



Local Government Use:

# BAL Contour Map Report

(AS 3959:2018 Bushfire Attack Level Methodology)

## PROPERTY LOCATION DETAILS

---

### Witchcliffe Ecovillage

---

Lots 2807 & 2812 Bussell Highway

WITCHCLIFFE WA 6286

Shire of Augusta Margaret River

---

## PROPOSED WORKS (FUTURE BUILDING) OR USE

---

**Planning Stage:** Development Application

**Main BCA Class:** Class 1 **Use(s):** Domestic **No. of Lots:** 27

**Purpose of the Plan** To inform the BAL Ratings across the subdivision site for specific Lots. The following report is to indicate the bushfire attack level ratings across the subject site. Changes to surrounding vegetation conditions and final building locations may alter the BAL rating. This report is based on current site observations.

---

## REPORT DETAILS

---

**Job Reference Number:** 200731

**Report Version:** V1.0

**Assessment Date:** 1 October 2020

**Report Date:** 2 November 2020

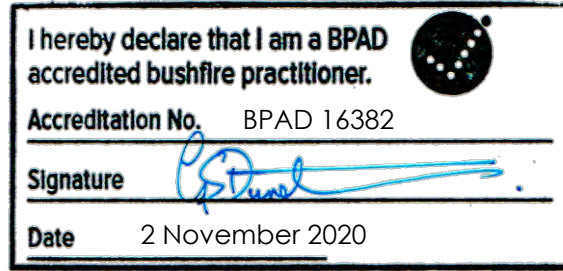
---

**BUSHFIRE PLANNING AND DESIGN (BPAD) ACCREDITED PRACTITIONER DETAILS**

**Name:** G Dunstan

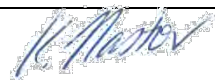
**Company Details:**

BPP Group Pty Ltd t/a Bushfire Prone Planning  
 ACN: 39 166 551 784 | ABN: 39 166 551 784  
 Level 1, 159-161 James Street  
 Guildford WA 6055  
 PO Box 388  
 Guildford WA 6935  
 08 6477 1144 | admin@bushfireprone.com.au



Authorised Practitioner Stamp

**REVIEWED/APPROVED:** Kathy Nastov (BPAD Level 3 - No. 27794)



This report has been prepared by an Accredited BPAD Practitioner using the Simplified Procedure (Method 1) as detailed in Section 2 of AS 3959:2018.

Fire Protection Association Australia as the accrediting body for BPAD accreditation, makes no warranties as to the accuracy of the information provided in the report. All enquiries related to the information and conclusions presented in this report must be made to the practitioner who prepared this report.

*Reliance on the assessment and determination of the Bushfire Attack Level contained in this report should not extend beyond a period of 12 months from the date of issue of the report. If this report was issued more than 12 months ago, it is recommended that the validity of the determination be confirmed with the Accredited Practitioner and where required an updated report and/or BAL Certificate issued.*

**Limitation of Liability:** The measures contained in this Report, are considered to be minimum requirements and they do not guarantee that a building will not be damaged in a bushfire, persons injured, or fatalities occur either on the subject site or off the site while evacuating. This is substantially due to the unpredictable nature and behaviour of fire and fire weather conditions. Additionally, the correct implementation of the required bushfire protection measures will depend upon, among other things, the ongoing actions of the landowners and/or operators over which Bushfire Prone Planning has no control.

All surveys, forecasts, projections and recommendations made in this report associated with the proposed development are made in good faith based on information available to Bushfire Prone Planning at the time. All maps included herein are indicative in nature and are not to be used for accurate calculations.

Notwithstanding anything contained therein, Bushfire Prone Planning will not, except as the law may require, be liable for any loss or other consequences whether or not due to the negligence of their consultants, their servants or agents, arising out of the services provided by their consultants.

BAL (Master) Template v12.2

**LANDOWNER RESPONSIBILITIES**

**Construction Requirements:** The bushfire construction standard to be applied to the assessed building works must be that which corresponds to the determined BAL in this assessment report and are established by AS 3959:2018 or the NASH Standard (refer to additional landowner information at the end of this report).

**Comply with the Landowner Responsibilities Established by the Bushfire Management Plan (BMP):** If the property (lot) is subject to an approved BMP (refer to the land title), all responsibilities created must be complied with. This will include the management of vegetation within the lot to a minimal fuel, low threat state to create an asset protection zone (APZ). The required dimensions of the APZ are established by either those corresponding to the determined BAL established by this BAL Assessment Report or those established by the Firebreak and Fuel Load Notice, whichever is greater (refer to additional landowner information at the end of this report).

**Comply with the Local Government Firebreak & Fuel Load Notice:** The requirement exists to comply with the relevant local government's Firebreak & Fuel Load Notice created under Section 33 of the Bushfires Act 1954 and issued annually to landowners (and available on their website).

**TABLE OF CONTENTS**

POTENTIAL BUSHFIRE IMPACT ASSESSMENT .....7

VEGETATION ASSESSMENT AND CLASSIFICATION – PHOTOGRAPHIC REPRESENTATION ..... 12

BUSHFIRE IMPACT ASSESSMENT OUTPUT ..... 16

BUSHFIRE ATTACK LEVEL RATINGS .....20

ADDITIONAL LANDOWNER INFORMATION: EXPLANATION OF BUSHFIRE ATTACK LEVELS AND REFERENCES FOR CONSTRUCTION REQUIREMENTS .....22

**LIST OF FIGURES**

Figure 1: Site Plan - relied upon to determine the bushfire attack level ..... 4

Figure 2: Bushfire Management Landscape Plan .....5

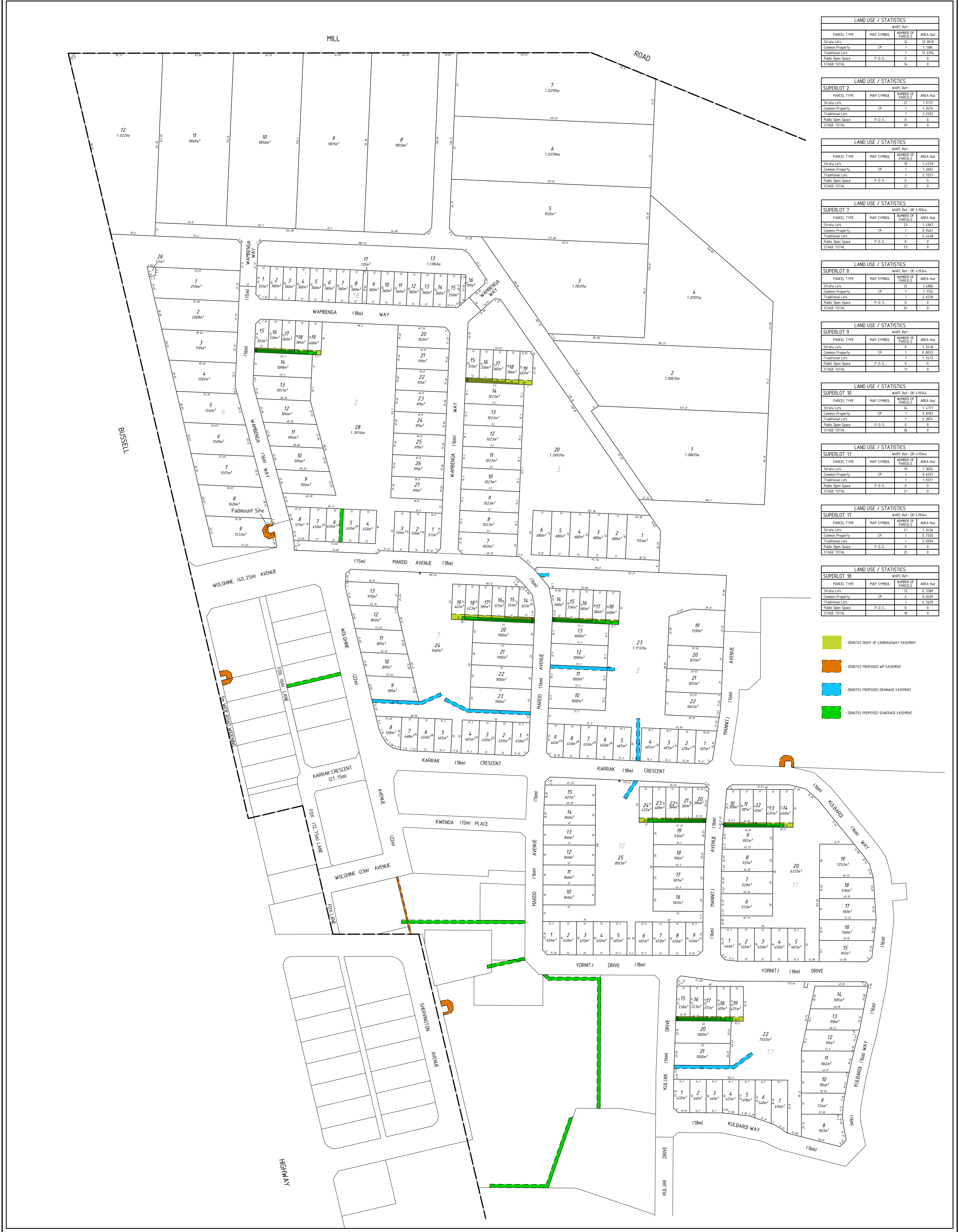
Figure 2: Bushfire Management Landscape Plan (Specifications) .....6

Figure 3: Existing Topography & Classified Vegetation .....8

Figure 4: Existing Topography & Classified Vegetation (Area 1 Vegetation Modification) ..... 11

Figure 5: BAL Contour Map Stage 1 & 2, 3A ..... 18

Figure 6: BAL Contour Map Stage 1 & 2 (Area 1 Zoom) ..... 19



LAND USE / STATISTICS			
WAPC Ref: -			
PARCEL TYPE	MAP SYMBOL	NUMBER OF PARCELS	AREA (ha)
Strata Lots		12	12.000
Common Property		1	1.136
Traditional Lots		1	13.224
Public Open Space	P.O.S.	0	0
<b>STAGE TOTAL</b>		<b>16</b>	<b>0</b>

