**Bushland Protection Systems**
Specialising in
BUSHFIRE HAZARD PLANNING & MITIGATION

ABN 97 782 336 595 Phone: 07 5546 7933 Fax: 07 5546 7988
PO Box 40, Ormeau, Qld, 4208 E-mail: admin@bpsfire.com.au

# SUB-PRECINCT SPECIFIC BUSHFIRE HAZARD ASSESSMENT AND MITIGATION PLAN

## FOR

## SUB-PRECINCT 3A YARRABILBA

## PREPARED BY

## BUSHLAND PROTECTION SYSTEMS PTY LTD

## FOR

PLANS AND DOCUMENTS
referred to in the PDA
DEVELOPMENT APPROVAL
Approval no: DEV2016/791
Date: 23 August 2017

Queensland Government

## LEND LEASE

## DATE: 20th July, 2016.

## 1. Background

A Bushfire Mitigation Plan is designed to identify and minimise the potential bushfire risk to a given property and to help property owners to minimise bushfire risk to themselves, their property and their neighbours. It will not completely eliminate that risk. Ultimately it is a community responsibility to protect the environmental values, life and property in their area.

This plan is a Sub-Precinct Specific Plan for Sub-Precinct 3A of Yarrabilba, produced in accordance with:

- The approved Conceptual Bushfire Risk Assessment and Mitigation Plan (BMP), produced by Bushland Protections Systems, dated 18/7/2012, based on the State Planning Policy 1/03, *Mitigating the Adverse Impacts of Flood, Bushfire and Landslide*, under the Queensland Sustainable Planning Act 2009, the Logan City Council Planning Code Part 5 Bushfire Hazard Area.
- The Context Bushfire Hazard Assessment and Mitigation Plan for Precinct 3 of Yarrabilba produced by Bushland Protections Systems, dated 2/4/16.
- This report also takes into consideration the 'Pre-Development Bushfire Mitigation Concept' Plan prepared by Bushland Protection Systems, dated 30/1/12.

This plan is based on the following material supplied by Lend Lease, and a number of site visits.

**1.1.** A copy of the Yarrabilba Precinct 3 Context Plan, Supplied by Lend Lease, drawing no. YAR_P03_PCP160318, dated 23/3/16, is included as Appendix 1 in this report.

**1.2.** A copy of the Bushfire Hazard Assessment and Management Plan, Sheet 1 of 2, drawn by RPS, drawing no. 106127-73EA, dated 18/7/16, is included as Appendix 2A in this report.

**1.3.** A copy of the Bushfire Hazard Assessment and Management Plan, Sheet 2 of 2, drawn by RPS, drawing no. 106127-74EA, dated 18/7/16, is included as Appendix 2B in this report.

## 2. Description

The overall Yarrabilba site has been used as a pine plantation in the past with operations ceasing some 19 years ago with minimal management since that time, creating considerable pine regrowth, grass and weed growth. Some areas have been hazard reduced by the local Rural Fire Brigade from time to time, although unauthorised ignitions have been responsible for the majority of fires on the site.

Sub-Precinct 3A consists of a proposed school site, a community site, future playing fields, linear open space and residential areas, which will be predominantly cleared for development.

Running east-west along the southern side of Sub-Precinct 3A is a proposed fauna corridor to be retained as bushland. This corridor is 200 metres in width and adjoins the conservation area to the east of Precinct 3. The fauna corridor will eventually consists of grassy eucalypt vegetation over slopes of up to 5%. The severity of bushfire hazard as calculated in accordance with appendix 3 of the State Planning Policy 1/03 Guidelines (SPP1/03) would assign a vegetation score of 6 (grassy eucalypt) a slope score of 1 (plain 0-5%) and an aspect score of 0 (slopes under 5%), equating to a severity of bushfire hazard score of 7 Medium (see Table 1).

© Commercial in Confidence.

Between the fauna corridor and the residential area is a 'Major Sports Park' which will consist of large sporting fields and other infrastructure, with peripheral landscaping that will be managed, as outlined in Section 6 of this report, to ensure a Low bushfire hazard, and will provide well over 100 metres of buffering to the Fauna corridor.

Running north-south along the eastern edge of Sub-Precinct 3 is an open space waterway corridor to be retained predominantly as bushland. The corridor will vary in width from 190 to 260 metres and follows a shallow water flow path, with slopes of less than 5%. The eventual bushland would be classified as grassy eucalypt vegetation. The severity of bushfire hazard as calculated in accordance with appendix 3 of the State Planning Policy 1/03 Guidelines (SPP1/03) would assign a vegetation score of 6 (grassy eucalypt) a slope score of 1 (plain 0-5%) and an aspect score of 0 (slopes under 5%), equating to a severity of bushfire hazard score of 7 Medium (see Table 1).

To the west of Sub-Precinct 3A is Precinct 2, with a narrow linear corridor located between the two. The narrow corridor is predominantly a drainage flow path required to have non-endemic grass and weed growth managed within it. The corridor would be classified as a linking vegetation strip in accordance with the SPP 1/03 guideline – FAQ, with separations in accordance with Table B, solution 1.5c of the SPP 1/03 guideline. Therefore the corridor is not deemed assessable and would be assigned a Low PBH rating in accordance with the SPP 1/03.

To the east of the proposed school site is a small retained pocket of open space. The open space in total is approximately 2.8 Ha in size with a conservation component of 1.46 Ha in size. The open space area would not be assessable under the SPP1/03 due to being under 5Ha in size (*SPP 1/03 FAQ, Ver.2, Nov. 2003*).

To the northeast of Sub-Precinct 3A is the Whickham Timber Reserve, consisting of grassy eucalypt vegetation. The area adjacent to Sub-Precinct 3A, on the neighbouring site, has a gentle slope of up to 4% with a northeast aspect. The severity of bushfire hazard as calculated in accordance with Appendix 3 of the State Planning Policy 1/03 Guidelines (SPP1/03) would assign a vegetation score of 6 (grassy eucalypt) a slope score of 1 (plain 0-5%) and an aspect score of 0 (slopes under 5%), equating to a severity of bushfire hazard score of 7 Medium (see Table 1).

The rural residential allotments to the north of Sub-Precinct 3A are well maintained grassland properties with scattered trees and have established residences. The maintained grassland areas, in accordance with appendix 3 of the State Planning Policy 1/03 (SPP1/03), would be assigned a vegetation score of 2 (grazed/slashed grass), and therefore would be given a PBH rating of 0 low, in accordance with table A3.1 and section A3.14 of the SPP 1/03 and the SPP 1/03 guideline - errata.

Between Sub-Precinct 3A and the rural residential lots to the north is the Southern Infrastructure Corridor. The corridor currently consists of slash pine with some remanent bushland and is currently under the control of Lend Lease and will eventually come under the control of the Department of Transport and Main Roads (DTMR). Lend Lease and DTMR have an agreement whereas Lend Lease will be removing the slash pine, heavily thinning out the mid-storey and managing ground fuel levels by regular slashing. The area will retain mature canopy trees and some scattered juvenile canopy trees and be managed as the equivalent to an outer radiation zone/buffer. Therefore the Southern Infrastructure Corridor will not pose a bushfire hazard, being classed as managed open woodland.

