

Development Application: Lots 768, 769 & 770

Montana Crescent, Alkimos

Alkimos Combine Pty Ltd







DOCUMENT TRACKING

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Appendix 6: Bushfire Management Plan

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1. Introduction

1.1 Proposal details

Eco Logical Australia (ELA) was commissioned by Alkimos Combine Pty Ltd to prepare a Bushfire Management Plan (BMP) to support a Development Application (DA) for Lots 768, 769 & 770 Montana Crescent, Alkimos (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 for three fast food outlets to be located within the subject site (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 2021; 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 DA in accordance with the associated Guidelines for Planning in Bushfire Prone Areas v 1.4 (the Guidelines; WAPC 2021).

The subject site is currently zoned 'Central City Area' and 'Special Control Area DCA (1) & DCA (2)' under the City of Wanneroo District Planning Scheme No.2. The subject site is adjacent to land zoned as 'Urban Development' consisting of undeveloped land and a residential subdivision to the west, commercial developments to the north and a primary distributer road (Marmion Avenue), vegetated areas and land cleared for development to the east and south.

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

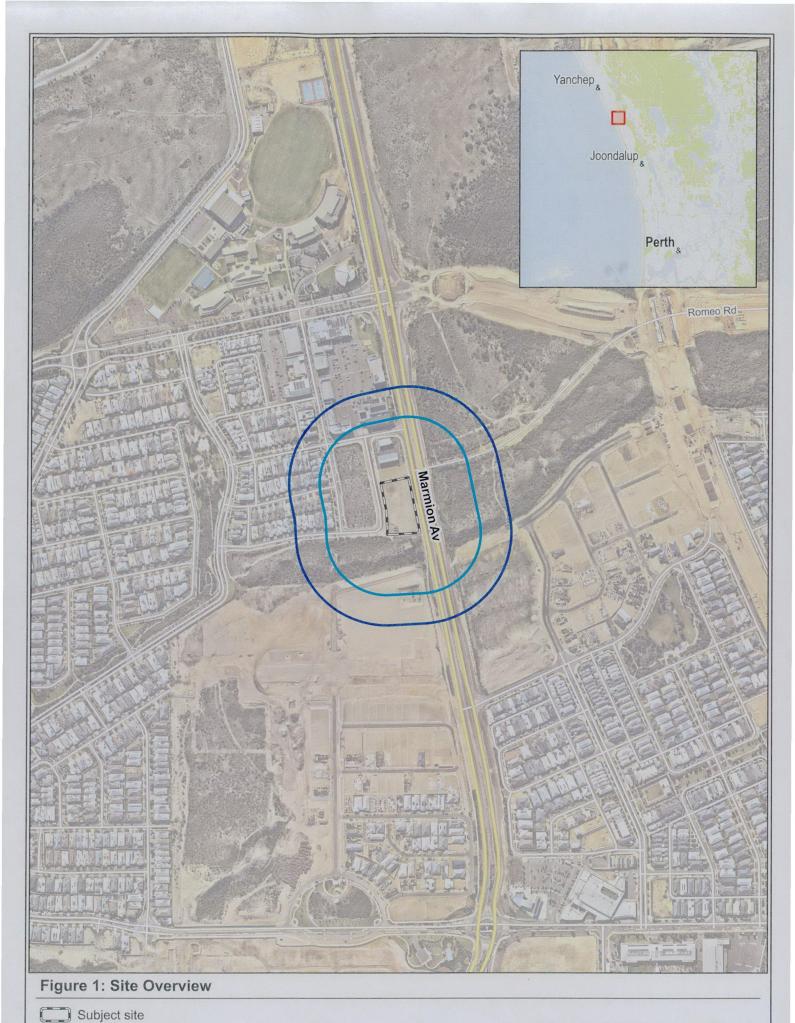
1.2 Purpose and application of the plan

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 development through implementation of a range of bushfire management measures in accordance with the Guidelines.

