, which setbacks and other relevant Bush Fire Protection Measures (BFPM) will be appropriate, this assessment adheres to the methodology and procedures outlined in "Planning for Bushfire Protection" (NSW Rural Fire Service, 2006) (hereafter referred to as 'PBP 2006').

This BTA found the land surrounding the site to support vegetation consistent with Forest and Woodland vegetation formation as described by PBP 2006.

In summary, the following key recommendations have been generated to enable the proposed development to comply with PBP 2006:

- Asset Protection Zones are required but will not be greater than 25m from the nearest bushfire hazard depending on the vegetation classification;
- Future dwellings within the site should have due regard to the specific considerations given in the BCA, which makes specific reference to the Australian Standard (AS3959 – 2009) construction of buildings in bushfire prone areas.
- Roads are to be constructed in accordance with PBP 2006 as outlined in section 3.3 of this report.
- Consideration should be given to landscaping and fuel loads on site to decrease potential fire hazards on site;
- Non-reticulated water supplies must comply with PBP 2006 to provide for firefighting operations, as outlined in section 3.4 of this report; and
- Any future gas connections must be established and maintained in accordance with AS1596 – 2002.

This assessment has been made based on the bushfire hazards in and around the site at the time of inspection and production (December 2014).

In conclusion, should the recommendations above be duly considered and incorporated, the bushfire hazard present should be reduced to a level considered necessary to provide an adequate level of protection to life and property of the site, however will not prevent a bushfire from occurring offsite or radiating from the site.

Finally, the implementation of the adopted measures and recommendations forwarded within this report comply with PBP (2006) and will contribute to the amelioration of the potential impact of any bushfire upon the development estate, but they do not and cannot guarantee that the area will not be affected by bushfire at some time.

Terms and Abbreviations

Abbreviation	Meaning
APZ	Asset Protection Zone
AS2419 -2005	Australian Standard – Fire Hydrant Installations
AS3959-2009	Australian Standard – Construction of Buildings in Bush Fire Prone Areas
BCA	Building Code of Australia
BRMC	Bushfire Risk Management Committee
BFRMP	Bush Fire Risk Management Plan
BPA	Bush Fire Prone Area (Also Bushfire Prone Land)
BPL	Bush Fire Prone Land
BPL Map	Bush Fire Prone Land Map
BPMs	Bush Fire Protection Measures
BTA	Bushfire Threat Assessment
EPA Act	NSW Environmental Planning and Assessment Act 1979
FDI	Fire Danger Index
FMP	Fuel Management Plan
ha	hectare
IPA	Inner Protection Area
LEP	Local Environment Plan
LGA	Local Government Area
OPA	Outer Protection Area
PBP	Planning for Bushfire Protection 2006
RF Act	Rural Fires Act 1997
RF Regulation	Rural Fires Regulation
RPS	RPS Australia East Pty Ltd

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Tables

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Appendices

1.0 Introduction

RPS has been engaged by Belford Land Corporation to undertake a Bushfire Threat Assessment (BTA) to inform a Planning Proposal over land at Lot 5 DP 823737, 257 Hermitage Road, Pokolbin NSW, hereafter referred to as the 'site' (**Figure 1**).

The assessment aims to consider and assess the bushfire hazard and associated potential threats relevant to such a proposal, and to outline the minimum mitigative measures which would be required in accordance with the provisions of the *Planning for Bush Fire Protection, 2006* that has been released and adopted through the *Environmental Planning & Assessment Amendment* (Planning for Bush Fire Protection) *Regulation 2007* & the *Rural Fires Amendment Regulation 2007.*

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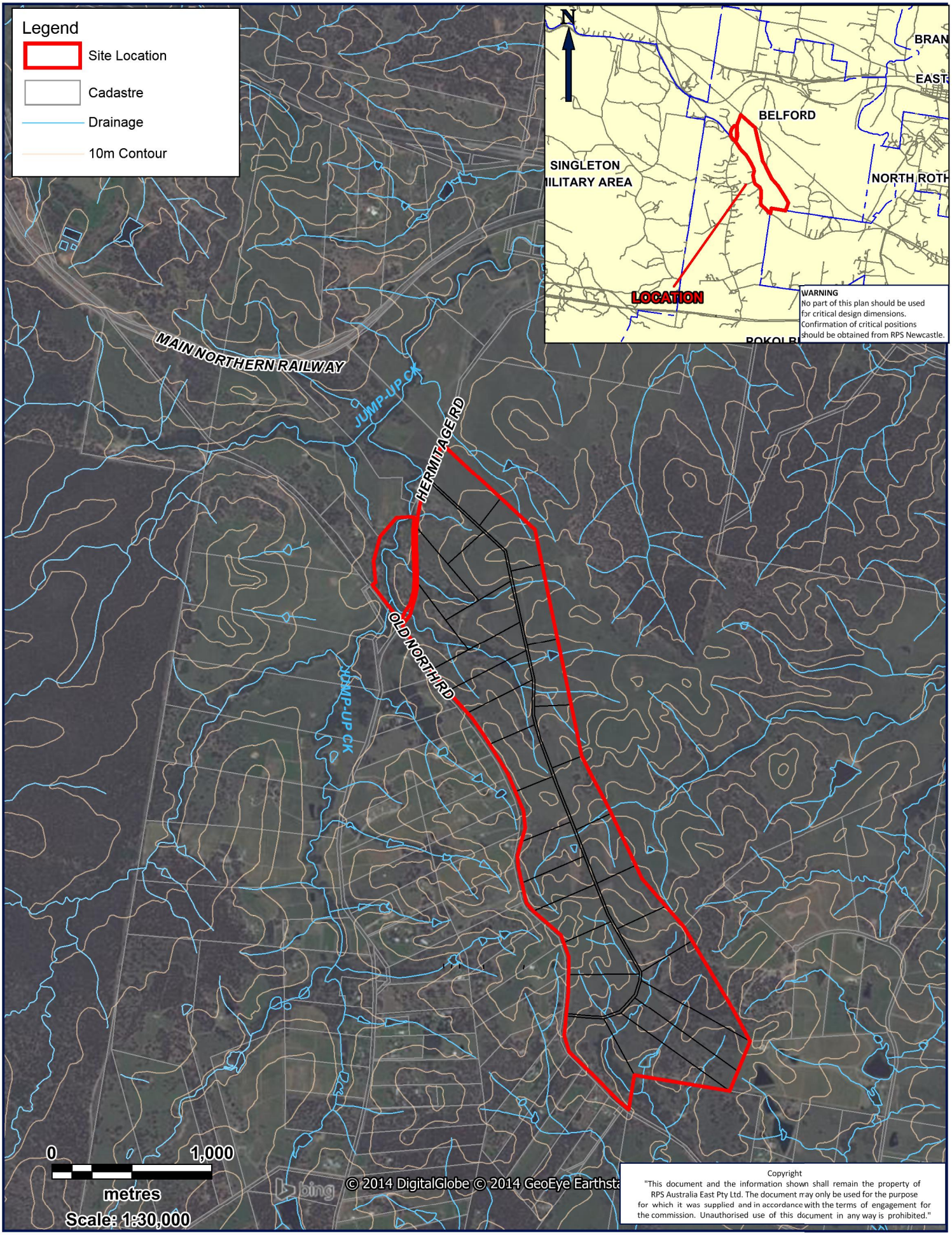
1.1 Site Particulars

Locality	Lot 5 DP 823737, 257 Hermitage Road, Pokolbin.
LGA	Singleton City Council
Area	Approximately 304.9 ha.
Zoning	The land is currently zoned as RU1 Primary Production by Singleton Council (2013).
Boundaries	The site is surrounded by a combination of native vegetation, cleared lands and rural residential properties.
Current Land Use	The land is currently vacant cleared land with remnant vegetation but has previously been utilised for stock grazing.
Topography	The site is displays many undulating hills with a gully depression running from the north west down the centre to the south.
Climate / Fire History	The site lies within a geographical area with a Fire Danger Index (FDI) rating of 100. Extreme bushfire weather is therefore associated with long periods of drought, high temperatures, low humidity and gusty often north-westerly winds. The site is classified by Singleton City Council as Vegetation Category 1, Vegetation Category 2 and Vegetation Buffer on the Bushfire Prone Land Map (2014) **Figure 2**.