LAND USE / STATISTICS			
SUPERLOT 2			
WAPC Ref: -			
PARCEL TYPE	MAP SYMBOL	NUMBER OF PARCELS	AREA (ha)
Strata Lots		23	1.917
Common Property		1	1.347
Traditional Lots		1	13.224
Public Open Space	P.O.S.	0	0
<b>STAGE TOTAL</b>		<b>25</b>	<b>0</b>

LAND USE / STATISTICS			
WAPC Ref: -			
PARCEL TYPE	MAP SYMBOL	NUMBER OF PARCELS	AREA (ha)
Strata Lots		15	1.453
Common Property		1	1.262
Traditional Lots		1	13.224
Public Open Space	P.O.S.	0	0
<b>STAGE TOTAL</b>		<b>21</b>	<b>0</b>

LAND USE / STATISTICS			
SUPERLOT 7			
WAPC Ref: DP 4/19344			
PARCEL TYPE	MAP SYMBOL	NUMBER OF PARCELS	AREA (ha)
Strata Lots		23	1.453
Common Property		1	1.262
Traditional Lots		1	13.224
Public Open Space	P.O.S.	0	0
<b>STAGE TOTAL</b>		<b>25</b>	<b>0</b>

LAND USE / STATISTICS			
SUPERLOT 8			
WAPC Ref: DP 4/19344			
PARCEL TYPE	MAP SYMBOL	NUMBER OF PARCELS	AREA (ha)
Strata Lots		1	1.456
Common Property		1	1.192
Traditional Lots		1	13.224
Public Open Space	P.O.S.	0	0
<b>STAGE TOTAL</b>		<b>3</b>	<b>0</b>

LAND USE / STATISTICS			
SUPERLOT 9			
WAPC Ref: -			
PARCEL TYPE	MAP SYMBOL	NUMBER OF PARCELS	AREA (ha)
Strata Lots		1	1.548
Common Property		1	1.543
Traditional Lots		1	13.224
Public Open Space	P.O.S.	0	0
<b>STAGE TOTAL</b>		<b>3</b>	<b>0</b>

LAND USE / STATISTICS			
SUPERLOT 10			
WAPC Ref: DP 4/19344			
PARCEL TYPE	MAP SYMBOL	NUMBER OF PARCELS	AREA (ha)
Strata Lots		1	1.371
Common Property		1	0.803
Traditional Lots		1	13.224
Public Open Space	P.O.S.	0	0
<b>STAGE TOTAL</b>		<b>3</b>	<b>0</b>

LAND USE / STATISTICS			
SUPERLOT 11			
WAPC Ref: DP 4/19344			
PARCEL TYPE	MAP SYMBOL	NUMBER OF PARCELS	AREA (ha)
Strata Lots		15	1.306
Common Property		1	0.833
Traditional Lots		1	13.224
Public Open Space	P.O.S.	0	0
<b>STAGE TOTAL</b>		<b>21</b>	<b>0</b>

LAND USE / STATISTICS			
SUPERLOT 17			
WAPC Ref: EP 4/19344			
PARCEL TYPE	MAP SYMBOL	NUMBER OF PARCELS	AREA (ha)
Strata Lots		21	1.346
Common Property		1	0.753
Traditional Lots		1	13.224
Public Open Space	P.O.S.	0	0
<b>STAGE TOTAL</b>		<b>23</b>	<b>0</b>

LAND USE / STATISTICS			
SUPERLOT 18			
WAPC Ref: -			
PARCEL TYPE	MAP SYMBOL	NUMBER OF PARCELS	AREA (ha)
Strata Lots		15	0.589
Common Property		1	0.039
Traditional Lots		0	0.542
Public Open Space	P.O.S.	0	0
<b>STAGE TOTAL</b>		<b>16</b>	<b>0</b>

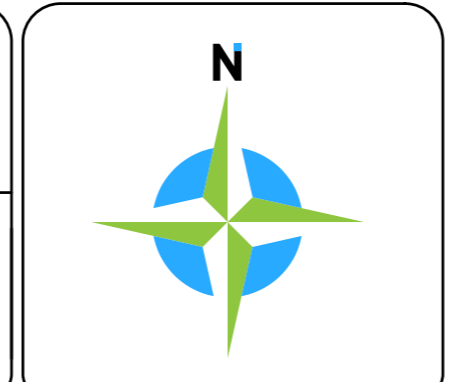
- DENOTES RIGHT OF CARRIAGEWAY EASEMENT
- DENOTES PROPOSED W/P EASEMENT
- DENOTES PROPOSED DRAINAGE EASEMENT
- DENOTES PROPOSED SEWERAGE EASEMENT

Ver.	Description	Drawn	Date	Checked
R	Amended alignment of various drainage and sewerage easements.	JTH	19/08/2020	CPO
Q	Amended road widening for lot 9505 & lot 15. Added various drainage and sewerage easements.	JTH	14/08/2020	CPO
	Added approved road names.			
P	Amended lots 2-5 & 19 in Super lot 8	JTH	30/07/2020	CPO

FILES  
map\COG0-98774  
Control Register: N/A  
File Name: 98774pr-015r.dgn

PRECAL LEGEND  
See below Lot Stats table for further information

--- Stage Boundary  
--- Vehicle Access Restriction  
--- Potential Dwellings / Lot



**SURVEY STRATA LOTS**  
Witchcliffe

CLIENT:  
**SUSTAINABLE SETTLEMENT PTY LTD**  
**PERRON DEVELOPMENTS PTY LTD**

The contents of this plan are current and correct as of the date within the revision panel. All consultants and persons wishing to utilise this data should satisfy themselves of this plan's currency by contacting the M&Hellen Nolan Group.

Project Mng: Casey P. OLIVER    Datum    PRC694

**98774 - 015 - R**

Job Number    Plan Number    Version

SCALE 1:1500 @ A1 - 1:3000 @ A3

ALL DISTANCES ARE IN METRES

For a true to scale reproduction of this plan, plot it to A1 with the Paging Scaling set to None.

PLANNER'S DESIGN SOURCE for Rev I  
Planner - Sustainable Settlements  
Received date: 21/11/2019  
File name: revised strata stage 1.dwg

ENGINEER'S DESIGN SOURCE for Rev N  
Engineer - SE  
Received date: 22/04/2020  
Data purpose: Power Design

All areas and dimensions depicted on this plan are subject to survey and Landgate registration. All cadastral information external to the stage/s which form the subject of this plan are not guaranteed and are supplied as a guide only.



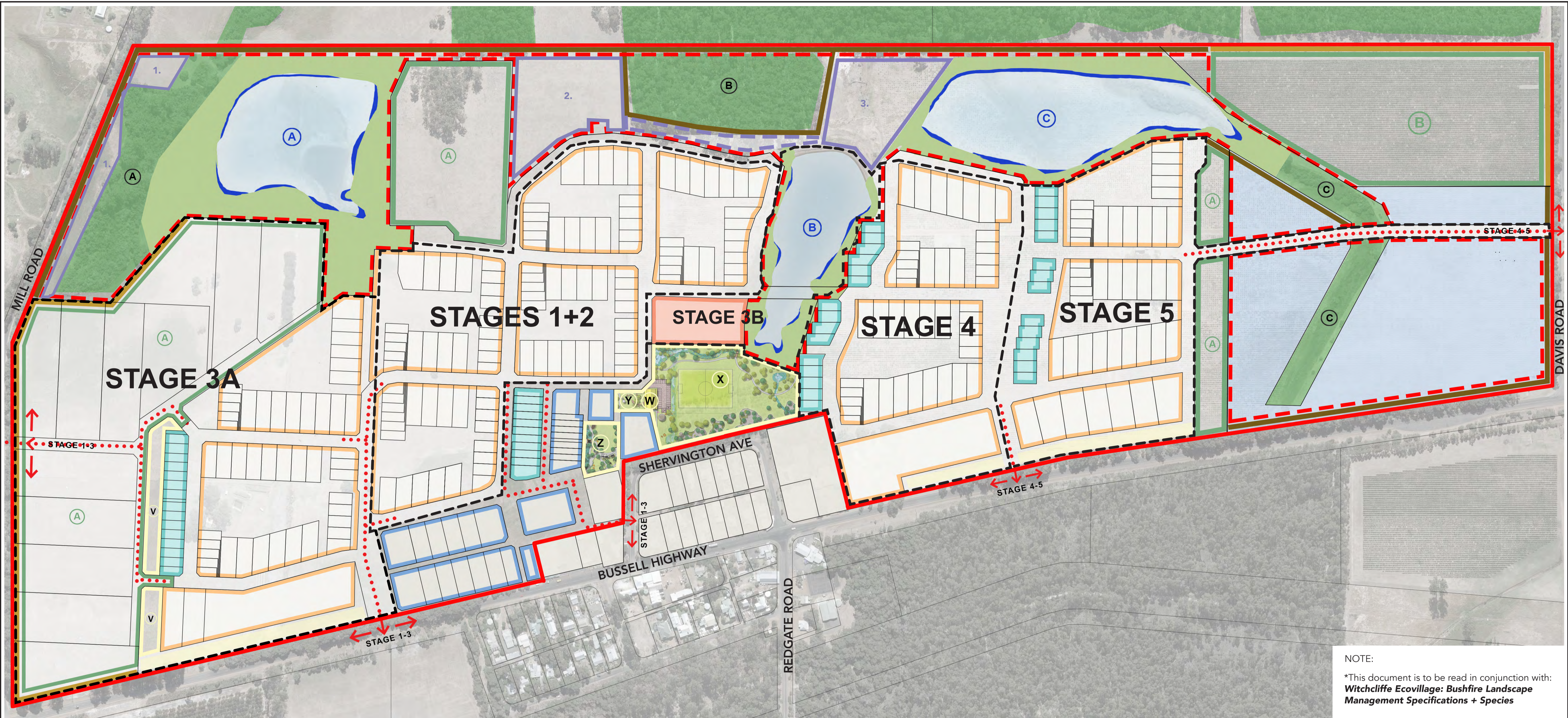
Head office:  
Level 1, 2, Sabre Crescent  
Jandakot, W.A. 6164  
PO Box 3526, Success  
W.A. 6964, Australia  
Offices in: Perth | Melbourne | Kimberley | South West WA

Tel: (08) 6436 1399  
Fax: (08) 6436 1500  
info@mngsurvey.com.au  
www.mngsurvey.com.au  
ABN 90 009 363 311

