Bushfire Management Plan Coversheet

This Coversheet and accompanying Bushfire Management Plan has been prepared and issued by a person accredited by Fire Protection Association Australia under the Bushfire Planning and Design (BPAD) Accreditation Scheme.

Bushfire Management Plan and Site Details

Site Address / Plan Reference: Lot 11 (655) Pechey Road		
Suburb: Swan View	**State:** WA	**P/code:** 6056
Local government area: Shire of Mundaring		
Description of the planning proposal: Subdivision		
BMP Plan / Reference Number: 211161	**Version:** v1.0	**Date of Issue:** 14/01/2022
Client / Business Name: StateWest Planning		

Reason for referral to DFES	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)?	☐	☒
Have any of the bushfire protection criteria elements been addressed through the use of a performance principle (tick no if only acceptable solutions have been used to address all of the BPC elements)?	☐	☒

Is the proposal any of the following special development types (see SPP 3.7 for definitions)?

Unavoidable development (in BAL-40 or BAL-FZ)	☐	☒
Strategic planning proposal (including rezoning applications)	☐	☒
Minor development (in BAL-40 or BAL-FZ)	☐	☒
High risk land-use	☐	☒
Vulnerable land-use	☐	☒

If the development is a special development type as listed above, explain why the proposal is considered to be one of the above listed classifications (E.g. considered vulnerable land-use as the development is for accommodation of the elderly, etc.)?

Note: The decision maker (e.g. local government or the WAPC) should only refer the proposal to DFES for comment if one (or more) of the above answers are ticked "Yes".

BPAD Accredited Practitioner Details and Declaration

Name	Accreditation Level	Accreditation No.	Accreditation Expiry
Kathy Nastov	Level 3	BPAD27794	01/08/2022
Company Bushfire Prone PLanning		**Contact No.** 64771144	

I declare that the information provided within this bushfire management plan is to the best of my knowledge true and correct

Signature of Practitioner  **Date** 14/01/2022

Bushfire Management Plan

Lot 11 (655) Pechey Road, Swan View

Shire of Mundaring

Planning Stage:	Subdivision Application
Planning Development Type:	Subdivision - Small Number of Lots
Bushfire Policy – Specific Development or Use Type:	SPP 3.7 s6.5 Information to accompany subdivision applications

Job Number:	210777
Assessment Date:	16 December 2021
Report Date:	11 January 2022

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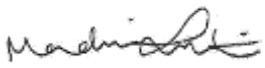
DOCUMENT CONTROL

PREPARATION		
Author:	Madison Smith (BPAD Level 1 - No. 56399)	
Co-Author:		
Review/Authorise:	Kathy Nastov (BPAD Level 3 - No. 27794)	

VERSION HISTORY		
Version	**Version Details**	**Date**
1.0	Original	11 January 2022
-		

BMP (Subdivision) Template v8.4

DISTRIBUTION				
Destination	**Version**	**No. Copies**	**Hard Copy**	**Electronic Copy**
Person/Business: Alan McLean Engineering Pty Ltd Email: amepl@iinet.net.au	V1.0		☐	☒
Person/Business: Khodaram Pollard Email: khodaram@adarsh.com.au	V1.0		☐	☒

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EXECUTIVE SUMMARY

This Bushfire Management Plan is to accompany a Subdivision Application for Lot 11 (655) Pechey Road, Swan View in the Shire of Mundaring.

The subdivision site comprising of Lot 11, of approximately 1.8191 ha in total area (4 proposed residential Lots) is within a designated bushfire prone area and the proposal requires the application of State Planning Policy 3.7: Planning in Bushfire Prone Areas (SPP 3.7).

Contained within this Bushfire Management Plan, contour mapping is utilised to visually show the potential radiant heat impacts (from bushfire prone vegetation) as separate Bushfire Attack Level contours across the site. The BAL's have been derived from the proposed Lots within the assessed area. The purpose is to inform future development planning by determining or indicating the Bushfire Attack Levels (BAL's) that future buildings, within the development site, are potentially subject to.

Against the Bushfire Prone Criteria, the decision maker's assessment of a future Proposal will be on the basis of it being able to meet the Acceptable Solutions, once construction and landscaping is complete as follows:

- For Element 1 'Location': the proposal is able to achieve the acceptable solution by being located in an area that on completion will provide each proposed lot an appropriate area subject to BAL-29 or less for the purposes of new buildings.
- For Element 2 'Siting and Design': the proposal is able to meet the acceptable solutions by existing buildings and future buildings being able to achieve an Asset Protection Zone (APZ) of sufficient size to ensure radiant heat impact does not exceed BAL-29.
- For Element 3 'Vehicular Access': the location of the development is able to meet the current acceptable solutions including two-way access from Pechey Road. A 103 m long cul-de-sac will be constructed with a minimum 6 m width and a turning area exceeding 17.5 m in diameter. Private driveways on the individual lots will be <50 m from the cul-de-sac and built to the required guidelines;
- For Element 4: 'Water Supply': the proposal meets the acceptable solutions by being located in a reticulated area. The closest hydrant is along the subject site boundary (Pechey Road and future extension of Tunnel Road easement).

Future buildings within 100 metres of classified vegetation will be required to be constructed to standards which correspond to the determined BAL's, as required by AS3959-2018 Construction of buildings in bushfire prone areas. As this proposal does not identify the actual location of building works within each Lot, there may be a requirement to determine the BAL ratings for individual building works once a building site has been identified.

1 PROPOSAL DETAILS

1.1 Description and Associated Plans and Maps

Landowner / Proponent:	Khodaram Pollard
Bushfire Prone Planning Commissioned to Produce the Bushfire Management Plan (BMP) By:	Alan McLean Engineering Pty Ltd
For Submission To:	WA Planning Commission (WAPC)
Purpose of the BMP:	To accompany a subdivision application
'Development' Site Total Area:	1.8191 hectares
No. of Existing/Proposed Lots:	Existing lot = 1 / Proposed lots = 4
Description of the Proposed Development/Use:	
Subdivision application for proposed 4 lots, zoned Residential.	
Staged Development and Management of Potential Bushfire Hazard Issues	
Site specific assessment to address the bushfire risk that considers the future potential bushfire impact on the subdivision proposal.	

Figure 1.1

Proposed Subdivision

Lot 11 on Plan 1299, Area: 1.8191 ha
655 Pechey Road
SWAN VIEW 6056
SHIRE OF MUNDARING

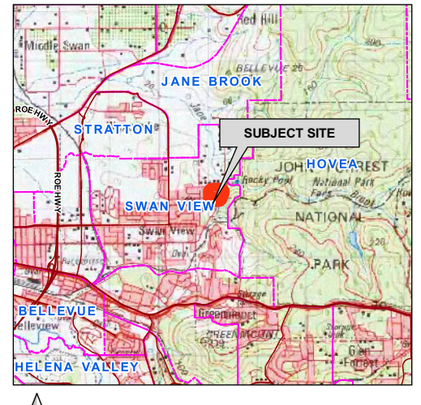
------ LEGEND ------

- Subject Site
- Other Lots
- Proposed Subdivision
- Hydrants
- Existing Buildings

0 10 20 30

Metres

------ LOCALITY ------



AERIAL IMAGERY: Landgate/SLIP

Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Merctaor Units: Metre
Map by: Madison Smith 14-12-2021
SCALE (A3): 1 : 800

BUSHFIRE PRONE PLANNING

Figure 1.2

Location Map

Lot 11 on Plan 1299, Area: 1.8191 ha
655 Pechey Road
SWAN VIEW 6056
SHIRE OF MUNDARING

------ LEGEND ------

- Subject Site
- Other Lots
- Reserves
- Bush Forever Sites

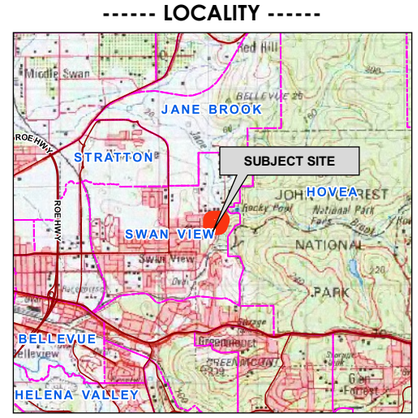
Legislated Lands and Waters

- National Park
- Nature Reserve

0 100 200 300 400

Metres

------ LOCALITY ------



AERIAL IMAGERY: Landgate/SLIP

BUSHFIRE PRONE PLANNING

Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Merctaor Units: Metre
Map by: Madison Smith 14-12-2021
SCALE (A3): 1 : 8000

Figure 1.3

Bushfire Prone Area Map

Lot 11 on Plan 1299, Area: 1.8191 ha
655 Pechey Road
SWAN VIEW 6056
SHIRE OF MUNDARING

NATIONAL PARK RD
PECHEY RD
TUNNEL RD
Lot 11
35m
40m
45m
50m
55m
60m
65m
70m
75m
80m
85m
90m
95m

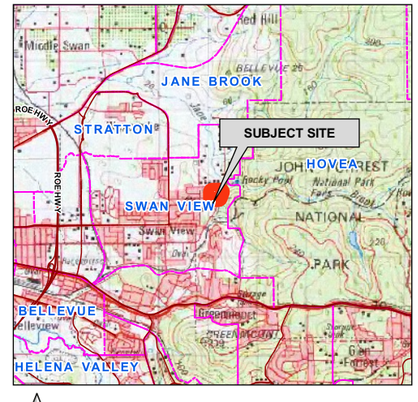
------ LEGEND ------

- Subject Site
- Other Lots
- Bushfire Prone Areas (2021)
- Hydrants
- Proposed Subdivision
- Existing Buildings

0 50 100

Metres

------ LOCALITY ------



AERIAL IMAGERY: Landgate/SLIP

BUSHFIRE PRONE PLANNING

Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Merctaor Units: Metre
Map by: Madison Smith 14-12-2021
SCALE (A3): 1 : 2000

1.2 Existing Documentation Relevant to the Construction of this Plan

This section acknowledges any known reports or plans that have been prepared for previous planning stages, that refer to the subject area and that may or will impact upon the assessment of bushfire risk and/or the implementation of bushfire protection measures and will be referenced in this Bushfire Management Plan.

Table 2.1: Existing relevant documentation.

RELEVANT EXISTING DOCUMENTS		
Existing Document	Copy Provided by Client	Title
Structure Plan	No	N/A
Environmental Report	No	N/A
Landscaping (Revegetation) Plan	No	N/A
Bushfire Risk Assessments	No	N/A

2 ENVIRONMENTAL CONSIDERATIONS

2.1 Native Vegetation – Restrictions to Modification and/or Clearing

Many bushfire prone areas also have high biodiversity values. SPP 3.7 policy objective 5.4 recognises the need to consider bushfire risk management measures alongside environmental, biodiversity and conservation values (Guidelines s2.3).

There is a requirement to identify the need for onsite modification and/or clearing of native vegetation and whether this might trigger potential environmental impact/referral requirements under State and Federal environmental legislation. Confirmation that any proposed native vegetation modification and/or clearing is acceptable, should be received from the relevant agencies by the proponent and provided to the bushfire consultant for inclusion in the Bushfire Management Plan if it will influence the required bushfire planning assessments and outcomes. The following table details any potential environmental restrictions of which the author of this report is aware.

Table 2.2: Native vegetation and potential environmental considerations and restrictions.

