



1530 Lion Street, Mount Helena,
Western Australia
Version 3.0
BMP No: BMP23016v3.0

Bushfire Management Plan
Proposed Development of Single Lot
Sb- Multi Lot Subdivision

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Bushfire Management Plan Coversheet

Addressing the Bushfire Protection Criteria

Site Address: 1530 Lion Street, Mount Helena, Western Australia

Site Visit: Yes No

Date of site visit: 29 July 2022

Report Author: Dwayne Griggs, WA Fire & Safety

(BMP) Bushfire Management Plan Number: BMP 23016v3.0

BMP Date: 24 April 2024

Yes No

Has the BAL been calculated by a method other than method 1 as outlined in AS3959 (tick no if AS3959 method 1 has been used to calculate the BAL)?		X
Have any of the bushfire protection criteria elements been addressed using a performance principle (tick no if only acceptable solutions have been used to address all the bushfire protection criteria elements)?		X
Is the proposal any of the following (see SPP 3.7 for definitions)?		
Unavoidable development (in BAL-40 or BAL-FZ)		X
Strategic planning proposal (including rezoning applications)		X
High risk land-use		X
Vulnerable land-use		X

Note: Only if one (or more) of the above answers in the tables is yes should the decision maker (e.g. local government or the WAPC) refer the proposal to DFES for comment.

The information provided within this bushfire management plan to the best of my knowledge is true and correct:



Dwayne Griggs, WA Fire & Safety, 24 April 2024

Document control

Report version	Purpose	Author/reviewer and accreditation details	Date submitted
1.0	2 lot subdivision	Author Dwayne Griggs BPAD40466	09 August 2022
2.0	Changes to site plan/lot layout	Author Dwayne Griggs BPAD40466	7 April 2024
3.0	Addition of a Building Envelope to lot 305	Author Dwayne Griggs BPAD40466	24 April 2024

Disclaimer

The Bushfire Management Plan prepared by WA Fire & Safety (Dwayne Griggs BPAD40466), is solely intended for the use of:

1. Current & future landowners
2. Developers & contractors engaged by the current landowners
3. Local Government Authority (LGA)

The enclosed strategies intended for the mitigation of the bushfire risk for this development are the minimum standard and the risk is assessed to the ability of the bushfire consultant and provided information from all stakeholders at the time of the accepted task.

This BMP considers the bushfire aspects of planning only and does not consider all the environmental aspects involved. A limited environmental survey has been completed and further consultation and/or approval for vegetation clearances is up to the Local Government Authority (LGA).

The setbacks and distances for the Asset Protection Zone(s) APZs should be confirmed at the time of vegetation modification for the proposed structures and after the vegetation clearance a final inspection may be required to provide a to confirm distance and issue a BAL certificate, thus ensuring the correct risk mitigation distances has been achieved, the decision for a final inspection is up to the LGA.

There is no guarantee that in the event of a bushfire that property loss will not occur, and the author has used the information provided, appropriate guidelines and due care to provide what they believe is the best possible solution to combat a relatively unpredictable fire threat.

WA Fire & Safety (Dwayne Griggs) excludes all liability for any damage, loss, injury or claim from any fire event, by the acceptance of this BMP the property owner is made aware and agrees to this exclusion of liability.

The ongoing responsibility falls on the landowner for the correct site maintenance to maintain the BAL Levels outlined inside this BMP and their continuance to mitigate the risks involved with extreme fire behaviour. The poor maintenance of vegetation, fuel loads, APZ requirements, Local government fire break notices and fire risk mitigation strategies provided within this BMP can severely impact the level of risk that a fire event can have. If the landowner believes that any factors have changed or modified the potential risk, then the bushfire consultant should be informed, and a new BMP may be required.

On submission of this BMP the landowner authorises direct contact from the LGA to the bushfire consultant for any issues, changes, or queries, contact details are below.

This Bushfire Management Plan is Valid for 3 years from the date completed.

Compliance Statement

This document has been prepared in accordance to the State Planning Policy 3.7 Planning in bushfire prone areas 2021 and the Guidelines for planning in bushfire prone areas v1.4 December 2021.

Bushfire Management Plan Author & Reviewer:
WA Fire & Safety, Maida Vale, Western Australia
Dwayne Griggs
Level 2 FPAA Accredited Practitioner
Accreditation Number: BPAD40466
Phone: 0415684681
Email Admin@wafiresafety.com.au



1.0 Introduction and Proposal Details

This BMP has been requested by the landowners for the proposed development of 1530 Lion Street, Mount Helena, Western Australia, within the LGA of the Shire of Mundaring.

The zoned rural residential lot is currently identified as inside the Bushfire Prone area. Currently this lot is in a developed state with the driveway, fuel management and firebreaks being established to an acceptable standard.

This proposed application is for a two-lot subdivision with the subject lot being split down the centre of the creating:

1. Lot 305 (north-east) of 1.0272ha keeping the established structures but with the ability to provide building envelope (BE) entirely inside the lot that achieves BAL-29 or less. and,
2. Lot 306 (north-west) of 1.0ha being not developed but with the ability to provide building envelope (BE) entirely inside the lot that achieves BAL-29 or less.

The assessed bushfire risk for the lot is extreme, BAL-29 is achievable for both lots a building envelope is also outlined for both lots.

The prescribed rating is BAL-29 or lower for the building envelope in entirety with vegetation modification only required once a dwelling is sited in either building envelope.

1.1 Site Location

The proposed development is located 6km ENE of Mundaring centre on Lion Street providing access north and south.

1.2 Aims and Objectives

The aim of this Bushfire Management Plan is to identify issues, requirements and provide bushfire risk mitigation measures for the proposed development. Aims for this site include:

- avoid increasing the threat to people, property and infrastructure
- reduce the developments vulnerability from extreme bushfire behaviour
- allow ingress and egress for fire and emergency services
- consider and minimize environmental impacts by reducing vegetation modification.

The objectives of this Bushfire Management Plan are to:

- demonstrate suitability for development
- display bushfire risk levels, fuels, vegetation types and the impact before and after
- show Bushfire management strategies recommended for the site
- demonstrate compliance with the bushfire protection criteria and the use of acceptable solutions for the site.

1.3 Document Preparation

Dwayne Griggs from WA Fire & Safety a BPAD Level 2 accredited practitioner with the Fire Protection Association of Australia has conducted the site assessment and prepared this BMP.

FIGURE 1: Copy of Site Plans

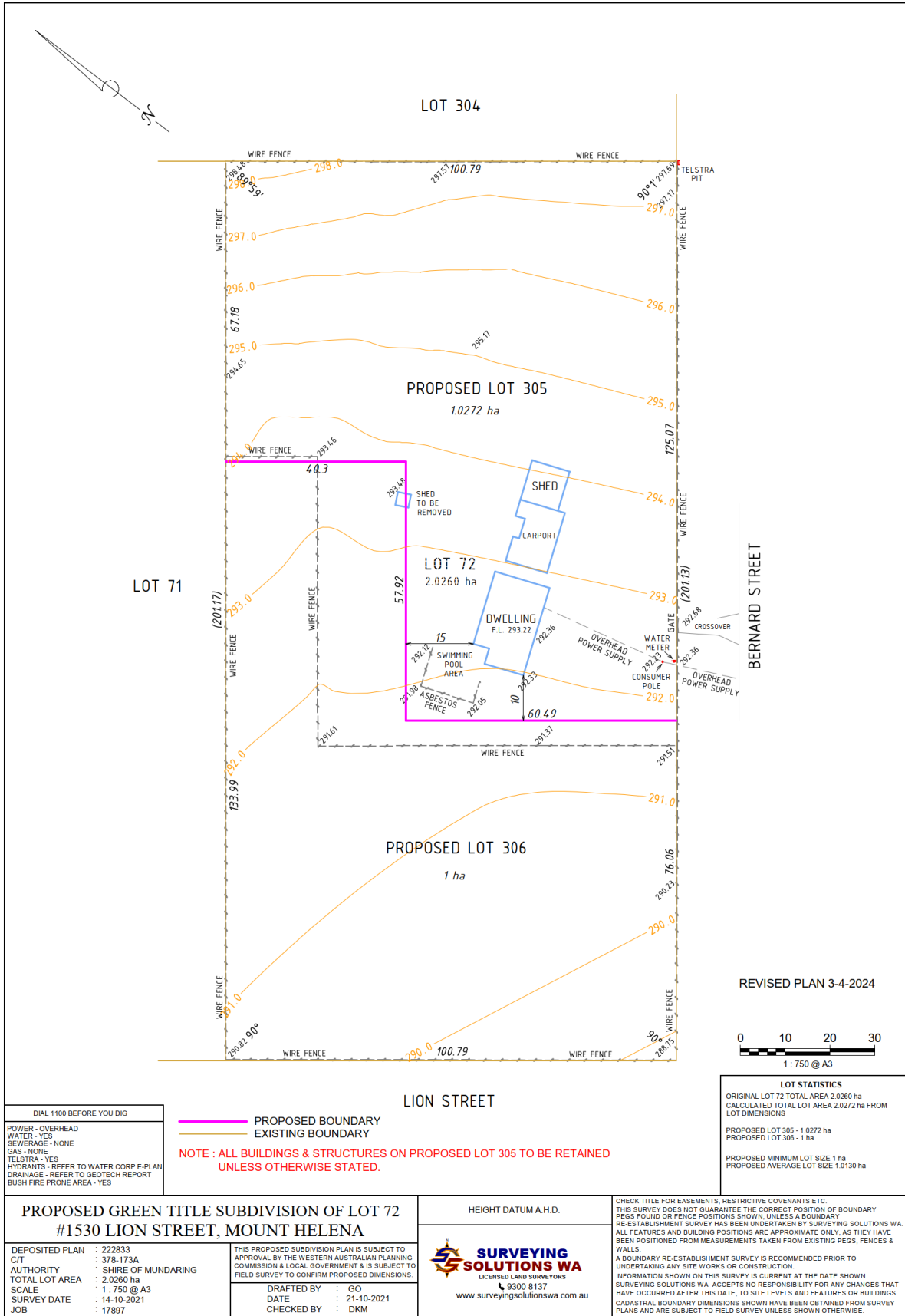
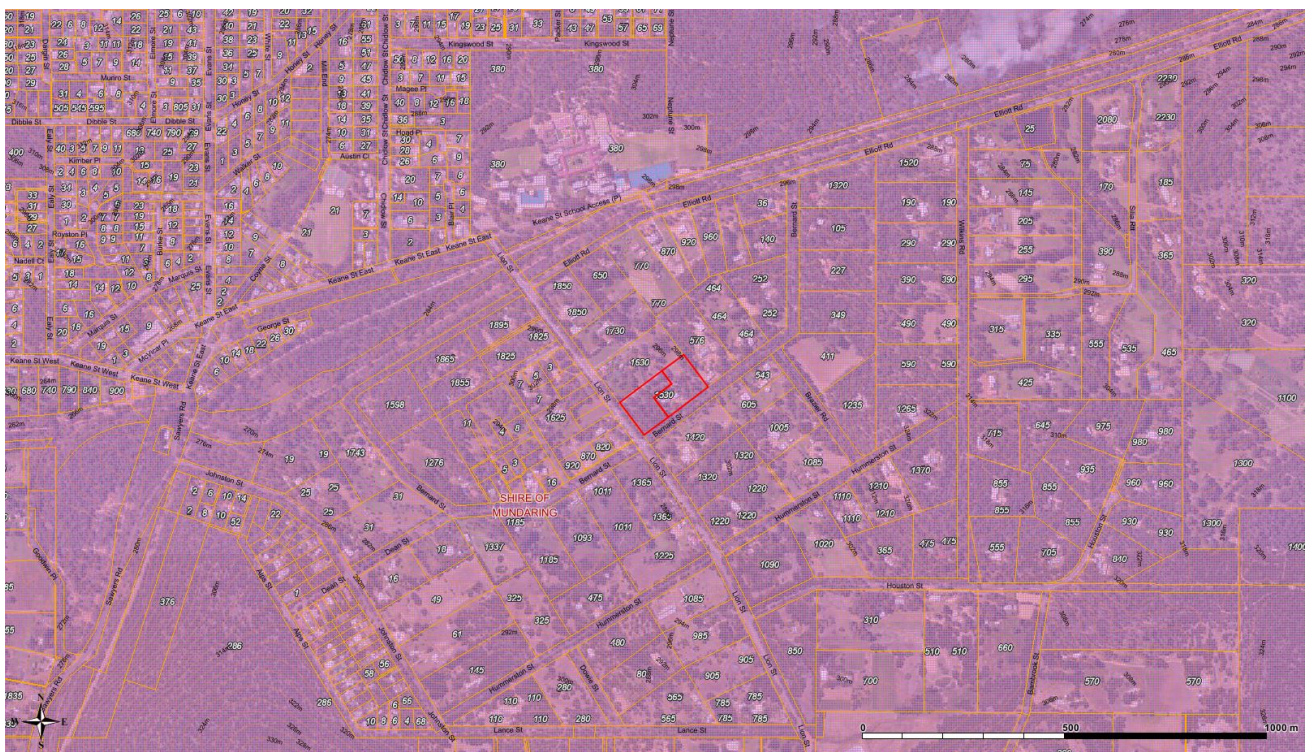


FIGURE 2: Proposed Location



FIGURE 3: Map of Bushfire Prone Areas for the subject site



Site is entirely inside the bushfire prone area.