Project Mng: Casey P. OLIVER    Datum    PRC694

**98774 - 015 - R**

Job Number    Plan Number    Version



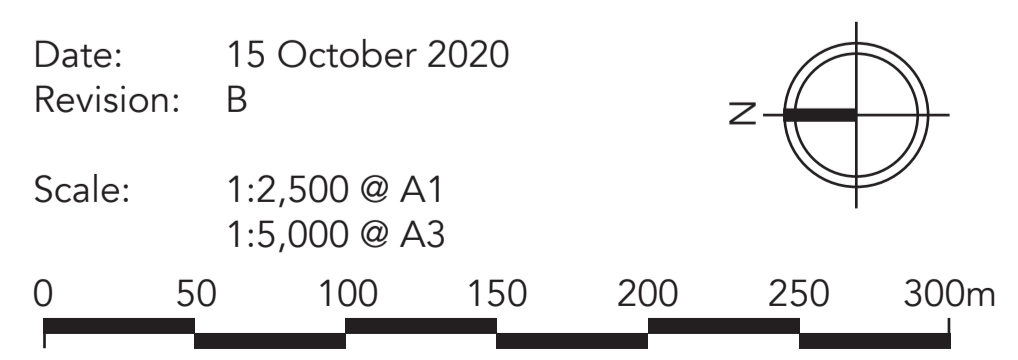
NOTE:  
 \*This document is to be read in conjunction with:  
**Witchcliffe Ecovillage: Bushfire Landscape Management Specifications + Species**

LEGEND

- |                         |                           |  |   |   |                          |
|-------------------------|---------------------------|--|---|---|--------------------------|
| Site Boundary           | ECL Managed Firebreak     | ECL Conservation Areas<br>A: Northern creekline<br>B: Central conservation area<br>C: Southern creekline | ECL Dam<br>A: ECL Northern Dam<br>B: ECL Central Dam<br>C: ECL Southern Dam | POS<br>W: Community building / hall<br>X: Sports oval<br>Y: Nature Playground<br>Z: Village Square<br>V: Olive tree grove | Commercial / Mixed Use   |
| Stage Boundary          | ECL Boundary              | ECL Managed Land   | Dam Planting  | Earth Bunds   | Residential              |
| Emergency Access Routes | ECL Waste water treatment | ECL Managed Road Reserve   | Dam Surrounds Planting  | Agricultural Lots   | Tourism                  |
| Private Firebreaks      |                           |  |   |   | Aged / Dependent Housing |




BUSHFIRE LANDSCAPE MANAGEMENT PLAN  
 Lots 2807 & 2812, Bussell Highway, Witchcliffe



Sustainable Settlements Pty Ltd /  
 Perron Developments Pty Ltd  
 Sustainable Human Settlement  
 Design & Development  
 10437 Bussell Hwy  
 Witchcliffe WA 6286  
 www.ecovillage.net.au  
 t. 08 9757 6688

LEGEND

 **Site Boundary**  
WEV site boundary

 **Stage Boundary**  
Stages 1-5 boundaries, including WEV strata clusters and green title lots, various future zonings approved in WESP as indicated below, currently zoned Future Development.


 **Emergency Access Routes**  
Constructed in stage number as indicated.

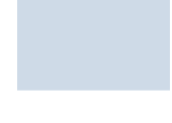
Stage 1-3: completed February 2021. Bussell Hwy access via AMRS vested roads, Mill Rd access via private road with easement to ECL for emergency access.


Stage 4-5: completed during subdivision construction of stage 4-5, Bussell Hwy and Davis Rd access via AMRS vested


 **Private Firebreaks**  
Managed by private lot owners, overseen by relevant strata bodies, as per FNBI requirements.


 **ECL Managed Firebreak**  
ECL managed firebreaks, as per FNBI requirements.

 **ECL Boundary**  
ECL managed land under one title, zoned in WESP as "Special Use Zone : Ecovillage Common," no residential entitlement.

 **ECL Waste water treatment**  
ECL waste water irrigation/dispersal area, management approved by DER, DoW, DoH, ERA. Irrigated avocado orchard to north of creekline, and mixed deciduous and evergreen irrigated silviculture to south, coppiced on 3 year rotation for mulch making, both managed by ECL to FNBI.

 **ECL Conservation Areas**  
A: Northern creekline, managed by ECL as riparian habitat.  
B: Central conservation area, Class A Forest managed by ECL in consultation with Wadandi elders, AMRS and local fire brigades.  
C: Southern creekline, springfed through most of summer, managed by ECL as riparian habitat.

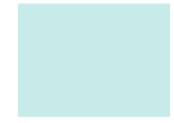

 **ECL Managed Land**  
1. Grazing cell low-lying wetland managed to FNBI requirements by ECL  
2. Future education precinct, currently grazing cell without trees, managed by ECL to FNBI requirements until developed  
3. Mowed grass amphitheatre, managed by ECL.


 **ECL Managed Road Reserve**  
Small area of paddock cleared remnant Marri and Jarrah trees, irrigated mowed grass, no understorey.  
Managed by ECL to low threat vegetation standards + FNBI requirements.

 **ECL Northern Dam (A)**

 **Dam Planting**  
Native reed plantings (edge of dam and subsurface). Planted in 5m separated pockets, 1-2m height. Managed by ECL to low threat vegetation standards + FNBI requirements.  
**Plant List:**  
*Baumea Juncea* - Bare Twig Rush  
*Juncus Kraussii* - Juncus  
*Meeboldina scariosa* - Velvet Rush  
*Anigozanthus flavidus* - Tall kangaroo paw

**Dam Surrounds Planting**  
Small groves (3-5 trees) with mowed understorey. Groves spaced 15-20m. Managed by ECL to low threat vegetation standards + FNBI requirements.  
**Plant List:**  
*Agonis Flexuosa* - Willow Myrtle  
*Banksia Littoralis* - Swamp Banksia  
*Allocasuarina fraseriana* - Western Sheoak  
*Variou Deciduous Trees* - TBC

 **ECL Central Dam (B)**  
 **Dam Planting**  
Native reed plantings (edge of dam and subsurface). Planted in 5m separated pockets, 1-2m height. Managed by ECL to low threat vegetation standards + FNBI requirements.  
**Plant List:**  
*Anigozanthus Flavidus* - Tall Kangaroo Paw  
*Baumea juncea* - Bare Twig Rush  
*Ficinia nodosa* - Knobby Club Rush  
*Hypocalymma angustifolium* -White myrtle  
*Juncus pallidus* - Pale Rush  
*Juncus subsecundus* - Finger Rush  
*Lepidosperma longitudinal* -Pithy sword sedge  
*Pattersonia occidentalis* - Purple Flags


 **Dam Surrounds Planting**  
**Northern Edge:**  
Road edge landscape, mowed grass, 30m separated trees, dam "beach" access. Managed by ECL to low threat vegetation standards + FNBI requirements.  
**Plant List:**  
*Araucaria heterophylla* - Norfolk Pines  
*Taxodium distichum* - Swamp Cyphress

**Southern Edge:**  
Small groves (3-5 trees) with mowed understorey. Groves spaced 15-20m. Managed by ECL to low threat vegetation standard FNBI requirements.  
**Plant List:**  
*Agonis Flexuosa* - Willow Myrtle  
*Banksia Littoralis* - Swamp Banksia  
*Allocasuarina fraseriana* - Western Sheoak

 **ECL Southern Dam (C)**  
 **Dam Planting**  
Native reed plantings (edge of dam and subsurface). Planted in 5m separated pockets, 1-2m height. Managed by ECL to low threat vegetation standards + FNBI requirements.  
**Plant List:**  
*Baumea Juncea* - Bare Twig Rush  
*Juncus Kraussii* - Juncus  
*Meeboldina scariosa* - Velvet Rush


 **Dam Surrounds Planting**  
Small groves (3-5 trees) with mowed understorey. Groves spaced 15-20m. Managed by ECL to low threat vegetation standard FNBI requirements.  
**Plant List:**  
*Agonis Flexuosa* - Willow Myrtle  
*Banksia Littoralis* - Swamp Banksia  
*Allocasuarina fraseriana* - Western Sheoak  
*Variou Deciduous Trees* - TBC


 **POS**  
V: Olive tree grove, spaced, irrigated, mowed understorey managed by Developer then ECL in perpetuity.  
W: Community building / hall  
X: Sports oval, irrigated mowed grass, surrounded by paddock cleared trees and separated clusters of shrubs, managed by Developer during 24 month Establishment Period (2021-22) thereafter managed by AMRS.  
Y: Nature Playground, managed by Developer in 24 month Establishment Period, thereafter managed by AMRS.  
Z: Village Square, paved, landscaped, mowed lawn, feature trees. Managed by Developer in 24 month Establishment Period, thereafter managed by AMRS.


 **Earth Bunds**  
Zoned POS.  
Shrub planting to occur in clumps of no larger than 5m<sup>2</sup> with spacing of 10m.  
Tree Planting minimum 20m apart. Managed to low threat vegetation state.  
Separated from residential zone by concrete path and mowed grass area. Managed by Developer during 24 month establishment period, thereafter managed by AMRS in conjunction with oversight by ECL to ensure FNBI compliance.

**Plant List:**  
*Agonis flexuosa* - WA Peppermint  
*Casuarina obesa* - Swamp Sheoak  
*Eucalyptus megacarpa* - Bullich  
*Eucalyptus patens* - Yarli  
*Hakea oleifolia* - Dungyn  
*Melaleuca pressiana* - Modong  
*Acacia myrtifolia* - Myrtle Wattle  
*Agonis flexuosa 'Nana'* - Willow Peppermint  
*Anigozanthus flavidus* - Tall Kangaroo Paw  
*Astatrea scoparia* - Common Astartea  
*Beaufortia sparsa* - Swamp Bottlebrush  
*Billardiera heterophylla* - Bluebell Creeper  
*Callistemon glaucus* - Albany Bottlebrush  
*Calothamnus quadrifidus* - One Sided Bottlebrush  
*Hakea varia* - Variable Leaved Hakea  
*Hibbertia cuneiformis* - Cut-Leaf Hibbertia  
*Melaleuca huegii* - Chenille Honey Myrtle  
*Melaleuca lateritia* - Robin Redbreast Bush  
*Patersonia occidentalis* - Purple Flag


*Hibbertia grossulariifolia* - Guinea Flower  
*Grevillea lavandulacea* - Mount Tamboritha Form

 **Commercial / Mixed Use**  
Zoned Village Centre in WESP, for commercial and mixed use.

 **Residential**  
Residential strata clusters, approved as Residential zone in SP, currently Future Development. Managed by Developer until sold, thereafter managed by individual strata bodies and lot owners.