NATIVE VEGETATION MODIFICATION / CLEARING - POTENTIAL ENVIRONMENTAL RESTRICTIONS IDENTIFIED				
Environmental Considerations / Features	Potential Mapping Data Source (SLIP / Local Planning)	Relevant to Proposed Development	Data Applied	Action Required
Onsite clearing of native vegetation is required.		Yes		
Environmental impact/referral requirements under State and Federal environmental legislation may be triggered.		Unlikely		
National Park / Nature Reserve	DBCA-011	No-Confirmed by Bushfire Consultant	Relevant Database Reviewed by Bushfire Consultant	None
Conservation Covenant	DPIRD-023	No-Confirmed by Bushfire Consultant	Relevant Database Reviewed by Bushfire Consultant	None
Bush Forever Site	DPLH-019	No-Confirmed by Bushfire Consultant	Relevant Database Reviewed by Bushfire Consultant	None
RAMSAR Wetland	DBCA-010	No-Confirmed by Bushfire Consultant	Relevant Database Reviewed by Bushfire Consultant	None
Geomorphic and Other Wetland	DBCA-011- 019, 040, 043, 044	No-Confirmed by Bushfire Consultant	Relevant Database Reviewed by Bushfire Consultant	None
Threatened and Priority Ecological Communities (TECs or PECs)	DBCA-038	Not Known	Data Not Readily Available to Bushfire Consultant	Select.
Threatened and Priority Flora including Declared Rare Flora (DRFs)	DBCA-036	Not Known	Data Not Readily Available to Bushfire Consultant	Select.
Land Identified as significant through a Local Biodiversity Strategy	LG - Intramaps	No-Confirmed by Bushfire Consultant	Relevant Database Reviewed by Bushfire Consultant	None

Statement of how the identified environmental feature(s) is dealt with in this Bushfire Management Plan (and the location of relevant information):

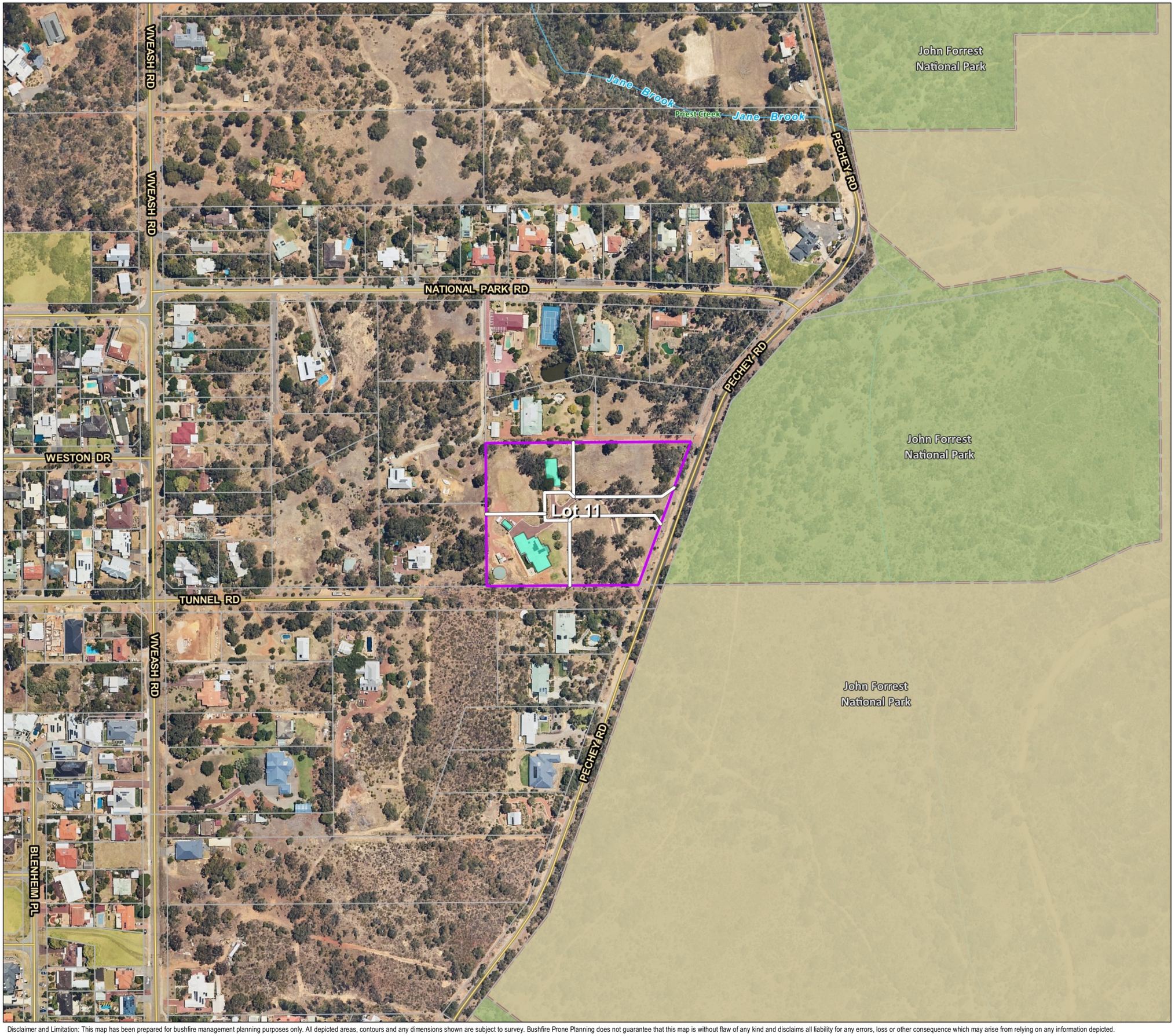
The assessments and bushfire protection measures detailed the BMP, assume that environmental approval will be achieved or clearing permit exemptions will apply. Trees may need to be removed at a later stage for future residential dwellings on proposed Lots 1, 2, and 3.

It is advised that the proponent seek further advice from an Environmental Consultant or the WA Department of Biodiversity Conservation and Attractions for further information on the condition and species contained within the proposed development area and the requirement for referral of the proposal.

Figure 2.1

Environmental Considerations

Lot 11 on Plan 1299, Area: 1.8191 ha
655 Pechey Road
SWAN VIEW 6056
SHIRE OF MUNDARING



0 50 100 150 200

Metres

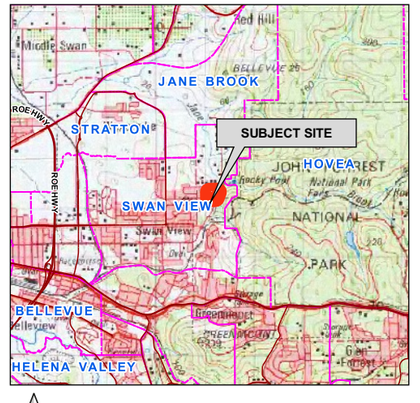
------ LEGEND ------

- Subject Site
- Other Lots
- Clearing Regulations
- Reserves

Legislated Lands and Waters

- National Park
- Nature Reserve

------ LOCALITY ------



AERIAL IMAGERY: Landgate/SLIP

Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Merctaor Units: Metre
Map by: Madison Smith 14-12-2021
SCALE (A3): 1 : 3000

BUSHFIRE PRONE PLANNING

Development Design Considerations

Establishing development in bushfire prone areas can adversely affect the retention of native vegetation through clearing associated with the creation of lots and/or asset protection zones. Where loss of vegetation is not acceptable or causes conflict with landscape or environmental objectives, it will be necessary to consider available design options to minimise the removal of native vegetation.

Table 2.3: Development design.

MINIMISE THE REMOVAL OF NATIVE VEGETATION	
Design Option	Assessment / Action
Reduction of lot yield	N/A
Cluster development	N/A
Construct building to a standard corresponding to a higher BAL as per BCA (AS 3959:2018 and/or NASH Standard)	N/A
Modify the development location	N/A
Subject to any applicable Environmental Survey Works and approval from the Local Government Authority, the proposed subdivision can achieve asset protection zone development and maintenance of vegetation of the development site in a low threat state, which will ensure the bushfire risk will be reduced to the immediate surrounding properties due to continued ongoing management of vegetation. Onsite trees may need to be removed dependent on the location of future residential dwellings.	
IMPACT ON ADJOINING LAND	
Is this planning proposal able to implement the required bushfire protection measures within the boundaries of the land being developed so as not to impact on the bushfire and environmental management of neighbouring reserves, properties or conservation covenants?	Yes
The required Asset Protection Zone (APZ) can be established within the extents of the subject lot. The construction of future development and ongoing management of onsite vegetation will reduce the threat of bushfire.	

2.2 Retained Vegetation / Re-vegetation / Landscape Plans (including POS)

Riparian zones, wetland/foreshore buffers, road verges and public open space may have plans to re-vegetate or retain vegetation as part of the proposed development. Vegetation corridors may be created between offsite and onsite vegetation and provide a route for fire to enter a development area.

All retained/planned vegetation and its management will be considered in the development of this Bushfire Management Plan.

Is re-vegetation of riparian zones and/or wetland or foreshore buffers and/or public open space a part of this Proposal?	No
N/A	
Is the requirement for ongoing maintenance of existing vegetation in riparian zones and/or wetland or foreshore buffers and/or public open space a part of this Proposal?	No
N/A	
Has a landscape plan been developed for the proposed development?	No
N/A	

2.3 Shire of Mundaring – Local Natural Areas (LNA)

The Shire of Mundaring has a Local Biodiversity Strategy that requires natural areas should be conserved, protected or retained wherever practicable to maintain the Shire's current levels of biodiversity, unless the area is already committed to development through zoning. To achieve this intention formal protection is put in place through the Local Planning Strategy and Town Planning Scheme No. 4 which specify controls and recommendations relating to each of these categories.

PROTECTION LEVELS Based a range of factors including land tenure, specific purpose of Crown reserves, existing lot sizes, subdivision potential and relative conservation priority, all LNA's in the Shire have been assigned a Protection Level.	
Map Shading	Level
Green	Conservation
Blue	Protection
Orange	Retention
Beige	Limited Protection – already committed by zoning

CONSERVATION PRIORITIES To assist with making decisions on planning proposals affecting LNA's and the allocation of resources to managing them, conservation priorities have been determined. LNA's are identified as having one of three conservation priorities (P1, P2 or P3) based on a range of ecological values. Refer to Shire of Mundaring Local Biodiversity Strategy and Local Planning Strategy)			
Map Shading	Priority	Intention	Conservation Assets
Green	1	To be conserved or protected and receive active management	Rare vegetation complexes / At risk vegetation complexes / Within 20 m of a watercourse Regional linkage over special features / Regional linkage over habituate
Brown	2	To be conserved or protected and receive active management	Habitat / Special features / Regional linkages Within 20-50m off watercourse
Yellow	3	To be retained and where possible receive active management	Every other LNA

Assessment Result

Has the proposed development area (lot(s)) been identified as being subject to a Local Natural Area classification over any portion?	No

3 POTENTIAL BUSHFIRE IMPACT ASSESSMENT

3.1 Assessment Input

3.1.1 Fire Danger Index (FDI) Applied

AS 3959:2018 Table 2.1 specifies the fire danger index values to apply for different regions. The values used in the model calculations are for the Forest Fire Danger Index (FFDI) and for which equivalent representative values of the Grassland Fire Danger Index (GFDI) are applied as per Appendix B. The values can be modified if appropriately justified.

Table 3.1: Applied FDI Value

FDI VALUE			
Vegetation Areas	As per AS 3959:2018 Table 2.1	As per DFES for the Location	Value Applied
1-13	80	N/A	80

3.1.2 Vegetation Classification and Effective Slope

Classification: Bushfire prone vegetation identification and classification has been conducted in accordance with AS 3959:2018 s2.2.3 and the Visual Guide for Bushfire Risk Assessment in WA (DoP February 2016).

When more than one vegetation type is present, each type is identified separately, and the applied classification considers the potential bushfire intensity and behaviour from the vegetation types present and ensures the worst case scenario is accounted for – this may not be from the predominant vegetation type.

