



AS3959 Bushfire Attack Level Assessment Report

This report has been prepared using the Simplified Procedure (Method 1) as detailed in Section 2 of AS3959-2018.

Site Details	
Address:	Subdivision Stage 3 - Lake Treeby
Suburb:	Treeby WA 6164
Local Government Area	City of Cockburn
State:	Western Australia
Description of Building Works	Residential lots for Class 1 Dwellings

Report Details			
Report / Job Number:	2211-67	Report Version	1.0
Assessment Date:	24/11/2022	Report Date	30/11/2022
Assessor Details			
Name:	Rohan Carboon		
Accredited Practitioner	Rohan Carboon Level 3 - BPAD 23160		

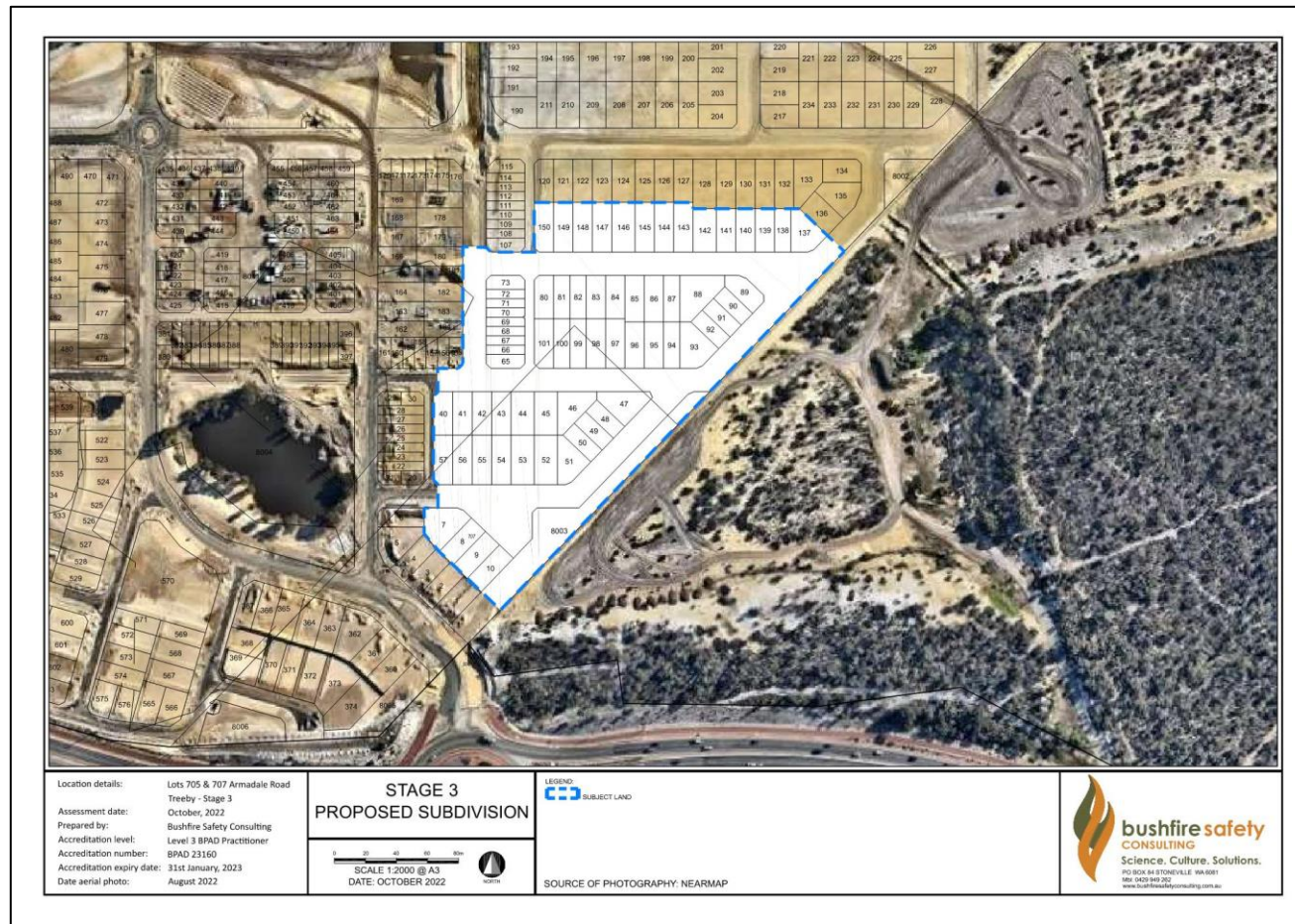
Disclaimer:

