



Bushfire Management Plan:
Subdivision: Lot 9500 Kingsway, Darch

Swancolt Pty Ltd.

DOCUMENT TRACKING

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Project Number	21PER-20736
Project Manager	Daniel Panickar
Prepared by	Daniel Panickar (BPAD Level 3 – 37802) and Stephen Moore
Reviewed by	Daniel Panickar (BPAD Level 3 – 37802)
Approved by	Daniel Panickar (BPAD Level 3 – 37802)
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1. Introduction

1.1 Proposal details

Eco Logical Australia (ELA) was commissioned by Swancolt Pty Ltd. to prepare a Bushfire Management Plan (BMP) to support a subdivision application for Lot 9500 Kingsway, Darch (hereafter referred to as the subject site, Figure 1). The proposed development will result in an intensification of land use and involves the development of 24 residential lots, a Public Open Space (POS) area and a childcare centre (Figure 2).

The subject site is within a designated bushfire prone area as per the *Western Australia State Map of Bush Fire Prone Areas* (DFES 2019; Figure 3), which triggers bushfire planning requirements *under State Planning Policy 3.7 Planning in Bushfire Prone Areas* (SPP 3.7; Western Australian Planning Commission (WAPC) 2015) and reporting to accompany submission of the development application in accordance with the associated *Guidelines for Planning in Bushfire Prone Areas v 1.3* (the Guidelines; WAPC 2017).

The subject site is located in the City of Wanneroo and is primarily zoned 'Urban Development under the City of Wanneroo District planning Scheme No. 2 (DPS 2). The southern portion of the subject site (south of future Hampton Road is zoned 'Conservation' under DPS 2 and is where the future POS area is located (Figure 2).

This assessment has been prepared by ELA Principal Bushfire Consultant Daniel Panickar (FPAA BPAD Level 3 Certified Practitioner No. BPAD37802) and Bushfire Consultant Stephen Moore.

1.2 Purpose and application of the plan

The primary purpose of this BMP is to act as a technical supporting document to inform planning assessment. This BMP is also designed to provide guidance on how to plan for and manage the bushfire risk to the subject site through implementation of a range of bushfire management measures in accordance with the Guidelines.

The proposed childcare centre within the subject site associated is categorised as a vulnerable land use due to the activities planned on site and the definitions within the Guidelines. These land uses typically trigger additional bushfire reporting requirements under SPP 3.7, however on completion of development, the proposed childcare centre will be situated >100 m from bushfire hazards and therefore is not considered bushfire prone. Consequently, no additional bushfire reporting requirements addressing this land use are required.

1.3 Environmental considerations




SPP 3.7 policy objective 5.4 recognises the need to consider bushfire risk management measures alongside environmental, biodiversity and conservation values.

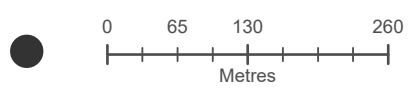
The subject site has been previously cleared, resulting in no existing native vegetation on site.

It has been assumed that the proposed POS area in the south of the subject site will be landscaped such that it represents low threat vegetation similar to the POS area south-west of the subject site within Appleby Park (refer to section 2.1).