 **Tourism**  
Zoned Tourism in WESP, short stay strata owned cottage lots. Managed by Developer until sold, thereafter managed by individual strata bodies and lot owners.

 **Aged / Dependent Housing**  
Aged and Dependent Care lot, zoned Residential in WESP. Planned 20 single storey aged and dependent care units, with shared common facilities. Managed by Developer until sold, thereafter managed by individual strata body and lot owners.

 **Agricultural Lots**  
A: WESP "Special Use Ecovillage: Agricultural" zoned lots, no residential use permitted, irrigated horticultural use (e.g., market garden vegetables, garlic, blueberries, cane berries, citrus, etc.)  
Managed as grazing cells as per FNBI requirements by Developer during Development Period until strata lots are sold, thereafter managed to FNBI requirements by private owners and overseen by strata bodies.  
B: WESP "Special Use Ecovillage: Agricultural" zoned lot, currently an irrigated vineyard, managed by Developer until sale as per FNBI requirements, thereafter managed by private lot owner, overseen by strata body.

**GLOSSARY**  
AMRS – Augusta Margaret River Shire  
DER – Dept. of Environmental Regulation  
Developer : Sustainable Settlements Pty Ltd and Perron Developments Pty Ltd  
DoW – Dept. of Water  
ECL – Ecovillage Commons Ltd, not for profit company which owns and manages the Ecovillage Commons Land.  
ERA – Economic Regulatory Authority  
FNBI – AMRS Firebreak Notice and Bushfire Information, as issued annually (<https://www.amrshire.wa.gov.au/library/file/2Services/01%20Animal%20Welfare/2019-20%20Firebreak%20Notice.pdf>)  
WAPC – West Australian Planning Commission  
WESP –Witchcliffe Ecovillage Structure Plan, approved by WAPC in 2018

**NOTE:**  
\*This document is to be read in conjunction with: **Witchcliffe Ecovillage: Bushfire Landscape Management Plan**



BUSHFIRE LANDSCAPE MANAGEMENT SPECIFICATIONS + SPECIES  
Lots 2807 & 2812, Bussell Highway, Witchcliffe

Date: 15 October 2020  
Revision: B  
Scale: 1:2,500 @ A1  
1:5,000 @ A3

Sustainable Settlements Pty Ltd / Perron Developments Pty Ltd  
Sustainable Human Settlement Design & Development  
10437 Bussell Hwy  
Witchcliffe WA 6286  
[www.ecovillage.net.au](http://www.ecovillage.net.au)  
t. 08 9757 6688

## POTENTIAL BUSHFIRE IMPACT ASSESSMENT

### 1.1 Assessment Input

#### 1.1.1 Fire Danger Index (FDI) Applied

AS 3959:2018 Table 2.1 specifies the fire danger index values to apply for different regions. The values used in the model calculations are for the Forest Fire Danger Index (FFDI) and for which equivalent representative values of the Grassland Fire Danger Index (GFDI) are applied as per Appendix B. The values can be modified if appropriately justified.

Table 1.1: Applied FDI Value

FDI VALUE			
Vegetation Areas	As per AS 3959:2018 Table 2.1	As per DFES for the Location	Value Applied
1 - 3	80	N/A	80

#### 1.1.2 Vegetation Classification and Effective Slope

**Classification:** Bushfire prone vegetation identification and classification has been conducted in accordance with AS 3959:2018 s2.2.3 and the Visual Guide for Bushfire Risk Assessment in WA (DoP February 2016).

When more than one vegetation type is present, each type is identified separately, and the applied classification considers the potential bushfire intensity and behaviour from the vegetation types present and ensures the worst case scenario is accounted for – this may not be from the predominant vegetation type.

The vegetation structure has been assessed as it will be in its mature state (rather than what might be observed on the day). Areas of modified vegetation are assessed as they will be in their natural unmodified state (unless maintained in a permanently low threat, minimal fuel condition, satisfying AS 3959:2018 s2.2.3.2(f) and asset protection zone standards). Vegetation destroyed or damaged by a bushfire or other natural disaster has been assessed on its revegetated mature state.

**Effective Slope:** Refers to the ground slope under each area of classified vegetation which most influences the bushfire attack (and is described in the direction relative to the view from the building or proposed development site). This slope has a direct and significant influence on the fire's rate of spread and intensity.

Where there is a significant change in effective slope under an area of classified vegetation, that will cause a change in fire behaviour, separate vegetation areas will be identified to enable the correct assessment.

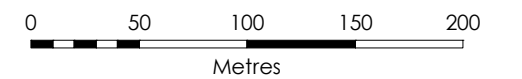
When the effective slope, under a given area of bushfire prone vegetation, will be different relative to multiple proposed development sites, then the effective slopes corresponding to the different locations, are separately identified.



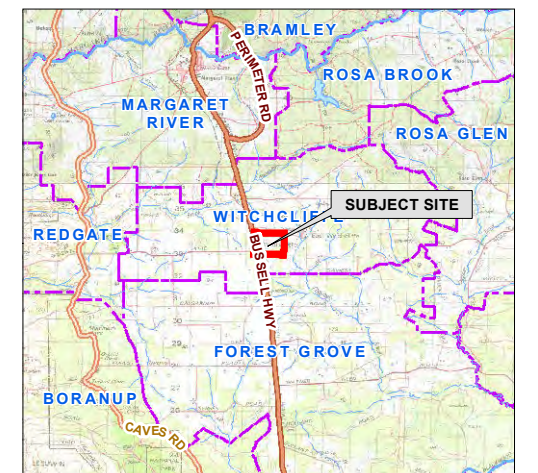
Figure 3  
**Existing Topography & Classified Vegetation**  
 Lots 2807 and 2712  
 Bussell Highway  
 WITCHCLIFFE  
**SHIRE OF AUGUSTA - MARGARET RIVER**

----- LEGEND -----

- Subject Site
  - Other Lots
  - Area of Interest
  - Subdivision Lots
  - Subdivision Easements
  - ↖ Photo & Direction
- Vegetation Assessment Area**
- 150m from Subject Site
- Classified Vegetation**
- Class (A) Forest
  - Class (B) Woodland
  - Exclusion 2.2.3.2



----- LOCALITY -----



Aerial Imagery : Landgate/SLIP  
 Image Date : Dec 2018



Coordinate System: GDA 1994 MGA Zone 50  
 Projection: Universal Transverse Mercator Units: Metre  
 Map compiled by: Ian Ross 28/10/2020  
 Map updated by: M.McVee 28/10/2020

Disclaimer and Limitation: This map has been prepared for bushfire management planning purposes only. All depicted areas, contours and any dimensions shown are subject to survey. Bushfire Prone Planning does not guarantee that this map is without flaw of any kind and disclaims all liability for any errors, loss or other consequence arising from relying on any information depicted.  
 Map Document Path / Name: d:\Users\User\Documents\GIS\Projects\Bushfire Prone Planning\Project\200731 - Lots 2807 & 2812 Bussell Hwy, Witchcliffe\MXD\200731\_Fig1\_VEG\_Lots 2807-2712 Bussell Hwy Witchcliffe.mxd



Table 1.2: Vegetation classification and effective slope.

ALL VEGETATION WITHIN 150 METRES OF THE PROPOSED DEVELOPMENT				
Vegetation Area	Identified Vegetation Types <sup>1</sup> or Description if 'Excluded'	Applied Vegetation Classification <sup>1</sup>	Effective Slope (degrees) <sup>2</sup>	
			Assessed	Applied Range
1	Tall Jarrah & Marri trees ~18.0m to 25.0m, with low shrub & grassy understorey. Foliage cover 70%. Open Forest A-03	Class A Forest	4.0	downslope >0-5
2	Tall Marri trees dominant ~25.0m, with grassy understorey. Foliage cover 30%. Woodland B-05	Class B Woodland	2.0	downslope >0-5
3	Tall Jarrah & Marri trees ~18.0m to 25.0m, with low shrub & grassy understorey. Foliage cover 70%. Open Forest A-03	Class A Forest	2.7	downslope >0-5
Representative photos of each vegetation area, descriptions and classification justification, are presented on the following pages. The areas of classified vegetation are defined, and the photo locations identified on Figure 3, the topography and vegetation map.				
Note <sup>1</sup> : Described and classified as per AS 3959:2018 Table 2.3 and Figures 2.3 and 2.4 (A)-(H)				
Note <sup>2</sup> : Effective slope measured as per AS 3959:2018 Section 2.2.5 and Appendix B Part B4				

It is assumed for the purposes of assessment that the subject residential Lots within the 'Witchcliffe Ecovillage' and the associated surrounding landscape area will continue to be managed in a low threat state in perpetuity. (Future established residential properties, managed land/maintained gardens, lawns and maintained street landscaping. Cleared areas, public open space and maintained agricultural Lots etc). Management of the Witchcliffe Ecovillage land will be in accordance with the approved **Bushfire Landscape Management Plan** and **Shire of Augusta-Margaret River Firebreak Notice and Bushfire Information**, as issued annually.

Modification of vegetation between the Stage 1 & 2 Lots and the ECL Conservation Area B has been undertaken (ECL Managed Road Reserve).

This report confirms that the required vegetation separation distances, as indicated in the BAL Contour Map report for the bushfire attack level, has been achieved.

The assessed potential bushfire impact is stated in Table 1.4 and the following evidence is included to support the determined Bushfire Attack Level.

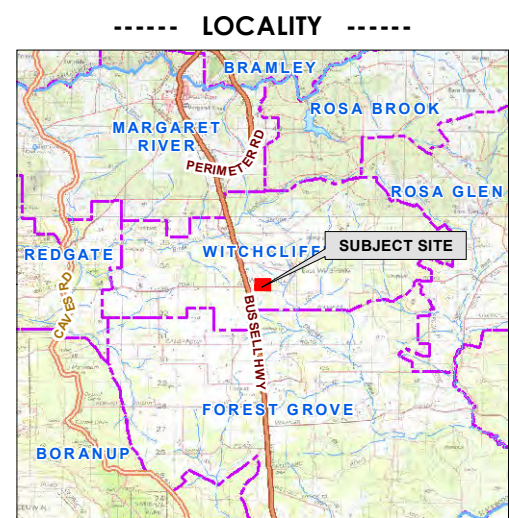
- Photographic evidence of the removal/modification/low threat vegetation or non-vegetated areas.