2.0 Environmental Considerations

Limited considerations below have been assessed with no issues:

Department of Biodiversity, Conservation and Attractions (DBCA)

Conservation category wetlands and buffer **DBCA-019**,

Augusta to Walpole **DBCA-017**

RAMSAR wetlands (**DBCA-010**)

Threatened and priority flora (**DBCA-036**)-May require investigation.

Threatened Ecological Communities (**DBCA-038**)-May require investigation.

Department of Planning, Lands and Heritage

Bush Forever areas 2000 (**DPLH-019**)

Department of Water and Environmental Resources (DWER)

Clearing regulations – Environmentally Sensitive Areas (**DWER-046**)

Swan Bioplan Regionally Significant Natural Areas 2010 (**DWER-070**)

Department of Primary Industries and Regional Development (DPIRD)

Conservation Covenants Western Australia (**DPIRD-023**)-May require investigation.

2.1 Native vegetation – Modification and Clearing

No vegetation modification required in this application.

Vegetation modification will be required in future if a dwelling is sited within either Building Envelopes for lot 305 and lot 306.

2.2 Revegetation/Landscape Plans

Revegetation inside the future APZ will be designed and maintained as per the standards for APZ's (Appendix 1) and the Local Government Authority Firebreak Notice (Appendix 2)

The intent would be to minimise vegetation modification inside the subject lot and this will be considered at the building permit stage when the dwelling is sited and APZ established with a Bushfire Management Statement.

3.0 Bushfire Assessment Results

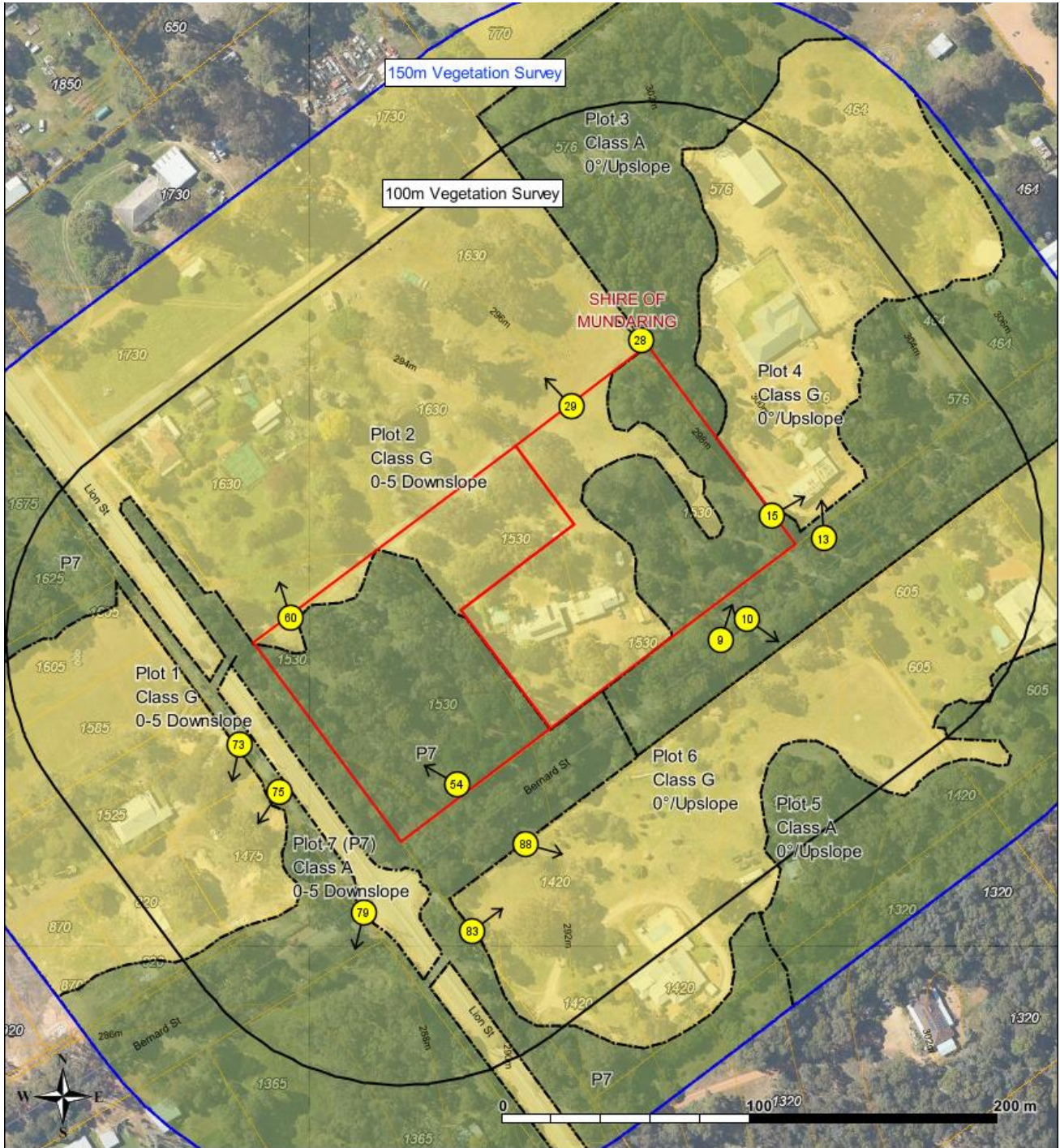
The site requires a BAL assessment in accordance with clause 6.5 of SPP 3.7. The assessment of this site or development was undertaken by Dwayne Griggs of WA Fire & Safety, a BPAD Accredited Level 2 Practitioner for the purpose of determining the Bushfire Attack Level in accordance with AS 3959 - 2018 Simplified Procedure (Method 1). All vegetation within 150m of the proposed site has been assessed and classified in accordance with AS3959.

3.1 Vegetation Classification

Vegetation and land use within 150 m of the site has been classified as per descriptions included in AS 3959 – 2018 Construction of Buildings within Bushfire Prone Areas.

All vegetation inside the 150m Vegetation survey is either Class A Forest or Class G Grassland.


FIGURE 5: Vegetation Classification Map



Legend

- | | | | | | | |
|--------------------|-------------------------------|----------------|-----------------------|-----------------------------------|--------------------|--------------------------|
| Photopoints | 100m Vegetation Survey | Lot 305 | Veg 0-150m ALL | G. Grassland, -5 | State Roads | DPIRD 2m Contours |
| | | | | | | |
| | 150m Vegetation Survey | Lot 306 | A. Forest, -5 | Local Government Authority | Other Roads | |
| | | | | | | |
| | | Lot 306 | A. Forest, 0 | | | |
| | | | | | | |

Photo ID:	73	Plot:	1
Vegetation Classification or Exclusion Clause			

<p>Class G Grassland</p>	<p>BRG: 191°S (T) POS: -31.880319, 116.221321 ±4 m ALT: 258 m</p>
<p>Description / Justification for Classification</p>	 <p>1530 Lion Street Chidlow WAFS DG 29 July 2022, 12:19:19</p>
<p>Grassland of >100mm in Height Canopy Cover of Less than 10% Understorey of Grasses Minimal surface, Near surface and Intermediate Fuel loads</p>	
<p>Photo ID: 75 Plot: 1</p>	
<p>Vegetation Classification or Exclusion Clause</p>	
<p>Class G Grassland</p>	
<p>Description / Justification for Classification</p>	







<p>Grassland of >100mm in Height Canopy Cover of Less than 10% Understorey of Grasses Minimal surface, Near surface and Intermediate Fuel loads</p> <p>Plot 7 in the distance</p>	<p>BRG: 213°S (T) POS: -31.880494, 116.22149 ±3 m ALT: 262 m</p>  <p>1530 Lion Street Chidlow WAFS DG 29 July 2022, 12:19:44</p>																				
<table border="1"> <tr> <td data-bbox="153 1099 300 1167">Photo ID:</td> <td data-bbox="300 1099 504 1167">60</td> <td data-bbox="504 1099 619 1167">Plot:</td> <td data-bbox="619 1099 754 1167">2</td> </tr> <tr> <td colspan="4" data-bbox="153 1167 754 1245">Vegetation Classification or Exclusion Clause</td> </tr> <tr> <td colspan="4" data-bbox="153 1245 754 1301">Class G Grassland</td> </tr> <tr> <td colspan="4" data-bbox="153 1301 754 1379">Description / Justification for Classification</td> </tr> <tr> <td colspan="4" data-bbox="153 1379 754 2022"> Grassland of >100mm in Height Canopy Cover of Less than 10% Understorey of Grasses Minimal surface, Near surface and Intermediate Fuel loads </td> </tr> </table>	Photo ID:	60	Plot:	2	Vegetation Classification or Exclusion Clause				Class G Grassland				Description / Justification for Classification				Grassland of >100mm in Height Canopy Cover of Less than 10% Understorey of Grasses Minimal surface, Near surface and Intermediate Fuel loads				<p>BRG: 339°NW (T) POS: -31.879856, 116.221543 ±3 m ALT: 260 m</p>  <p>1530 Lion Street Chidlow WAFS DG 29 July 2022, 12:15:41</p>
Photo ID:	60	Plot:	2																		
Vegetation Classification or Exclusion Clause																					
Class G Grassland																					
Description / Justification for Classification																					
Grassland of >100mm in Height Canopy Cover of Less than 10% Understorey of Grasses Minimal surface, Near surface and Intermediate Fuel loads																					

Photo ID:	29	Plot:	2	BRG: 318°NW (T) POS: -31.879082, 116.222751 ±3 m ALT: 268 m  <p>1530 Lion Street Chidlow WAFS DG 29 July 2022, 12:07:53</p>
Vegetation Classification or Exclusion Clause				
Class G Grassland				
Description / Justification for Classification				
Grassland of <100mm in Height Canopy Cover of Less than 10% Understorey of Grasses Minimal surface, Near surface and Intermediate Fuel loads				
Photo ID:	28	Plot:	3	
Vegetation Classification or Exclusion Clause				
Class A Forest				
Description / Justification for Classification				

<p>Overstorey 10-30m in Height Canopy Cover of More than 90% Understorey of Low Trees, Shrubs, Scrub and Grasses Moderate surface, Near surface and Intermediate Fuel loads</p>	<p>BRG: 311°NW (T) POS: -31.878841, 116.223053 ±6 m ALT: 274 m</p>  <p>1530 Lion Street Chidlow WAFS DG 29 July 2022, 12:07:16</p>																
<table border="1"> <tr> <td>Photo ID:</td> <td>9</td> <td>Plot:</td> <td>3</td> </tr> <tr> <td colspan="4">Vegetation Classification or Exclusion Clause</td> </tr> <tr> <td colspan="4">Class A Forest</td> </tr> <tr> <td colspan="4">Description / Justification for Classification</td> </tr> </table>	Photo ID:	9	Plot:	3	Vegetation Classification or Exclusion Clause				Class A Forest				Description / Justification for Classification				
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Vegetation Classification or Exclusion Clause																	
Class A Forest																	
Description / Justification for Classification																	

<p>Overstorey 10-30m in Height Canopy Cover of More than 90% Understorey of Low Trees, Shrubs, Scrub and Grasses Moderate surface, Near surface and Intermediate Fuel loads</p>	<p>BRG: 18°N (T) POS: -31.879939, 116.223395 ±4 m ALT: 262 m</p>  <p>1530 Lion Street Chidlow WAFS DG 29 July 2022, 12:03:25</p>																
<table border="1"> <tr> <td>Photo ID:</td> <td>15</td> <td>Plot:</td> <td>4</td> </tr> <tr> <td colspan="4">Vegetation Classification or Exclusion Clause</td> </tr> <tr> <td colspan="4">Class G Grassland</td> </tr> <tr> <td colspan="4">Description / Justification for Classification</td> </tr> </table>	Photo ID:	15	Plot:	4	Vegetation Classification or Exclusion Clause				Class G Grassland				Description / Justification for Classification				
Photo ID:	15	Plot:	4														
Vegetation Classification or Exclusion Clause																	
Class G Grassland																	
Description / Justification for Classification																	