The vegetation structure has been assessed as it will be in its mature state (rather than what might be observed on the day). Areas of modified vegetation are assessed as they will be in their natural unmodified state (unless maintained in a permanently low threat, minimal fuel condition, satisfying AS 3959:2018 s2.2.3.2(f) and asset protection zone standards). Vegetation destroyed or damaged by a bushfire or other natural disaster has been assessed on its revegetated mature state.

Effective Slope: Refers to the ground slope under each area of classified vegetation and is described in the direction relative to the view from the building or proposed development site. Effective slope is not the same as 'average slope', rather it is the slope which most significantly influences fire behaviour. This slope has a direct and significant influence on a bushfire's rate of spread and intensity.

Where there is a significant change in effective slope under an area of classified vegetation, that will cause a change in fire behaviour, separate vegetation areas will be identified to enable the correct assessment.

When the effective slope, under a given area of bushfire prone vegetation, will be different relative to multiple proposed development sites, then the effective slopes corresponding to the different locations, are separately identified.

Table 3.2: Vegetation classification and effective slope.

ALL VEGETATION WITHIN 150 METRES OF THE PROPOSED DEVELOPMENT				
Vegetation Area	Identified Vegetation Types [1] or Description if 'Excluded'	Applied Vegetation Classification [1]	Effective Slope (degrees)[2] (AS 3959:2018 Method 1)	
			Assessed	Applied Range
1	Open forest A-03	Class A Forest	Upslope 5	Upslope or flat
2	Open heath C-11	Class C Shrubland	Upslope 12	Upslope or flat
3	Open heath C-11	Class C Shrubland	Upslope 8	Upslope or flat
4	Open forest A-03	Class A Forest	Downslope 4	Downslope >0-5
5	Open forest A-03	Class A Forest	Upslope 6	Upslope or flat
6	Sown pasture G-26	Class G Grassland	Upslope 6	Upslope or flat
7	Open forest A-03	Class A Forest	Flat 0	Upslope or flat
8	Woodland B-05	Class B Woodland	Downslope 3	Downslope >0-5
9	Open forest A-03	Class A Forest	Downslope 3	Downslope >0-5
10	Woodland B-05	Class B Woodland	Downslope 8	downslope >5-10
11	Sown pasture G-26	Class G Grassland	Downslope 8	downslope >5-10
12	Non-Vegetated Area, Low Threat Vegetation	Excluded as per Section 2.2.3.2 (e)(f)	N/A	N/A
13	Non-Vegetated Area, Low Threat Vegetation	Excluded as per Section 2.2.3.2 (e)(f)	N/A	N/A
Representative photos of each vegetation area, descriptions and classification justification, are presented on the following pages. The areas of classified vegetation are defined, and the photo locations identified on Figure 3.1, the vegetation and topography map.				
Note[1]: Described and classified as per AS 3959:2018 Table 2.3 and Figures 2.3 and 2.4 (A)-(H) Note[2]: Effective slope measured as per AS 3959:2018 Section 2.2.5 and Appendix B Part B4				

Additional Supporting Information

Area 10 and 11 are onsite and have been considered 'Excluded' under AS 3959-2018 s2.2.3.2 (f) 'Low Threat Vegetation' in post-development vegetation as detailed in the Post-Vegetation Map and BAL Contour Map. The subject site landowner(s) have the ability to maintain the areas in a low threat state in perpetuity. This primarily requires management of grasses.

VEGETATION AREA 1	
AS 3959:2018 Vegetation Classification Applied:	Class A Forest
Vegetation Types Present:	Open forest A-03
Description/Justification:	John Forrest National Park: Mixed species tree composition dominated by jarrah and marri trees up to 20 m in height, foliage cover 30-50%. Understory comprises of mixed species shrubs of various heights and unmanaged tall grass.
Post Dev. Assumptions:	Vegetation is offsite and cannot be managed or removed by the subject site landowner. Vegetation is classified as worst-case scenario.

Photo ID: 1

Photo ID: 2

Photo ID: 3

Photo ID: 4

VEGETATION AREA 2			
AS 3959:2018 Vegetation Classification Applied:	Class C Shrubland		
Vegetation Types Present:	Tussock grassland G-22	Dense sown pasture G-25	Sown pasture G-26
Description/Justification:	Mixed species shrubs <2 m in height including grasstrees, hakeas, grevilleas, dryandras and acacias. Mixed species unmanaged grass between shrubs. Sparse jarrah and marri trees. Includes areas of John Forrest National Park.		
Post Dev. Assumptions:	Vegetation is offsite and cannot be managed or removed by the subject site landowner. Vegetation is classified as worst-case scenario.		

Photo ID: 5

Photo ID: 6

Photo ID: 7

Photo ID: 8

VEGETATION AREA 3			
AS 3959:2018 Vegetation Classification Applied:	Class C Shrubland		
Vegetation Types Present:	Tussock grassland G-22	Dense sown pasture G-25	Sown pasture G-26
Description/Justification:	Mixed species shrub composition <2 m in height, with grasstrees, hakeas, grevilleas, and pimelias. Jarrah and marri trees present <10% foliage cover. Understory of mixed species grasses and groundcovers.		
Post Dev. Assumptions:	Vegetation is offsite and cannot be managed or removed by the subject site landowner. Vegetation is classified as worst-case scenario. The Road Reserve Easement vegetation may be removed in the future for extension of tunnel road.		

Photo ID: 9

Photo ID: 10

VEGETATION AREA 4		
AS 3959:2018 Vegetation Classification Applied:	Class A Forest	
Vegetation Types Present:	Open forest A-03	
Description/Justification:	Mixed species trees including jarrah and marri up to 20 m in height, foliage cover ~40%. Understory of mixed species shrubs including grasstrees and acacias, mixed species unmanaged grass and groundcovers.	
Post Dev. Assumptions:	Vegetation is offsite and cannot be managed or removed by the subject site landowner. Vegetation is classified as worst-case scenario. Vegetation may be removed at a later date for the development of a road easement.	

Photo ID: 11

Photo ID: 12

VEGETATION AREA 5	
AS 3959:2018 Vegetation Classification Applied:	Class A Forest
Vegetation Types Present:	Open forest A-03
Description/Justification:	Mixed species tree composition dominated by smooth bark eucalyptus trees >20 m in height. Foliage cover ~30%. Understory of unmanaged mixed species grass.
Post Dev. Assumptions:	Vegetation is offsite and cannot be managed or removed by the subject site landowner. Vegetation is classified as worst-case scenario.

Photo ID: 13

Photo ID: 14

Photo ID: 15

Photo ID: -

VEGETATION AREA 6	
AS 3959:2018 Vegetation Classification Applied:	Class G Grassland
Vegetation Types Present:	Open forest A-03
Description/Justification:	Unmanaged grass surrounded by forest and woodland vegetation.
Post Dev. Assumptions:	Vegetation is offsite and cannot be managed or removed by the subject site landowner. Vegetation is classified as worst-case scenario.

Photo ID: 16

Photo ID: 17

VEGETATION AREA 7	
AS 3959:2018 Vegetation Classification Applied:	Class A Forest
Vegetation Types Present:	Open forest A-03
Description/Justification:	Forest vegetation along a brook running through northern neighbouring lots. Mixed species tree composition with trees up to 15 m in height, foliage cover 30-40%. Understory of dense mixed species grass and dried reeds.
Post Dev. Assumptions:	Vegetation is offsite and cannot be managed or removed by the subject site landowner. Vegetation is classified as worst-case scenario.

Photo ID: 18

Photo ID: 19

VEGETATION AREA 7	
	
Photo ID: 20	Photo ID: 21

VEGETATION AREA 8	
AS 3959:2018 Vegetation Classification Applied:	Class B Woodland
Vegetation Types Present:	Woodland B-05
Description/Justification:	Mixed species eucalyptus tree composition, trees up to 15 m in height, with foliage cover ~20% along paddock fence-lines. Understory of unmanaged grass.
Post Dev. Assumptions:	Vegetation is offsite and cannot be managed or removed by the subject site landowner. Vegetation is classified as worst-case scenario.
	
Photo ID: 22	

VEGETATION AREA 9	
AS 3959:2018 Vegetation Classification Applied:	Class A Forest
Vegetation Types Present:	Open forest A-03
Description/Justification:	Forest vegetation along a brook running through the north-eastern corner of the subject site. Mixed species tree composition with trees up to 15 m in height, foliage cover 30-40%. Understory of dense mixed species grass and dried reeds.
Post Dev. Assumptions:	Vegetation is onsite and can be managed and/or removed by the subject site landowner. Vegetation is classified as worst-case scenario.

Photo ID: 23

Photo ID: 24

VEGETATION AREA 10	
AS 3959:2018 Vegetation Classification Applied:	Class B Woodland
Vegetation Types Present:	Woodland B-05
Description/Justification:	Mixed species trees with areas dominated by jarrah and marri up to 20 m in height, foliage cover <30% and areas of peppermint trees for bank stabilisation. Understory comprises of unmanaged grass and ground cover (morning glory).
Post Dev. Assumptions:	Vegetation is onsite and classified as worst-case scenario. It can be reasonably expected that vegetation will be maintained to a low threat state in perpetuity post-subdivision by the subject site landowners. Future development of proposed lots may require the management of vegetation.

Photo ID: 25

Photo ID: 26

VEGETATION AREA 10	
	
Photo ID: 27	Photo ID: 28

VEGETATION AREA 11	
AS 3959:2018 Vegetation Classification Applied:	Class G Grassland
Vegetation Types Present:	Open forest A-03
Description/Justification:	Tall grass on subject site lot. Grass between maintained shrubs and hedge.
Post Dev. Assumptions:	Vegetation is onsite and classified as worst-case scenario. It can be reasonably expected that vegetation will be maintained to a low threat state in perpetuity post-subdivision by the subject site landowners. Future development of proposed lots may require the management of vegetation.
	
Photo ID: 29	Photo ID: 30

VEGETATION AREA 12		
AS 3959:2018 Vegetation Classification Applied:	Excluded as per Section 2.2.3.2 (e)(f)	
Vegetation Types Present:	Non-Vegetated Areas Low Threat Vegetation	
Description/Justification:	Onsite sealed driveway and cleared/gravel areas surrounding the existing buildings. Maintained lawn and private garden.	
Post Dev. Assumptions:	Low threat areas onsite will be maintained in a low threat state by the subject site landowner(s) in perpetuity.	
		
Photo ID: 31	Photo ID: 32	
		
Photo ID: 33	Photo ID: -	

VEGETATION AREA 13	
AS 3959:2018 Vegetation Classification Applied:	Excluded as per Section 2.2.3.2 (e)(f)
Vegetation Types Present:	Non-Vegetated Areas Low Threat Vegetation
Description/Justification:	Non-vegetated areas include sealed public roads, private driveways and built out areas. Low threat areas of vegetation including maintained road verges, managed grass and private reticulated gardens.
Post Dev. Assumptions:	Low threat areas offsite can be reasonably expected to remain in a low threat state in perpetuity.