This report has been prepared in good faith and is derived from sources believed to be reliable and accurate at the time of publication. Nevertheless, this publication is distributed on the terms and understanding that the author is not responsible for results of any actions taken based on information in this publication or for any error in or omission from this publication.

Notwithstanding the precautions adopted in this report, it should always be remembered that bushfires burn under a wide range of conditions. An element of risk, no matter how small always remains. The objective of the standard (AS 3959:2018) is 'to prescribe particular construction details for buildings to reduce the risk of ignition from a bushfire while the front passes' (Standards Australia, 2018). Building to the standard (AS 3959:2018) does not guarantee a building will survive a bushfire.

Site Assessment and Site Plans

The assessment of this development was undertaken on 24/11/2022 by Bushfire Safety Consulting Pty Ltd for the purposes of determining the Bushfire Attack Level for each lot and dwelling in accordance with AS 3959 – 2018 Simplified Procedure (Method 1). The Stage 3 subdivision development creates a further 67 urban residential lots, one POS area and internal roads adjacent to an existing developed area. This assessment has been undertaken to provide BAL ratings for each lot and dwellings in the subdivision stage (below) as outlined in the vegetation classification map.






Vegetation Classification

All vegetation within 150m of the subdivision was classified in accordance with Clause 2.2.3 of AS 3959-2018. There is no vegetation on the lots, the entire area has been cleared and adjacent subdivision stages have also been cleared including the adjacent development. Roads and lots are nearing completion. Classified vegetation within 100 metres only occurs south of the stage.

Class D Scrub is the dominant vegetation.

The small Public Open Space (POS) reserve will be developed into a pocket park with turf and fuel low maintained vegetation.

Each distinguishable vegetation plot with the potential to determine the Bushfire Attack Level is identified below and outlined in the Vegetation Classification Plan.

<p>Photo ID: 1</p> <p>Plot Number: 6</p> <p>Vegetation classification or exclusion clause: Class D Scrub</p> <p>Description/justification of classification: Mixed species of shrubs greater than 2m high; 10 – 30% foliage cover.</p>	
<p>Photo ID: 2</p> <p>Plot Number: 6</p> <p>Vegetation classification or exclusion clause: Class D Scrub</p> <p>Description/justification of classification: Mixed species of shrubs greater than 2m high; 10 – 30% foliage cover.</p>	
<p>Photo ID: 3</p> <p>Plot Number: 9</p> <p>Vegetation classification or exclusion clause: Exclusion Clause 2.2.3.2 (f)</p> <p>Description/justification of classification: Cleared area to be revegetated into managed parkland/public open space</p>	

<p>Photo ID: 4</p> <p>Plot Number: 9</p> <p>Vegetation classification or exclusion clause: Exclusion Clause 2.2.3.2 (f)</p> <p>Description/justification of classification: Cleared area to be revegetated into managed parkland/public open space</p>	
<p>Photo ID: 5</p> <p>Plot Number: 9</p> <p>Vegetation classification or exclusion clause: Exclusion Clause 2.2.3.2(f)</p> <p>Description/justification of classification: Cleared area to be revegetated into managed parkland/public open space</p>	
<p>Photo ID: 6</p> <p>Plot Number: 10</p> <p>Vegetation classification or exclusion clause: Exclusion Clause 2.2.3.2(e)</p> <p>Description/justification of classification: Cleared area to be revegetated into managed parkland as per approved landscape plans</p>	
<p>Photo ID: 7</p> <p>Plot Number: 10</p> <p>Vegetation classification or exclusion clause: Exclusion Clause 2.2.3.2(e)</p> <p>Description/justification of classification: Cleared development stages for residential lots – no threat vegetation – minimal vegetation proposed in urban landscape.</p>	
<p>Photo ID: 8</p> <p>Plot Number: 10</p> <p>Vegetation classification or exclusion clause: Exclusion Clause 2.2.3.2(e)</p> <p>Description/justification of classification: Cleared development stages for residential lots – no threat vegetation – minimal vegetation proposed in urban landscape.</p>	