Figure 1: Site Overview

-  Subject site
-  100m site assessment
-  150m site assessment



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SUBDIVISION CONCEPT PLAN

Lot 9500 Kingsway, DARCH

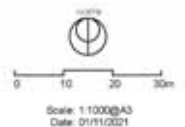


Figure 2: Site Plan

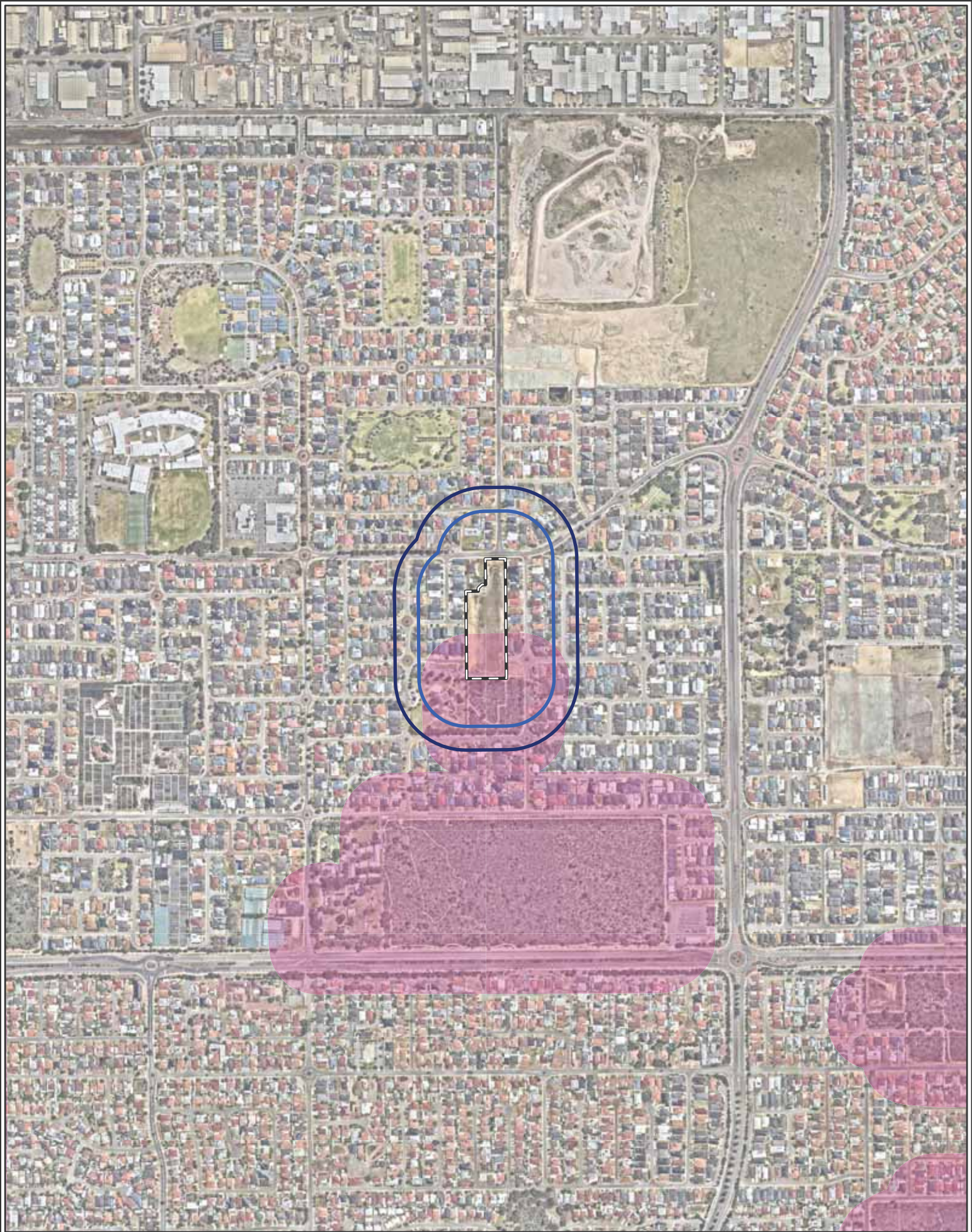






Figure 3: Bushfire Prone Areas

-  Subject site
-  100m site assessment
-  150m site assessment
-  Bushfire Prone Mapping (DFES 2019)



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2. Bushfire assessment results

2.1 Bushfire assessment inputs

The following section is a consideration of spatial bushfire risk and has been used to inform the bushfire assessment in this report.

2.1.1 Fire Danger Index

A blanket Fire Danger Index (FDI) 80 is adopted for Western Australia, as outlined in Australian Standard AS 3959: 2018 *Construction of Buildings in Bushfire Prone Areas* (SA 2018) and endorsed by Australasian Fire and Emergency Service Authorities Council (AFAC).

2.1.2 Vegetation classification and slope under vegetation

Vegetation and effective slope (i.e. slope under vegetation) within the subject site and surrounding 150 m (the assessment area) were assessed in accordance with the Guidelines and AS 3959: 2018 with regard given to the *Visual guide for bushfire risk assessment in Western Australia* (DoP 2016). Site assessment was undertaken on 29 November 2021.

The classified vegetation and effective slope for the proposed development from each of the identified vegetation plots are identified below in Table 1 and Figure 4.

