

# **WORKING ON FIRE** **PLANNING**



## **BUSHFIRE MANAGEMENT PLAN** **Avonlee Stages 10-15 Park Road, Brabham**

**CLIENT:** Warren Spencer  
**SITE LOCATION:** Stages 10-15, Avonlee, Park Rd Brabham  
**DATE:** 2/04/2020  
**SHIRE/CITY:** City of Swan  
**FIRE CONSULTANT:** Dr David Deeley  
**CLIENT CONTACT #** 0410 027 387  
**WOFP FILE #:** 20190513  
**VERSION #:** 2.1

 **WORKING ON FIRE**  
**PLANNING**  
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# Bushfire management plan/Statement addressing the Bushfire Protection Criteria coversheet

Site address: Avonlee Stages 10-15 Park Rd Brabham

Site visit: Yes ☒ No ☐

Date of site visit (if applicable): Day 23rd Month May Year 2019

Report author or reviewer: David Deeley (L2)

WA BPAD accreditation level (please circle):

Not accredited ☐ Level 1 BAL assessor ☐ Level 2 practitioner ☒ Level 3 practitioner ☐

If accredited please provide the following.

BPAD accreditation number: 37575 Accreditation expiry: Month September Year 2020

Bushfire management plan version number: V2.1

Bushfire management plan date: Day 2nd Month April Year 2020

Client/business name: Terranovis Pty Ltd

	Yes	No
Has the BAL been calculated by a method other than method 1 as outlined in AS3959 (tick no if AS3959 method 1 has been used to calculate the BAL)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Have any of the bushfire protection criteria elements been addressed through the use of a performance principle (tick no if only acceptable solutions have been used to address all of the bushfire protection criteria elements)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Is the proposal any of the following (see [SPP 3.7 for definitions](#))?

	Yes	No
Unavoidable development (in BAL-40 or BAL-FZ)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Strategic planning proposal (including rezoning applications)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
High risk land-use	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Vulnerable land-use	<input type="checkbox"/>	<input checked="" type="checkbox"/>

None of the above ☒

**Note:** Only if one (or more) of the above answers in the tables is yes should the decision maker (e.g. local government or the WAPC) refer the proposal to DFES for comment.

Why has it been given one of the above listed classifications (E.g. Considered vulnerable land-use as the development is for accommodation of the elderly, etc.)?

The information provided within this bushfire management plan to the best of my knowledge is true and correct:

Signature of report author or reviewer





Date 02/04/2020

## Document control

Client: Warren Spencer

Report version	Purpose	Author/reviewer and accreditation details	Date submitted
Final 1.0	BMP, review and sign-off	Dr David Deeley L2	28/08/2019
Draft V2.0	Incorporate Co Swan, DPLH requirements	Dr David Deeley L2	30/03/2020
Final V2.1	Incorporate review team edits	Dr David Deeley L2	02/04/2020

I hereby declare that I am a BPAD Accredited bushfire practitioner.		
Accreditation No.	37575	
Signature		
Date	02/04/2020	

## Disclaimer

The recommendations and measures contained in this assessment report are based on the requirements of the Australian Standards 3959 – Building in Bushfire prone Areas, WAPC / DFES Guidelines for Building in Bushfire Prone areas (State Planning Policy 3.7) and CSIRO's research into Bushfire behaviour. These are considered the minimum standards required to balance the protection of the proposed dwelling and occupants with the aesthetic and environmental conditions required by local, state and federal government authorities. They DO NOT guarantee that a building will not be destroyed or damaged by a bushfire. All surveys and forecasts, projections and recommendations made in this assessment report and associated with this proposed dwelling are made in good faith on the basis of the information available to the fire protection consultant at the time of assessment. The achievement of the level of implementation of fire precautions will depend amongst other things on actions of the landowner or occupiers of the land, over which the fire protection consultant has no control. Notwithstanding anything contained within, the fire consultant/s or local government authority will not, except as the law may require, be liable for any loss or other consequences (whether or not due to negligence of the fire consultant/s and the local government authority, their servants or agents) arising out of the services rendered by the fire consultant/s or local government authority.