Photo ID: 34

Photo ID: 35

Photo ID: 36

Photo ID: 37

Photo ID: 38

Photo ID: 39

Figure 3.1

Existing Topography and Classified Vegetation

Lot 11 on Plan 1299, Area: 1.8191 ha
655 Pechey Road
SWAN VIEW 6056
SHIRE OF MUNDARING

NATIONAL PARK RD
PECHEY RD
TUNNEL RD
Lot 11
Lot1
Lot3
Lot4
AREA 1 Class (A) Forest Effective Slope 0°
AREA 2 Class (C) Shrubland Effective Slope 0°
AREA 3 Class (C) Shrubland Effective Slope 0°
AREA 4 Class (A) Forest Effective Slope >0-5°
AREA 5 Class (A) Forest Effective Slope 0°
AREA 6 Class (G) Grassland Effective Slope 0°
AREA 7 Class (A) Forest Effective Slope 0°
AREA 8 Class (B) Woodland Effective Slope 0°
AREA 9 Class (A) Forest Effective Slope >0-5°
AREA 10 Class (B) Woodland Effective Slope >5-10°
AREA 11 Class (G) Grassland Effective Slope >5-10°
AREA 12 Excluded
AREA 13 Excluded

------ LEGEND ------

- Subject Site
- Other Lots
- 150m Assessment Area
- Proposed Subdivision
- Photo & Direction
- Hydrants
- Existing Buildings

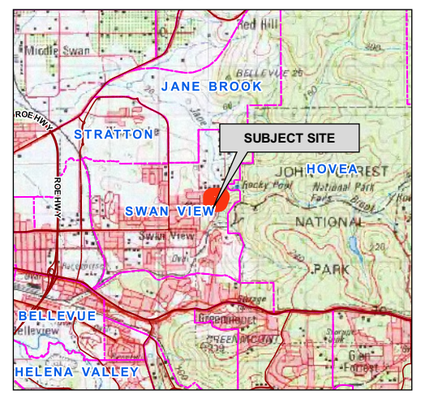
Classified Vegetation Slope Range

- Class A - Forest
- Class B - Woodland
- Class C - Shrubland
- Class G - Grassland
- Exclusion 2.2.3.2

0 20 40 60

Metres

------ LOCALITY ------



AERIAL IMAGERY: Landgate/SLIP

BUSHFIRE PRONE PLANNING

Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Merctaor Units: Metre
Map by: Madison Smith 21-12-2021
SCALE (A3): 1 : 1500

Figure 3.1.1

Post-Development Topography and Classified Vegetation

Lot 11 on Plan 1299, Area: 1.8191 ha
655 Pechey Road
SWAN VIEW 6056
SHIRE OF MUNDARING

NATIONAL PARK RD
PECHEY RD
TUNNEL RD

AREA 8
Class (B) Woodland
Effective Slope 0°

AREA 5
Class (A) Forest
Effective Slope 0°

AREA 7
Class (A) Forest
Effective Slope 0°

AREA 13
Excluded

AREA 6
Class (G) Grassland
Effective Slope 0°

AREA 9
Class (A) Forest
Effective Slope >0-5°

Lot 1
Lot 2
AREA 11
Excluded
Lot 11

AREA 5
Class (A) Forest
Effective Slope 0°

20 m
AREA 12
Excluded
Lot 4
20 m
AREA 10
Excluded
Lot 3

AREA 1
Class (A) Forest
Effective Slope 0°

AREA 2
Class (C) Shrubland
Effective Slope 0°

AREA 13
Excluded

AREA 4
Class (A) Forest
Effective Slope >0-5°

AREA 3
Class (C) Shrubland
Effective Slope 0°

AREA 3
Class (C) Shrubland
Effective Slope 0°

50m 55m 60m 65m 70m 75m 80m 90m 95m 85m 35m 40m 45m

------ LEGEND ------

- Subject Site
- Other Lots
- 150m Assessment Area
- APZ
- APZ Distance (m)
- Proposed Subdivision
- Hydrants
- Existing Buildings

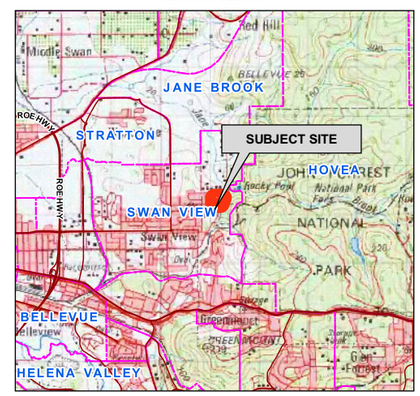
Classified Vegetation Slope Range

- Class A - Forest
- Class B - Woodland
- Class C - Shrubland
- Class G - Grassland
- Exclusion 2.2.3.2

0 20 40 60

Metres

------ LOCALITY ------



AERIAL IMAGERY: Landgate/SLIP

BUSHFIRE PRONE PLANNING

Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Merctaor Units: Metre
Map by: Madison Smith 14-01-2022
SCALE (A3): 1 : 1500

3.1.3 Vegetation Separation Distance

The vegetation separation distance is the horizontal distance measured from the relevant parts of an existing building or a future building's planned location (within a lot), to the determined edge of an area of classified vegetation.

This separation distance applied to determining a Bushfire Attack Level (BAL) can be either:

- The *measured distance* – for which the location of the building relative to the edge of classified vegetation must be known. This will result in single determined BAL that will apply to a building. (The measured distance is a required calculation input); or
- A *calculated minimum and maximum distance (range)* that will correspond to each individual BAL. The calculated distances provide an indicative (or achievable) BAL for which the determined BAL will be dependent on the known location of the building relative to the edge of classified vegetation.

  The calculated range of distances corresponding to each BAL can be presented in different formats (tables or a BAL contour map), dependent on the form of information that is most appropriate for the proposed development/use. These distance ranges corresponding to BAL(s) will be presented in Section 3.2: 'Assessment Output".

For the proposed development/use, the applicable vegetation separation distances will be presented within the Bushfire Management Plan in this location:	In Section 3.2 'Assessment Output' as a table containing the calculated ranges of distance corresponding to each BAL and illustrated as a BAL Contour Map.

3.2 Assessment Output

UNDERSTANDING THE RESULTS OF THE BUSHFIRE IMPACT ASSESSMENT

Bushfire Attack Levels (BALs) – Their Application in the Building Environment is Different to the Planning Environment

In the building environment, a ***determined BAL*** is required for the proposed construction at the building application stage. This is to inform approval considerations and establish the bushfire construction standards that are to apply. An indicative BAL is not acceptable for a building application.

In the planning environment, through the application of SPP 3.7 and associated Guidelines, the deemed to satisfy requirement for a proposed 'development site' or sites (defined by the LPS Amendment Regulations 2015 as "that part of a lot on which a building that is the subject of development stands or is to be constructed"), is that a BAL-29 or lower rating can be achieved once all works associated with the proposal are completed. For planning approval purposes, an ***indicative BAL*** can provide the required information.

Determined Bushfire Attack Level

A determined BAL is to apply to an existing building or the 'development site' on which the building is to be constructed and not to a lot or building envelope. Its purpose is to state the potential radiant heat flux to which the building will be exposed, thereby determining the construction standard to be applied.

A determined BAL cannot be given for a future building whose design and position on the lot are unknown or the vegetation separation distance has not been established. It is not until these variables have been fixed that a determined BAL can be stated, and a BAL Certificate can be issued.

The one exception is when a building ***of any dimension*** can be ***positioned anywhere*** on a proposed lot (within R-Code building setbacks) or within a defined building envelope, and always remain subject to the same BAL, regardless of the retention of any existing classified vegetation either onsite or offsite.

Indicative Bushfire Attack Level

If a BAL is not able to achieve 'determined' status it will be an indicative BAL. It indicates the BAL that can be achieved by the proposed development/use. However, it is conditional upon an assessment variable(s) being confirmed at a later stage (e.g. the building location is established/changed, or vegetation is modified/removed to establish the vegetation separation distance).

A BAL certificate cannot be issued for an indicative BAL – unless that BAL cannot vary (refer to 'Determined BAL' above).

In table form, a single or a range of indicative BAL(s) may be presented. If a single indicative BAL is stated for a defined area (i.e. the lot or building envelope), this will be the highest indicative BAL impacting the defined area.

In BAL contour map form (refer to Section 3.2.1), the illustrated BAL contours visually identify areas of land for which if any part of an existing or proposed building is located on that land and within the BAL contours, then the highest BAL affecting that building (or part of the land on which the building will be constructed), will be the indicative BAL that is to apply.

The BAL can only become a determined BAL once the actual location of that building on the land is known and/or the required minimum vegetation separation distance corresponding to the relevant BAL contour is established (refer to Table 3.3).

3.2.1 Bushfire Attack Level Results - BAL Contour Map Format

INTERPRETATION OF THE BUSHFIRE ATTACK LEVEL (BAL) CONTOUR MAP

The contour map will present different coloured contour intervals extending from the areas of classified bushfire prone vegetation. These represent the different bushfire attack levels that will exist at varying distances away from the classified vegetation in the event of a bushfire in that vegetation.

The areas of classified vegetation to be considered in developing the BAL contours, are those that will remain as the intended end state of the subject development once earthworks, clearing and/or landscaping and re-vegetation have been completed (or each stage completed).

Each bushfire attack level corresponds to a set range of radiant heat flux that is generated by a bushfire. That range is defined by the AS 3959:2018 BAL determination methodology.

The width of each shaded BAL contour is a diagrammatic representation of the separation distances from the classified vegetation that correspond to each BAL for each separately identified area of classified vegetation. They have been calculated by the application of the unique site variables including vegetation types and structure, ground slope and applied fire weather.

(Refer to Section 3.2 'Understanding the Results of the Bushfire Impact Assessment' for the explanation of how BAL(s) for buildings will be assessed from the BAL Contour Map).

Construction of the BAL Contours

VEGETATION AREAS APPLIED TO THE DEVELOPMENT OF THE BAL CONTOUR MAP

All identified areas of classified vegetation have been applied with the following exception:

1. For Figure 3.1.1, all classified vegetation within the subject site, apart from the forest vegetation bordering the brook, is excluded and the BAL contours (Fig 3.2) are constructed into the lot from any classified vegetation outside the boundaries of proposed subdivision site.

This approach is applied to indicate the achievable bushfire attack levels within the specified proposed lots and the resultant area of developable land (i.e. subject to BAL-29 or less). It is based on the following assumptions:

1. Any classified vegetation within each lot can potentially be managed by the landowner to meet asset protection zone standards and dimensions corresponding to an indicated BAL; and
2. Each lot must be considered independent of what development may or may not take place on the adjoining lot.

VEGETATION SEPARATION DISTANCES APPLIED

The distances that have been applied to illustrating the width of each BAL contour shown in Figures 3.2 are stated in Table 3.3. These correspond to each Bushfire Attack Level and are specific to the proposed development site.