Table 1: Classified vegetation as per AS 3959: 2018

Plot	Vegetation Classification	Effective Slope
1	Class D Scrub	All upslopes and flat land (0 degrees)
2	Class C Shrubland	All upslopes and flat land (0 degrees)
3	Excluded AS 3959: 2018 2.2.3.2 (e) & (f)	-

Photographs relating to each area and vegetation type are included in Appendix A.

The proposed POS area will be used for a mixture of active open space and drainage. For the purposes of this assessment, it has been assumed that the POS area will resemble managed parkland within Appleby Park to the west (i.e. low threat vegetation) as shown in Appendix A.

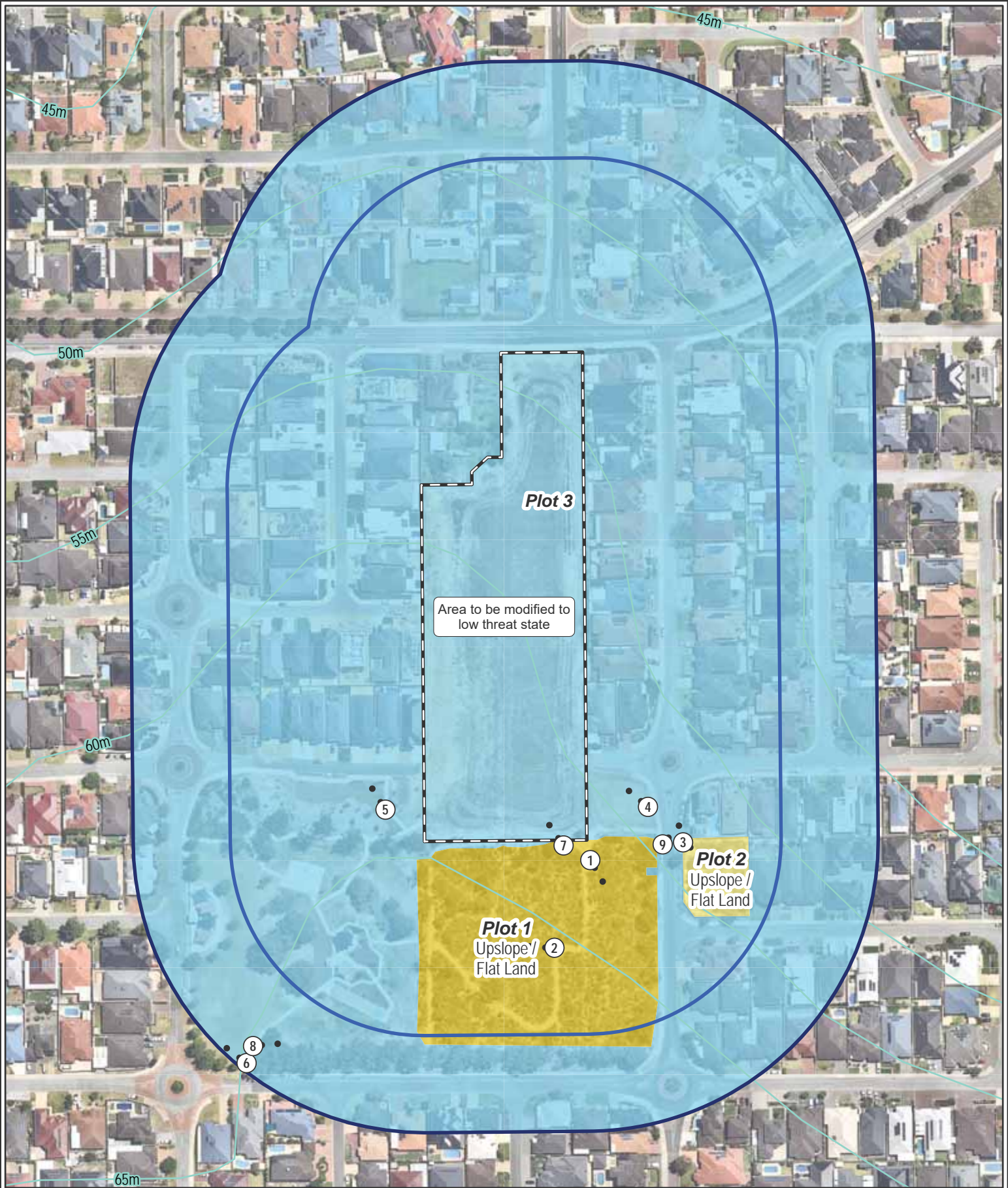
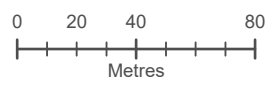