## Section 1: Proposal details

The proposal is to subdivide a 13.3 ha area to produce 189 residential lots. The area has been subject the normal statutory processes of urban development (Table 1), including approved regional and local structure plans (Figure 1). The development will see extensive clearing and filling of low-lying areas. The development area is surrounded by proposed or existing urban development. Areas to the south and west of the proposed development, although part of district structure plans, have not been developed and retain some original native vegetation although much of this has been parkland cleared under previous grazing enterprises. The subject land (Figure 2) is being converted from low-intensity grazing pastures with small clumps or retained original vegetation to residential living. Two gas pipeline easements and other POS areas are to be based on recreated and irrigated landscapes using exotic and native shrub and understory species, designed to minimize any bushfire risks.

Table 1 WAPC references for subdivision approvals for Stages 10-15

WAPC Ref	Expiry Dates	Stage
150381	16/10/18	10
152434	16/11/19	10
989-15	16/11/19	10
47-17	28/6/21	11
152434	16/11/19	11
150381	16/10/18	12
152434	16/11/19	12
152434	16/11/19	13
988-15	16/11/19	13
150381	16/10/18	14
990-15	16/11/19	14
152434	16/11/19	15
989-15	16/11/19	15
990-15	16/11/19	15

The 'Acceptable Solutions' described in this BMP will ensure the development conforms to all relevant policies and standards for the safety of guests, as required by SPP 3.7 and the WAPC Guidelines<sup>1</sup>.

This BMP document and the recommendations contained within it are aligned to the following;

- Consistency with SPP 3.7 and the planning requirements for local government;
- Identification of bushfire risks using vegetation types and slopes as in AS3959:2018;
- Identification of assets at risk- life, property, infrastructure and the environment;
- Identification of bushfire risk mitigation measures as acceptable solutions within SPP 3.7;
- Allocation of responsibilities to persons / entities for the implementation of recommendations and management measures;
- Compliance with the City of Swan's "Fire Hazard Reduction Notice".

## Section 2: Bushfire Attack Level Assessment

A BAL contour plan has been developed for this site (See Section 4.2).

<sup>1</sup>WAPC (2017) Guidelines for Planning in Bushfire Prone Areas v1.3, Dec 2017.