<p>Photo ID: 9</p> <p>Plot Number: 10</p> <p>Vegetation classification or exclusion clause: Exclusion Clause 2.2.3.2(e)</p> <p>Description/justification of classification: Cleared development stages for residential lots – no threat vegetation – minimal vegetation proposed in urban landscape.</p>	 <p>Photo 9: A wide, cleared dirt area with some mounds of earth and a yellow sign in the distance. The sky is overcast.</p>
<p>Photo ID: 10</p> <p>Plot Number: 10</p> <p>Vegetation classification or exclusion clause: Exclusion Clause 2.2.3.2(e)</p> <p>Description/justification of classification: Cleared development stages for residential lots – no threat vegetation – minimal vegetation proposed in urban landscape.</p>	 <p>Photo 10: A paved road with a concrete curb and a fence on the right side. A truck is visible in the distance.</p>
<p>Photo ID: 11</p> <p>Plot Number: 10</p> <p>Vegetation classification or exclusion clause: Exclusion Clause 2.2.3.2(e)</p> <p>Description/justification of classification: Cleared development stages for residential lots – no threat vegetation – minimal vegetation proposed in urban landscape.</p>	 <p>Photo 11: A cleared dirt area with some construction materials and a fence in the background.</p>
<p>Photo ID: 12</p> <p>Plot Number: 10</p> <p>Vegetation classification or exclusion clause: Exclusion Clause 2.2.3.2(e)</p> <p>Description/justification of classification: Cleared development stages for residential lots – no threat vegetation – minimal vegetation proposed in urban landscape.</p>	 <p>Photo 12: A paved road curving to the right, with a concrete curb and a fence on the right side.</p>
<p>Photo ID: 13</p> <p>Plot Number: 10</p> <p>Vegetation classification or exclusion clause: Exclusion Clause 2.2.3.2(e)</p> <p>Description/justification of classification: Cleared development stages for residential lots – no threat vegetation – minimal vegetation proposed in urban landscape.</p>	 <p>Photo 13: A paved road with a concrete curb and a fence on the right side, similar to Photo 10.</p>

Photo ID: 14

Plot Number: 10

Vegetation classification or exclusion clause:

Exclusion Clause 2.2.3.2(e)

Description/justification of classification:

Cleared development stages for residential lots – no threat vegetation – minimal vegetation proposed in urban landscape.



Photo ID: 15

Plot Number: 10

Vegetation classification or exclusion clause:

Exclusion Clause 2.2.3.2(e)

Description/justification of classification:

Cleared development stages for residential lots – no threat vegetation – minimal vegetation proposed in urban landscape.



Relevant Fire Danger Index

The fire danger index for this site has been determined in accordance with Table 2.1 in AS3959–2018.

Fire Danger Index:	Table
FDI : 80	2.5

Effective Slope

The effective slope under the classified vegetation is outlined in the following table.