Figure 4: Vegetation Classification

- Subject site
- 100m site assessment
- 150m site assessment
- Contour (5m)
- Photo location

- Vegetation classification**
- Class C shrubland
 - Class D scrub
 - Excluded as per clause 2.2.3.2 (e) and (f)



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2.2 Bushfire assessment outputs

A Bushfire Attack Level (BAL) assessment has been undertaken in accordance with SPP 3.7, the Guidelines, AS 3959: 2018 and the bushfire assessment inputs in Section 2.1.

2.2.1 BAL assessment

All land located within 100 m of the classified vegetation depicted in Figure 4 is considered bushfire prone and is subject to a BAL assessment in accordance with AS 3959: 2018.

A Method 1 BAL assessment (as outlined in AS 3959: 2018) has been completed for the proposed development and incorporates the following factors:

- Fire Danger Index (FDI) rating;
- Vegetation class;
- Slope under classified vegetation; and
- Distance between proposed subdivision and the classified vegetation.

Based on the identified BAL, construction requirements for future buildings can then be assigned. The BAL rating gives an indication of the expected level of bushfire attack (i.e. radiant heat flux, flame contact and ember penetration) that may be received by proposed buildings and subsequently informs the standard of construction required to increase building survivability.

2.2.2 Method 1 BAL assessment

Table 2 and Figure 5 display the Method 1 BAL assessment (in the form of BAL contours) that has been completed for the proposed subdivision in accordance with AS 3959: 2018 methodology.

Table 2: Method 1 BAL calculation (BAL contours)

Plot and vegetation classification	Effective slope	Hazard separation distance	BAL rating	Comment
Plot 1 Class D Scrub	All upslopes and flat land (0 degrees)	0-<10	BAL-FZ	No development proposed in this area
		10-<13	BAL-40	No development proposed in this area
		13-<19	BAL-29	No development proposed in this area
		19-<27	BAL-19	No development proposed in this area
		27-<100	BAL-12.5	Development proposed in this area
Plot 2 Class C Shrubland	All upslopes and flat land (0 degrees)	0-<7	BAL-FZ	No development proposed in this area
		7-<9	BAL-40	No development proposed in this area
		9-<13	BAL-29	No development proposed in this area
		13-<19	BAL-19	No development proposed in this area
		19-<100	BAL-12.5	Development proposed in this area
Plot 4 Excluded AS 3959: 2018 2.2.3.2 (e) & (f)		N/A		

Based on the site assessment inputs and BAL assessment, all proposed lots within the subject site have BAL ratings \leq BAL-12.5.

The proposed childcare centre within the subject site is located >100 m from classified vegetation and has a BAL rating of BAL-LOW, therefore no further bushfire planning reporting is required for this aspect of the proposed development.

2.3 Identification of issues arising from the BAL assessment

Should there be any changes in development design or vegetation/hazard extent that requires a modified bushfire management response, then the above BAL ratings will need to be reassessed for the affected areas and documented in a brief addendum to this BMP.

