



Bushfire Management Plan

North Ellenbrook – District Structure Plan Amendment

Lot 5892 Maralla Road, Bullsbrook

City of Swan

Planning Stage:	Strategic Proposal - District Structure Plan Amendment
Planning Development Type:	Subdivision - Large Number of Lots
Bushfire Policy – Specific Development or Use Type:	SPP 3.7 - 6.2 Strategic planning proposals, subdivision and development applications

Job Number:	210548
Assessment Date:	3 February 2022
Report Date:	13 November 2024

BPP Group Pty Ltd t/a Bushfire Prone Planning
ACN: 39 166 551 784 | ABN: 39 166 551 784

Level 1, 159-161 James Street
Guildford WA 6055

PO Box 388
Guildford WA 6935

08 6477 1144 | admin@bushfireprone.com.au



DOCUMENT CONTROL

PREPARATION				
Author:	Sarina Gorman (BPAD Level 2 - No. 42204)			
Review/Authorise:	Kathy Nastov (BPAD Level 3 - No. 27794)			
VERSION HISTORY				
Version	Version Details	Date		
1.0	Initial Document – BMP (District Structure Plan Amendment)	18 February 2022		
1.1	Amendment to Original Document – BMP (District Structure Plan Amendment) – Design Changes and to address DFES Comments	13 November 2024		
-				
DISTRIBUTION				
Destination	Version	No. Copies	Hard Copy	Electronic Copy
Person/Business: Tom Barry – Stockland Email: tom.barry@stockland.com.au	v1.1	1	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Person/Business: Email:			<input type="checkbox"/>	<input type="checkbox"/>
<p>Limitation of Liability: The measures contained in this Bushfire Management Plan, are considered to be minimum requirements and they do not guarantee that a building will not be damaged in a bushfire, persons injured, or fatalities occur either on the subject site or off the site while evacuating. This is substantially due to the unpredictable nature and behaviour of fire and fire weather conditions. Additionally, the correct implementation of the required bushfire protection measures will depend upon, among other things, the ongoing actions of the landowners and/or operators over which Bushfire Prone Planning has no control.</p> <p>All surveys, forecasts, projections and recommendations made in this report associated with the proposed development are made in good faith based on information available to Bushfire Prone Planning at the time. All maps included herein are indicative in nature and are not to be used for accurate calculations.</p> <p>Notwithstanding anything contained therein, Bushfire Prone Planning will not, except as the law may require, be liable for any loss or other consequences whether or not due to the negligence of their consultants, their servants or agents, arising out of the services provided by their consultants.</p> <p>Copyright ©2020 BPP Group Pty Ltd: All intellectual property rights, including copyright, in format and proprietary content contained in documents created by Bushfire Prone Planning, remain the property of BPP Group Pty Ltd. Any use made of such format or content without the prior written approval of Bushfire Prone Planning, will constitute an infringement on the rights of the Company which reserves all legal rights and remedies in respect of any such infringement.</p>				

TABLE OF CONTENTS

EXECUTIVE SUMMARY	3
1 PROPOSAL DETAILS	4
1.1 DESCRIPTION AND ASSOCIATED PLANS AND MAPS.....	4
1.2 EXISTING DOCUMENTATION RELEVANT TO THE CONSTRUCTION OF THIS PLAN	11
2 ENVIRONMENTAL CONSIDERATIONS	12
2.1 NATIVE VEGETATION – RESTRICTIONS TO MODIFICATION AND/OR CLEARING	12
2.2 RETAINED VEGETATION / RE-VEGETATION / LANDSCAPE PLANS (INCLUDING POS)	16
3 POTENTIAL BUSHFIRE IMPACT ASSESSMENT	17
3.1 ASSESSMENT INPUT.....	17
3.1.1 Fire Danger Index (FDI) Applied	17
3.1.2 Vegetation Classification and Effective Slope	17
3.1.3 Vegetation Separation Distance	38
3.2 ASSESSMENT OUTPUT	39
3.2.1 Bushfire Attack Level Results - BAL Contour Map Format	43
3.2.2 Identification of Bushfire Hazard Issues Arising from the BAL Contour Map	47
4 IDENTIFICATION OF BUSHFIRE HAZARD ISSUES	48
5 ASSESSMENT AGAINST THE BUSHFIRE PROTECTION CRITERIA ESTABLISHED BY THE GUIDELINES	50
5.1 LOCAL GOVERNMENT VARIATIONS TO APPLY.....	50
5.2 SUMMARY OF ASSESSMENT AGAINST THE BUSHFIRE PROTECTION CRITERIA	51
5.3 ASSESSMENT DETAIL	52
Element 1: Location	52
Element 2: Siting and Design of Development.....	54
Element 3: Vehicular Access.....	57
Element 4: Water	59
5.4 ADDITIONAL BUSHFIRE PROTECTION MEASURES	60
6 RESPONSIBILITIES FOR IMPLEMENTATION AND MANAGEMENT OF THE BUSHFIRE PROTECTION MEASURES	61
6.1 DEVELOPER (LANDOWNER) - PRIOR TO ISSUE OF CLEARANCES	61
6.2 LANDOWNER (DEVELOPER) - PRIOR TO SALE OF LOT(S)	62
6.3 LANDOWNER/OCCUPIER - ONGOING	62
6.4 LOCAL GOVERNMENT - ONGOING.....	63
APPENDIX 1: TECHNICAL REQUIREMENTS FOR ONSITE VEGETATION MANAGEMENT.....	64
APPENDIX 2: TECHNICAL REQUIREMENTS FOR VEHICULAR ACCESS	72
APPENDIX 3: TECHNICAL REQUIREMENTS FOR FIREFIGHTING WATER	77
APPENDIX 4: ALTERNATIVE PATHWAYS FOR COMPLYING WITH SPP 3.7	82
APPENDIX 5: LOCAL GOVERNMENT FIRE HAZARD REDUCTION NOTICE.....	83

LIST OF FIGURES

Figure 1.1: District Structure Plan Amendment Plan	5
Figure 1.1a: District Structure Plan Amendment Plan – Demonstrating Compliance with A3.2a	6
Figure 1.2: Cell Structure Plan	7
Figure 1.3: Subject land map.	8
Figure 1.4: Location map (spatial context).....	9
Figure 1.5: Map of Bushfire Prone Areas (DFES)	10
Figure 2.1: Identified environmental features map.....	14
Figure 3.1: Existing Vegetation Classification and Topography Map.....	37
Table 3.2.1: Indicative BAL ratings – (Pre-Development).....	40
Table 3.2.2: Indicative BAL ratings – General Use Area & High Use Area - (Post-Development)	41
Figure 3.2: Vegetation Classification and Topography Map – (Post Development).....	42
Figure 3.3: BAL Contour Map Post Development.....	46

EXECUTIVE SUMMARY

This Bushfire Management Plan has been prepared to accompany a District Structure Plan Amendment application for Lot 5892 Maralla Road, Bullsbrook in the City of Swan. The proposal is to facilitate future development (re-zoning and subsequent subdivision) of the subject land into a combination of land uses including Residential Areas, Activity Centres, Schools and Public Open Space Areas, ensuring the protection of biodiversity and enabling settlement in areas with acceptable bushfire risk.

Future development of the land will incorporate additional mitigation measures in accordance with the bushfire planning requirements through the implementation of subsequent further detailed bushfire management plans at the subdivision application stages.

The subject land, of approximately 163 hectares in total area is within a designated bushfire prone area and the proposal requires the application of State Planning Policy No. 3.7: Planning in Bushfire Prone Areas (SPP 3.7). The assessed bushfire risk is considered to be manageable and can be achieved by the identified stakeholders implementing and maintaining the bushfire risk management measures that are presented in this Plan.

The proposal, as set out in this Plan has addressed the applicable legislation, policy, standards and guidelines including the four elements of the Bushfire Protection Criteria of Location, Siting and Design, Vehicular Access and Water Supply. The determination is that the proposal can meet all the requirements.

Against the Bushfire Protection Criteria, the decision maker's assessment of a future Proposal will be on the basis of it being able to meet the Acceptable Solutions, as follows:

- For Element 1 'Location', the development is able to achieve the acceptable solution (by being located in an area that will on completion be subject to BAL-29 or less);
- For Element 2 'Siting and Design' any future Proposal is able to meet the acceptable solutions by habitable buildings being able to achieve an Asset Protection Zone (APZ) of sufficient size to ensure the radiant heat impact does not exceed BAL-29;
- For Element 3 'Vehicular Access', the location of the development area is able to meet the current acceptable solution A3.2a and E3.2a (provision of Multiple Access Routes in two different directions to two suitable destinations); and
- For Element 4 'Water', the Location of the Lots (once known) are able to achieve the acceptable solution. A reticulated water supply is currently not available to the subject site. It is anticipated however, that hydrants will be installed at regular intervals as part of this proposal.

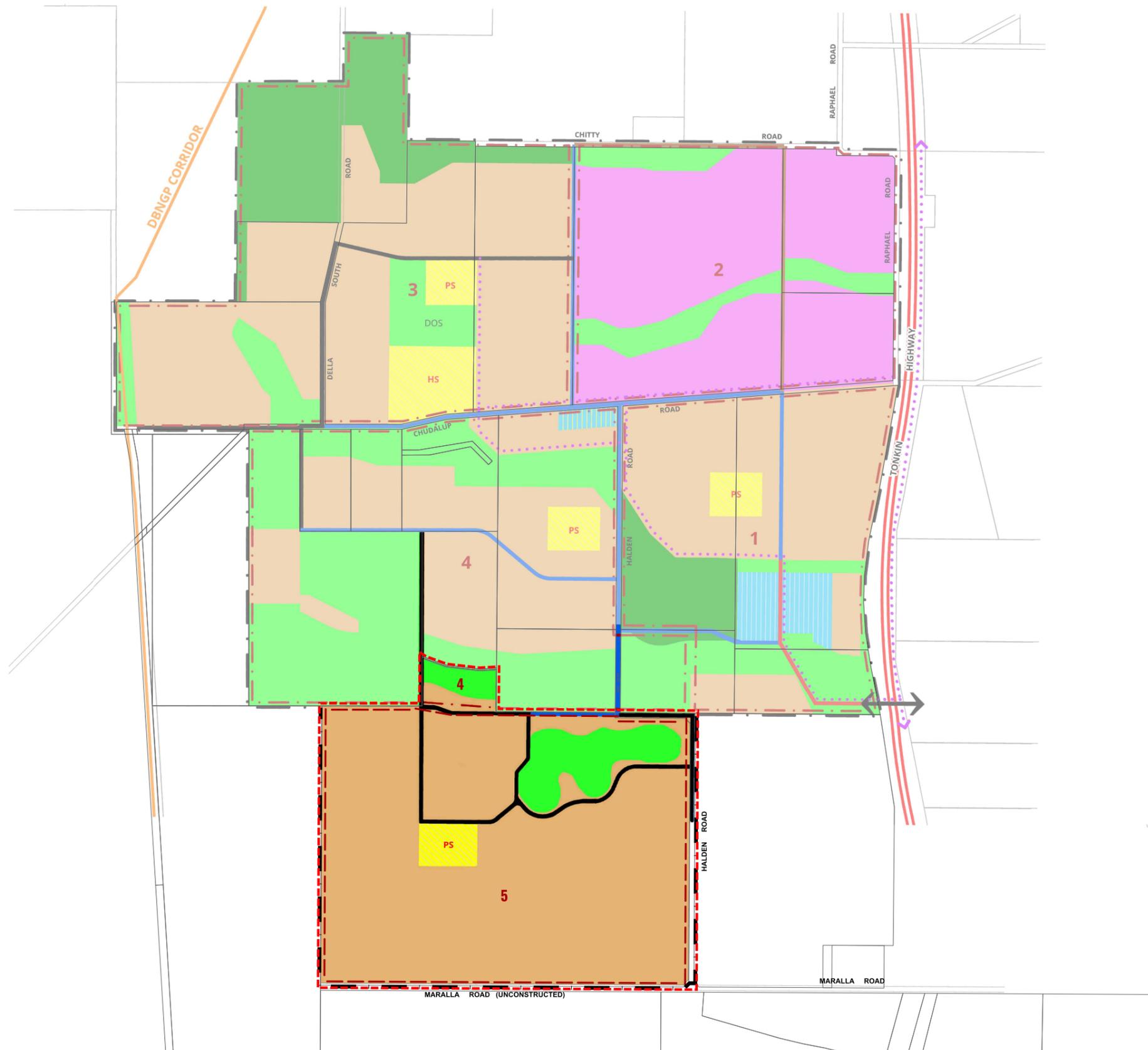
The vegetation within the boundaries of the subject site (consisting of a combination of Forest, Shrub, Scrub and Grassland) has been considered and it is anticipated that in the future (with the exception of the Conservation Category Wetland (CCW) and Resource Enhancement Wetland (REW) and their associated buffers, where vegetation will be retained, or revegetation works (where applicable) will take place) will be maintained in a low threat state. It will meet the requirements of AS3959-2018 requirements and will continue to be maintained in a low threat state as stipulated in the City of Swan Fire Hazard Reduction Notice.

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 AS 3959-2018 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:	Stockland
Bushfire Prone Planning Commissioned to Produce the Bushfire Management Plan (BMP) By:	Stockland
For Submission To:	City of Swan
Purpose of the BMP:	To accompany a District Structure Plan Amendment application
'Subject Land' Site Total Area:	Approximately: 163 hectares
No. of Existing Lots identified:	1
No. of Existing Reserves identified:	0
Description of the Proposed Development/Use:	
District Structure Plan Amendment to facilitate the development of the subject land into a combination of land uses including Residential Areas, Activity Centres, Schools and Public Open Space Areas.	
Staged Development and Management of Potential Bushfire Hazard Issues	
Strategic assessment to address the bushfire risk that considers the future potential development proposal as identified in Figure 1.2 – Cell Structure Plan.	



LEGEND

- DISTRICT STRUCTURE PLAN AMENDMENT BOUNDARY
- DISTRICT STRUCTURE PLAN BOUNDARY
- LOCAL STRUCTURE PLAN BOUNDARY
- CADASTRAL BOUNDARIES

LAND USE TYPE

- RESIDENTIAL
- LIGHT INDUSTRIAL / SERVICE COMMERCIAL
- DISTRICT CENTRE
- NEIGHBOURHOOD CENTRE
- PS PUBLIC PURPOSE - PRIMARY SCHOOL
- HS PUBLIC PURPOSE - HIGH SCHOOL
- OPEN SPACE
- DOS DISTRICT OPEN SPACE
- FUTURE MRS PARKS AND RECREATION RESERVE
- DBNGP CORRIDOR

TRANSPORT

- PRIMARY DISTRIBUTOR ROAD
- INTEGRATOR ARTERIAL ROAD
- NEIGHBOURHOOD CONNECTOR ROAD
- INDUSTRIAL ROAD
- DISTRICT PATH NETWORK / PRINCIPAL SHARED PATH (NORTHLINK)
- ↔ PROPOSED INTERCHANGE TO TONKIN HIGHWAY

NOTES

1. The Tonkin Highway interchange is subject to confirmation as part of the Metropolitan Region Scheme Amendment process required to reserve the interchange land.
2. The Parks and Recreation identified areas recognise BushForever, Conservation Category Wetland (CCW) and EPBC Act areas to be retained. They are subject to refinement as part of the Metropolitan Region Scheme amendment process.
3. Public Open Space areas encompass vegetation retention, heritage and hydrology land requirements of District Structure Plan level significance. The refinement, reservation or reclassification of these and localised areas of open space as restricted open space, unrestricted open space or otherwise will be determined following environmental reporting at the local structure plan stage.
4. An area of District Open Space (DOS) is identified for co-location with the High School site and will accommodate the future active district recreation needs of the community. The acquisition and development of the DOS is to be provided for within the relevant Development Contribution Scheme(s) for the North Ellenbrook West District Structure Plan area to ensure the equitable provision of open space.
5. DSP Amendment subject to Environmental and Local Structure Plan Approvals.

DISTRICT STRUCTURE PLAN AMENDMENT PLAN

Lot 5892 Maralla Rd, BULLSBROOK

An Stockland Project

NORTH

Scale: 1:17 500 @ A3

0 200 400 600m

PLAN: STONE-5-007 REVISION: E
 DATE: 12/09/2024 DRAWN: JP
 PROJECTION: PCG 94 PLANNER: BK
 DATUM: AHD CHECK: CH

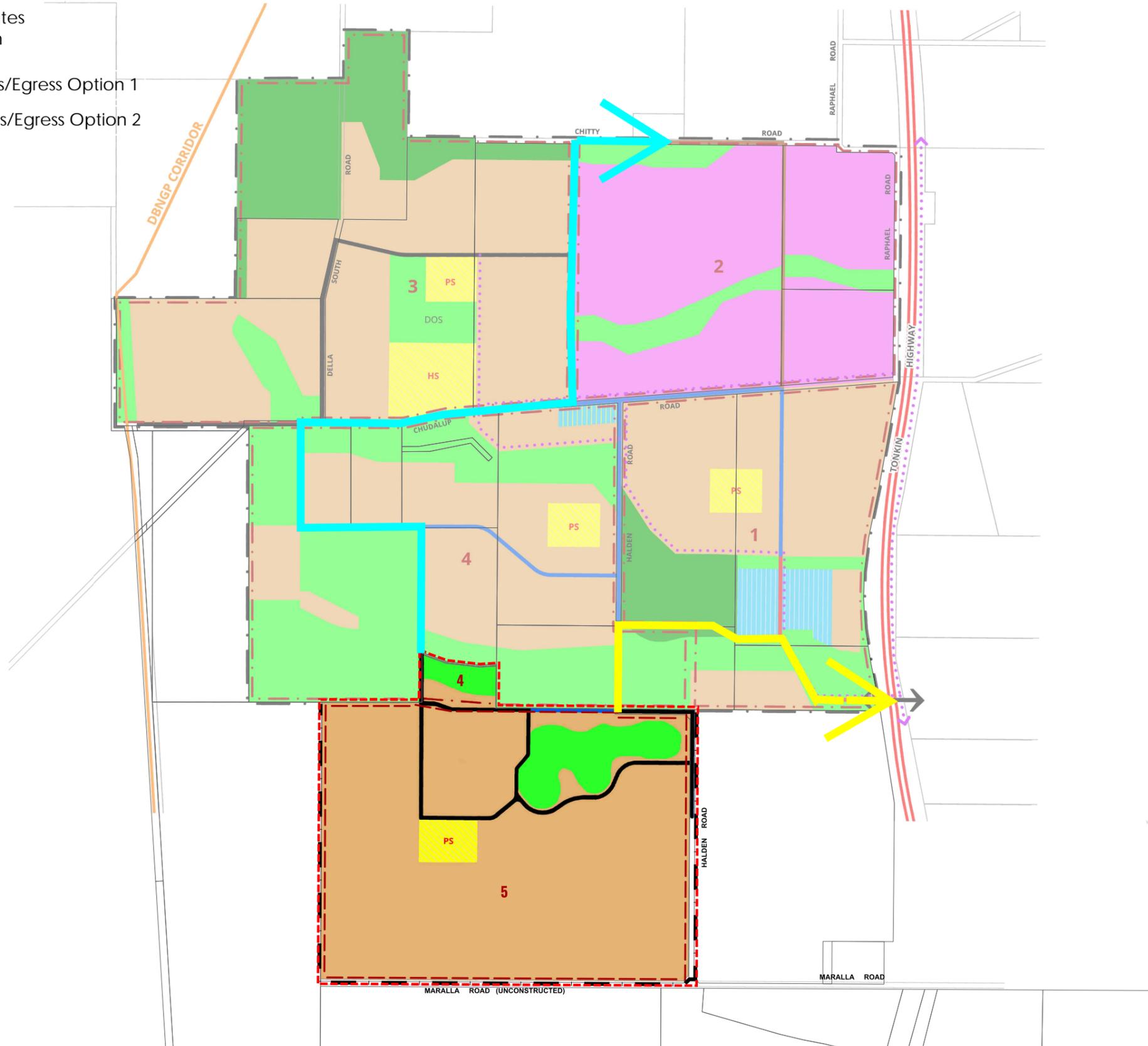


Unit 2, 464 Murray Street
 Perth WA 6000
 (08) 6333 1888
 info@cdpau.com.au
 www.cdpau.com.au

Copyright CDP. No part of this plan may be reproduced in any form without prior consent from CDP. All care has been taken in preparation of this plan but no responsibility is taken for any errors or omissions and is subject to change. Areas and dimensions shown on plan are subject to final survey. Carriageways depicted on plan are diagrammatic only.