<p>Grassland of >100mm in Height Canopy Cover of Less than 10% Understorey of Grasses Minimal surface, Near surface and Intermediate Fuel loads</p>	<p>BRG: 231°SW (T) POS: -31.879482, 116.223618 ±3 m ALT: 264 m</p>  <p>1530 Lion Street Chidlow WAFS-DG 29 July 2022, 12:04:57</p>																
<table border="1"> <tr> <td>Photo ID:</td> <td>13</td> <td>Plot:</td> <td>4</td> </tr> <tr> <td colspan="4">Vegetation Classification or Exclusion Clause</td> </tr> <tr> <td colspan="4">Class G Grassland</td> </tr> <tr> <td colspan="4">Description / Justification for Classification</td> </tr> </table>	Photo ID:	13	Plot:	4	Vegetation Classification or Exclusion Clause				Class G Grassland				Description / Justification for Classification				
Photo ID:	13	Plot:	4														
Vegetation Classification or Exclusion Clause																	
Class G Grassland																	
Description / Justification for Classification																	

<p>Grassland of <100mm in Height Canopy Cover of Less than 10% Understorey of Grasses Minimal surface, Near surface and Intermediate Fuel loads</p>	<p>BRG: 357°N (T) POS: -31.879566, 116.223842 ±3 m ALT: 269 m</p>  <p>1530 Lion Street Chidlow WAFS DG 29 July 2022, 12:04:23</p>																
<table border="1"> <tr> <td>Photo ID:</td> <td>10</td> <td>Plot:</td> <td>5</td> </tr> <tr> <td colspan="4">Vegetation Classification or Exclusion Clause</td> </tr> <tr> <td colspan="4">Class A Forest</td> </tr> <tr> <td colspan="4">Description / Justification for Classification</td> </tr> </table>	Photo ID:	10	Plot:	5	Vegetation Classification or Exclusion Clause				Class A Forest				Description / Justification for Classification				
Photo ID:	10	Plot:	5														
Vegetation Classification or Exclusion Clause																	
Class A Forest																	
Description / Justification for Classification																	



<p>Overstorey 10-30m in Height Canopy Cover of More than 90% Understorey of Low Trees, Shrubs, Scrub and Grasses Moderate surface, Near surface and Intermediate Fuel loads Access on property SW restricted landowner would not allow. Precautionary principal applied. Forest in distance</p>	<p>BRG: 124°SE (T) POS: -31.879861, 116.223511 ±4 m ALT: 268 m</p>  <p>1530 Lion Street Chidlow WAFS DG 29 July 2022, 12:03:37</p>																				
<table border="1"> <tr> <td>Photo ID:</td> <td>88</td> <td>Plot:</td> <td>5</td> </tr> <tr> <td colspan="4">Vegetation Classification or Exclusion Clause</td> </tr> <tr> <td colspan="4">Class A Forest</td> </tr> <tr> <td colspan="4">Description / Justification for Classification</td> </tr> <tr> <td colspan="4">Overstorey 10-30m in Height Canopy Cover of More than 90% Understorey of Low Trees, Shrubs, Scrub and Grasses Moderate surface, Near surface and Intermediate Fuel loads Access on property SW restricted landowner would not allow. Precautionary principal applied. Forest in distance</td> </tr> </table>	Photo ID:	88	Plot:	5	Vegetation Classification or Exclusion Clause				Class A Forest				Description / Justification for Classification				Overstorey 10-30m in Height Canopy Cover of More than 90% Understorey of Low Trees, Shrubs, Scrub and Grasses Moderate surface, Near surface and Intermediate Fuel loads Access on property SW restricted landowner would not allow. Precautionary principal applied. Forest in distance				<p>BRG: 105°E (T) POS: -31.880685, 116.222557 ±3 m ALT: 265 m</p>  <p>1530 Lion Street Chidlow WAFS DG 29 July 2022, 12:23:10</p>
Photo ID:	88	Plot:	5																		
Vegetation Classification or Exclusion Clause																					
Class A Forest																					
Description / Justification for Classification																					
Overstorey 10-30m in Height Canopy Cover of More than 90% Understorey of Low Trees, Shrubs, Scrub and Grasses Moderate surface, Near surface and Intermediate Fuel loads Access on property SW restricted landowner would not allow. Precautionary principal applied. Forest in distance																					

Photo ID:	88	Plot:	6	BRG: 105°E (T) POS: -31.880685, 116.222557 ±3 m ALT: 265 m
Vegetation Classification or Exclusion Clause				
Class G Grassland				
Description / Justification for Classification				
Grassland of >100mm in Height Canopy Cover of Less than 10% Understorey of Grasses Minimal surface, Near surface and Intermediate Fuel loads				1530 Lion Street Chidlow WAFS DG 29 July 2022, 12:23:10
Photo ID:	83	Plot:	6	
Vegetation Classification or Exclusion Clause				
Class G Grassland				
Description / Justification for Classification				


<p>Grassland of >100mm in Height Canopy Cover of Less than 10% Understorey of Grasses Minimal surface, Near surface and Intermediate Fuel loads</p>	<p>BRG: 52°NE (T) POS: -31.881002, 116.222325 ±3 m ALT: 262 m</p>  <p>1530 Lion Street Chidlow WAFS DG 29 July 2022, 12:21:33</p>
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Photo ID:	54	Plot:	7	
Vegetation Classification or Exclusion Clause				
Class A Forest				
Description / Justification for Classification				




<p>Overstorey 10-30m in Height Canopy Cover of More than 90% Understorey of Low Trees, Shrubs, Scrub and Grasses Moderate surface, Near surface and Intermediate Fuel loads</p>	<p>BRG: 299°W (T) POS: -31.880466, 116.222259 ±3 m ALT: 263 m</p>  <p>1530 Lion Street Chidlow WAFS DG 29 July 2022, 12:14:10</p>																				
<table border="1"> <tr> <td>Photo ID:</td> <td>79</td> <td>Plot:</td> <td>7</td> </tr> <tr> <td colspan="4">Vegetation Classification or Exclusion Clause</td> </tr> <tr> <td colspan="4">Class A Forest</td> </tr> <tr> <td colspan="4">Description / Justification for Classification</td> </tr> <tr> <td colspan="4">Overstorey 10-30m in Height Canopy Cover of More than 90% Understorey of Low Trees, Shrubs, Scrub and Grasses Moderate surface, Near surface and Intermediate Fuel loads</td> </tr> </table>	Photo ID:	79	Plot:	7	Vegetation Classification or Exclusion Clause				Class A Forest				Description / Justification for Classification				Overstorey 10-30m in Height Canopy Cover of More than 90% Understorey of Low Trees, Shrubs, Scrub and Grasses Moderate surface, Near surface and Intermediate Fuel loads				<p>BRG: 193°S (T) POS: -31.880936, 116.221855 ±4 m ALT: 256 m</p>  <p>1530 Lion Street Chidlow WAFS DG 29 July 2022, 12:20:40</p>
Photo ID:	79	Plot:	7																		
Vegetation Classification or Exclusion Clause																					
Class A Forest																					
Description / Justification for Classification																					
Overstorey 10-30m in Height Canopy Cover of More than 90% Understorey of Low Trees, Shrubs, Scrub and Grasses Moderate surface, Near surface and Intermediate Fuel loads																					

Photo ID:	85	Plot:	7	BRG: 302°W (T) POS: -31.880745, 116.222038 ±4 m ALT: 260 m
Vegetation Classification or Exclusion Clause				
Class A Forest				
Description / Justification for Classification				
Overstorey 10-30m in Height Canopy Cover of More than 90% Understorey of Low Trees, Shrubs, Scrub and Grasses Moderate surface, Near surface and Intermediate Fuel loads				1530 Lion Street Chidlow 29 July 2022, 12:22:09 WAFS DG
Photo ID:	39	Plot:	7	
Vegetation Classification or Exclusion Clause				
Class A Forest				
Description / Justification for Classification				



3.2 Slope

This site slopes downslope to the southeast.

Table 3A: Vegetation Classification and Slopes

Plot	Vegetation Classification	Effective Slope
1	Class G Grassland	0-5 Downslope
2	Class G Grassland	0-5 Downslope
3	Class A - Forest	0/Upslope
4	Class G Grassland	0/Upslope
5	Class A - Forest	0/Upslope
6	Class G Grassland	0/Upslope
7	Class A - Forest	0-5 Downslope

3.3 Fire Danger Index

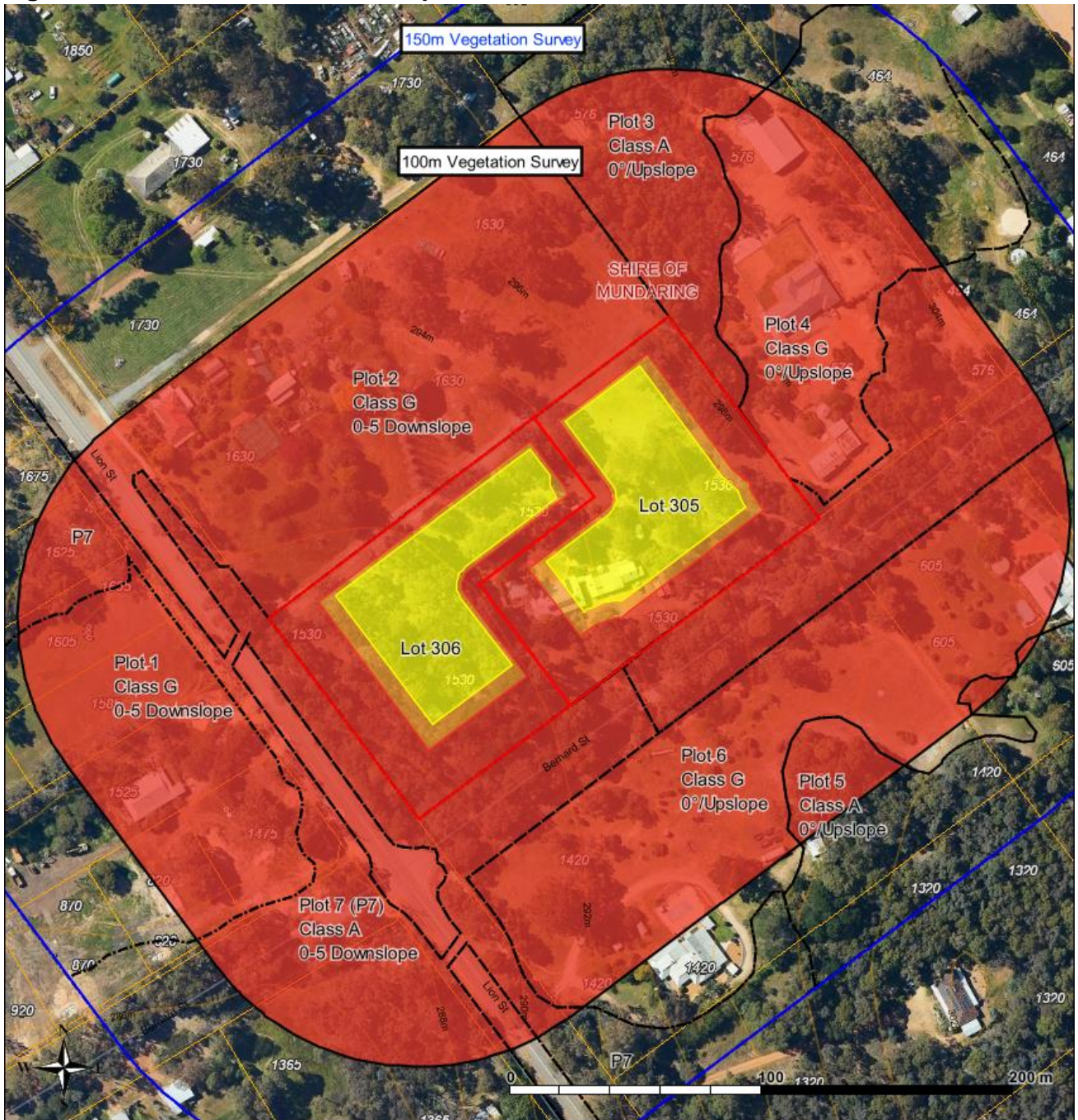
The nominated fire danger index (FDI) for Western Australia is 80

3.4 BAL- Contour Assessment

Figure 6 is a BAL Contour assessment that shows the ratings within the subject lot where the vegetation inside the lot is in a managed state, this is not what the site will be when completed and demonstrates what ratings are possible inside the subject lot.

An indicative Building envelope is also provided for the siting of any class 1a or associated class10a structures at a rating of BAL-29 or less within the proposed lots.