TITLE: FIGURE 1: SITE LOCATION

LOCATION: POKOLBIN

DATUM: (GDA 94)
PROJECTION: MGA ZONE 56

DATE: 5/12/2014
PURPOSE: BTA

LAYOUT REF: J:\JOBS\124k\124712 Pokolbin\10 - Drafting \MapInfo Workspaces\Eco
VERSION (PLAN BY): B A4 (LV-NW)

CLIENT: BELFORD LAND CORPORATION
JOB REF: PR 124712

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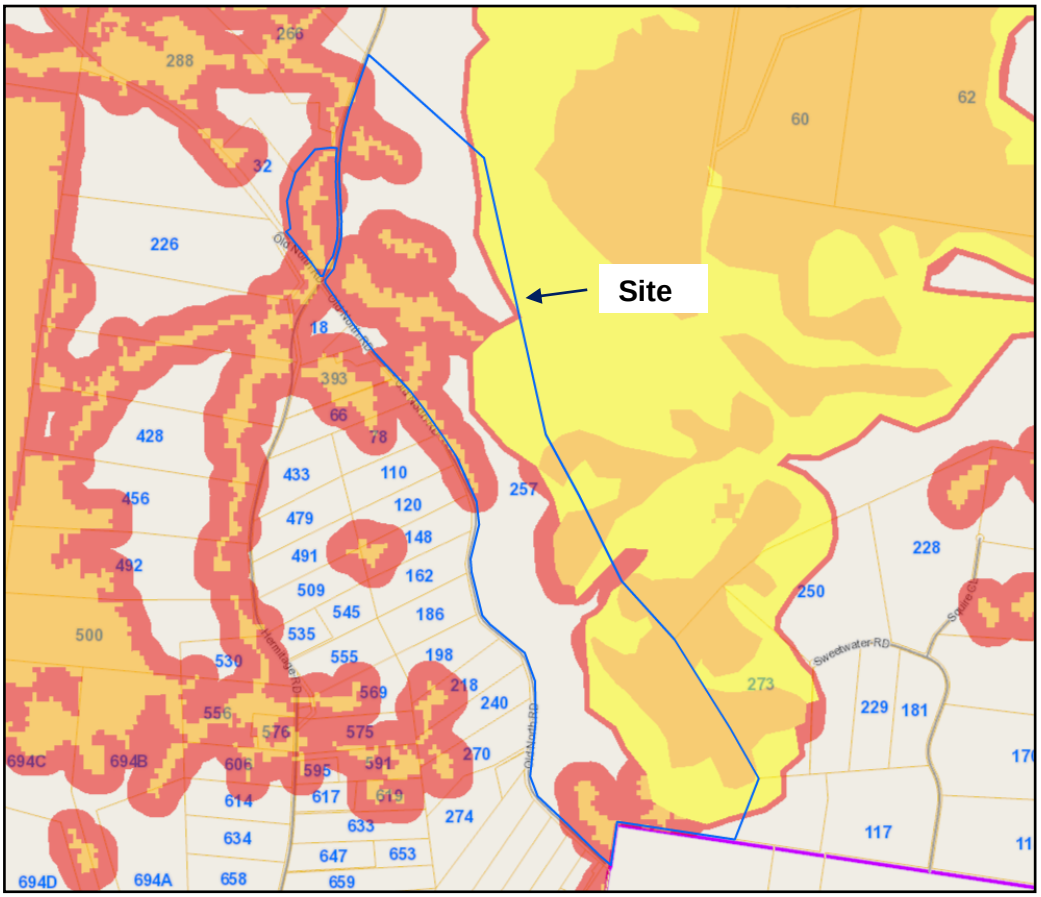


Figure 2 Bushfire Prone Land Map of the Site

1.2 Description of Proposal

The proposed activity is to rezone the 304.9 ha site from RU1 Primary Production to RU4 Primary Production Small Lots. The planning proposal also seeks to permit a range of lot sizes ranging in area from 2 to 9 ha to permit approximately 50 lots to facilitate tourism, horticulture, viticulture and rural residential purposes (JBA 2014).

A site plan for development of the proposal is contained in **Appendix 1**.

1.3 Objectives of Assessment

This assessment has been undertaken in accordance with clause 44 of the RF Regulation 2008. This BTA also addresses the six key Bush Fire Protection Measures (BFPMs) in a development assessment context being:

(1) The provision of clear separation of buildings and bush fire hazards, in the form of fuel-reduced Asset Protection Zones (and their components being Inner Protection Areas and Outer Protection Areas);

(2) Construction standards and design (Bushfire Attack Levels);

(3) Appropriate access standards for residents, fire-fighters, emergency workers and those involved in evacuation;

(4) Adequate water supply and pressure;

(5) Emergency management arrangements for fire protection and / or evacuation; and

(6) Suitable landscaping, to limit fire spreading to a building.

2.0 Bushfire Hazard Assessment

2.1 Vegetation Assessment

2.1.1 Methodology

Vegetation classification over the site has been carried out as follows:

- Aerial Photograph Interpretation to map the vegetation classification and extent;
- On site vegetation assessment; and
- Reference to regional vegetation community mapping.

In accordance with PBP (2006), an assessment of the vegetation over a distance of 140m in all directions from the site was undertaken. Additionally, an assessment of the vegetation within the site has been undertaken to display the potential hazards for any proposed future developments. Vegetation that may be considered a bushfire hazard was identified in all directions from and within the site. The vegetation classification is based on the revised Appendix 3 of PBP (2006).

Refer to **Table 1** and **Figure 3** for vegetation classification surrounding the site, and **Table 2** and **Figure 4** for vegetation classification within the site.