A3.2a - Multiple Access Routes
Compliance Demonstration

- Access/Egress Option 1
- Access/Egress Option 2



LEGEND

- DISTRICT STRUCTURE PLAN AMENDMENT BOUNDARY
 - DISTRICT STRUCTURE PLAN BOUNDARY
 - LOCAL STRUCTURE PLAN BOUNDARY
 - CADASTRAL BOUNDARIES
- LAND USE TYPE**
- RESIDENTIAL
 - LIGHT INDUSTRIAL / SERVICE COMMERCIAL
 - DISTRICT CENTRE
 - NEIGHBOURHOOD CENTRE
 - PS PUBLIC PURPOSE - PRIMARY SCHOOL
 - HS PUBLIC PURPOSE - HIGH SCHOOL
 - OPEN SPACE
 - DOS DISTRICT OPEN SPACE
 - FUTURE MRS PARKS AND RECREATION RESERVE
 - DBNGP CORRIDOR
- TRANSPORT**
- PRIMARY DISTRIBUTOR ROAD
 - INTEGRATOR ARTERIAL ROAD
 - NEIGHBOURHOOD CONNECTOR ROAD
 - INDUSTRIAL ROAD
 - DISTRICT PATH NETWORK / PRINCIPAL SHARED PATH (NORTHLINK)
 - PROPOSED INTERCHANGE TO TONKIN HIGHWAY

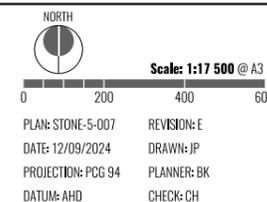
NOTES

1. The Tonkin Highway interchange is subject to confirmation as part of the Metropolitan Region Scheme Amendment process required to reserve the interchange land.
2. The Parks and Recreation identified areas recognise BushForever, Conservation Category Wetland (CCW) and EPBC Act areas to be retained. They are subject to refinement as part of the Metropolitan Region Scheme amendment process.
3. Public Open Space areas encompass vegetation retention, heritage and hydrology land requirements of District Structure Plan level significance. The refinement, reservation or reclassification of these and localised areas of open space as restricted open space, unrestricted open space or otherwise will be determined following environmental reporting at the local structure plan stage.
4. An area of District Open Space (DOS) is identified for co-location with the High School site and will accommodate the future active district recreation needs of the community. The acquisition and development of the DOS is to be provided for within the relevant Development Contribution Scheme(s) for the North Ellenbrook West District Structure Plan area to ensure the equitable provision of open space.
5. DSP Amendment subject to Environmental and Local Structure Plan Approvals.

DISTRICT STRUCTURE PLAN AMENDMENT PLAN

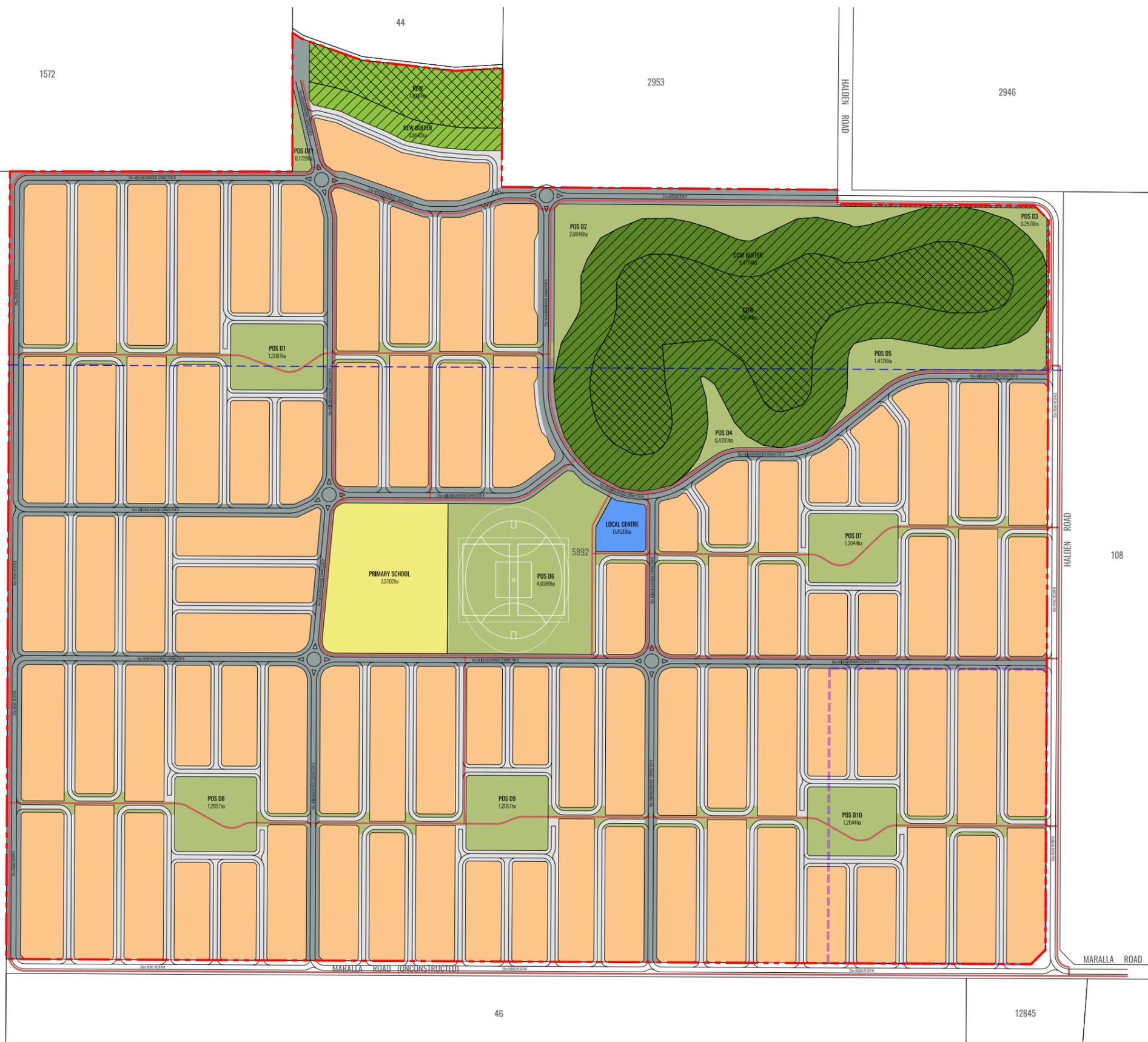
Lot 5892 Maralla Rd, BULLSBROOK

An Stockland Project



Unit 2, 464 Murray Street
Perth WA 6000
(08) 6333 1888
info@cdpau.com.au
www.cdpau.com.au

Copyright CDP. No part of this plan may be reproduced in any form without prior consent from CDP. All care has been taken in preparation of this plan but no responsibility is taken for any errors or omissions and is subject to change. Areas and dimensions shown on plan are subject to final survey. Carriageways depicted on plan are diagrammatic only.



LEGEND		
	SUBJECT SITE	162.962ha
	RESIDENTIAL	84.027ha
	LOCAL ACTIVITY CENTRE	0.454ha
	PRIMARY SCHOOL	3.510ha
	CONSERVATION CATEGORY WETLAND (CORE)	7.554ha
	CONSERVATION CATEGORY WETLAND (50m BUFFER)	9.475ha
	RESOURCE ENHANCEMENT WETLAND (CORE)	1.839ha
	RESOURCE ENHANCEMENT WETLAND (30m BUFFER)	0.864ha
	POS	15.056ha
	KEY ROAD CONNECTIONS	14.507ha
	LOCAL ROAD RESERVE	25.533ha
	ROAD WIDENING	0.143ha
	PROPOSED MRS AMENDMENT BOUNDARY	
	INDICATIVE SHARED PATH NETWORK	
	PEDESTRIAN/CYCLE LINKAGES	
	INDICATIVE LAND LEASE COMMUNITY SITE (APPROX. 12.5ha.)	

ASSUMPTIONS	
GENERAL	<ul style="list-style-type: none"> Concept Plan is subject to further detailed design, engineering, hydrology, survey and approvals. <ul style="list-style-type: none"> Potential for sewer pump station, subject to engineering investigation and detailed design. Concept Plan subject to MRS Rezoning. DSP Amendment approved subject to modifications, including but not limited to: <ul style="list-style-type: none"> providing a 50m CCW Buffer; centralising Primary School; and potential opportunity to declassify northern wetland from REW (and assumed 30m buffer) to MUC, subject to environmental assessment and approvals. Staging subject to further investigation and 300m sand mining buffers. Concept Plan subject to Bushfire Management Plan.
MOVEMENT	<ul style="list-style-type: none"> North-Link interchange to be determined and subject to Traffic Engineering investigation and detailed design. 27m wide Integrator B road, subject to Traffic Engineering investigation and detailed design. <ul style="list-style-type: none"> Assumes 23m width within subject site with continuous southern boundary with proposed 23m Halden Road to the east. Assumes future 4m road widening to the north to accommodate ultimate 27m width. 23m wide Neighbourhood Connector A Roads, subject to Traffic Engineering investigation and detailed design. <ul style="list-style-type: none"> 3m widening to existing Halden Road reserve. 18m wide Neighbourhood Connector B Roads, subject to Traffic Engineering investigation and detailed design. 16m wide Pedestrian/Cycle Linkages (Access Street D roads), subject to Traffic Engineering investigation and detailed design. <ul style="list-style-type: none"> 18-20m wide peripheral roads to mitigate bushfire threat i.e. built form achieving minimum BAL29 at 4m front setback to dwellings. 15m wide Access Street D roads to all other roads, subject to Traffic Engineering investigation and detailed design. Strong pedestrian/cycle (shared path) network provided throughout the estate, supported by east-west Pedestrian/Cycle linkages - refer " below. No direct lot access along Neighbourhood Connector A road along eastern interface of CCW (i.e. cap road proposed), subject to Traffic Engineering investigation.
LAND USE	<ul style="list-style-type: none"> 3.51m Public Primary School site (standalone), subject to negotiation and approval with Department of Education & Training. <ul style="list-style-type: none"> Opportunity for 2-storey built form outcome to accommodate additional students, considering circa 2200 overall estate lot yield. 4539m² Local Centre site indicated, subject to retail needs assessment and retail strategy. Potential for LSP to provide land use flexibility. Indicative 12.5ha. Land Lease Community Site shown, subject to reconfiguring POS provision and detailed design.
OPEN SPACE	<ul style="list-style-type: none"> Plan indicatively provides 10% POS credit, subject to detailed design, hydrological assessment and approvals, based on the following: <ul style="list-style-type: none"> In the absence of drainage surface areas, concept plan is based on assumed 1% 1:1yr, 1.71% 1:5yr and 1.04% 1:100yr drainage (exclusive %'s), subject to hydrological assessment and approvals. Approx. 4.7ha. Neighbourhood Park (POS8) within 800m walkable catchment of all residents, in accordance with POL-LP-1-12. <ul style="list-style-type: none"> Senior oval proposed within POS6 subject to change. POL-LP-1-12 suggests that larger playing fields be located within DOS (i.e. adjacent High School further north). Approx. 1.2ha. Local Parks (POS1, 7-10) within 400m walkable catchment of all residents, in accordance with POL-LP-1-12. Note: POL-LP-1-12 prefers provision of larger open spaces. Drainage/engineering strategy within POS8-10 catchments, considering natural low points along Maralla Road, subject to detailed engineering/hydrology design. Pedestrian/Cycle Linkages, uninterrupted by Access Street D roads, providing strong east-west pedestrian/cycle movement (via shared path) within each "Village", fostering community, whilst connected to broader overall Estate movement network. Open Space hierarchy and function, subject to Landscape Architect assessment and negotiations with City of Swan. Retention of existing trees subject to Arborist assessment. POS2-5 around CCW credited towards POS (minus bio-retention), subject to assessment and approval. POS11 not credited towards POS, subject to assessment and approval.

CELL STRUCTURE PLAN

Lot 5892 Maralla Rd, BULLSBROOK

An Stockland Project

DRAFT

NORTH

Scale: 1:6000 @ A3

0 60 120 180m

PLAN: STONE-1-001 REVISION: E
 DATE: 07/11/2024 DRAWN: JP
 PROJECTION: PCG 94 PLANNER: BK
 DATUM: AHD CHECK: CH

cdp

Town Planning & Urban Design

Unit 2, 464 Murray Street
 Perth WA 6000
 (08) 6333 1888
 info@cdpau.com.au
 www.cdpau.com.au

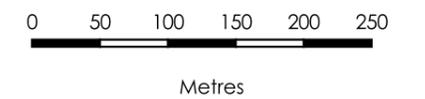
Copyright CDP. No part of this plan may be reproduced in any form without prior consent from CDP. All care has been taken in preparation of this plan but no responsibility is taken for any errors or omissions and is subject to change. Areas and dimensions shown on plan are subject to final survey. Carriageways depicted on plan are diagrammatic only.

Figure 1.3
Subject Land Map

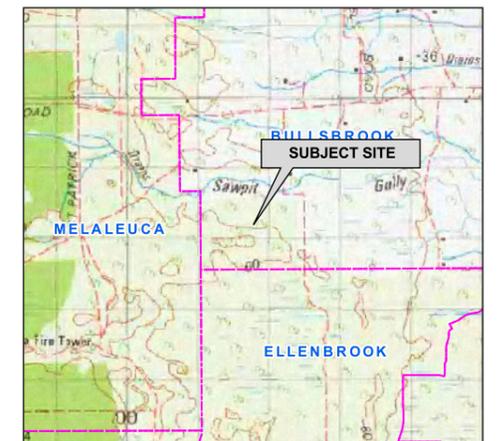
Lot 5892 on Plan / Diagram: P208236
 Maralla Road
 Bullsbrook
 City of Swan

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

-  Cadastre
-  Subject Site
- Cell Structure Plan - Indicative**
-  Residential
-  Local Activity Centre
-  Primary School
-  Green Linkages
-  POS
-  CCW Core
-  CCW Buffer
-  REW Core
-  REW Buffer



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



AERIAL IMAGERY: Landgate/SLIP



Coordinate System: GDA 1994 MGA Zone 50
 Projection: Universal Transverse Mercator Units: Metre
 Map by: Sarina Gorman 13-11-2024
 SCALE (A3): 1 : 5200

Figure 1.4

Location Plan

Lot 5892 on Plan / Diagram: P208236
Maralla Road
Bullsbrook
City of Swan

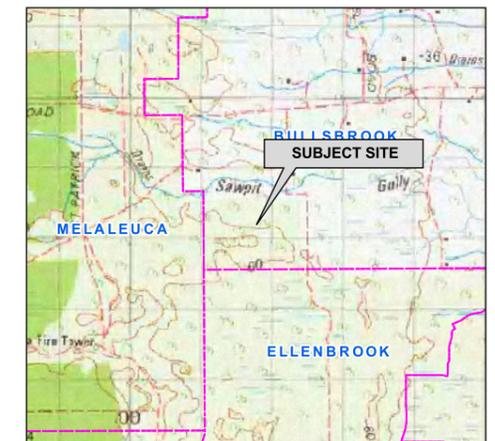
----- LEGEND -----

-  Subject Site
-  Local Government Authority
-  Localities/Suburb
- DFES Stations (DFES-023)**
-  Bush Fire Brigade
-  Career Fire Rescue Service
-  Volunteer Fire & Emergency Service
- Reserves**
-  Reserves
- DBCA Legislated Lands & Waters**
-  Crown Freehold - Dept Managed
-  Nature Reserve
-  State Forest
- DBCA Lands of Interest (DBCA-012)**
-  Crown Freehold



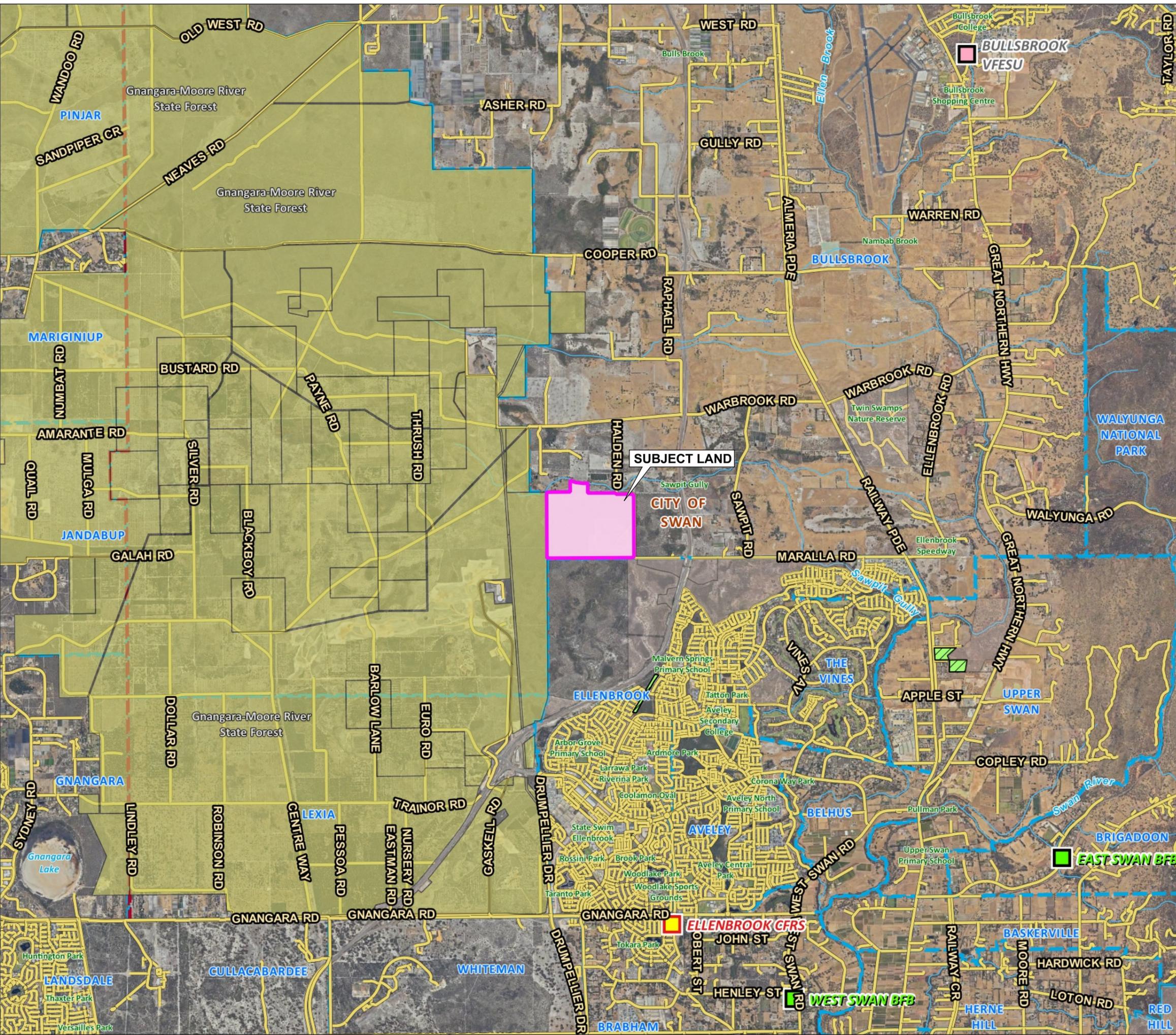
Metres

----- LOCALITY -----



AERIAL IMAGERY: Landgate/SLIP

Coordinate System: GDA 1994 MGA Zone 50
 Projection: Universal Transverse Mercator Units: Metre
 Map by: Sarina Gorman 12-11-2024
 SCALE (A3): 1 : 60000



Disclaimer and Limitation: This map has been prepared for bushfire management planning purposes only. All depicted areas, contours and any dimensions shown are subject to survey. Bushfire Prone Planning does not guarantee that this map is without flaw of any kind and disclaims all liability for any errors, loss or other consequence which may arise from relying on any information depicted.