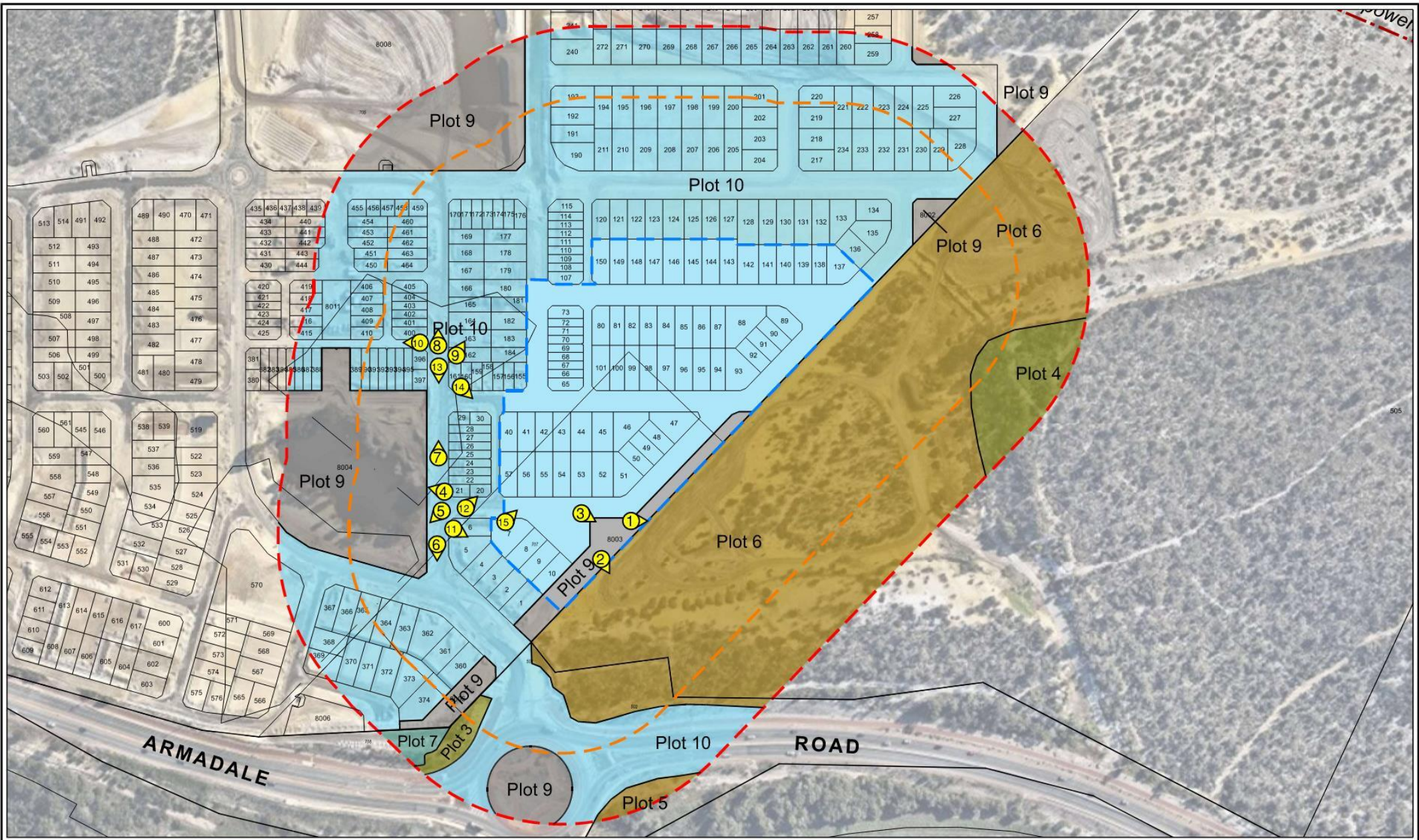
Plot No.	Classified Vegetation	Effective slope
3	Class B Woodland	Downslope 0-5°
4	Class B Woodland	Flat/Upslope
5	Class D Scrub	Downslope 0-5°
6	Class D Scrub	Flat/Upslope
7	Class C Shrubland	Flat/Upslope
9	Exclusion Clause 2.2.3.2 (f)	N/A
10	Exclusion Clause 2.2.3.2(e)	N/A

Determined Bushfire Attack Level

The determined Bushfire Attack Level (highest BAL) for the lots and future dwellings has been determined in accordance with clause 2.2.6 of AS3959-2018 using the above analysis.

Potential Bushfire Impacts

The predicted radiant heat flux levels into the site from the assessment are outlined below in Table 1 and the BAL Contour Plan.