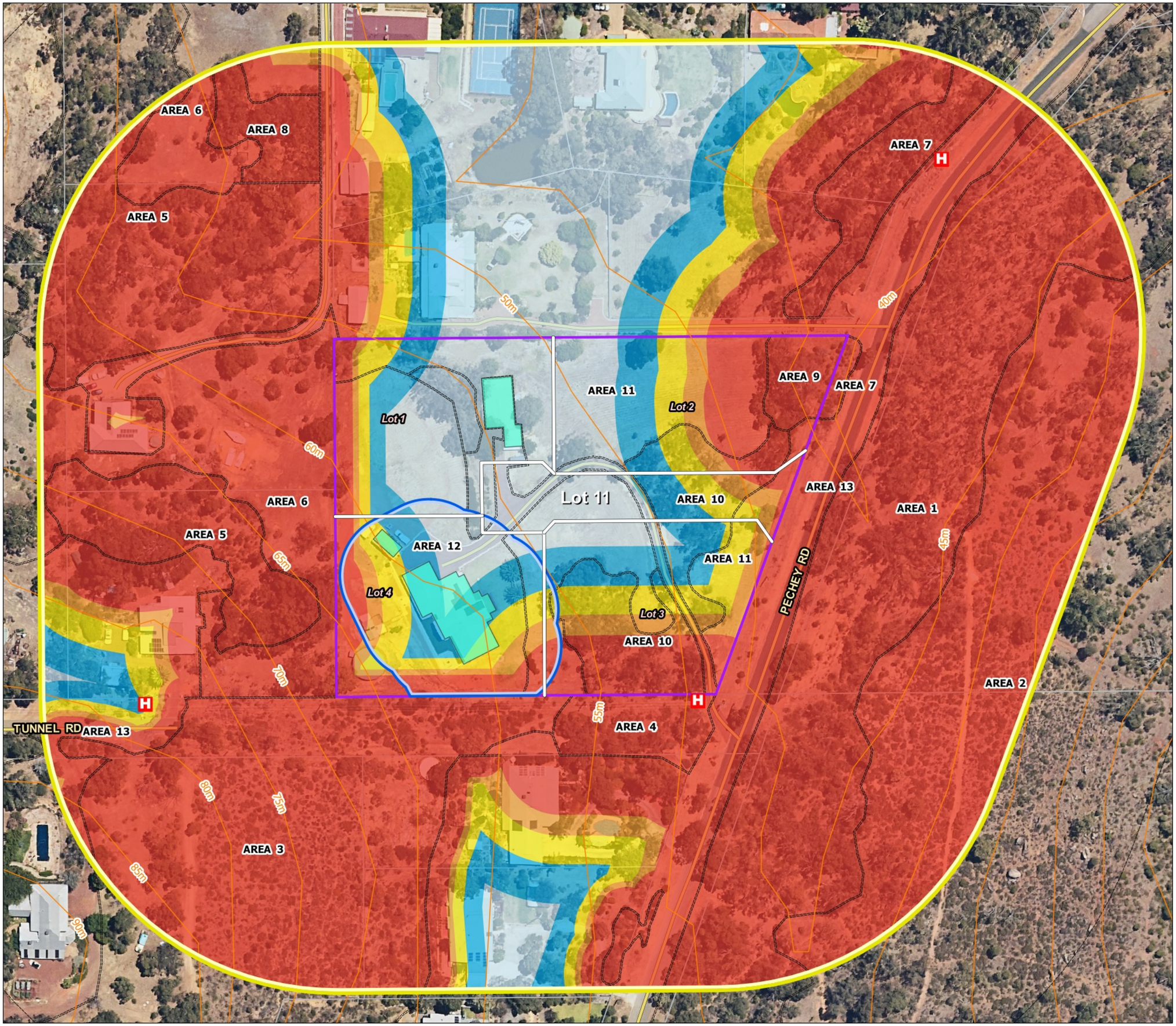
Table 3.3: Vegetation separation distances applied to construct the BAL contours.

BAL CONTOUR MAP – APPLIED VEGETATION SEPARATION DISTANCES								
Derived from the Application of Method 1 BAL Determination Methodology (AS 3959:2018 Section 2, Table 2.5)[1]								
Vegetation Area	Vegetation Classification	Effective Slope (degree range)	BAL and Corresponding Separation Distance (m)					
			BAL-FZ	BAL-40	BAL-29	BAL-19	BAL12.5	BAL-LOW
1	Class A Forest	Upslope or flat	<16	16-<21	21-<31	31-<42	42-<100	>100
2	Class C Shrubland	Upslope or flat	<10	10-<13	13-<19	19-<27	27-<100	>100
3	Class C Shrubland	Upslope or flat	<7	7-<9	9-<13	13-<19	19-<100	>100
4	Class A Forest	Downslope >0-5	<20	20-<27	27-<37	37-<50	50-<100	>100
5	Class A Forest	Upslope or flat	<16	16-<21	21-<31	31-<42	42-<100	>100
6	Class G Grassland	Upslope or flat	<6	6-<8	8-<12	12-<17	17-<50	>50
7	Class A Forest	Upslope or flat	<16	16-<21	21-<31	31-<42	42-<100	>100
8	Class B Woodland	Downslope >0-5	<13	13-<17	17-<25	25-<35	35-<100	>100
9	Class A Forest	Downslope >0-5	<20	20-<27	27-<37	37-<50	50-<100	>100
*10	Class B Woodland	Downslope >5-10	<16	16-<22	22-<31	31-<43	43-<100	>100
*11	Class G Grassland	Downslope >5-10	<8	8-<10	10-<16	16-<23	23-<100	>100
12	Excluded as per Section 2.2.3.2 (e)(f)	N/A	-	-	-	-	-	-
13	Excluded as per Section 2.2.3.2 (e)(f)	N/A	-	-	-	-	-	-
Note[1] All the assessment inputs applied are presented in Section 3.1.								
Note[2] * Indicates vegetation is subject to change post-development, with areas being reclassified to 'Excluded AS 3959-2018 (f)': This is the result of the implementation of the Asset Protection Zone around future structures and any applicable landscaping within the development site. The development site is to be maintained to a low bushfire threat state in perpetuity in accordance with Schedule 1: Standard for Asset Protection Zones as stipulated in the Guidelines for Planning in Bushfire Areas AS 3959-2018 s2.2.3.2 requirements and the Shire of Mundaring Fire Break and Fuel Load Notice. Grassland areas are to be maintained to <50 mm height.								
Note [3] It is assumed for the purposes of the assessment that Area 13 will remain in a low threat state in perpetuity. Under the Shire of Mundaring Fire Break and Fuel Load Notice, adjoining properties must maintain vegetation in a low threat state (grass <5 cm in height) during annual fire season.								

Figure 3.2

BAL Contour Map

Lot 11 on Plan 1299, Area: 1.8191 ha
655 Pechey Road
SWAN VIEW 6056
SHIRE OF MUNDARING



------ **LEGEND** ------

- Subject Site
- Other Lots
- 100m Assessment Area
- APZ
- Proposed Subdivision
- Hydrants
- Existing Buildings

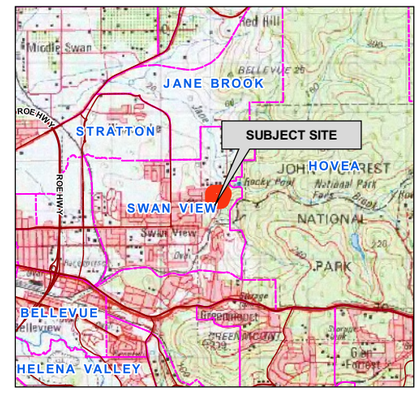
Bushfire Attack Levels

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

0 20 40 60

Metres

------ **LOCALITY** ------



AERIAL IMAGERY: Landgate/SLIP

N

BUSHFIRE PRONE PLANNING

Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Merctaor Units: Metre
Map by: Madison Smith 21-12-2021
SCALE (A3): 1 : 1200

4 IDENTIFICATION OF BUSHFIRE HAZARD ISSUES

In response to the Bushfire Management Plan requirements established by Appendix 5 of the Guidelines for Planning in Bushfire Prone Areas (WAPC 2017 v1.3), the following statements are made to assist in the understanding of whether the proposal is likely to be able to comply with the bushfire protection criteria now or in subsequent planning stages.

Spatial Context - Broader Landscape Considerations	
Wider road network and access constraints	The surrounding area has an extensive public road network at the larger scale associated with the residential and rural residential zoning and corresponding large lot sizes. West of the subject site lot has numerous access routes available (built-out area). There is no access constraint for the subject site with regard to what is considered acceptable from a planning perspective.
Proximity of settlements and emergency services	The subject site is part of a large area of urban/semi-rural settlement. The commercial/industrial area of Midland is approximately 10 minutes away. Nearby built-out residential areas include Swan View, Greenmount, Stratton and Jane Brook. Emergency services are located in Midland and Darlington (4.6 km, 8 minutes travel; 6.6 km, 8 minutes travel).
Bushfire prone vegetation types and extent (including conserved vegetation)	Significant extents of bushfire prone vegetation exist across the broader landscape as retained native vegetation (jarrah/marri forest) but interspersed with improved pastures (grassland) and asset protection zones around existing dwellings. Most of the bushfire prone vegetation that will impact the subject site is on crown land (National Park). Additional small areas of bushfire prone vegetation are on private land and subject to various levels of fuel load management. The John Forrest National Park (2678 ha) is across from the subject site – separated by Pechey Road. This is a significant continuous (unfragmented) extent of bushfire prone vegetation. Talbot Road Nature Reserve is ~1.2 km from the subject site (106.9 ha). The forest vegetation will produce significant embers and firebrands in a bushfire event primarily due to the type of bark.
Topography and fire behaviour interactions.	The topography is undulating rather than rugged. Some areas of flat land but most has slopes of zero to five degrees and up to ten degrees over significant areas. Bushfire rates of spread can double for every ten degrees of upslope while downslopes will slow the rate of spread.
Potential for extreme fire behaviour and pyro convective events.	Possible due to the proximity to John Forrest National Park and it's connection to other significant areas of bushfire prone vegetation. However, the likelihood for extreme fire behaviour and pyro convective events is reduced by the fragmentation of areas of bushfire prone vegetation due to cleared areas, pastured areas, fuel load management by landowners surrounding the subject site and the availability of emergency services (including being a part of the greater Perth metropolitan area).
Environmental Considerations	
Constraints to implementing required and/or additional bushfire protection measures	The environment considerations have not identified any issues or constraints to implementing the required bushfire protection measures.
Provision of Access Within the Subject Site	
Potential constraints	No constraints to establishing the required access will exist.
Potential Bushfire Impacts	
Flame and radiant heat and ability to establish an APZ	The proposed lot sizes will allow a BAL-29 dimensioned APZ to be established within each lot. This will prevent flame contact from the classified vegetation. Application of the BAL-29 bushfire construction standard will mitigate the risks from radiant heat impact to what is considered an acceptable level.

Embers/firebrands, smoke and fire-driven wind	These will be the major impacts to the subject site. The appropriate protection measures of building construction and strict management of the APZ will mitigate the risk to what is considered an acceptable level.
Issues to be Considered at Subsequent Planning Stages (additional assessments/documents)	
Specific land uses to be addressed	N/A
Additional assessments	N/A
Additional documents	N/A
Discretionary Decision Making and the Precautionary Principle (SPP 3.7 and Guidelines)	
Does the bushfire consultant consider there are issues that need to be addressed in this space?	No.

5 ASSESSMENT AGAINST THE BUSHFIRE PROTECTION CRITERIA ESTABLISHED BY THE GUIDELINES

For a subdivision application to be considered compliant with SPP 3.7, it must satisfy (achieve) the intent of each of the four elements of the bushfire protection criteria. These criteria are established by the *Guidelines for Planning in Bushfire Prone Areas WAPC 2017 v1.3*). Compliance can be achieved by either:

- Meeting all applicable acceptable solutions corresponding to each element (i.e. the minimum bushfire protection measures that are deemed to satisfy planning requirements); or
- Where an acceptable solution cannot be met, by developing a performance solution that satisfies the established requirements.

5.1 Local Government Variations to Apply

Local governments may add to or modify the acceptable solutions of the Bushfire Protection Criteria (BPC) and/or apply technical requirements that vary from those specified in the Guidelines for Planning in Bushfire Prone Areas (WAPC). In such instances, this Proposal will be assessed against these variations and/or any specific local government technical requirements for emergency access and water. Refer to Appendices 2 and 3 for relevant technical requirements.