Figure 1.5

Bushfire Prone Areas

Lot 5892 on Plan / Diagram: P208236
Maralla Road
Bullsbrook
City of Swan

----- LEGEND -----

Bushfire Prone Area 2024 OBRM_023

-  Bushfire Prone Area 1
-  Bushfire Prone Area 2
-  Local Government Authority
-  Localities/Suburb
-  Cadastre
-  Subject Site

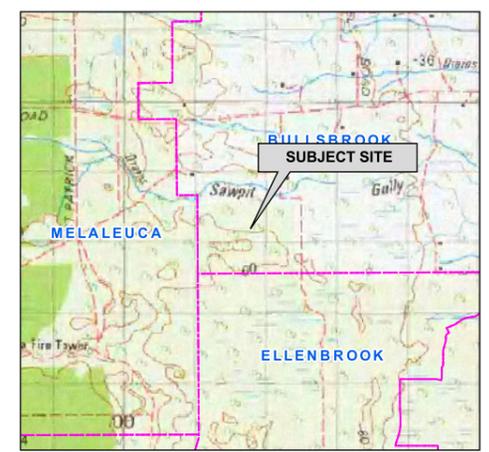
Cell Structure Plan - Indicative

-  Residential
-  Local Activity Centre
-  Primary School
-  Green Linkages
-  POS
-  CCW Core
-  CCW Buffer
-  REW Core
-  REW Buffer



Metres

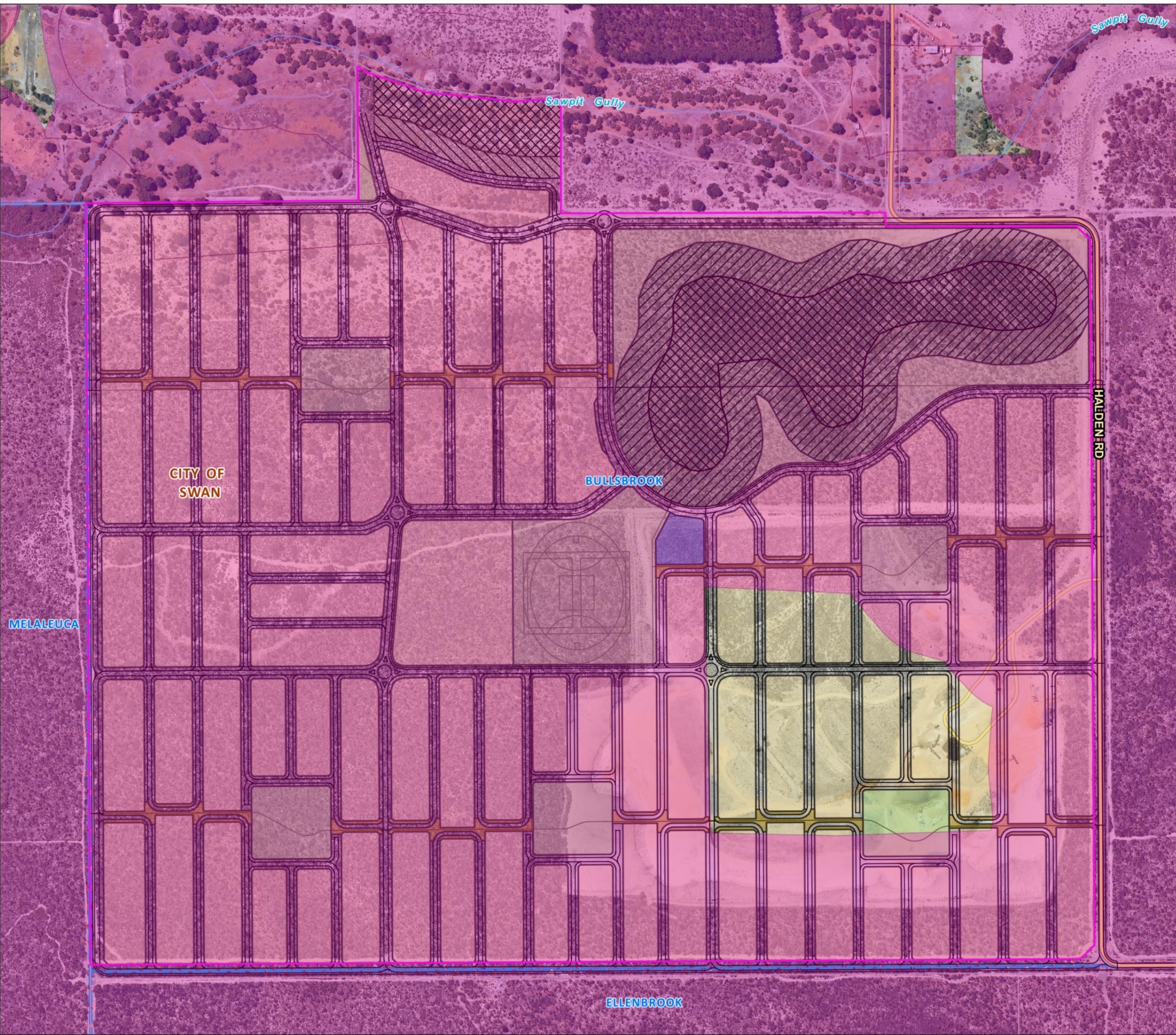
----- LOCALITY -----



AERIAL IMAGERY: Landgate/SLIP



Coordinate System: GDA 1994 MGA Zone 50
 Projection: Universal Transverse Mercator Units: Metre
 Map by: Sarina Gorman 13-11-2024
 SCALE (A3): 1 : 5200



Disclaimer and Limitation: This map has been prepared for bushfire management planning purposes only. All depicted areas, contours and any dimensions shown are subject to survey. Bushfire Prone Planning does not guarantee that this map is without flaw of any kind and disclaims all liability for any errors, loss or other consequence which may arise from relying on any information depicted.

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 1.1: Existing relevant documentation.

RELEVANT EXISTING DOCUMENTS		
Existing Document	Copy Provided by Client	Title
Local Planning Considerations	No	
Environmental Considerations	No	
Landscaping (Revegetation) Plan	No	
Bushfire	Yes	Desktop Due Feasibility and Diligence Conducted by Bushfire Prone Planning (Dated 30 June 2021)

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 2.1: 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.		Likely		
National Park / Nature Reserve	DBCA-011	No-Confirmed by Bushfire Consultant	Relevant Database Reviewed by Bushfire Consultant	None
Conservation Covenant	DPIRD-023	Possible	Data Not Readily Available to Bushfire Consultant	Proponent to Seek Advice
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	Yes-Confirmed by Bushfire Consultant	Relevant Database Reviewed by Bushfire Consultant	Proponent to Seek Advice
Threatened and Priority Ecological Communities (TECs or PECs)	DBCA-038	No-Confirmed by Bushfire Consultant	Relevant Database Reviewed by Bushfire Consultant	None
Threatened and Priority Flora including Declared Rare Flora (DRFs)	DBCA-037	No-Confirmed by Bushfire Consultant	Relevant Database Reviewed by Bushfire Consultant	None
Land Identified as significant through a Local Biodiversity Strategy	LG - Intramaps	Yes-Confirmed by Bushfire Consultant	Relevant Database Reviewed by Bushfire Consultant	Proponent to Seek Advice
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 in the BMP, assume that environmental approval will be achieved or clearing permit exemptions will apply.

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 5892 on Plan / Diagram: P208236
 Maralla Road
 Bullsbrook
 City of Swan

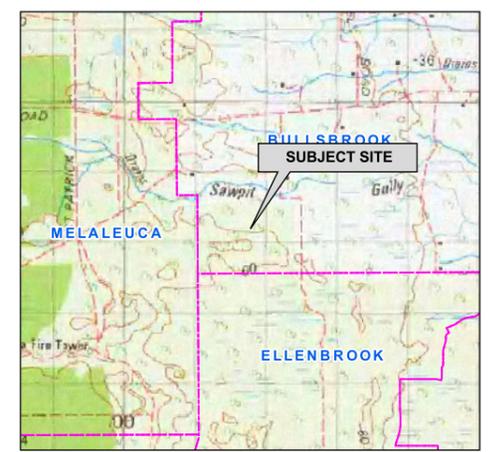
----- LEGEND -----

- Subject Site
- Reserves
- Bush Forever Sites
- Clearing Regulations**
- Clearing Regulations
- DBCA Legislated Lands & Waters**
- Crown Freehold - Dept Managed
- Nature Reserve
- State Forest
- DBCA Lands of Interest (DBCA-012)**
- Crown Freehold
- Geomorphic Wetlands Swan Coastal Plain**
- Dampland
- Floodplain
- Lake
- No Longer a Wetland
- Not Assessed
- Palusplain
- Sumpland



Metres

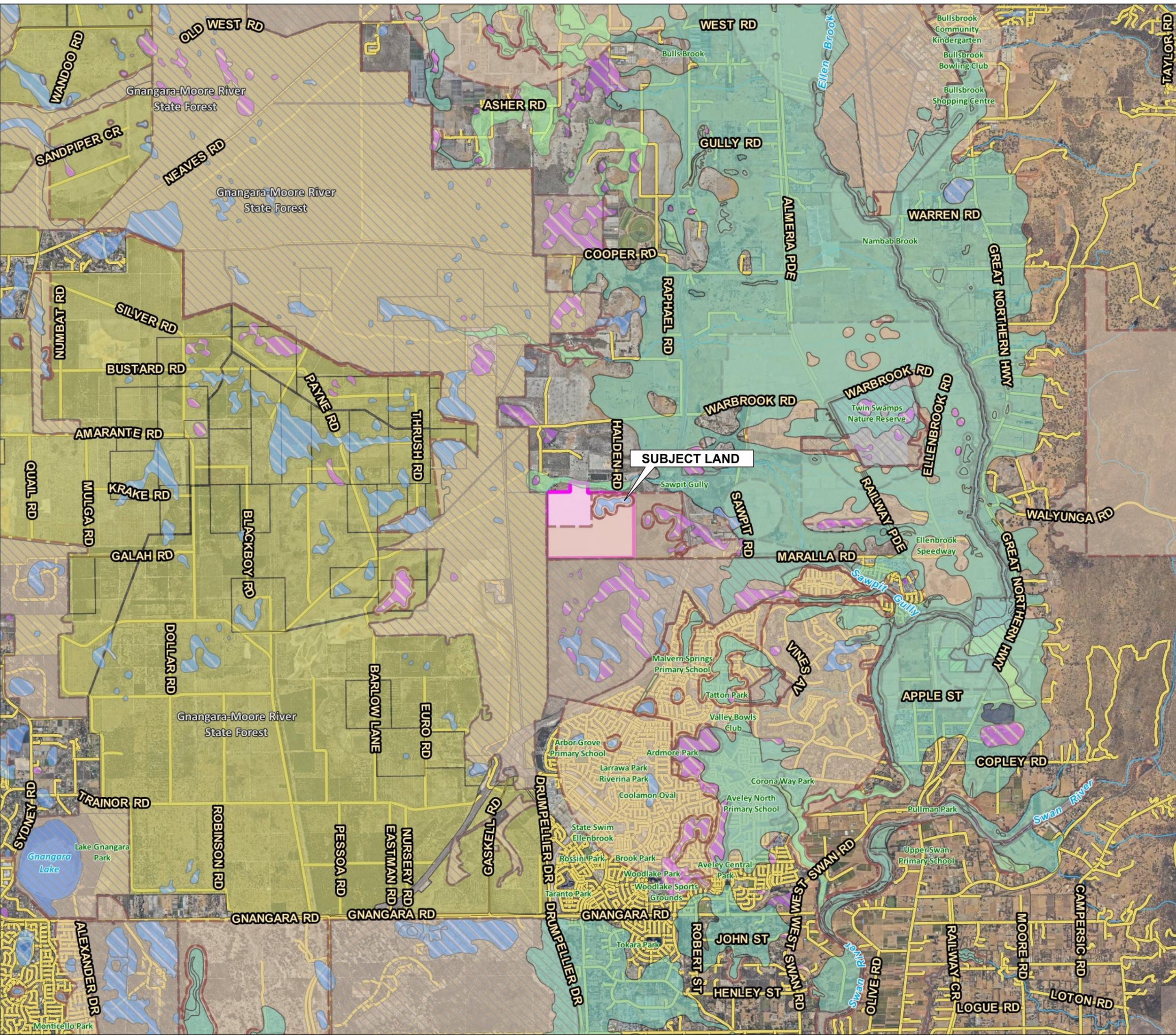
----- LOCALITY -----



AERIAL IMAGERY: Landgate/SLIP



Coordinate System: GDA 1994 MGA Zone 50
 Projection: Universal Transverse Mercator Units: Metre
 Map by: Sarina Gorman 12-11-2024
 SCALE (A3): 1 : 60000



Disclaimer and Limitation: This map has been prepared for bushfire management planning purposes only. All depicted areas, contours and any dimensions shown are subject to survey. Bushfire Prone Planning does not guarantee that this map is without flaw of any kind and disclaims all liability for any errors, loss or other consequence which may arise from relying on any information depicted.

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 2.2: 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
Future development sites within this locality will be able to achieve asset protection zones and corresponding bushfire attack level ratings to a bushfire attack level rating of BAL-29, to minimise extensive clearing where native standing vegetation is of environmental significance.	
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?	No
Future buildings as part of future re-zoning and subsequent subdivision proposal will consider achievable asset protection zones within the boundaries of the subject individual Lots. It is assumed for the purposes of assessment that Maralla Road to the south of the subject site will be constructed to meet the Bushfire Technical requirements established by the Guidelines to enable access to the Residential and POS areas at the southern portion of the site. In addition, it is reasonable to assume that vegetation along Halden road, immediately adjacent to the subject site will be modified to enable the widening of the road in accordance with the proposal.	
CONSIDERATION OF BUSHFIRE RISK (SUBDIVISION DESIGN)	
Is the proposal able to implement subdivision design to reduce risks relating to bushfire while considering future growth?	Yes
Road layout design, construction standards for buildings, clearing of land, vegetation management and the size and shape of building lots are under the control of planning and building systems. Through avoiding exposure to the bushfire hazards, risks to people and property are precluded. The clearing or modification of vegetation around new or existing structures or subdivision areas is a way to reduce radiant heat, flame contact and, to an extent, ember attack on buildings and structures.	
Large building lot sizes may allow for the retention of significant vegetation but result in retaining of higher levels of hazardous fuel loads and continuous vegetation conducive to fire run. Grouped smaller building lot sizes incorporating separation from hazards with road design and landscape treatments assist in reducing fuel loads and subsequent reduction in radiant heat and flame contact exposure.	

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 future Bushfire Management Plans at the subdivision stages.

Is re-vegetation of riparian zones and/or wetland or foreshore buffers and/or public open space a part of this Proposal?	Possible
*See comment below.	
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?	Possible
*See comment below	
Is a landscape plan required for the future proposed development?	Yes
Where future development proposals incorporate landscaping within the subject land, modification and/or replanted vegetation types, will require a landscape plan indicating how the vegetation will be configured and managed in perpetuity, so as not to increase the bushfire risk and limit ignition sources.	

*An approved Landscape Management Plan should be provided to demonstrate that the landowner/proponent responsible for the on-going management has an obligation to undertake mitigation works and the approving decision maker (i.e. local government and / or Department of Biodiversity, Conservation and Attractions) support the vegetation classification and management treatments assigned to the subject area.

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
1-12	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.

Planned Re-vegetation/Landscaping Considerations/Public Open Space Management

Re-vegetation – It is assumed re-vegetation/re-planting will take place in both the CCW and REW Buffers. It is further assumed that these buffers will not be managed. As such, classification in accordance with AS3959-2018 will be required. This will result in an eventual classification of Class A Forest at maturity.

Landscaping - Final landscaping detail will be addressed at the future development stages. If any such vegetation is excluded from classification due to proposed management, the subsequent BMP will ensure the obligation to manage to a minimal fuel, low threat state, in perpetuity, is created in the landowner responsibilities. For the purposes of assessment, it is assumed that the proposed POS Areas will be managed in a low threat state in perpetuity to ensure there is no increase in bushfire risk nor alter indicative BAL ratings indicated in this plan. They will meet AS3959-2018 s2.2.3.2 requirements, Schedule 1: Standards for Asset Protection Zones as stipulated in the Guidelines for Planning in Bushfire Prone Areas in conjunction with the City of Swan Fire Hazard Reduction Notice.

Excluded Bushfire Prone Vegetation

The exclusion of existing bushfire prone vegetation from classification includes areas that can reasonably be expected to remain as vegetation in a minimal fuel, low threat state or areas devoid of vegetation. Consequently, the potential bushfire impact is determined by bushfire prone vegetation at the strategic level in this District Structure Plan Amendment BMP. Future development of the Subject Land will incorporate areas of minimal fuel, low threat state, detail of which will be demonstrated in the BMP for the subsequent subdivision and/or development applications.

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 tussock G-23; Sown pasture G-26; Open herbfield G-27; Sparse open herbfield G-28	Class G Grassland	0	upslope or flat
2	Open forest A-03; Low open forest A-04; Closed scrub D-13; Open scrub D-14	Class A Forest	0	upslope or flat
3	Closed heath C-10; Open heath C-11	Class C Shrubland	0	upslope or flat
4	Low woodland B-07; Closed scrub D-13; Open scrub D-14	Class D Scrub	0	upslope or flat
5	Low open forest A-04; Closed scrub D-13; Open scrub D-14	Class A Forest	0	upslope or flat
6	Sown pasture G-26; Open herbfield G-27	Class G Grassland	0	upslope or flat
7	Excluded – Non-Vegetated Areas	Excluded as per Section 2.2.3.2 (e) Non-Vegetated Areas	N/A	N/A
8	Low woodland B-07; Closed scrub D-13; Open scrub D-14	Class D Scrub	7.5	downslope >5-10
9	Closed heath C-10	Class C Shrubland	3.6	downslope >0-5
10	Closed heath C-10	Class C Shrubland	0	upslope or flat
11	Low woodland B-07; Closed heath C-10 Closed scrub D-13; Open scrub D-14	Class D Scrub	4	downslope >0-5
12	Low open forest A-04; Closed scrub D-13; Open scrub D-14	Class A Forest	4.8	downslope >0-5
Representative photos of each vegetation area, descriptions and classification justification, are presented on the following 10 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				
Note ³ : It is assumed for the purposes of assessment that Area 7 will continue/remain either devoid of vegetation or be managed in a low threat state in perpetuity as development of the site progresses.				

VEGETATION AREA 1

AS 3959:2018 Vegetation Classification Applied:	Class G Grassland
Vegetation Types Present:	Open tussock G-23; Sown pasture G-26; Open herbfield G-27; Sparse open herbfield G-28
Description/Justification:	Assessed as Grassland due to areas of grasses present in paddock/open areas. Although grasses may appear to be in a managed state or sparse in some sections, other sections do appear unmanaged. As such, the entire area/s have been classified as a precautionary measure with a worst-case scenario approach. There is the potential to become significantly unmanaged in the future. Foliage cover less than 10%.
Post Dev. Assumptions:	Grassland areas can be modified to less than 100mm in height within the development boundary.



Photo ID: 1

Photo ID: 2



Photo ID: 3

Photo ID: 4

VEGETATION AREA 1

AS 3959:2018 Vegetation Classification Applied:	Class G Grassland
Vegetation Types Present:	Open tussock G-23; Sown pasture G-26; Open herbfield G-27; Sparse open herbfield G-28
Description/Justification:	Assessed as Grassland due to areas of grasses present in paddock/open areas. Although grasses may appear to be in a managed state or sparse in some sections, other sections do appear unmanaged. As such, the entire area/s have been classified as a precautionary measure with a worst-case scenario approach. There is the potential to become significantly unmanaged in the future. Foliage cover less than 10%.
Post Dev. Assumptions:	Grassland areas can be modified to less than 100mm in height within the development boundary.



Photo ID: 5



Photo ID: 6



Photo ID: 7



Photo ID: 8

VEGETATION AREA 2

AS 3959:2018 Vegetation Classification Applied:	Class A Forest
Vegetation Types Present:	Open forest A-03; Low open forest A-04; Closed scrub D-13; Open scrub D-14
Description/Justification:	Mixed species of trees present inclusive of tall Banksia, Melaleuca and Pine. Trees with an average height of 10-15 metres. Canopy coverage greater than 50%. Understorey consists of unmanaged grasses, low shrub and low trees. NOTE: Zoom factor increased at Photo ID: 12 to obtain a suitable image. This is due to lack of access to the area.
Post Dev. Assumptions:	It is anticipated that sections of Area 2 within the boundaries of the subject site (with the exception of the Resource Enhancement Wetland Areas) will have some form of modification at the future development stage. This is however, subject to applicable Environmental and Local Government Authority Approvals.



Photo ID: 9



Photo ID: 10



Photo ID: 11



Photo ID: 12

VEGETATION AREA 2

AS 3959:2018 Vegetation Classification Applied:	Class A Forest
Vegetation Types Present:	Open forest A-03; Low open forest A-04; Closed scrub D-13; Open scrub D-14
Description/Justification:	Mixed species of trees present inclusive of tall Banksia, Melaleuca and Pine. Trees with an average height of 10-15 metres. Canopy coverage greater than 50%. Understorey consists of unmanaged grasses, low shrub and low trees.
Post Dev. Assumptions:	It is anticipated that sections of Area 2 within the boundaries of the subject site (with the exception of the Resource Enhancement Wetland Areas) will have some form of modification at the future development stage. This is however, subject to applicable Environmental and Local Government Authority Approvals.