Figure 6: Indicative BAL Contour Map



Legend

100m Vegetation Survey 100m	Lot 305 Lot 305	veg -b A. Forest, -5 A. Forest, 0 G. Grassland, -5	Contour lot 305 306 BAL-29 BAL-40 BAL-FZ	Local Government Authority State Roads	Other Roads DPIRD 2m Contours
150m Vegetation Survey 150m	Lot 306 Lot 306				

Table 3B shows the indicative BAL contours within lot 306.

Table 3B: Indicative BAL Contour ratings

Plot	Vegetation Class	Effective Slope	Highest BAL	Lowest BAL
1	Class G Grassland	0-5 Downslope	BAL – 12.5	BAL – LOW
2	Class G Grassland	0-5 Downslope	BAL – FZ	BAL – LOW
3	Class A - Forest	0/Upslope	BAL – FZ	BAL – LOW
4	Class G Grassland	0/Upslope	BAL – LOW	BAL – LOW
5	Class A - Forest	0/Upslope	BAL – 12.5	BAL – LOW
6	Class G Grassland	0/Upslope	BAL – 12.5	BAL – LOW
7	Class A - Forest	0-5 Downslope	BAL – FZ	BAL – 12.5

Table 3C: Proposed BAL-29 Building Envelope Standoff distances.

Lot 305

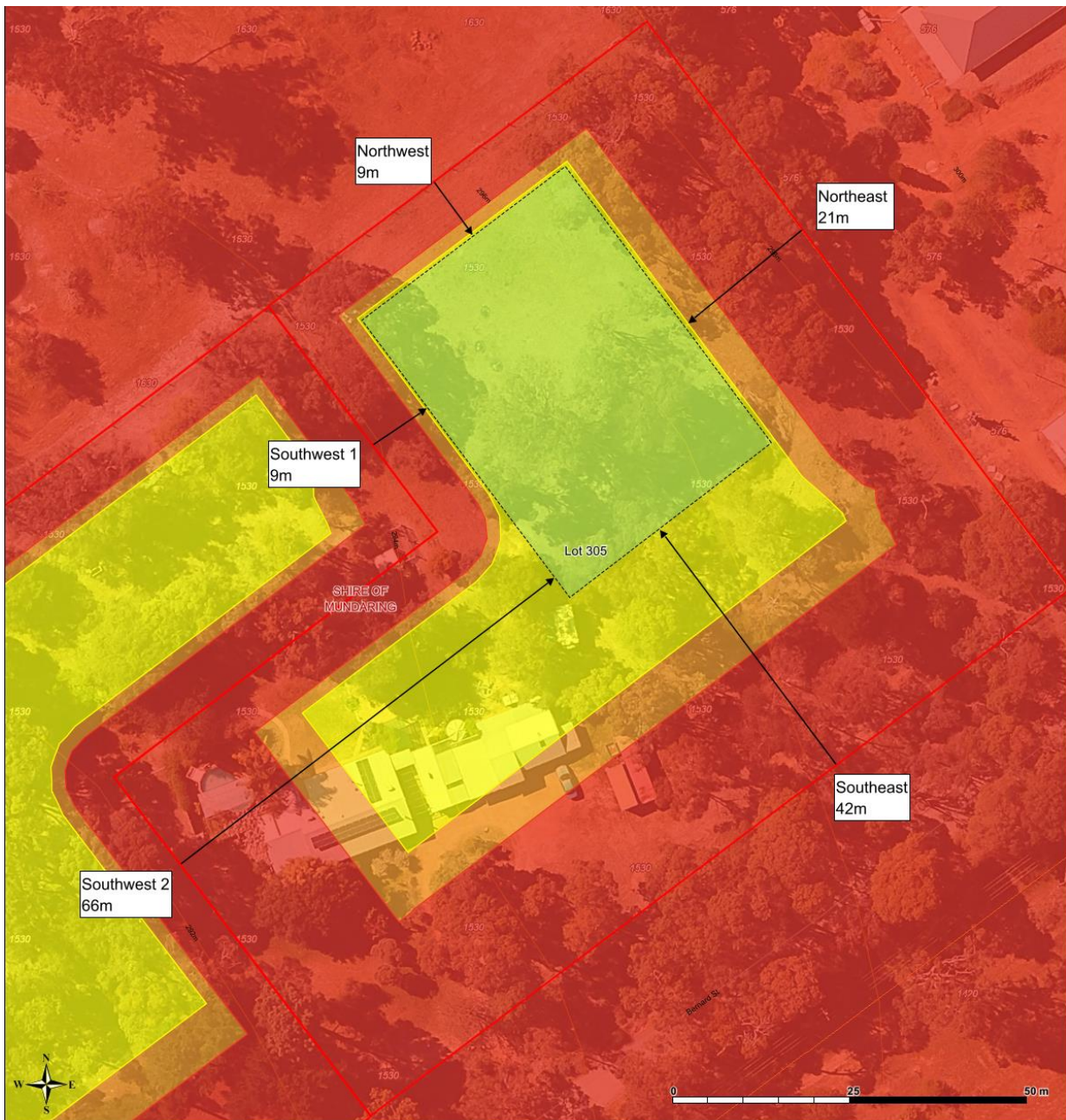
Boundary	Minimum Standoff
Northwest	9m
Northeast	21m
Southeast 1	42m
Southeast 2	66m
Southwest	9m

Lot 306

Boundary	Minimum Standoff
Northwest	9m
Northeast 1	66m
Northeast 2	9m
Southeast	41m
Southwest	27m

Figure 8 Individual Lot minimum Setback Maps (next pages)

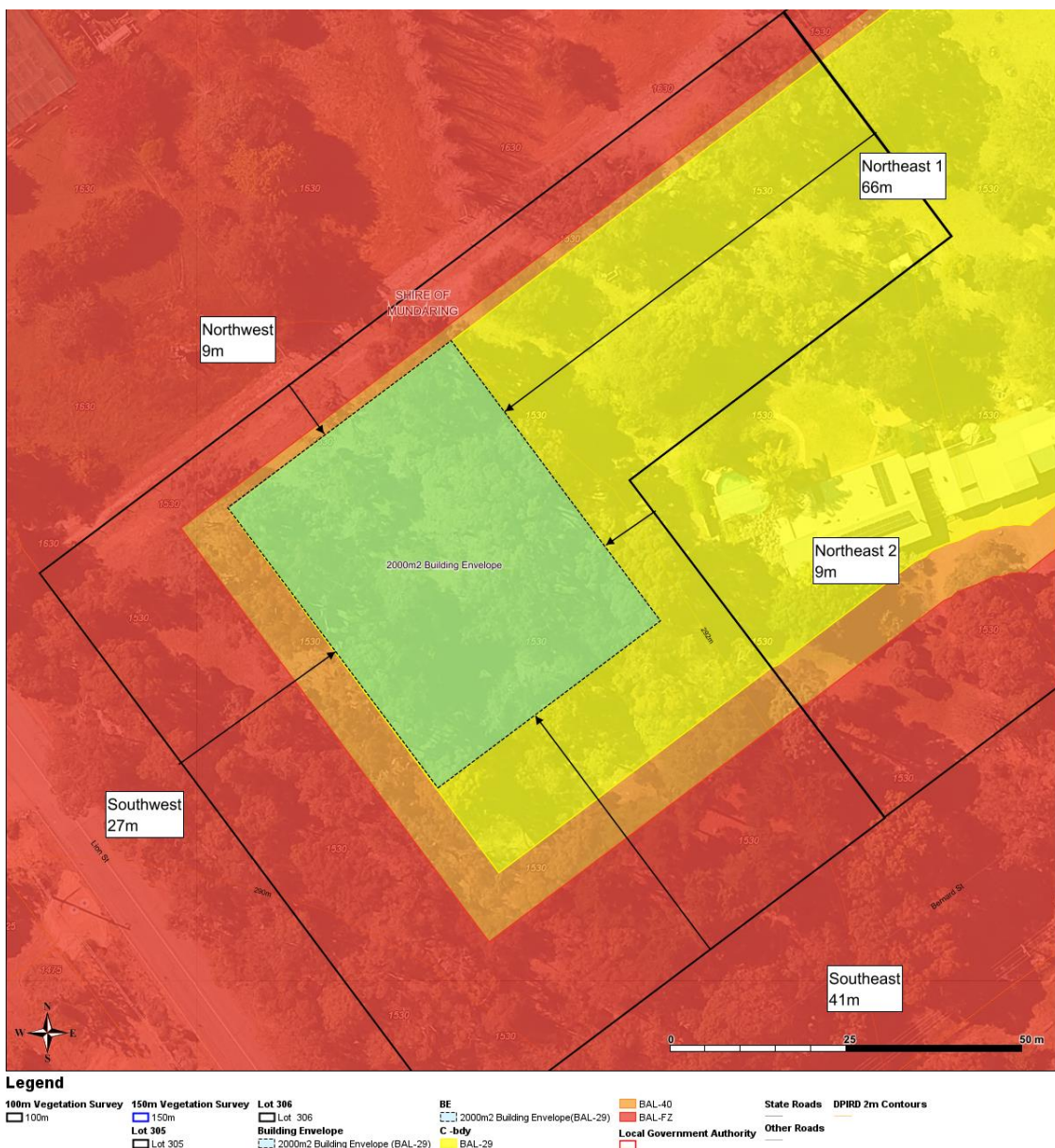
Lot 305



Legend

100m Vegetation Survey	150m Vegetation Survey	Lot 305	Lot 306	BE (305)	305	BAL-FZ	BAL-40	Local Government Authority	Other Roads
100m	150m	Lot 305	Lot 306	1800m2 Building Envelope(BAL-29)	BAL-29	BAL-FZ	BAL-40	State Roads	DPIRD 2m Contours
					306	BAL-FZ	BAL-29		

Lot 306



3.5 Additional Bushfire Hazard Issues

Below are the identified bushfire hazard issues relating to this site:

- The building envelope is bounded by class A Forest on all sides.
- Asset Protection Zones are to be established when a building permit is applied for and maintained in perpetuity to ensure the future class 1a dwelling will maintain BAL-29.
- The indicative BAL ratings are to demonstrate compliance only and will need to be established during the building process.
- As this development is above BAL-LOW the relevant bushfire protection criteria apply and will need to be addressed (section 4.0).

4.0 Compliance and Justifications

4.1 SPP 3.7 Objectives and Application of Policy Measures

The intent of *State Planning Policy (SPP) 3.7 Planning in Bushfire Prone Areas* (Department of Planning and Western Australian Planning Commission, 2015) is to ensure that bushfire risks are considered in a timely manner and that planning documents demonstrate the appropriate application of the various policy measures. Table 3 summarises the intent and objectives of SPP 3.7 and provides evidence of how the site complies.

Table 3: Evidence of compliance with SPP 3.7 intent and objectives

SPP Reference	Description	Evidence of Compliance
Intent	<ul style="list-style-type: none"> Ensure that risks associated with bushfires are planned using a risk-based approach 	<ul style="list-style-type: none"> Preparation of a bushfire management plan in accordance with SPP 3.7 BAL assessment indicates risks associated with bushland are manageable
Objective 1	<ul style="list-style-type: none"> Avoid any increase in the threat of bushfire to people, property and infrastructure 	<ul style="list-style-type: none"> BAL assessment indicates risks associated with bushland are manageable Structures within 100 m of vegetation assigned BAL-rating as per AS-3959 – 2018
Objective 2	<ul style="list-style-type: none"> Reduce vulnerability to bushfire 	<ul style="list-style-type: none"> BAL assessment indicates risks associated with bushland are manageable Structures within 100 m of vegetation assigned BAL-rating as per AS-3959 – 2018
Objective 3	<ul style="list-style-type: none"> Ensure that higher order strategic planning documents and proposals consider bushfire protection requirements at an early stage 	<ul style="list-style-type: none"> Planning at the site is largely complete, with bushfire risk being considered at an appropriate stage of the development This bushfire management plan documents the risks as they stand
Objective 4	<ul style="list-style-type: none"> Achieve an appropriate balance between bushfire risk management and biodiversity conservation 	<ul style="list-style-type: none"> Biodiversity values will remain in the surrounding bushland area Site environmental values have been considered during previous stages of the planning approvals process

4.2 Compliance table

The Bushfire protection criteria have been provided to assist in the assessment of proposed bushfire risk management measures required for development applications in bushfire prone areas. Table 4 demonstrates the Site's Compliance with Bushfire Protection Criteria.