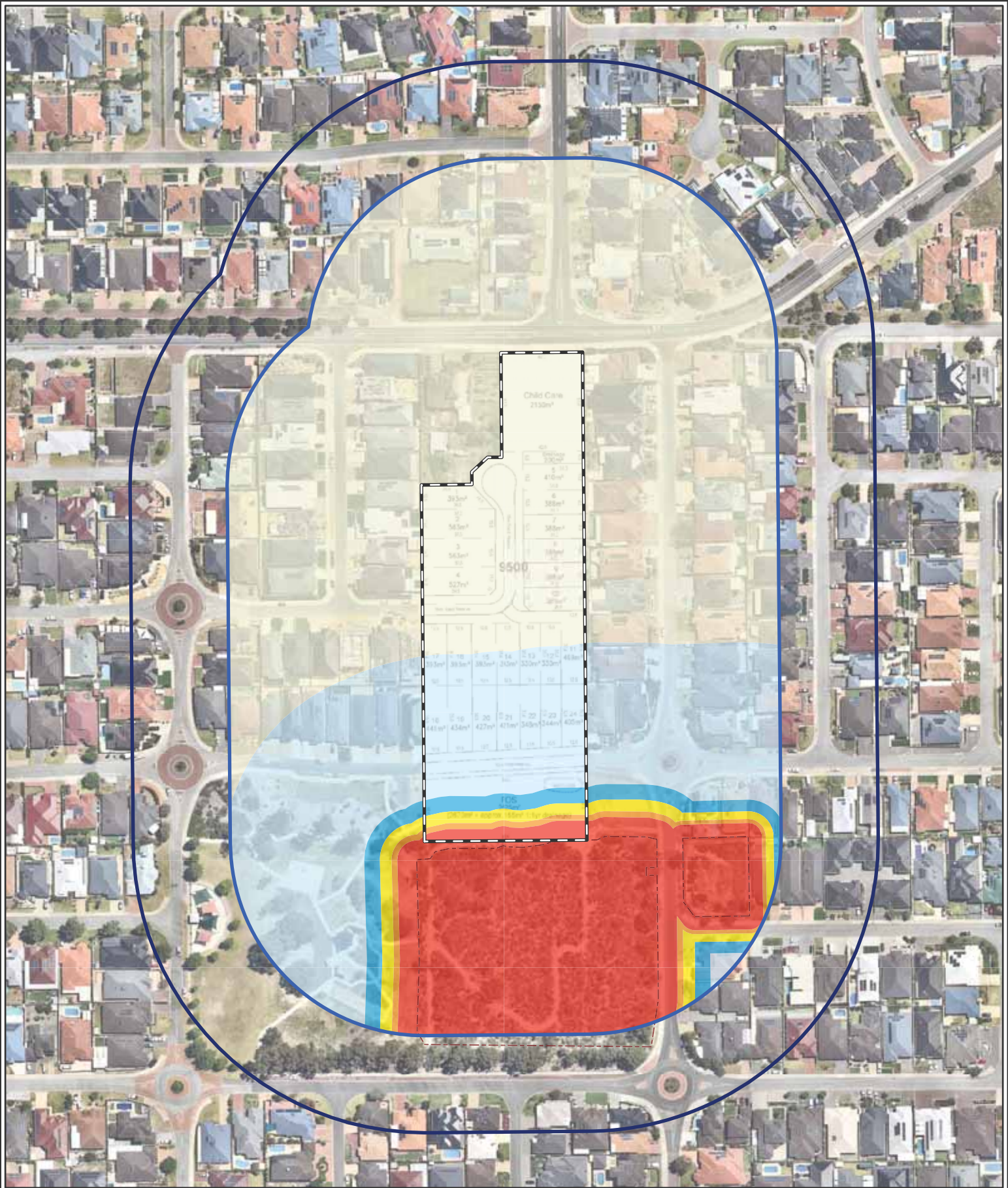











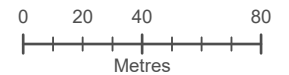


Figure 5: Bushfire Attack Level (BAL) Contours

-  Subject site
-  100m site assessment
-  150m site assessment
-  Lot boundary
-  Bushfire hazard interface

Bushfire Attack Level (BAL)

-  BAL - FZ
-  BAL - 40
-  BAL - 29
-  BAL - 19
-  BAL - 12.5
-  BAL - LOW



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3. Assessment against the Bushfire Protection Criteria

3.1 Compliance

The proposed subdivision is required to comply with policy measures 6.2 and 6.4 of SPP 3.7 and the Guidelines. Implementation of this BMP is expected to meet objectives 5.1-5.4 of SPP 3.7.

In response to the above requirements of SPP 3.7 and the Guidelines, bushfire risk management measures, as outlined, have been devised for the proposed subdivision in accordance with Guideline acceptable solutions to meet compliance with bushfire protection criteria.