Photo ID: 13



Photo ID: 14



Photo ID: 15



Photo ID: 16



Photo ID: 17

VEGETATION AREA 3

AS 3959:2018 Vegetation Classification Applied: Class C Shrubland

Vegetation Types Present: Closed heath C-10;
Open heath C-11

Description/Justification: Unmanaged shrub averaging less than 2 metres in height. Mixed species composition. Unmanaged grasses present also.

Post Dev. Assumptions: It is anticipated that sections of Area 3 within the boundaries of the subject site (with the exception of the Resource Enhancement Wetland Areas) will have some form of modification at the future development stage, resulting in a change in classification to 'Excluded' AS3959-2018 (f). This is however, subject to applicable Environmental and Local Government Authority Approvals. In addition to the above, it is assumed for the purposes of assessment that natural re-seeding and/or revegetation will take place within the REW Buffer. As it is unlikely to receive any form of maintenance, classification in accordance with AS3959-2018 is required. As such, an eventual classification of Class A – Forest has been applied as a precautionary measure with a worst-case scenario approach to this area.



Photo ID: 18

Photo ID: 19



Photo ID: 20

VEGETATION AREA 4

AS 3959:2018 Vegetation Classification Applied: Class D Scrub

Vegetation Types Present: Low woodland B-07;
Closed scrub D-13;
Open scrub D-14

Description/Justification: Scrub dominant. Unmanaged medium to tall shrub up to 6 metres in height, but no greater. Mixed species composition inclusive of low Banksia and Woolly Bush. Unmanaged grasses present also.

Post Dev. Assumptions: **It is anticipated that sections of Area 4 within the boundaries of the subject with the exception of the Conservation Category Wetland Areas) will have some form of modification at the future development stage, resulting in a change in classification to 'Excluded' AS3959-2018 (f). This is however, subject to applicable Environmental and Local Government Authority Approvals.**
In addition to the above, it is assumed for the purposes of assessment that natural re-seeding and/or revegetation will take place within the CCW Buffer. As it is unlikely to receive any form of maintenance, classification in accordance with AS3959-2018 is required. As such, an eventual classification of Class A – Forest has been applied as a precautionary measure with a worst-case scenario approach to this area.



Photo ID: 21



Photo ID: 22



Photo ID: 23

VEGETATION AREA 4

AS 3959:2018 Vegetation Classification Applied: Class D Scrub

Vegetation Types Present: Low woodland B-07;
Closed scrub D-13;
Open scrub D-14

Description/Justification: Scrub dominant. Unmanaged medium to tall shrub up to 6 metres in height, but no greater. Mixed species composition inclusive of low Banksia and Woolly Bush. Unmanaged grasses present also.

Post Dev. Assumptions: **It is anticipated that sections of Area 4 within the boundaries of the subject with the exception of the Conservation Category Wetland Areas) will have some form of modification at the future development stage, resulting in a change in classification to 'Excluded' AS3959-2018 (f). This is however, subject to applicable Environmental and Local Government Authority Approvals.**
In addition to the above, it is assumed for the purposes of assessment that natural re-seeding and/or revegetation will take place within the CCW Buffer. As it is unlikely to receive any form of maintenance, classification in accordance with AS3959-2018 is required. As such, an eventual classification of Class A – Forest has been applied as a precautionary measure with a worst-case scenario approach to this area.



Photo ID: 24



Photo ID: 25



Photo ID: 26



Photo ID: 27

VEGETATION AREA 4

AS 3959:2018 Vegetation Classification Applied: Class D Scrub

Vegetation Types Present: Low woodland B-07;
Closed scrub D-13;
Open scrub D-14

Description/Justification: Scrub dominant. Unmanaged medium to tall shrub up to 6 metres in height, but no greater. Mixed species composition inclusive of low Banksia and Woolly Bush. Unmanaged grasses present also.

Post Dev. Assumptions: **It is anticipated that sections of Area 4 within the boundaries of the subject with the exception of the Conservation Category Wetland Areas) will have some form of modification at the future development stage, resulting in a change in classification to 'Excluded' AS3959-2018 (f). This is however, subject to applicable Environmental and Local Government Authority Approvals.**
In addition to the above, it is assumed for the purposes of assessment that natural re-seeding and/or revegetation will take place within the CCW Buffer. As it is unlikely to receive any form of maintenance, classification in accordance with AS3959-2018 is required. As such, an eventual classification of Class A – Forest has been applied as a precautionary measure with a worst-case scenario approach to this area.



Photo ID: 28



Photo ID: 29



Photo ID: 30



Photo ID: 31

VEGETATION AREA 4

AS 3959:2018 Vegetation Classification Applied: Class D Scrub

Vegetation Types Present: Low woodland B-07;
Closed scrub D-13;
Open scrub D-14

Description/Justification: Scrub dominant. Unmanaged medium to tall shrub up to 6 metres in height, but no greater. Mixed species composition inclusive of low Banksia and Woolly Bush. Unmanaged grasses present also.

Post Dev. Assumptions: **It is anticipated that sections of Area 4 within the boundaries of the subject with the exception of the Conservation Category Wetland Areas) will have some form of modification at the future development stage, resulting in a change in classification to 'Excluded' AS3959-2018 (f). This is however, subject to applicable Environmental and Local Government Authority Approvals.**
In addition to the above, it is assumed for the purposes of assessment that natural re-seeding and/or revegetation will take place within the CCW Buffer. As it is unlikely to receive any form of maintenance, classification in accordance with AS3959-2018 is required. As such, an eventual classification of Class A – Forest has been applied as a precautionary measure with a worst-case scenario approach to this area.



Photo ID: 32



Photo ID: 33



Photo ID: 34



Photo ID: 35

VEGETATION AREA 4

AS 3959:2018 Vegetation Classification Applied: Class D Scrub

Vegetation Types Present: Low woodland B-07;
Closed scrub D-13;
Open scrub D-14

Description/Justification: Scrub dominant. Unmanaged medium to tall shrub up to 6 metres in height, but no greater. Mixed species composition inclusive of low Banksia and Woolly Bush. Unmanaged grasses present also.

Post Dev. Assumptions: **It is anticipated that sections of Area 4 within the boundaries of the subject with the exception of the Conservation Category Wetland Areas) will have some form of modification at the future development stage, resulting in a change in classification to 'Excluded' AS3959-2018 (f). This is however, subject to applicable Environmental and Local Government Authority Approvals.**
In addition to the above, it is assumed for the purposes of assessment that natural re-seeding and/or revegetation will take place within the CCW Buffer. As it is unlikely to receive any form of maintenance, classification in accordance with AS3959-2018 is required. As such, an eventual classification of Class A – Forest has been applied as a precautionary measure with a worst-case scenario approach to this area.



Photo ID: 36



Photo ID: 37



Photo ID: 38



Photo ID: 39

VEGETATION AREA 5

AS 3959:2018 Vegetation Classification Applied:	Class A Forest
Vegetation Types Present:	Low open forest A-04; Closed scrub D-13; Open scrub D-14
Description/Justification:	Forest dominant. Mixed species of trees present inclusive of tall Banksia and Melaleuca. Trees with an average height of up to 10 metres. Canopy coverage greater than 50%. Understorey consists of unmanaged grasses, low shrub and low trees.
Post Dev. Assumptions:	It is anticipated that sections of Area 5 within the boundaries of the subject site (with the exception of the Conservation Category Wetland Areas) will have some form of modification at the future development stage, resulting in a change in classification to 'Excluded' AS3959-2018 (f). This is however, subject to applicable Environmental and Local Government Authority Approvals.



Photo ID: 40



Photo ID: 41



Photo ID: 42



Photo ID: 43

VEGETATION AREA 6

AS 3959:2018 Vegetation Classification Applied:	Class G Grassland
Vegetation Types Present:	Sown pasture G-26; Open herbfield G-27
Description/Justification:	Assessed as Grassland due to areas of grasses present in paddock/open areas. Although grasses may appear to be in a managed state or sparse in some sections, other sections do appear unmanaged. As such, the entire area/s have been classified as a precautionary measure with a worst-case scenario approach. There is the potential to become significantly unmanaged in the future. Foliage cover less than 10%.
Post Dev. Assumptions:	Grassland areas can be modified to less than 100mm in height within the development boundary.



Photo ID: 44



Photo ID: 45



Photo ID: 46

VEGETATION AREA 7

AS 3959:2018 Vegetation Classification Applied:	Excluded as per Section 2.2.3.2 (e) Non-Vegetated Areas
Vegetation Types Present:	Non-Vegetated Areas
Description/Justification:	An existing Sand Quarry and public road network. Currently devoid of classifiable vegetation.
Post Dev. Assumptions:	Not Applicable.



Photo ID: 47



Photo ID: 48



Photo ID: 49



Photo ID: 50



Photo ID: 51

VEGETATION AREA 8	
AS 3959:2018 Vegetation Classification Applied:	Class D Scrub
Vegetation Types Present:	Low woodland B-07; Closed scrub D-13; Open scrub D-14
Description/Justification:	Scrub dominant. Unmanaged medium to tall shrub up to 6 metres in height, but no greater. Mixed species composition inclusive of low Banksia and Woolly Bush. Unmanaged grasses present also.
Post Dev. Assumptions:	It is anticipated that sections of Area 8 within the boundaries of the subject site will have some form of modification at the future development stage. This is however, subject to applicable Environmental and Local Government Authority Approvals.
	
Photo ID: 52	Photo ID: 53

VEGETATION AREA 9	
AS 3959:2018 Vegetation Classification Applied:	Class C Shrubland
Vegetation Types Present:	Closed heath C-10
Description/Justification:	Unmanaged shrub averaging less than 2 metres in height. Mixed species composition. Unmanaged grasses present also.
Post Dev. Assumptions:	It is anticipated that sections of Area 9 within the boundaries of the subject site will have some form of modification at the future development stage. This is however, subject to applicable Environmental and Local Government Authority Approvals.
	
Photo ID: 54	Photo ID: 55

VEGETATION AREA 10

AS 3959:2018 Vegetation Classification Applied:	Class C Shrubland
Vegetation Types Present:	Closed heath C-10
Description/Justification:	Unmanaged shrub averaging less than 2 metres in height. Mixed species composition. Unmanaged grasses present also.
Post Dev. Assumptions:	It is anticipated that sections of Area 10 within the boundaries of the subject site will have some form of modification at the future development stage. This is however, subject to applicable Environmental and Local Government Authority Approvals.



Photo ID: 56



Photo ID: 57

VEGETATION AREA 11

AS 3959:2018 Vegetation Classification Applied:	Class D Scrub
Vegetation Types Present:	Low woodland B-07; Closed heath C-10 Closed scrub D-13; Open scrub D-14
Description/Justification:	Scrub dominant. Unmanaged medium to tall shrub up to 6 metres in height, but no greater. Mixed species composition inclusive of low Banksia. Unmanaged grasses present also.
Post Dev. Assumptions:	It is anticipated that sections of Area 11 within the boundaries of the subject site will have some form of modification at the future development stage. This is however, subject to applicable Environmental and Local Government Authority Approvals.



Photo ID: 58



Photo ID: 59



Photo ID: 60

VEGETATION AREA 12

AS 3959:2018 Vegetation Classification Applied:	Class A Forest
Vegetation Types Present:	Low open forest A-04; Closed scrub D-13; Open scrub D-14
Description/Justification:	Forest dominant. Mixed species of trees present inclusive of tall Banksia and juvenile Jarrah. Trees with an average height of up to 10 metres. Canopy coverage greater than 50%. Understorey consists of unmanaged grasses, low shrub and low trees.
Post Dev. Assumptions:	It is anticipated that sections of Area 12 within the boundaries of the subject site will have some form of modification at the future development stage. This is however, subject to applicable Environmental and Local Government Authority Approvals.



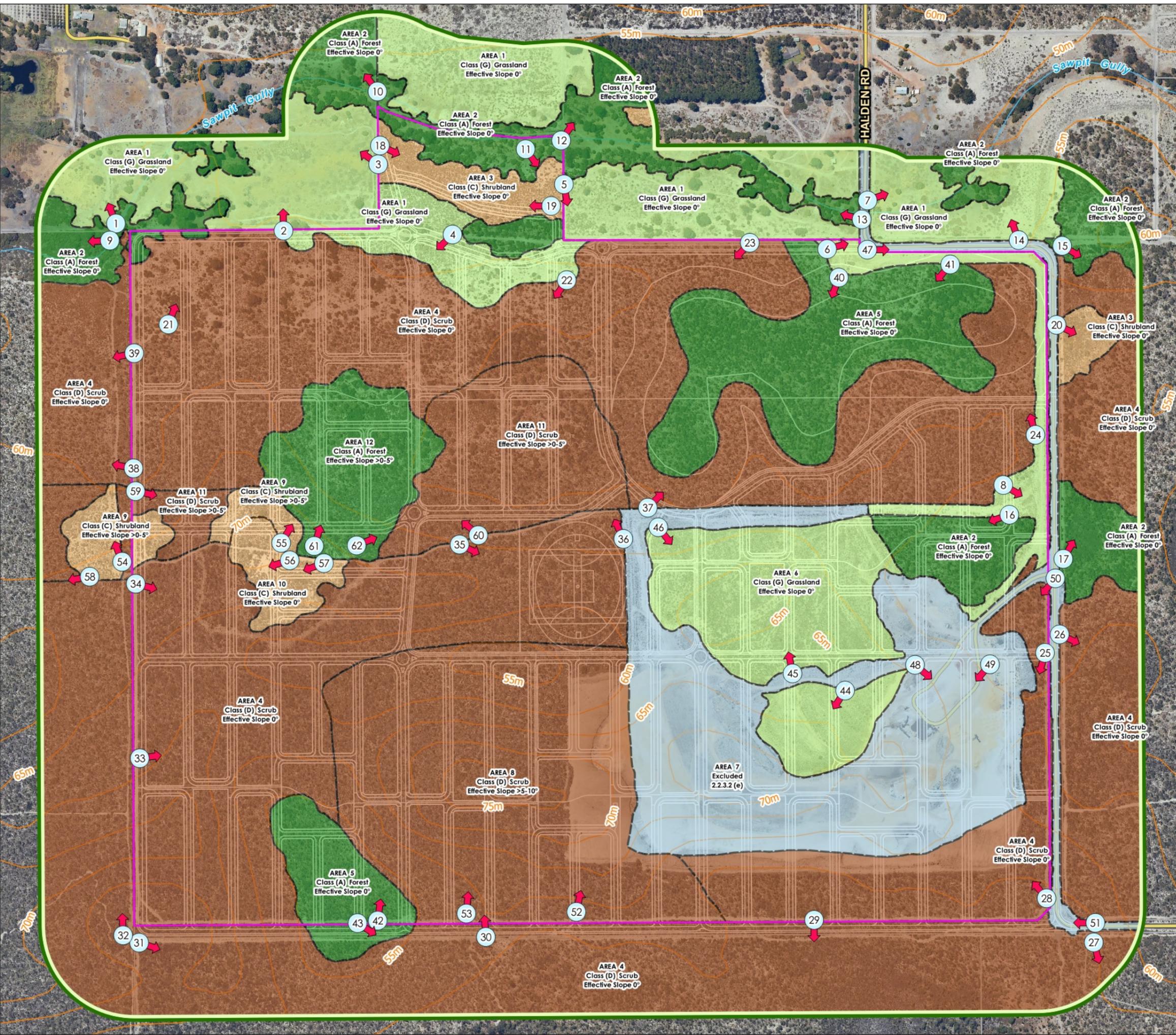
Photo ID: 61

Photo ID: 62

Figure 3.1

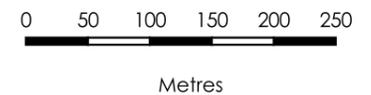
Vegetation Classification & Topography Map - (Existing)

Lot 5892 on Plan / Diagram: P208236
 Maralla Road
 Bullsbrook
 City of Swan

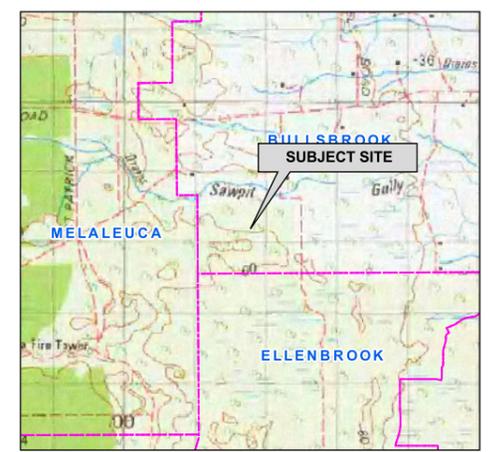


----- LEGEND -----

- Photos
- Elevation (m)
- Subject Site
- Proposal**
- Land Use Areas - (Outline)
- Assessment Area**
- 150m Buffer
- Classified Vegetation**
- Class A - Forest
- Class C - Shrubland
- Class D - Scrub
- Class G - Grassland
- Exclusion 2.2.3.2



----- LOCALITY -----



AERIAL IMAGERY: Landgate/SLIP



Coordinate System: GDA 1994 MGA Zone 50
 Projection: Universal Transverse Mercator Units: Metre
 Map by: Sarina Gorman 13-11-2024
 SCALE (A3): 1 : 5700

Disclaimer and Limitation: This map has been prepared for bushfire management planning purposes only. All depicted areas, contours and any dimensions shown are subject to survey. Bushfire Prone Planning does not guarantee that this map is without flaw of any kind and disclaims all liability for any errors, loss or other consequence which may arise from relying on any information depicted.

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 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 3.2.2), 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 3.2.2).

Table 3.2.1: Indicative BAL ratings – (Pre-Development)

MINIMUM SEPARATION DISTANCES REQUIRED TO RETAIN INDICATIVE, MAXIMUM, ACCEPTABLE BAL RATING – PRE-DEVELOPMENT				
Vegetation Area	Vegetation Classification	Effective Slope (degrees)	Maximum Acceptable BAL Rating	Required Separation Distances (metres)
1	Class G Grassland	upslope or flat	BAL-29	8m
2	Class A Forest	upslope or flat		21m
3	Class C Shrubland	upslope or flat		9m
4	Class D Scrub	upslope or flat		13m
5	Class A Forest	upslope or flat		21m
6	Class G Grassland	upslope or flat		8m
7	Excluded AS3959:2018 2.2.3.2 (e & f)	N/A		N/A
8	Class D Scrub	downslope >5-10		17m
9	Class C Shrubland	downslope >0-5		10m
10	Class C Shrubland	upslope or flat		9m
11	Class D Scrub	downslope >0-5		15m
12	Class A Forest	downslope >0-5		27m
<p>Note¹: Subject to any applicable Environmental Survey Works and approval from the Local Government Authority, it is possible for sections of Areas 1, 2, 3, 4, 5, 6, 8, 9, 10, 11 and 12 (within the boundaries of the subject site) to be re-classified to "Excluded AS3959:2018 2.2.3.2 (e&f)" once any applicable vegetation clearing/modification works can be conducted. Refer to Figure 3.2 – Vegetation Classification and Topography Map – (Post Development) and Figure 3.3 – BAL Contour Map – (Post Development).</p> <p>Note²: It is assumed for the purposes of assessment that Area 7 will continue/remains either devoid of vegetation or be managed in a low threat state in perpetuity as development of the site progresses.</p>				