Location details: Lots 705 & 707 Armadale Road
Treeby - Stage 3

Assessment date: October, 2022

Prepared by: Bushfire Safety Consulting

Accreditation level: Level 3 BPAD Practitioner

Accreditation number: BPAD 23160

Accreditation expiry date: 31st January, 2023

Date aerial photo: August 2022

FIGURE 4 - VEGETATION CLASSIFICATION MAP (BAL CONTOUR MAP)

0 20 40 60 80 100m

SCALE 1:2500 @ A3

DATE: OCTOBER 2022



LEGEND:

- SUBJECT LAND
- ASSESSMENT AREA (150m) FROM THE EXTERNAL BOUNDARY OF THE SUBJECT SITE
- ASSESSMENT AREA (100m) FROM THE EXTERNAL BOUNDARY OF THE SUBJECT SITE
- Photo Location & Direction

SOURCE OF PHOTOGRAPHY: NEARMAP

- PLOT 1 CLASS A FOREST - DOWNSLOPE 0-5
- PLOT 2 CLASS A FOREST - FLAT/UPSLOPE
- PLOT 3 CLASS B WOODLAND - DOWNSLOPE 0-5
- PLOT 4 CLASS B WOODLAND - FLAT/UPSLOPE
- PLOT 5 - CLASS D SCRUB - DOWNSLOPE 0-5
- PLOT 6 - CLASS D SCRUB - FLAT/UPSLOPE
- PLOT 7 - CLASS C SHRUBLAND - FLAT/UPSLOPE
- PLOT 8 CLASS G GRASSLAND - FLAT/UPSLOPE
- PLOT 9 EXCLUSION CLAUSE 2.2.3.2(i)
- PLOT 10 - EXCLUSION CLAUSE 2.2.3.2(e)



