

Bushfire Management Plan:
Development Application: Service Station, Lot 1
(1369) and Lot 1 (1351) Wanneroo Road, Wanneroo

LP WA No6 Pty Ltd

DOCUMENT TRACKING

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Template 2.8.1

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v1	Draft – Submission to client
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1. Introduction

1.1 Proposal details

Eco Logical Australia (ELA) was commissioned by LP WA No6 P/L (Liberty) to prepare a Bushfire Management Plan (BMP) to support a development application for Lot 1 (1369) and Lot 1 (1351) Wanneroo Road, Wanneroo (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 a service station.

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 currently zoned as Urban under the Metro Regional Scheme and lies within the Drover Place Central Precinct. The site is currently undergoing staged development with the subject site and surrounding land cleared and partially developed ready for the construction of new development.

This assessment has been prepared by ELA Senior Bushfire Consultant Alex Aitken (FPAA BPAD Level 2 Certified Practitioner No. BPAD37739) with quality assurance undertaken by Principal Bushfire Consultants Daniel Panickar (FPAA BPAD Level 3 Certified Practitioner No. BPAD37802).

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.

High risk land uses may expose the community, fire fighters and the environment to dangerous, uncontrolled substances during a bushfire event. High risk land uses may include, but are not limited to service stations, landfill sites, bulk storage of hazardous materials, fuel depots and certain heavy industries as well as military bases, power generating land uses, saw-mills, highways and railways.

Planning and development applications that incorporate proposals for non-residential, high-risk land uses in bushfire prone areas are to comply with policy measure 6.6 which requires a Bushfire Management Plan jointly endorsed by the local government and the Department of Fire and Emergency Services. In most instance the requirement of the bushfire risk management plan should be incorporated into the proposed site management plans.

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.

No revegetation is proposed within the development and landscaping will be maintained in a low-threat state.