Table 1

| TOTAL HAZARD SCORE | SEVERITY OF BUSHFIRE HAZARD |
|---|---|
| 13 or greater | High |
| 6 to 12.5 | Medium |
| 1 to 5.5 | Low |

Section A3.24 and table A3.5 of the State Planning Policy 1/03 (SPP 1/03) sets out inclusion zones when calculating a PBH level. Any land within 50 metres of Medium PBH rated bushland is deemed to have a Medium PBH rating. Any land within 100 metres of High PBH rated bushland is deemed to have a High PBH rating. Therefore any proposed dwellings within 50 metres of the Whickham Timber Reserve and the north-south corridor to the east, Lots 42-44, 60, 61, 63, 64, 83, 89-94, 99-116, 128, 129, 190-199, 207-213, 226 & 227 will be assigned a Medium PBH rating. These lots will be subject to the required mitigation measures outlined in this report. Lots 37-41, 45-49, 55-59, 65-68, 84-88, 117-121, 123-127, 186-189, 200-206, 214-216, 222-225 & 249-253 will also be subject to bushfire construction ratings, being within 100 metres of Medium rated bushland as further explained in Section 5 of this report.

## 3. Appropriate Building Location

As the site is relatively level to undulating topography, there are no significant steep slopes causing dwellings to be located along ridgelines or the like. The majority of the developable area is on the lower slopes, where future dwellings will not be exposed to significant upslope bushfire approach and therefore would be classified in order of degree of fire safety as 1 and 2 as the safer locations in accordance with section A7.6 and Figure 1 of the SPP 1/03.

Being a residential community, it would be recommended that dwellings be located on allotments so as to maximise setbacks from any unmanaged bushland, allowing for optimal defendable space.

In accordance with the approved Concept Bushfire Risk Assessment and Mitigation Plan, dwellings are to have a minimum bushfire buffer of 20 metres, or the distance required to achieve a Bushfire Attack Level BAL-29 (as identified under AS3959), whichever is the greater from large bushland areas and corridors over 100 metres in width. This includes the fauna corridor, the north-south waterway corridor and the Whickham Timber Reserve.

Appendix 1 demonstrates a 20 metre road reserve separation between the lots in Sub-Precinct 3A and the Whickham Timber Reserve to the northeast.

The major sports park provides well over 100 metre separation from the fauna corridor.

The dwellings on Lots 112-116, 192-197, 209 & 210 will be provided a minimum 20 metres of separation from the north-south waterway corridor, consisting of a 16 metre wide road reserve and 4 metre in-lot setback for the proposed buildings.

Lots 129 & 227 will have a 19.2 metre mowed grass buffer to the east (inclusive of a fire trail, as outlined in Section 4 of this report). This is to be supplemented with a further minimum 0.8metre building setback within the lot to achieve a total of 20 metres of separation. External buffering is to be extended to the northeast to ensure a minimum 20 metre separation for the dwelling on Lot 129.

In accordance with the approved Concept Bushfire Risk Assessment and Mitigation Plan, dwellings are to have a minimum bushfire buffer of 10 metres, or the distance required to achieve a Bushfire Attack Level BAL-29 (as identified under AS3959), whichever is the greater from narrow corridors and small areas of bushland. This includes the narrow linear corridor between Sub-Precinct 3A and Precinct 2 (Lot 9043), as well as the small open space pocket to the east of the school site (Lot 9044).

The allotments in Sub-Precinct 3A, adjacent to the corridor between Precincts 2 & 3, are provided with roadway separation of 13.5 metres, meeting the minimum setback requirement.

A minimum separation of 11 metres is to be provided between buildings on the proposed childcare site and vegetation in the narrow linear corridor to its northeast. A minimum separation of 11 metres is to be provided between buildings on the proposed school site and vegetation in the narrow linear corridor to its northeast also. Where there is managed lawn area within the linear corridor, adjoining these sites, the managed lawn area can be utilised as part of the 11 metre buffer.

The 2.817Ha parkland area (Lot 9044) within Sub-precinct 3A is separated from the majority of allotments by roadway, with the exception of the northern and southern ends. A minimum 10 metre mowed grass buffer is to be provided within the open space between dwellings and the conservation portion of the park. Where the road/driveway separation doesn't exist, it is only a very short distance and pedestrian access trail within the minimum 10 metre managed buffer will suffice, for providing access. This includes Lots 74-82, 130 & 143.

## 4. Roads, Driveways and Fire Trails

As with any proposed development of this size, it will have a substantial road network. Existing roads in the area will provide for multiple access/egress options for the proposed development. It is considered that access/egress is highly unlikely to be restricted by bushfire.

The only cul-de-sac road within Sub-Precinct 3A (near Lots 143 & 146) is in a Low hazard rated area.

Being residential allotments, the dwellings will have short direct driveway access.

The future internal design of the school site is to provide vehicle access along the adjoining corridor on the northwest boundary, by either a fire trail or some form of internal driveway, with connections to the external roads at each end. This trail would be within the 11 metre building setback outlined in Section 3 of this report.

© Commercial in Confidence.

Along the eastern boundary of Sub-precinct 3A are two allotments without road separation from the waterway corridor (Lots 129 & 227). These lots are to have a fire trail established within the buffer area, with connections to the roadways at each end.

A fire trail connection is to be provided to Steele Road, until such time as a road is constructed or the transport corridor is developed.

A fire trail connection is to be provided to the existing fire trail in the Whickham Timber Reserve, opposite Lots 63 & 89.

Fire Trails are to be 6 metres in width with 4 metres formed. They would be low impact preferably with a mowed or slashed surface which would minimise disturbance or erosion, Appendix 4 on fire trails is included in this report as a guide on establishing and maintaining fire access trails.

## 5. Appropriate Building Construction

Since the approved concept BMP, the Logan City Council has adopted the Logan Planning Scheme 2015, which has changed the assessment criteria for bushfire and increased the triggering zone to 100 metres for all hazard levels. Whilst the new planning scheme doesn't affect the already approved and future development applications, it does affect building construction ratings that will be applicable at the time of building application. The building code relies on the current planning scheme for designating bushfire prone areas, hence the site would require assessment under the current planning scheme methodology for the purpose of determining those areas deemed as bushfire prone for the purpose of the BCA.

PSP 6 of the Logan Planning Scheme 2015 states "*A bushfire hazard assessment report is required to be prepared in accordance with the methodology in the CSIRO report: A new methodology for state-wide mapping of bushfire prone areas in Queensland by J. Leonard, G. Newnham, K. Opie, R. Blanchi. 2014, CSIRO, Australia."* However it is noted that this document does not provide a complete nor suitable methodology and that the State Bushfire Mapping maintained by the Public Safety Business Agency is now using an adapted version of this methodology, in particular a completely different categorisation system for vegetation types, as the original was found to be inept. This report utilises the latest accepted methodology available at the time of producing this report.

The narrow linear corridor between Precinct 2 & 3 would still be assigned a Low hazard rating, being a corridor of less than 100 metre in width with Urban uses either side for a minimum of 25 metres, it is downgraded under corridor and patch filtering (CSIRO report, Section 2.2.1).

The small pocket of vegetation within the open space area east of the school site, would also still have a Low hazard rating. State bushfire methodology downgrades the pocket through its corridor and pocket filtering (CSIRO report, Section 2.2.1). The current State methodology downgrades hazard ratings based on area, with the PSBA bushfire overlay mapping excluding High or Very High areas under 1 hectare in size and Medium areas under 2 hectares in size.

© Commercial in Confidence.