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

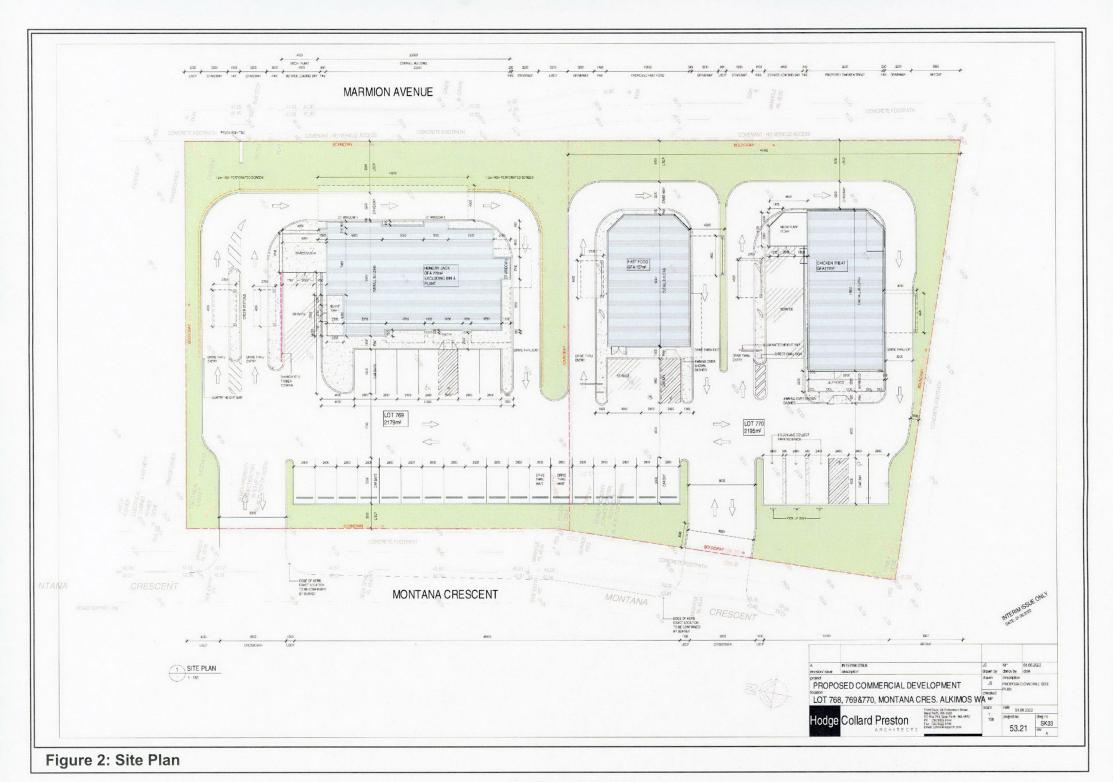


150m site assessment

100m site assessment

Datum/Projection: GDA 1994 MGA Zone 50 . 22PER2351-SM Date: 21/06/2022





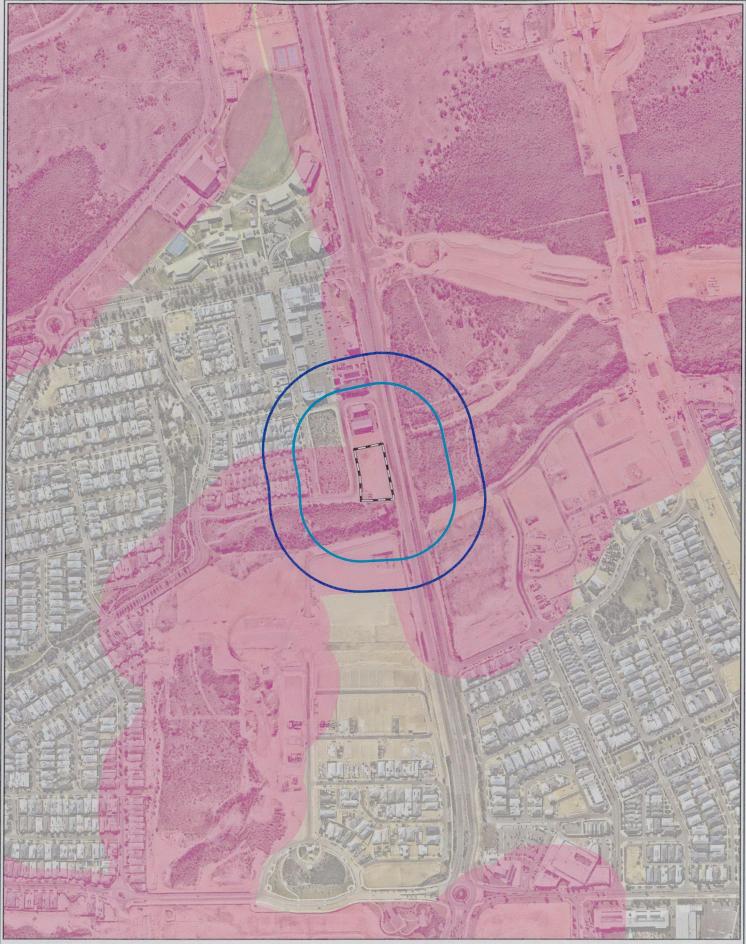


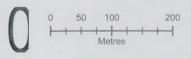
Figure 3: Bushfire Prone Areas

Subject site

100m site assessment

150m site assessment

Bushfire Prone Mapping (DFES 2021)



Datum/Projection: GDA 1994 MGA Zone 50