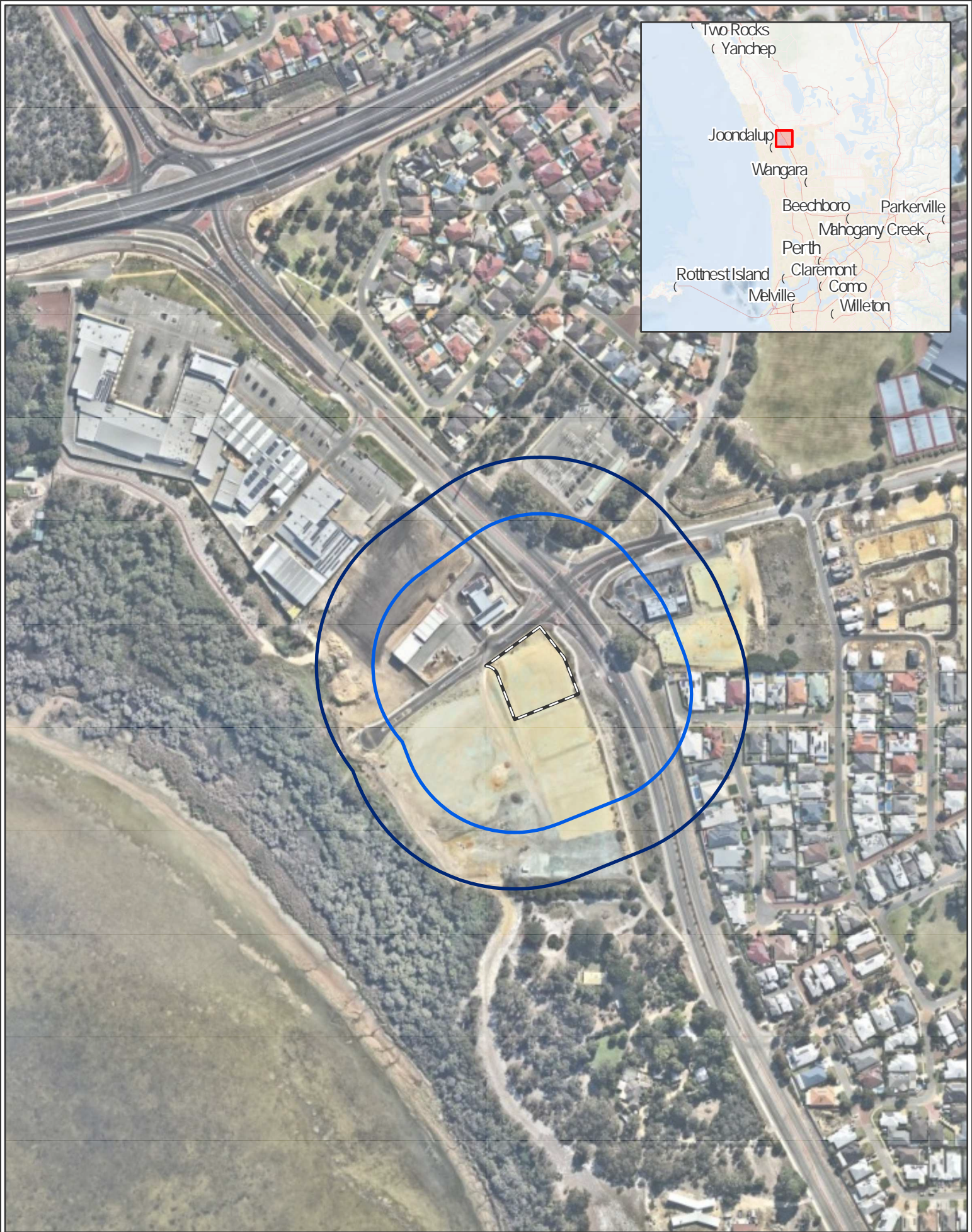



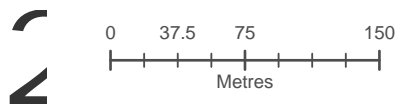


Figure 1: Site Overview

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



Datum/Projection:
GDA 1994 MGA Zone 50
Project: 1933-DD Date: 9/09/2021



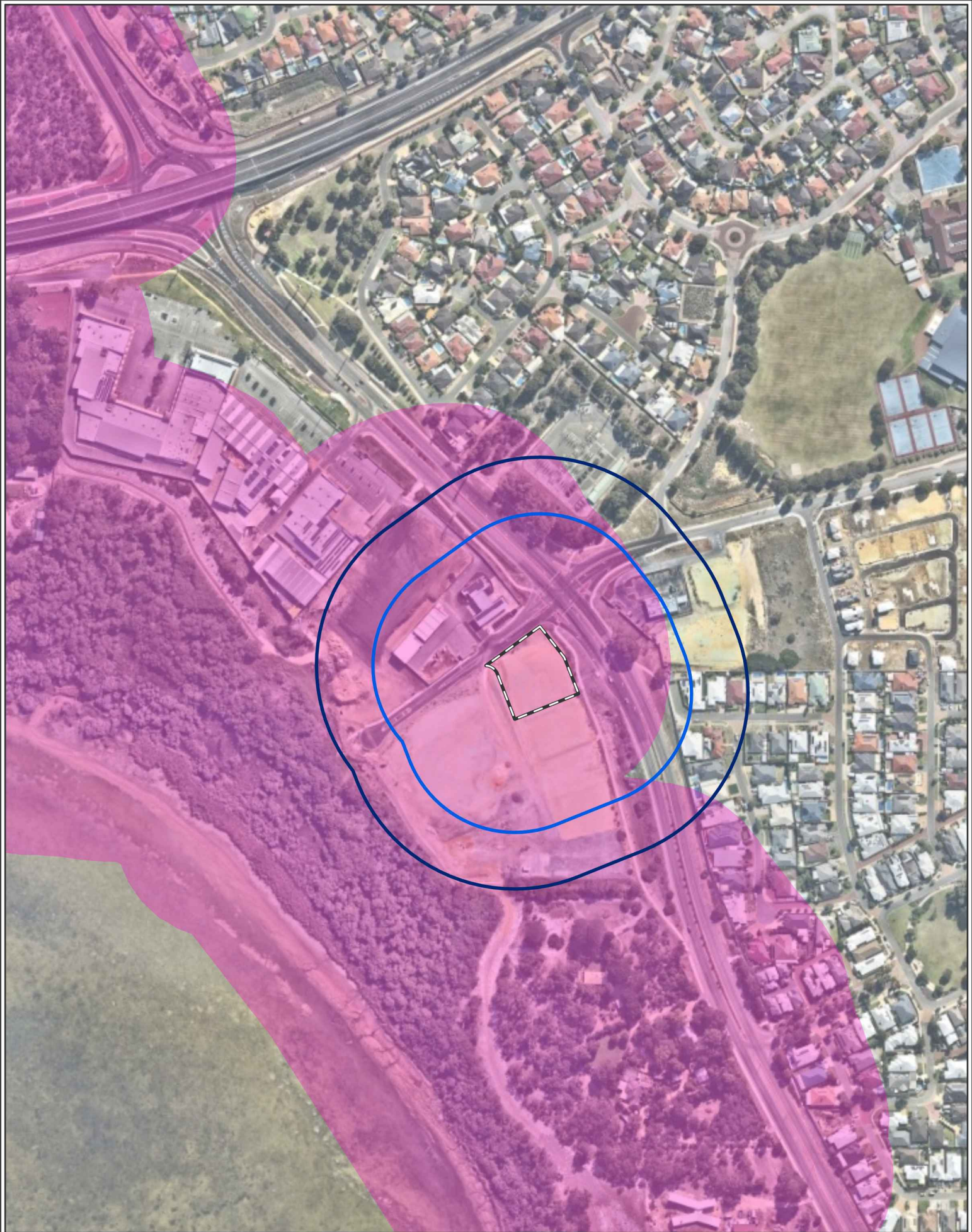




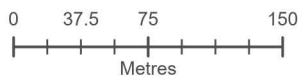


Figure 3: Bushfire Prone Areas

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



Datum/Projection:
GDA 1994 MGA Zone 50
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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 23 August 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 A Forest	All upslopes and flat land (0 degrees)
2	Class A Forest	Downslope >0 to 5 degrees
3	Class G Grassland	All upslopes and flat land (0 degrees)
4	Excluded AS 3959: 2018 2.2.3.2 (e)	-

