



Bushfire Management Plan

**Chambers Pines Lifestyle Resort
Lot 21 RP804908 - 609-657 Chambers Flat Road,
Chambers Flat, QLD**

Prepared by:

RPS AUSTRALIA EAST PTY LTD

PO Box 428
Hamilton NSW 2303

T: +61 2 4940 4200
F: +61 2 4961 6794
E: stuart.greville@rpsgroup.com.au

Client Manager: Stuart Greville
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Prepared for:

INGENIA COMMUNITIES

Suite 4, Level 5
241 Adelaide Street
Brisbane QLD 4000

T: 0400 391 784
E: paul.brumpton@possibilitiesqld.com

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Document Status

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Approval for Issue

Name	Signature	Date
Stuart Greville		15 May 2015

Bushfire Planning and Design Certification


Stuart Greville

Accredited Bushfire Practitioner
BPD-PD-26202



Executive Summary

RPS Australia East Pty Ltd (RPS) has been commissioned by Ingenia Communities to undertake a Bushfire Management Plan (BMP) for the expansion of the existing Chambers Pines Lifestyle Resort on land at Lot 21 RP804908 Chambers Flat Road, Chambers Flat, QLD.

The assessment aims to consider and assess the bushfire hazard and associated potential threats relevant to such a proposal with regard to *Part E* of the *Queensland State Government State Planning Policy* (SPP) (2014), the Draft Logan Planning Scheme (2014) and the Beaudesert Planning Scheme (2007). These policies set out the State's and Council's interest in ensuring that natural bushfire hazards are adequately considered when making decisions regarding development.

The Australian Standard *AS3959-2009 Construction of buildings in bushfire prone areas* applies to Class 1 buildings located within designated bushfire areas. Therefore, this proposal will recommend that all future dwellings meet the performance criteria outlined in the Building Code of Australia (BCA), being compliant with AS3959-2009.

This BMP found the land surrounding the site to support vegetation consistent with *Forest* in accordance with AS3959-2009 and *Vegetation Hazard Class 2: Open Forest/Woodland-shrubby* in accordance with CSIRO (2014) based on the current fuel load assessed during a site visit.

In summary, the following measures are recommended to enable the proposal to address adequate bushfire protection procedures with regard to the abovementioned authorities:

A minimum 11m wide Asset Protection Zone is to be created alongside the entire length of the western boundary of the site;

All vegetation within the setback between the northern and western boundaries and the dwelling sites shall be managed as a low-fuel zone;

All vegetation throughout the entire site shall be managed as a reduced fuel zone;

All dwellings and habitable buildings constructed within the site should have due regard to the specific considerations given in the National Construction Code: Building Code of Australia (BCA) 2014 and Australian Standard *AS3959-2009 Construction of buildings in bushfire prone areas*;

Access roads shall comply with Section 3.3 of this report;

The development is to be connected to the reticulated water supply and that suitable hydrants be clearly marked and provided for the purposes of bushfire protection. Fire hydrant spacing, sizing, and pressure should comply with AS2419.1, 2005; and

An Emergency Management Plan (EMP) shall be prepared to improve the preparedness of the residents and to clearly identify the procedures to be followed in the event of a bushfire.

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.

This assessment has been made based on the bushfire hazards in and around the site at the time of inspection and production (May 2015).

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

Finally, the implementation of the adopted measures and recommendations forwarded within this report 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.

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1.0 Introduction

RPS Australia East Pty Ltd (RPS) has been commissioned by Ingenia Communities to undertake a Bushfire Management Plan (BMP) for the expansion of the existing Chambers Pines Lifestyle Resort on land at Lot 21 RP804908, Chambers Flat Road, Chambers Flat, QLD (**Figure 1**).

The assessment aims to consider and assess the bushfire hazard and associated potential threats relevant to such a proposal with regard to *Part E* of the *Queensland State Government Single State Planning Policy* (SPP) (2014), the Draft Logan Planning Scheme (LPS) (2014) and the Beaudesert Planning Scheme (BPS) (2007). These policies set out the State's and Council's interest in ensuring that natural bushfire hazards are adequately considered when making decisions regarding development.

The Australian Standard AS3959-2009 *Construction of buildings in bushfire prone areas* applies to Class 1 buildings located within designated bushfire areas. Therefore, this BTA will recommend that all future dwellings meet the performance criteria outlined in the Building Code of Australia (BCA), being compliant with AS3959-2009.

Additionally, this BMP will make reference to the CSIRO report 'A new methodology for State-wide mapping of bushfire prone areas in Queensland' (2014) with specific focus on their method of vegetation classification.

This BMP has been prepared and reviewed by an Accredited Bushfire Practitioner certified by the Fire Protection Association of Australia.

1.1 Site Particulars

Locality	Chambers Flat Road, Chambers Flat, QLD
LGA	Logan City Council
Titles	Lot 21 RP804908
Area	Approximately 15.9 hectares
Zoning	The site is zoned Mt Lindesay (Countryside (CTYSD)) under the Beaudesert Planning Scheme Zoning Map (ZM 04).
Boundaries	Chambers Flat Road borders the site to the east. Vegetation and a creek line occur directly adjacent to the site's northern boundary, followed by Koplick Road. A large stand of vegetation occurs to the immediate west of the site, with scattered vegetation associated with a rural property occurring to the south.
Current Land Use	The existing Chambers Pines Lifestyle Resort occurs on site, along with a golf course, multiple dams and access ways.
Topography	The site is relatively flat in nature.

1.2 Scope of Works

The scope of works includes the preparation of a Bushfire Management Plan (BMP) in accordance with the SPP and BPS.

The purpose of the BMP in a development assessment context is to:

- (1) Confirm bushfire hazard exposure;
- (2) Direct where on a site development should be located to minimize exposure for people, property and buildings to bushfire hazard;
- (3) Determine measures to be utilized to reduce bushfire hazard;
- (4) Determine measures to be utilized to mitigate any remaining bushfire hazard; and
- (5) Demonstrate all dwelling sites are exposed to Bushfire Attack Level (BAL) 29 or less.