bushfire safety
CONSULTING

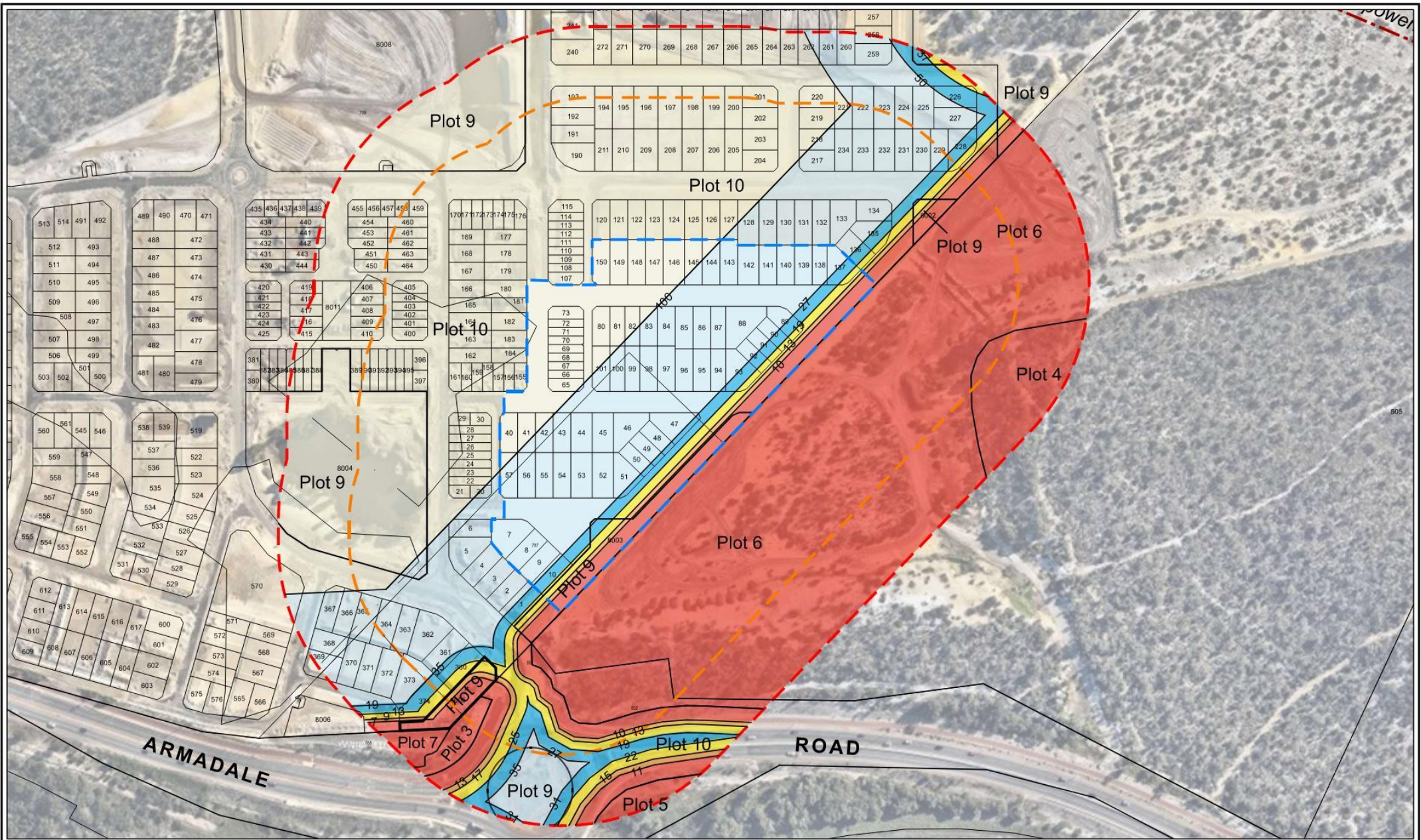
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Table 1: BAL Inputs and BAL Ratings						
Lots	Vegetation Class	Plot No.	Slope	Setback Distance		BAL Rating
				external	Internal lot	
7	Class D Scrub	6	Flat / upslope	54.6 metres		BAL-12.5
8	Class D Scrub	6	Flat / upslope	42 metres		BAL-12.5
9	Class D Scrub	6	Flat / upslope	29.5 metres		BAL-12.5
10	Class D Scrub	6	Flat / upslope	17.8 metres		BAL-29
40	Class D Scrub	6	Flat / upslope	99 metres		BAL-12.5
41	Class D Scrub	6	Flat / upslope	90.9 metres		BAL-12.5
42	Class D Scrub	6	Flat / upslope	82 metres		BAL-12.5
43	Class D Scrub	6	Flat / upslope	72.7 metres		BAL-12.5
44	Class D Scrub	6	Flat / upslope	61.8 metres		BAL-12.5
45	Class D Scrub	6	Flat / upslope	51 metres		BAL-12.5
46	Class D Scrub	6	Flat / upslope	48 metres		BAL-12.5
47 -51	Class D Scrub	6	Flat / upslope	24 metres		BAL-19
52	Class D Scrub	6	Flat / upslope	28.9 metres		BAL-12.5
53	Class D Scrub	6	Flat / upslope	38.9 metres		BAL-12.5
54	Class D Scrub	6	Flat / upslope	50.8 metres		BAL-12.5
55	Class D Scrub	6	Flat / upslope	60.7 metres		BAL-12.5
56	Class D Scrub	6	Flat / upslope	69.9 metres		BAL-12.5
57	Class D Scrub	6	Flat / upslope	78 metres		BAL-12.5
65	Class D Scrub	6	Flat / upslope	98.7 metres		BAL-12.5
66-73	Class D Scrub	6	Flat / upslope	>100 metres		BAL-LOW
80	Class D Scrub	6	Flat / upslope	>100 metres		BAL-LOW

Lot	Vegetation Class	Wind Speed (km/h)	Slope	Distance (metres)	BAL Rating
81	Class D Scrub	6	Flat / upslope	98 metres	BAL-12.5
82	Class D Scrub	6	Flat / upslope	96.5 metres	BAL-12.5
83	Class D Scrub	6	Flat / upslope	81 metres	BAL-12.5
84	Class D Scrub	6	Flat / upslope	71.8 metres	BAL-12.5
85	Class D Scrub	6	Flat / upslope	61 metres	BAL-12.5
86	Class D Scrub	6	Flat / upslope	52 metres	BAL-12.5
87	Class D Scrub	6	Flat / upslope	44.8 metres	BAL-12.5
88	Class D Scrub	6	Flat / upslope	39.6 metres	BAL-12.5
89 - 93	Class D Scrub	6	Flat / upslope	14.7 metres	BAL-29
94	Class D Scrub	6	Flat / upslope	22.6 metres	BAL-19
95	Class D Scrub	6	Flat / upslope	37.7 metres	BAL-12.5
96	Class D Scrub	6	Flat / upslope	40.7 metres	BAL-12.5
97	Class D Scrub	6	Flat / upslope	49.7 metres	BAL-12.5
98	Class D Scrub	6	Flat / upslope	59 metres	BAL-12.5
99	Class D Scrub	6	Flat / upslope	67 metres	BAL-12.5
100	Class D Scrub	6	Flat / upslope	74.7 metres	BAL-12.5
101	Class D Scrub	6	Flat / upslope	82.9 metres	BAL-12.5
147 - 150	Class D Scrub	6	Flat / upslope	>100 metres	BAL-LOW
137	Class D Scrub	6	Flat / upslope	14.7 metres	BAL-29
138	Class D Scrub	6	Flat / upslope	24.6 metres	BAL-19
139	Class D Scrub	6	Flat / upslope	32.5 metres	BAL-12.5
140	Class D Scrub	6	Flat / upslope	41 metres	BAL-12.5
141	Class D Scrub	6	Flat / upslope	50 metres	BAL-12.5