Will local or regional variations (endorsed by WAPC / DFES) to the applicable acceptable solutions established by the *Guidelines* or the *Position Statement: Tourism land uses in bushfire prone areas WAPC October 2019,* apply to this Proposal?	N/A

5.2 Summary of Assessment Against the Bushfire Protection Criteria

SUMMARISED OUTCOME OF THE ASSESSMENT AGAINST THE BUSHFIRE PROTECTION CRITERIA					
Element of the Bushfire Protection Criteria	Basis for the Proposal Achieving Full Compliance with SPP 3.7			The Proposal Cannot Achieve Full Compliance with SPP 3.7	
	Acceptable Solutions Met	Achieves the Intent of the Element			
	All applicable solutions are fully met	All applicable solutions are not fully met. A merit based assessment and/or a bushfire performance comparison of the proposals residual risk with that of the residual risk of the acceptable solution is conducted (refer Note 4)	A performance principle-based solution is applied	Bushfire planning development type that may not require full compliance is applied	An improvement in bushfire performance compared to the existing development is detailed (refer Note 4)
1. Location	✓			N/A	
2. Siting and Design of Development	✓				
3. Vehicular Access	✓				
4. Water	✓				

Note: The development proposal has been assessed:

1. Against the requirements established in Appendix 4 of the *Guidelines for Planning in Bushfire Prone Areas, WAPC 2017 v1.3 (Guidelines)*. The Guidelines are found at https://www.planning.wa.gov.au/8194.aspx; and
2. Applying the interpretation guidance provided in *Position Statement: Planning in bushfire prone areas – Demonstrating Element 1: Location and Element 2: Siting and design (WAPC Nov 2019)*.
3. Applying any endorsed variations to the Guideline's acceptable solutions and associated technical requirements that have been established by the local government. If known and applicable these have been stated in Section 5.1 with the detail included as an appendix if required by the local government.
4. When non-compliant with SPP 3.7 and when appropriate, by utilising additional compliance pathways that include the application of merit based assessment and comparative bushfire performance. The validity of this approach is derived from relevant decisions made by the responsible authorities (refer Appendix 2).

5.3 Assessment Detail

Element 1: Location	
Intent: To 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.	
Compliance: How the proposed development achieves the intent of Element 1:	By fully meeting all applicable acceptable solutions established by the bushfire protection criteria (Guidelines v1.3 WAPC 2017)

ASSESSMENT (COMPLIANCE) STATEMENTS

For each applicable acceptable solution, the following statements present the results of the assessment of the proposed development/use against the requirements established by the *Guidelines (WAPC 2017 v1.3)* and apply the interpretation guidance established by the *Position Statement: Planning in bushfire prone areas – Demonstrating Element 1: Location and Element 2: Siting and design (WAPC Nov 2019)*.

Acceptable Solution: A1.1: Development Location

ASSESSMENT AGAINST THE REQUIREMENTS ESTABLISHED BY THE GUIDELINES

The proposed subdivision will provide an area of land within each lot that can be considered suitable for development as BAL-40 or BAL-FZ construction standards will not be required to be applied. This meets the requirements established by Acceptable Solution A1.1 and its associated explanatory note.

Areas of the development site subject to radiant heat levels corresponding to the BAL-40 and BAL-FZ ratings, is addressed by development design through minimum setbacks from unmanaged onsite and offsite vegetation (refer to the Element 2 assessment).

ASSESSMENT AGAINST THE REQUIREMENTS ESTABLISHED BY THE POSITION STATEMENT

The position statement establishes that:

- The source of risk (the hazard) to be considered in Element 1 is the "level of bushfire exposure" from the type and extent of bushfire prone vegetation and the topography of the land on which it exists; and
- "Consideration should be given to the site context" which includes the land both "within and adjoining the subject site". The "hazards remaining within the site should not be considered in isolation of the hazards adjoining the site, as the potential impact of a bushfire will be dependent on the wider risk context."

The position statement also recognises:

- That the proposed development site and its surrounding land may be part of an area "identified for development or intensification of land use prior to the release of SPP 3.7"; consequently
- Consideration by decision-makers "should also be given to improving bushfire management of the site and surrounding area, thereby reducing the vulnerability of people property and infrastructure to bushfire"; and
- The application of mitigation measures to lessen the risk to the broader area would include improvements to the local road network (including emergency access ways), improvements/additions to firefighting water supply and increasing separation distance from the hazard.

The Hazard Within the Subject Site

The existing lot is vegetated with native vegetation classified as Class A Forest, Class B Woodland and Class G Grassland. Areas of the subject site are cleared of vegetation and/or maintained in a low threat state by the subject site landowner as asset protection zones established around the existing dwelling and shed.

Element 1: Location

The impact of the slope under the vegetation will be dependent on a bushfire's direction of travel, but slopes in the range of zero to five degrees downslope from the proposed lots do exist. Bushfire travelling upslope will have increased intensity and rate of spread. However, the adjoining land cannot be considered as rugged (which would present the potential for more extreme and variable fire behaviour).

Significantly intense bushfire behaviour is possible, particularly if vegetation within the lot is ignited by bushfire in the adjoining hazard and they are involved together.

However, the ability to establish a BAL-29 dimensioned APZ within each proposed lot's boundaries removes the threat of greater levels of radiant heat or flame contact upon a future dwelling. The BAL-29 APZ will exist over a significant area of each proposed lot.

The primary bushfire threat from bushfire prone vegetation remaining within the proposed lot will be embers. This threat will be mitigated by the application of appropriate building design, bushfire construction standards and the ongoing maintenance of the APZ to ensure the buildings will not be impacted by consequential fire within combustible materials used, stored or accumulated within the APZ.

The Hazard Adjoining the Subject Site

Bushfire prone vegetation adjoining the subject site lot exists as native vegetation classified as Class A Forest, Class C Shrubland, and Class G Grassland and it surrounds the lot. The extent of this hazard is shown in Figure 1.2. Most of the land within the locality supports this vegetation except for the asset protection zones surrounding existing dwellings. These areas of vegetation are occurring under these scenarios:

1. Native vegetation that has been retained on the residential lots and is managed to varying levels.
2. Road easement for the future extension of Tunnel Road, along the southern boundary of the subject site lot. Class A Forest and Class C Shrubland may be removed and or managed to lower fuel levels during and post-road development.
3. John Forrest National Park (2678 ha) is separated from the subject site by Pechey Road. This area of bushfire prone vegetation presents the single most significant extent of bushfire prone vegetation in the surrounding area.

Consequently, the potential exists for intense bushfire behaviour to occur within these areas of bushfire prone vegetation. The potential bushfire impact on persons and property within the proposed lots will be to increase the level of ember attack in the event of a bushfire.

This ember threat will be mitigated by the application of appropriate building design, bushfire construction standards and the ongoing maintenance of the BAL-29 dimensioned APZ, to ensure the buildings will not be impacted by consequential fire within combustible materials used, stored or accumulated within the APZ.

Element 2: Siting and Design of Development

Intent: To ensure that the siting and design of development (note: not building/construction design) minimises the level of bushfire impact.

Compliance: How the proposed development achieves the intent of Element 2:	By fully meeting all applicable acceptable solutions established by the bushfire protection criteria (Guidelines v1.3 WAPC 2017)

ASSESSMENT (COMPLIANCE) STATEMENTS

For each applicable acceptable solution, the following statements present the results of the assessment of the proposed development/use against the requirements established by the *Guidelines (WAPC 2017 v1.3)* and apply the interpretation guidance established by the *Position Statement: Planning in bushfire prone areas – Demonstrating Element 1: Location and Element 2: Siting and design (WAPC Nov 2019)*.

Acceptable Solution: A2.1: Asset Protection Zone

THE APZ - DEVELOPMENT SITING AND DESIGN PLANNING REQUIREMENTS

The necessary outcome of bushfire planning for development siting and design, is to ensure that a building can be located within the developable portion of any lot (i.e. outside those parts of the lot that form the required R-Code building setbacks, or any other excluded area), and be subject to potential radiant heat from a bushfire not exceeding 29 kW/m^2 (i.e. a maximum BAL of BAL-29).

This will be achieved when the size of the "low fuel area immediately surrounding a building", the asset protection zone (APZ), is large enough. This requires a certain separation distance to exist between the building and areas of classified vegetation. These are the BAL-29 APZ dimensions and they will vary dependent on site specific parameters.

The APZ should be contained solely within the boundaries of each lot, except in instances where the neighbouring lot(s) or adjacent public land will be managed in a low-fuel state on an ongoing basis, in perpetuity.

Where possible, planning for siting and design should incorporate elements that include non-vegetated areas (e.g. roads/parking/drainage) and/or formally managed areas of vegetation (public open space/recreation areas/ services installed in a common section of land), as either part of the required APZ dimensions or to additionally increase separation distances to provide greater protection. These elements create robust and easier managed asset protection zones.

THE ASSESSMENT

Future buildings on the lots of the proposed subdivision can be surrounded by an APZ that will ensure the potential radiant heat impact of a bushfire does not exceed 29 kW/m^2 (BAL-29). The required APZ specifications of width, location and management can be achieved.

APZ Width: The required APZ dimensions to ensure buildings are subject to a maximum BAL of BAL-29 (measured from any external wall or supporting post or column to the edge of the classified vegetation), has been determined in Section 3.2 of this BMP and are:

BAL-29 APZ Dimensions		
Applicable to Following Lot:	Building to Vegetation Area 1	Minimum 21 metres
	Building to Vegetation Area 2	Minimum 13 metres
Lot 11 (655) Pechey Road	Building to Vegetation Area 3	Minimum 9 metres
	Building to Vegetation Area 4	Minimum 27 metres
	Building to Vegetation Area 5	Minimum 21 metres
	Building to Vegetation Area 6	Minimum 8 metres
	Building to Vegetation Area 7	Minimum 21 metres
	Building to Vegetation Area 8	Minimum 17 metres
	Building to Vegetation Area 9	Minimum 27 metres

Element 2: Siting and Design of Development

	Building to Vegetation Area 10*	Excluded AS3959-2018 s2.2.3.2(f)
	Building to Vegetation Area 11*	Excluded AS3959-2018 s2.2.3.2(f)
	Building to Vegetation Area 12	-
	Building to Vegetation Area 13	-

* Indicates vegetation subject to change post development onsite, with areas being reclassified to 'Excluded' under AS 3959-2018 section 2.2.3.2 (f). This is the result of the implementation of Asset Protection Zones around future structures and any applicable landscaping within the development site. The development site is to be maintained to a low bushfire threat state in perpetuity in accordance with Schedule 1: Standards for Asset Protection Zones as stipulated in the Guidelines for Planning in Bushfire Prone Areas, AS3959-2018 s2.2.3.2 requirements and the Shire of Mundaring Fire Break and Fuel Load Notice.

APZ Location: Onsite vegetation will be required to be modified/removed (grass management), the authority for which will need to be received from the local government. Trees do not need to be removed to establish low threat areas onsite, however future residential dwelling locations may require tree removal to establish BAL-29 APZs. The BAL-29 APZ will exist solely within the boundaries of each proposed lot, except in instances where the neighbouring lot(s) will be managed in a low fuel state on an ongoing basis, in perpetuity.

APZ Management: All vegetation that will require modification/removal and future management is onsite and therefore under the control of the landowner(s).

Retained vegetation will be managed in accordance with the technical requirements established by the Schedule 1: 'Standards for Asset Protection Zones (Guidelines). The APZ specifications are also detailed in Appendix 1 and the Shire of Mundaring may have additional requirements established by their Fire Break and Fuel Load Notice.

THE APZ – REQUIRED DIMENSIONS TO SATISFY FUTURE BUILDING (AND ONGOING MANAGEMENT)

It is important for the landowner to be aware that the APZ dimensions that will be required to be physically established and maintained on each lot surrounding relevant future buildings, may be different to those stated above for the BAL-29 APZ - which is the minimum dimension a planning proposal needs to show can be established to comply with SPP 3.7.

The actual APZ dimensions to be physically established and maintained, will be based on which of the following establishes the larger APZ dimension:

- The dimensions corresponding to the determined BAL of a building (refer to Section 3.2 for explanation of the 'planning' versus 'building' requirements and 'indicative' versus 'determined' BAL); or
- The APZ dimensions established by the local government's Firebreak Notice.

If the dimensions of the APZ that are to be established are known at this time, they will be stated below.

Areas of the proposed subdivision, subject to post-development onsite vegetation management can achieve a BAL rating of less than BAL-29 (BAL-19 and BAL-12.5). Future buildings within the subdivision can be located in these areas and constructed to the associated construction standards (BAL-19 or BAL-12.5).

Element 3: Vehicular Access

Intent: To ensure that the vehicular access serving a subdivision/development is available and safe during a bushfire event.