Bushfire Management Plan – BAL Assessment

Table 4: Compliance with bushfire protection criteria

Bushfire protection criteria Intent	Acceptable solutions	Proposed bushfire management strategies/solutions
<p>Element 1: Location</p> <p>Ensure that strategic planning proposals, subdivision and development applications are located in areas with the least possible risk of bushfire to facilitate the protection of people, property and infrastructure</p>	<p>A1.1 Development location</p> <ol style="list-style-type: none"> 1. Bushfire hazard level is or on completion will be moderate or low or 2. BAL Rating is BAL-29 or lower 	<p>BAL Contour concludes and indicative BAL-29 rating is possible inside the subject lots.</p>
<p>Element 2: Siting and design</p> <p>To ensure that the siting and design of development minimises the level of bushfire impact</p>	<p>A2.1 Asset Protection Zone</p> <p>Every habitable building is surrounded by, and every proposed lot can achieve an APZ depicted on plans that meets the following:</p> <ol style="list-style-type: none"> 1. Width – bushfire radiant heat does not exceed radiant heat of 29 kW/m² (BAL-29) as measured from any external wall or supporting post or column in all circumstances 2. Location – APZ contained solely within the boundaries of the lot on which the building is situated, except in instances where the neighbouring lot(s) will be managed in a low-fuel state on an ongoing basis, in perpetuity 3. Management – the APZ is managed in accordance with the requirements of Schedule 1 ‘Standards for Asset Protection Zones’ (BMP Appendix 1) 	<p>APZ is to be established when building permit application is applied for.</p> <p>APZ’s are to be maintained in perpetuity in accordance with:</p> <ol style="list-style-type: none"> 1. Schedule 1 of the Guidelines for Planning in Bushfire Prone Areas (Appendix 1) and 2. Local Government Authority Firebreak Notice (Appendix 2).
<p>Element 3: Vehicular access</p>	<p>A3.1 Public Roads</p> <p>Minimum requirements under the acceptable solution are applicable to all proposed and existing roads.</p>	<p>The Surrounding Roads are Suitable and comply with Table 6, Column 1</p>

Bushfire protection criteria Intent	Acceptable solutions	Proposed bushfire management strategies/solutions
Vehicular access servicing a subdivision/development is available and safe during a bushfire event	<ol style="list-style-type: none"> Public Roads are to meet minimum technical requirements in Table 6, Column 1 (BMP Appendix 3) <p>SP – Strategic planning proposal and structure plan where the lot layout is not known Sb – Structure plan where the lot layout is known and subdivision application Do – Development application for any other development</p>	
	<p>A3.2a Multiple Access Routes Public road access is to be provided in two different directions to at least two different destinations with an all-weather surface (Two Way Access)</p> <ol style="list-style-type: none"> If the public road access to the subject site is via a no-through road which cannot be avoided due to demonstrated site constraints, the road access is to be a maximum of 200m from the subject lot(s) boundary to and intersection providing two way access. The no-through road may exceed 200 metres if it is demonstrated that an alternative access, including an emergency access way, cannot be provided due to site constraints and the following requirements are met: <ol style="list-style-type: none"> the no-through road travels towards a suitable destination; and the balance of the no-through road, that is greater than 200 metres from the subject site, is wholly within BAL-LOW, or is within a residential built-out area <p>SP – Strategic planning proposal and structure plan where the lot layout is not known Sb – Structure plan where the lot layout is known and subdivision application Do – Development application for any other development</p>	Fully compliant with Lion Street providing access both north and south with Bernard Street to the West.

Bushfire protection criteria Intent	Acceptable solutions	Proposed bushfire management strategies/solutions
	<p>A3.2b Emergency Access Way</p> <p>Where it is demonstrated that A3.2a cannot be achieved due to site constraints, or where an alternative design option does not exist, an emergency access way can be considered as an acceptable solution.</p> <p>An emergency access way is to meet all the following requirements:</p> <ol style="list-style-type: none"> 1. requirements in Table 6, Column 2 (BMP Appendix 3); 2. provides a through connection to a public road. 3. be no more than 500 metres in length; and 4. must be signposted and if gated, gates must open the whole trafficable width and remain unlocked. <p>SP – Strategic planning proposal and structure plan where the lot layout is not known Sb – Structure plan where the lot layout is known and subdivision application Do – Development application for any other development</p>	<p>N/A</p>
	<p>A3.3 Through Roads</p> <p>All public roads should be through-roads. No-through roads should be avoided and should only be considered as an acceptable solution where:</p> <ol style="list-style-type: none"> 1. it is demonstrated that no alternative road layout exists due to site constraints; and 2. the no-through road is a maximum length of 200 metres to an intersection providing 3. two-way access, unless it satisfies the exemption provisions in A3.2a of this table. 4. A no-through road is to meet all the following requirements: 5. requirements of a public road Table 6, Column 1 (BMP Appendix 3); and 6. turn-around area as shown in (BMP Appendix 3) <p>SP – Strategic planning proposal and structure plan where the lot layout is not known Sb – Structure plan where the lot layout is known and subdivision application</p>	<p>The Surrounding Roads are Suitable and comply with Table 6, Column 1</p>

Bushfire protection criteria Intent	Acceptable solutions	Proposed bushfire management strategies/solutions
	<p>A3.4a Perimeter roads</p> <p>A perimeter road is a public road and should be provided for greenfield or infill development where 10 or more lots are being proposed (including staged subdivision) with the aim of:</p> <ol style="list-style-type: none"> 1. Separating areas of classified vegetation under AS3959, which adjoin the subject site, from the proposed lot(s) and 2. Removing the need for battle-axe lots that back onto the areas of classified vegetation <p>A perimeter road is to meet the requirements contained in Table 6, Column 1 (BMP Appendix 3)</p> <p>A Perimeter Road may not be required where:</p> <ol style="list-style-type: none"> 1. The adjoining classified vegetation is class G 2. Lots are zoned for rural living or equivalent 3. It is demonstrated that it cannot be provided due to site constraints; or 4. All lots have frontage to an existing public road <p>SP – Strategic planning proposal and structure plan where the lot layout is not known Sb – Structure plan where the lot layout is known and subdivision application</p>	N/A
	<p>A3.4b Fire service access route (FSA)</p> <p>Where proposed lots adjoin classified vegetation under AS3959, and a perimeter road is not required in accordance with A3.4a, a FSA route can be considered as an acceptable solution to provide fire fighter access, where access is not available to the classified vegetation.</p> <p>FSA is to meet all the following requirements:</p>	N/A

Bushfire protection criteria Intent	Acceptable solutions	Proposed bushfire management strategies/solutions
	<ol style="list-style-type: none"> 1. Table 6, column 3 (BMP Appendix 3) 2. Be “through roads” with no dead ends 3. Linked to an internal road system at regular intervals, every 500 metres 4. Be signposted 5. No further than 500 metres to a public road 6. If gated, gates must open the required horizontal clearance and can be locked by the LGA or emergency services, if keys are provided for each gate 7. Have turn-around areas for 3.4 fire appliances every 500m <p>SP – Strategic planning proposal and structure plan where the lot layout is not known Sb – Structure plan where the lot layout is known and subdivision application</p>	
	<p>A3.5 Battle-axe access legs Where it is demonstrated that a battle-axe cannot be avoided due to site constraints, it can be considered as an acceptable solution.</p> <p>There are no battle-axe technical requirements where the point the battle-axe access leg joins the effective area of the lot, is less than 50 metres from a public road in a reticulated area.</p> <p>In circumstances where the above condition is not met, or the battle-axe is in a non-reticulated water area, the battle-axe is to meet all the following requirements:</p> <ol style="list-style-type: none"> 1. requirements in Table 6, Column 4; and 2. passing bays every 200 metres with a minimum length of 20 metres and a 3. minimum additional trafficable width of two metres (i.e. the combined trafficable 4. width of the passing bay and constructed private driveway to be a minimum six metres). <p>See (BMP Appendix 3 E3.5) Sb – Structure plan where the lot layout is known and subdivision application</p>	N/A

Bushfire protection criteria Intent	Acceptable solutions	Proposed bushfire management strategies/solutions
	<p>A3.6 Private Driveways There are no private driveway technical requirements where the private driveway is:</p> <ol style="list-style-type: none"> 1. within a lot serviced by reticulated water; 2. no greater than 70 metres in length between the most distant external part of the development site and the public road measured as a hose lay; and 3. accessed by a public road where the road speed limit is not greater than 70 km/h. <p>In circumstances where all of the above conditions are not met, or the private driveway is in a non-reticulated water area, the private driveway is to meet all the following requirements:</p> <ol style="list-style-type: none"> 1. Requirements in Table 6, Column 4; 2. Passing bays every 200 metres with a minimum length of 20 metres and a minimum additional trafficable width of two metres (i.e. the combined trafficable width of the passing bay and constructed private driveway to be a minimum six metres); and 3. Turn-around area as shown in (BMP Appendix 3, E3.6) and within 30 metres of the habitable building. <p>See BMP Appendix 3, E3.6</p> <p>Dd – Development application for a single dwelling, ancillary dwelling or minor development Do – Development application for any other development</p>	<p>Future compliance with A3.6 will need to be considered with the driveway design on Bernard Street when a dwelling is sited on the subject lots.</p> <p>Also see BMP Appendix 3, E3.6</p>
<p>Element 4: Water Water is available to the subdivision, development or land use to enable people, property and infrastructure to be defended from bushfire</p>	<p>A4.1 Identification of future water supply Evidence that a reticulated or sufficient non-reticulated water supply for bushfire fighting can be provided at the subdivision and/or development application stage, in accordance with the specifications of the relevant water supply authority or the requirements of Schedule 2 (BMP Appendix 4, Schedule 2).</p> <p>Where the provision of a strategic water tank(s) is required a suitable area within a road reserve or a dedicated lot the location should be identified, should be</p>	<p>N/A</p>

Bushfire protection criteria Intent	Acceptable solutions	Proposed bushfire management strategies/solutions
	<p>identified on the structure plan, to the satisfaction of the local government.</p> <p>SP – Strategic planning proposal and structure plan where the lot layout is not known</p> <p>A4.2 Provision of water for firefighting purposes Where a reticulated water supply is existing or proposed, hydrant connection(s) should be provided in accordance with the specifications of the relevant water supply authority. Where these specifications cannot be met, then the following applies:</p> <ol style="list-style-type: none"> 1. The provision of a water tank(s), in accordance with the requirements of Schedule 2 (BMP Appendix 4, Schedule 2); and 2. Where the provision of a strategic water tank(s) is applicable, then the following requirements apply: 3. land to be ceded free of cost to the local government for the placement of the tank(s); 4. the lot or road reserve where the tank is to be located is identified on the plan of subdivision. 5. tank capacity, construction, and fittings, provided in accordance with the requirements of Schedule 2(BMP Appendix 4, Schedule 2); and 6. a strategic water tank is to be located no more than 10 minutes from the subject site (at legal road speeds). <p>Where a subdivision includes an existing habitable building(s) that is to be retained, a water supply should be provided to this existing habitable building(s), in accordance with the requirements listed above.</p> <p>Sb – Structure plan where the lot layout is known and subdivision application Dd – Development application for a single dwelling, ancillary dwelling or minor development Do – Development application for any other development that is not a single dwelling, ancillary dwelling or minor development</p>	<p>20kL Dedicated (being 10kL per lot) fire water supply is required and would need to be considered at the building permit stage.</p> <p>See Appendix 4.</p>

5.0 Bushfire Management Strategies



Legend

Lot 305	Lot 306	A3.6 Private Drive >70m	Building Envelope	Building Envelope (305)	Firebreaks	Local Government Authority	State Roads	Other Roads	DPIRD 2m Contours
Lot 305	Lot 306	Driveway	2000m ² Building Envelope (BAL-29)	1800m ² Building Envelope (BAL-29)	LGA FBN 3m (w), 4m (h)				

6.0 Roles & Responsibilities

Responsibilities & implementation measure for the proposed development, these are shared by the Current and future landowners, project developer and the Local Government Authority (LGA).