2.1.2 Predominant Vegetation Formation

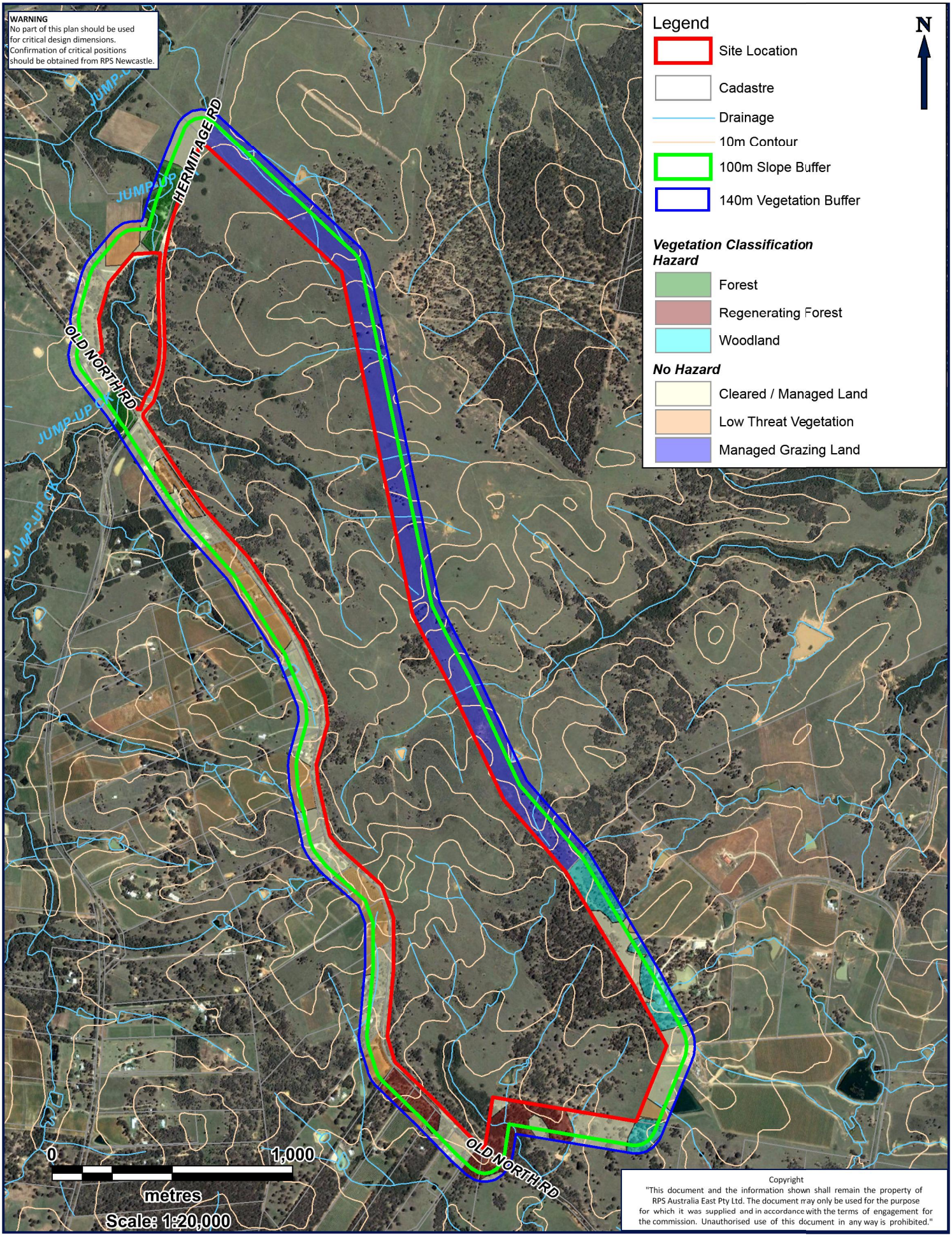
Table 1 Vegetation Classification surrounding the site

Direction	Vegetation Description	Classification of Vegetation Formations (PBP 2006)
North	Cleared lands and vegetation	No Hazard/ Hazard (Forest)
East	Managed Grazing Lands	No Hazard
Southeast	Vegetation	Hazard (Woodland)
South	Vegetation, vineyards and managed lands	Hazard (Woodland) and Low Threat Vegetation
Southwest	Vegetation and managed lands	Hazard (Woodland)
West	Rural residential properties and vineyards	No Hazard/Low Threat Vegetation
Northwest	Vegetation	Hazard (Regenerating Forest)

Table 2 Vegetation Classification within the site

Direction	Vegetation Description	Classification of Vegetation Formations (PBP 2006)
North	Vegetation and cleared/managed lands	Hazard (Forest)/No Hazard
East	Vegetation and cleared/managed lands	Hazard (Forest)/No Hazard
South	Vegetation and cleared/managed lands	Hazard (Woodland)/No Hazard

Direction	Vegetation Description	Classification of Vegetation Formations (PBP 2006)
Southwest	Vegetation	Hazard (Forest)
West	Cleared/managed lands	No Hazard



TITLE: FIGURE 3: VEGETATION CLASSIFICATION SURROUNDING SITE
LOCATION: POKOLBIN
DATUM: (GDA 94)
PROJECTION: MGA ZONE 56
DATE: 28/10/2014
PURPOSE: BTA
LAYOUT REF: J:\JOBS\124k\124712 Pokolbin\10 - Drafting \MapInfo Workspaces\Eco
VERSION (PLAN BY): A A4 (LV-NW)

CLIENT: BELFORD LAND CORPORATION
JOB REF: PR 124712

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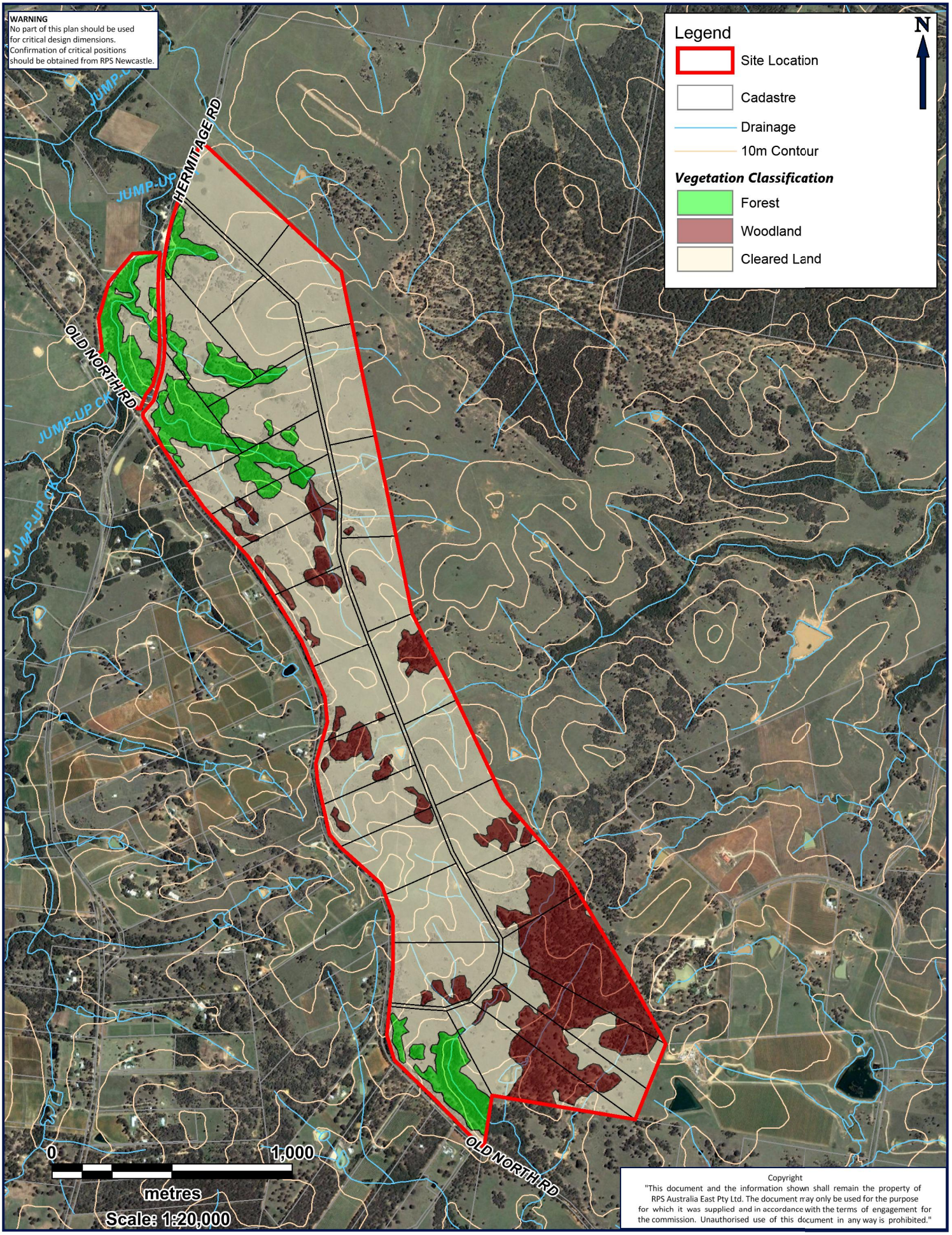