22PER2351-SM Date: 21/06/2022



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

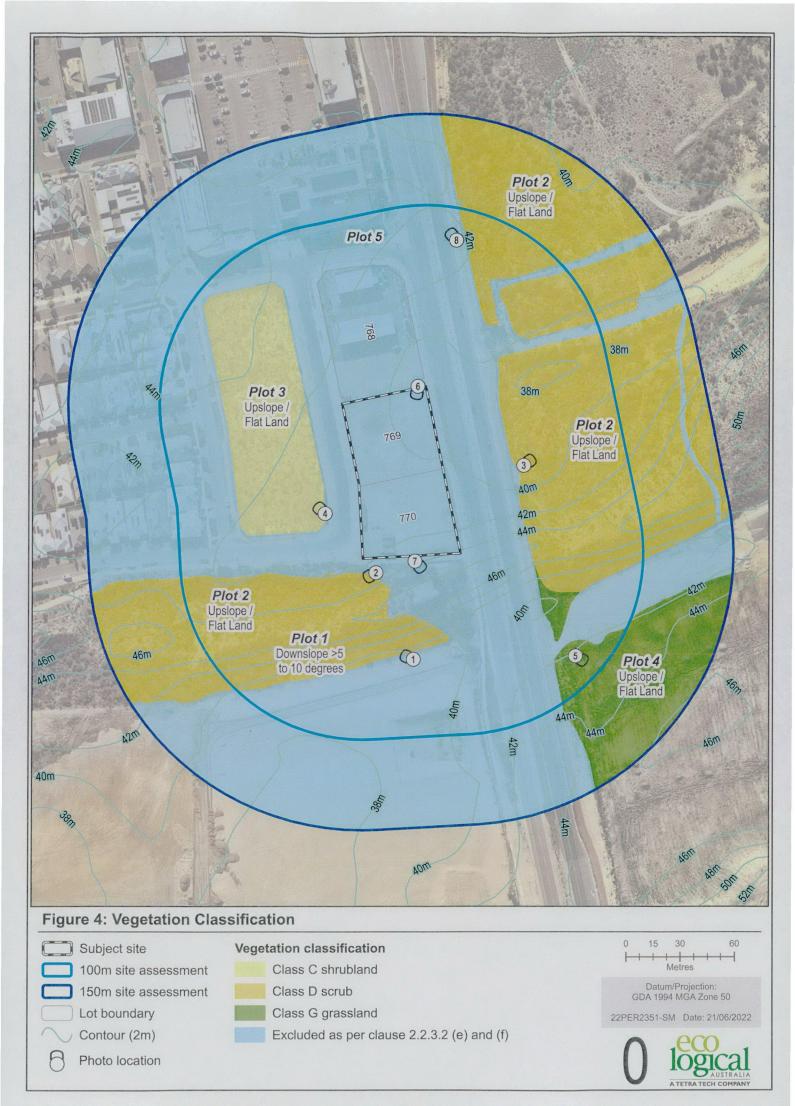
Vegetation and effective slope (i.e. slope under vegetation) within the subject site and surrounding 150 m (the assessment area) were assessed in accordance with the Guidelines and *AS 3959: 2018* with regard given to the *Visual guide for bushfire risk assessment in Western Australia* (DoP 2016). Site assessment was undertaken on 15 June 2022.