142	Class D Scrub	6	Flat / upslope	59 metres		BAL-12.5
143	Class D Scrub	6	Flat / upslope	69.7 metres		BAL-12.5
144	Class D Scrub	6	Flat / upslope	78.8 metres		BAL-12.5
145	Class D Scrub	6	Flat / upslope	88 metres		BAL-12.5
146	Class D Scrub	6	Flat / upslope	96.9 metres		BAL-12.5






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FIGURE 5
BAL CONTOUR PLAN





0 20 40 60 80 100m
 SCALE 1:2500 @ A3
 DATE: OCTOBER 2022



LEGEND:
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 ASSESSMENT AREA (150m) FROM THE EXTERNAL BOUNDARY OF THE SUBJECT SITE
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SOURCE OF PHOTOGRAPHY: NEARMAP

INDICATIVE BUSHFIRE ATTACK LEVELS

 BAL LOW
 BAL 12.5
 BAL 19
 BAL 40
 BAL FLAME ZONE



Appendix 1: Additional Information / Advisory Notes

A Bushfire Attack Level (BAL) Assessment is a means of measuring the severity of a buildings potential exposure to ember attack, radiant heat and direct flame contact from a bushfire event, and thereby determining the construction measures required for the dwelling.

The method used to determination of the BAL rating, and subsequent building construction standards, are directly referenced from Australian Standard *AS3959-2018 Construction of buildings in bushfire prone areas*.

The BAL rating is determined through the identification and assessment of the following parameters:

- Fire danger Index (FDI) rating; assumed to be FDI-80 for Western Australia
- All classified vegetation **within 100m** of the subject building
- Separation distance between the building and the classified vegetation
- Slope of the land under the classified vegetation

AS3959-2018 has six (6) levels of BAL, based on the radiant heat flux exposure to the building, and also identifies the relevant sections for building construction as detailed below;

Bushfire Attack Level (BAL)	Classified Vegetation within 100m of the site and heat flux exposure thresholds	Description of predicted bushfire attack and levels of exposure	Construction Sections (within AS3959)
BAL-LOW	See Clause 2.2.3.2	There is insufficient risk to warrant specific construction requirements	4
BAL-12.5	$\leq 12.5 \text{ kW/m}^2$	Ember attack	3 & 5
BAL-19	$> 12.5 \text{ kW/m}^2$ to $\leq 19 \text{ kW/m}^2$	Increasing levels of ember attack and burning debris ignited by windbourne embers together with increasing heat flux	3 & 6
BAL-29	$> 19 \text{ kW/m}^2$ to $\leq 29 \text{ kW/m}^2$	Increasing levels of ember attack and burning debris ignited by windbourne embers together with increasing heat flux	3 & 7
BAL-40	$> 29 \text{ kW/m}^2$ to $\leq 40 \text{ kW/m}^2$	Increasing levels of ember attack and burning debris ignited by windbourne embers together with increasing heat flux with the increased likelihood of exposure to flames	3 & 8
BAL-FZ	$> 40 \text{ kW/m}^2$	Direct exposure to flames from fire front in addition to heat flux and ember attack	3 & 9