Compliance: How the proposed development achieves the intent of Element 3:	By fully meeting all applicable acceptable solutions established by the bushfire protection criteria (Guidelines v1.3 WAPC 2017)

ASSESSMENT (COMPLIANCE) STATEMENTS

For each applicable acceptable solution, the following statements present the results of the assessment of the proposed development/use against the requirements established by the *Guidelines (WAPC 2017 v1.3)*.

Acceptable Solution: A3.1: Two Access Routes

Pechey Road provides two directions of access to different destinations by connecting with, but not restrictive to, National Park Road and Morrison Road. These roads are available to the public at all times under all weather conditions.

Acceptable Solution: A3.2: Public Road

The surrounding existing public roads comply with the construction technical requirements established by the Guidelines and/or the local government, including 6 m minimum trafficable surface area and 4.5 vertical clearance.

Acceptable Solution: A3.3: Cul-de-sacs (including a dead-end road)

The proposed cul-de-sac has a provided area for turning of 23 m in width (exceeding the requirements of 17.5 m diameter). It is less than 200 m before connecting to Pechey Road (~103 m in length). The cul-de-sac will be constructed to a minimum 6 m in width. The construction technical requirements established by the Guidelines and/or the local government can and will be complied with. These requirements are set out in Appendix 2.

Acceptable Solution: A3.4: Battle-axe

N/A

Acceptable Solution: A3.5: Private Driveways

The private driveways to the proposed lots will be <50 m from the cul-de-sac road.
The construction technical requirements established by the Guidelines and/or the local government can and will be complied with. These requirements are set out in Appendix 2.

Acceptable Solution: A3.6: Emergency Access Way

N/A

Acceptable Solution: A3.7: Fire Service Access Routes

N/A

Acceptable Solution: A3.8: Firebreak Width

The proposed lots will comply with the requirements of the local government annual firebreak notice issued under s33 of the Bush Fires Act 1954.

Element 4: Water	
Intent: To ensure water is available to the subdivision, development or land use to enable people, property and infrastructure to be defended from bushfire.	
Compliance: How the proposed development achieves the intent of Element 4:	By fully meeting all applicable acceptable solutions established by the bushfire protection criteria (Guidelines v1.3 WAPC 2017)
ASSESSMENT (COMPLIANCE) STATEMENTS For each applicable acceptable solution, the following statements present the results of the assessment of the proposed development/use against the requirements established by the *Guidelines (WAPC 2017 v1.3)*.	
Acceptable Solution: A4.1: Reticulated Areas	
A reticulated water supply is available to the subject site. The closest hydrant is located at the south-east Lot corner along Pechey Road and the easement for future Tunnel Road extension. Additional hydrants are located along Pechey Road 67 m north of the subject site, 191 m south of the subject site, and at the Tunnel Road cul-de-sac 64 m west of the subject site. Required hydrant separation distances – 100 m commercial, 200 m residential, 400 m rural residential > 1ha The construction technical requirements established by the Guidelines and/or the local government can and will be complied with.	
Acceptable Solution: A4.2: Non-Reticulated Areas	
N/A	
Acceptable Solution: A4.3: Non-Reticulated Areas – Individual Lots	
N/A	

6 RESPONSIBILITIES FOR IMPLEMENTATION AND MANAGEMENT OF THE BUSHFIRE PROTECTION MEASURES

Table 6.1: BMP Implementation responsibilities prior to the issue of titles.

Developer (Landowner) - Prior to Issue of Titles		
No.	Implementation Actions	Subdivision Clearance
Note: Planning approval may be conditioned with the requirements: 1. To place certain notifications on the certificates of title and the deposited plan, regarding the existence of this bushfire management plan and the obligations it creates; and 2. To provide certification of the implementation of certain bushfire protection measures established by this bushfire management plan.		
1	Condition (as per Code F2 of Model Subdivision Schedule, WAPC April 2020): A notification, pursuant to Section 165 of the *Planning and Development Act 2005*, may be 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: *"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).	☐
2	Condition (as per Code F3 of Model Subdivision Schedule, WAPC April 2020): A restrictive covenant to the benefit of the local government pursuant to section 129BA of the *Transfer of Land Act 1893*, may be required to be placed on the certificate(s) of title of the proposed lot(s) advising of the existence of a restriction on the use of land within areas that have been assessed a BAL-40 or BAL-FZ.	☐
3	Construct the cul-de-sac to the standards stated in the BMP.	☐
4	Construct the private driveways to the standards stated in the BMP.	☐

Table 6.2: BMP Implementation responsibilities prior to lot sale, occupancy or building.

Landowner (Developer) - Prior to Sale of Lot(s)	
No.	Implementation Actions
1	Prior to sale and post planning approval, the entity responsible for having the BMP prepared should ensure that anyone listed as having responsibility under the Plan has endorsed it and is provided with a copy for their information and informed that it contains their responsibilities. This includes the landowners/proponents (including future landowners where the Plan was prepared as part of a subdivision approval), local government and any other authorities or referral agencies ('Guidelines' s4.6.3).
2	Prior to sale of the subject lots, each individual lot is to be compliant with the Shire of Mundaring Firebreak and Fuel Load notice issued under s33 of the Bushfires Act 1954. This may include specifications for asset protection zones that differ from the Guideline's APZ Standards, with the intent to better satisfy local conditions. When these are more stringent than those created by the Guidelines, or less stringent and endorsed by the WAPC and DFES, they must be complied with. Refer to Appendix 1.
3	Prior to occupancy, install the private driveways to the standards stated in the BMP.
4	Prior to any building work, inform the builder of the existence of this Bushfire Management Plan and the responsibilities it contains, regarding the required construction standards. This will be: • The standard corresponding to the determined BAL, as per the bushfire provisions of the Building Code of Australia (BCA); and/or • A higher standard because the BMP establishes that the construction standard is to correspond to a higher BAL as an additional bushfire protection measure.
5	Maintain the Asset Protection Zone (APZ) surrounding existing and future relevant buildings to the largest dimension as determined by either: • The dimensions corresponding to the determined BAL of a building (refer to Section 3.2 for explanation of the 'planning' versus 'building' requirements and 'indicative' versus 'determined' BAL); or • The dimensions corresponding to the local government's Firebreak Notice. Maintain the APZ to the above dimensions and to the standards established by the Guidelines (refer to Appendix 1) or as varied by the local government through their Firebreak Notice.

Table 6.3: Ongoing management responsibilities for the Landowner/Occupier.

Landowner/Occupier - Ongoing	
No.	Ongoing Management Actions
1	Maintain the Asset Protection Zone (APZ) surrounding existing and future relevant buildings to the largest dimension as determined by either: • The dimensions corresponding to the determined BAL of a building (refer to Section 3.2 for explanation of the 'planning' versus 'building' requirements and 'indicative' versus 'determined' BAL); or • The dimensions corresponding to the local government's Firebreak Notice. Maintain the APZ to the above dimensions and to the standards established by the Guidelines (refer to Appendix 1) or as varied by the local government through their Firebreak Notice.
2	Comply with the Shire of Mundaring Firebreak and Fuel Load notice issued under s33 of the Bush Fires Act 1954. This may include specifications for asset protection zones that differ from the Guideline's APZ Standards, with the intent to better satisfy local conditions. When these are more stringent than those created by the Guidelines, or less stringent and endorsed by the WAPC and DFES, they must be complied with. Refer to Appendix 1.
3	Maintain vehicular access routes within the lot to the required surface condition and clearances as stated in the BMP.
4	Ensure that any builders (of future structures on the lot) are aware of the existence of this Bushfire Management Plan and the responsibilities it contains regarding the application of construction standards corresponding to a determined BAL.
5	Ensure all future buildings the landowner has responsibility for, are designed and constructed in full compliance with: 1. the requirements of the WA Building Act 2011 and the bushfire provisions of the Building Code of Australia (BCA); and 2. with any identified additional requirements established by this BMP or the local government.

Table 6.4: Ongoing management responsibilities for the Local Government.

Local Government - Ongoing	
No.	Ongoing Management Actions
1	Monitor landowner compliance with the Bushfire Management Plan and the annual Firebreak and Fuel Load notice.

A1.1 Requirements Established by the Guidelines – Standards for Asset Protection Zones

(Source: Guidelines for Planning in Bushfire Prone Areas - WAPC 2017 v1.3 Appendix 4, Element 2, Schedule 1 and Explanatory Note E2.1)

DEFINING THE ASSET PROTECTION ZONE (APZ)

Description: An APZ is an area surrounding a building that is managed to reduce the bushfire hazard to an acceptable level (by reducing fuel loads). The width of the required APZ varies with slope and vegetation and varies corresponding to the BAL rating determined for a building (lower BAL = greater dimensioned APZ).

For planning applications, the minimum sized acceptable APZ is that which is of sufficient size to ensure the potential radiant heat impact of a fire does not exceed 29kW/m² (BAL-29). It will be site specific.

For subdivision planning, design elements and excluded/low threat vegetation adjacent to the lot(s) can be utilised to achieve the required vegetation separation distances and therefore reduce the required dimensions of the APZ within the lot(s).

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

Establishment: 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.

[Note: Regardless of whether an Asset Protection Zone exists in accordance with the acceptable solutions and is appropriately maintained, fire fighters are not obliged to protect an asset if they think the separation distance between the dwelling and vegetation that can be involved in a bushfire, is unsafe.]

Schedule 1: Standards for APZ

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.

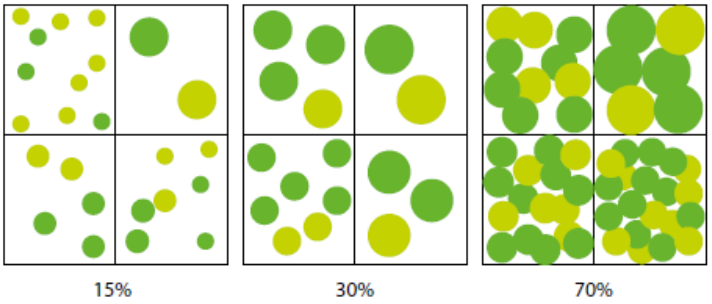
Objects: within 10 metres of a building, combustible objects must not be located close to the vulnerable parts of the building i.e. windows and doors.

Fine Fuel Load: combustible dead vegetation matter less than 6 mm in thickness reduced to and maintained at an average of two tonnes per hectare (example below).

Example: Fine fuel load of 2 t/ha
(Image source: Shire of Augusta Margaret River's Firebreak and Fuel Reduction Hazard Notice)

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. Diagram below represents tree canopy cover at maturity.

Tree canopy cover – ranging from 15 to 70 per cent at maturity



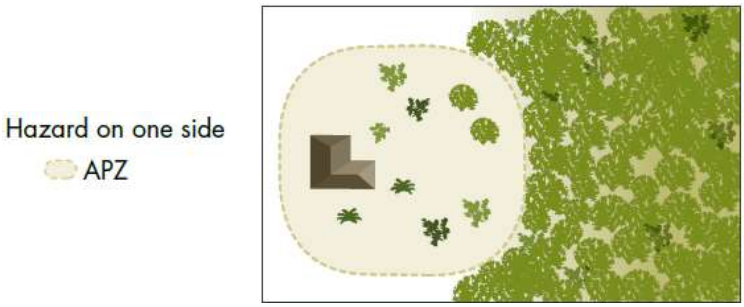
(Source: Guidelines for Planning in Bushfire Prone Areas 2017, Appendix 4)

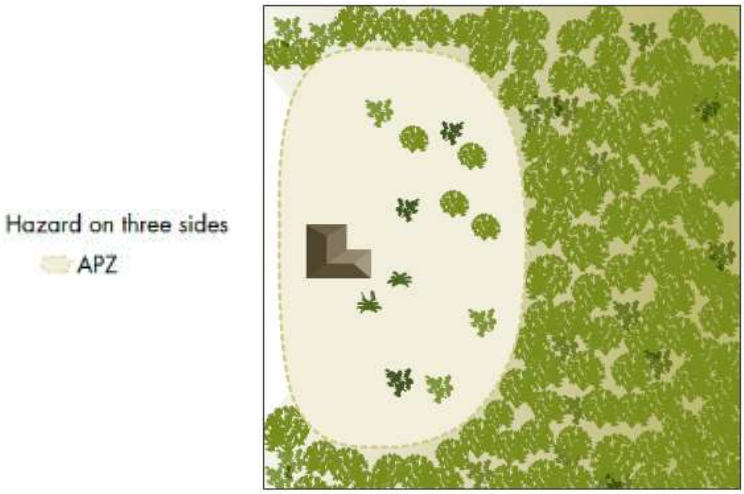
Shrubs (0.5 metres to 5 metres in height): should not be located under trees or within 3 metres of buildings, should not be planted in clumps greater than 5m2 in area, clumps of shrubs should be separated from each other and any exposed window or door by at least 10 metres. Shrubs greater than 5 metres 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 mm 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 mm or less.