<b>LANDSCAPE MANAGEMENT AREA – ECL MANAGED ROAD RESERVE</b>	
<b>AS 3959:2018 Vegetation Classification Applied:</b>	Excluded as per Section 2.2.3.2 (e)&(f)
<b>Vegetation Types Present:</b>	Non-vegetated Areas & Low Threat Vegetation
<b>Description/Justification:</b>	Road reserve vegetation modified to low threat vegetation standard 37m from rear of Lot boundaries. Grasses to be maintained <100mm in height.
<b>Post Development Assumptions:</b>	Refer Bushfire Landscape Management Plan for management in perpetuity requirement.
	
Photo ID: (a)	Photo ID: (b)
	
Photo ID: (c)	Photo ID: -



Figure 4  
**Existing Topography & Classified Vegetation**  
 Lots 2807 and 2712  
 Bussell Highway  
 WITCHCLIFFE  
**SHIRE OF AUGUSTA - MARGARET RIVER**

- **LEGEND** -----
- Subject Site
  - Other Lots
  - Area of Interest
  - Subdivision Lots
  - Subdivision Easements
  - Photo & Direction
- Vegetation Assessment**
- 150m from Subject Site
- Classified**
- Class (A) Forest
  - Exclusion 2.2.3.2
  - Vegetation Distance
  - Vegetation Modified to Low Threat



Aerial Imagery : Landgate/SLIP  
 Image Date : Dec 2018

Coordinate System: GDA 1994 MGA Zone 50  
 Projection: Universal Transverse Mercator Units: Metre  
 Map compiled by: Ian Ross 28/10/2020  
 Map updated by: M.McVee 28/10/2020

**Disclaimer and Limitation:** This map has been prepared for bushfire management planning purposes only. All depicted areas, contours and any dimensions shown are subject to survey. Bushfire Prone Planning does not guarantee that this map is without flaw of any kind and disclaims all liability for any errors, loss or other consequence arising from relying on any information depicted.  
 Map Document Path / Name: d:\Users\User\Documents\GIS\Projects\Bushfire Prone Planning\Project\200731 - Lots 2807 & 2812 Bussell Hwy, Witchcliffe\MXD\200731\_Fig1\_VEG\_Lots 2807-2712 Bussell Hwy Witchcliffe\_CloseUP.mxd

**VEGETATION ASSESSMENT AND CLASSIFICATION – PHOTOGRAPHIC REPRESENTATION**

In accordance with AS 3959:2018 Section 2, clause 2.2.3, FPA Australia guidance and the Visual Guide for Bushfire Risk Assessment in WA (DoP February 2016), all vegetation within 150 metres of the site (part of the lot on which a building stands or is to be erected) is assessed and classified. Vegetation of any type more than 100m from the site is excluded from the BAL assessment.

**VEGETATION AREA 1 – ECL CONSERVATION AREA (B)**

<b>AS 3959:2018 Vegetation Classification Applied:</b>	Class A Forest
<b>Vegetation Types Present:</b>	Open forest A-03
<b>Description/Justification:</b>	Species: Jarrah and Marri tree Eucalypts species. Tree/Shrub Height: Trees ~18 to 25m. Foliage Cover: 70% Understorey: Grasses and low shrubs.
<b>Post Development Assumptions:</b>	N/A





Photo ID: 1



Photo ID: 2



Photo ID: 3

Photo ID: -

LANDSCAPE MANAGEMENT AREA ECL MANAGED LAND (2)	
<b>AS 3959:2018 Vegetation Classification Applied:</b>	Excluded as per Section 2.2.3.2 (f)
<b>Vegetation Types Present:</b>	Low Threat Vegetation
<b>Description/Justification:</b>	Grasses maintained <100mm in height.
<b>Post Development Assumptions:</b>	Refer Bushfire Landscape Management Plan for management in perpetuity requirement.
 <p style="font-size: small; text-align: right;">Site Assessment Photo -34°1'25", 115°6'21", 46.0m, 93° 01/10/2020 11:46:27</p>	 <p style="font-size: small; text-align: right;">Site Assessment Photo -34°1'25", 115°6'21", 46.5m, 75° 01/10/2020 11:46:46</p>
Photo ID: 4	Photo ID: 5

VEGETATION AREA 2	
<b>AS 3959:2018 Vegetation Classification Applied:</b>	Class B Woodland
<b>Vegetation Types Present:</b>	Woodland B-05
<b>Description/Justification:</b>	Species: Marri tree dominant Eucalypts species. Tree/Shrub Height: Trees ~25m. Foliage Cover: 30% Understorey: Grasses.
<b>Post Development Assumptions:</b>	N/A
 <p style="font-size: small; text-align: right;">Site Assessment Photo -34°1'18", 115°6'22", 47.2m, 124° 01/10/2020 11:50:23</p>	 <p style="font-size: small; text-align: right;">Site Assessment Photo -34°1'18", 115°6'21", 47.5m, 149° 01/10/2020 11:50:51</p>
Photo ID: 6	Photo ID: 7

LANDSCAPE MANAGEMENT AREA ECL NORTHERN DAM (A)	
<b>AS 3959:2018 Vegetation Classification Applied:</b>	Excluded as per Section 2.2.3.2 (e)&(f)
<b>Vegetation Types Present:</b>	Non-vegetated Areas & Low Threat Vegetation
<b>Description/Justification:</b>	Dam Surrounds Planting area. Grasses maintained <100mm in height.
<b>Post Development Assumptions:</b>	Refer Bushfire Landscape Management Plan for management in perpetuity requirement.
 <p style="text-align: right; font-size: small;">Site Assessment Photo -34°1'17", 115°6'16", 52.4m, 50° 01/10/2020 11:52:54</p>	 <p style="text-align: right; font-size: small;">Site Assessment Photo -34°1'17", 115°6'16", 51.9m, 351° 01/10/2020 11:52:59</p>
Photo ID: 8	Photo ID: 9
 <p style="text-align: right; font-size: small;">Site Assessment Photo -34°1'17", 115°6'16", 52.8m, 295° 01/10/2020 11:53:09</p>	
Photo ID: 10	Photo ID: -

LANDSCAPE MANAGEMENT AREA AGRICULTURAL LOT (A)	
<b>AS 3959:2018 Vegetation Classification Applied:</b>	Excluded as per Section 2.2.3.2 (f)
<b>Vegetation Types Present:</b>	Low Threat Vegetation
<b>Description/Justification:</b>	Grasses maintained <100mm in height.
<b>Post Development Assumptions:</b>	Refer Bushfire Landscape Management Plan for management in perpetuity requirement.
 <p style="text-align: right; font-size: small;">Site Assessment Photo -34°1'20", 115°6'15", 47.6m, 95° 01/10/2020 11:54:42</p>	 <p style="text-align: right; font-size: small;">Site Assessment Photo -34°1'20", 115°6'15", 49.4m, 110° 01/10/2020 11:55:00</p>
Photo ID: 11	Photo ID: 12

### 1.1.3 Vegetation Separation Distance

<p>The vegetation separation distance is the horizontal distance measured from the relevant parts of an existing building or a future building's planned location (within a lot), to the determined edge of an area of classified vegetation.</p> <p>This separation distance applied to determining a Bushfire Attack Level (BAL) can be either:</p> <ul style="list-style-type: none"> <li>The <u>measured distance</u> – for which the location of the building relative to the edge of classified vegetation must be known. This will result in single determined BAL that will apply to a building. (The measured distance is a required calculation input); or</li> <li>A <u>calculated minimum and maximum distance (range)</u> that will correspond to each individual BAL. The calculated distances provide an indicative (or achievable) BAL for which the determined BAL will be dependent on the known location of the building relative to the edge of classified vegetation.</li> </ul> <p>The calculated range of distances corresponding to each BAL can be presented in different formats (tables or a BAL contour map), dependent on the form of information that is most appropriate for the proposed development/use. These distance ranges corresponding to BAL(s) will be presented in Section 1.2: 'Assessment Output'.</p>	
<p>For the proposed development/use, the applicable vegetation separation distances will be presented within the Bushfire Management Plan in this location:</p>	<p>In Section 1.2 'Assessment Output' as a table containing the calculated ranges of distance corresponding to each BAL and illustrated as a BAL Contour Map.</p>

## BUSHFIRE IMPACT ASSESSMENT OUTPUT

### 1.2 Assessment Output

#### UNDERSTANDING THE RESULTS OF THE BUSHFIRE IMPACT ASSESSMENT

##### **Bushfire Attack Levels (BALs) – Their Application in the Building Environment is Different to the Planning Environment**

In the building environment, a **determined BAL** is required for the proposed construction at the building application stage. This is to inform approval considerations and establish the bushfire construction standards that are to apply. An indicative BAL is not acceptable for a building application.

In the planning environment, through the application of SPP 3.7 and associated Guidelines, the deemed to satisfy requirement for a proposed 'development site' or sites (defined by the LPS Amendment Regulations 2015 as "that part of a lot on which a building that is the subject of development stands or is to be constructed"), is that a BAL-29 or lower rating can be achieved once all works associated with the proposal are completed. For planning approval purposes, an **indicative BAL** can provide the required information.

##### **Determined Bushfire Attack Level**

A determined BAL is to apply to an existing building or the 'development site' on which the building is to be constructed and not to a lot or building envelope. Its purpose is to state the potential radiant heat flux to which the building will be exposed, thereby determining the construction standard to be applied.

A determined BAL cannot be given for a future building whose design and position on the lot are unknown or the vegetation separation distance has not been established. It is not until these variables have been fixed that a determined BAL can be stated, and a BAL Certificate can be issued.

The one exception is when a building **of any dimension** can be **positioned anywhere** on a proposed lot (within R-Code building setbacks) or within a defined building envelope, and always remain subject to the same BAL, regardless of the retention of any existing classified vegetation either onsite or offsite.