The 'Major Sports Park' would be assigned a Vegetation Hazard Class (VHC) of 39.2 with associated fuel loads of up to 8t/Ha, over level land with an FFDI of 54, providing for a potential fire line intensity of up to 2,296kw/m equating to a Low hazard rating.

The north-south corridor to the east of Sub-Precinct 3A would be assigned a VHC of 16.1 with associated fuel loads of up to 15.9t/Ha, over relatively level land with an FFDI of 54, providing for a potential fire line intensity of up to 9,069kw/m equating to a Medium hazard rating.

The Whickham Timber Reserve to the northeast of Sub-Precinct 3A has a strip of slashpine plantation between the boundary and the continuation of the north-south corridor. The strip of slashpine would be assigned a VHC of 36.1 with associated fuel loads of up to 26t/Ha, over a slope of 2 degrees (4%) with an FFDI of 54, providing for a potential fire line intensity of up to 25,982kw/m equating to a High hazard rating. The continuation of the north-south corridor however would be assigned a VHC of 16.1 with associated fuel loads of up to 15.9t/Ha, over relatively level land with an FFDI of 54, providing for a potential fire line intensity of up to 9,069kw/m equating to a Medium hazard rating.

The Bushfire Hazard Mapping also incorporates a 100 metre Potential Impact Buffer meaning that any land within 100 metres of a Potential Bushfire Hazard is also assigned the same rating as that bushland and triggers the Bushfire Code if Medium, High or Very High. Whilst having the same distance for all three levels of hazard is not considered a fit for purpose application, it is unfortunately what is legislated at this current time. Therefore proposed Lots within 100 metres of the medium-high hazard rated bushland, Lots 37-49, 55-68, 83-94, 99-121, 123-129, 186-216, 222-227 & 249-253, will require the bushfire provision of the BCA applied.

The bushfire provisions of the Building Code of Australia (BCA) are applied to Class 1, 2 & 3 buildings and associated Class 10a buildings, located in designated bushfire prone areas. "Designated bushfire prone area means land which has been designated under a power in legislation as being subject, or likely to be subject, to bushfires" *(BCA 1.1.1 Definitions)*.

The Logan Planning Scheme 2015, Table 5.7.1 – Building Work, Editor's note, states "*Land identified in a bushfire hazard area on Bushfire hazard overlay map-OM-03.00 is a designated bushfire prone area for the Building Code of Australia and the Queensland Development Code.*" OM-03.00 only maps areas of Very High, High or Medium Potential Bushfire Hazard (PBH).

P2.3.4 of the BCA requires:- "A Class 1 building or a Class 10a building or deck associated with a Class 1 building that is constructed in a designated bushfire prone area must be designed and constructed to reduce the risk of ignition from a bushfire while the fire front passes."

Section 3.7.4.0 (Qld variation) of the BCA states:-

*(a) Subject to (b), Performance Requirement P.2.3.4 is satisfied for—*

*(i) a Class 1 building; or*

*(ii) a Class 10a building or deck associated with a Class 1 building, located in a designated bushfire prone area if it is constructed in accordance with—*

*(iii) AS 3959; or*

*(iv) NASH Standard – Steel Framed Construction in Bushfire Areas.*

*(b) The requirements of (a) do not apply when, in accordance with AS 3959, the classified vegetation is Group F rainforest (excluding wet sclerophyll forest types), mangrove communities and grasslands under 300 mm high.*

Section 3.7.4 of the BCA states:- "Where an alternative bushfire protection design is proposed as a Performance Solution to that described in Part 3.7.4, that proposal must comply with Performance Requirement P2.3.4 and the relevant Performance Requirements determined in accordance with 1.0.7.

It should be noted that the bushfire provisions of the BCA including AS3959-2009 do not apply to commercial, industrial or school buildings.

The following levels of construction (as shown in Appendix 2B) are reliant on the recommendations of this report being implemented and maintained.

**5.1.** Lots 37-49, 55-68, 83-106 & 249-253

Lots 37-49, 55-68, 83-106 & 249-253 are within 100 metres of the Whickham Timber Reserve upslope to the northeast. The allotments have a minimum 20 metres of separation from the bushland.

In accordance with AS3959-2009 – Table 2.4.5 '*Determination of Bushfire Attack Level (BAL)-FDI 40 (1090K)'*, the vegetation class is woodland, distance from unmanaged vegetation is between 19 and 100 metres and slope is upslope, which equates to a BAL-12.5 Bushfire Attack Level for the proposed dwelling. A BAL-12.5 Bushfire Attack Level requires Sections 3 and 5 of AS3959-2009 to be applied.

**5.2.** Lots 107-111 & 117-121

Lots 107-111 & 117-121 have an exposure to the Whickham Timber Reserve upslope to the north with 20 metres or more separation, and an exposure to the north-south corridor to the east with well over 23 metres separation.

For the bushland to the north; In accordance with AS3959-2009 – Table 2.4.5 '*Determination of Bushfire Attack Level (BAL)-FDI 40 (1090K)'*, the vegetation class is woodland, distance from unmanaged vegetation is between 19 and 100 metres and slope is upslope, which equates to a BAL-12.5 Bushfire Attack Level for the proposed dwelling.

For the bushland to the east; In accordance with AS3959-2009 – Table 2.4.5 '*Determination of Bushfire Attack Level (BAL)-FDI 40 (1090K)'*, the vegetation class is woodland, distance from unmanaged vegetation is between 23 and 100 metres and slope is 0-5 degrees, which equates to a BAL-12.5 Bushfire Attack Level for the proposed dwelling.

Therefore dwellings on Lots 107-111 & 117-121 are to be constructed to a BAL-12.5 Bushfire Attack Level, requiring Sections 3 and 5 of AS3959-2009 to be applied.

© Commercial in Confidence.

**5.3.** Lots 112-116

Lots 112-116 have an exposure to the Whickham Timber Reserve upslope to the north with 20 metres or more separation. The dwellings on these lots also have an exposure to the north-south corridor to the east with a minimum separation of 20 metres consisting of the 16 metre road reserve and the 4 metre building setback from the eastern lot boundary.

For the bushland to the north; In accordance with AS3959-2009 – Table 2.4.5 '*Determination of Bushfire Attack Level (BAL)-FDI 40 (1090K)'*, the vegetation class is woodland, distance from unmanaged vegetation is between 19 and 100 metres and slope is upslope, which equates to a BAL-12.5 Bushfire Attack Level.

For the bushland to the east; In accordance with AS3959-2009 – Table 2.4.5 '*Determination of Bushfire Attack Level (BAL)-FDI 40 (1090K)'*, the vegetation class is woodland and slope is 0-5 degrees. The distance between the building and eastern (front) boundary will determine the standard of construction required.

- If the distance between the eastern boundary and the building is less than 7 metres, the Bushfire Attack Level for the proposed dwelling will equate to BAL-19. A BAL-19 level requires Sections 3 and 6 of AS3959-2009 to be applied.
- If the distance between the eastern boundary and the building is more than 7 metres, the Bushfire Attack Level for the proposed dwelling will equate to BAL-12.5. A BAL-12.5 level requires Sections 3 and 5 of AS3959-2009 to be applied.

Section 3.5 of AS3959-2009 states "*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*." Therefore the west elevation of the proposed building can be constructed to the next lower Bushfire Attack Level, unless the level is already at BAL-12.5.

**5.4.** Lots 129 & 227

Lots 129 & 227 are within 100 metres of the north-south corridor to the east. Dwellings will have a minimum separation of 20 metres consisting of the 19.2 metre managed buffer and the 0.8 metre building setback from the eastern lot boundary.