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

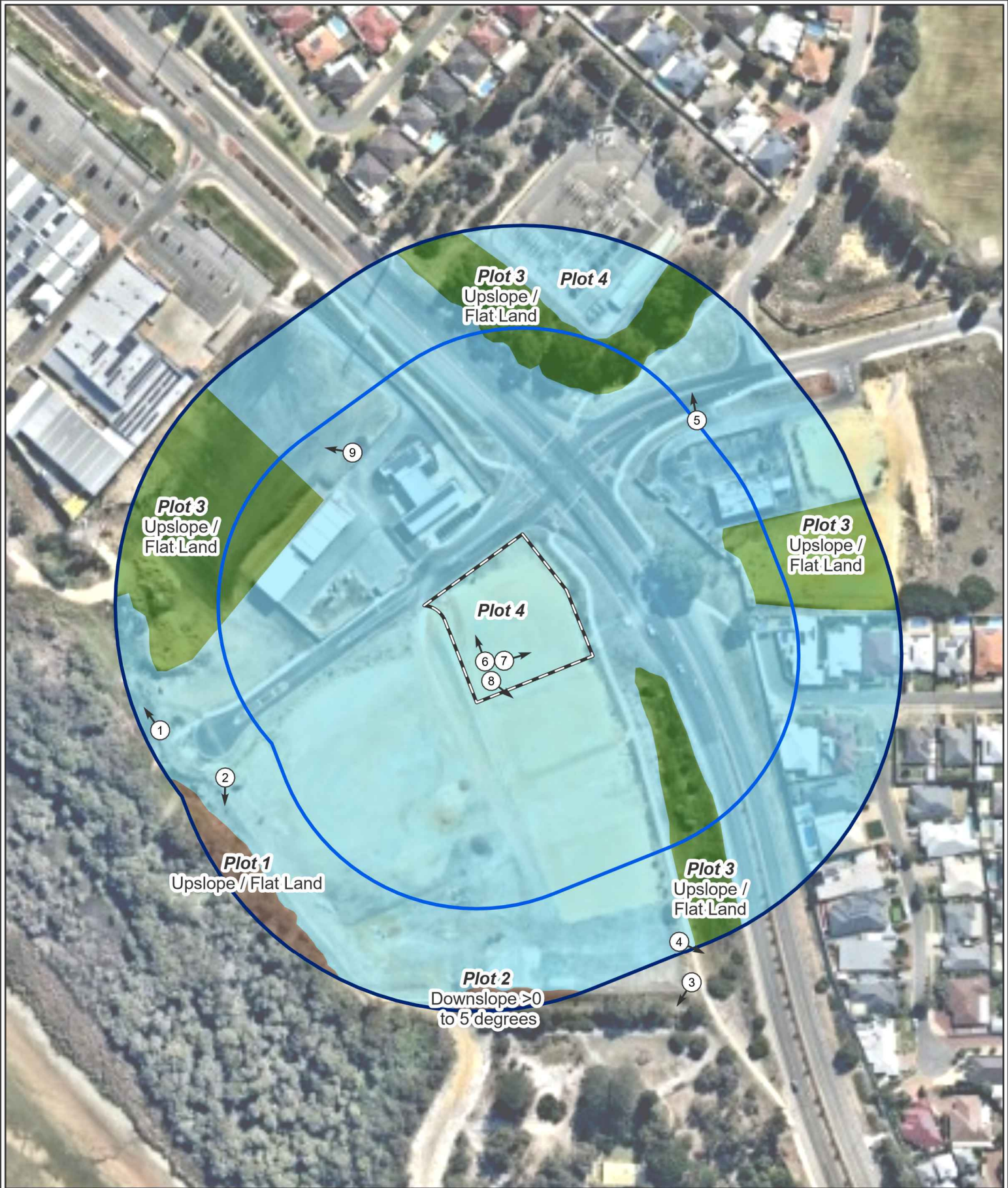
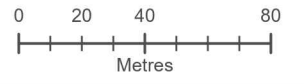


Figure 4: Vegetation Classification

- Subject site
- Lot boundary
- 100m site assessment
- 150m site assessment
- Contour (2m)
- Photo location

- Vegetation classification**
- Class A forest
 - Class G grassland
 - Excluded as per clause 2.2.3.2 (e) and (f)



Datum/Projection:
GDA 1994 MGA Zone 50
Project: 19332-DD Date: 9/09/2021



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 development area and the classified vegetation.