##### **Indicative Bushfire Attack Level**

If a BAL is not able to achieve 'determined' status it will be an indicative BAL. It indicates the BAL that can be achieved by the proposed development/use. However, it is conditional upon an assessment variable(s) being confirmed at a later stage (e.g. the building location is established/changed, or vegetation is removed to establish the vegetation separation distance).

A BAL certificate cannot be issued for an indicative BAL – unless that BAL cannot vary (refer to 'Determined BAL' above).

In table form, a single or a range of indicative BAL(s) may be presented. If a single indicative BAL is stated for a defined area (i.e. the lot or building envelope), this will be the highest indicative BAL impacting the defined area.

In BAL contour map form (refer to Section 1.2), the illustrated BAL contours visually identify areas of land for which if any part of an existing or proposed building is located on that land and within the BAL contours, then the highest BAL affecting that building (or part of the land on which the building will be constructed), will be the indicative BAL that is to apply.

The BAL can only become a determined BAL once the actual location of that building on the land is known and/or the required minimum vegetation separation distance corresponding to the relevant BAL contour is established (refer to Table 1.4).



## 1.2.1 Bushfire Attack Level Results - BAL Contour Map Format

### INTERPRETATION OF THE BUSHFIRE ATTACK LEVEL (BAL) CONTOUR MAP

The contour map will present different coloured contour intervals extending from the areas of classified bushfire prone vegetation. These represent the different bushfire attack levels that will exist at varying distances away from the classified vegetation in the event of a bushfire in that vegetation.

The areas of classified vegetation are those that will remain as the intended end state of the subject development once earthworks, clearing and/or landscaping and re-vegetation have been completed (or each stage completed).

Each bushfire attack level corresponds to a set range of radiant heat flux that is generated by a bushfire. That range is defined by the AS 3959:2018 BAL determination methodology.

The width of each shaded BAL contour is a diagrammatic representation of the separation distances from the classified vegetation that correspond to each BAL for each separately identified area of classified vegetation. They have been calculated by the application of the unique site variables including vegetation types and structure, ground slope and applied fire weather.

(Refer to Section 1.2 'Understanding the Results of the Bushfire Impact Assessment' for the explanation of how BAL(s) for buildings will be assessed from the BAL Contour Map).

## Construction of the BAL Contours

Table 1.3: Vegetation separation distances applied to construct the BAL contours.

BAL CONTOUR MAP – APPLIED VEGETATION SEPARATION DISTANCES								
Derived from the Application of Method 1 BAL Determination Methodology (AS 3959:2018 Section 2, Table 2.5)								
Vegetation Area	Vegetation Classification	Effective Slope (degree range)	BAL and Corresponding Separation Distance (m)					
			BAL-FZ	BAL-40	BAL-29	BAL-19	BAL12.5	BAL-LOW
1	Class A Forest	downslope >0-5	<20	20-<27	27-<37	37-<50	50-<100	>100
2	Class B Woodland	downslope >0-5	<13	13-<17	17-<25	25-<35	35-<100	>100
3	Class A Forest	downslope >0-5	<20	20-<27	27-<37	37-<50	50-<100	>100

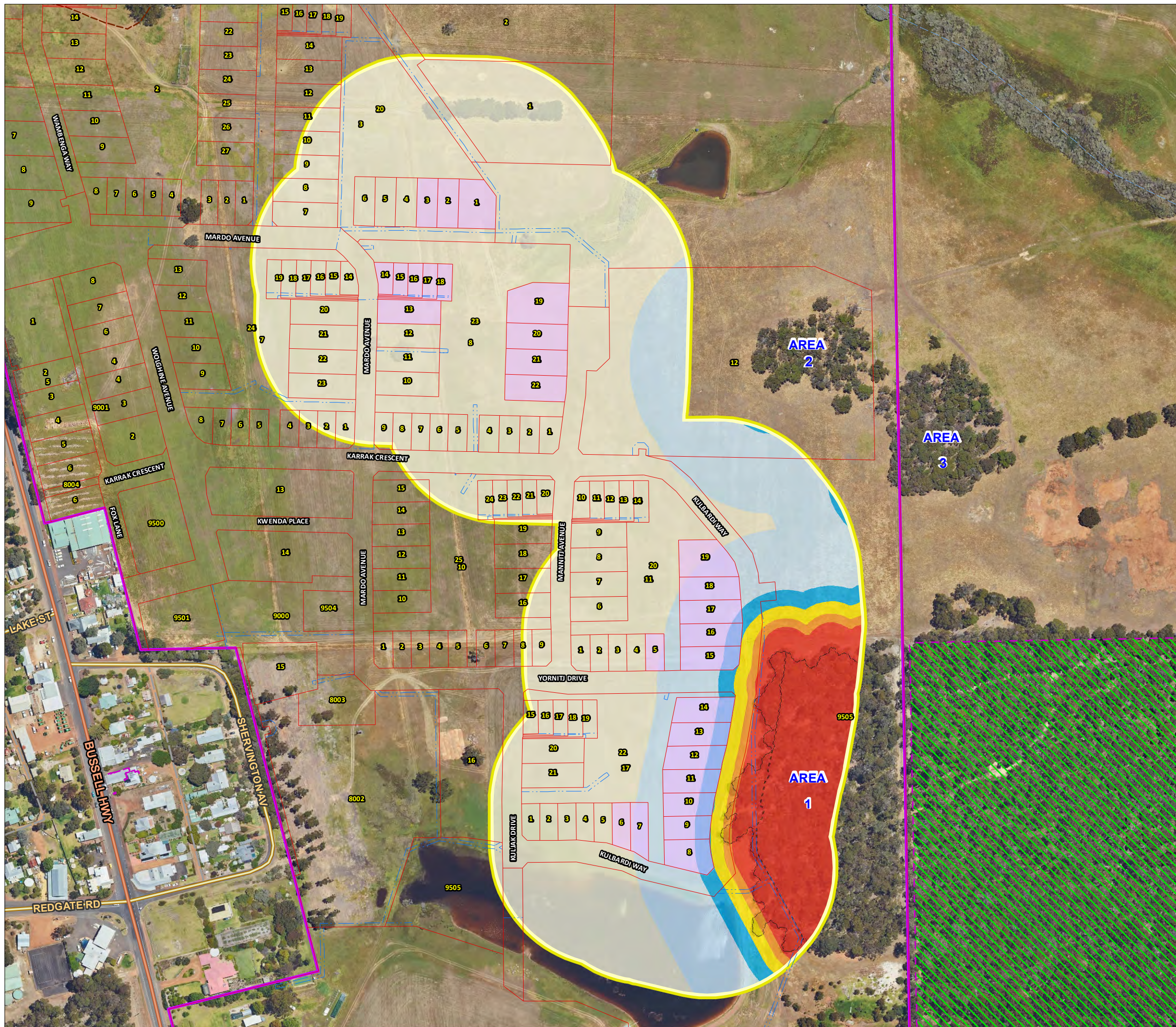
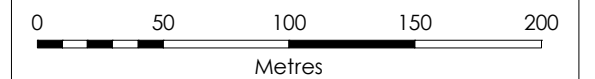


Figure 5  
**BAL Contour Map**

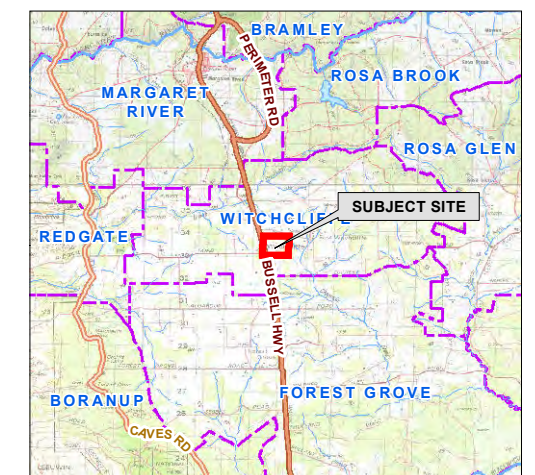
Lots 2807 and 2712  
 Bussell Highway  
 WITCHCLIFFE  
**SHIRE OF AUGUSTA - MARGARET RIVER**

----- **LEGEND** -----

- Subject Site
  - Area of Interest
  - Subdivision Lots
  - Subdivision Easements
- Vegetation Assessment Area**
- 100m from Subject Site
  - Classified Vegetation Boundary
- Indicative Bushfire Attack Levels**
- BAL FZ
  - BAL 40
  - BAL 29
  - BAL 19
  - BAL 12.5
  - BAL LOW