In accordance with AS3959-2009 – Table 2.4.5 '*Determination of Bushfire Attack Level (BAL)-FDI 40 (1090K)'*, the vegetation class is woodland and slope is 0-5 degrees. The distance between the building and eastern lot boundary will determine the standard of construction required.

- If the distance between the eastern boundary and the building is less than 3.8 metres, the Bushfire Attack Level for the proposed dwelling will equate to BAL-19. A BAL-19 level requires Sections 3 and 6 of AS3959-2009 to be applied.
- If the distance between the eastern boundary and the building is more than 3.8 metres, the Bushfire Attack Level for the proposed dwelling will equate to BAL-12.5. A BAL-12.5 level requires Sections 3 and 5 of AS3959-2009 to be applied.

Section 3.5 of AS3959-2009 states "*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*." Therefore the west elevation of the proposed building can be constructed to the next lower Bushfire Attack Level, unless the level is already at BAL-12.5.

**5.5.** Lots 192-197, 209 & 210

Lots 192-197, 209 & 210 are within 100 metres of the north-south corridor to the east. Dwellings will have a minimum separation of 20 metres consisting of the 16 metre road reserve and the 4 metre building setback from the eastern lot boundary.

In accordance with AS3959-2009 – Table 2.4.5 '*Determination of Bushfire Attack Level (BAL)-FDI 40 (1090K)'*, the vegetation class is woodland, distance from unmanaged vegetation is between 16 and 23 metres and slope is 0-5 degrees, which equates to a BAL-19 Bushfire Attack Level for the proposed dwellings.

Section 3.5 of AS3959-2009 states "*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*." Therefore the west elevation of the proposed building can be constructed to BAL-12.5 Bushfire Attack Level, requiring Sections 3 and 5 of AS3959-2009 to be applied, while the remainder of the building must be constructed to a BAL-19 Bushfire Attack Level, requiring Sections 3 and 6 of AS3959-2009 to be applied.

**5.6.** Lots 123-128, 186-191, 198-208 & 211-216, 222-226

Lots 123-128, 186-191, 198-208 & 211-216, 222-226 are within 100 metres of the north-south corridor to the east. Dwellings will have a separation of over 23 metres.

In accordance with AS3959-2009 – Table 2.4.5 '*Determination of Bushfire Attack Level (BAL)-FDI 40 (1090K)'*, the vegetation class is woodland, distance from unmanaged vegetation is between 23 and 100 metres and slope is 0-5 degrees, which equates to a BAL-12.5 Bushfire Attack Level for the proposed dwellings. A BAL-12.5 Bushfire Attack Level requires Sections 3 and 5 of AS3959-2009 to be applied.

**5.7.** Remaining Allotments

The remainder of the allotments in Sub-Precinct 3A have a Low PBH rating.

Under the Logan Planning Scheme 2015, Table 5.7.1 – Building Work, Editor's note, a site with a Low PBH rating does not require assessment under the Building Code of Australia or under the Australian Standard (AS3959) for *Construction of Buildings in Bushfire Prone Areas* and therefore no specific level of construction would be required in relation to bushfire on these lots.

## 6. Appropriate Clearing and Landscaping

The residential allotments are to be maintained with low ground fuel levels at all times and may include domestic gardens, lawns with grass kept under 100mm in height and scattered trees with discontinuous canopy.

Areas such as the proposed school site, child care centre site and the community site are to be cleared during operational works in the residential area and managed by regular slashing until developed to avoid posing a bushfire hazard to adjoining development areas.

The retained bushland along the fauna corridor, waterway corridor, open space corridors, and the open space pocket are to be managed by the removal of weed species and control of non-endemic grass growth. All slash pine is to be removed from the site including within the retained bushland areas and future regrowth slash pine is also to be removed.

The open space area within Sub-precinct 3A, east of the proposed school site, is to be managed around the outer edges as managed active park, ensuring the total unmanaged vegetation within the open space area remains at less than 2Ha in size. The managed area may contain scattered mature eucalypts with dis-continuous canopy, but will be regularly mowed. A minimum 11 metre managed buffer is to be provided at the northern and southern ends to allotments without road separation.

The 'Major Sports Park' is to be a managed area. Vegetated areas can consist of tall canopy tree species and mowed grass under 300mm high and be managed by removal of tree limbs less than 2 metres high on trees over 4 metre tall, removal of weed growth & slash pine, grass kept under 300mm high, prevention of mid-storey vegetation (except the juvenile tall canopy tree species) to prevent ladder fuel structure, removal of fallen timber and by restricting leaf litter build-up to 5t/Ha (approx. 10mm deep).

In bushland areas, the areas around the fringes of the bushland and along fire trails have a tendency to have increased ground fuel loading, as a result of increased sunlight penetration producing better growing conditions for grass and weeds (known as 'Edge Effects'), which can have an adverse impact on the local ecosystem and safety issues for fire suppression personnel during unplanned fire events. These non-endemic grasses penetrate into the edges of the retained bushland, creating conditions for high intensity fire which damages the edges of the bushland, opening up the canopy which then allows more sunlight in and promotes grass and weed intrusion further into the bushland. This cyclic process has the effect of decreasing the size of quality bushland and increasing grass and weed dominated areas. The most cost effective way to control grass and weed growth is to create a good closed in canopy cover, which will shade out the undesirable species. The control of fuel loads along the edges by regular mowing, brush cutting or in some cases poisoning may be suitable. Areas with a build-up of volatile fuel levels along the open edges of bushland, where full sunlight is available, can be where the most damage is inflicted on the bushland during a bushfire.

Added protection from bushfire can be achieved by establishing green fire breaks which include green lawns, trees arranged to create a shield to catch sparks or fire brands or the expanding of rainforest species. Trees and shrubs not subject to drought stress will cope better during bushfires. The higher the moisture content in the plant the slower it burns. Therefore by keeping the surrounding area green and low in dry ground fuel, the intensity of an approaching fire will be reduced and the risk of spot fires minimised.

© Commercial in Confidence.

For optimal bushfire safety and best practise, the required vegetation management practises for allotments must be established during operational works and maintained by the developer until sold. Once sold the purchaser must maintain the allotment at all times, before, during and after construction of the dwelling.

All land under the control of the developer is to be managed to control ground fuel levels and prevent uncontrolled regrowth, in areas identified as developable in accordance with the Pre-development Bushfire Mitigation Concept plan dated 30/1/12.

## 7. Provision of Adequate Water Supplies

The area of the proposed development is to be serviced by reticulated water supplies with the inclusion of fire hydrants for firefighting purposes. These services are to comply with the relevant standards as required by the local authorities, including a minimum pressure and flow of 10 litres per second at 200kPa.

## 8. Provision of Fire Fighting Infrastructure

Dwellings are to have external taps and hoses that are positioned so water supply is capable of reaching to all parts of the building. All water lines are to be covered by at least 300mm of soil or be of metal above ground. Residents should maintain good access around their homes for fire suppression activities by fire authorities.

## 9. Local Fire Brigades

The subject property is currently in the Tamborine Rural Fire Brigade district and they would be responded on a 000 emergency call, with back-up from Logan Village Rural Fire Brigade. If further back-up is required, additional units would be engaged by the Beaudesert/Logan Rural Fire Brigades Group. Urban fire appliances would be responded in the event of a structural fire or specialised structural protection being required.