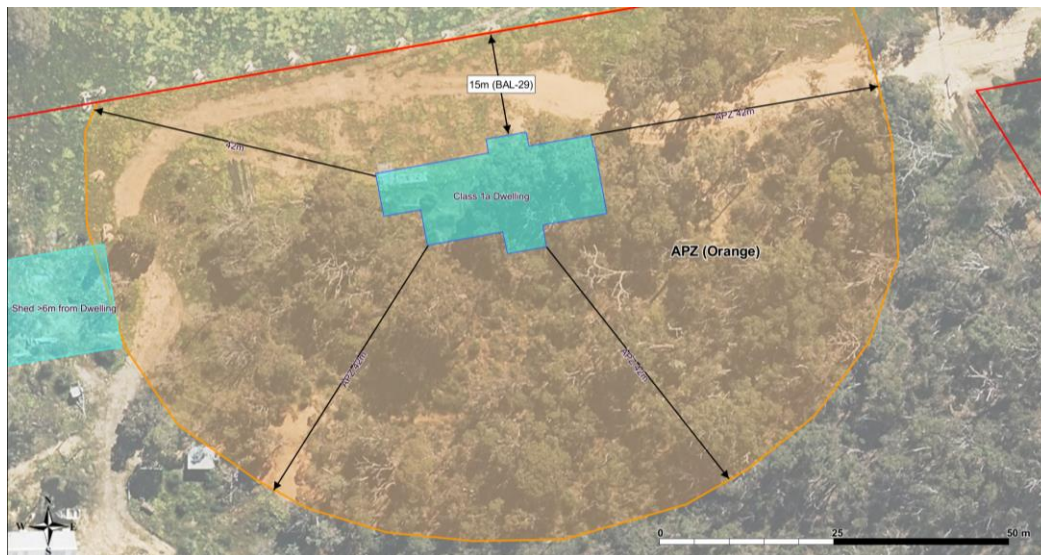
Table 5: Roles & Responsibilities

DEVELOPER/LANDOWNER/CONSULTANT – PRIOR TO USE/DISPOSAL/SALE	
No.	Implementation action
1	<p>A notification, pursuant to Section 165 of the Planning and Development Act 2005, is required to be placed on the certificate(s) of title of the proposed lot(s) with a Bushfire Attack Level (BAL) rating of 12.5 or above, advising of the existence of a hazard or other factor. Notice of this notification is to be included on the diagram or plan of survey (deposited plan). The notification is to state as follows</p> <p>“This land is within a bushfire prone area as designated by an Order made by the Fire and Emergency Services Commissioner and is/may be subject to a Bushfire Management Plan. Additional planning and building requirements may apply to development on this land.” (Western Australian Planning Commission).</p> <p>Notification placed on title <input type="checkbox"/> dated the ___ of _____ 20___ - Certified by</p>
2	Maintain the lot(s) as per the LGA firebreak notice until disposal and handover where the responsibility is transferred to the purchaser.
3	Maintain the firebreaks, defendable spaces, fuels and fully comply with the relevant Local Government Authority (LGA) annual firebreak notice issued under s33 of the Bush Fires Act 1954 to required standard in perpetuity as per Local Government Authority Firebreak Notice (Appendix 2).
4	Install dedicated fire water supply tank(s) of 10,000L per habitable dwelling as per BMP (table 4 A4.2) and the standards stated in BMP Appendix 4 Water Supply & Schedule 2.
5	A notification, pursuant to Section 165 of the Planning and Development Act 2005, is to be placed on the certificate(s) of title of the proposed lot(s) with a Bushfire Attack Level (BAL) rating of 12.5 or above, advising of the existence of a hazard or other factor.
LANDOWNER – ONGOING	
No.	Management action
1	Maintain the firebreaks, defendable spaces, fuels and fully comply with the relevant Local Government Authority (LGA) annual firebreak notice issued under s33 of the Bush Fires Act 1954 to required standard in perpetuity as per Local Government Authority Firebreak Notice (Appendix 2).
2	Maintain functionality, couplings, hard stand to 4m, accessibility and level of fire water tank as per (table 4 A4.2) and the standard stated in BMP (See Appendix 4 E4.2).
LOCAL GOVERNMENT AUTHORITY (LGA) – ONGOING MANAGEMENT	
No.	Management action
1	Inspection and issue of works orders or fines for non-compliance, this includes firebreaks, access, APZ and water supply.

Bushfire Management Plan Appendices

Appendix 1 – Information and SPP3.7, Schedule 1 - Standards for APZ's

An APZ is an area surrounding a building that is managed to reduce the bushfire hazard to an acceptable level. The width of the required APZ varies with slope and vegetation. The APZ should at a minimum be of sufficient size to ensure the potential radiant heat impact of a fire does not exceed 29kW/m² (BAL-29). It should be lot specific and will extend from the walls and supporting posts of a dwelling or any structure that is associated (<6m) from the dwelling.



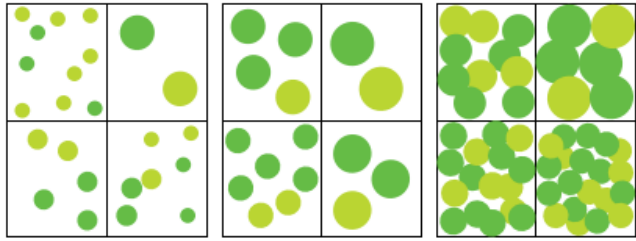
The APZ includes a defensible space which is an area adjoining the asset within which firefighting operations can be undertaken to defend the structure. Vegetation within the defensible space should be kept at an absolute minimum and the area should be free from combustible items and obstructions. The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

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 or rating of BAL-29 or less is achieved.

APZs can adversely affect the retention of native vegetation. Where the loss of vegetation is not acceptable or causes conflict with landscape or environmental objectives, such as waterway foreshore areas and wetland buffers, reducing lot yield may be necessary in order to minimise the removal and modification of remnant vegetation.

It is the responsibility of the landowner/proponent to maintain their APZ in accordance with Schedule 1 'Standards for Asset Protection Zones'. It is further recommended that maintenance of APZs is addressed through the local government firebreak notice, issued under s33 of the Bushfires Act 1954, and preferably included in a Bushfire Management Plan specifically as a how-to guide for the landowner.

SCHEDULE 1: STANDARDS FOR ASSET PROTECTION ZONES

OBJECT	REQUIREMENT
Fences within the APZ	<ul style="list-style-type: none"> Should be constructed from non-combustible materials (for example, iron, brick, limestone, metal post and wire, or bushfire-resisting timber referenced in Appendix F of AS 3959).
Fine fuel load (Combustible, dead vegetation matter <6 millimetres in thickness)	<ul style="list-style-type: none"> Should be managed and removed on a regular basis to maintain a low threat state. Should be maintained at <2 tonnes per hectare (on average). Mulches should be non-combustible such as stone, gravel or crushed mineral earth or wood mulch >6 millimetres in thickness.
Trees* (>6 metres in height)	<ul style="list-style-type: none"> Trunks at maturity should be a minimum distance of six metres from all elevations of the building. Branches at maturity should not touch or overhang a building or powerline. Lower branches and loose bark should be removed to a height of two metres above the ground and/or surface vegetation. Canopy cover within the APZ should be <15 per cent of the total APZ area. Tree canopies at maturity should be at least five metres apart to avoid forming a continuous canopy. Stands of existing mature trees with interlocking canopies may be treated as an individual canopy provided that the total canopy cover within the APZ will not exceed 15 per cent and are not connected to the tree canopy outside the APZ. <p data-bbox="587 902 1098 969">Figure 19: Tree canopy cover – ranging from 15 to 70 per cent at maturity</p>  <p data-bbox="671 1234 708 1256">15%</p> <p data-bbox="890 1234 927 1256">30%</p> <p data-bbox="1102 1234 1139 1256">70%</p>
Shrub* and scrub* (0.5 metres to six metres in height). Shrub and scrub >6 metres in height are to be treated as trees.	<ul style="list-style-type: none"> Should not be located under trees or within three metres of buildings. Should not be planted in clumps >5 square metres in area. Clumps should be separated from each other and any exposed window or door by at least 10 metres.
Ground covers* (<0.5 metres in height. Ground covers >0.5 metres in height are to be treated as shrubs)	<ul style="list-style-type: none"> Can be planted under trees but must be maintained to remove dead plant material, as prescribed in 'Fine fuel load' above. Can be located within two metres of a structure, but three metres from windows or doors if >100 millimetres in height.
Grass	<ul style="list-style-type: none"> Grass should be maintained at a height of 100 millimetres or less, at all times. Wherever possible, perennial grasses should be used and well-hydrated with regular application of wetting agents and efficient irrigation.
Defendable space	<ul style="list-style-type: none"> Within three metres of each wall or supporting post of a habitable building, the area is kept free from vegetation, but can include ground covers, grass and non-combustible mulches as prescribed above.
LP Gas Cylinders	<ul style="list-style-type: none"> Should be located on the side of a building furthest from the likely direction of a bushfire or on the side of a building where surrounding classified vegetation is upslope, at least one metre from vulnerable parts of a building. The pressure relief valve should point away from the house. No flammable material within six metres from the front of the valve. Must sit on a firm, level and non-combustible base and be secured to a solid structure.

E2 Managing an Asset Protection Zone (APZ) to a low threat state

An APZ is a low fuel area maintained around a habitable building to increase the likelihood that it will survive a bushfire, by providing a defensible space and reducing the potential for direct flame contact, radiant heat exposure and ember attack.

Vegetation management within an APZ should provide defensible space and be maintained to a low threat state, in perpetuity, in accordance with the requirements outlined in Schedule 1.

The width of an APZ varies with slope and vegetation type, however it should only be as wide as needed to ensure the potential radiant heat impact of a bushfire does not exceed $29\text{kW}/\text{m}^2$ (BAL-29), or $10\text{kW}/\text{m}^2$ where a building is identified for use as an on-site shelter. An APZ is generally not required where a building or development site achieves $29\text{kW}/\text{m}^2$ (BAL-29) or lower in its pre-development state (prior to any vegetation clearing or modification).

An APZ should include an area of defensible space immediately adjoining a building, that is kept free from combustible items and obstructions, within which firefighting operations can be undertaken to defend the structure. Where a lot contains a building envelope, it may not be necessary for the entire building envelope to achieve $29\text{kW}/\text{m}^2$ (BAL-29) as this may result in significant unnecessary clearing. It is recommended that the BMP identifies that a sufficient APZ can be accommodated within the building envelope, with the development site and associated APZ to be determined at the development approval stage.

An APZ should be contained within the boundaries of the lot on which the building is situated, except in instances where it is demonstrated that the vegetation on the adjoining land is managed in a low threat state, as per cl. 2.2.3.2 of AS 3959, such as a road, managed park, rocky outcrop or a water body.

The siting of a habitable building and associated APZ should aim to minimise the clearing of vegetation. The BMP should demonstrate that the proposed APZ has minimised the unnecessary loss of vegetation or potential for conflict with landscape or environmental objectives; and complies with environmental approvals/exemptions (where necessary). A re-design or reduction in lot yield may be necessary to minimise the removal and modification of remnant vegetation.

It is recommended that development be located on flat areas or slopes less than 20 degrees (especially where classified vegetation is located downslope to a building) and away from ridge tops, crests or narrow gullies, as bushfire can spread rapidly in these areas. Circumstances where these locations may be suitable for development to occur include where the land is already cleared, and $29\text{kW}/\text{m}^2$ (BAL-29) or lower can be achieved for the whole development site without the use of an APZ. To ensure soil stability within an APZ, vegetation removal on slopes exceeding 18 degrees is discouraged.

Fine fuel load should be maintained to less than two tonnes per hectare, however this is often a subjective assessment. Reducing fuel load levels does not necessarily require the removal of existing vegetation. A combination of methods can be utilised to reduce fuel load such as raking, weed removal, pruning, mulching and/or the removal of plant material.

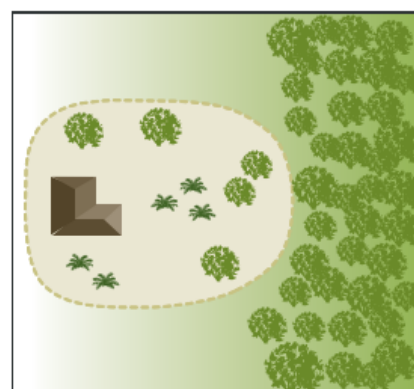
A simple method to estimate fuel load is to roughly equate one tonne of fuel load per hectare as 100 grams per square metre. For example, two tonnes per hectare of leaf litter is roughly 200 grams of leaf litter per square metre and eight tonnes per hectare is roughly 800 grams. Eucalyptus leaf litter is approximately 100 grams per handful, so two handfuls of litter per square metre will roughly equate to two tonnes per hectare. Different types of fine fuel, like mulch or pine needles may be more or less than a handful, however the 100 grams per square metre rule of thumb can still be used.

The landowner or proponent is responsible for maintaining an APZ in accordance with Schedule 1 - Standards for Asset Protection Zones. Ongoing maintenance of an APZ is usually enforced through the local government firebreak notice issued under section 33 of the *Bushfires Act 1954*, and/or through a condition of a development approval, which requires the implementation of measures identified within a BMP.