1.3 Proposed Development

The Chambers Pines Lifestyle Resort currently seeks development consent for an additional 256 dwelling sites, 57 car parking spaces and 23 caravan parking bays to be located in the land currently occupied by a golf course.

The reconfiguration and establishment of the new dwelling sites suitable for the installation of relocatable homes is part of the reinvestment program that is being undertaken by Ingenia Communities after their acquisition of the Chambers Pines Lifestyle Resort. The proposed development will assist in modernising the site while providing manufactured home accommodation that is in line with community demands and expectations.

Associated works include clearing, earthworks, roadwork, stormwater and landscaping as well as servicing provisions for sewer, water supply, power and communications.

The Plan of the Proposed Development is contained in **Appendix 1**.

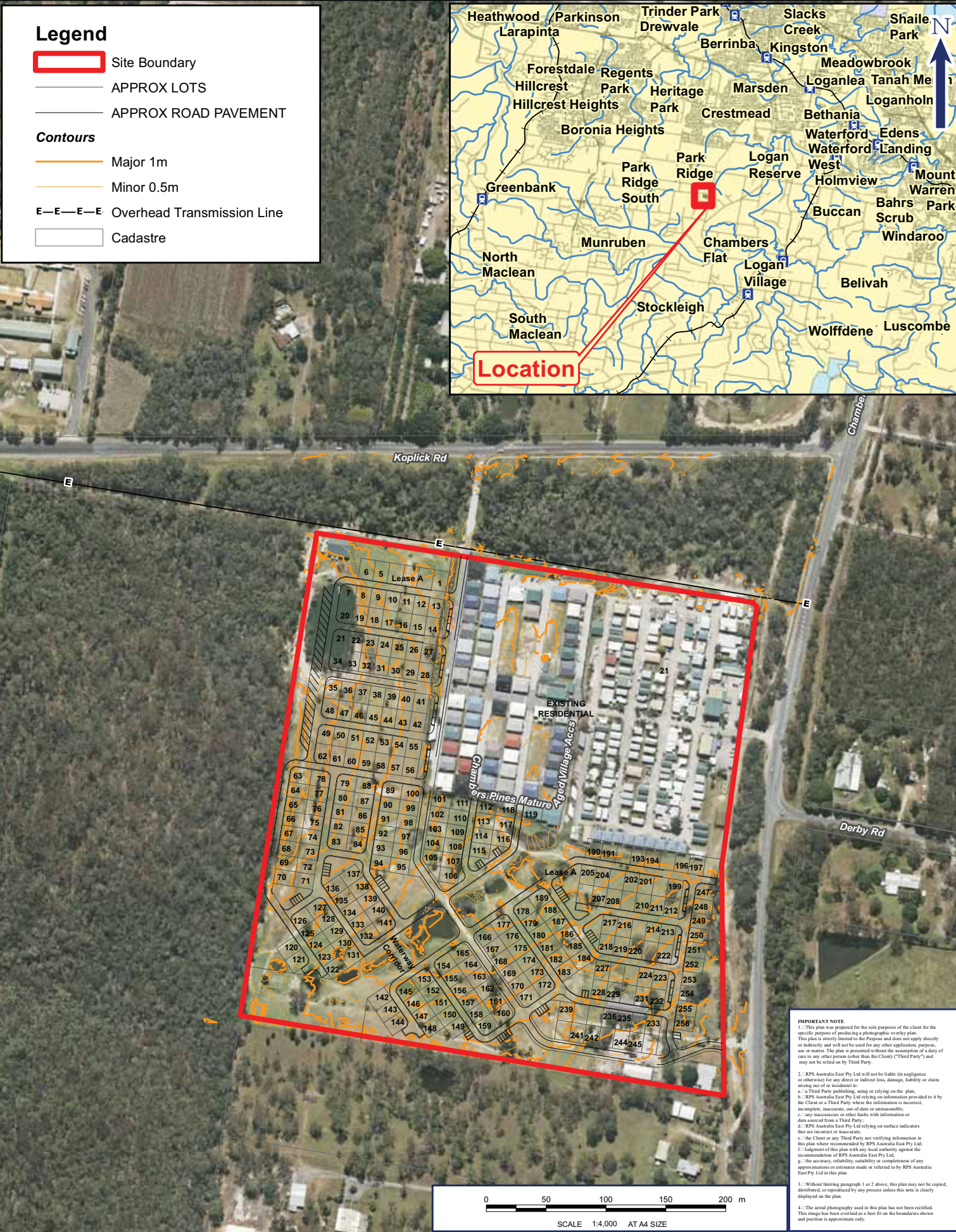


Figure 1: Site Location		LOCATION: Chambers Pine	DATUM: GDA94
		JOB NO.: PR123731	PROJECTION: MGA Zone 56
		PURPOSE: BTA	Data Sources: RPS
		Technician: Natalie Wood	Date: 15/05/2015
CLIENT: Ingenia Communities		RPS AUSTRALIA EAST PTY LTD (ABN 44 140 292 762) 241 DENISON STREET BROADMEADOW PO BOX 428 HAMILTON NSW 2303 T: 02 4940 4200 F: 02 4961 6794 www.rpsgroup.com.au	

2.0 Bushfire Hazard Assessment

Bushfire activity is prevalent in landscapes that carry fuel and the two predominant bushfire types are grassland and forest fires. Factors such as topographic characteristics and quantity of fuel loads influence the intensity and spread of fire. The scale of a bushfire hazard is tailored to the characteristics of the hazard, the size and characteristics of the affected population, types of land use exposed to bushfire, predicted development growth pressures and other factors affecting bushfire risk. This section assesses the types and nature of potential hazards surrounding the proposed development.