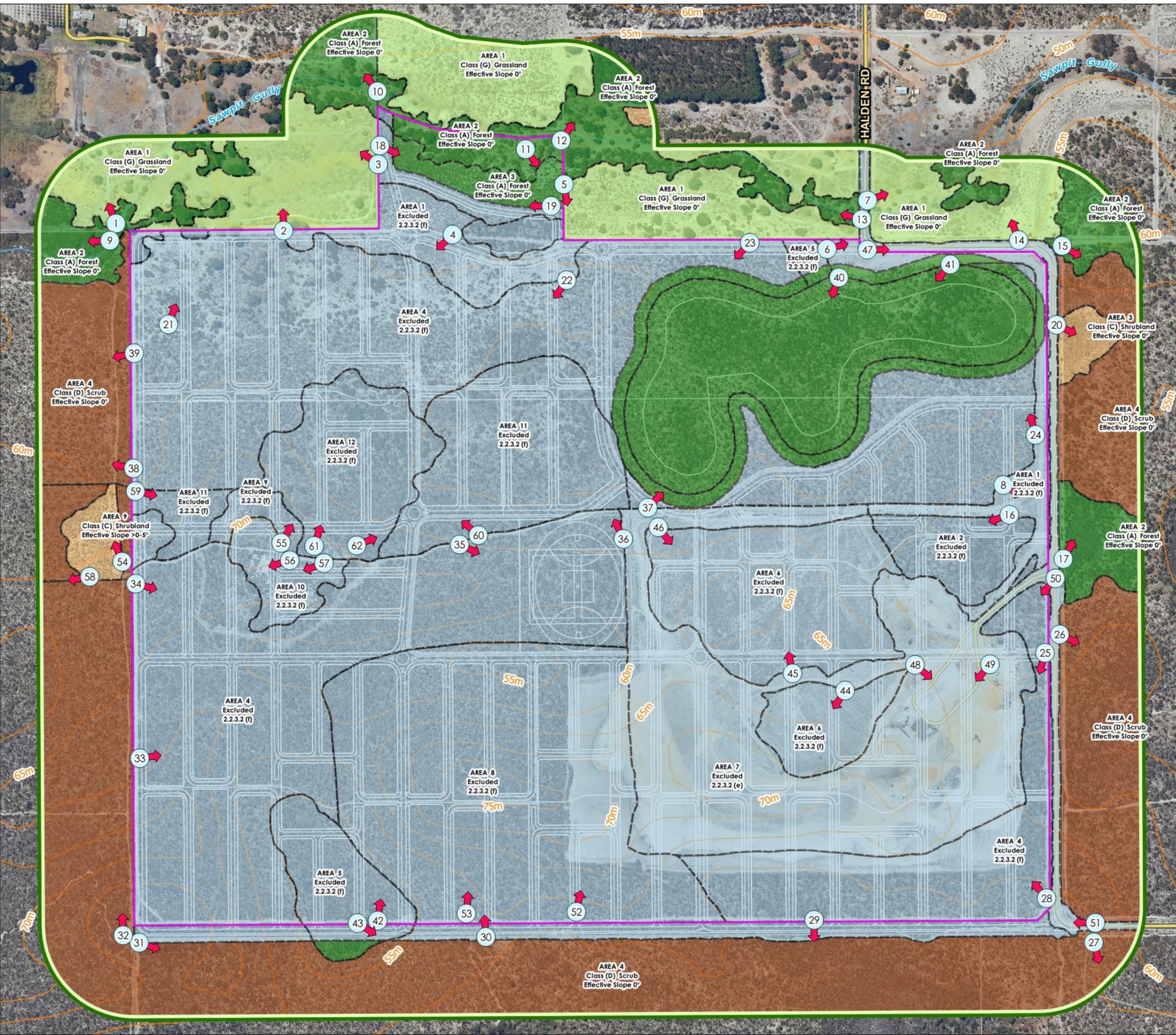
Table 3.2.2: Indicative BAL ratings – General Use Area & High Use Area - (Post-Development)

MINIMUM SEPARATION DISTANCES REQUIRED TO RETAIN INDICATIVE, MAXIMUM, ACCEPTABLE BAL RATING – POST-DEVELOPMENT				
Vegetation Area	Vegetation Classification	Effective Slope (degrees)	Maximum Acceptable BAL Rating	Required Separation Distances (metres)
1	Class G Grassland	upslope or flat	BAL-29	8m
*1	Excluded AS3959:2018 2.2.3.2 (e & f)	N/A		N/A
2	Class A Forest	upslope or flat		21m
*2	Excluded AS3959:2018 2.2.3.2 (e & f)	N/A		N/A
3	Class C Shrubland	upslope or flat		9m
*3	Excluded AS3959:2018 2.2.3.2 (e & f)	N/A		N/A
**3	Class A Forest	upslope or flat		21m
4	Class D Scrub	upslope or flat		13m
*4	Excluded AS3959:2018 2.2.3.2 (e & f)	N/A		N/A
**4	Class A Forest	upslope or flat		21m
5	Class A Forest	upslope or flat		21m
*5	Excluded AS3959:2018 2.2.3.2 (e & f)	N/A		N/A
**5	Class A Forest	upslope or flat		21m
6	Class G Grassland	upslope or flat		8m
*6	Excluded AS3959:2018 2.2.3.2 (e & f)	N/A		N/A
7	Excluded AS3959:2018 2.2.3.2 (e & f)	N/A		N/A
8	Class D Scrub	downslope >5-10		17m
*8	Excluded AS3959:2018 2.2.3.2 (e & f)	N/A		N/A
9	Class C Shrubland	downslope >0-5		10m
*9	Excluded AS3959:2018 2.2.3.2 (e & f)	N/A		N/A
10	Class C Shrubland	upslope or flat		9m
*10	Excluded AS3959:2018 2.2.3.2 (e & f)	N/A		N/A
11	Class D Scrub	downslope >0-5		15m
*11	Excluded AS3959:2018 2.2.3.2 (e & f)	N/A		N/A
12	Class A Forest	downslope >0-5	27m	
*12	Excluded AS3959:2018 2.2.3.2 (e & f)	N/A	N/A	
Note ¹ : It is assumed for the purposes of assessment that Area 7 will continue/remain either devoid of vegetation or be managed in a low threat state in perpetuity as development of the site progresses.				
Note ² : *1, *2, *3, *4, *5, *6, *8, *9, *10, *11 and *12 indicates vegetation subject to changes post development, with sections being reclassified to 'Excluded' AS3959-2018 (f)'. It is assumed for the purposes of assessment that these areas (where modified) will be maintained in a low threat state during the development process.				
Note ³ : **3, **4, **5 indicates vegetation subject to changes post development of this site as a result of revegetation works within the Conservation Category and Resource Enhancement Wetlands and their associated buffers. It is assumed for the purposes of assessment that these areas will not receive management. As such, sections are reclassified to Class A – Forest as a precautionary measure.				

Figure 3.2

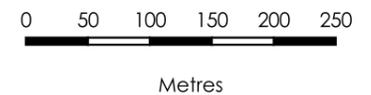
Classified Vegetation & Topography Map - (Post Development)

Lot 5892 on Plan / Diagram: P208236
 Maralla Road
 Bullsbrook
 City of Swan

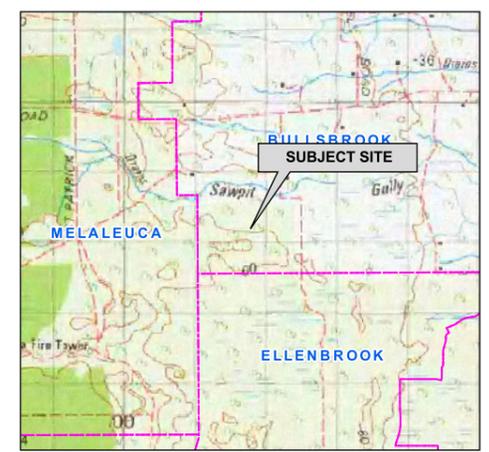


----- LEGEND -----

- Photos
- Elevation (m)
- Subject Site
- Proposal**
- Land Use Areas - (Outline)
- Assessment Area**
- 150m Buffer
- Classified Vegetation**
- Class A - Forest
- Class C - Shrubland
- Class D - Scrub
- Class G - Grassland
- Exclusion 2.2.3.2



----- LOCALITY -----



AERIAL IMAGERY: Landgate/SLIP



Coordinate System: GDA 1994 MGA Zone 50
 Projection: Universal Transverse Mercator Units: Metre
 Map by: Sarina Gorman 13-11-2024
 SCALE (A3): 1 : 5700

Disclaimer and Limitation: This map has been prepared for bushfire management planning purposes only. All depicted areas, contours and any dimensions shown are subject to survey. Bushfire Prone Planning does not guarantee that this map is without flaw of any kind and disclaims all liability for any errors, loss or other consequence which may arise from relying on any information depicted.

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 exceptions:

1. For Figures 3.2 and 3.3, all classified vegetation within the subject land (with the exception of the Conservation Category and Resource Enhancement Wetlands and their associated buffers), is excluded. BAL contours are constructed into the subject land from any classified vegetation outside of these areas.

This approach is applied to indicate the achievable bushfire attack levels within the specified land 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 the lot (where applicable) can potentially be managed by the landowner to meet asset protection zone standards and dimensions corresponding to an indicated BAL; and
2. Each lot/s (where applicable) must be considered independent of what development may or may not take place on the adjoining lot.

Construction of the BAL Contours

Table 3.2.3: 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 (degrees)	BAL and Corresponding Separation Distance (m)					
			BAL-FZ	BAL-40	BAL-29	BAL-19	BAL12.5	BAL-LOW
1	Class G Grassland	upslope or flat	<6	6-<8	8-<12	12-<17	17-<50	>50
*1	Excluded AS3959:2018 2.2.3.2 (f)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2	Class A Forest	upslope or flat	<16	16-<21	21-<31	31-<42	42-<100	>100
*2	Excluded AS3959:2018 2.2.3.2 (f)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
3	Class C Shrubland	upslope or flat	<7	7-<9	9-<13	13-<19	19-<100	>100
*3	Excluded AS3959:2018 2.2.3.2 (f)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
**3	Class A Forest	upslope or flat	<16	16-<21	21-<31	31-<42	42-<100	>100
4	Class D Scrub	upslope or flat	<10	10-<13	13-<19	19-<27	27-<100	>100
*4	Excluded AS3959:2018 2.2.3.2 (f)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
**4	Class A Forest	upslope or flat	<16	16-<21	21-<31	31-<42	42-<100	>100
5	Class A Forest	upslope or flat	<16	16-<21	21-<31	31-<42	42-<100	>100
*5	Excluded AS3959:2018 2.2.3.2 (f)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
**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
*6	Excluded AS3959:2018 2.2.3.2 (f)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
7	Excluded AS3959:2018 2.2.3.2 (f)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
8	Class D Scrub	downslope >5-10	<12	12-<17	17-<24	24-<35	35-<100	>100
*8	Excluded AS3959:2018 2.2.3.2 (f)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
9	Class C Shrubland	downslope >0-5	<7	7-<10	10-<15	15-<22	22-<100	>100
*9	Excluded AS3959:2018 2.2.3.2 (f)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10	Class C Shrubland	upslope or flat	<7	7-<9	9-<13	13-<19	19-<100	>100
*10	Excluded AS3959:2018 2.2.3.2 (f)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
11	Class D Scrub	downslope >0-5	<11	11-<15	15-<22	22-<31	31-<100	>100

*11	Excluded AS3959:2018 2.2.3.2 (f)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
12	Class A Forest	downslope >0-5	<20	20-<27	27-<31	37-<50	50-<100	>100
*12	Excluded AS3959:2018 2.2.3.2 (f)	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Note¹: It is assumed for the purposes of assessment that Area 7 will continue/remain either devoid of vegetation or be managed in a low threat state in perpetuity as development of the site progresses.

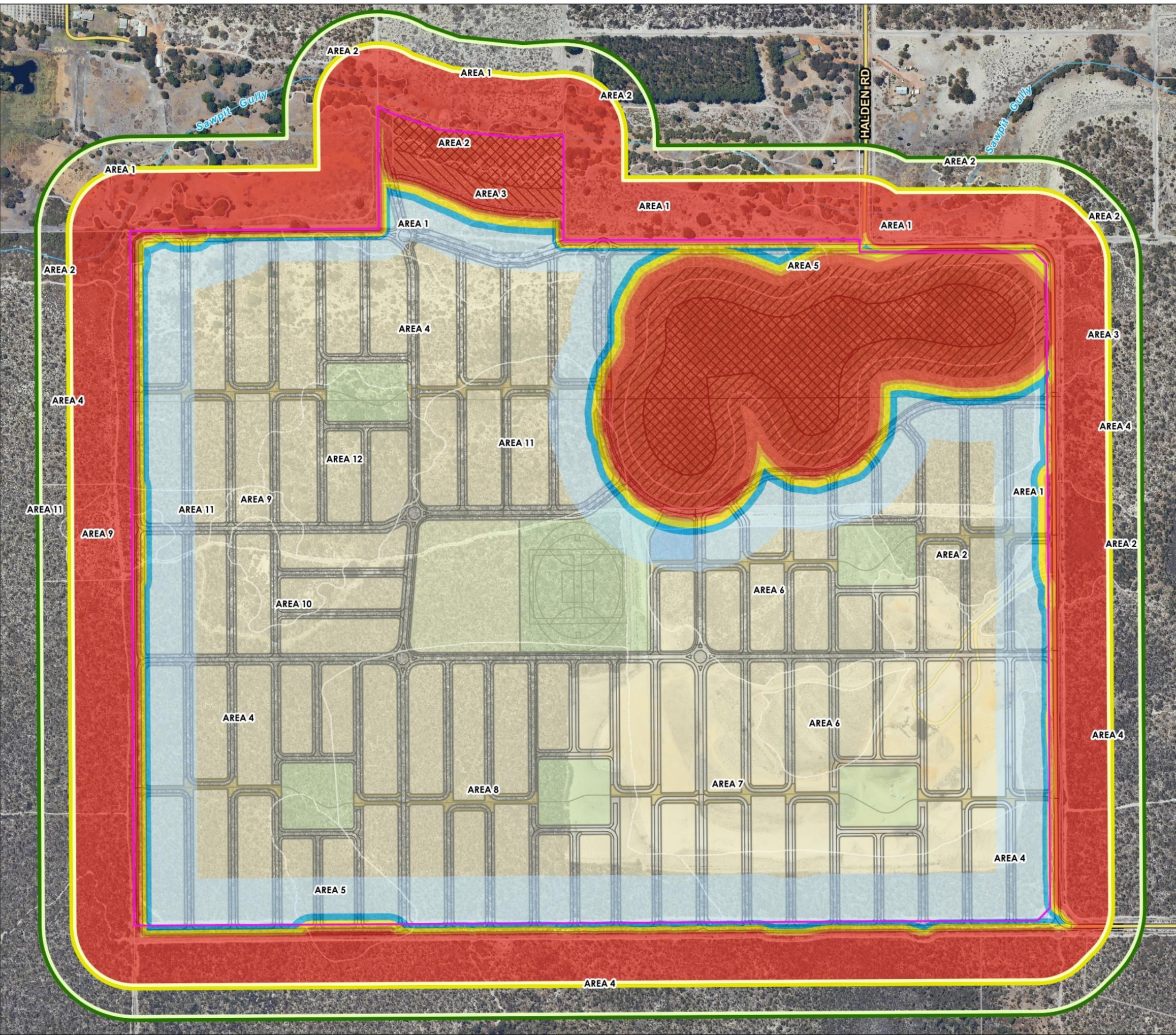
Note²: *1, *2, *3, *4, *5, *6, *8, *9, *10, *11 and *12 indicates vegetation subject to changes post development, with sections being reclassified to 'Excluded' AS3959-2018 (f)'. It is assumed for the purposes of assessment that these areas (where modified) will be maintained in a low threat state during the development process.

Note³: **3, **4, **5 indicates vegetation subject to changes post development of this site as a result of revegetation works within the Conservation Category and Resource Enhancement Wetlands and their associated buffers. It is assumed for the purposes of assessment that these areas will not receive management. As such, sections are reclassified to Class A – Forest as a precautionary measure.

Figure 3.3

BAL Contour Map - (Post Development)

Lot 5892 on Plan / Diagram: P208236
Maralla Road
Bullsbrook
City of Swan



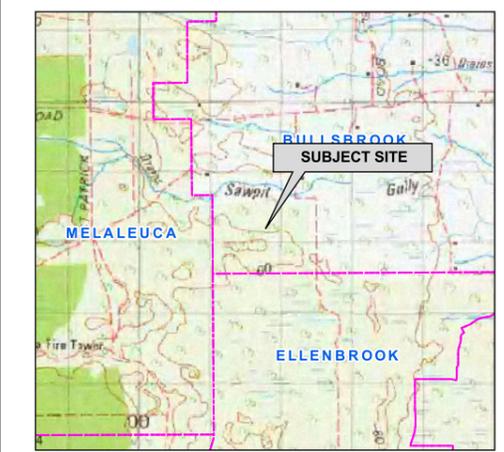
----- LEGEND -----

- Subject Site
- Cell Structure Plan - Indicative**
- Residential
- Local Activity Centre
- Primary School
- Green Linkages
- POS
- CCW Core
- CCW Buffer
- REW Core
- REW Buffer
- Assessment Area**
- 100m Buffer
- 150m Buffer
- Bushfire Attack Levels**
- BAL-FZ
- BAL-40
- BAL-29
- BAL-19
- BAL-12.5
- BAL-LOW



Metres

----- LOCALITY -----



AERIAL IMAGERY: Landgate/SLIP



Coordinate System: GDA 1994 MGA Zone 50
 Projection: Universal Transverse Mercator Units: Metre
 Map by: Sarina Gorman 13-11-2024
 SCALE (A3): 1 : 5700

Disclaimer and Limitation: This map has been prepared for bushfire management planning purposes only. All depicted areas, contours and any dimensions shown are subject to survey. Bushfire Prone Planning does not guarantee that this map is without flaw of any kind and disclaims all liability for any errors, loss or other consequence which may arise from relying on any information depicted.

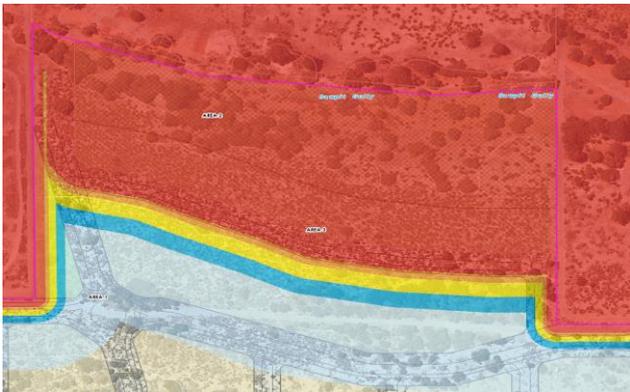
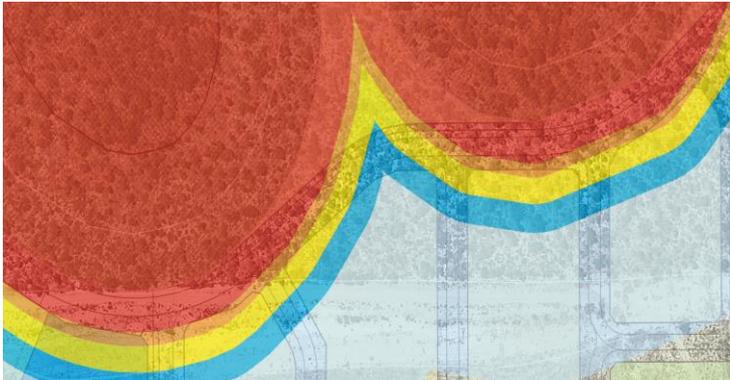
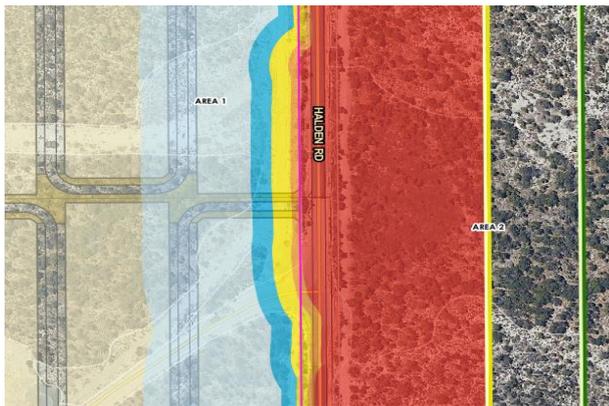
3.2.2 Identification of Bushfire Hazard Issues Arising from the BAL Contour Map

While allotment layouts are not known at this stage, the proposal sets out various land use zones across the subject site. A BAL Contour Map has been used in lieu of a Bushfire Hazard Level (BHL) Assessment as it demonstrates in greater detail, that the development can be located in an area that will, on completion be subject to BAL-29 or below, subject to development design and location of allotments and associated structures.

IMPACT FROM VEGETATION – AS IT CURRENTLY EXISTS

The key assumption used to facilitate the determining of indicative Bushfire Attack Levels on the proposed development site is that vegetation onsite is under the control of the landowner and therefore can be removed or modified to present a low bushfire threat (Note: any proposed vegetation removal may be subject to Local Government approval, dependant on the lot's specific situation with respect to identified environmental protection areas and lot size).

Table 3.2.4: Land Use Zones currently subject to radiant heat levels corresponding to BAL-40 and/or BAL-FZ ratings that require consideration for development design and location of eventual allotments and associated structures.