Based on the identified BAL, construction requirements for proposed 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 development 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 A Forest	All upslopes and flat land (0 degrees)	0-<16	BAL-FZ	No development proposed in this area
		16-<21	BAL-40	No development proposed in this area
		21-<31	BAL-29	No development proposed in this area
		31-<42	BAL-19	No development proposed in this area
		42-<100	BAL-12.5	No development proposed in this area
Plot 2 Class A Forest	Downslope >0 to 5 degrees	0-<20	BAL-FZ	No development proposed in this area
		20-<27	BAL-40	No development proposed in this area
		27-<37	BAL-29	No development proposed in this area
		37-<50	BAL-19	No development proposed in this area
		50-<100	BAL-12.5	No development proposed in this area
Plot 3 Class G Grassland	All upslopes and flat land (0 degrees)	0-<6	BAL-FZ	No development proposed in this area
		6-<8	BAL-40	No development proposed in this area
		8-<12	BAL-29	No development proposed in this area
		12-<17	BAL-19	No development proposed in this area
		17-<50	BAL-12.5	Development proposed in this area

Plot and vegetation classification	Effective slope	Hazard separation distance	BAL rating	Comment
Plot 4				
Excluded as per clause 2.2.3.2 (e) and (f) of AS3959: 2018		N/A		
*PLOT LOCATED >100 M FROM SUBJECT SITE				

Based on the site assessment inputs and BAL assessment, the proposed service station within the subject site has a BAL rating of BAL-12.5.

The Guidelines state:

The bushfire construction requirements of the Building Code of Australia only apply to certain types of residential buildings (being Class 1, 2 or 3 buildings and/or Class 10a buildings or decks associated with a Class 1, 2 or 3 building) in designated bushfire prone areas. As such, AS 3959 does not apply to all buildings. Only vulnerable or high-risk land uses that fall within the relevant classes of buildings as set out in the Building Code of Australia will be required to comply with the bushfire construction requirements of the Building Code of Australia. As such, the planning process focuses on the location and siting of vulnerable and high-risk land uses rather than the application of bushfire construction requirements.

As none of the proposed structures is a Class 1, 2 or 3 building and/or Class 10a building or deck associated with a Class 1, 2 or 3 building, construction to AS 3959: 2018 is not required for this proposal.

The general fire safety construction provisions within the National Construction Code (NCC) are considered suitable for bushfire construction measures, however ember protection measures in sections 3 and 5 of AS 3959: 2018 are recommended to be incorporated where applicable.

Table 3: BAL rating for proposed building within the subject site

Proposed building	Plot most affecting BAL rating	BAL Rating
Service Station	3	BAL-12.5
Bowsers & Annexure	3	BAL-LOW

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.