In time as urban development progresses in this area it will most likely become the responsibility of the Urban Fire Service.

## 10. Improved Community Awareness

Managing ground fuel in small pockets of bushland at the interface between urban development and bushland (Izone) is the easiest way of reducing bushfire hazard, particularly the removal of non-endemic grass and weeds.

It would be recommended that a copy of this report be placed on display at any sales office, and a copy of the plans including Appendix 3 on being prepared, be given to the purchasers of lots within 100 metres of bushland areas to provide them with the necessary information required for the building application process.

It would be recommended that residents prepare a ‘Bushfire Survival Plan’, which is available from the Rural Fire Service Queensland website at www.ruralfire.qld.gov.au. The ‘Bushfire Survival Plan’ document provides information on Bushfire Danger

Ratings, Community Warning Information, how to prepare your property, what to do in the event of a bushfire and what to expect. The Bushfire Survival Plan should be updated annually. Further information is also available through the Prepare•Act•Survive brochure also available on the Rural Fire Service website. For further information contact your local Fire Brigade for assistance or phone 1300 369 003.

The Bushland open space is a very sensitive ecosystem and could be altered drastically if not cared for properly. Residents can assist in maintaining this fragile ecosystem by preventing unwanted fires from encroaching into the parkland, ensure that dumping of rubbish does not degrade the area and that exotic plant species do not invade the bushland. Hot fires on a regular basis will degrade the bushlands biodiversity.

## 11. Conclusion

This plan is a Sub-Precinct Specific Plan for Sub-Precinct 3A of Yarrabilba, produced in accordance with:

- The approved Conceptual Bushfire Risk Assessment and Mitigation Plan (BMP), produced by Bushland Protections Systems, dated 18/7/2012, based on the State Planning Policy 1/03, *Mitigating the Adverse Impacts of Flood, Bushfire and Landslide*, under the Queensland Sustainable Planning Act 2009, the Logan City Council Planning Code Part 5 Bushfire Hazard Area.
- The Context Bushfire Hazard Assessment and Mitigation Plan for Precinct 3 of Yarrabilba produced by Bushland Protections Systems, dated 2/4/16.
- This report also takes into consideration the 'Pre-Development Bushfire Mitigation Concept' Plan prepared by Bushland Protection Systems, dated 30/1/12.

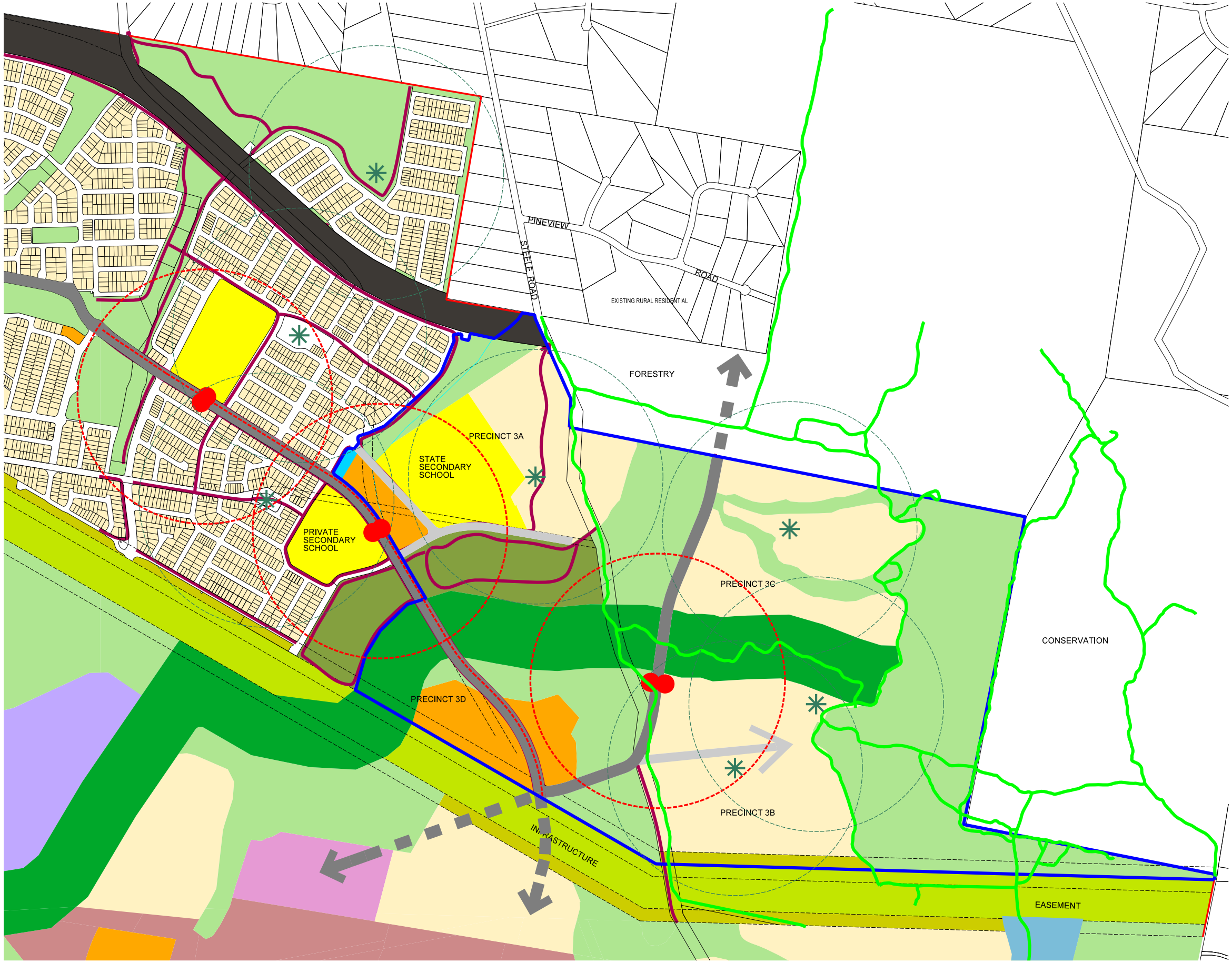
With the appropriate management of the passive open space areas, adequate water supply, good access provisions and minimising of ground fuels, the risk of bushfire damage can be managed and improve the safety of residents and fire services in attending to a bushfire threat, as well as maintaining the localised ecosystems.

This plan should remain current for a period of 5 years, until 2022, at which time it should be subject to review to take account of changing land use and vegetation patterns. Any major bush fire event affecting the subject site should also trigger a review in order to determine effectiveness of protection measures and annual hazard reduction initiatives.

Ultimately, persons living in a bushfire prone area must take the precautions necessary to protect themselves, their families and their homes if Brigades are stretched and are unable to attend immediately.

If you require any further assistance please do not hesitate to contact this office.