The following example diagrams illustrate how the required dimensions of the APZ will be determined by the type and location of the vegetation.





A1.2 Requirements Established by the Local Government – the Firebreak Notice

The local government's current Firebreak Notice is available on their website, at their offices and is distributed as ratepayer's information. It must be complied with.

These requirements are established by the local government's Firebreak Notice created under s33 of the Bushfires Act 1954 and issued annually (potentially with revisions). The Firebreak Notice may include additional components directed at managing fuel loads, accessibility and general property management with respect to limiting potential bushfire impact.

If Asset Protection Zone (APZ) specifications are defined in the Firebreak Notice, these may differ from the Standards established by the Guideline's, with the intent to better satisfy local conditions. When these are more stringent than those created by the Guidelines, or less stringent and endorsed by the WAPC and DFES, they must be complied with.

The APZ dimensions to be physically established and maintained, will be based on which of the following establishes the larger APZ dimension:

- The dimensions corresponding to the determined BAL of a building (refer to Section 3.2 explanation of the 'planning' versus 'building' requirements and 'indicative' versus 'determined' BAL(s)); or
- The APZ dimensions established by the local government's Firebreak Notice.

A1.3 Requirements Recommended by DFES – Property Protection Checklists

Further guidance regarding ongoing/lasting property protection (from potential bushfire impact) is presented in the publication 'DFES – Fire Chat – Your Bushfire Protection Toolkit'. It is available from the Department of Fire and Emergency Services (DFES) website.

A1.4 Requirements Established by AS 3959:2018 – 'Minimal Fuel Condition'

This information is provided for reference purposes. This knowledge will assist the landowner to comply with Management Requirement No. 3 set out in the Guidance Panel at the start of this Appendix. It identifies what is required for an area of land to be excluded from classification as a potential bushfire threat.

"Australian Standard - AS 3959:2018 Section 2.2.3.2: Exclusions - Low threat vegetation and non-vegetated areas:

The Bushfire Attack Level shall be classified BAL-LOW where the vegetation is one or a combination of the following:

a) Vegetation of any type that is more than 100m from the site.

b) Single areas of vegetation less than 1ha in area and not within 100m of other areas of vegetation being classified vegetation.

c) Multiple area of vegetation less than 0.25ha in area and not within 20m of the site or each other or other areas of vegetation being classified vegetation.

d) Strips of vegetation less than 20m in width (measured perpendicular to the elevation exposed to the strip of vegetation) regardless of length and not within 20m of the site or each other, or other areas of vegetation being classified vegetation.

e) Non-vegetated areas, that is, areas permanently cleared of vegetation, including waterways, exposed beaches, roads, footpaths, buildings and rocky outcrops.

f) *Vegetation regarded as low threat due to factors such as flammability, moisture content or fuel load. This includes grassland managed in a* ***minimal fuel condition,*** *(means insufficient fuel available to significantly increase the severity of a bushfire attack – for example, recognisable as short cropped grass to a nominal height of 100mm), mangroves and other saline wetlands, maintained lawns, golf courses (such as playing areas and fairways), maintained public reserves and parklands, sporting fields, vineyards, orchards, banana plantations, market gardens (and other non-curing crops), cultivated gardens, commercial nurseries, nature strips and windbreaks (single row of trees)."*

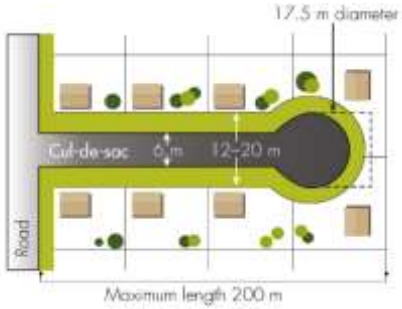
APPENDIX 2: TECHNICAL REQUIREMENTS FOR VEHICULAR ACCESS

Each local government may have their own standard technical requirements for emergency vehicular access, and they may vary from those stated in the Guidelines.

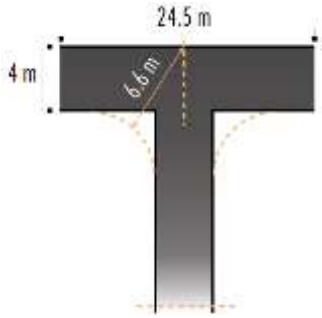
When required, these are stated in Section 5.1 of this bushfire management plan.

Requirements Established by the Guidelines – The Acceptable Solutions

(Source: Guidelines for Planning in Bushfire Prone Areas WAPC 2017 v1.3, Appendix 4)

VEHICULAR ACCESS TECHNICAL REQUIREMENTS - PART 1
Acceptable Solution 3.3: Cul-de-sacs (including a dead-end road) Their use in bushfire prone areas should be avoided. Where no alternative exists then the following requirements are to be achieved: • Maximum length is 200m. If public emergency access is provided between cul-de-sac heads (as a right of way or public access easement in gross), the maximum length can be increased to 600m provided no more than 8 lots are serviced and the emergency access way is less than 600m in length; • Turnaround area requirements, including a minimum 17.5m diameter head to allow type 3.4 fire appliances to turn around safely; • The cul-de-sac connects to a public road that allows for travel in two directions; and • Meet the additional design requirements set out in Part 2 of this appendix.

Acceptable Solution 3.5: Private Driveways The following requirements are to be achieved: • The design requirements set out in Part 2 of this appendix; and Where the house site is more than 50 metres from a public road: • Passing bays every 200 metres with a minimum length of 20 metres and a minimum width of two metres (ie combined width of the passing bay and constructed private driveway to be a minimum six metres); • Turn-around areas every 500 metres and within 50 metres of a house, designed to accommodate type 3.4 fire appliances to turn around safely (ie kerb to kerb 17.5 metres); • Any bridges or culverts are able to support a minimum weight capacity of 15 tonnes; and • All weather surface (i.e. compacted gravel, limestone or sealed).

VEHICULAR ACCESS TECHNICAL REQUIREMENTS - PART 1



Acceptable Solution 3.8: Firebreak Width

Lots greater than 0.5 hectares must have an internal perimeter firebreak of a minimum width of three meters or to the level as prescribed in the local firebreak notice issued by the local government.

VEHICULAR ACCESS TECHNICAL REQUIREMENTS - PART 2

Technical Component	Vehicular Access Types				
	Public Roads	Cul-de-sacs	Private Driveways	Emergency Access Ways	Fire Service Access Routes
Minimum trafficable surface (m)	6*	6	4	6*	6*
Horizontal clearance (m)	6	6	6	6	6
Vertical clearance (m)	4.5	4.5	4.5	4.5	4.5
Maximum grade <50 metres	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 cross-fall	1 in 33	1 in 33	1 in 33	1 in 33	1 in 33
Curves minimum inner radius (m)	8.5	8.5	8.5	8.5	8.5

* A six metre trafficable surface does not necessarily mean paving width. It could, for example, include four metres of paving and one metre of constructed road shoulders. In special circumstances, where 8 lots or less are being serviced, a public road with a minimum trafficable surface of four metres for a maximum distance of ninety metres may be provided subject to the approval of both the local government and DFES.

Reticulated Areas

[Source: Guidelines for Planning in Bushfire Prone Areas WAPC 2017 v1.3, Appendix 4, Element 4]

The Water Corporation's 'No 63 Water Reticulation Standard' is deemed to be the baseline criteria for developments and should be applied unless local water supply authority's conditions apply.

The requirement is to supply a reticulated water supply and fire hydrants, in accordance with the technical requirements of the relevant water supply authority and DFES.

Key specifications in the most recent version/revision of the design standard include:

- ***Residential Standard*** – hydrants are to be located so that the maximum distance between the hydrants shall be no more than 200 metres.
- ***Commercial Standard*** – hydrants are to be located with a maximum of 100 metre spacing in Industrial and Commercial areas.
- ***Rural Residential Standard*** – where minimum site areas per dwelling is 10,000 m^2 (1ha), hydrants are to be located with a maximum 400m spacing. If the area is further subdivided to land parcels less than 1ha, then the residential standard (200m) is to be applied.

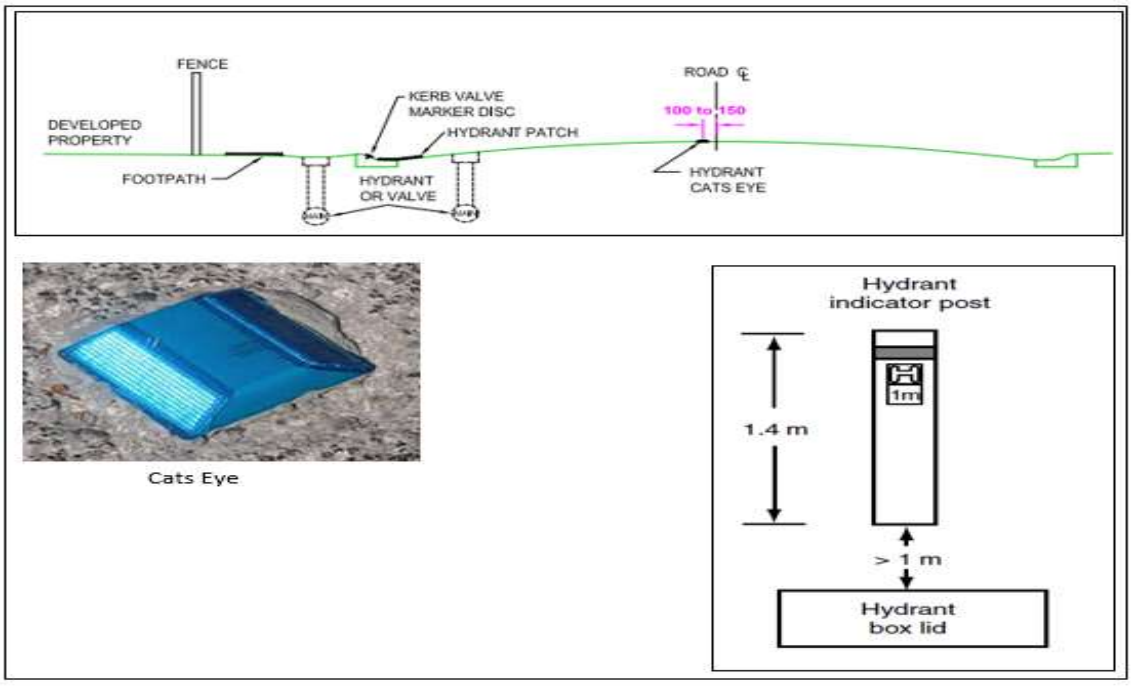


Figure A4.1: Hydrant Location and Identification Specifications