----- **LOCALITY** -----



Aerial Imagery : Landgate/SLIP  
 Image Date : Dec 2018

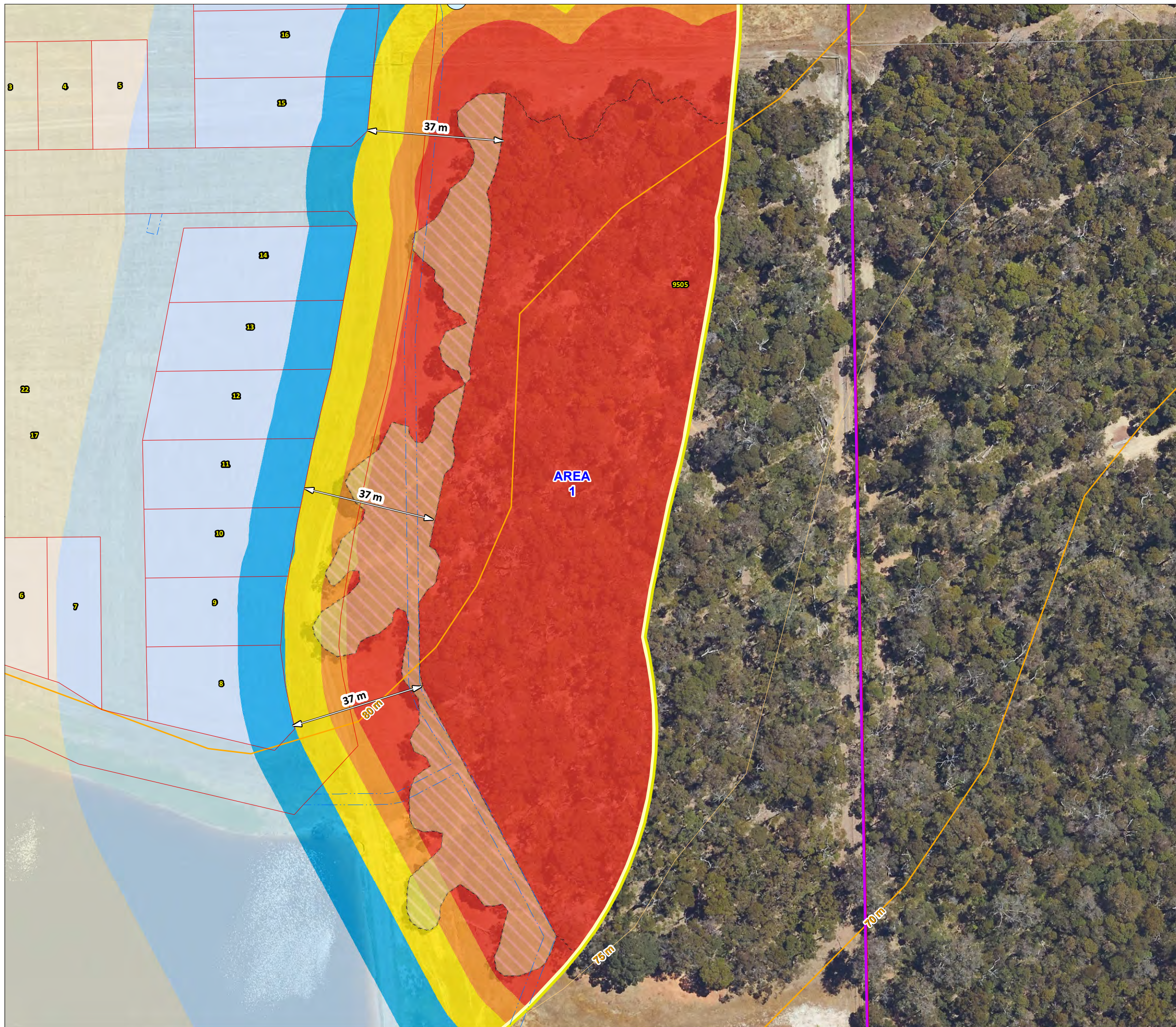


Coordinate System: GDA 1994 MGA Zone 50  
 Projection: Universal Transverse Mercator Units: Metre  
 Map compiled by: Ian Ross 28/10/2020  
 Map updated by: User 28/10/2020

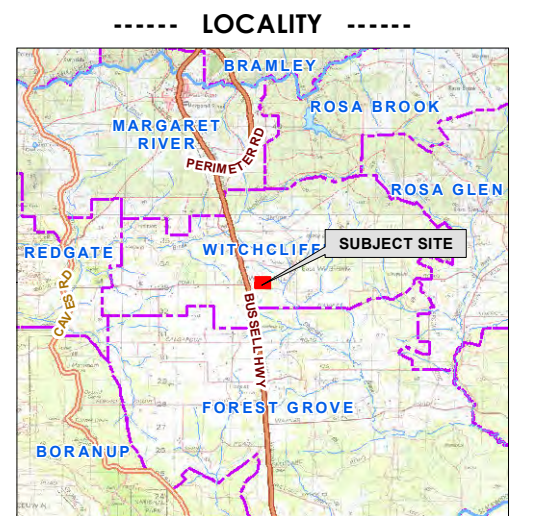
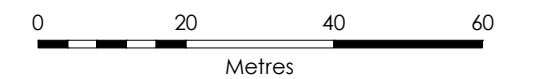
Disclaimer and Limitation: This map has been prepared for bushfire management planning purposes only. All depicted areas, contours and any dimensions shown are subject to survey. Bushfire Prone Planning does not guarantee that this map is without flaw of any kind and disclaims all liability for any errors, loss or other consequence arising from relying on any information depicted.  
 Map Document Path / Name: d:\Users\User\Documents\GIS\Projects\Bushfire Prone Planning\Project\200731 - Lots 2807 & 2812 Bussell Hwy, Witchcliffe\MXD\200731\_Fig2\_BAL\_Lots 2807-2712 Bussell Hwy Witchcliffe.mxd

Figure 6  
**BAL Assessment Map**

Lots 2807 and 2712  
 Bussell Highway  
 WITCHCLIFFE  
**SHIRE OF AUGUSTA - MARGARET RIVER**



- **LEGEND** -----
- Subject Site
  - Other Lots
  - Area of Interest
  - Subdivision Lots
  - Subdivision Easements
  - Photo & Direction
- Vegetation Assessment Area**
- 100m from Subject Site
  - Classified Vegetation Boundary
- Indicative Bushfire Attack Levels**
- BAL FZ
  - BAL 40
  - BAL 29
  - BAL 19
  - BAL 12.5
  - BAL LOW
- Vegetation Distance
  - Vegetation Modified to Low Threat



Aerial Imagery : Landgate/SLIP  
 Image Date : Dec 2018

Coordinate System: GDA 1994 MGA Zone 50  
 Projection: Universal Transverse Mercator Units: Metre  
 Map compiled by: Ian Ross 28/10/2020  
 Map updated by: M.McVee 28/10/2020

## BUSHFIRE ATTACK LEVEL RATINGS

Table 1.4: **Stage 1 & 2** Bushfire attack levels and corresponding building setbacks.

<b>STAGE 1 &amp; 2 BUSHFIRE ATTACK LEVELS FOR FUTURE BUILDINGS ON PROPOSED LOTS AND REQUIRED BUILDING SETBACKS</b>									
Lot ID.	Vegetation Separation Distance to Boundaries of Proposed Lots (stated when relevant)	Relevant Vegetation Area/s <sup>1</sup>	Relevant Lot Boundary <sup>2</sup>	Highest BAL Impacting the Lot	AS 3959:2018 BAL Determination Method Applied	Required Minimum Building Setback to Achieve the Stated BAL (from relevant lot boundary)		Applied R-Code Building Setback (metres)	Additional Building Setback Required (restrictive covenant) (metres)
	metres					BAL	metres		
5	-	1	East	<b>BAL-12.5</b>	Method 1	BAL-12.5	50		
6	-			<b>BAL-LOW</b>		BAL-LOW	100		
7	-			<b>BAL-12.5</b>		BAL-12.5	50		
8	37			<b>BAL-19</b>		BAL-19	37		
9	37					BAL-19	37		
10	37					BAL-19	37		
11	37					BAL-19	37		
12	37					BAL-19	37		
13	37					BAL-19	37		
14	37					BAL-19	37		
15	37					BAL-19	37		
16	37					BAL-19	37		
17	-					BAL-19	37		
18	-			<b>BAL-12.5</b>		BAL-12.5	50		
19	-					BAL-12.5	50		

Note <sup>1</sup>: The vegetation area(s) that generate the highest BAL for the lot.  
Note <sup>2</sup>: The lot boundary adjacent to the relevant vegetation area from which the required building setback distance to achieve the stated BAL is to be applied.

Table 1.5: **Stage 3A** Bushfire attack levels and corresponding building setbacks.

STAGE 3A BUSHFIRE ATTACK LEVELS FOR FUTURE BUILDINGS ON PROPOSED LOTS AND REQUIRED BUILDING SETBACKS									
Lot ID.	Vegetation Separation Distance to Boundaries of Proposed Lots (stated when relevant)	Relevant Vegetation Area/s <sup>1</sup>	Relevant Lot Boundary <sup>2</sup>	Highest BAL Impacting the Lot	AS 3959:2018 BAL Determination Method Applied	Required Minimum Building Setback to Achieve the Stated BAL (from relevant lot boundary)		Applied R-Code Building Setback metres	Additional Building Setback Required (restrictive covenant) metres
	metres					BAL	metres		
1	>100	2	East	<b>BAL-LOW</b>	Method 1	BAL-LOW	100		
2									
3									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									

Note <sup>1</sup>: The vegetation area(s) that generate the highest BAL for the lot.  
 Note<sup>2</sup>: The lot boundary adjacent to the relevant vegetation area from which the required building setback distance to achieve the stated BAL is to be applied.

**ADDITIONAL LANDOWNER INFORMATION: EXPLANATION OF BUSHFIRE ATTACK LEVELS AND REFERENCES FOR CONSTRUCTION REQUIREMENTS**

AS 3959:2018 *Construction of buildings in bushfire prone areas*, defines a Bushfire Attack Level (BAL) as a “means of measuring the severity of a building’s potential exposure to ember attack, radiant heat and direct flame contact, using increments of radiant heat flux expressed in kW/m<sup>2</sup>, and is the basis for establishing the requirements for construction to improve protection of building elements from attack by bushfire.”

Bushfire Attack Level	Explanation of BAL Levels	References for Construction Requirements	
		AS 3959:2018 Construction of Buildings in Bushfire Prone Areas	The Nash Standard – Steel Framed Construction in Bushfire Areas
		Referenced by the Building Code of Australia for Building Classes 1, 2, 3 & 10a	Referenced by the Building Code of Australia for Building Classes 1 & 10a
<b>BAL – LOW</b>	There is insufficient risk to warrant specific construction requirements but there is still some risk. <i>(Note: DFES recommend that ember attack protection features be incorporated in the design where practicable).</i>	Section 4. No Requirements	No Requirements
<b>BAL – 12.5</b>	There is a risk of ember attack. Construction elements are expected to be exposed to heat flux not greater than 12.5 kW/m <sup>2</sup>	Sections 3 & 5.	All construction requirements for BAL-12.5 to BAL-40 are the same except for windows and external doors, which must comply with AS 3959.  The construction requirements are set out as essentially non-combustible construction systems for each of the following building elements:  Section 1.4: General Requirements Section 2: Roof and Ceiling System Section 3: External Wall System Section 4: Floor System Section 5: Carports Verandahs and Decks.
<b>BAL – 19</b>	There is a risk of ember attack and burning debris ignited by windborne embers and a likelihood of exposure to radiant heat. The construction elements are expected to be exposed to a heat flux not greater than 19 kW/m <sup>2</sup> .	Sections 3 & 6	
<b>BAL – 29</b>	There is an increased risk of ember attack and burning debris ignited by windborne embers and a likelihood of exposure to an increased level radiant heat. The construction elements are expected to be exposed to a heat flux not greater than 29 kW/m <sup>2</sup> .	Sections 3 & 7.	
<b>BAL – 40</b>	There is a much increased risk of ember attack and burning debris ignited by windborne embers, a likelihood of exposure to a high level of radiant heat and some likelihood of direct exposure to flames from the fire front. The construction elements are expected to be exposed to a heat flux not greater than 40kW/m <sup>2</sup> .	Sections 3 & 8.	
<b>BAL – FZ (Flame Zone)</b>	There is an extremely high risk of ember attack and burning debris ignited by windborne embers, and a likelihood of exposure to an extreme level of radiant heat and direct exposure to flames from the fire front. The construction elements are expected to be exposed to a heat flux greater than 40 kW/m <sup>2</sup> .	Sections 3 & 9.	