The classified vegetation and effective slope from each of the identified vegetation plots within the assessment area 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	Downslope >5 to 10 degrees
2	Class D Scrub	All upslopes and flat land (0 degrees)
3	Class C Shrubland	All upslopes and flat land (0 degrees)
4	Class G Grassland	All upslopes and flat land (0 degrees)
5	Excluded AS 3959: 2018 2.2.3.2 (e) & (f)	

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



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 and the classified vegetation.

Based on the identified BAL, construction requirements for the subject 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 the 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)

Dlot	Vozatation Classification	Separati					
Plot	Vegetation Classification	Effective Slope	BAL-FZ	BAL-40	BAL-29	BAL-19	BAL-12.5
1	Class D Scrub	Downslope >5 to 10 degrees	<12	12-<17	17-<24	24-<35	35-<100
2	Class D Scrub	All upslopes and flat land (0 degrees)	<10	10-<13	13-<19	19-<27	27-<100
3	Class C Shrubland	All upslopes and flat land (0 degrees)	<7	7-<9	9-<13	13-<19	19-<100
4	Class G Grassland	All upslopes and flat land (0 degrees)	<6	6-<8	8-<12	12-<17	17-<50
5	Excluded AS 3959: 2018 2.2.3.2 (e) & (f)	-	N	o separation	distances req	uired – BAL-L	ow

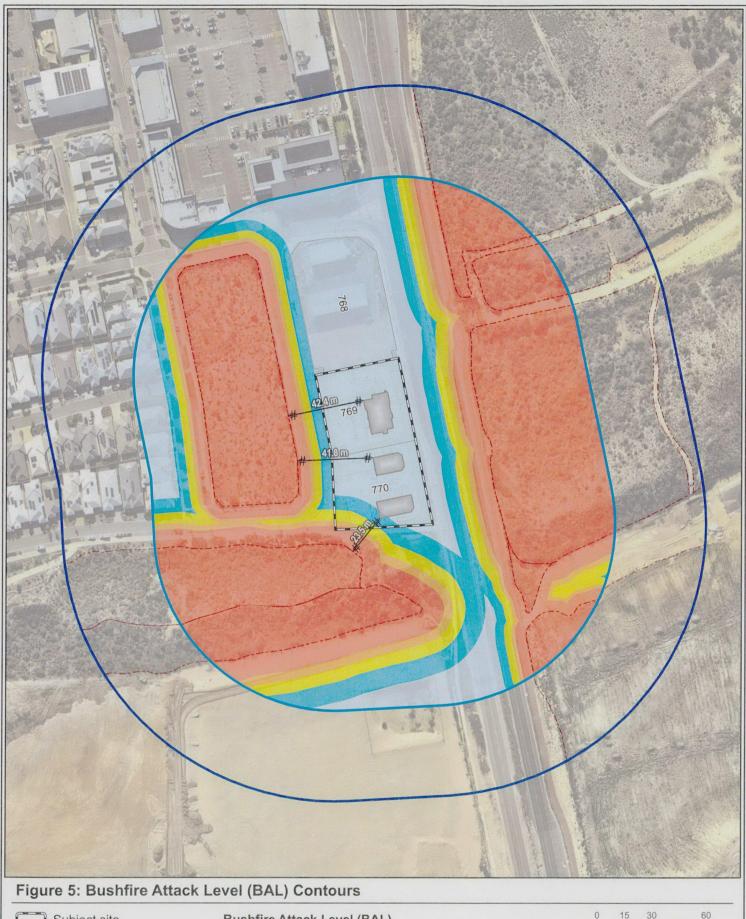
Based on the site assessment inputs and BAL assessment, the subject building within lot 769 and the subject building in the north of lot 770 will achieve a BAL rating of BAL-12.5. The subject building in the south of lot 770 will achieve a BAL rating of BAL-19. A summary of the BAL rating for the subject building is provided in Table 3.