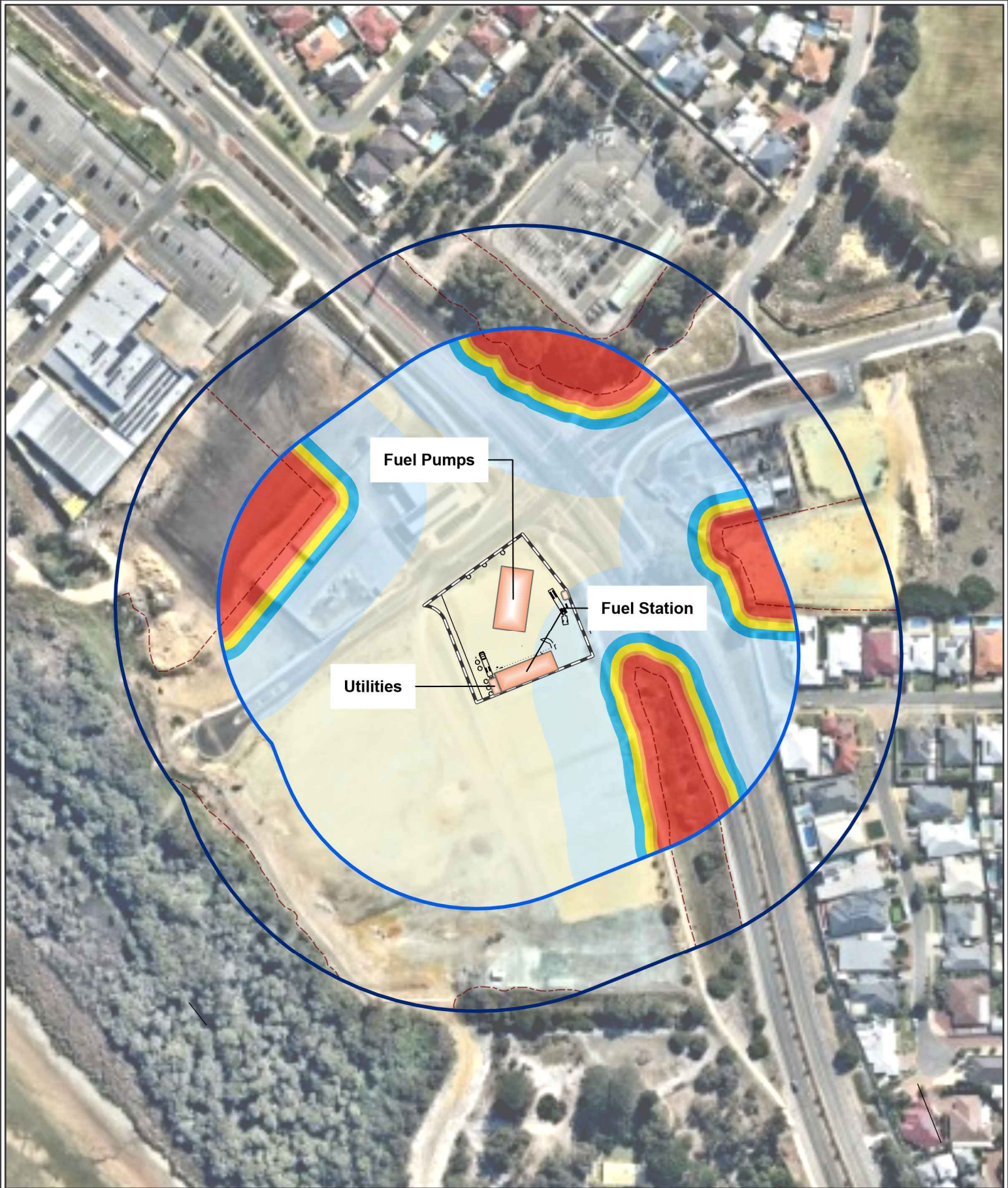






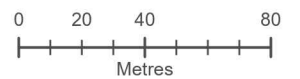


Figure 5: Bushfire Attack Level (BAL) Contours

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

Bushfire Attack Level (BAL)

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



Datum/Projection:
GDA 1994 MGA Zone 50

Project: 19332-DD Date: 9/09/2021



3. Assessment against the Bushfire Protection Criteria

3.1 Compliance

The proposed development is required to comply with policy measures 6.2, 6.5 and 6.6 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 development in accordance with Guideline acceptable solutions to meet compliance with bushfire protection criteria.

Table 4 outlines the Acceptable Solutions (AS) that are relevant to the proposal and summaries 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 4: 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"/>	The proposed development 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 checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The proposed development has an APZ sufficient for the potential radiant heat flux to not exceed 29kW/m ² and will be managed in accordance with the requirements of 'Standards for Asset Protection Zones' (WAPC 2017; Appendix B). The APZ can be contained within the boundaries of the lot or managed in perpetuity in a low fuel state. The proposed development is considered to be compliant with A2.1.
Element 3: Vehicular access A3.1 Two access routes	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The subject site is serviced by a 100 m long cul-de-sac that provides access onto Wanneroo Road (a main road allowing travel in two directions). Until future development within the subdivision takes place, the road network will be limited to this cul-de-sac (Figure 6) A secondary access point onto Wanneroo Avenue is not possible due to WAPC conditions of approval (i.e. Condition 4 of Subdivision Approval 156082), however as Wanneroo Road provides access in two directions, two access routes are available. The proposed development is considered to be compliant with A3.1.
A3.2 Public road	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No public roads are proposed as part of this development.

Bushfire Protection Criteria	AS	PS	N/A	Comment
A3.3 Cul-de-sac	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	As detailed in A3.1, the subject site is serviced by a temporary cul-de-sac which will be connected to other roads in line with future development. This cul-de-sac is approximately 100 m long and a turning area with a minimum diameter of 17.5 m is provided within the subject site, thereby complying with the requirements for cul-de-sacs in the Guidelines. The proposed development is considered to be compliant with A3.3.
A3.4 Battle-axe	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No battle axe lots are proposed.
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 type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No fire breaks are required or proposed as per the 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

3.2 Additional Bushfire Requirements

All landscaping areas within the subject site will be maintained in accordance with Standards for Asset Protection Zones (Appendix B).