## REQUIREMENTS ESTABLISHED BY THE GUIDELINES – THE APZ

(Source: *Guidelines for Planning in Bushfire Prone Areas - WAPC 2017 v1.3 Appendix 4, Element 2, Schedule 1 and Explanatory Note E2.1*)

### DEFINING THE ASSET PROTECTION ZONE (APZ)

**Description:** An APZ is an area surrounding a building that is managed to reduce the bushfire hazard to an acceptable level (by reducing fuel loads). The width of the required APZ varies with slope and vegetation and varies corresponding to the BAL rating determined for a building (lower BAL = greater dimensioned APZ).

For planning applications, the minimum sized acceptable APZ is that which is of sufficient size to ensure the potential radiant heat impact of a fire does not exceed 29kW/m<sup>2</sup> (BAL-29). It will be site specific.

For subdivision planning, design elements and excluded/low threat vegetation adjacent to the lot(s) can be utilised to achieve the required vegetation separation distances and therefore reduce the required dimensions of the APZ within the lot(s).

**Defendable Space:** The APZ includes a defendable space which is an area adjoining the asset within which firefighting operations can be undertaken to defend the structure. Vegetation within the defendable space should be kept at an absolute minimum and the area should be free from combustible items and obstructions. The width of the defendable space is dependent on the space, which is available on the property, but as a minimum should be 3 metres.

**Establishment:** The APZ should be contained solely within the boundaries of the lot on which the building is situated, except in instances where the neighbouring lot or lots will be managed in a low-fuel state on an ongoing basis, in perpetuity.

The APZ may include public roads, waterways, footpaths, buildings, rocky outcrops, golf courses, maintained parkland as well as cultivated gardens in an urban context, but does not include grassland or vegetation on a neighbouring rural lot, farmland, wetland reserves and unmanaged public reserves.

*[Note: Regardless of whether an Asset Protection Zone exists in accordance with the acceptable solutions and is appropriately maintained, fire fighters are not obliged to protect an asset if they think the separation distance between the dwelling and vegetation that can be involved in a bushfire, is unsafe.]*

### Schedule 1: Standards for APZ

**Fences:** within the APZ are constructed from non-combustible materials (e.g. iron, brick, limestone, metal post and wire). It is recommended that solid or slatted non-combustible perimeter fences are used.

**Objects:** within 10 metres of a building, combustible objects must not be located close to the vulnerable parts of the building i.e. windows and doors.

**Fine Fuel Load:** combustible dead vegetation matter less than 6 mm in thickness reduced to and maintained at an average of two tonnes per hectare (example below).

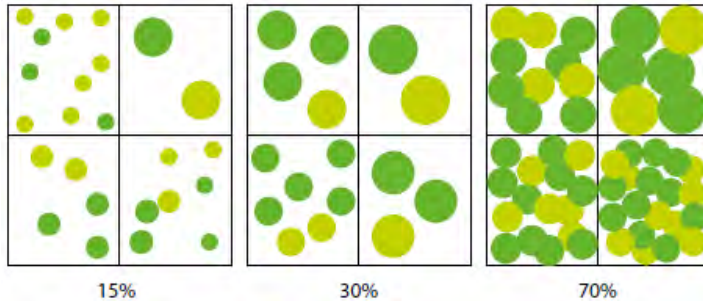


Example: Fine fuel load of 2 t/ha

(Image source: Shire of Augusta Margaret River's Firebreak and Fuel Reduction Hazard Notice)

**Trees (> 5 metres in height):** trunks at maturity should be a minimum distance of 6 metres from all elevations of the building, branches at maturity should not touch or overhang the building, lower branches should be removed to a height of 2 metres above the ground and or surface vegetation, canopy cover should be less than 15% with tree canopies at maturity well spread to at least 5 metres apart as to not form a continuous canopy. Diagram below represents tree canopy cover at maturity.

Tree canopy cover – ranging from 15 to 70 per cent at maturity



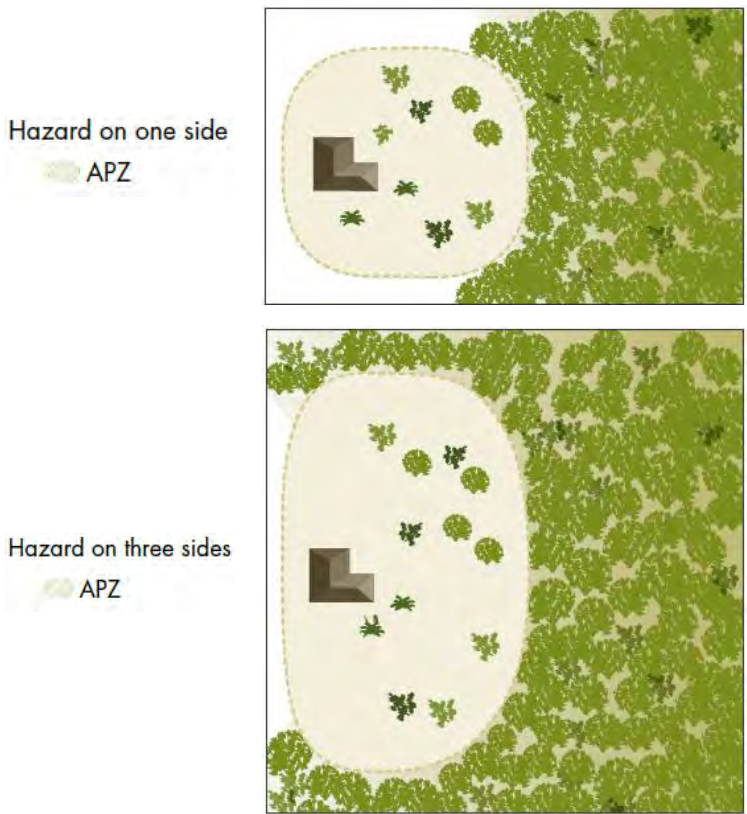
(Source: Guidelines for Planning in Bushfire Prone Areas 2017, Appendix 4)

**Shrubs (0.5 metres to 5 metres in height):** should not be located under trees or within 3 metres of buildings, should not be planted in clumps greater than 5m<sup>2</sup> in area, clumps of shrubs should be separated from each other and any exposed window or door by at least 10 metres. Shrubs greater than 5 metres in height are to be treated as trees.

**Ground covers (<0.5 metres in height):** can be planted under trees but must be properly maintained to remove dead plant material and any parts within 2 metres of a structure, but 3 metres from windows or doors if greater than 100 mm in height. Ground covers greater than 0.5 metres in height are to be treated as shrubs.

**Grass:** should be managed to maintain a height of 100 mm or less.

The following example diagrams illustrate how the required dimensions of the APZ will be determined by the type and location of the vegetation.





## REQUIREMENTS ESTABLISHED BY THE LOCAL GOVERNMENT – THE FIREBREAK NOTICE

The relevant local government's current Firebreak Notice is available on their website, at their offices and is distributed as ratepayer's information. It must be complied with.

These requirements are established by the relevant local government's Firebreak Notice created under s33 of the Bushfires Act 1954 and issued annually (potentially with revisions). The Firebreak Notice may include additional components directed at managing fuel loads, accessibility and general property management with respect to limiting potential bushfire impact.

If Asset Protection Zone (APZ) specifications are defined in the Firebreak Notice, these may differ from the Standards established by the Guideline's, with the intent to better satisfy local conditions. When these are more stringent than those created by the Guidelines, or less stringent and endorsed by the WAPC and DFES, they must be complied with.

The APZ dimensions to be physically established and maintained, will be based on which of the following establishes the larger APZ dimension:

- The dimensions corresponding to the determined BAL of a building; or
- The APZ dimensions established by the local government's Firebreak Notice.

## REQUIREMENTS RECOMMENDED BY DFES – PROPERTY PROTECTION CHECKLISTS

Further guidance regarding ongoing/lasting property protection (from potential bushfire impact) is presented in the publication 'DFES – Fire Chat – Your Bushfire Protection Toolkit'. It is available from the Department of Fire and Emergency Services (DFES) website.

## REQUIREMENTS ESTABLISHED BY AS 3959:2018 – 'MINIMAL FUEL CONDITION'

This information is provided for reference purposes. It identifies what is required for an area of land to be excluded from classification as a potential bushfire threat.

*"Australian Standard - AS 3959:2018 Section 2.2.3.2: Exclusions - Low threat vegetation and non-vegetated areas:*

*The Bushfire Attack Level shall be classified BAL-LOW where the vegetation is one or a combination of the following:*

- a) Vegetation of any type that is more than 100m from the site.*
- b) Single areas of vegetation less than 1ha in area and not within 100m of other areas of vegetation being classified vegetation.*
- c) Multiple area of vegetation less than 0.25ha in area and not within 20m of the site or each other or other areas of vegetation being classified vegetation.*
- d) Strips of vegetation less than 20m in width (measured perpendicular to the elevation exposed to the strip of vegetation) regardless of length and not within 20m of the site or each other, or other areas of vegetation being classified vegetation.*
- e) Non-vegetated areas, that is, areas permanently cleared of vegetation, including waterways, exposed beaches, roads, footpaths, buildings and rocky outcrops.*
- f) Vegetation regarded as low threat due to factors such as flammability, moisture content or fuel load. This includes grassland managed in a **minimal fuel condition**, (means insufficient fuel available to significantly increase the severity of a bushfire attack – for example, recognisable as short cropped grass to a nominal height of 100mm), mangroves and other saline wetlands, maintained lawns, golf courses (such as playing areas and fairways), maintained public reserves and parklands, sporting fields, vineyards, orchards, banana plantations, market gardens (and other non-curing crops), cultivated gardens, commercial nurseries, nature strips and windbreaks (single row of trees)."*