TITLE: FIGURE 4: VEGETATION CLASSIFICATION WITHIN SITE

LOCATION: POKOLBIN

DATUM: (GDA 94)
PROJECTION: MGA ZONE 56

DATE: 5/12/2014
PURPOSE: BTA

LAYOUT REF: J:\JOBS\124k\124712 Pokolbin\10 - Drafting \MapInfo Workspaces\Eco
VERSION (PLAN BY): B A4 (LV-NW)

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2.2 Effective Slope Assessment

2.2.1 Methodology

Slope assessment has been undertaken as follows:

- Aerial Photograph Interpretation in conjunction with analysis of electronic contour maps with a contour interval of 2m; and
- On site slope inspection.

In accordance with PBP 2006, an assessment of the slope affecting the bushfire behaviour was undertaken for a distance of 100m from the edge of the site boundary in the direction of the bushfire hazard.

The slopes leading away from the site in the direction of the identified bushfire threats have been evaluated to identify both the average slope and by identifying the maximum slope present. These values help determine the level of gradient which will most significantly influence the fire behaviour of the site.

2.2.2 Effective Slope

The slopes of the bushfire hazard surrounding the site and within the site are documented in **Table 3** and **Table 4** respectively below.

Table 3 Slope Assessment of Vegetation Surrounding the Site

Direction of Vegetation	Vegetation Type	Slope Classes
North	Forest	Flat
Southeast	Regenerating Forest	0-<5° Downslope
South	Woodland	0-<5° Downslope
Southwest	Regenerating Forest	0-<5° Downslope
Northwest	Forest	Flat

Table 4 Slope Assessment of Vegetation within the Site

Direction of Vegetation	Vegetation Type	Slope Classes
North	Forest	Flat/ Upslope and 0-<5° Downslope
East	Forest	Flat/ Upslope and 0-<5° Downslope
South	Woodland	Flat/ Upslope and 0-<5° Downslope
Southwest	Forest (Riparian)	Flat/ Upslope and 0-<5° Downslope

2.3 Significant Environmental Features

Site surveys were undertaken in October 2014 by RPS Ecologists to detect significant Environmental Features across the Site. No significant environmental features such as riparian corridors, SEPP wetlands or rainforests, Koala habitat, areas of geological interest, steep lands, national parks or land slip areas were identified on site.

2.4 Significant Threatened Species

A search of the Atlas of NSW Wildlife Database was conducted on 24th October 2014 in addition to ecological surveys. The Atlas includes records of threatened species listed under both the NSW *Threatened Species Act 1995* and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*. One threatened fauna species, namely the Speckled Warbler (*Chthonicola sagittatus*), listed as vulnerable

under the TSC Act, was identified during ecological surveys. Additionally, two Endangered Ecological Communities listed as Vulnerable under the TSC Act were identified on site. No threatened flora species were identified on site.

2.5 Cultural Significance

A search of The Aboriginal Heritage Information Management System (AHIMS) (**Appendix 2**) confirmed that there is one record of an Aboriginal Site within or near the site. It is recommended that suitably qualified consultants undertake Archaeological investigations prior to development upon the site to ensure that any culturally significant sites or artefacts are retained and not impacted upon.

2.6 Bushfire Risk Management Plan

The RF Act requires each bushfire management committee to prepare a bushfire risk management plan for a nominated area; commonly defined by local government area boundaries. The Singleton Bushfire Management Committee developed the Singleton Bush Fire Risk Management Plan (BFRMP) which was endorsed in November 2009 and finally approved in March 2011. The BFRMP investigated the community assets in the Singleton Local Government Area and ranked them according to the assessed bushfire risk and the likely consequence of a bushfire attack.

BFRMPs are often not site specific, and individual sites or development do not have a statutory obligation to prepare a BFRMP, however it is often recommended as part of preparedness, a BFRMP is prepared.

Singleton Bush Fire Risk Management Plan

The proposed Development does not fall within any recognised assets in the Singleton BFRMP, however it falls within the Singleton Military Area.

A description of the different bushfire management zones are described in **Table 5** below.

Table 5 Bushfire Management Zones

Zone	Purpose	Suppression Objectives (s)	Zone characteristics
Asset Protection Zone (APZ)	To protection human life, property and highly valued public assets and values.	To enable the safe use of Direct Attack suppression strategies within the zone.	As per RFS document *Standards for Asset Protection Zones.*
Strategic Fire Advantage Zone (SFAZ)	To provide strategic areas of fire protection advantage which will reduce the speed and intensity of bushfires and reduce the potential for spot fire development; To aid containment of wildfires to existing management boundaries.	To improve the likelihood and safe use of: **Parallel Attack** suppression strategies with the zone. and/or **Indirect Attack** (back burning) in high to very high fire weather conditions within the zone. To reduce the likelihood of: Crown fire development within the zone; and/or Spot fire ignition potential from the zone.	Zone width related to suppression objectives and dependant: • Topography; • Aspect; • Spotting propensity; • Location of adjacent firebreaks; • Mosaic pattern of treatment; Assess Overall Fuel Hazard (OFH) once vegetation communities reach minimum fire thresholds within this plan. Management practises should aim to achieve mosaic fuel reduction patterns so that the majority of the SFAZ has an OFH of less than high.
Land	To meet relevant land	As per the land management	As appropriate to achieve land

Zone	Purpose	Suppression Objectives (s)	Zone characteristics
Management Zone (LMZ)	management objectives in areas where APZ's or SFAZ's are not appropriate.	and fire objectives of the responsible land management agency. To reduce the likelihood of spread of fires. To undertake mosaic burning.	management eg. heritage and/or fire protection eg. broad scale mosaic burning objectives.
Fire Exclusion Zone (FEZ)	To exclude bushfires	N/A	Variable dependant on size of fire sensitive area requiring protection.