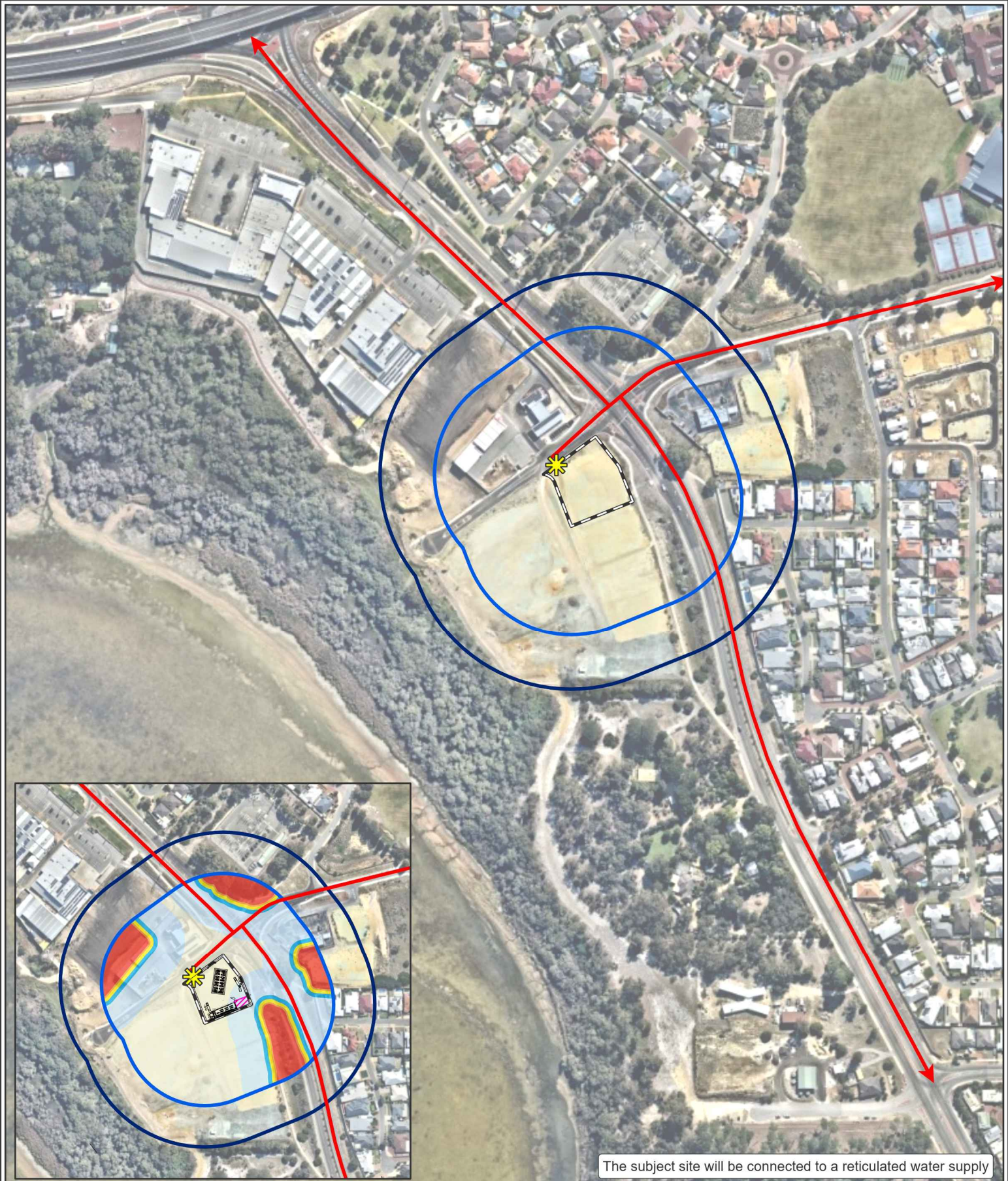


Figure 6: Spatial representation of the bushfire management strategies

Subject site	Access point	Bushfire Attack Level (BAL)	0 40 80 160
Lot boundary	Access / egress route		BAL - FZ
100m site assessment	Hydrant	BAL - 40	Metres
150m site assessment		BAL - 29	Datum/Projection: GDA 1994 MGA Zone 50
Asset Protection Zone (APZ)		BAL - 19	Project: 19332-DD Date: 9/09/2021
		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 5. 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 5: Proposed work program

No	Bushfire management measure	Responsibility
Prior to occupancy		
1	Ensure proposed building is located outside of areas subject to BAL-FZ and BAL-40 as per the design in Figure 6.	Developer
2	Connect reticulated water supply to the subject site.	Developer
3	Ensure all APZs are implemented and maintained.	Developer
4	Construct proposed building to relevant construction standard in the NCC and if considered relevant, AS 3959: 2018.	Developer
Ongoing management		
5	Maintain APZs to the standard in the Guidelines.	Owners

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 development. As such, the proposed development 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*.