## Bushfire Management Plan – Complex Development Application

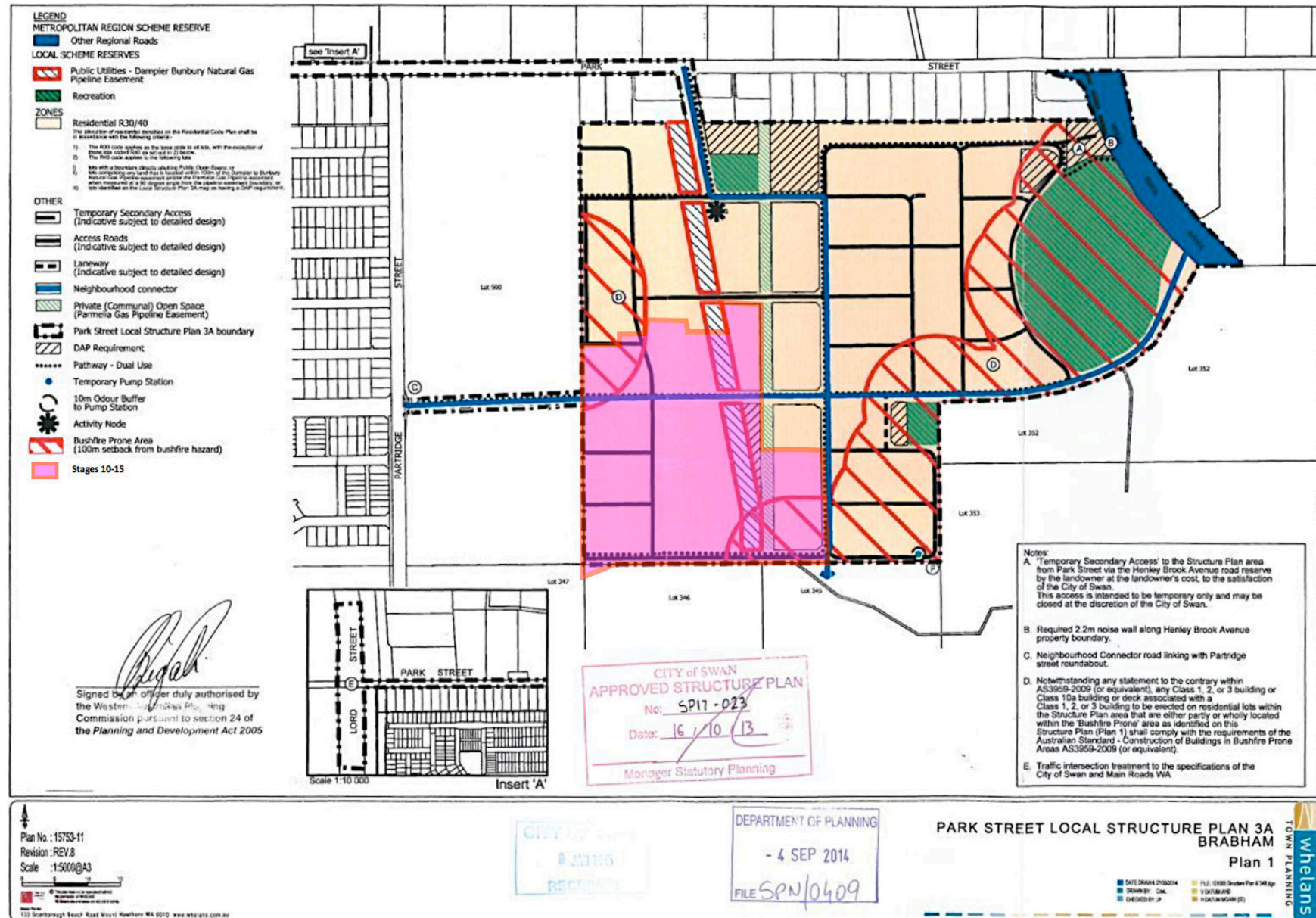


Figure 1 Local approved structure plan for Avonlee, showing Stages 10-15



## Location, Bushfire prone area, 150m survey, Stages 10–15 footprint, Lots, 2m contours

### Legend

Stages 10–15 boundary  
 Stage 10–15

Subdivision plan 10–15  
 Polyline

Stages 10–15

Stage 10  
 Stage 11  
 Stage 12  
 Stage 13  
 Stage 14  
 Stage 15

150m survey  
 150m contour

Bushfire Prone Areas (OBRM, July 2019)