2.1 Existing Bushfire Prone Land Mapping

The site lies within a geographical area with a Fire Danger Index (FDI) rating of 40 (Queensland). The site is mapped as a Medium Hazard area under the Beaudesert Bushfire Overlay and is only marginally mapped as a Medium Hazard area under the SPP Interactive Mapping (**Figures 2 and 3**). It is noted at the time of lodgement the Beaudesert Shire Planning Scheme is the applicable statutory instrument. Having consideration to the Draft Logan City Council Planning Scheme, the bushfire overlay is consistent with a potential bushfire impact buffer and a marginal area of medium potential bushfire hazard.

Aerial images demonstrate that the adjacent lot to the west of the site (74 Koplick Rd) supports dense vegetation that directly abuts the western boundary of the site. Based on current aerial imagery, both bushfire maps (**Figures 2 and 3**) are therefore inaccurate to some extent. Nevertheless, the site is mapped as a Medium Bushfire Hazard and will be assessed accordingly.



Figure 2 Excerpt from the SPP Interactive Mapping System showing the locations and extents of bushfire hazard area.

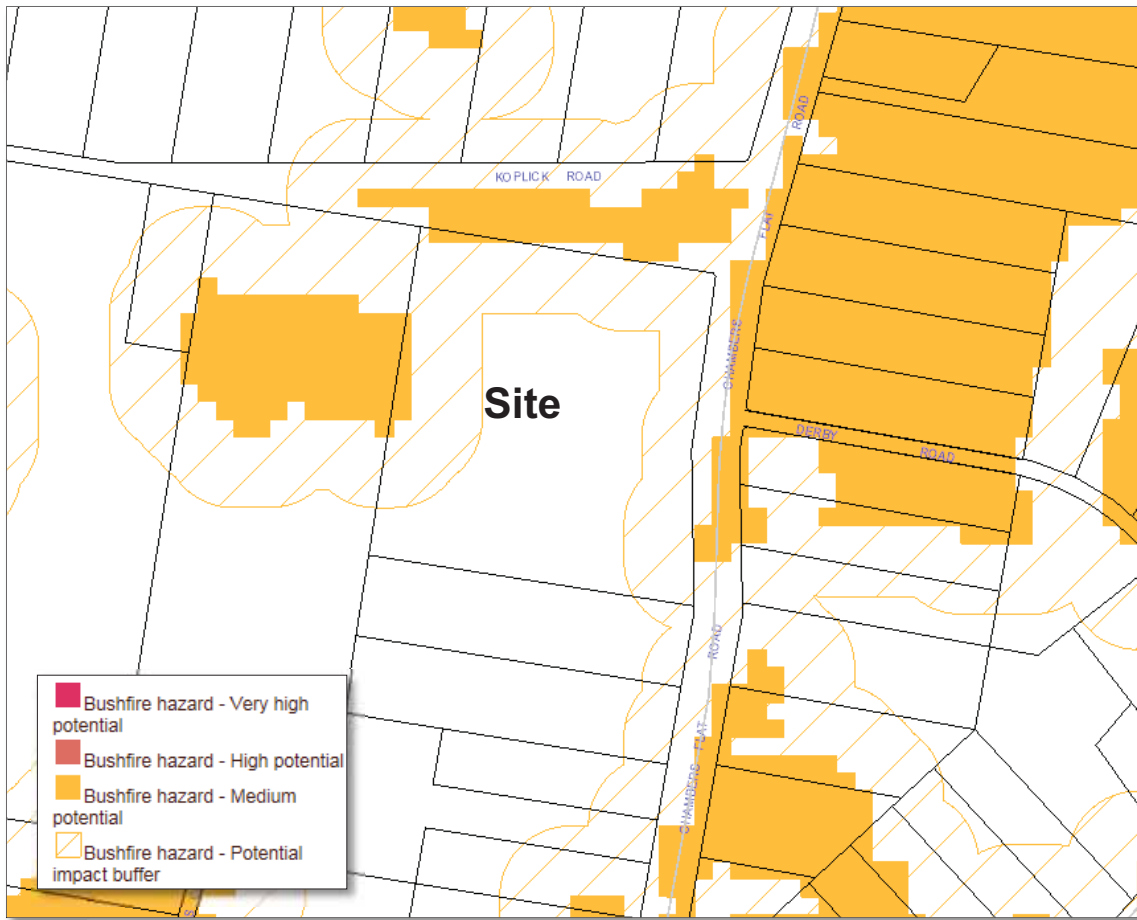


Figure 3 Excerpt of the Draft Logan Planning Scheme Bushfire Overlay



Figure 4 Excerpt of the Beaudesert Planning Scheme Bushfire Overlay

2.2 Vegetation Assessment

2.2.1 Methodology

The site is located within Bushfire Prone Land. Vegetation classification over the site has been carried out as follows:

- Aerial Photograph Interpretation to map the vegetation classification and extent;
- Queensland Department of Natural Resources and Mines Vegetation Mapping;
- CSIRO, A new methodology for State-wide mapping of bushfire prone areas in Queensland; and
- On site vegetation assessment (29th April 2015).

In accordance with AS3959-2009, an assessment of the vegetation over a distance of 140m in all directions from the site was undertaken. The predominant vegetation was identified in all directions from the site. The vegetation was classified in accordance with Table 2.3 in AS3959-2009, Appendix A of CSIRO (2014) and the QLD Globe Vegetation Mapping.

2.2.2 Predominant Vegetation Formation

An RPS Ecologist ground truthed all vegetation hazards surrounding the proposed development with reference to the QLD Department of Natural Resources and Mines (DNRM) Regulated Vegetation and Regional Ecosystem (RE) Mapping. In some instances Regional Ecosystems (RE) mapped by DNRM were marginally inconsistent with the true vegetation. Consequently, as a result of varying vegetation ecotones the available fuel load varied. Existing vegetation mapping along with the site inspection results were cross referenced with the CSIRO Report (2014) to determine the overall fuel load to provide the most accurate fuel load for each hazard. In cases where REs overlap, the predominant vegetation with the higher fuel load has been taken into account.