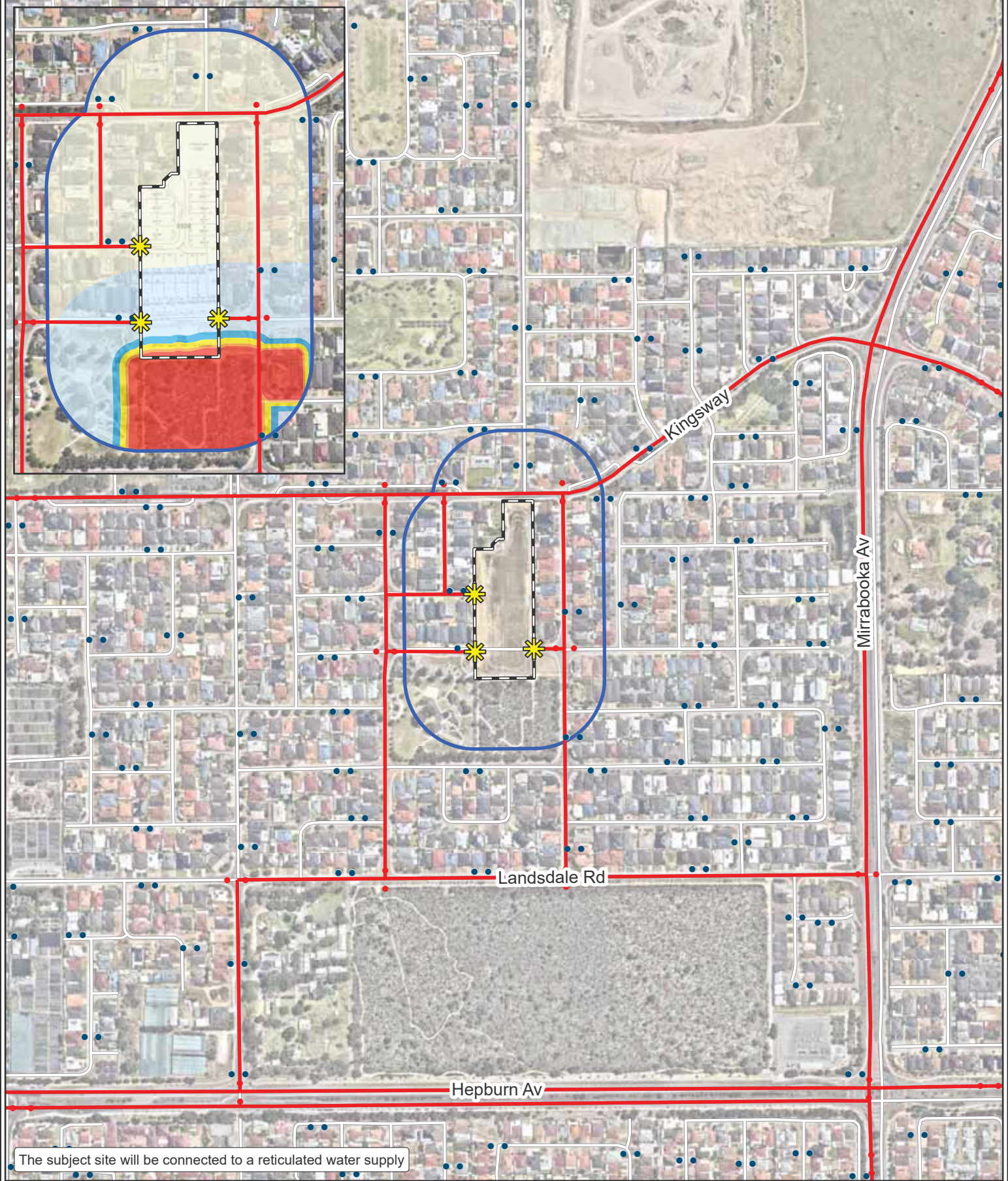
Table 3 outlines the Acceptable Solutions (AS) that are relevant to the proposal and summarises how the intent of each Bushfire Protection Criteria has been achieved. No Performance Solutions (PS) have been proposed for this proposal. These management measures are depicted in Figure 6 where relevant.

Table 3: Summary of solutions used to achieve bushfire protection criteria

Bushfire Protection Criteria	AS	PS	N/A	Comment
Element 1: Location A1.1 Development location	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	All proposed lots within the subject site will be located in an area subject to BAL ratings of ≤BAL-29 (Figure 5; Figure 6). The proposed development is considered to be compliant with A1.1.
Element 2: Siting and design of development A2.1 Asset Protection Zone (APZ)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	The proposed residential lots within the subject site are located within areas subject to BAL ratings ≤BAL-12.5. The proposed lots will be separated from classified vegetation by a 13 m wide road reserve and a proposed POS area (maintained in a low threat state). No APZs are required.
Element 3: Vehicular access A3.1 Two access routes	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Three access routes to/from the subject site are available (Figure 6). All roads are public roads and comply with requirements outlined in the Guidelines (Appendix B). The proposed development is considered to be compliant with A3.1.
A3.2 Public road	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	All public roads proposed within the subject site will comply with the requirements in the Guidelines (Appendix B). The proposed development is considered to be compliant with A3.2.
A3.3 Cul-de-sac	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	One cul-de-sac is proposed as part of this subdivision. However, this cul-de-sac is in an area subject to BAL-LOW (i.e. not bushfire prone) and does not need to comply with the Guidelines.
A3.4 Battle-axe	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No battle axe lots are proposed.