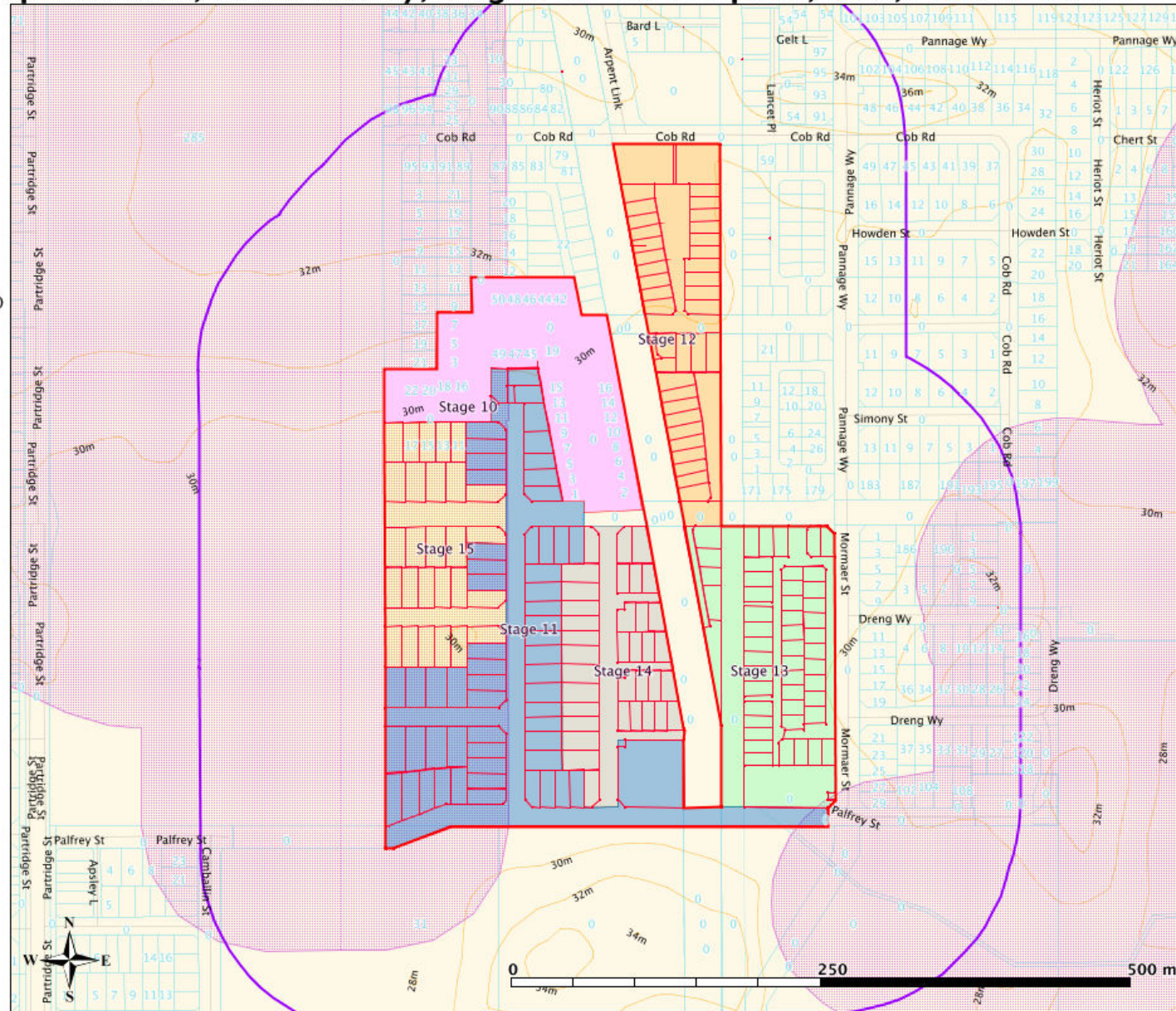
Cadastral Address

State Roads

Other Roads

DAFWA 2m Contours

Coast and Sea  
 water  
 land



Map Printed from WALGA Environmental Planning Tool on Wed Sep 04 11:12:54 AWST 2019

Figure 2 Location, Bushfire prone area, 150m survey, Development footprint, Lots, 2m contours.