LAND USE ZONES CURRENTLY SUBJECT TO RADIANT HEAT LEVELS CORRESPONDING TO BAL-40 AND/OR BAL-FZ	
Derived from the Application of Method 1 BAL Determination Methodology (AS 3959:2018 Section 2, Table 2.5) ¹	
	
Photo ID: 1 – Residential Zone South of REW	Photo ID: 2 – Local Activity Centre & Residential Zones South of CCW
	
Photo ID: 3 – Residential Zone West of Neighbouring Allotment	

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 2021 v1.4), 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	At a local level, access options won't be limited to a single road in two directions to at least two suitable destinations once construction of the internal road network and surrounding road network connections to arterial roads have been completed. There is no access constraint for the subject site with regard to what is considered acceptable from a planning perspective, however, where development opportunities can increase local access options within the surrounding area, this would have merit that should be considered as benefiting a greater number of residents/occupants.
Proximity of settlements and emergency services	The subject site currently forms part of a large rural area. The closest Emergency services are located in Bullsbrook (17.7km and 18 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 (a combination forest, shrubland, scrub and grassland). The forest, shrub and scrub vegetation will produce significant embers and firebrands in a bushfire event primarily due to the type foliage and type of bark.
Topography and fire behaviour interactions.	The topography is undulating rather than rugged. Some areas of flat land, but slopes of zero (0) to five (5) degrees and five (5) to ten (10) do exist. 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 extreme fire behaviour, due to vegetation types and connectivity of vegetation in its current, unmanaged state. Large landscape scale fire events are possible.
Environmental Considerations	
Constraints to implementing required and/or additional bushfire protection measures	The environment considerations have identified existing Conservation Category Wetlands (CCW) and Resource Enhancement Wetlands (REW) within the development boundary. Consideration to the allotment design layout will be given as to ensure that vegetation in these areas can be retained and ensure there is no increase in bushfire risk. Any retained native vegetation and/or proposed gardens, requires implementation of a landscape management plan to ensure ongoing mitigation treatments lessen the on-site bushfire threat and minimise ignition sources from direct (deliberate) or indirect (accidental) origin.
Provision of Access Within the Subject Site	
Potential constraints	Staging of future development will consider constraints to ensure establishing the required access to meet bushfire planning requirements.
Potential Bushfire Impacts	
Flame and radiant heat and ability to establish an APZ	Future development will implement a minimum of a BAL-29 dimensioned APZ (around habitable buildings and required structures) to be established within the individual lots. 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 land. The appropriate protection measures of building construction and strict management of the APZ's 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	Land Use can be considered at the future development stage.
Additional assessments	N/A
Additional documents	Site specific Bushfire Management Plan for future subdivision proposals/development applications on the subject land that considers land use at that time.
Discretionary Decision Making and the Precautionary Principle (SPP 3.7 and Guidelines)	
Bushfire consultant consideration for further issues that need to be addressed?	Consideration for future staging of the land into various land uses through implementation of subsequent bushfire management plans to enable the creation of new lots at the localised level, to address bushfire risk.

5 ASSESSMENT AGAINST THE BUSHFIRE PROTECTION CRITERIA ESTABLISHED BY THE GUIDELINES

For a development 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 2021 v1.4*). 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 <i>Guidelines</i> apply to this Proposal?	N/A
---	-----

Specific Local Government technical requirements where required to be applied will be addressed at the subsequent subdivision stage/s where requested by the local government.

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		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)
	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		
1. Location	✓			N/A	
2. Siting and Design of Development	✓				
3. Vehicular Access	✓				
4. Water	✓				
<p>Note: The development proposal has been assessed:</p> <ol style="list-style-type: none"> Against the requirements established in Appendix 4 of the <i>Guidelines for Planning in Bushfire Prone Areas, WAPC 2021 v1.4 (Guidelines)</i>. The Guidelines are found at https://www.planning.wa.gov.au/8194.aspx; and Applying the interpretation guidance provided in <i>Position Statement: Planning in bushfire prone areas – Demonstrating Element 1: Location and Element 2: Siting and design (WAPC Nov 2019)</i>. 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. 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 4). 					

5.3 Assessment Detail

Element 1: Location	
<p>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.</p>	
<p>Compliance: How the proposed development achieves the intent of Element 1:</p>	<p>Will be able to achieve the intent of the element by fully meeting all applicable acceptable solutions.</p>
<p>ASSESSMENT (COMPLIANCE) STATEMENTS</p>	
<p>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 <i>Guidelines (WAPC 2021 v1.4)</i> and apply the interpretation guidance established by the <i>Position Statement: Planning in bushfire prone areas – Demonstrating Element 1: Location and Element 2: Siting and design (WAPC Nov 2019)</i>.</p>	
<p>Acceptable Solution: A1.1: Development Location</p>	
<p>ASSESSMENT AGAINST THE REQUIREMENTS ESTABLISHED BY THE GUIDELINES</p>	
<p>The future development of the subject land can provide an area of land within each individual lot (once known) that can be considered suitable for development as BAL-40 or BAL-FZ construction standards will not be required to be applied. Subject to further Environmental Studies, this can meet the requirements established by Acceptable Solution A1.1 and its associated explanatory note.</p>	
<p>ASSESSMENT AGAINST THE REQUIREMENTS ESTABLISHED BY THE POSITION STATEMENT</p>	
<p>The position statement establishes that:</p> <ul style="list-style-type: none"> • 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.” <p>The position statement also recognises:</p> <ul style="list-style-type: none"> • 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. 	
<p>The Hazard Within the Subject Land</p> <p>The proposal is determining the suitability of, and to facilitate future development (re-zoning and subsequent subdivision) of the subject land into a combination of land uses including Residential Areas, Activity Centres, Schools and Public Open Space Areas. The development site currently lies within a bushfire prone area as defined by the OBRM map of Bushfire Prone Areas. It exists within an existing rural area (suburb of Bullsbrook). The removal or modification of classifiable vegetation will be required (subject to further environmental studies (where applicable) and approval by the Local Government) within the subject land.</p>	

Element 1: Location

The existing area is currently vegetated with vegetation being classified as Class A – Forest, Class D – Scrub, Class C – Shrubland and Class G – Grassland. The topography is undulating rather than rugged, however has a predominantly 'flat land' appearance over large areas. The impact of slopes under the vegetation will be dependent on a bushfire's direction of travel. A bushfire travelling upslope will have increased intensity and rate of spread.

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

However, the ability to establish a BAL-29 dimensioned APZ within the lot's boundaries for future development removes the threat of greater levels of radiant heat or flame contact upon a future structure.

The primary bushfire threat from bushfire prone vegetation remaining within the subject land will be radiant heat and 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 Land

Bushfire prone vegetation within the area exists as retained native vegetation classified as Class A – Forest, Class C – Shrubland, Class D – Scrub and Class G – Grassland. The undeveloped land within the locality supports this vegetation. Non-vegetated areas (existing Sand Quarry and constructed road network) do exist.

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).

Bushfire prone vegetation adjoining the existing subject land exists as native vegetation. The extent of this hazard is shown in Figures 3.2 and 3.3. These areas of vegetation are occurring under two scenarios:

1. Native vegetation that has been retained both on the subject land due to environmental significance and the adjoining land; and
2. A bush forever site that adjoins the southern and western boundaries of the subject land which would present the most significant extent of bushfire prone vegetation once development has been completed.

Consequently, the potential exists for intense bushfire behaviour to occur on heightened days of bushfire risk where low humidity and high temperatures occur. The potential bushfire impact on persons and property within the site will be an increase the level of ember attack and potential for running fire on site in the event of a bushfire.

This ember threat and subsequent running fire will be mitigated by the application of appropriate building design, bushfire construction standards and the ongoing maintenance of the BAL-29 dimensioned APZ's, 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:

Will be able to achieve the intent of the element at a later planning stage by fully meeting all applicable acceptable solutions.

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 2021 v1.4)* 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/m² (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 subject land, at the subsequent development application stage, can be surrounded by an APZ that will ensure the potential radiant heat impact of a bushfire does not exceed 29 kW/m² (BAL-29). The required APZ specifications of width, location and management can be achieved through site planning and positioning of buildings.

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 all Future Lots	Building to Vegetation Area *1	Minimum 8 metres
	Building to Vegetation Area **1	Excluded AS3959:2018 2.2.3.2 (f)
	Building to Vegetation Area *2	Minimum 21 metres
	Building to Vegetation Area **2	Excluded AS3959:2018 2.2.3.2 (f)
	Building to Vegetation Area *3	Minimum 9 metres

Element 2: Siting and Design of Development

Building to Vegetation Area **3	Excluded AS3959:2018 2.2.3.2 (f)
Building to Vegetation Area ***3	Minimum 21 metres
Building to Vegetation Area 4	Minimum 13 metres
Building to Vegetation Area **4	Excluded AS3959:2018 2.2.3.2 (f)
Building to Vegetation Area ***4	Minimum 21 metres
Building to Vegetation Area *5	Minimum 21 metres
Building to Vegetation Area **5	Excluded AS3959:2018 2.2.3.2 (f)
Building to Vegetation Area ***5	Minimum 21 metres
Building to Vegetation Area 6	Minimum 8 metres
Building to Vegetation Area **6	Excluded AS3959:2018 2.2.3.2 (f)
Building to Vegetation Area 8	Minimum 17 metres
Building to Vegetation Area **8	Excluded AS3959:2018 2.2.3.2 (f)
Building to Vegetation Area *9	Minimum 10 metres
Building to Vegetation Area **9	Excluded AS3959:2018 2.2.3.2 (f)
Building to Vegetation Area 10	Minimum 9 metres
Building to Vegetation Area **10	Excluded AS3959:2018 2.2.3.2 (f)
Building to Vegetation Area *11	Minimum 13 metres
Building to Vegetation Area **11	Excluded AS3959:2018 2.2.3.2 (f)
Building to Vegetation Area 12	Minimum 27 metres
Building to Vegetation Area **11	Excluded AS3959:2018 2.2.3.2 (f)

- * Indicates unmanaged vegetation that is also located outside of the subject land. Vegetation that is onsite is within the control of the subject site's landowner/s and therefore can potentially be removed or maintained to mitigate the bushfire risk, subject to any approval being required by a local government. With the exception of Maralla Road to the south of the subject site (it is assumed that this will be constructed to meet the Bushfire Technical requirements established by the Guidelines to enable access to the Residential and POS areas at the southern portion of the site), vegetation that is located offsite however, cannot be removed or modified for BAL reduction purposes as it is not within the control of the subject site landowner.
- ** Indicates vegetation subject to changes post development of this site, with the area/s being reclassified to 'Excluded' AS3959-2018 (f)'. This is the result of the implementation of Asset Protection Zones around any proposed structures and landscaping within the subject land. These areas are 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 City of Swan Fire Hazard Reduction Notice.
- *** Indicates vegetation subject to changes post development of this site, with the area/s being reclassified to as a result of potential revegetation works or natural re-seeding within the CCW and REW buffers with sections being reclassified to Class A – Forest.

APZ Location: Asset protection zones can be contained solely within the boundaries of the lots (where applicable). Onsite vegetation will be required to be modified/removed, the authority for which will need to be received from the local government.

Element 2: Siting and Design of Development

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

Retained vegetation within the APZ's 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 City of Swan may have additional requirements established by their Fire Hazard Reduction Notice (Firebreak 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 the lot surrounding relevant future buildings, may be different to those 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; or
- The APZ dimensions established by the local government's Firebreak Notice.

The dimensions of the APZ that are to be established are not known at this time, they will be stated within the future bushfire management plans at the subdivision stages.

For the future development on the site, any future buildings potential for determined BAL(s) lower than BAL-29 being achieved, will require greater sized APZ's. The APZ's are to be determined at the future subdivision stage.

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:

Will be able to achieve the intent of the element at a later planning stage by fully meeting all applicable acceptable solutions.

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 2021 v1.4)*.

Acceptable Solution: A3.1: Public Roads

The existing sealed bitumen road network available to the proposed subdivision can provide a suitable trafficable transport route. The construction technical requirements established by the Guidelines and/or the local government for all proposed public roads both internal and external to the subject site (subject to relevant approvals) can and will be complied with. These requirements are set out in Appendix 2.

Acceptable Solution: A3.2a: Multiple Access Routes

It is recognised that the Subject Site currently has only one access route - One way in and one way out - Halden Road to the east is currently a No-Through Road. As such, compliance with this Acceptable Solution as defined in this Element is not achieved at this time – While it is acknowledged that compliance with this Acceptable Solution would be reliant on connections to future development to the north, this is a Strategic Assessment that addresses the bushfire risk and gives consideration for future potential development.

Refer to Figure 1.1a - To demonstrate that compliance with this Acceptable Solution can be achieved, it is assumed for the purposes of assessment that future development to the north has received relevant endorsement and subsequent approvals, enabling the provision of access in two different directions to at least two different destinations for the Subject Site. The relevant Decision Maker to be satisfied that the Acceptable Solution for this element can be achieved on this basis.

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: A3.2b: Emergency Access Way

There are no Emergency Access Ways identified as part of this proposal. This clause is therefore not applicable at this time. Where future subdivision proposes development in stages however, each stage is to comply with the relevant bushfire protection criteria which may include the provision of an Emergency Access Way (or similar) to facilitate this staging.

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: A3.3: Through Roads

Halden Road to the east is currently a No-Through Road. To ensure compliance with this Acceptable Solution, 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: A3.4a: Perimeter Roads

This proposal appears to comprise of greenfield or infill development that will consist of 10 or more lots (including those that are part of a staged subdivision) and therefore should have a perimeter road.

It is recognised that the Subject Site currently has only one access route (one way in and one way out) and would not be compliant with the Acceptable Solutions within this Element at this time – While it is acknowledged that

Element 3: Vehicular Access

compliance with this Acceptable Solution would be reliant on the construction of Maralla Road to the south of the Subject Site, this is a Strategic assessment that addresses the bushfire risk and gives consideration for future potential development.

Refer to Figure 1.2 – To demonstrate that compliance with this Acceptable Solution can be achieved, it is assumed for the purposes of assessment that Maralla Road to the south of the Subject Site can be constructed, providing not only connections to the proposed internal road network, but the creation of a perimeter road that surrounds the entirety of the Subject Site. The relevant Decision Maker to be satisfied that the Acceptable Solution for this element can be achieved. It should be noted however that where future subdivision proposes development in stages, each stage is to comply with the relevant bushfire protection criteria.

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: A3.4b: Fire Service Access Route

N/A

Acceptable Solution: A3.5: Battle-axe Access Legs

N/A

Acceptable Solution: A3.6: Private Driveways

The proposed lots will have frontage to the internal subdivision road networks. In addition, there will be limited building setbacks due to their size/area. Increased driveway standards will not be required for this proposal.

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:

Will be able to achieve the intent of the element at a later planning stage by fully meeting all applicable acceptable solutions.

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 2021 v1.4)*.

Acceptable Solution: A4.1: Identification of Future Water Supply

It can be demonstrated that reticulated or sufficient non-reticulated water for firefighting can be provided at the relevant Subdivision and/or Development Application stage in accordance with the specifications of the relevant water supply authority or the requirements of Schedule 2 of the Guidelines for Planning in Bushfire Prone Areas.

It is assumed for the purposes of assessment that the Subject Site will have a reticulated water supply available. Where it will be available, Hydrants are to be installed at the following, required intervals:

Commercial – 100 metres,

Residential – 200 metres,

Rural Residential – 400 metres.

Refer to information contained in Appendix 3 of this Bushfire Management Plan for the firefighting water supply specifications and technical requirements.

Acceptable Solution: A4.2: Provision of Water for Firefighting Purposes

Not applicable as this proposal is currently in the Strategic Planning Stages. It will need to be demonstrated at the relevant Subdivision and/or Development Application Stage that a reticulated water supply sufficient for firefighting can be provided.

Refer to information contained in Appendix 3 of this Bushfire Management Plan for the firefighting water supply specifications and technical requirements.

5.4 Additional Bushfire Protection Measures

SUMMARY OF ADDITIONAL BUSHFIRE PROTECTION MEASURES (TREATMENTS) TO BE APPLIED		
Treatment Category	Brief Description	Intent the Treatment Has Been Developed to Help Achieve
Siting and Design	Locating future Land Use Zones, allotments and their associated buildings on the subject site where an APZ can achieve a minimum 29kW/m ² .	Avoid areas of BAL-40 or BAL-FZ to lessen the bushfire impact on the buildings and occupants.
Vehicular Access	Construction of internal public road networks (if applicable) within the subject site to achieve the requirements of Table 6 in the <i>Guidelines for Planning in Bushfire Prone Areas</i> .	Vehicular Access – To provide a safe operational environment for emergency services and while occupants are accessing or egressing the site.
Provision of Water	Dedicated water supply for fire-fighting operations and appropriate access for fire appliances.	To provide an adequate supply of water for fire-fighting operations should resources be available, and conditions are tenable to do so during a bushfire event, by the property manager and emergency services.

6 RESPONSIBILITIES FOR IMPLEMENTATION AND MANAGEMENT OF THE BUSHFIRE PROTECTION MEASURES

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

Developer (Landowner) - Prior to Issue of Clearances		
No.	Implementation Actions	Development Clearance
<p>Note: Planning approval may be conditioned with the requirements:</p> <ol style="list-style-type: none"> 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 To provide certification of the implementation of certain bushfire protection measures established by this bushfire management plan. 		
1	<p>Condition (as per Code F1 of Model Subdivision Schedule, WAPC April 2020):</p> <p>Information is to be provided to demonstrate that the measures contained in Section 6; Tables 6.1 and 6.2 of this Bushfire Management Plan (version and date referenced in the condition), have been implemented during development works. This information should include a completed 'Certification by Bushfire Consultant' from the bushfire management plan. (Local Government)</p>	<input type="checkbox"/>
2	<p>Condition (as per Code F2 of Model Subdivision Schedule, WAPC April 2020):</p> <p>A notification, pursuant to Section 165 of the <i>Planning and Development Act 2005</i>, is to be placed on the certificate(s) of title of the proposed lot(s) with a Bushfire Attack Level (BAL) rating of 12.5 or above, advising of the existence of a hazard or other factor.</p> <p>Notice of this notification is to be included on the diagram or plan of survey (deposited plan). The notification is to state as follows:</p> <p><i>"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."</i> (Western Australian Planning Commission).</p>	<input type="checkbox"/>
3	Construct the public roads to the standards stated in the BMP.	<input type="checkbox"/>
4	Where Required - Construct the emergency access ways, fire service access routes and associated signs and gates to the standards stated in the BMP.	<input type="checkbox"/>
5	Where Required - Install the reticulated water supply (hydrants) to the standards stated in the BMP.	<input type="checkbox"/>
6	Where Required - Install the required strategic 50,000 litre water tank/s to the standards stated in the relevant acceptable solution and applying the guidance provided in Appendix 3 or to the specific requirements of the local government.	<input type="checkbox"/>

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 (where applicable), each individual lot is to be compliant with the City of Swan Fire Hazard Reduction 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	There is an outstanding obligation, created by this Bushfire Management Plan, for a site-specific Bushfire Management Plan at the future subdivision or development stage/s for the land use, at the subsequent subdivision/development application stage.

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 buildings to the largest dimension as determined by either: <ul style="list-style-type: none"> The dimensions corresponding to the determined BAL of a building; 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 (refer to the following responsibility).
2	Comply with the City of Swan Fire Hazard Reduction 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	Ensure all future buildings the landowner has responsibility for, are designed and constructed in full compliance with: <ol style="list-style-type: none"> the requirements of the WA Building Act 2011 and the bushfire provisions of the Building Code of Australia (BCA); and 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 Fire Hazard Reduction Notice (Firebreak Notice).

APPENDIX 1: TECHNICAL REQUIREMENTS FOR ONSITE VEGETATION MANAGEMENT

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

(Source: Guidelines for Planning in Bushfire Prone Areas - WAPC 2021 v1.4 Appendix 4, Element 2, Schedule 1 and Explanatory Note E2)

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.]

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

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

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

The width of an APZ varies with slope and vegetation type, however it should only be as wide as needed to ensure the potential radiant heat impact of a bushfire does not exceed 29kW/m² (BAL-29), or 10kW/m² where a building is identified for use as an on-site shelter. An APZ is generally not required where a building or development site achieves 29kW/m² (BAL-29) or lower in its pre-development state (prior to any vegetation clearing or modification).