The determined vegetation classifications are displayed in **Table 1** and **Figures 4** and **5**. **Plates 1 – 6** depict the site and surrounding vegetation.

Table 1 Vegetation Classifications

Direction of Bushfire Attack	Vegetation or other infrastructure	Classification of Vegetation Formations AS3959-2009	DNRM Vegetation Mapping	Classification of Vegetation Formations CSIRO (2014)	Overall Fuel Load
North	Vegetation, Koplick Road and existing resort – separated by an overhead electricity line (12m wide)	Forest (Hazard) / No Hazard	RE 12.3.11	Class 2: Open Forest/Woodland-shrubby	30 Tonnes/ha
North east	Vegetation (not considered a threat to the development)	Forest	RE 12.3.6	Class 1: Melaleuca Communities	33 Tonnes/ha
East	Existing Resort and Chambers Flat Road	No Hazard	No Hazard	No Hazard	N/A
South	Scattered vegetation and rural residential property	Low Threat Vegetation	N/A	Class 16: Mixture of Urban Classes	5 Tonnes/ha
West	Vegetation	Forest (Hazard)	RE 12.9-10.4	Class 2: Open Forest/Woodland-shrubby	30 Tonnes/ha
North-west	Vegetation and Koplick Road	Forest (Hazard)	RE 12.3.11	Class 2: Open Forest/Woodland-shrubby	30 Tonnes/ha



Figure 5 DNR Vegetation Mapping



Plate 1 Vegetation along the southwest boundary of the site



Plate 2 A more open area of vegetation to the west of the site



Plate 3 Shrubby woodland community to the west of the site



Plate 4 Melaleuca dominated community adjacent to the northern access road



Plate 5 Melaleuca dominated community adjacent to the northern access road



Plate 6 Managed land underneath overhead transmission line – north of the site

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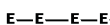
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Legend

-  Site Boundary
-  APPROX LOTS
-  APPROX ROAD PAVEMENT
-  Cadastre
-  100m Slope Buffer
-  140m Vegetation Buffer
-  Overhead Transmission Line (12 wide and variable)
-  1m Contours

Vegetation Classification

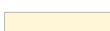
-  Forest - Class 1
-  Forest - Class 2
-  Low Threat Vegetation - Class 16
-  No Hazard



Figure 5: Vegetation Classification

LOCATION: Chambers Pine	DATUM: GDA94
JOB NO.: PR123731	PROJECTION: MGA Zone 56
PURPOSE: BTA	Data Sources: RPS
Technician: Natalie Wood	Date: 15/05/2015

CLIENT: Ingenia Communities

RPS AUSTRALIA EAST PTY LTD (ABN 44 140 292 762)
241 DENISON STREET BROADMEADOW PO BOX 428 HAMILTON NSW 2303
T: 02 4940 4200 F: 02 4961 6794 www.rpsgroup.com.au

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2.3 Effective Slope Assessment

2.3.1 Methodology

Slope assessment has been undertaken as follows:

- Aerial photography;
- UAV detail survey; and
- Site inspection (29th April 2015).

As outlined in AS3959-2009, an assessment of the slope over a distance of 100m of the hazard direction from the site boundary was undertaken. The effective slope was then calculated under the classified vegetation. The topography of the site has 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.

2.3.2 Effective Slope

The slope of the bushfire hazard is documented in **Table 2** below.

Table 2 Site Slope Assessment

Direction of Hazard	Classification of Vegetation Formations AS3959-2009	Classification of Vegetation Formations CSIRO (2014)	DNRM Vegetation Mapping	Slope
North	Forest	Class 2: Open Forest/Woodland-shrubby	RE 12.3.11	Flat
South	Low Threat Vegetation	Class 16: Mixture of Urban Classes	N/A	Flat
West	Forest	Class 2: Open Forest/Woodland-shrubby	RE 12.9-10.4	Upslope
North-west	Forest	Class 2: Open Forest/Woodland-shrubby	RE 12.3.11	Flat

2.4 Significant Environmental Features

Current operations on site largely prohibit the potential presence of any significant environmental features. The Chambers Pines Lifestyle Resort and Golf Course currently occupies the site, with few areas remaining that contain natural environs. The site inspection also revealed that no significant environmental features were present on site.

3.0 Bushfire Mitigation Measures

The Queensland State Government *State Planning Policy* and the *Draft Logan Planning Scheme* (2014) have been used to determine the appropriate measures for protection from bushfire hazards across the site and immediate vicinity.

Requirements outlined by the SPP and LPS include the following:

- Development avoids natural hazard areas or mitigates the risk of the natural hazard;
- Development supports, and does not unduly burden, disaster management response, or recovery capacity and capabilities;
- Development directly, indirectly and cumulatively avoids an increase in the severity of the natural hazard and the potential for damage on the site or to other properties;
- Development avoids the risk to public safety and the environment from the location of hazardous materials and the release of these materials as a result of a natural hazard; and
- Development maintains or enhances natural processes and the protective function of landforms and vegetation that can mitigate risks associated with the natural hazard.

3.1 Asset Protection Zones and Fire Breaks

Acceptable Outcomes

Areas of defensible space are created by firebreaks that separate lots from areas of bushfire hazard. The Bushfire Overlay Code in the Draft LPS provides several acceptable solutions to provide setbacks, access and defensible space for emergency vehicles. These firebreaks will be referred to as Asset Protection Zones (APZs).

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.

An APZ can include the following:

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

The presence of a few shrubs or trees in the firebreak 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 recommended in the APZ.

Proposed Measures

AS3959-2009 applies a Fire Danger Index (FDI) of 40 to the entire state of Queensland. APZs are not mandatory under the SPP, however adequate defendable space is required for each dwelling affected by a medium or high bushfire hazard. Additionally, APZ distances have not been prescribed under the LPS however APZs are still a requirement under the Bushfire Hazard Overlay Code (Part 8 section 8.2.3) for medium or high bushfire hazard areas. LPS requires that APZs should be situated on land <18 degrees and within the boundaries of the private property of the development site.