C. L. Bain
Principal Consultant.




YARRABILBA

LEGEND

- YARRABILBA SITE BOUNDARY
- PRECINCT THREE BOUNDARY
- ROAD TO BE CLOSED
- NEIGHBOURHOOD CENTRE
- RESIDENTIAL
- URBAN RESIDENTIAL
- EDUCATIONAL ESTABLISHMENT
- RETAIL/COMMUNITY/COMMERCIAL INFRASTRUCTURE/MIXED USE
- FORNA CORRIDOR
- OPEN SPACE
- MAJOR SPORTS PARK
- NEIGHBOURHOOD RECREATION PARK & 400m RADIUS LOOP
- ELECTRICITY EASEMENT
- LANDSCAPE BUFFER
- SOUTHERN INFRASTRUCTURE CORRIDOR
- PRIMARY MOVEMENT NETWORK
- SECONDARY MOVEMENT NETWORK
- BUS ROUTE
- BUS STOP/PROPOSED BUS STOP & 400M RADIUS LOOP
- EXISTING TRAILS

| | |
|---|---|
| TOTAL PRECINCT AREA | 254 ha |
| GROSS RESIDENTIAL AREA<br>Approx 950 lots at an average density of 15dw/ha | 67ha |
| NEIGHBOURHOOD CENTRE | 0.5 |
| COMMUNITY CENTRE | 11.0ha |
| STATE SECONDARY SCHOOL | 12.0ha |
| OPEN SPACE | 157.0ha |
| ROAD | 7.0ha |

DISCLAIMER
The context plan is intended to guide development within the Yarrabilba Precinct Two area and show the preferred land use designations and structural elements. The context plan does not prescribe these designations and structural elements with complete accuracy and the final location will be determined through further detailed design and development applications.

NOTES
The contents of this plan are conceptual only. All areas are approximate only and subject to relevant studies, survey, engineering and relevant authority approvals.

# YARRABILBA - PRECINCT THREE CONTEXT PLAN

NOTE: This plan is indicative only, and specific uses, road alignment, boundaries, setbacks, and building layout shown may vary due to detailed design consideration. ©2015 Lend Lease Communities (Australia). All rights reserved. Except as permitted by Lend Lease, no part of this publication may be reproduced or distributed in any form or by any means, or stored in a database or retrieval system, without the permission of Lend Lease.

0 125 250 375 500 625m

Scale 1:12500 at A3

North

lendlease

File No. D Dgn No. YAR_P03_PCP160318 Date 23rd MARCH 2016

Appendix 1

YARRABILBA

**LEGEND**

- PRECINCT 3A BOUNDARY
- LOW (POTENTIAL INTENSITY)
- MEDIUM (POTENTIAL INTENSITY)
- MANAGED BUFFER

SOUTHERN INFRASTRUCTURE CORRIDOR
STEELE ROAD
WICKHAM TIMBER RESERVE
LINEAR PARK
COMMUNITY / COMMERCIAL
FUTURE STATE SECONDARY SCHOOL
LOCAL PARK
FUTURE COMMUITY USE
YARRABILBA DRIVE
FUTURE MAJOR SPORTS PARK
OPEN SPACE

Appendix 2A

NOTE:
The boundaries shown hereon are subject to detailed engineering design, final survey and approval of subsequent permits as necessary.

**Prepared by RPS on behalf of Bushland Protection Systems July 2017.**

# PRECINCT THREE - VILLAGE 3A (APPLICATION ONE)
# BUSHFIRE HAZARD ASSESSMENT & MANAGEMENT PLAN - Sheet 1 of 2

NOTE: This plan is indicative only, and specific uses, road alignment, boundaries, setbacks, and building layout shown may vary due to detailed design consideration. © 2015 Lend Lease Communities (Australia). All rights reserved. Except as permitted by Lend Lease, no part of this publication may be reproduced or distributed in any form or by any means, or stored in a database or retrieval system, without the permission of Lend Lease.

0 40 80 120 160 200m

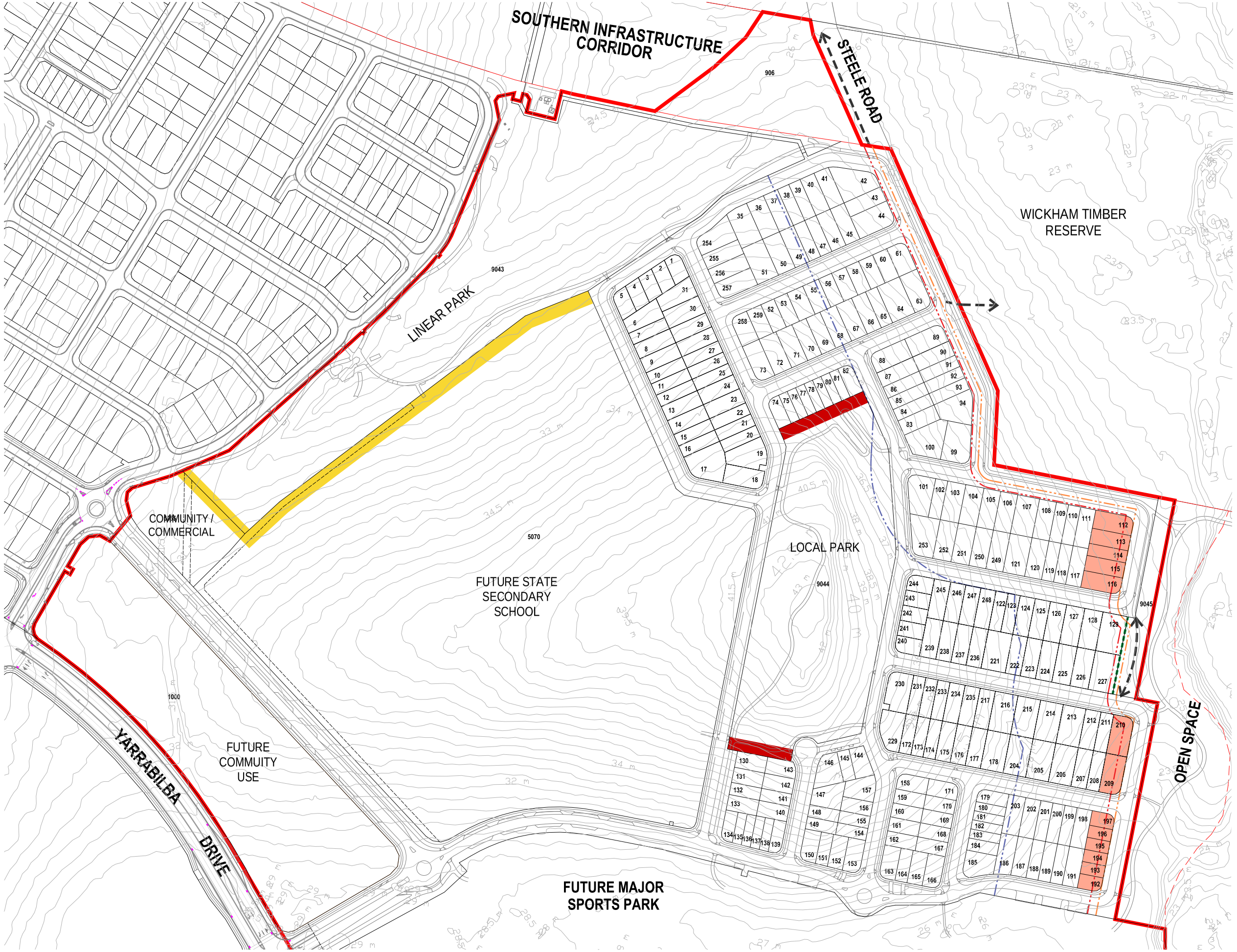
Scale 1: 4000 at A3

North

lendlease

File No. 106127-73c Bushfire Dwg No. 106127-73E A

Date: 18/07/2017




YARRABILBA

## LEGEND

- PRECINCT 3A BOUNDARY
- LOTS INCLUDE A 4m IN-LOT SETBACK
- MINIMUM SEPARATION OF 11.0m BETWEEN BUILDINGS AND EDGE OF OPEN SPACE
- 10m MINIMUM WIDTH MOWN GRASS BUFFER IN PARK ADJOINING LOTS
- 0.8m SETBACK TO WALL OF DWELLING
- FIRE TRAIL
- BAL - Low Rating
- BAL - 12.5 Rating
- BAL - 19 Rating

Appendix 2B

NOTE:
The boundaries shown hereon are subject to detailed engineering design, final survey and approval of subsequent permits as necessary.