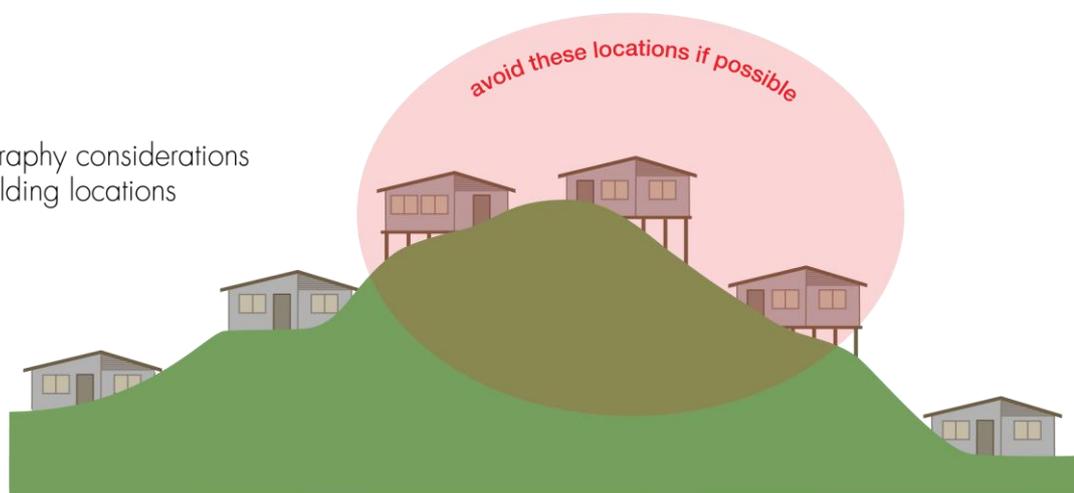
An APZ should include an area of defensible space immediately adjoining a building, that is kept free from combustible items and obstructions, within which firefighting operations can be undertaken to defend the structure. Where a lot contains a building envelope, it may not be necessary for the entire building envelope to achieve 29kW/m² (BAL-29) as this may result in significant unnecessary clearing. It is recommended that the BMP identifies that a sufficient APZ can be accommodated within the building envelope, with the development site and associated APZ to be determined at the development approval stage.

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

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

It is recommended that development be located on flat areas or slopes less than 20 degrees (especially where classified vegetation is located downslope to a building) and away from ridge tops, crests or narrow gullies, as bushfire can spread rapidly in these areas. Circumstances where these locations may be suitable for development to occur include where the land is already cleared, and 29kW/m² (BAL-29) or lower can be achieved for the whole development site without the use of an APZ. To ensure soil stability within an APZ, vegetation removal on slopes exceeding 18 degrees is discouraged.

Figure 17: Topography considerations for building locations



(Source: Guidelines for Planning in Bushfire Prone Areas 2021, Appendix 4)

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

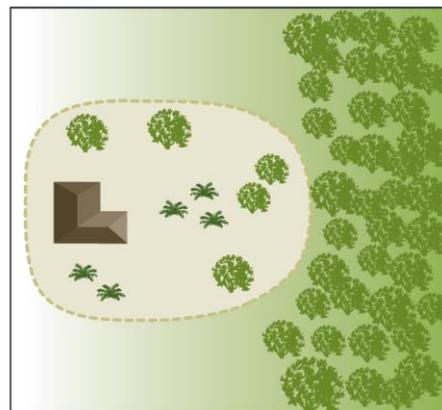
A simple method to estimate fuel load is to roughly equate one tonne of fuel load per hectare as 100 grams per square metre. For example, two tonnes per hectare of leaf litter is roughly 200 grams of leaf litter per square metre and eight tonnes per hectare is roughly 800 grams. Eucalyptus leaf litter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

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

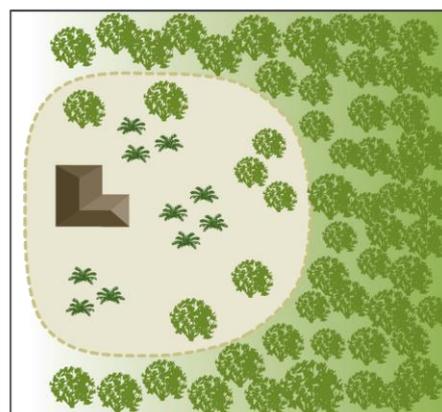
A copy of the firebreak notice and Schedule 1 should be included in a BMP specifically as a how-to guide for the landowner, and to demonstrate to decision-makers that the measures outlined in the BMP to achieve the appropriate BAL rating through provision and ongoing management of an APZ, can be implemented.

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

Hazard on one side



Hazard on three sides



Legend

-  APZ
-  trees
-  shrubs

(Source: Guidelines for Planning in Bushfire Prone Areas 2021, Appendix 4)

E2 Landscaping and design of an asset protection zone

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

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

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

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

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

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

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

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

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

by: – ensuring gutters are free from vegetation;

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

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

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

E2 Plant flammability

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

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

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

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

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

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

Refer to the WAPC Bushfire and Vegetation Fact Sheet for further information on clearing and vegetation management and APZ landscaping, design and plant selection reference material.

Schedule 1: Standards for APZ

Fences: Should be constructed from non-combustible materials (for example, iron, brick, limestone, metal post and wire, or bushfire-resisting timber referenced in Appendix F of AS 3959).

Fine Fuel Load (Combustible, dead vegetation matter <6 millimetres in thickness):

- Should be managed and removed on a regular basis to maintain a low threat state.
- Should be maintained at <2 tonnes per hectare (on average).
- Mulches should be non-combustible such as stone, gravel or crushed mineral earth or wood mulch >6 millimetres in thickness.



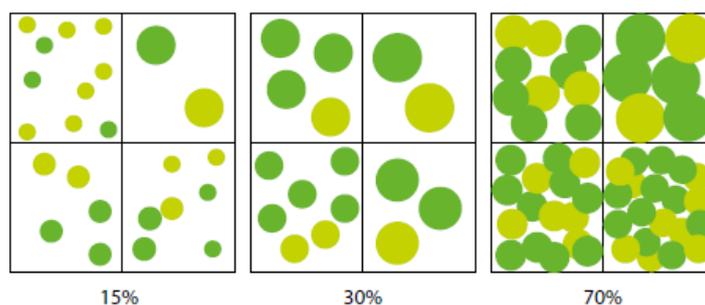
Example: Fine fuel load of 2 t/ha

(Image source: Shire of Augusta Margaret River's Firebreak and Fuel Reduction Hazard Notice)

Trees* (> 6 metres in height):

- Trunks at maturity should be a minimum distance of six metres from all elevations of the building.
- Branches at maturity should not touch or overhang a building or powerline.
- Lower branches and loose bark should be removed to a height of two metres above the ground and/or surface vegetation.
- Canopy cover within the APZ should be <15 per cent of the total APZ area.
- Tree canopies at maturity should be at least five metres apart to avoid forming a continuous canopy. Stands of existing mature trees with interlocking canopies may be treated as an individual canopy provided that the total canopy cover within the APZ will not exceed 15 per cent and are not connected to the tree canopy outside the APZ.

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



(Source: Guidelines for Planning in Bushfire Prone Areas 2021, Appendix 4)

Shrub* and Scrub* (0.5 metres to 6 metres in height Shrub and Scrub >6 metres in height are to be treated as trees):

- Should not be located under trees or within three metres of buildings.
- Should not be planted in clumps >5 square metres in area.
- Clumps should be separated from each other and any exposed window or door by at least 10 metres.

Ground covers* (<0.5 metres in height. Ground covers greater than >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.
- Can be located within two metres of a structure, but three metres from windows or doors if >100 millimetres in height.

Grass:

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

Defendable Space: 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.

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

** Plant flammability, landscaping design and maintenance should be considered – refer to explanatory notes*

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 2021 v1.4, Appendix 4)

VEHICULAR ACCESS TECHNICAL REQUIREMENTS

Acceptable Solution 3.1: Public Roads

The minimum requirements under this acceptable solution are applicable to all proposed and existing public roads. Public roads are to meet the minimum technical requirements in Table 6, Column 1. The trafficable (carriageway/pavement) width is to be in accordance with the relevant class of road in the Local Government Guidelines for Subdivisional Development (IPWEA Subdivision Guidelines), Liveable Neighbourhoods, Austroad standards and/or any applicable standards for the local government area.

Acceptable Solution 3.2a: Multiple Access Routes

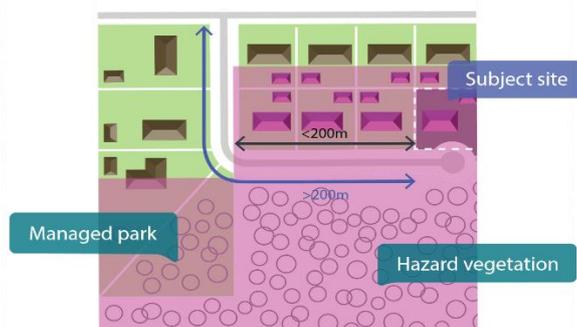
Public road access is to be provided in two different directions to at least two different suitable destinations with an all-weather surface (two-way access).

If the public road access to the subject site is via a no-through road which cannot be avoided due to demonstrated site constraints, the road access is to be a maximum of 200 metres from the subject lot(s) boundary to an intersection where two-way access is provided.

The no-through road may exceed 200 metres if it is demonstrated that an alternative access, including an emergency access way, cannot be provided due to site constraints and the following requirements are met:

the no-through road travels towards a suitable destination; and

- the balance of the no-through road, that is greater than 200 metres from the subject site, is wholly within BAL-LOW, or is within a residential built-out area.



Acceptable Solution 3.2b: Emergency Access Way

Where it is demonstrated that A3.2a cannot be achieved due to site constraints, or where an alternative design option does not exist, an emergency access way can be considered as an acceptable solution.

An emergency access way is to meet all the following requirements:

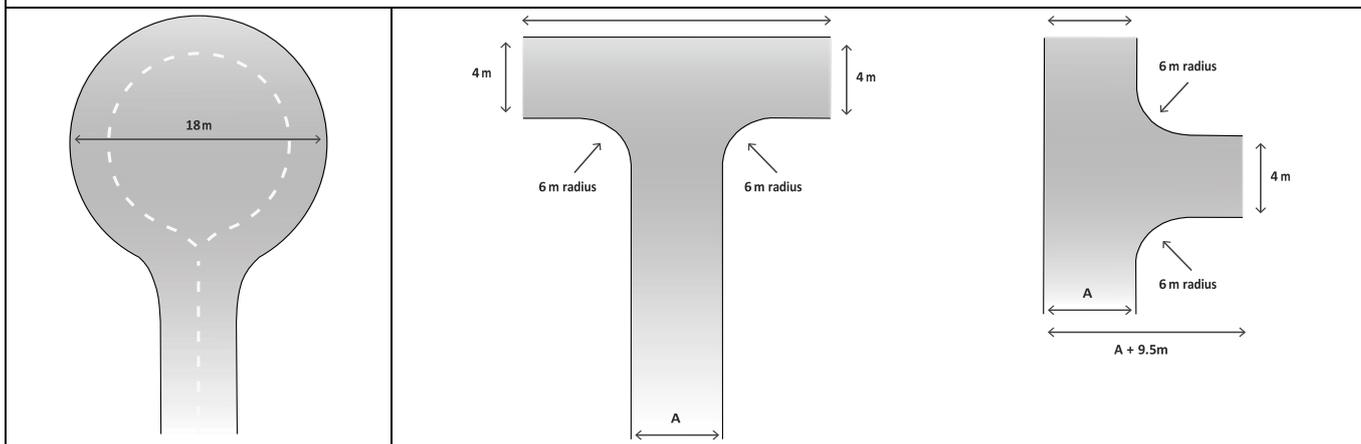
- requirements in Table 6, Column 2;
- provides a through connection to a public road;
- be no more than 500 metres in length; and
- must be signposted and if gated, gates must open the whole trafficable width and remain unlocked.

VEHICULAR ACCESS TECHNICAL REQUIREMENTS

Acceptable Solution 3.3: Through Roads

All public roads should be through-roads. No-through roads should be avoided and should only be considered as an acceptable solution where:

- it is demonstrated that no alternative road layout exists due to site constraints; and
- the no-through road is a maximum length of 200 metres to an intersection providing two-way access, unless it satisfies the exemption provisions in A3.2a of this table. A no-through road is to meet all the following requirements:
- requirements of a public road (Table 6, Column 1); and
- turn-around area as shown in Figure 24



Acceptable Solution 3.4a: Perimeter Roads

A perimeter road is a public road and should be provided for greenfield or infill development where 10 or more lots are being proposed (including as part of a staged subdivision) with the aim of:

- separating areas of classified vegetation under AS3959, which adjoin the subject site, from the proposed lot(s); and
- removing the need for battle-axe lots that back onto areas of classified vegetation.

A perimeter road is to meet the requirements contained in Table 6, Column 1. A perimeter road may not be required where:

- the adjoining classified vegetation is Class G Grassland;
- lots are zoned for rural living or equivalent;
- it is demonstrated that it cannot be provided due to site constraints; or
- all lots have frontage to an existing public road

Acceptable Solution 3.4b: Fire Service Access Route

Where proposed lots adjoin classified vegetation under AS3959, and a perimeter road is not required in accordance with A3.4a, a fire service access route can be considered as an acceptable solution to provide firefighter access, where access is not available, to the classified vegetation.

A fire service access route is to meet all the following requirements:

- requirements in Table 6, Column 3;
- be through-routes with no dead-ends;
- linked to the internal road system at regular intervals, every 500 metres; – must be signposted;
- no further than 500 metres from a public road;
- if gated, gates must open the required horizontal clearance and can be locked by the local government and/or emergency services, if keys are provided for each gate; and
- turn-around areas designed to accommodate type 3.4 fire appliances and to enable them to turn around safely every 500 metres.

VEHICULAR ACCESS TECHNICAL REQUIREMENTS

Acceptable Solution 3.5: Battle-axe Access Legs

Where it is demonstrated that a battle-axe cannot be avoided due to site constraints, it can be considered as an acceptable solution.

There are no battle-axe technical requirements where the point the battle-axe access leg joins the effective area of the lot, is less than 50 metres from a public road in a reticulated area.

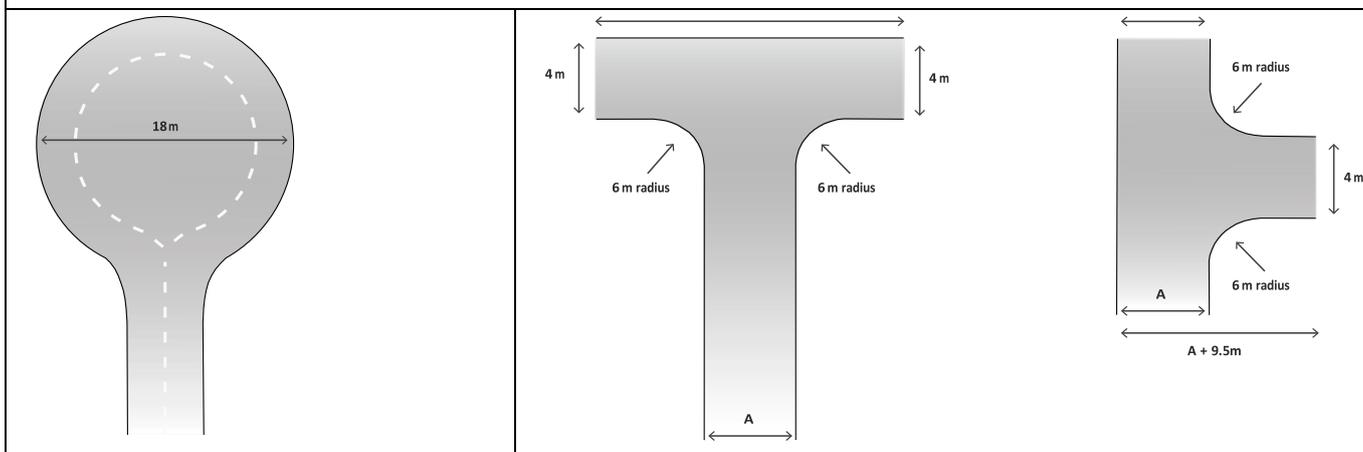
In circumstances where the above condition is not met, or the battle-axe is in a non-reticulated water area, the battle-axe is to meet all the following requirements:

- requirements in Table 6, Column 4; and
- passing bays every 200 metres with a minimum length of 20 metres and a minimum additional trafficable width of two metres (i.e. the combined trafficable width of the passing bay and constructed private driveway to be a minimum six metres).

Acceptable Solution 3.6: Private Driveways

There are no private driveway technical requirements where the private driveway is:

- within a lot serviced by reticulated water;
- no greater than 70 metres in length between the most distant external part of the development site and the public road measured as a hose lay; and
- accessed by a public road where the road speed limit is not greater than 70 km/h. In circumstances where all of the above conditions are not met, or the private driveway is in a non-reticulated water area, the private driveway is to meet all the following require:
- requirements in Table 6, Column 4;
- passing bays every 200 metres with a minimum length of 20 metres and a minimum additional trafficable width of two metres (i.e. the combined trafficable width of the passing bay and constructed private driveway to be a minimum six metres); and
- turn-around area as shown in Figure 28 and within 30 metres of the habitable building.



VEHICULAR ACCESS TECHNICAL REQUIREMENTS

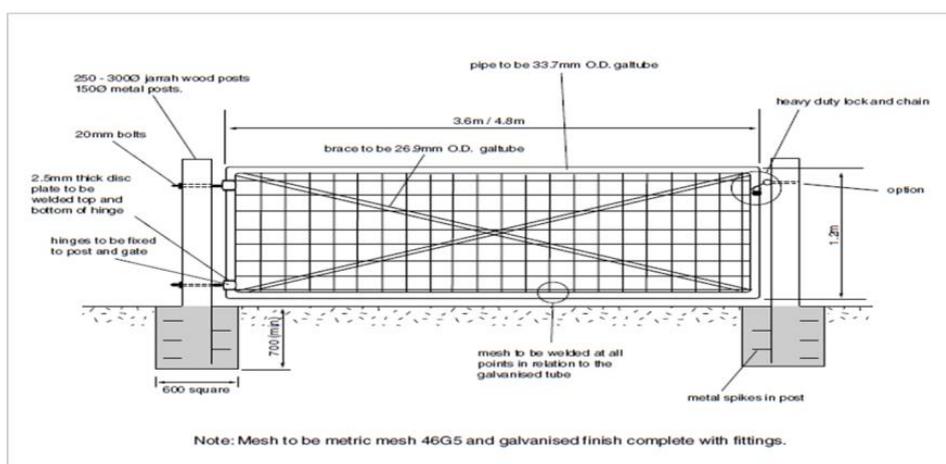
Technical Component	Vehicular Access Types			
	Public Roads	Emergency Access Way ¹	Fire Service Access Routes ¹	Battle-axe and Private Driveways ²
Minimum trafficable surface (m)	In accordance with A3.1	6	6	4
Minimum Horizontal clearance (m)	N/A	6	6	6
Minimum Vertical clearance (m)	4.5			
Minimum weight capacity (t)	15			
Maximum Grade Unsealed Road ³	As outlined in the IPWEA Subdivision Guidelines	1:10 (10%)		
Maximum Grade Sealed Road ³		1:7 (14.3%)		
Maximum Average Grade Sealed Road		1:10 (10%)		
Minimum Inner Radius of Road Curves (m)		8.5		
Note ¹ : To have crossfalls between 3 and 6%.				
Note 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.				
Note ³ : Dips must have no more than a 1 in 8 (12.5% -7.1 degree) entry and exit angle				

VEHICULAR ACCESS TECHNICAL REQUIREMENTS – GATES AND SIGNS EXAMPLES

Gates

Design and construction to be approved by local government.

- Minimum width 3.6m
- Emergency access way gates must not be locked.
- Fire service access route gates may be locked but only with a common key that is available to local fire service personnel.
- Bollards will be to the local government specifications



Signs

Design and construction to be approved by the local government.

- Minimum height above ground of 0.9m.
- Lettering height to be 100mm.
- To display the words (as appropriate) "Emergency Access Only" or "Fire Service Access – No Public Access".
- Size 600mm x 400mm.
- Sign colour red, base (white) area is reflective background.
- Rounded corners, radius 20mm.
- White key-line 3mm wide, 3mm from outside edge.
- Suggested mounting hole 6mm diameter.



APPENDIX 3: TECHNICAL REQUIREMENTS FOR FIREFIGHTING WATER

A1.5 Requirements Established by the Guidelines – Water Supply Dedicated for Bushfire Firefighting Purposes

(Source: *Guidelines for Planning in Bushfire Prone Areas - WAPC 2021 v1.4 Appendix 4, Element 2, Schedule 1 and Explanatory Note E4*)

E4 Use of Water Supply

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

E4 Independent Water and Power Supply

Bushfires can directly impact a water service provider's equipment or pipes. As such, a reticulated water supply may not be reliable due to a reduction in water pressure or loss of supply. Where development is in a bushfire prone area (even if there is access to reticulated water), it is recommended that the landowner consider providing an additional water supply for use by emergency services.

Where a landowner intends on staying to defend their property during a bushfire event, as identified in their [Bushfire Survival Plan](#), it is recommended that pumping equipment separate to the electricity network be provided. The pumping equipment could be a diesel or petrol-powered pump, or an electric pump if there is an onsite generator or backup power supply independent from electricity network grid.

It is recommended that combustion pumps should be a minimum 5hp or 3kW diesel or petrol powered pump and should be shielded against bushfire attack. Where an electric pump is used, a backup power supply independent from electricity network grid should be provided. A 3.7kw/12kw-h sized battery (14.8kw-h reserved solely for bushfire will power a 3.7kw system for 4 hours) with blackout protection or a generator should be provided.