Table 3: BAL rating for subject building within the development footprint

Subject Building	Plot most affecting BAL rating	Separation Distance (m)	BAL Rating
Lot 769	Plot 3	42.4 m	BAL-12.5
Lot 770 (North)	Plot 3	41.8 m	BAL-12.5
Lot 770 (South)	Plot 2	23.5 m	BAL-19

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.



15 Subject site **Bushfire Attack Level (BAL)** 100m site assessment BAL - FZ Datum/Projection: GDA 1994 MGA Zone 50 150m site assessment BAL - 40 **BAL - 29** Lot boundary 22PER2351-SM Date: 21/06/2022 Subject building BAL - 19 Bushfire hazard interface BAL - 12.5 BAL - LOW

3. Assessment against the Bushfire Protection Criteria

3.1 Compliance

The proposed development is required to comply with policy measures 6.2 and 6.5 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 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 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	\boxtimes			The subject buildings within the development will be located in an area that is subject to a BAL rating of ≤BAL-19 (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)				The proposed development has an APZ sufficient for the potential radiant heat flux to not exceed 29kW/m², is contained within the boundary of the subject site and will be managed in accordance with the requirements of 'Standards for Asset Protection Zones' (WAPC 2021; Appendix B). The proposed development is considered to be compliant with A2.1.
Element 3: Vehicular access A3.1 Public Roads				The subject site is accessed via existing public roads. The Guidelines do not prescribe values for the trafficable (carriageway/pavement) width of public roads as they should be in accordance with the class of road as specified in the IPWEA Subdivision Guidelines, Liveable Neighbourhoods, Austroad Standards and/or any applicable standard in the local government area. ELA are not traffic/civil engineers so cannot comment on whether these roads comply with Local Government Guidelines for Subdivisional Development (IPWEA Subdivision Guidelines), Liveable Neighbourhoods, Austroad standards and/or any applicable standards for the local government area, however the surrounding roads including Montana Cres that provides access to the subject site is a local access road and connected to Sanderling St, Turnstone St, Graceful Bvd, local access roads and Marmion Av, a primary distributer.