The methodology to establish the appropriate setbacks outlined in the bushfire planning guidelines have been considered to support requirements of the LPS Bushfire Hazard Overlay Code. Refer to **Table 3** and **Figure 6** for required APZs and fire trails.

Table 3 Required APZ

Direction of Hazard	Classification of Vegetation Formations AS3959-2009	DNRM Vegetation Mapping	Classification of Vegetation Formations CSIRO (2014)	Slope	Required APZ (BAL-29)	APZ Provided
North	Forest	RE 12.3.11	Class 2: Open Forest/Woodland-shrubby	Flat	11m	27m
South	Low Threat Vegetation	N/A	Class 16: Mixture of Urban Classes	Flat	N/A	N/A
West	Forest	RE 12.9-10.4	Class 2: Open Forest/Woodland-shrubby	Upslope	11m	11.5m – 29m
North-west	Forest	RE 12.3.11	Class 2: Open Forest/Woodland-shrubby	Flat	11m	>27m

There is sufficient space between the vegetation hazards and the edge of the development footprint to provide an 11m APZ. At a distance of 11m from the bushfire hazard, the exposure to radiant heat is modeled to not exceed 29kW/m² (BAL-29).

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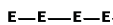
-  Site Boundary
-  APPROX LOTS
-  APPROX ROAD PAVEMENT
-  Cadastre
-  1m Contours
-  Asset Protection Zone 11m
-  Overhead Transmission Line (12 wide and variable)



Figure 6: Required Asset Protection Zone

LOCATION: Chambers Pine	DATUM: GDA94
	PROJECTION: MGA Zone 56
JOB NO.: PR123731	Data Sources: RPS
PURPOSE: BTA	
Technician: Natalie Wood	Date: 15/05/2015

CLIENT: Ingenia Communities

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241 DENISON STREET BROADMEADOW PO BOX 428 HAMILTON NSW 2303
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3.2 Building Design and Construction

Acceptable Outcomes

All buildings, including pre-fabricated relocatable homes (Class 1), must satisfy the Performance Requirements of the National Construction Code: Building Code of Australia (BCA). Part 2.3 of Volume 2 of the BCA applies to dwellings located within designated bushfire areas, which are defined as:

Land which has been designated under a power in legislation as being subject, or likely to be subject to, bushfires.

Accordingly, due consideration of the requirements of the BCA should be made. The *Deemed-to-Satisfy* provision of the BCA can only be achieved if dwellings in bushfire prone areas are constructed in accordance with Australia Standard AS3959-2009 *Construction of buildings in bushfire prone areas*.

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 should be 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 = 40;
- Flame temperature;
- Slope;
- Vegetation classification; and
- Building location.

3.2.1 Bushfire Attack Level for the Proposed Development

The Detailed Assessment (Method 2) outlined in Australian Standard AS3959-2009 *Construction of buildings in bushfire prone areas* was used to calculate the Bushfire Attack Level for the development. The NBC Bushfire Attack Assessor V2.1 was used to model the bushfire radiant heat exposure which determined the applicable bushfire attack level.

Refer to **Table 4** and **Figure 7** for the distance between the bushfire hazard and the proposed development.

Table 4 Required BAL (AS 3959-2009)

Direction of Hazard	Vegetation Classification			Slope	APZ	Separation Distance from Lot	AS3959-2009 BAL – 29 (Detailed Method)	Construction Section
	AS3959-2009	CSIRO (2014)	DNRM (2015)					
North	Forest	RE 12.3.11	Class 2: Open Forest/Wood land-shrubby	Flat	12m	0m – 10m	BAL – FZ	Sect 5, 6, 7, 8 & 9 of AS3959-2009 and Sect A3.7 of PBP Addendum Appendix 3.
						10m – 11m	BAL – 40	
						11m - 16m	BAL – 29	
						16m - 23m	BAL – 19	

Direction of Hazard	Vegetation Classification			Slope	APZ	Separation Distance from Lot	AS3959-2009 BAL – 29 (Detailed Method)	Construction Section
	AS3959-2009	CSIRO (2014)	DNRM (2015)					
						23m - 100m	BAL – 12.5	
South	Low Threat Vegetation	N/A	Class 16: Mixture of Urban Classes	Flat	N/A	0m - 100m	BAL - LOW	
West	Forest	RE 12.9-10.4	Class 2: Open Forest/Wood land-shrubby	Flat	10m	0m – 10m	BAL – FZ	
						10m – 11m	BAL – 40	
						11m - 16m	BAL – 29	
						16m - 23m	BAL – 19	
						23m - 100m	BAL – 12.5	
North-west	Forest	RE 12.3.11	Class 2: Open Forest/Wood land-shrubby	Flat	11m	0m – 10m	BAL – FZ	
						10m – 11m	BAL – 40	
						11m - 16m	BAL – 29	
						16m - 23m	BAL – 19	
						23m - 100m	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.

IMPORTANT NOTE
1. This plan was prepared for the sole purposes of the client for the specific purpose of producing a photographic overlay plan. This plan is strictly limited to the Purpose and does not apply directly or indirectly and will not be used for any other application, purpose, use or matter. The plan is presented without the assumption of a duty of care to any other person (other than the Client) ("Third Party") and may not be relied on by Third Party.
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4. The aerial photography used in this plan has not been rectified. This image has been overlaid as a best fit on the boundaries shown and position is approximate only.