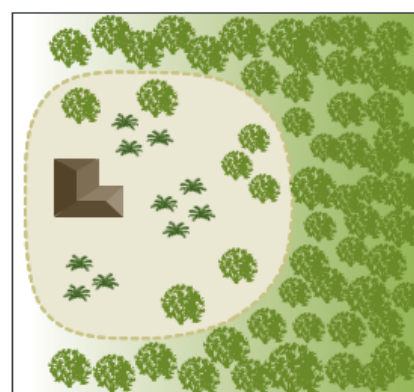
A copy of the firebreak notice and Schedule 1 should be included in a BMP specifically as a how-to guide for the landowner, and to demonstrate to decision-makers that the measures outlined in the BMP to achieve the appropriate BAL rating through provision and ongoing management of an APZ, can be implemented.

Regardless of whether an Asset Protection Zone exists in accordance with the acceptable solutions and is appropriately maintained, it should be noted that fire fighters are not obliged to protect an asset if they think the separation distance between the dwelling and vegetation is unsafe.

Hazard on one side



Hazard on three sides



Legend

- APZ
- trees
- shrubs

Figure 18: Design of Asset Protection Zone

E2 Landscaping and design of an asset protection zone

Landscaping, design, and maintenance of an APZ in a bushfire prone area can significantly improve the bushfire resilience of a building. An APZ should not be seen as an area entirely cleared of vegetation, but as a strategically designed space that gives holistic consideration to how existing or proposed vegetation or non-combustible features interact with, or affect the building's bushfire resilience.

A well designed APZ provides a greater level of vegetation management within the first few metres of a building with, for example, less vegetation or inclusion of non-combustible materials. The vegetation within the remainder of an APZ can increase further away from the building with carefully considered plant selection and landscaping techniques.

Strategic landscaping measures can be applied, such as replacing weeds with low flammability vegetation (refer to E2 Plant Flammability) to create horizontal and vertical separations between the retained vegetation. The accumulation of fine fuel load from different plants is an important consideration for ongoing maintenance in accordance with Schedule 1. For example, when planting ground covers under deciduous trees within an APZ, the total fine fuel load prescribed in Schedule 1 will include any dead plant material from ground covers and leaf litter from the trees.

Plant density and final structure and form of mature vegetation should be considered in the initial landscaping stages. For example, clumps of sapling shrubs planted at a density without consideration of future growth, may increase the bushfire risk as a clump will quickly grow to exceed 5m². It should be noted that in some cases, a single shrub in a mature state may be so dense as to fill a 5m² clump alone.

The location of plants within an APZ is a key design technique. Separation of garden beds with areas of low fuel or non-combustible material, will break up fuel continuity and reduce the likelihood of a bushfire running through an APZ and subjecting a dwelling to radiant heat or direct flame contact. It is important to note, where mature trees are separated from a building by six metres, but the canopy has grown to extend or overhang a building, maintenance and pruning to remove the overhanging branches should be undertaken without the entirety of the tree being removed.

Mulches used within the APZ should be non-combustible. The use of stone, gravel, rock and crushed mineral earth is encouraged. Wood mulch >6mm in thickness may be used, however it is recommended that it is used in garden beds or areas where the moisture level is higher by regular irrigation. These materials could be sourced from non-toxic construction and demolition waste giving the added benefit of reducing the environmental impact of any 'hard landscaping' actions.

Combustible objects, plants, garden supplies such as mulches, fences made from combustible material, should be avoided within 10 metres of a building. Vines or climbing plants on pergolas, posts or beams, should be located away from vulnerable parts of the building, such as windows and doors. Non-flammable features can be used to provide hazard separation from classified vegetation, such as tennis courts, pools, lawns and driveways or paths that use inorganic mulches (gravel or crushed rock). Consider locating firewood stacks away from trees and habitable buildings.

Incorporation of landscaping features, such as masonry feature walls can provide habitable buildings with barriers to wind, radiant heat and embers. These features can include noise walls or wind breaks. Use of Appendix F of AS 3959 for bushfire resistant timber selection within areas of 29kW/m² (BAL-29) or below, or the use of non-combustible fencing materials such as iron, brick, limestone, metal post and wire is encouraged.

In addition to regular maintenance of an APZ, further bushfire protection can be provided at any time by:

- ensuring gutters are free from vegetation;
- installing gutter guards or plugs;
- regular cleaning of underfloor spaces, or enclosing them to prevent gaps;
- trimming and removing dead plants or leaf litter;
- pruning climbing vegetation (such as vines) on a trellis, to ensure it does not connect to a building, particularly near windows and doors;
- removing vegetation in close proximity to a water tank to ensure it is not touching the sides of a tank; and/or
- following the requirements of the relevant local government section 33 fire break notice, which may include additional provisions such as locating wood piles more than 10 metres from a building.

Preparation of a property prior to the bushfire season and/or in anticipation of a bushfire is beneficial even if your plan is to evacuate. As embers can travel up to several kilometres from a bushfire and fall into small spaces and crevices or land against the external walls of a building, best practice recommends that objects within the APZ are moved away from the building prior to any bushfire event. Objects may include, but are not limited to:

- door mats;
 - outdoor furniture;
 - potted plants;
 - shade sails or umbrellas;
 - plastic garbage bins;
 - firewood stacks;
 - flammable sculptures; and/or
 - playground equipment and children's toys.
-

E2 Plant flammability

There are certain plant characteristics that are known to influence flammability, such as moisture or oil content and the presence and type of bark. Plants with lower flammability properties may still burn during a bushfire event, but may be more resistant to burning and some may regenerate faster post-bushfire.

There are many terms for plant flammability that should not be confused, including:

- Fire resistant – plant species that survive being burnt and will regrow after a bushfire and therefore may be highly flammable and inappropriate for a garden in areas of high bushfire risk.
- Fire retardant – plants that may not burn readily or may slow the passage of a bushfire.
- Fire wise – plants that have been identified and selected based on their flammability properties and linked to maintenance advice and planting location within a garden.

Although not a requirement of these Guidelines, local governments may develop their own list of fire wise or fire-retardant plant species that suit the environmental characteristics of an area. When developing a recommended plant species list, local governments should consult with ecologists, land care officers or environmental authorities to ensure the plants do not present a risk to endangered ecological communities, threatened, or endangered species or their habitat.

When selecting plants, private landholders and developers should aim for plants within the APZ that have the following characteristics:

- grow in a predicted structure, shape and height;
- are open and loose branching with leaves that are thinly spread;
- have a coarse texture and low surface-area-to-volume ratio;
- will not drop large amounts of leaves or limbs, that require regular maintenance;
- have wide, flat, and thick or succulent leaves;
- trees that have bark attached tightly to their trunk or have smooth bark;
- have low amounts of oils, waxes, and resins (which will often have a strong scent when crushed);
- do not produce or hold large amounts of fine dead material in their crowns; and/or
- will not become a weed in the area.

Appendix 2 – Local Government Authority Firebreak Notice

FIREBREAK AND FUEL LOAD NOTICE



Bush Fires Act 1954

Section 33

Notice to all owners and occupiers of land situated within the Shire of Mundaring

Pursuant to *section 33(1)* of the *Bush Fires Act 1954*, the Shire of Mundaring (the Shire) gives notice that the owners and/or occupiers of land district are required to undertake the following works on land owned or occupied by them. This must be done by 1 November each year and maintained until 31 March the year following.

DEFINITIONS WITHIN THIS NOTICE

Authorised Officer - means an employee of the Shire appointed as a Bush Fire Control Officer pursuant to the powers conferred in *section 38 of the Bush Fires Act 1954*.

Trafficable - means to be able to travel from one point to another in an emergency services vehicle on a clear surface, unhindered, without any obstruction that may endanger such vehicles. It must not terminate, lead to a dead end, or have any pinch points without provision for egress to a safe place or a cleared turnaround area of not less than an 18-metre diameter.

Inflammable Material - means any substance which will catch fire easily without contact with flames or with a low ignition point, such as but not limited to petrol or liquefied petroleum gas.

Fuel Depot / Fuel Storage Area - means an area of land, a building or a structure where fuel, i.e. (petrol, diesel, kerosene, liquid gas or any other fossil fuel) is kept in any container or vessel.

Flammable Material - means any fine fuels, plant, tree, grass, substance, object, thing or material that may or is likely to catch fire and burn or any other thing deemed by an Authorised Officer to be capable of combustion.

Vertical Clearance - means a continuous, uninterrupted vertical line at a right angle to the horizontal baseline of the firebreak to a minimum height of 4 metres from the ground.

Firebreak - means a strip or area of ground, with a minimum width of 3 metres and a vertical clearance of 4 metres, immediately inside all external boundaries of any lot and constructed to a trafficable surface that is kept and maintained totally clear of all flammable material and includes the pruning and removal of any living or dead trees, scrub or any other material encroaching onto it or into the vertical clearance of the firebreak area. Firebreaks may be constructed by one or more of the following methods: Ploughing, Cultivating, Scarifying, Raking, Burning, Chemical Spraying, Blowing or other methods as approved by an Authorised Officer

Fuel Loads

Fine Fuel Loads - means the leaf litter on the ground, including leaves, twigs (up to 6mm in diameter) and bark. A fine fuel load depth of 5mm from the top of the layer to the mineral earth beneath indicates approximately 2 tonnes per hectare. A fine fuel load depth of 15mm from the top of the layer to the mineral earth beneath indicates approximately 8 tonnes per hectare.

Coarse Fuel Loads - means branches, logs etc.

Maintaining Fuel Loads - relates to managing fuel loads described in this Notice. Reducing fuel load levels does not necessarily require the removal of existing natural vegetation. A combination of methods can be utilised, including planned burning, raking, weed removal, pruning and/or removing dead plant material.

Managed Vegetation - includes vegetation that is pruned away from buildings, under pruned to minimise contact with ground fuels, and that is kept free of dead suspended matter such as twigs, leaves and bark.

Notice to all owners and occupiers of land situated within the Shire of Mundaring

Habitable Buildings - means any building or other dwelling suitable for human residency, occupation, or use. This includes attached or adjacent structures such as garages, carports, verandas, or similar roofed structures that are attached to, or within 6 metres, of the dwelling or primary building.

Asset Protection Zone (APZ) - is an area of very low fuel levels surrounding a habitable building extending to a minimum of 20 metres out from any external walls of the building, attached structures, or adjacent structures within 6 metres of that building. On sloping ground, it shall increase at 1 metre for every degree in slope on the sides of the habitable building that are exposed to downslope natural vegetation.

1. The Land owner (or occupier) is required to do the following

1.1 All land with an area of 5000sqm up to 50,000sqm (5 Hectares) with a building on it must

- a) Maintain all grass on the land to a height no greater than 5cm
- b) Install a firebreak around all structures outside of your APZ and immediately inside all external boundaries of the land
- c) Maintain fuel loads in natural bush areas at less than 8 tonnes per hectare across the land.
- d) Maintain an APZ in line with the requirements of section 1.5 of this Notice

1.2 All land with an area of 50,000sqm or greater, with a building on it must

- a) Maintain all grass to a height no greater than 5cm for a distance of 10m from any firebreak.
- b) All other grasses within the area must be managed by slashing or effective grazing by livestock or as directed by an Authorised Officer.
- c) Install a firebreak around all structures outside of your APZ and immediately inside all external boundaries of the land.
- d) Maintain fuel loads in natural bush areas at less than 8 tonnes per hectare across the land.
- e) Maintain an APZ in line with the requirements of section 1.5 of this Notice

1.3 All land with an area of 5,000sqm or less, with a building on it must

- a) Maintain all grass on the land to a height no greater than 5cm
- b) Maintain fuel loads in natural bush areas at less than 8 tonnes per hectare across the land.
- c) Maintain an APZ in line with the requirements of section 1.5 of this Notice

1.4 All vacant land with an area less than 2000sqm

Must ensure all grass be maintained on the land to a height no greater than 5cm and that fuel loads in natural bush areas are maintained to less than 8 tonnes per hectare across the land.

All vacant land with an area more than 2000sqm must

- a) Install a firebreak immediately inside all external boundaries of the land All land with an area of less than 50,000sqm (5 Hectares), all grass must be maintained on the land to a height no greater than 5cm
- b) All land with an area of 50,000sqm (5 Hectares) or greater, the grass must be maintained on the land to a height no greater than 5cm for a distance of 10 metres from any firebreak, and all other grasses managed by slashing or effective grazing by livestock or as directed by an Authorised Officer
- c) Maintain fuel loads in natural bush areas to less than 8 tonnes per hectare across the land.

1.5 Asset Protection Zone Specification

- a) Maintain all grass on the land to a height no greater than 5cm.
- b) Fuel loads maintained at 2 tonnes per hectare or lower.