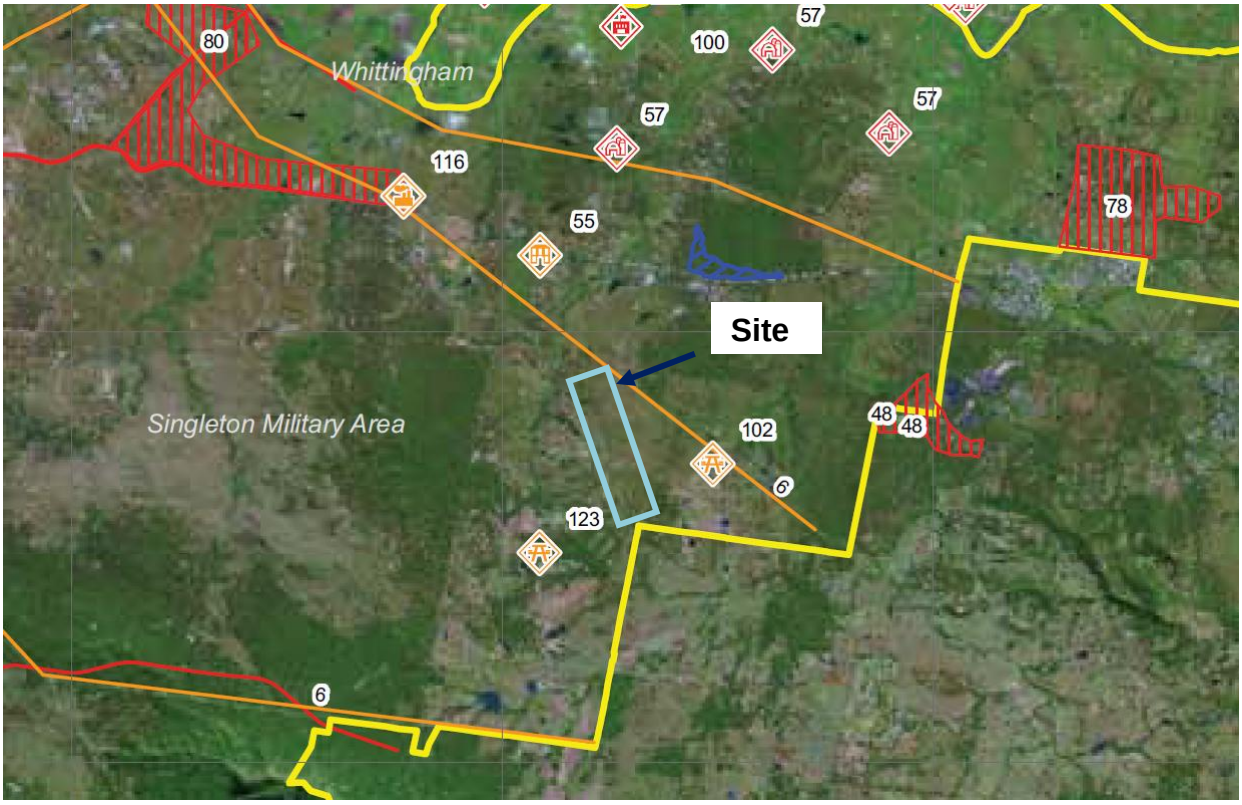


Figure 5 Singleton Bushfire Risk Management Plan

Figure 5 displays the context of the site in relation to other assets included in the BFRMP. The red hatching represents human residential, blue hatching represents Strategic Fire Advantage Zones and orange lines are Asset Protection Zones.

The Singleton BFMC includes a series of treatment actions available for implementation at any particular site exposed to a bushfire threat. **Table 6** describes the available treatment actions.

Table 6 Asset specific treatments used in the Singleton BFMC area

Strategy	Targeted treatments used in the BFMC
Ignition Management	▪ Limit, restrict or manage access to potential ignition areas. ▪ Enact fire restriction protocol when Fire Danger Rating is greater than high.
Hazard Reduction	▪ Maintain APZ ▪ Inspect and maintain APZ as required ▪ Implement SFAZ burning strategies ▪ Management burns after harvesting operations

Strategy	Targeted treatments used in the BFMC
	▪ Implement firebreak/easement maintenance program
Community Education	▪ Conduct community education programs e.g. targeted community meetings, school visits etc. ▪ Review and provide advice for fuel management plans
Property Planning	▪ Assist with preparation of emergency/relocation plan ▪ Review and update existing fire relocation plan
Preparedness	▪ Inspect and maintain fire trail network ▪ Develop management guidelines for IMT's ▪ Prepare Pre Incident Plan ▪ Property Identification Project (PIP) ▪ Provide training and resources for CFU ▪ Undertake building maintenance works

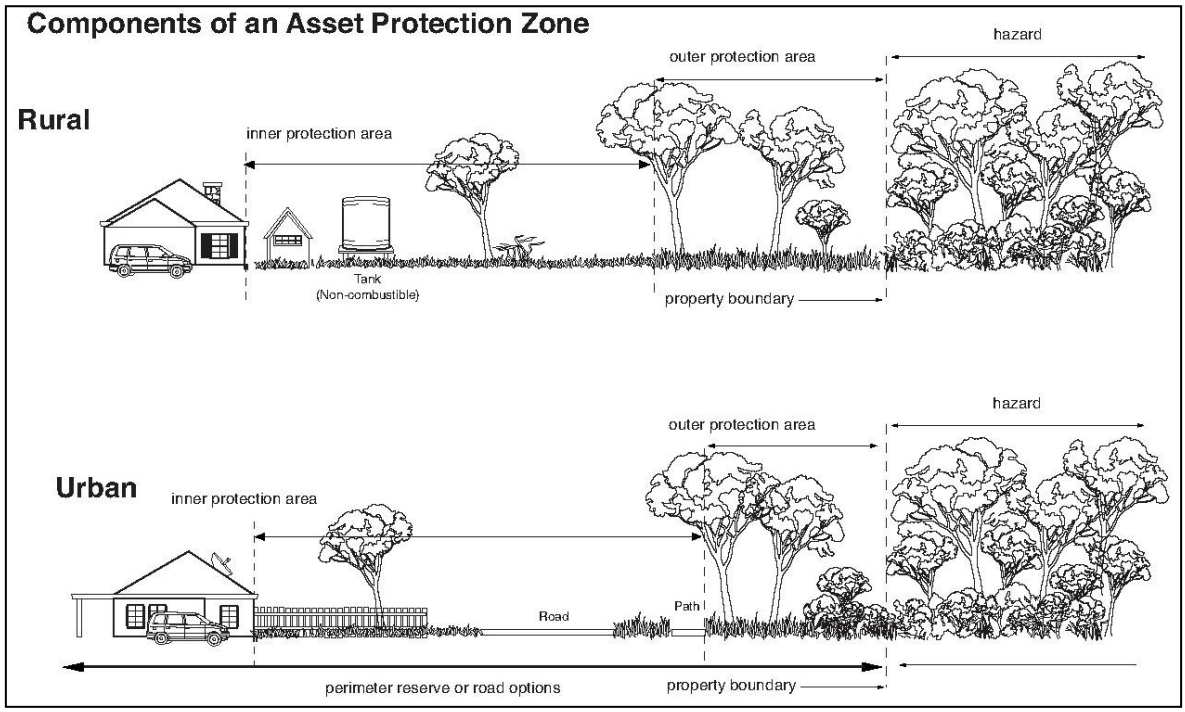
3.0 Bushfire Protection Measures

3.1 Asset Protection Zones

An APZ is an area surrounding a development that is managed to reduce the bushfire hazard to an acceptable level to mitigate the risk to life and property. The required width of the APZ varies with slope and the type of hazard. An APZ can consist of both an Inner Protection Area (IPA) and an Outer Protection Area (OPA). The respective IPA and OPA widths for the required APZs are as detailed in **Table 7**. An APZ can include the following:

- lawns;
- discontinuous gardens;
- swimming pools;
- driveways;
- unattached non-combustible garages with suitable separation from the dwelling;
- open space / parkland; and
- car parking.