Legend

- Site Boundary
- APPROX LOTS
- APPROX ROAD PAVEMENT
- Cadastre
- Overhead Transmission Line (12 wide and variable)
- 1m Contours

Required BALs (AS3959-2009)

- BAL-FZ 0-10m
- BAL-40 10m-11m
- BAL-29 11m-16m
- BAL-19 16m-23m
- BAL-12.5 23m-100m

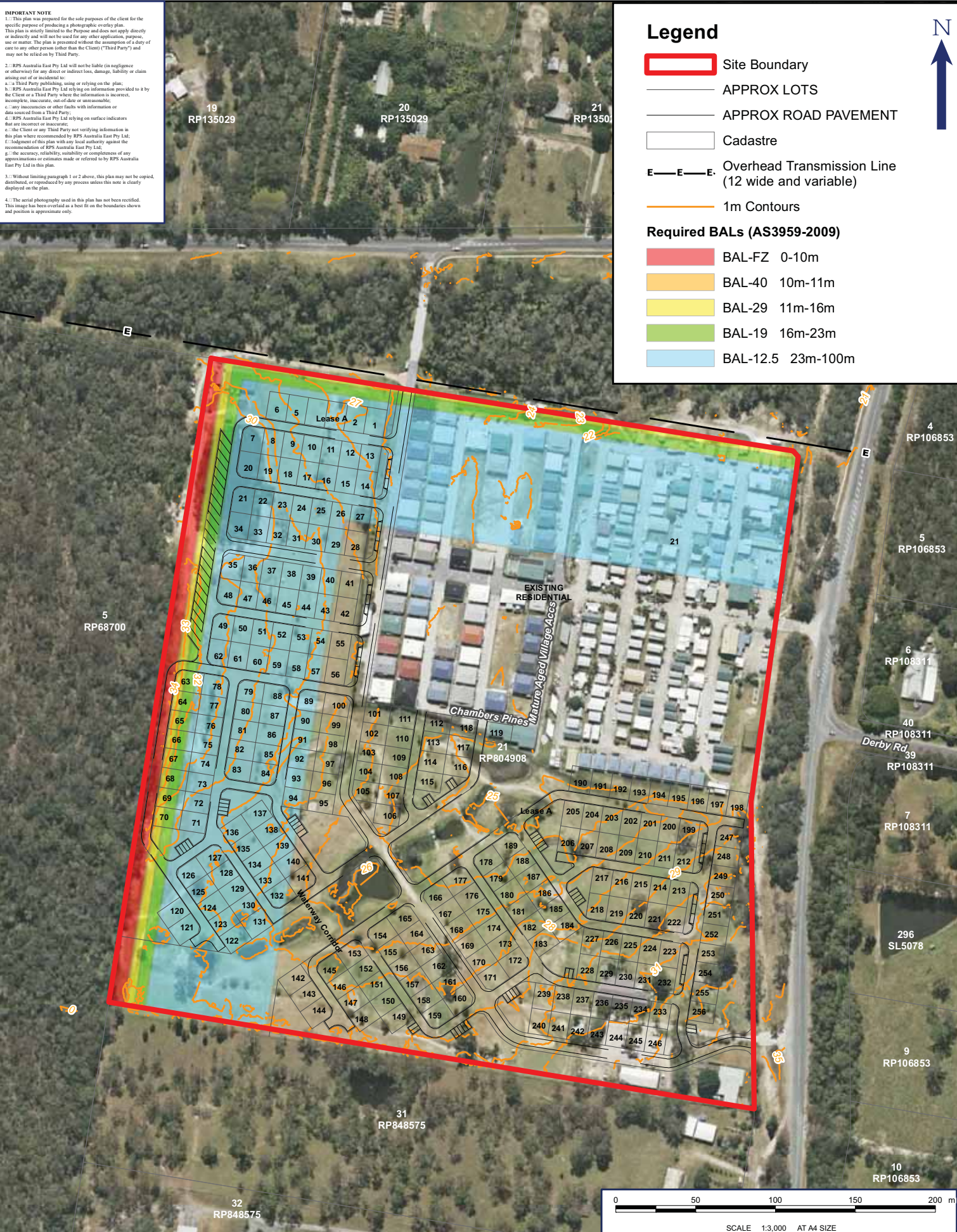


Figure 7: Required BALs (AS3959-2009)

LOCATION: Chambers Pine	DATUM: GDA94
	PROJECTION: MGA Zone 56
JOB NO.: PR123731	Data Sources: RPS
PURPOSE: BTA	
Technician: Natalie Wood	Date: 15/05/2015

3.3 Access – Evacuation Routes

Acceptable Outcomes

In the unlikely event of a serious bushfire, it will be essential to ensure that adequate ingress / egress and the provision of defensible space are afforded in the subdivision layout. The following recommends design specifications for internal public roads as designated under the Draft LPS (2014):

- A minimum cleared width of six metres located between the premises and adjoining vegetation;
- To have a minimum formed width of four metres;
- To have a maximum gradient of 12.5 percent;
- To have vehicular access to a road at each end and at least every 200 metres;
- Does not include a dead end; and
- To have a turning or passing area at least every 400 metres.

Proposed Measures

Access to the proposed development will be provided from 3 resort entry points from Koplick Road to the north the primary entrance on Chambers Flat Road to the east and a redesigned entrance to Chambers Flat Road near the existing golf club.

The internal road layout provides a regular grid network of access roads including perimeter roads along the western boundary that provides defensible space and multiple evacuation routes. All internal roads are a minimum of 6.5 wide and connect to central spine road that is 10m wide. Given the extensive internal road layout and the 3 points of access to the site, evacuating residents are unlikely to obstruct emergency personnel from accessing all areas of the site.

With the exception of sites 63-70, all sites are separated from the nearest bushfire hazard by at least 22m. In the case of sites 63-70, a perimeter road combined with a 5m bushfire buffer combines to create an 11.5m setback, which also results in the dwelling sites being exposed to a radiant heat of $<29\text{kW/m}^2$ – equivalent to BAL-29. The reduced setback does not expose emergency personnel to an unacceptable risk as defensive fire fighting operations can be safely carried out.

Reversing bays are provided for the 2 short cul-de-sacs to ensure residents and emergency personnel can safely access all areas of the site.

Refer to **Appendix 1** for proposed development showing access.