**Prepared by RPS on behalf of Bushland Protection Systems July 2017.**

# PRECINCT THREE - VILLAGE 3A (APPLICATION ONE)
# BUSHFIRE HAZARD ASSESSMENT & MANAGEMENT PLAN - Sheet 2 of 2

NOTE: This plan is indicative only, and specific uses, road alignment, boundaries, setbacks, and building layout shown may vary due to detailed design consideration. © 2015 Lend Lease Communities (Australia). All rights reserved. Except as permitted by Lend Lease, no part of this publication may be reproduced or distributed in any form or by any means, or stored in a database or retrieval system, without the permission of Lend Lease.

0 50 100 150m

Scale 1: 3000 at A3

North

lendlease

File No. 106127-73c Bushfire Dwg No. 106127-74E A

Date: 18/07/2017

# APPENDIX 3

## Being Prepared

Knowing how to prepare your property for bush fire, both pre-fire and during a fire, can assist in protecting people and property. It can also alleviate a lot of the stress and panic and the feeling of helplessness that is commonly felt by the inexperienced and by the ill-prepared.

It is generally accepted that South East Queensland does not experience the same degree of extreme fire conditions as the southern states of New South Wales, Victoria and South Australia. Having said this it is also accepted that this State's bushland experiences a relatively regular fire regime. From time to time conditions may occur that will institute a serious and potentially destructive fire. These conditions can be recognised and precautions taken. It must be remembered that during extreme fire conditions the fire services may be stretched to the limit and may not be able to respond immediately to your particular emergency. Fire trucks and fire fighters are a limited resource so it is important that they are deployed in an appropriate manner to best manage the fire. The Queensland Fire and Rescue Service do not guarantee a fire truck will be available to defend every structure during a large bushfire. So it would be desirable to be as prepared and self-reliant as possible to protect yourself, your family and your assets. It is not difficult if appropriate preparation is undertaken and the following information is provided to be of some assistance.

### 1. Conditions that may lead to a Serious Fire:

1.1. Higher than average air temperatures for prolonged periods.

1.2. Large and very dry fuel loads.

1.3. Prolonged dry spell with little or no rain resulting in low soil moisture content.

1.4. Very low relative humidity, ie. there is very little moisture in the air.

1.5. Strong and gusty winds, usually from the north through to the west contribute to increased fire hazard. The longer these winds continue the drier the conditions become, and the higher the risk of serious fire.

Observation of local weather conditions past and present will give the best indication of the potential intensity of a fire at any given time or place.

Notification of potential bushfire conditions are available from the Queensland Rural Fire Service and Local Brigades, in the form of Fire Danger Ratings often seen on roadside signs, Advice Messages, Watch and Act Messages and Emergency Warnings. More information on these information sources, where to find them and what they mean, is available on the Rural Fire Service Website www.ruralfire.qld.gov.au or through the local Fire Brigade.

## 2. Basic Fire Behaviour.

Having some idea of what a fire is likely to do in your local area, will help you make the right decisions and give you the confidence to deal with an approaching fire if necessary. Following are some basic fire behaviours.

2.1. Fire will travel faster and hotter uphill. The steeper the slope the faster the rate of spread, in some cases allowing little time to react. The speed of a fire will double for every 10 degrees of upslope.

2.2. Fire will usually travel relatively slower down hill even with reasonably high fuel loads, which will give more time to prepare. The speed of a fire will halve for every 10 degrees of down slope.

2.3. A fire will generally travel faster and at higher intensities with a wind behind it. The stronger the wind, the faster the rate of spread. Likewise a fire will slow considerably when burning against the wind in some cases it may even go out.

2.4. The fire will usually burn at a higher intensity and spread faster during the hottest times of the day and tend to slow down considerably as the evening approaches and air temperatures drop.

2.5. The greater the supply of dry ground fuel available to the fire, ie. grass, dry leaf litter, hanging bark and twigs, the greater the intensity of the fire. If the ground fuel is minimised the intensity of the fire reduces considerably and so does the personal risk and the potential for damage.

2.6. If ground fuels are kept relatively low the chances of a fire progressing into the treetops (crown fire) would be considerably reduced within the Queensland coastal bushlands. For a fire to progress into the tree tops ground fuels and elevated fuels must be present providing a ‘ladder’ of fuels from ground level to tree top. Control of these fuels is the best way of minimising fire intensity and therefore limiting the destructiveness of a bushfire.

Talk to neighbours that have been present during previous bushfires or consult the local Fire Brigade to develop an understanding of usual fire behaviour for your specific location.

## 3. Preparing for the bushfire season.

Most cases of damage to property are caused by radiated heat, direct flame contact or most commonly by burning debris or sparks landing in, on, or around buildings and starting small spot fires which if not attended to may destroy the property long after a fire front has passed. There are many steps that should be taken prior to the onset of a fire season to help protect your property.

3.1. Keep ground fuel cleared from around buildings such as long dry grass, branches, dead leaves, bark and thick undergrowth.

3.2. Remove elevated fuels, such as hanging bark and fallen debris hung up on lower branches.

3.3. Ensure fire breaks/trails/buffers are checked and maintained, even a well-watered lawn can be an effective firebreak.

3.4. Flammable material around buildings should be kept well clear, such as firewood piles, rubbish, fuels, hazardous materials, plant pots, boxes, paper, patio and garden furniture.

3.5. Ensure flammable materials are not stored in open areas under the building.

3.6. Make sure that rainwater gutters are kept clear of leaf litter build-up. Consider a method of blocking off down pipes so gutters can be filled with water during a fire to extinguish sparks landing in gutters. There are commercially made products available or you can create your own.

3.7. Make sure that the roofing is well secured, as winds created during a fire may lift roofing and allow the entry of burning embers into the roof space. Also clear any leaf litter or debris build-up from roof areas.

3.8. All windows and vents should be screened with fine wire mesh and all roof areas closed in to prevent entry by sparks.

3.9. Ensure gas tanks have their emergency relief valves facing away from the building (this includes barbeque bottles).

3.10. Make sure of reserve water supplies. Power frequently fails during a fire. If petrol or diesel pumps are available make sure they and associated hoses and fittings are in good working order.

3.11. Ensure your bushfire survival kit is up to date and complete.

The Queensland Fire and Rescue Service provide detailed lists for preparation prior to fire season and what to do during a bushfire event. This information can be found at www.ruralfire.qld.gov.au or obtained from your local fire brigade.

## 4. Green Fire Breaks

Added protection from bushfire can be achieved by establishing green fire breaks which include green lawns, trees arranged to create a shield to catch sparks or fire brands or the expanding of tropical rainforest species. Excess rainwater or tertiary treated waste water could be stored and used for this purpose during dry periods to maintain the green fire breaks. Trees and shrubs not subject to drought stress will cope better during bushfires. The higher the moisture content in the plant the slower it burns. Therefore by keeping the surrounding area green and low in dry ground fuel, the intensity of an approaching fire will be reduced and the risk of spot fires minimised.