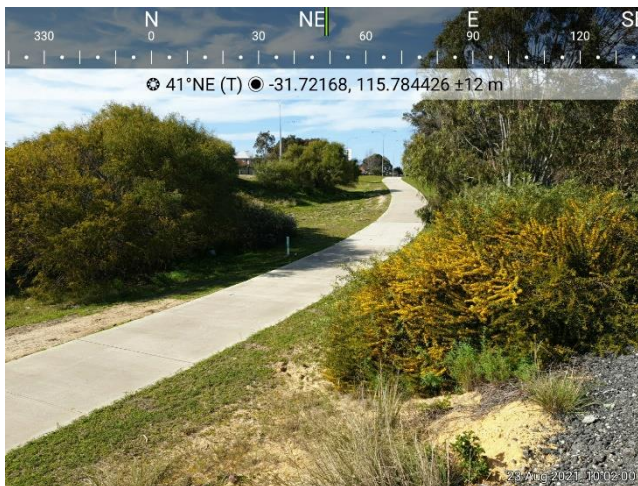
Appendix A – Classified Vegetation Photos

Plot	Classification or Exclusion Clause	Class A Forest
1	<p>Photo Point 1</p> <p>Classified vegetation is offsite melaleuca wetland with shrub understorey, trees up to 6m tall and ~40-50% canopy cover.</p> <p>Effective slope under vegetation is flat</p>	
1	<p>Photo Point 2</p> <p>Classified vegetation is offsite melaleuca wetland with shrub understorey, trees up to 6m tall.</p> <p>Effective slope under vegetation is flat</p>	
2	<p>Photo Point 3</p> <p>Classified vegetation within this plot is comprised of trees between 8-10 m tall with approximately 15% foliage cover. Planted and young regrowth eucalypt trees with shrub revegetation along drainage line and grass understorey.</p> <p>Effective slope is downslope 0-5 degrees</p>	

Plot 3 Classification or Exclusion Clause Class G Grassland

Photo Point 4

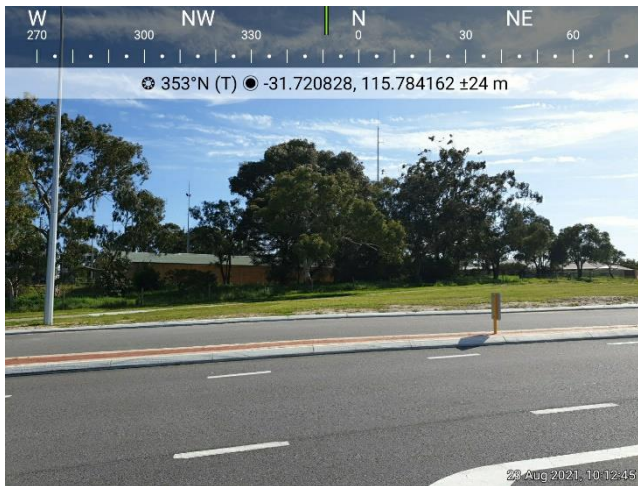
Classified vegetation is offsite unmanaged grassland with sedges within drainage swale and minor isolated scrub
 Effective slope is up slope/flat from development



Plot 3 Classification or Exclusion Clause Class G Grassland

Photo Point 5

Classified vegetation is offsite unmanaged grassland with within utilities compound
 Effective slope is up slope from development



Plot 4 Classification or Exclusion Clause Excluded AS 3959: 2018 2.2.3.2 (f)

Photo Point 6

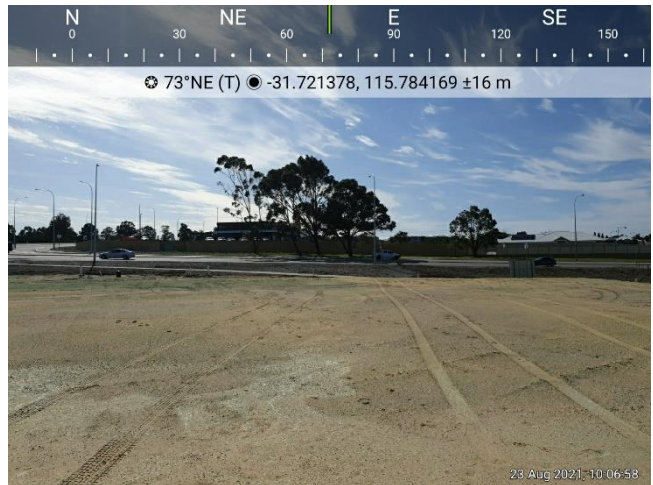
Cleared and developed areas onsite and offsite.



Plot 4 Classification or Exclusion Clause Excluded AS 3959: 2018 2.2.3.2 (f)

Photo Point 7

Cleared and developed areas onsite and offsite.



Plot 4 Classification or Exclusion Clause Excluded AS 3959: 2018 2.2.3.2 (f)

Photo Point 8

Cleared and developed areas onsite and offsite.



Plot 4 Classification or Exclusion Clause Excluded AS 3959: 2018 2.2.3.2 (f)

Photo Point 9

Cleared and developed areas onsite and offsite.