3.3.1 Fire Trails

Acceptable Outcomes

Fire trails are used as access for firefighters as fire control lines if they are connected to the public road system at regular intervals. In urban areas fire trails may also function as a strategic control line around the hazard side of the APZ.

The following design specifications are required under the Draft LPS (2014):

- Access for fire management and evacuation is provided by vehicular access in the form of a perimeter road:
 - » Within a minimum reserve width of 20 metres;

- » Located between the premises and adjoining vegetation;
- » With a maximum gradient of 12.5 percent;
- » Constructed to otherwise comply with section 3.4-Movement infrastructure standards of planning scheme policy 5-infrastructure; and
- » That has a layout that does not include a cul-de-sac.

Proposed Measures

In addition to the perimeter road being situated between the hazard and the proposed development, a 6m fire trail may be incorporated within the 11m APZ to provide direct access to the threat for emergency personnel permanently. Accordingly, the proposed development generally meets the Acceptable Outcomes.

3.4 Water

Acceptable Outcomes

Provision of access to the reticulated water supply must be provided for fire-crews in the form of readily accessible and easily located fire hydrants. Fire hydrant spacing, sizing and pressure should comply with AS 2419.1 – 2005. Hydrants are not to be located within any road carriageway. All above ground water and gas service pipes external to the building are metal, including and up to any taps. The reticulated water supply must provide a minimum pressure and flow of 10 litres per second at 200KPa.

Alternatively, an on-site water storage with a dedicated water supply for fire fighting purposes of 20,000 litres is acceptable.

Proposed Measures

To facilitate quick and efficient action by the Fire & Rescue / Rural Fire Service upon arrival, all necessary connections / pumps etc be clearly marked and visible, and in good working order.

3.5 Gas

Acceptable Outcomes

Any reticulated or bottled gas should be installed and maintained according to the requirements of the relevant authorities and AS 1596 – 2002.

Proposed Measures

It is expected that the location of gas services will not lead to ignition of surrounding bushland or the fabric of buildings.

3.6 Landscaping

Acceptable Outcomes

In areas that are prone to bushfire, the design and management of the landscape in the immediate vicinity of buildings have great potential to improve the chances of survival of people and buildings. Generally landscaping in and around a bushfire hazard should consider the following:

- Priority given to retaining species that have a low flammability;
- Priority given to retaining 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;

- Priority given to retaining smooth barked species over stringy bark; and
- Create discontinuous or gaps in the vegetation to slow down or break the progress of fire towards the dwellings.

The principles of landscaping for bush fire protection aim to:

- Prevent flame impingement on the dwelling;
- Provide for a defendable space for the property protection;
- Reduce fire spread;
- Deflect and filter embers;
- Provide shelter from radiant heat; and
- Reduce wind speed.

Avoiding understorey planting and regular trimming of the lower limbs of trees also assists in reducing fire penetration into the canopy. Rainforests species such as *Syzygium* and figs are preferred to species with high fine fuel and/or oil content.

Trees with loose, fibrous or stringy bark should be avoided. These trees can easily ignite and encourage ground fire to spread up to, and then through the crown of trees.

Proposed Measures

The following sets out the specific requirements for vegetation management within the expanded Chambers Pines Lifestyle Resort:

- Grass must be no more than 10 centimetres in height and leaf and other debris must be mowed, slashed or mulched;
- Shrubs, and/or trees must not form a continuous canopy with unmanaged fuels;
- Tree branches below 2 metres from ground level must be removed;
- Trees may touch each other with an overall canopy cover of no more than 30% at maturity; and
- Shrubs must be in clumps of no greater than 10m², which are separated from each other by at least 10m.

3.7 Community Infrastructure

Acceptable Outcomes

The proposed development includes the construction of a new community building for the use of residents. The location of the community building is greater than 60m from the bushfire and will provide a temporary refuge for residents during a bushfire event; therefore able to function effectively during and immediately after a bushfire event.

Proposed Measures

The community building has three road frontages and direct access to all three evacuation routes.

4.0 Ongoing Management Actions

4.1 Property Maintenance and Inspection Regime

In considering property maintenance the following items should be implemented in advance of the bushfire season; prior to October each year:

- Removal of material such as litter from the roof and gutters of buildings;
- Ensure painted surfaces are in good condition with decaying timbers being given particular attention to prevent the lodging of embers within gaps;
- Check pumps and water supplies (fire hydrants) are available and in good working order;
- Driveways are in good condition with trees not being too close and forming an obstacles during smoky conditions;
- Check tiles and roof lines for broken tiles or dislodging roofing materials;
- Screens on windows and doors are in good condition without breaks or holes in flyscreen material and frames are well fitting into sills and window frames;
- Hose and hose reels are not perished and fittings are tight and in good order;
- Doors are fitted with draught seals and well maintained;
- Mats are of non combustible material or in areas of low potential exposure (sheltered from direction of bushfire hazard and under cover); and
- Woodpiles, sheds and other combustible materials are located well away from buildings.

4.2 Vegetation Fuel Management

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

The following sets out the specific requirements for vegetation management within the entire site:

- Shrubs, and/or trees must not form a continuous canopy with unmanaged fuels;
- Tree branches below 2 metres from ground level must be removed;
- Trees may touch each other with an overall canopy cover of no more than 30% at maturity; and
- Shrubs must be in clumps of no greater than 10m², which are separated from each other by at least 10m.

4.2.1 Fine Fuel loads

Ground fuels such as fallen leaves, twigs and barks should be removed on a regular basis from within the APZ. The most flammable fuel is dry vegetation, sticks and other debris less than 6mm in diameter.

4.2.2 Grass

Grass within the site and APZ shall be kept short (<100mm) and mowed regularly. No stockpiling of mown grass should be left within the APZ.