Figure 6 Components of an APZ (PBP 2006)



3.1.2 IPA (Inner Protection Area)

The IPA extends from the edge of the OPA to the development. The IPA aims to ensure that the presence of fuels which could contribute to a fire event / intensity, are minimised close to the development. The performance of the IPA must be such that:

- there is minimal fine fuel at ground level which could be set alight by a bushfire; and
- any vegetation in the IPA does not provide a path for the transfer of fire to the development – that is, the fuels are discontinuous.

The presence of a few shrubs or trees in the IPA is acceptable provided that they:

- do not touch or overhang any buildings;
- are well spread out and do not form a continuous canopy;
- are not species that retain dead material or deposit excessive quantities of ground fuel in a short period or in a danger period; and
- are located far enough away from any dwelling so that they will not ignite the dwelling by direct flame contact or radiant heat emission.

Woodpiles, wooden sheds, combustible material storage areas, large areas / quantities of garden mulch, stacked flammable building materials etc. are not be permitted in the IPA.

3.1.3 OPA (Outer Protection Area)

The OPA is located adjacent to the hazard. Within the OPA any trees and shrubs should be maintained in a manner such that the vegetation is not continuous. Fine fuel loadings should be kept to a level where the fire intensity expected will not impact on adjacent developments.

3.1.4 Determining the Appropriate Setbacks

The site lies within the Singleton LGA and therefore is assessed under a FDI rating of 100. In accordance with Table A2.4 and Table A2.7 within PBP (2006), the appropriate width setbacks have been calculated based on the topography and the vegetation on and around the site. Refer to **Table 7** for required APZs. Based on the determined slope and vegetation classifications, an APZ greater than 25m will not be required for any proposed lot.

Table 7 Required APZ

Vegetation Classification	Slope	Required APZ (PBP 2006)	APZ Components (Table A2.7 PBP 2006)
Forest	Flat/Upslope	20m	10m IPA + 10m OPA
Forest	0-<5° Downslope	25m	10m IPA + 15m OPA
Woodland	Flat/Upslope	10m	NA
Woodland	0-<5° Downslope	15m	NA
Regenerating Forest	Flat/Upslope	20m	10m IPA + 10m OPA
Regenerating Forest	0-<5° Downslope	25m	10m IPA + 15m IPA

Note: Section 2 classified vineyards as Low Threat Vegetation in line with PBP 2006, and as such no APZ is required for this vegetation type. Section A2.3 of Appendix 2 in PBP 2006 states that vineyards are not considered a hazard and can be included within an APZ as they are a reduced vegetation type.

3.2 Dwelling Design and Construction

Building design and the materials used for construction of future dwellings should be chosen based on the information contained within AS3959-2009, and accordingly the designer/architect has been made aware of this recommendation. The dwelling plans should be checked by the architect to confirm they meet the relevant Bushfire Attack Level (BAL) as detailed in AS3959-2009.

The determinations of the appropriate BAL are based upon parameters such as weather modelling, fire-line intensity, flame length calculations, as well as vegetation and fuel load analysis. The determination of the construction level is derived by assessing the:

- Relevant FDI = 100
- Flame temperature
- Slope
- Vegetation classification; and
- Building location.

3.2.1 Bushfire Attack Level for the Proposed Development

Using the Addendum: Appendix 3 (NSW Rural Fire Service, 2010), the information relating to vegetation and slope as presented within this report and according to Table 2.4.2 of AS3959-2009 the BAL for the site have been calculated.

Each lot within the proposed development is capable of being provided with BAL 29 or less.

Refer to **Table 8** for the BALs calculated for the site.

Table 8 Required BAL (AS 3959-2009)

Vegetation Classification (PBP 2006)	Slope Class	Separation Distance	BAL	Construction Section (AS3959-2009)
Forest	Flat/Upslope	<19m	BAL - FZ	Sect 4, 5, 6, 7, 8 and 9 of AS3959-2009 and Sect A3.7 of PBP Addendum Appendix 3.
		19-<25m	BAL – 40	
		25-<35m	BAL – 29	
		35-<48m	BAL – 19	
		48-<100	BAL – 12.5	
Forest	0-<5° Downslope	<24m	BAL - FZ	
		24-<32m	BAL – 40	
		32-<43m	BAL – 29	
		43-<57m	BAL – 19	
		57-<100m	BAL – 12.5	
Woodland	Flat/Upslope	<12m	BAL - FZ	
		12-<16m	BAL – 40	
		16-<24m	BAL – 29	
		24-<33m	BAL – 19	
		33-<100m	BAL – 12.5	
Woodland	0-<5° Downslope	<15m	BAL - FZ	
		15-<21m	BAL – 40	

Vegetation Classification (PBP 2006)	Slope Class	Separation Distance	BAL	Construction Section (AS3959-2009)
		21-<29m	BAL – 29	
		29-<41m	BAL – 19	
		41-<100	BAL – 12.5	
Regenerating Forest	0-<5° Downslope	<24	BAL - FZ	
		24-<32m	BAL – 40	
		32-<43m	BAL – 29	
		43-<57m	BAL – 19	
		57-<100m	BAL – 12.5	
Regenerating Forest	Flat/Upslope	<19m	BAL - FZ	
		19-<25m	BAL – 40	
		25-<35m	BAL – 29	
		35-<48m	BAL – 19	
		48-<100	BAL – 12.5	

To Note: *The construction requirements for the next lower BAL than that determined for the site may be applied to an elevation of the building where the elevation is not exposed to the source of bushfire attack. An elevation is deemed to be not exposed to the source of bushfire attack if all straight lines between that elevation and the source of bushfire attack are obstructed by another part of the building.*

3.3 Access

In the event of a serious bushfire threat to the proposed development, it will be essential to ensure that adequate ingress/ egress and the provision of defendable space are afforded in the subdivision design. The following summarises the requirements of PBP (2006).

According to PBP (2006), the design specifications for **public road** require that roads:

- be two-wheel drive all weather roads;
- not be hindered by an overuse of traffic calming devices such as speed humps and chicanes;
- be through roads, but if unavoidable then dead ends should be not more than 200 metres in length, incorporate a minimum 12 metres turning circle and should be clearly sign posted as dead ends;
- the capacity of road surfaces and bridges is sufficient to carry fully loaded fire fighting vehicles (approximately 15 tonnes for areas with reticulated water, 28 tonnes for all other areas). Bridges clearly indicate load rating;
- non perimeter roads comply with table – Road widths for Category 1 Tanker;

Curve radius (inside edge metres)	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

- curves of roads (other than perimeter roads) are a minimum inner radius of 6 metres and minimal in number, to allow for rapid access and egress;

- public roads do not have a cross fall exceeding 3 degrees;
- maximum grade for sealed roads do not exceed 15^{o} and an average grade of not more than 10^{o} or other gradient specified by road design standards, whichever is the lesser gradient;
- have a minimum vertical clearance to a height of 4 metres at all times;
- public roads between 6.5m and 8m wide are no parking on one side with the services located on the side to ensure accessibility for any future reticulated water (notably the subdivision is unlikely to be serviced by town water supply);
- one way public 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;
- parking bays are a minimum of 2.6 metres wide from kerb edge to road pavement. No services or hydrants are located within the parking bays; and
- that part of the public road directly interfacing the bush fire hazard vegetation should provide roll top kerbing to the hazard side of the road.