- c) Clear separation between adjoining or nearby tree crowns
- d) Small group/s of trees within close proximity to one another may be treated as one crown provided the combined crowns do not exceed the area of a large or mature crown size for that species.
- e) No trees/shrubs over 2 metres high are to be within 2 metres of a habitable building.
- f) Trees and shrubs must be under-pruned to a minimum height of 2 metres from the ground.
- g) Shrubs over 2 metres high must not be planted in groups close to habitable buildings, ensuring there is a gap of at least three times the height (at maturity) of the shrub away from habitable buildings.
- h) Ensure no part of a tree overhangs any buildings.
- i) Roofs, gutters, and walls of all buildings on the land are free of fine fuel loads and other flammable material.
- j) Ensure paths and non-flammable features immediately adjacent to habitable buildings are installed.
- k) Wood piles and flammable materials are stored a safe distance from habitable buildings.
- l) Ensure roofs, gutters, and walls of all buildings on the land are free of flammable matter, for example, the accumulation of leaves in gutters, wood piles against building walls and flammable/inflammable materials against that building or stored under pole-framed houses.

1.6 Fuel Depot /Storage Area, Haystacks / Stockpiled Flammable Material

- a) Remove all flammable material within 10 metres of where it is stored.
- b) Install a firebreak immediately adjacent to any haystacks or stockpiled flammable material

1.7 Application to vary the above Requirements/Arrangements

An application to vary any of the above requirements can be made to the Shire to implement measures in the case of geographical or environmental obstructions. This will be assessed by an Authorised Officer, and will be granted for a time period as decided by the Authorised Officer assessing your application. If approved you must still comply with the other sections of this notice. If not approved, your property must still comply with this notice. Bushfire Management Plans, Bushfire Management Statements, or Fuel Load Management Plans, approved by the Shire to reduce and mitigate fire hazards within a particular subdivision, lot or other area of land anywhere in the district, are also included.

1.8 Additional Works

- a) All driveways must be clear of flammable material and accessible to allow for the safe access and egress of emergency services vehicles as deemed by the Authorised Officer.
- b) In addition to the requirements of this Notice, you may be required to carry out further works that are considered necessary by an Authorised Officer and specified by way of a separate written notice forwarded to the address of the owner/s as shown on the Shire rates record for the relevant land.

The Shire advises that its officers, servants, workmen, contractors, vehicles, machinery, and appliances (as the officers deem fit) may carry out the requisitions of this notice that are not complied with by the date specified above, and any costs and expenses incurred may be recovered from you as the owner and/or occupier of the land.

The penalty for failing or neglecting to comply with this Notice is a fine not exceeding \$5000, and a person in default is also liable, whether prosecuted or not, to pay the costs of performing the work directed by this Notice if it is not carried out by the owner and/or occupier by the date required by this Notice.



Supplementary requirements to this notice section 24F and 24G (Restricted Burning) Burning of Garden Refuse

- a) 1 sqm piles of garden refuse may be burnt without a permit between 6 pm and 11 pm.
- b) No more than one pile of garden refuse is to be burnt at any one time.
- c) A permit to burn before 6 pm is required, and all permit conditions must be followed.
- d) One able-bodied adult person must be in attendance at all times or as specified on your permit.

The following requirements must be carried out by the responsible person in attendance

- Piles to be fully extinguished by midnight. Fully extinguished means no heat, smoke or steam, or white ash is to be present where the fire was situated.
- The persons responsible for the lighting of piles are required to check the Fire Danger Rating and weather conditions to ensure burning is allowed at that time.

If the requirements of this Notice are carried out by burning, such burning must be in accordance with the relevant provisions of the *Bush Fires Act 1954*.

By order of the Council.



Jonathan Throssell
CHIEF EXECUTIVE OFFICER

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Appendix 3 – Vehicular Access Requirements

Table 6: Vehicular access technical requirements

TECHNICAL REQUIREMENTS	1 Public roads	2 Emergency access way ¹	3 Fire service access route ¹	4 Battle-axe and private driveways ²
Minimum trafficable surface (metres)	In accordance with A3.1	6	6	4
Minimum horizontal clearance (metres)	N/A	6	6	6
Minimum vertical clearance (metres)	4.5			
Minimum weight capacity (tonnes)	15			
Maximum grade unsealed road ³	As outlined in the IPWEA Subdivision Guidelines	1:10 (10%)		
Maximum grade sealed road ³		1:7 (14.3%)		
Maximum average grade sealed road		1:10 (10%)		
Minimum inner radius of road curves (metres)		8.5		

E3.6 Private driveways

In areas serviced by reticulated water, where the road speed limit is not greater than 70 km/h, and where the distance from the public road to the further part of the habitable building is no greater than 70 metres, emergency service vehicles typically operate from the street frontage.

In the event the habitable building cannot be reached by hose reel from the public road, then emergency service vehicles will need to gain access within the property. Emergency service vehicles will also need to gain access within the property, where access to reticulated water (fire hydrants) is not possible. In these situations, the driveway and battle-axe (if applicable) will need to be wide enough for access for an emergency service vehicle and a vehicle to evacuate.

Turnaround areas should be available for both conventional two-wheel drive vehicles of residents and Type 3.4 fire appliances. Turn-around areas should be located within 30 metres of habitable buildings. Circular and loop driveway design may also be considered. Note that the design requirements for a turn-around area for a private driveway or battle-axe differ to a cul-de-sac.

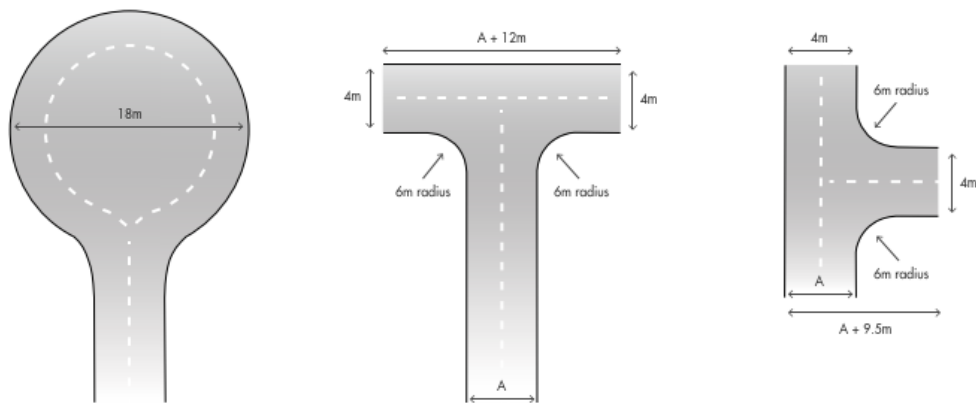


Figure 28: Design requirements for a turn-around area for a private driveway or battle-axe

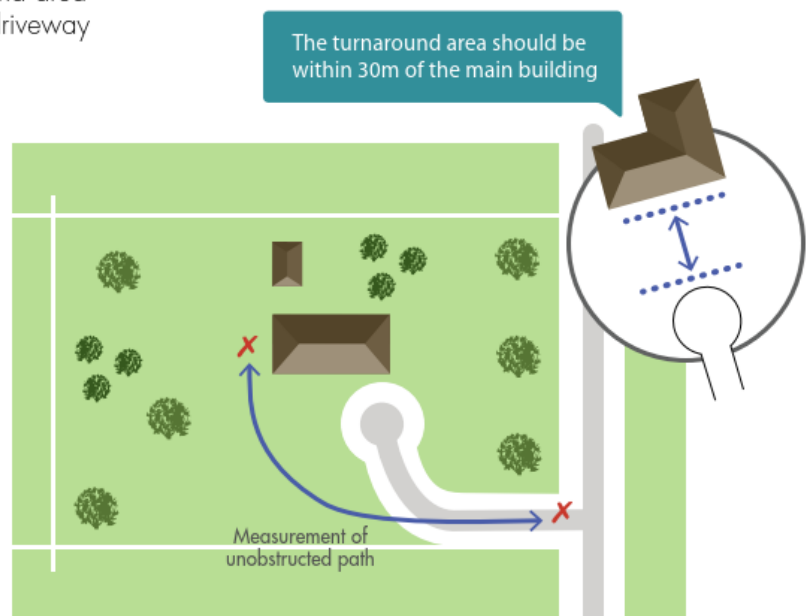
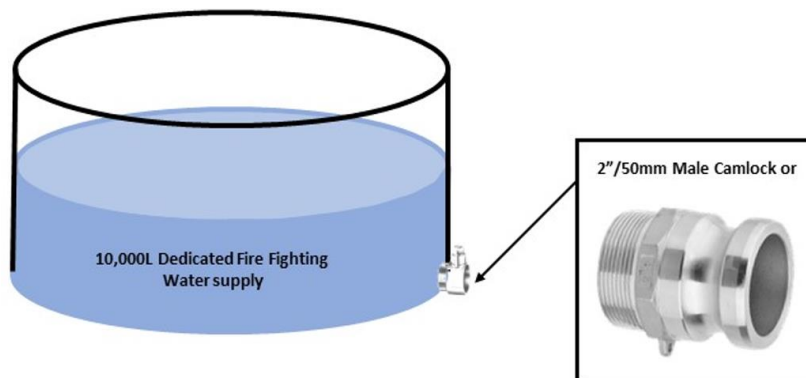


Figure 29: Design requirements for a private driveway where required under A3.6

Appendix 4 – Water Supply & Schedule 2

To ensure that water is available to enable people property and infrastructure to be defended a permanent dedicated fire water supply with:

1. Water tank with 10,000L capacity, constructed of steel or able to maintain integrity though a bushfire



2. 50mm male camlock coupling with full flow valve shielded from the bushfire hazard by facing away from the threat and towards the emergency vehicle access.
3. Having unobstructed hardened ground provided 4m from water supply point where emergency vehicles can freely move.
4. Within 50m of the dwelling and 30m from the turn around area.



Use of Water Supply:

Water supply for firefighting in the event of a bushfire can be provided on a lot for use by emergency services or for use by the landowner, if their Bushfire Survival Plan is to stay and defend their property. Water supply in the form of a dedicated standalone tank may be provided solely for use by emergency services, and/or a water supply may be provided for use by the landowner in the form of non-drinking water (garden or grey water for firefighting) or drinking water. **It is important to note, that a combined tank of drinking water and water for firefighting purposes is not recommended.** It is required to be separated in accordance with section 4.2.3 of AS/NZS 3500.1:2018.

This requirement is necessary, as stagnant water may alter the quality of the drinking water and the emergency services, by law, may not be able to take water from the water supply to suppress a bushfire.

SCHEDULE 2: WATER SUPPLY DEDICATED FOR BUSHFIRE FIREFIGHTING PURPOSES

2.1 Water supply requirements

Water dedicated for firefighting should be provided in accordance with Table 7 below, and be in addition to water required for drinking purposes.

Table 7: Water supply dedicated for bushfire firefighting purposes

PLANNING APPLICATION	NON-RETICULATED AREAS
Development application	10,000L per habitable building
Structure Plan / Subdivision: Creation of 1 additional lot	10,000L per lot
Structure Plan / Subdivision: Creation of 3 to 24 lots	10,000L tank per lot or 50,000L strategic water tank
Structure Plan / Subdivision: Creation of 25 lots or more	50,000L per 25 lots or part thereof Provided as a strategic water tank(s) or 10,000L tank per lot

2.2 Technical requirements

2.2.1 Construction and design

An above-ground tank and associated stand should be constructed of non-combustible material. The tank may need to comply with AS/NZS 3500.1:2018.

Below ground tanks should have a 200mm diameter access hole to allow tankers or emergency service vehicles to refill direct from the tank, with the outlet location clearly marked at the surface. The tank may need to comply with AS/NZS 3500.1:2018. An inspection opening may double as the access hole provided that the inspection opening meets the requirements of AS/NZS 3500.1:2018. If the tank is required under the BCA as part of fire hydrant installation, then the tank will also need to comply with AS 2419.

Where an outlet for an emergency service vehicle is provided, then an unobstructed, hardened ground surface is to be supplied within four metres of any water supply.

2.2.2 Pipes and fittings

All above-ground, exposed water supply pipes and fittings should be metal. Fittings should be located away from the source of bushfire attack and be in accordance with the applicable section below, unless otherwise specified by the local government.

2.2.2.1 Fittings for above-ground water tanks:

- Commercial land uses: 125mm Storz fitting; or
- Strategic water tanks: 50mm or 100mm (where applicable and adapters are available) male camlock coupling with full flow valve; or
- Standalone water tanks: 50mm male camlock coupling with full flow valve; or
- Combined water tanks: 50mm male camlock coupling with full flow valve or a domestic fitting, being a standard household tap that enables an occupant to access the water supply with domestic hoses or buckets for extinguishing minor fires.

2.2.2.2 Remote outlets

In certain circumstances, it may be beneficial to have the outlet located away from the water supply. In such instances in which a remote outlet is to be used, the applicant should consult the local government and DFES on their proposal.