5.0 Recommendations

In summary, the following recommendations have been prepared based on the Specific Outcomes assessment criteria outlined in the *QLD Government Single State Planning Policy* and Draft Logan Planning Scheme;

- A minimum 11m wide Asset Protection Zone is to be created alongside the entire length of the western boundary of the site;
- All vegetation within the setback between the northern and western boundaries and the dwelling sites shall be managed as a low-fuel zone;
- All vegetation throughout the entire site shall be managed as a reduced fuel zone;
- All dwellings and habitable buildings constructed within the site should have due regard to the specific considerations given in the National Construction Code: Building Code of Australia (BCA) 2014 and Australian Standard AS3959-2009 *Construction of buildings in bushfire prone areas*;
- Access roads shall comply with Section 3.3 of this report;
- The development is to be connected to the reticulated water supply and that suitable hydrants be clearly marked and provided for the purposes of bushfire protection. Fire hydrant spacing, sizing, and pressure should comply with AS2419.1, 2005; and
- An Emergency Management Plan (EMP) shall be prepared to improve the preparedness of the residents and to clearly identify the procedures to be followed in the event of a bushfire.

This assessment has been made based on the bushfire hazards in and around the site at the time of inspection, production, and a review of the development vision documentation (May 2015).

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.

6.0 Conclusion

It is clear from this investigation and assessment that the site constitutes Bushfire Prone Land.

The Bushfire Management Plan provided an assessment of the potential bushfire hazards specific to the proposed development on land at 609-657 Chambers Flat Road, Chambers Flat, Qld; known as the Chambers Pines Lifestyle Resort. This Bushfire Management Plan considered the performance criteria of the Queensland Government Single State Planning Policy and Draft Logan Planning Scheme and concluded that subject to the implementation of the recommended bushfire protection measures the risk of harm or injury to life or damage to property is minimised.

Finally, the implementation of the adopted measures and recommendations forwarded within this report 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.

7.0 References

Beaudesert Planning Scheme (2007) *Development Constraints Overlay – Bushfire Hazard*. Accessed online:
http://www.logan.qld.gov.au/_data/assets/pdf_file/0019/8038/ov3-1a.pdf

CSIRO (2014) *A New Methodology for State-wide Mapping of Bushfire Prone Areas in Queensland*.
Queensland Government, Queensland.

Logan City Council (2014) *Revised Logan Planning Scheme 2014*: Draft (currently in review).

Standards Australia (2009) AS 3959 – 2009: *Construction of Buildings in Bushfire-prone Areas*.

Appendix I

Site Layout Plan

DRAFT



KOPLICK ROAD

ROAD

FLAT

CHAMBERS

EXISTING RESIDENTIAL

5
RP68700

31
RP848575

LEGEND	
	Site Boundary
	Open Space - Waterway Corridor
	Open Space / Landscaping
	10m Buffer to Adjoining Use
	Carparking - 62 bays
	Caravan Parking - 23 bays

House Type	Dimensions	Area (m ²)	No of Lots	% Mix
16m Deep Allotments				
1.5 Bed	12 x 16	192	20	8%
2 Bed 1.5 Bath	12 x 16	192	64	25%
2 Bed 2 Bath	12.5 x 16	200	59	23%
2.5 Bed	12.5 x 16	200	59	23%
3 Bed	13 x 16	208	35	14%
17m Deep Allotments				
1.5 Bed	12 x 17	204	2	1%
2 Bed 1.5 Bath	12 x 17	204	4	2%
2 Bed 2 Bath	12.5 x 17	212.5	5	2%
2.5 Bed	12.5 x 17	212.5	5	2%
3 Bed	13 x 17	221	3	1%
Total			256	

Note:
All Lot Numbers, Dimensions and Areas are approximate only, and are subject to survey and Council approval.
Dimensions have been rounded to the nearest 0.1 metres.
Areas have been rounded down to the nearest 5m².
The boundaries shown on this plan should not be used for final detailed engineers design.

SCALE 1 : 1000 @ A1

0 20 40 60 80 100
DATE : 14 MAY 2015 DWG NAME : 126720-05-PRO DWG # 126720-05A

RPS

SITE LAYOUT PLAN
Ingénia Communities Holdings Ltd

Appendix 2

Bushfire Attack Assessor Report

NBC Bushfire Attack Assessment Report V2.1

AS3959 (2009) Appendix B - Detailed Method 2

Printed: 15/05/2015 Assessment Date: 14/04/2015



Site Street Address: Chambers Pines, Chambers Flat
Assessor: Stuart Greville; RPS Australia East Pty Ltd
Local Government Area: QLD **Alpine Area:** No

Equations Used

Transmissivity: Fuss and Hammins, 2002
Flame Length: RFS PBP, 2001
Rate of Fire Spread: Noble et al., 1980
Radiant Heat: Drysdale, 1985; Sullivan et al., 2003; Tan et al., 2005
Peak Elevation of Receiver: Tan et al., 2005
Peak Flame Angle: Tan et al., 2005

Run Description: West

Vegetation Information

Vegetation Type:	Forest	Vegetation Group:	Forest and Woodland
Vegetation Slope:	2 Degrees	Vegetation Slope Type:	Upslope
Surface Fuel Load(t/ha):	22	Overall Fuel Load(t/ha):	30

Site Information

Site Slope	0 Degrees	Site Slope Type:	Downslope
Elevation of Receiver(m)	Default	APZ/Separation(m):	11

Fire Inputs

Veg./Flame Width(m):	100	Flame Temp(K)	1090
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Calculation Parameters

Flame Emissivity:	95	Relative Humidity(%):	25
Heat of Combustion(kJ/kg)	18600	Ambient Temp(K):	308
Moisture Factor:	5	FDI:	40

Program Outputs

Category of Attack:	HIGH	Peak Elevation of Receiver(m):	4.3
Level of Construction:	BAL 29	Fire Intensity(kW/m):	14258
Radiant Heat(kW/m2):	28.66	Flame Angle (degrees):	64
Flame Length(m):	9.58	Maximum View Factor:	0.434
Rate Of Spread (km/h):	0.92	Inner Protection Area(m):	11
Transmissivity:	0.868	Outer Protection Area(m):	0