Appendix B – Standards for Asset Protection Zones

The following standards have been extracted from the *Guidelines for Planning in Bushfire Prone Areas v 1.3* (WAPC 2017).

Every habitable building is to be surrounded by, and every proposed lot can achieve, an APZ depicted on submitted plans, which meets the following requirements:

a. Width: Measured from any external wall or supporting post or column of the proposed building, and of sufficient size to ensure the potential radiant heat impact of a fire does not exceed 29kW/m^2 (BAL-29) in all circumstances.

b. Location: the APZ should be contained solely within the boundaries of the lot on which a 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 (see explanatory notes).

c. Management: the APZ is managed in accordance with the requirements of ‘Standards for Asset Protection Zones’ (below):

- Fences: within the APZ are constructed from non-combustible materials (e.g. iron, brick, limestone, metal post and wire). It is recommended that solid or slatted non-combustible perimeter fences are used
- Objects: within 10 metres of a building, combustible objects must not be located close to the vulnerable parts of the building i.e. windows and doors
- Fine Fuel load: combustible dead vegetation matter less than 6 millimetres in thickness reduced to and maintained at an average of two tonnes per hectare
- Trees (> 5 metres in height): trunks at maturity should be a minimum distance of 6 metres from all elevations of the building, branches at maturity should not touch or overhang the building, lower branches should be removed to a height of 2 metres above the ground and or surface vegetation, canopy cover should be less than 15% with tree canopies at maturity well spread to at least 5 metres apart as to not form a continuous canopy (Figure 7).

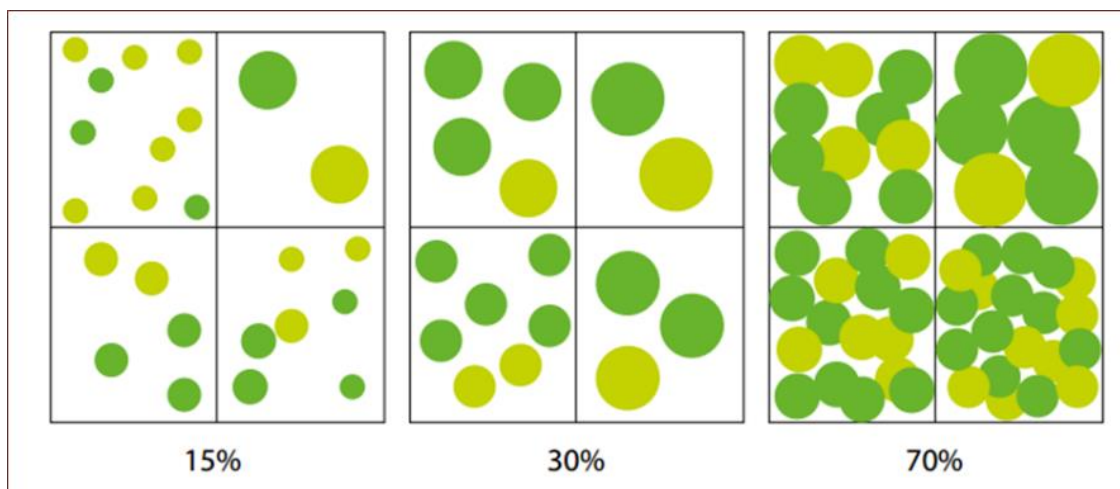


Figure 7: Illustrated tree canopy cover projection (WAPC 2017)

- **Shrubs (0.5 metres to 5 metres in height):** should not be located under trees or within 3 metres of buildings, should not be planted in clumps greater than 5m² in area, clumps of shrubs should be separated from each other and any exposed window or door by at least 10 metres. Shrubs greater than 5 metres in height are to be treated as trees
- **Ground covers (<0.5 metres in height):** can be planted under trees but must be properly maintained to remove dead plant material and any parts within 2 metres of a structure, but 3 metres from windows or doors if greater than 100 millimetres in height. Ground covers greater than 0.5 metres in height are to be treated as shrubs
- **Grass:** should be managed to maintain a height of 100 millimetres or less.

Additional notes

The Asset Protection Zone (APZ) is an area surrounding a building that is managed to reduce the bushfire hazard to an acceptable level. Hazard separation in the form of using subdivision design elements or excluded and low threat vegetation adjacent to the lot may be used to reduce the dimensions of the APZ within the lot.

The APZ should be contained solely within the boundaries of the lot on which the building is situated, except in instances where the neighbouring lot or lots will be managed in a low-fuel state on an ongoing basis, in perpetuity. The APZ may include public roads, waterways, footpaths, buildings, rocky outcrops, golf courses, maintained parkland as well as cultivated gardens in an urban context, but does not include grassland or vegetation on a neighbouring rural lot, farmland, wetland reserves and unmanaged public reserves.

Appendix C - 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					