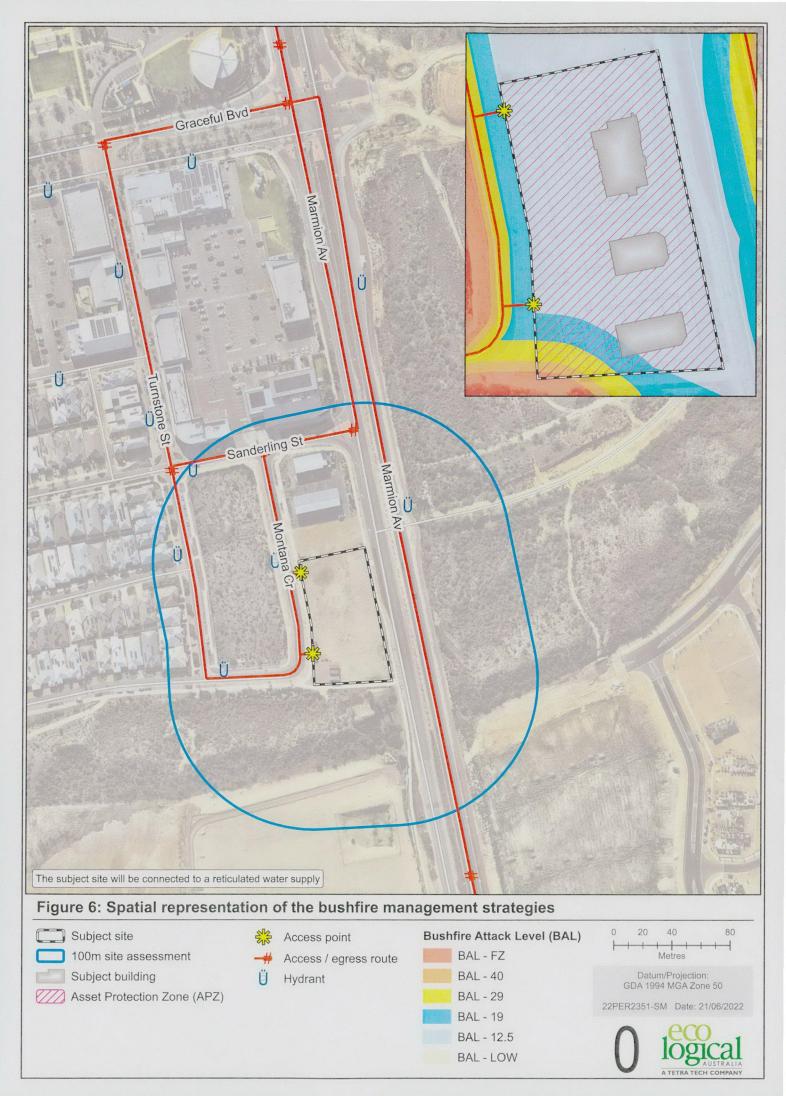
Bushfire Protection Criteria	AS	PS	N/A	Comment
				ELA's assessment identified that all connecting roads are bitumen with estimated width of the sealed surface achieving a minimum width of 6 m and therefore consider the existing road network would provide suitable access and egress for the community and emergency services personnel in the event of a bushfire. Vehicular access technical requirements in accordance with the Guidelines are detailed in (Appendix C). The proposed development is considered to be
				compliant with A3.1.
A3.2a Multiple access routes				The subject site has direct access onto Marmion Av through Montana Cres, Sanderling St, Turnstone St and Graceful Bvd, which provides access in at least two directions to/from the subject site to suitable destinations (Figure 6).
				The proposed development is considered to be compliant with A3.2a.
A3.2b Emergency Access way				No emergency access way is required or proposed. A3.2b is not applicable to the proposed development.
A3.3 Through-roads				Acceptable Solution A3.3 only applies to the strategic planning proposal, structure plan or subdivision application stage of the planning process. A3.3 is not applicable to the proposed development.
A3.4a Perimeter roads				Acceptable Solution A3.4a only applies to the strategic planning proposal, structure plan or subdivision application stage of the planning process. A3.4a is not applicable to the proposed development.
A3.4b Fire service access route				Acceptable Solution A3.4b only applies to the strategic planning proposal, structure plan or subdivision application stage of the planning process. A3.4b is not applicable to the proposed development.
A3.5 Battle-axe access legs				Acceptable Solution A3.5 only applies to the structure plan or subdivision application stage of the planning process. A3.4b is not applicable to the proposed development.
A3.6 Private driveways				The subject site is serviced by reticulated water. The most distant external part of the subject building is within 70 m of the public road (measured as a hose lay) and the subject site is accessed by public roads where speed limit is not greater than 70 km/hr. A3.6 is not applicable to the proposed development.
Element 4: Water A4.1 Identification of future water supply				Acceptable Solution A4.1 only applies to the strategic planning proposal or structure plan stage of the planning process. A4.1 is not applicable to the proposed development.