Bushfire Protection Criteria	AS	PS	N/A	Comment
A3.5 Private Driveway longer than 50 m	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No private driveways longer than 50 m are proposed.
A3.6 Emergency Access way	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No emergency access way is required.
A3.7 Fire-service access routes	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No fire service access routes are required or proposed.
A3.8 Firebreak width	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The subject site will be maintained in accordance with the current City of Wanneroo Firebreak Notice.
Element 4: Water				The subject site will be connected to a reticulated water supply.
A4.1 Reticulated areas	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The proposed development is considered to be compliant with A4.1. A4.2 and A4.3 are not applicable to this proposed development.
A4.2 Non-Reticulated areas	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Reticulated water is present within the area.
A4.3 Individual Lots within non-reticulated areas	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Reticulated water is present within the area.

NOTE – AS- ACCEPTABLE SOLUTION, PS- PERFORMANCE SOLUTION, N/A- NOT APPLICABLE



The subject site will be connected to a reticulated water supply

Figure 6: Spatial representation of the bushfire management strategies

Subject site	Access point	Bushfire Attack Level (BAL)	0 65 130 260 Metres
Lot boundary	Access / egress route	BAL - FZ	
100m site assessment	Hydrant	BAL - 40	Datum/Projection: GDA 1994 MGA Zone 50
150m site assessment		BAL - 29	Project: 20736-RD Date: 30/11/2021
		BAL - 19	
		BAL - 12.5	
		BAL - LOW	

4. Implementation and enforcement

Implementation of the BMP applies to the developer, future owners within the subject site and the local government to ensure bushfire management measures are adopted and implemented on an ongoing basis. A summary of the bushfire management measures described in Section 3, as well as a works program, is provided in Table 4. These measures will be implemented to ensure the ongoing protection of life and property assets is achieved. Timing and responsibilities are also defined to assist with implementation of each measure.

Table 4: Proposed work program

No	Bushfire management measure	Responsibility
Prior to issue of Titles		
1	Ensure proposed lots are located outside of areas subject to BAL-FZ and BAL-40 as per the design in Figure 6.	Developer
2	Clear all vegetation within the subject site.	Developer
3	Ensure POS is landscaped such that it resembles low threat vegetation and non-vegetated areas as per clause 2.2.3.2 of AS 3959: 2018.	Developer
4	Provide reticulated water supply to all lots and hydrants in accordance with Water Corporation 'No. 63 Water Reticulation Standard'.	Developer
5	Place Section 165 Notification on Title for all lots within Bushfire Prone Areas.	Developer
6	Construct road network as per plan in Figure 6.	Developer
Prior to occupancy		
7	Ensure no classified vegetation exists within the subject site.	Developer / City of Wanneroo (in public reserve)
8	Construct future buildings to relevant construction standard in AS 3959: 2018.	Developer
Ongoing management		
9	Ensure no classified vegetation exists within the subject site.	Owners / City of Wanneroo (in public reserve)

5. Conclusion

In the author's professional opinion, the bushfire protection requirements listed in this assessment provide an adequate standard of bushfire protection for the proposed subdivision. As such, the proposed subdivision is consistent with the aim and objectives of SPP 3.7 and associated guidelines and is recommended for approval.

6. References

Department of Fire and Emergency Services (DFES), 2019, *Map of Bush Fire Prone Areas*, [Online], Government of Western Australia, available from: <http://www.dfes.wa.gov.au/regulationandcompliance/bushfireproneareas/Pages/default.aspx>

Department of Planning (DoP), 2016, *Visual guide for bushfire risk assessment in Western Australia*. DoP, Perth.

Standards Australia (SA), 2018, *Construction of buildings in bushfire-prone areas, AS 3959-2018*. SAI Global, Sydney.