Access to the proposed lots will be provided by a public through road extending north to south, connecting to the existing formed Hermitage Road and Old North Road.

Refer to **Appendix 1** for Proposed Layout showing access.

3.4 Water

The site does not have access to a reticulated water supply, as such, must comply with the Acceptable Solutions for non-reticulated water supplies as outlined in Chapter 4 of PBP 2006, including:

- A minimum of 10,000L dedicated water supply must be provided on each lot 1,000-10,000m^2 and a minimum of 20,000L dedicated water supply must be provided on each lot >10,000m^2 for firefighting purposes. The tanks must also be connected to the reticulated water supply at such time if a reticulated water supply is provided to the site (notably the subdivision is unlikely to be serviced by town water supply).
- The water supply must be located within 20m of the future building footprint.
- The water supply must be visible from the public road network or appropriate signage installed to direct emergency personnel to the water supply.
- A 65mm Storz outlet with a Gate or Ball valve is provided and the pipes adequate for water flow and are metal (non-combustible).
- Above ground tanks are manufactured of either concrete or metal and raised tanks have their stands protected, and
- Where provided, all pipework and connections for pumps are non-combustible. If the tank and/or pump are located on the hazard side of the building, adequate shielding is provided for the protection of firefighters.

3.5 Gas

Any gas should be installed and maintained according to the requirements of the relevant authorities and AS 1596 – 2002. It is expected that the location of gas services will not lead to ignition of surrounding bushland or the fabric of buildings.

Additionally any flammable or hazardous materials are to be stored separately in a suitably bunded area no less than 100m from the nearest identified bushfire threat.

3.6 Fire Fighting Capability

To facilitate quick and efficient action by the Fire Brigade / Rural Fire Service upon arrival, it is recommended that all necessary connections / pumps etc on the property be clearly marked and visible, and in good working order. Stored water tanks will exist on site in which fire fighters can utilise in the event of an emergency. In this regard all stored water tanks should be fitted with a suitable connection – 65mm Storz outlet with a Gate or Ball valve.

3.7 Landscaping

Landscaping should be designed and managed to minimise flame contact and radiant heat to buildings and the potential for wind driven embers to cause ignitions.

In choosing plants for landscaping consideration should be given to plants that possess properties, which help to protect buildings. If the plants themselves can be prevented from ignition, they can improve the defence of buildings by:

- filtering out wind-driven burning debris and embers;
- acting as a barrier against radiation and flame; and
- reducing wind forces.

Consequently landscaping of the site should consider the following:

- meet the specifications of an Inner Protection Area (IPA) detailed in PBP 2006;
- priority given to retaining or planting species which have a low flammability and high moisture content;
- priority given to retaining or planting species which do not drop much litter in the bushfire season and which do not drop litter that persists as ground fuel in the bush fire season; and
- create discontinuous or gaps in the vegetation to slow down or break the progress of fire towards the dwellings.

Specific landscaping commitments from the project include the following features:

- Setbacks which wrap around three sides of the development for bushfire management;
- A combination of hard and soft landscaping;
- An intensive area of planting centred on a contoured garden mound on the southern boundary of the site to provide an effective screening of the development from future residential development; and
- A selection of plants suitable to the landscape objectives based on native species.

3.8 Vegetation Fuel Management

Consideration should be given to vegetation fuel loads present on site with particular attention on APZs.

Careful thought must be given to the type and physical location of any proposed site landscaping. Inappropriately selected and positioned vegetation has the potential to ‘replace’ any previously removed fuel load.

Bearing in mind the desired aesthetic and environment sought by site landscaping, some basic principles have been recommended to help minimise the chance of such works contributing to the potential hazard on site.

Whilst it is recognised that fire-retardant plant species are not always the most aesthetically pleasing choice for site landscaping, the need for adequate protection of life and property requires that a suitable balance between visual and safety concerns be considered.

It is reiterated again that it is essential that any landscaped areas and surrounds are subject to ongoing fuel management and reduction to ensure that fine fuels do not build up.

4.0 Conclusion and Recommendations

It is clear from this investigation and assessment that the site constitutes Bushfire Prone Land. In accordance with the provisions of PBP 2006, the recommendations outlined within this assessment will substitute as appropriate actions to reduce the risk of damage and/or harm in the event of a bushfire event.

This BTA found the land surrounding the site to support vegetation consistent with Forest and Woodland as described by PBP 2006.

In summary, the following key recommendations have been generated to enable the proposed development to comply with PBP 2006:

- Asset Protection Zones are required but will not be greater than 25m from the nearest bushfire hazard depending on the vegetation classification;
- Future dwellings within the site should have due regard to the specific considerations given in the BCA, which makes specific reference to the Australian Standard (AS3959 – 2009) construction of buildings in bushfire prone areas.
- Roads are to be constructed in accordance with PBP 2006 as outlined in section 3.3 of this report.
- Consideration should be given to landscaping and fuel loads on site to decrease potential fire hazards on site;
- Non-reticulated water supplies must comply with PBP 2006 to provide for firefighting operations, as outlined in section 3.4 of this report; and
- Any future gas connections must be established and maintained in accordance with AS1596 – 2002.

A review of the site and proposed development layout indicates that compliance with the above recommendations can be achieved or practically implemented without substantial change to the proposed layout or construction methodology.

Finally, the implementation of the adopted measures and recommendations forwarded within this report comply with PBP 2006 and will contribute to the amelioration of the potential impact of any bushfire upon the development, but they do not and cannot guarantee that the area will not be affected by bushfire at some time.