Bushfire Protection Criteria	AS	PS	N/A	Comment
A4.2 Provision of water for firefighting purposes				Existing reticulated water is present within the are and existing hydrants installed on Montana Crescent with the nearest being approximately 16 m from the subject site. ELA assume these hydrants and the reticulated water supply present in the area complexith Water Corporation Design Standard DS 63 Water Reticulation Standard, however, recommend this is confirmed with the Water Corporation, where possible. Hydrants within the surrounding residential development are generally spaced approximately 100 m apart as depicted in Figure 6. The proposed development is considered to be compliant with A4.2.
Element 5: Vulnerable tourism land uses			\boxtimes	This development application is not considere vulnerable tourism land use.
			- EA	Element 5 is not applicable to the propose development.

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 a low threat state in accordance with Standards for Asset Protection Zones (Appendix B).



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
Imme	diately following development approval (where issued)	
1.	Ensure proposed development is located outside of areas subject to BAL-FZ and BAL-40 as per the design in Figure 6.	Developer
2	Ensure all APZs as depicted in Figure 6 are established and maintained to a low-threat standard as per 2.2.3.2 of AS 3959: 2018.	Developer
Ongoi	ng management	
5	Continue to maintain all APZs as depicted in Figure 6 to a low-threat standard as per 2.2.3.2 of AS 3959: 2018.	Landowner

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

City of Mandurah. 2021. City of Mandurah Fire Compliance Notice.

Department of Fire and Emergency Services (DFES), 2021, 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), 2021, Guidelines for Planning in Bushfire Prone Areas Version 1.4 (including appendices), WAPC, Perth.

Appendix A - Classified Vegetation Photos

Plot 1 Classification

Photo Point 1

Classified vegetation within this plot consists of shrubs greater >2 m high (2 m height pole for reference) and a foliage cover >30%.

Effective slope under the vegetation is all downslope >5 to 10 degrees.



Plot 2 Classification

Photo Point 2

Classified vegetation within this plot consists of shrubs greater >2 m high (2 m height pole for reference) and a foliage cover >30%.

Effective slope under the vegetation is all upslopes and flat land (0 degrees).



Plot 2 Classification

Photo Point 3

Classified vegetation within this plot consists of shrubs greater >2 m high (2 m height pole for reference) and a foliage cover >30%.

Effective slope under the vegetation is all upslopes and flat land (0 degrees).



Class D Scrub

Plot 3 Classification

Photo Point 4

This plot is comprised of a previously cleared lot, surrounded by 2 m fencing. The lot has been managed with mulch added, however there has been significant regrowth of shrubs and weeds. Without additional management this area is likely to develop into Class C Shrubland.

Effective slope under the vegetation is all upslopes and flat land (0 degrees).



Plot 4 Classification

Photo Point 5

Classified vegetation within this plot consists of unmanaged grassland with an overstory foliage cover of less than 10%. This plot has been previously cleared for development, however, it has significant regrowth of grass.

Effective slope under the vegetation is all upslopes and flat land (0 degrees).



Plot 5 Classification

Photo Point 6

This plot consists of land cleared for development within the subject site.



Plot 5 Classification

Photo Point 7

This plot consists of vegetation managed to a low-threat state within the entry to the development with mulch added.

Excluded AS 3959: 2018 2.2.3.2 (f)



Plot 5 Classification

Photo Point 8

This plot consists of land cleared for development, developed land, vegetation managed to a low-threat state, roadways and footpaths.