E4 Strategic Water Supplies

Many local governments have a well-developed network of strategic water tanks for firefighting within their local government area. Given this, it is at the discretion of the local government to determine if the water supply within a locality, is sufficient to cater for an increasing population when a subdivision is proposed. Local governments are encouraged to work with their local emergency services to ensure the water needs for firefighting is understood.

Where a structure plan or subdivision proposes to create more than three but less than 24 lots, it is optional as to whether each lot is provided with a 10,000 litre tank or a strategic water tank is provided for the entire development. If 25 or more lots are proposed, then it is recommended that a 50,000 litre strategic water tank (for every 25 lots) is provided. For every lot additional to the 25, it is at the discretion of the local government whether they require an additional strategic water tank or for each lot to be provided with a 10,000 litre tank. For example, 37 proposed lots require two strategic water tanks, or a 10,000 litre tank on each lot, or a combination of both with a strategic water tank and 12 proposed lots with a 10,000 litre tank on each lot. Where the local government, following consultation with the local emergency services, is of the opinion that a strategic water tank is unnecessary, a 10,000 litre standalone tank per lot can be provided.

A strategic water tank should be located no more than 10 minutes from the subject site (20-minute turnaround time). The turnaround time is the time it takes from a lot to the water supply and return back to the lot, at legal road speeds. Where a strategic water tank has been provided at the subdivision stage and a development application is located within the 20-minute turnaround time of that (or another) strategic water source, then the decision-maker could remove the requirement for the provision of an additional water supply at the development application stage. Local government will need to consider whether the strategic water tank has the capacity to serve the lot identified in the development application i.e. what lots were identified at subdivision stage to be serviced by the strategic water tank. A landowner should enquire with their local government to determine whether a water supply on their lot will be required.

When there is fragmented ownership of a structure plan area, or when staging of a subdivision is to occur and the local government has determined that a strategic water tank is required, then the first stage should include arrangements for the installation of a water tank and the identification of land to be ceded to the local government authority (if applicable).

Where local planning scheme provisions provide for developer contributions for public infrastructure and the local government is supportive, then a cash-in lieu arrangement may be established for the provision of a strategic water tank.

Grouped dwellings may provide dedicated firefighting water supply in one standalone tank per lot or may provide one shared standalone tank with the accumulative amount of water needed, for the number of lots it will serve. For example, a development proposing three lots may either have three tanks of 10,000L (one per lot) or one tank with 30,000L (shared between three lots).

E4 Alternative Water Sources

A dam, river or other source may be considered a firefighting water source if it complies with DFES guidelines and it can be demonstrated that the water level will be maintained above the top of the highest fire brigade suction point in perpetuity, if it is expected that the water supply will be used by emergency services. Approval for the use of these types of water supplies are on a case-by-case basis and at the discretion of the decision maker, in consultation with emergency services and local government.

E4 Location of Water Tanks

A water tank should be located with consideration to surrounding vegetation and should avoid locations where the tank will be situated underneath existing vegetation or where vegetation will grow against or overhang the tank, as shown in Figure 30 below. Where a tank is located on the bushfire hazard side of a building, sufficient shielding for the protection of firefighters should be provided. In addition to the tank location, the fitting should be positioned and/or shielded from the bushfire hazard to allow access by emergency services. It is recommended that the fitting face away from the bushfire hazard and be within four metres of a hardstand area.

A good and bad example of landscaping around a water tank



(Source: Guidelines for Planning in Bushfire Prone Areas 2021, Appendix 4)

Schedule 2: Water Supply Dedicated for Bushfire Firefighting Purposes

2.1: Water supply requirements

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

Table 7: Water supply dedicated for bushfire firefighting purposes

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

2.2: Technical requirements

2.2.1 Construction and design

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

Below ground tanks should have a 200mm diameter access hole to allow tankers or emergency service vehicles to refill direct from the tank, with the outlet location clearly marked at the surface. The tank may need to comply with AS/NZS3500.1:2018. An inspection opening may double as the access hole provided that the inspection opening meets the requirements of AS/NZS 3500.1:2018. If the tank is required under the BCA as part of fire hydrant installation, then the tank will also need to comply with AS 2419.

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

2.2.2 Pipes and fittings

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

2.2.2.1 Fittings for above-ground water tanks:

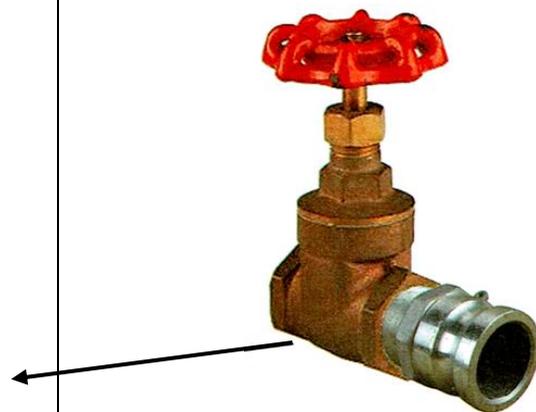
- Commercial land uses: 125mm Storz fitting; or
- Strategic water tanks: 50mm or 100mm (where applicable and adapters are available) male camlock coupling with full flow valve; or
- Standalone water tanks: 50mm male camlock coupling with full flow valve; or
- Combined water tanks: 50mm male camlock coupling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

2.2.2.2 Remote outlets

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

TECHNICAL REQUIREMENTS FOR STATIC WATER SUPPLY
(EXAMPLES ONLY – CHECK WITH LOCAL GOVERNMENT FOR VARIATIONS)

Example construction / coupling requirements from various sources including FESA (DFES) Operational Circular 07/2011 and Planning for Bushfire Protection Guidelines WAPC 2010]



Reticulated Areas

[Source: Guidelines for Planning in Bushfire Prone Areas WAPC 2021 v1.4, Appendix 4, Element 4]

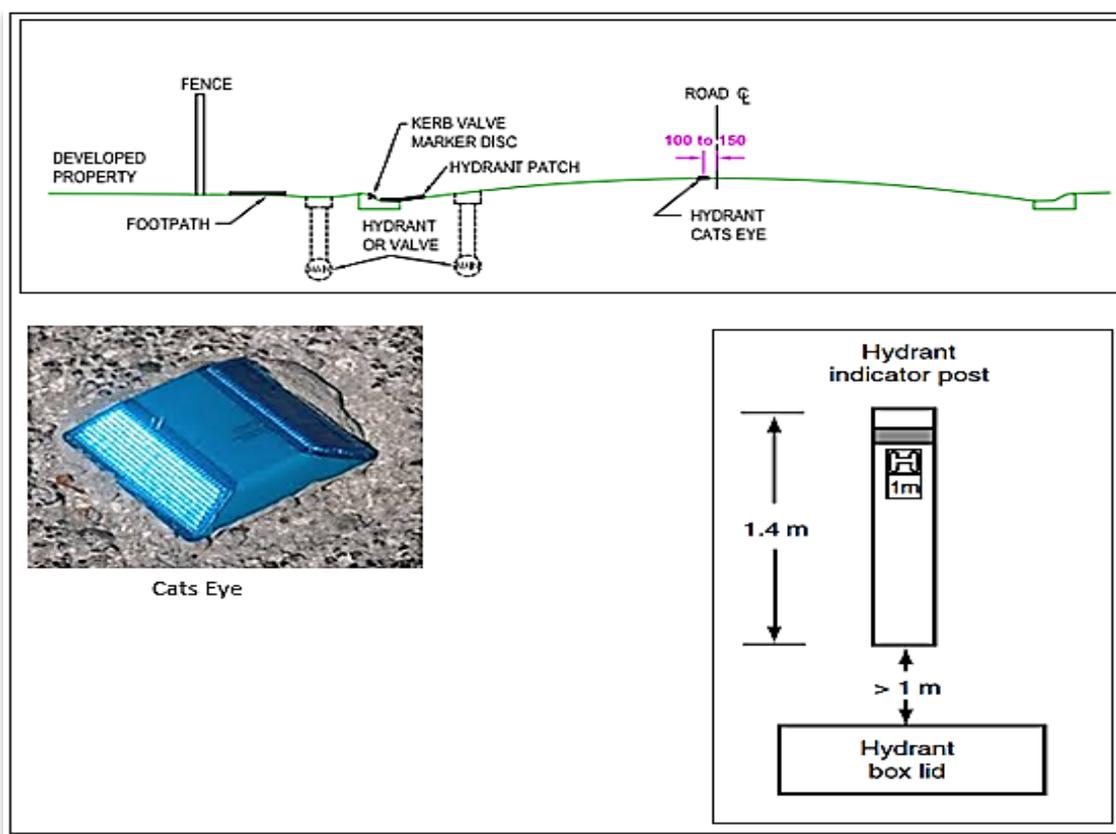
Where a reticulated water supply is existing or proposed, hydrant connection(s) should be provided in accordance with the specifications of the relevant water supply authority.

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 m² (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



APPENDIX 4: ALTERNATIVE PATHWAYS FOR COMPLYING WITH SPP 3.7

Bushfire Prone Planning, for applicable proposals, is sometimes required to apply argument for the application of compliance pathways that differ from those established by the Guidelines for Planning in Bushfire Prone Areas (WAPC v1.3) - these being meeting the acceptable solutions and developing performance principle-based solutions (alternative solutions).

These additional pathways include the application of merit based assessment and comparative bushfire performance. The validity of this approach is derived from relevant Tribunal hearings and Court cases. A key recent decision highlights many relevant factors and is detailed below.

The Tribunal decision in Bunnings Group Limited and Presiding Member of the Metro North West JDAP [2019] WASAT 121 references many of these and made its decisions. These include the following paraphrased relevant decisions. Decision makers will need to refer to the actual proceedings.

- [153] In considering the requirements of State Planning Policy 1: State Planning Framework (SPP1) in the application of SPP3.7, there is no basis on which provisions lower in the hierarchy (the Guidelines) should necessarily prevail over provisions higher in the hierarchy (SPP3.7).
- [141] The intent and objectives of policy (SPP3.7) can be infringed by the inflexible application of the provisions of the Guidelines.
- [99] The existence of the principle that policy should not be inflexibly applied means that it is open to the Tribunal to consider the proposed development through the applications of a merits review.
- [145] Application of the precautionary principle requires caution in departing from policy but doesn't preclude approval and provides for assessment on merit and the use of discretion.
- [122] One should be slow to depart from policies unless satisfied that good reason exists.
- [123] It cannot be accepted that, simply because a proposal contemplates a solution that is not contemplated by the Guidelines, the Tribunal cannot approve that proposal. To accept that proposition would amount to inflexibly applying policy.
- [230] The Tribunal finds a sound basis for departing from SPP 3.7 cl. 6.6.2 and Elements 1 and 2 of the Guidelines while being able to accord with the intent and relevant objectives SPP 3.7.
- [231] Finds against the inflexible application of SPP 3.7 and associated Guidelines.

Key to considerations is the Intent of SPP 3.7 which is:

*"... to implement **effective risk-based** land use planning and development to preserve life and reduce the impact of bushfire on property and infrastructure".*

Applying this risk based approach requires an appreciation that the overarching requirement is for:

1. Identification, analysis and evaluation of the risks from the threats of bushfire;
2. Comparison of these to the residual level of risk that will exist after any proposed bushfire protection measures are implemented (i.e. risk treatments); with
3. The intent being to arrive at a tolerable level of risk for the particular land use.

APPENDIX 5: LOCAL GOVERNMENT FIRE HAZARD REDUCTION NOTICE

This page has been intentionally left blank

Bush Fires Act 1954

Fire Hazard Reduction Notice (Firebreak Notice)

Notice to Owners and/or Occupiers of land situated within the City of Swan.

To assist in the control of bushfires, and pursuant to Section 33 of the Bush Fires Act 1954, all owners and occupiers of land within the City of Swan are required on or before November 1, 2024, or within 14 days of becoming an owner or occupier of land after that date, to meet the fire hazard reduction conditions described in this notice and maintain these conditions up to and including April 30, 2025.

1. All land equal to or less than 5,000 sqm (0.5 ha or 1.2 acres)

- a. Install and maintain an asset protection zone in accordance with the requirements specified in clause 8
- b. Maintain all grass to a height of no greater than 10cm
- c. Maintain areas of natural vegetation to at or below eight tonnes per hectare.

2. All land greater than 5,000 sqm (0.5 ha or 1.2 acres)

- a. Install and maintain an asset protection zone in accordance with the requirements specified in clause 8
- b. Install firebreaks as close as practicable inside of, but no more than 10m from, the property's external boundaries firebreaks need to be 3m wide with 4m vertical height clearance free from flammable materials and overhanging branches (see clause 7 for further details):
 - i. A boundary firebreak is not required where the land is 90 per cent or more covered by buildings, other non-vegetated areas, and/or irrigated orchards/vineyards. All grass must be maintained to 10cm or less
 - ii. Properties over 100 ha require additional firebreaks to divide the land into areas not exceeding 100 ha.
- c. Maintain all grass:
 - i. On land between 5,000 sqm and 25,000 sqm (0.5-2.5 ha) or (1.2-6.2 acres) all grass must be reduced to a height no greater than 10cm
 - ii. On land greater than 25,000 sqm (2.5 ha or 6.2 acres) all grass immediately adjacent to any firebreak must be reduced to a height of no greater than 10cm for a minimum width of 3m
 - iii. If the land is stocked, compliance with conditions 2(a) and 2(b) can postponed until December 1.
- d. Maintain areas of natural vegetation within 100m of relevant buildings to at or below eight tonnes per hectare fuel load, by passive methods of fuel reduction.

3. Bushfire management plans

- a. Where a property is affected by an approved bushfire management plan, property owners must still comply with all requirements in this notice and with any additional requirements outlined within that plan.

4. Fuel storage areas/haystacks/stockpiled flammable material

- a. Remove all flammable material within 10m of the storage area
- b. Install a firebreak (to the specifications outlined in clause 7) immediately adjacent to any haystacks or stockpiled flammable material.

5. Fire service access routes (strategic firebreaks) and emergency access ways

Where under a written agreement with the City, or where depicted on an approved bushfire management plan, fire service access routes (FSARs) or emergency access ways (EAWs) are required on the land, you are required to:

- a. Clear and maintain the FSAR/EAW to 6m wide free from flammable material with a 4m vertical height clearance above the full 6m width
- b. The FSAR/EAW must remain unimpeded by obstructions at all times, including boundary fences and gates unless approved in writing by the City
 - i. Approved gates on FSARs may be secured with a City of Swan fire service padlock. Private padlocks may be added if approved in writing by the City
 - ii. Approved gates on EAWs must always remain unlocked
- c. FSARs must provide a continuous 4-wheel drive trafficable surface for the full 6m width
- d. EAWs must provide a continuous 2-wheel drive trafficable surface for the full 6m width.

6. Driveways

Where a dwelling is situated more than 70m from a public road

- a. Driveways must be maintained clear of all obstacles and flammable materials to create a minimum 3m wide trafficable surface suitable for all types of 2-wheel drive vehicles
- b. Overhanging branches must be pruned to provide 4m vertical clearance above the driveway.

7. Firebreak specification

- a. Firebreaks are to be installed and maintained clear of all obstacles and flammable materials (e.g. maintained to mineral earth, gravel, limestone, bitumen, or green lawn to a height no greater than 25mm) to create a minimum 3m wide trafficable surface suitable for 4-wheel drive vehicles
- b. Overhanging branches must be pruned to provide 4m vertical clearance above the full width of the firebreak
- c. Firebreaks must not terminate in a dead-end
- d. Firebreaks may be constructed by ploughing, grading, raking, burning, chemical spraying or any other method that achieves the required standard.

8. Asset protection zone specification

Asset protection zones must be installed around relevant buildings (see section 12) and must meet the following requirements:

- a. Extend 20m out from the external walls of the relevant building. Note: Asset protection zone requirements only apply within the boundaries of the lot on which the relevant building is located
- b. The average fuel loads must be reduced and maintained at two tonnes per hectare or lower
- c. All grass is maintained to under 10cm
- d. Tree canopy coverage is no greater than 15 per cent. The crowns of trees must have clear separation distance between one another
- e. A small group of trees within proximity to one another may be treated as one crown provided the combined crowns do not exceed the area of a large or mature crown size for that species
- f. Trees must be low-pruned (or under-pruned) to at least a height of 2m from the ground
- g. No tree or shrub over 2m high is planted within 3m of a building

- h. There are no tree crowns or branches hanging over buildings
- i. Scrub is reduced to a sparse density (able to walk through vegetation with relative ease and minimal deviation)
- j. Install paths or clear flammable or dry vegetation, debris, and materials immediately adjacent to the building
- k. Wood piles and flammable materials are stored a safe distance from buildings.

9. Application to vary firebreak and hazard reduction requirements

- a. If it is considered impractical for any reason to clear firebreaks in a manner or location required by this notice, or to carry out any fire hazard reduction work or measures required by this notice, you may apply in writing on or before November 1 for approval to provide firebreaks in alternative positions or to take alternative measures to abate fire hazards on the land
- b. If permission is not granted in writing by the City prior to December 1, you shall comply with the requirements of this notice
- c. When permission for alternative firebreaks or fire hazard reduction measures has been granted, you shall comply with all conditions on the approved plan and maintain the land to the required standard throughout the period specified by this notice.

10. Environmental and heritage considerations

It is the responsibility of the landowner to ensure appropriate environmental and heritage due diligence relating to any works required by this notice is undertaken. Please refer to the Department of Water and Environmental Regulation (DWER), the Department of Planning, Lands and Heritage, and/or the Department of Fire and Emergency Services (DFES) websites for further information.

11. Compliance

- a. In addition to the requirements of this notice, further works which are considered necessary by an authorised officer of the City may be required as specified in writing in a subsequent notice addressed to the landowner
- b. Where the owner or occupier of the land fails or neglects to comply with the requirements of this notice or a subsequent notice addressed to the landowner, the City of Swan may enter onto the land with workers, contractors, vehicles, and machinery to carry out the requisitions of the notice at the expense of the landowner
- c. Failure to comply with this notice and subsequent written notices may result in a penalty not exceeding \$5,000, or the issue of a \$250 infringement notice and liability for any costs incurred by the City in relation to works undertaken on behalf of the landowner.

12. Definitions

'Alternative firebreak' is a firebreak that is in an alternative position or alignment to the requirement specified in paragraphs 2 and 3 of this notice.

'Asset protection zone (APZ)' is a low fuel area that is reduced of flammable vegetation and materials surrounding relevant buildings to minimise the likelihood and impact that direct flame contact, radiant heat or ember attack may have on buildings and assets in the event of a bushfire.

'Bushfire management plan' or **'fire management plan'** is a plan that may be placed on the certificate of title(s) of land that has been developed as a condition of development or subdivision.

'Emergency access way' is a two-wheel drive trafficable, 6m wide access route to provide local residents, general public and emergency services alternative links to road networks at the end of cul-de-sacs or areas where access is limited during an emergency incident.

'Firebreak' is an area of land cleared of flammable material to minimise the spread of a bushfire and to provide access for firefighting vehicles.

'Fire service access route (strategic firebreaks)' is a firebreak that is 6m wide established to provide strategic access and links to road networks whilst providing a wider control/ containment line for emergency services use only.

'Flammable material' is anything that is easily able to catch on fire including, but not limited to, grasses, leaves, branches, scrub and trees.

'Irrigated' means an area that is watered and maintained, with all vegetation in an alive, green, and non-flammable state.

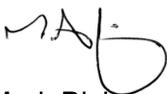
'Natural vegetation' means natural areas of forest, woodland, shrubland, scrub, mallee, or mulga.

'Passive fuel reduction' means lowering the amount of available fuel that will burn under prevailing conditions by means that will not permanently reduce or modify the structure or life cycle of plant, shrub, scrub, or tree communities within a treated area.

'Relevant building' is classified under the building code as one of the following:

- i. Single dwelling such as a detached house, duplex, villa or townhouse (class 1a)
- ii. Small boarding house, guest house or hostel (class 1b)
- iii. Dwellings such as apartments and flats in a building containing two or more units (class 2)
- iv. Accommodation for unrelated people such as a hotel, motel, residential part of a school, accommodation for the aged, children or people with disabilities (class 3)
- v. Building of a public nature such as a health care building (9a), an assembly building such as a school (9b) or an aged care building (9c)
- vi. Private bushfire shelters associated with a single dwelling (class 10c) or
- vii. Non-habitable buildings including sheds, carports, and private garages (class 10a) when within 6m of a class 1a, 1b, 2, 3 or 9 building.

By order of the Council,



Mark Bishop

Acting Chief Executive Officer