5.0 Bibliography

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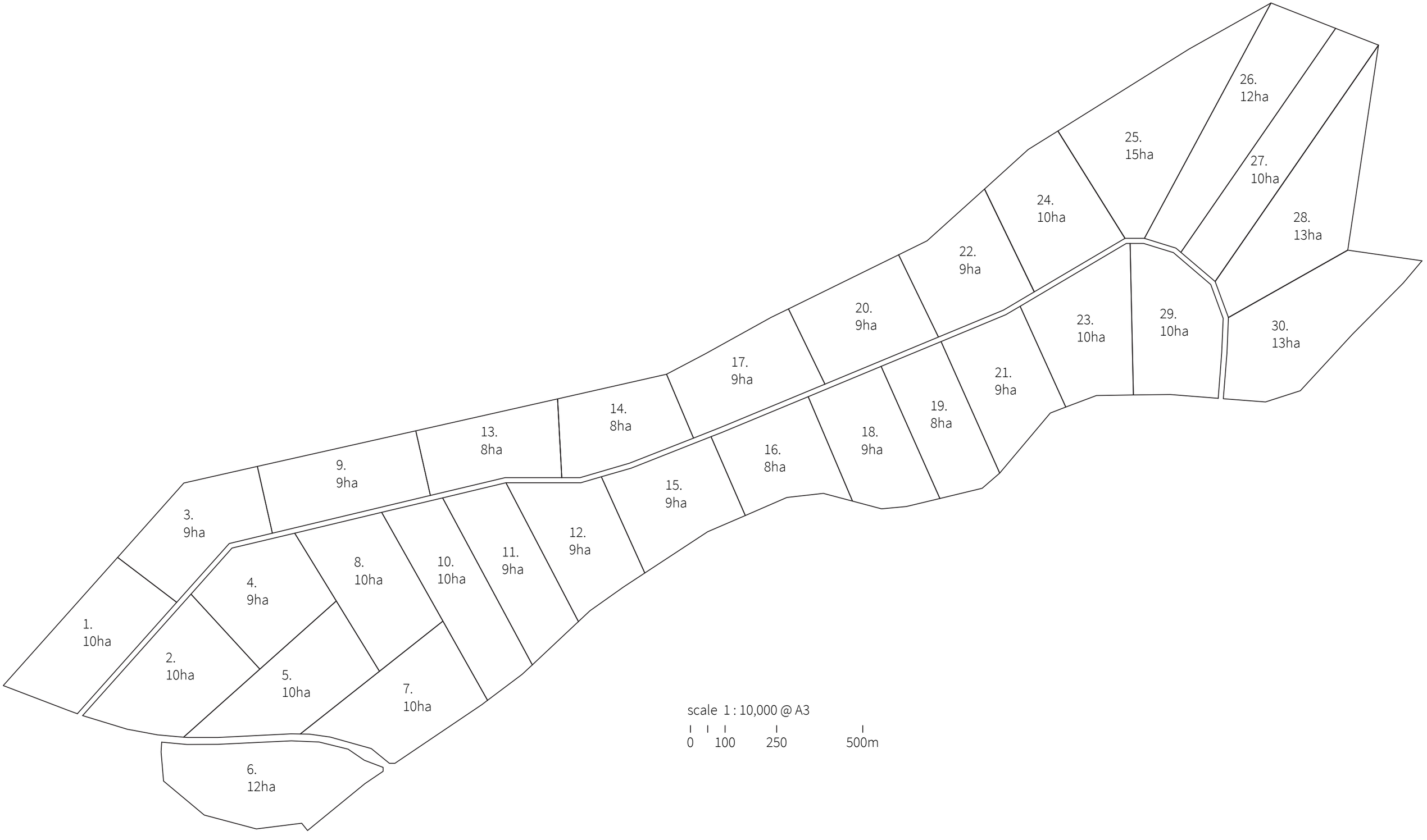
Appendix 1

Site Plan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Appendix 2

AHIMS

AHIMS Web Services (AWS)
Search Result

Your Ref Number : Pokolbin BTA

Client Service ID : 152110

RPS Australia East Pty Ltd -Hamilton

Date: 24 October 2014

Accounts Payable Fortitude Valley PO Box 237
Brisbane Queensland 4006

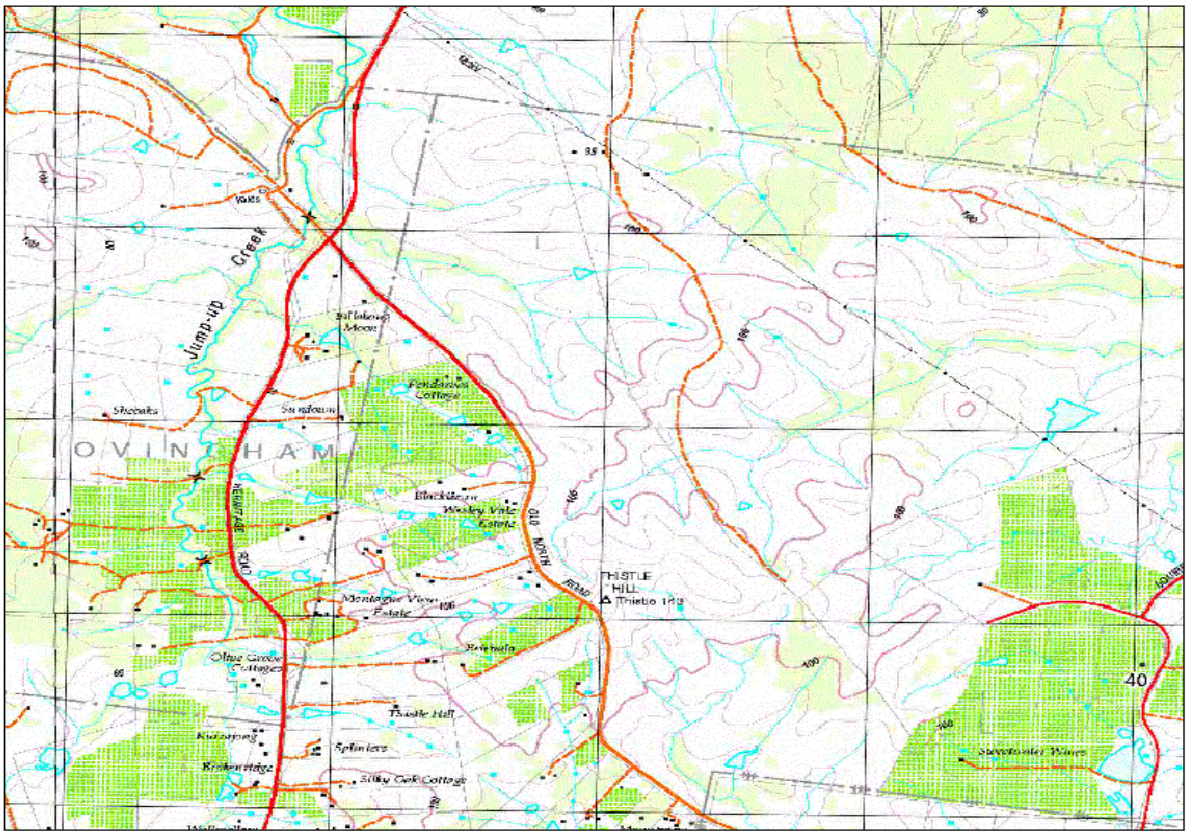
Attention: Lauren Vanderwyk

Email: lauren.vanderwyk@rpsgroup.com.au

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lot : 5, DP:DP823737 with a Buffer of 0 meters, conducted by Lauren Vanderwyk on 24 October 2014.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.



A search of the Office of the Environment and Heritage AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

1	**Aboriginal sites are recorded in or near the above location.**
0	**Aboriginal places have been declared in or near the above location. ***

If your search shows Aboriginal sites or places what should you do?

- You must do an extensive search if AHIMS has shown that there are Aboriginal sites or places recorded in the search area.
- If you are checking AHIMS as a part of your due diligence, refer to the next steps of the Due Diligence Code of practice.
- You can get further information about Aboriginal places by looking at the gazettal notice that declared it. Aboriginal places gazetted after 2001 are available on the NSW Government Gazette (http://www.nsw.gov.au/gazette) website. Gazettal notices published prior to 2001 can be obtained from Office of Environment and Heritage's Aboriginal Heritage Information Unit upon request

Important information about your AHIMS search

- The information derived from the AHIMS search is only to be used for the purpose for which it was requested. It is not be made available to the public.
- AHIMS records information about Aboriginal sites that have been provided to Office of Environment and Heritage and Aboriginal places that have been declared by the Minister;
- Information recorded on AHIMS may vary in its accuracy and may not be up to date .Location details are recorded as grid references and it is important to note that there may be errors or omissions in these recordings,
- Some parts of New South Wales have not been investigated in detail and there may be fewer records of Aboriginal sites in those areas. These areas may contain Aboriginal sites which are not recorded on AHIMS.
- Aboriginal objects are protected under the National Parks and Wildlife Act 1974 even if they are not recorded as a site on AHIMS.
- This search can form part of your due diligence and remains valid for 12 months.

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