Western Australian Planning Commission (WAPC), 2015, *State Planning Policy 3.7 Planning in Bushfire Prone Areas*. WAPC, Perth.

Western Australian Planning Commission (WAPC), 2017, *Guidelines for Planning in Bushfire Prone Areas Version 1.3 (including appendices)*, WAPC, Perth.

Western Australian Planning Commission (WAPC), 2019, *A guide to developing a Bushfire Emergency Evacuation Plan, October 2019*.

Appendix A – Classified Vegetation Photos

Plot	Classification or Exclusion Clause	Class D Scrub
1	<p>Photo Point 1</p> <p>Classified vegetation within this plot is comprised of shrubs >2 m high with greater than 30% foliage cover. Vegetation is predominantly comprised of <i>Banksia</i>, <i>Xanthorrhoea</i>, <i>Acacia</i> and other species common to the Spearwood Dune System.</p> <p>Slope under the vegetation has been assessed as Upslope/ flat land.</p>	
1	<p>Photo Point 2</p> <p>Classified vegetation within this plot is comprised of shrubs >2 m high with greater than 30% foliage cover. Vegetation is predominantly comprised of <i>Banksia</i>, <i>Xanthorrhoea</i>, <i>Acacia</i> and other species common to the Spearwood Dune System.</p> <p>Slope under the vegetation has been assessed as Upslope/ flat land.</p>	
2	<p>Photo Point 3</p> <p>Classified vegetation within this plot is primarily comprised of exotic grasses within a fenced drainage basin. There are scattered <i>Adenanthos</i> shrubs present <2 m in height and given the unmanaged nature of this area, ELA has adopted a conservative classification of Class C shrubland for this plot.</p> <p>Slope under the vegetation has been assessed as Upslope/ flat land.</p>	

Plot 3 Classification or Exclusion Clause Excluded AS 3959: 2018 2.2.3.2 (e) & (f)

Photo Point 4

This plot has been excluded under clause 2.2.3.2 (e) & (f) of AS 3959: 2018.

This area represents managed grass within Appleby Park (south-east of the subject site).



Plot 3 Classification or Exclusion Clause Excluded AS 3959: 2018 2.2.3.2 (e) & (f)

Photo Point 5

This plot has been excluded under clause 2.2.3.2 (e) & (f) of AS 3959: 2018.

This area represents managed grass and landscaping within Appleby Park (south-west of the subject site).



Plot 3 Classification or Exclusion Clause Excluded AS 3959: 2018 2.2.3.2 (e) & (f)

Photo Point 6

This plot has been excluded under clause 2.2.3.2 (e) & (f) of AS 3959: 2018.

This area represents managed grass within Appleby Park (south-west of the subject site).



Plot 3 Classification or Exclusion Clause Excluded AS 3959: 2018 2.2.3.2 (e) & (f)

Photo Point 7

This plot has been excluded under clause 2.2.3.2 (e) & (f) of AS 3959: 2018.

This area is the currently unmanaged grassland and firebreaks within the subject site that will be cleared for development.



Plot 3 Classification or Exclusion Clause Excluded AS 3959: 2018 2.2.3.2 (e) & (f)

Photo Point 8

This plot has been excluded under clause 2.2.3.2 (e) & (f) of AS 3959: 2018.

This area represents managed parkland within Appleby Park (south-west of the subject site).



Plot 3 Classification or Exclusion Clause Excluded AS 3959: 2018 2.2.3.2 (e) & (f)

Photo Point 9

This plot has been excluded under clause 2.2.3.2 (e) & (f) of AS 3959: 2018.

This area is comprised of surrounding existing residential development.



Appendix B - Vehicular access technical requirements (WAPC 2017)

Technical requirements	Public road	Cul-de-sac	Private driveway	Emergency access way	Fire service access route
Minimum trafficable surface (m)	6*	6	4	6*	6*
Horizontal distance (m)	6	6	6	6	6
Vertical clearance (m)	4.5	N/A	4.5	4.5	4.5
Maximum grade <50 m	1 in 10	1 in 10	1 in 10	1 in 10	1 in 10
Minimum weight capacity (t)	15	15	15	15	15
Maximum crossfall	1 in 33	1 in 33	1 in 33	1 in 33	1 in 33
Curves minimum inner radius	8.5	8.5	8.5	8.5	8.5
* Refer to E3.2 Public roads: Trafficable surface					