## 5. Personal Protection

5.1. If you plan to evacuate, make sure you do so early, long before the fire front arrives. Evacuating at the very last moment results in the majority of deaths at bushfires. People remaining to fight the fire need to be physically and mentally fit to do so.

5.2. Those staying to protect the property should make sure they protect themselves from radiant heat, flying embers, smoke and most importantly heat stress. Protection measures should include the following:

- Long trousers and long sleeve shirt made of wool, denim or cotton (no synthetics)
- Woollen socks and sturdy work boots for foot protection
- Goggles for eye protection
- A good pair of work gloves to protect hands from burns
- A smoke mask or a damp cloth (non-synthetic), to cover your nose and mouth to protect you from inhaling smoke and embers.
- Have plenty of drinking water available to protect against dehydration (not refrigerated as this can cause cramping).

5.3. During the fire

When a fire is approaching and given that you have already carried out your pre-fire precautions, established adequate buffers, implemented mitigation measures and established the degree of risk to your property, protection from the actual fire should be relatively straight forward.

5.3.1. Dress in the appropriate clothing and be sure to drink water regularly.

5.3.2. Fill up bathtubs, sinks, buckets, laundry tubs etc. in case of blackouts.

5.3.3. Close doors and windows.

5.3.4. Close gaps under doors and windows with wet towels.

5.3.5. Block up down pipes, wet down roof, walls and gardens, paying particular attention to the side the fire is approaching from.

5.3.6. Have a battery-powered radio on hand to listen for information about the fire's progress from local radio stations.

5.3.7. Patrol your property while the fire is approaching and take shelter inside as the fire front passes. Then continue patrolling the property for many hours after it has passed, to ensure that any spot fires or smouldering debris do not get a chance to develop into a major fire, paying particular attention to the roof cavity of your buildings. Smouldering embers have been known to start fires hours or even days after the initial passing of the bushfire front.

The Queensland Fire and Rescue Service provide detailed lists for preparation prior to the arrival of a bushfire and what to do during a bushfire event. This information can be found at www.ruralfire.qld.gov.au or obtained from your local fire brigade.

## 6. Further Information?

The local fire brigade is a good source of local district knowledge, they also have pamphlets and literature produced by the Queensland Fire and Rescue Service available. Most brigades will also be happy to advise local residents.

The information provided above is only a basic guide. Further and more details information is available from the Queensland Fire and Rescue Service. It would be recommended that residents in bushfire prone areas prepare a 'Bushfire Survival Plan', which is available from the Queensland Rural Fire Service website at www.ruralfire.qld.gov.au. The 'Bushfire Survival Plan' document provides information on Bushfire Danger Ratings, Community Warning Information, how to prepare your property, what to do in the event of a bushfire and what to expect. The Bushfire Survival Plan should be updated annually. Further information is also available through the Prepare•Act•Survive brochure also available on the Rural Fire Service website. For further information contact your local Fire Brigade for assistance or phone 1300 369 003.

# APPENDIX 4

Recommendations for Fire Trails

Fire trails can be a very effective tool in the management of bushland, for weed control, hazard reduction requirements, prescribed burns and fire suppression activities. A good well maintained trail network can effectively enhance and maintain desired ecosystems, while providing added safety for the protection of life and property. The following is some ways in which fire trails can be constructed and maintained to improve their viability.

1. Fire trails should preferably be constructed to a cleared width of 6 metres and a formed width of 4 metres, and be able to be negotiated by light and medium 4 wheel drive fire appliances.

2. They should preferably have a maximum gradient of 25%, a maximum cross slope of 5%, avoid large cut and fill and avoid sharp corners.

3. Fire trails up to 25% can be of compacted earth surface designed with water shedding devices, such as pipes under trail, woa boys or change of gradients, to prevent washouts or gouging of slopes. It would also be advantageous in some cases if grass coverage can be established, which with periodic slashing or mowing will assist in preventing washouts.

4. Fire trails should have access at each end and multiple access/egress points where possible.

5. Fire tails are to have passing and turn around areas at maximum intervals of 400 metres.

6. Periodic management of ground fuel levels along the edges of fire trails should be implemented to at least one metre each side to improve accessibility during a fire event.

7. Trees alongside fire trails should have low branches removed to a height of 2 metres to assist in preventing fire from climbing into treetops. Branches overhanging fire trails should be removed to a minimum height of 4 metres to ensure access by fire vehicles.

8. Fire trails should be inspected each year prior to fire season, to ensure their condition and carry out remedial work if required.

9. Dead or dying trees that are close to fire trails and may pose a risk to fire services should be removed.

10. Fire trails should not be seen as fire breaks. They are an aid in the management of fuel levels and fire suppression activities.

11. Fire trails should be identifiable to land managers and fire services by signage and map records. Where a fire trail network exists, intersections should also be identifiable.

**Bushland Protection Systems**
Specialising in
BUSHFIRE HAZARD PLANNING & MITIGATION

ABN 97 782 336 595 Phone: 07 5546 7933 Fax: 07 5546 7988
PO Box 40, Ormeau, Qld, 4208 E-mail: admin@bpsfire.com.au

Fire is a part of nature. Its effects can be catastrophic and fire can never be totally eliminated, however there are steps that can be taken to reduce the chances of uncontrolled fires occurring and the risk to life, property and the environment, in the event of uncontrolled fires. This is what we concentrate on, how the threats from bushfire can be minimised. There are many methods to do so, however deciding which method/s is best to use can be a complex decision to make. There are so many factors to consider such as ecological values, biodiversity, fire history, availability of resources, cost effectiveness and public awareness just to name a few. No guarantees can ever be given when dealing with Mother Nature, with ever increasing complexities it has now become a specialist field to be able to create plans to try and minimise the risk from bushfire. Ultimately it is a community responsibility to protect the environmental values, life and property in their area

## COMPANY PROFILE

Bushland Protection Systems Pty Ltd (BPS) is a leading Bushfire Management Consultancy firm in Queensland, with many clients, ranging from private landowners to multi-national companies and government bodies.

BPS consultants began operating as Bushfire Management Consultants with the introduction of the Gold Coast Bushfire Management Strategy in 1998 and spread their operations across the state with the implementation in 2003 of the State Planning Policy for mitigating the adverse impacts of flood, bushfire and landslide.

During that time over 3000 projects have been successfully completed, including large residential estates such as Coomera Waters, Spring Mountain, Pacific Pines, Coomera Springs, Observatory, Highland Reserve, Delfin Woodlands & Yarrabilba as well as commercial or Government project sites such as Paradise Country, Wacol Police Academy, Numinbah Correctional Facility, Silkwood Steiner School, Canon Hill Community Links Project & Griffith University. Clyde Bain, the Principal Consultant, is also one of the two most highly sought after expert witnesses for Land and Environment Court Appeals, in Queensland, having worked as the Bushfire Expert for several Regional and City Councils throughout the state on a number of various projects before the Land and Environment Court.

With a strong background in bush fire fighting and involvement with numerous industry bodies, Bushland Protection Systems continues to deliver realistic and cost effective advice, solutions to provide higher levels of safety for the community, improve wildfire suppression and mitigation options for emergency services and land managers, while maintaining and improving environmental values for the future. All our Consultants are members of the Rural Fire Association of Queensland.