Excluded AS 3959: 2018 2.2.3.2 (e) & (f)



Appendix B – Standards for Asset Protection Zones

The following standards have been extracted from the *Guidelines for Planning in Bushfire Prone Areas* v 1.4 (WAPC 2021).

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/m² (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:
 - Should be constructed from non-combustible materials or bushfire-resisting timber referenced in Appendix F of AS 3959.
 - Fine fuel load (Combustible, dead vegetation matter <6 millimetres in thickness):
 - 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); and
 - Mulches should be non-combustible (e.g. stone, gravel or crushed mineral earth) or wood mulch >6 millimetres in thickness.
 - Trees (>6 metres in height):
 - Trunks at maturity should be a minimum distance of six metres from all elevations of the building;
 - o Branches at maturity should not touch or overhand 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; and
 - 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.

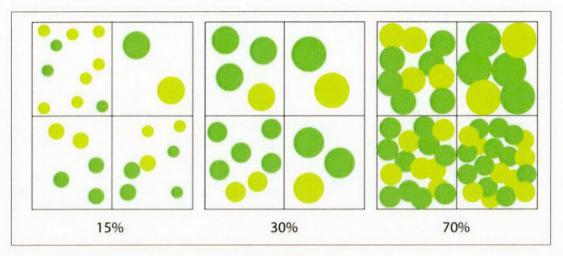


Figure 7: Illustrated tree canopy cover projection (WAPC 2021)

- Shrub and scrub 0.5 metres to six metres in height (shrub or scrub >6 metres in height are to be treated as trees):
 - Should not be located under trees or within three metres of buildings;
 - o Should not be planted in clumps >5 square metres in area; and
 - 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):
 - Can be planted under trees but must be maintained to remove dead plant material, as prescribed in 'Fine fuel load' above; and
 - Can be located within two metres of a structure, but three metres from windows or doors if >100 millimetres in height.

Grass:

- o Grass should be maintained at a height of 100 millimetres or less, at all times; and
- Wherever possible, perennial grasses should be used and well-hydrated with regular application of wetting agents and efficient irrigation.

Defendable space:

 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:

- 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;
- o No flammable material within six metres from the front of the valve; and
- Must site on a firm, level and non-combustible base and be secured to a solid structure.

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.

Plant flammability, landscaping design and maintenance should also be considered for trees, shrub, scrub and ground covers with the APZ. Please refer to explanatory notes 'E2 Managing an Asset Protection Zone (APZ) to a low threat state,' 'E2 Landscaping and design of an asset protection zone,' and 'E2 Plant flammability' in the Guidelines for further information relating to APZ standards.

Appendix C – Vehicular access technical requirements (WAPC 2021)

Technical requirements	Public road	Emergency access way ¹	Fire service access route ¹	Battle-axe and private driveways ²
Minimum trafficable surface (m)	In accordance with A3.1	6	6	4
Minimum horizontal clearance (m)	N/A	6	6	6
Minimum vertical clearance (m)		4	.5	
Minimum weight capacity (t)		1	.5	
Maximum grade unsealed road ³	As outlined in the IPWEA Subdivision Guidelines		1:10 (10%)	
Maximum grade sealed road ³	As outlined in the IPWEA Subdivision Guidelines		1:7 (14.3%)	
Maximum average grade sealed road	As outlined in the IPWEA Subdivision Guidelines		1:10 (10%)	
Minimum inner radius of road curves (m)	As outlined in the IPWEA Subdivision Guidelines		8.5	

¹ To have crossfalls between 3 and 6 %.

² Where driveways and battle-axe legs are not required to comply with the widths in A3.5 or A3.6, they are to comply with the Residential Design Codes and Development Control Policy 2.2 Residential Subdivision.

 $^{^3}$ Dips must have no more than a 1 in 8 (12.5% -7.1 degree) entry and exit angle.





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