## Air photo, Photo points

### Legend

Photo points 11-15



Stages 10-15 boundary



Subdivision plan 10-15



150m survey



150m contour



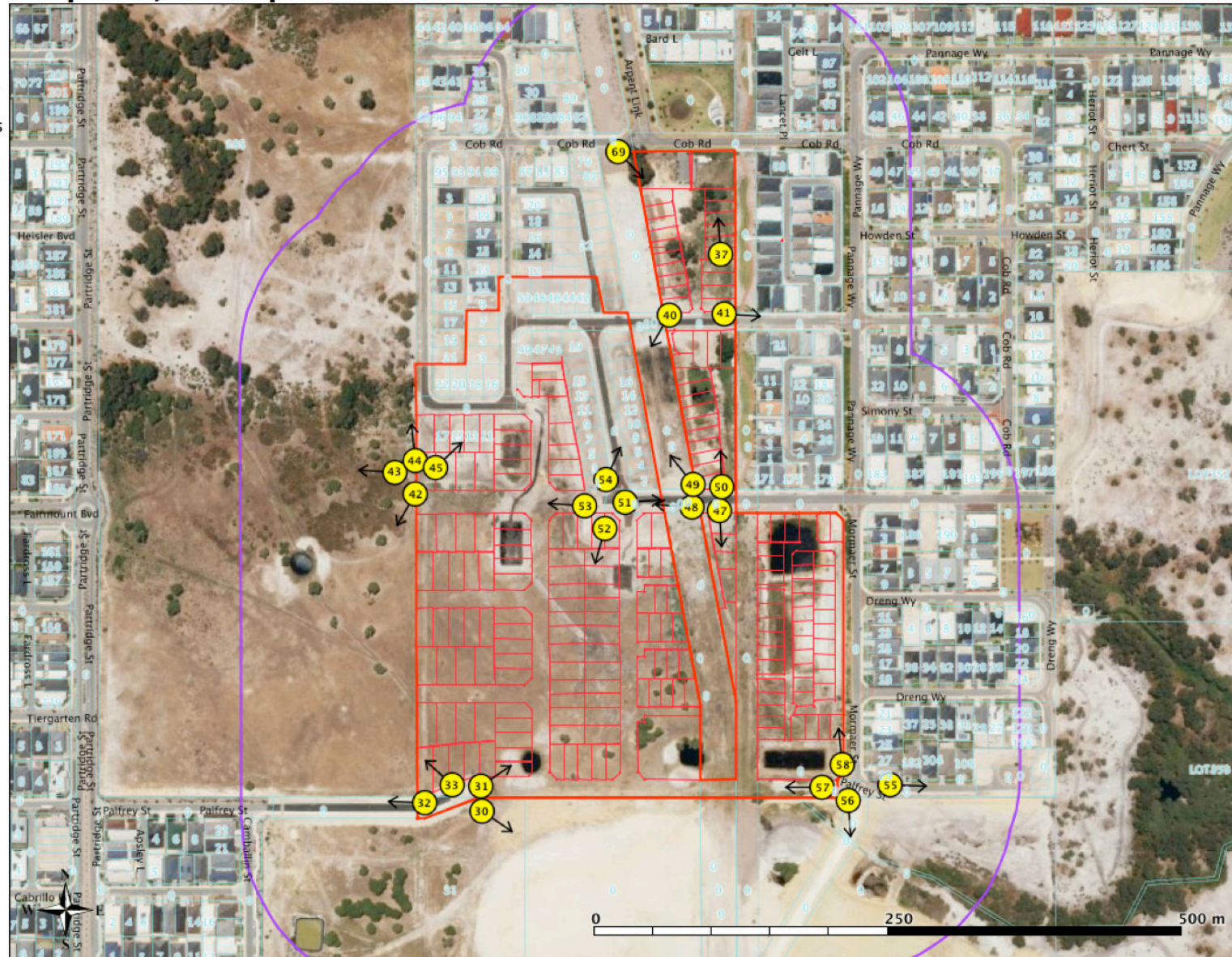
Cadastre Address



State Roads



Other Roads



Map Printed from WALGA Environmental Planning Tool on Tue Sep 03 12:48:18 AWST 2019

Figure 3 Air photo, Photo points



## Section 3: Environmental considerations

Some bushfire prone areas (Figure 2), also have high biodiversity values. State Planning Policy 3.7 (SPP3.7) policy objective 5.4 recognises the need to consider bushfire risk management measures alongside environmental, biodiversity and conservation values.

An environmental clearance search revealed that there are no specific environmental considerations for the development site. Previous approved local structure planning for the development area (Figure 1) also confirmed the lack of environmental considerations requiring specific management measures.

### Sub-section 3.1: Native vegetation – modification and clearing

There is no native vegetation modification / clearing required (Figure 3), other than establishing APZs within the development, described under Element A2.1. In discussions with the western neighbouring landowner (Lot 500) it is anticipated that future clearing of existing vegetation as part of bulk earthworks for urban subdivision will occur. In this instance, the current bushfire hazard from existing vegetation impacting the subject site will be removed. Accordingly, this Bushfire Management Plan incorporates an implementation measure which allows for the BAL to be reviewed for those lots currently impacted by vegetation on Lot 500.

### Sub-section 3.2: Revegetation/Landscape plans

Any future revegetation or landscape plans for this site will proceed in line with the requirements of Schedule 1 of the WAPC's guidelines (Page 17).

## Section 4: Bushfire assessment results

### Sub-section 4.1: Assessment inputs

All vegetation within 150 m of the Subject Site was classified (Figure 4), according to the requirements of AS3959:2018. A number of types of Classified vegetation were recorded including:

1. Areas within the development boundary under the control of the developer managed to the specifications of Schedule 1 (eg. Photos 31, 37, 47, 52).
2. Areas of Class G Grassland outside the development boundary and not under the control of the developer (eg. Photos 30, 42, 44, 56).
3. Small areas of areas of Class C Shrubland outside the development boundary (eg. Photo 42).
4. Small areas of Class D Scrub to the west and south of the development boundary (eg. Photo 42, 56).
5. Areas of Class B Woodland to the west of the property having minimal understorey (eg. Photo 44).
6. An area of Class A Forest to the west of the property boundary (eg. Photo 43).

## Vegetation classified existing

### Legend

Stages 10-15 boundary  
Stage 10-15

Subdivision plan 10-15  
Polyline

150m survey  
150m contour

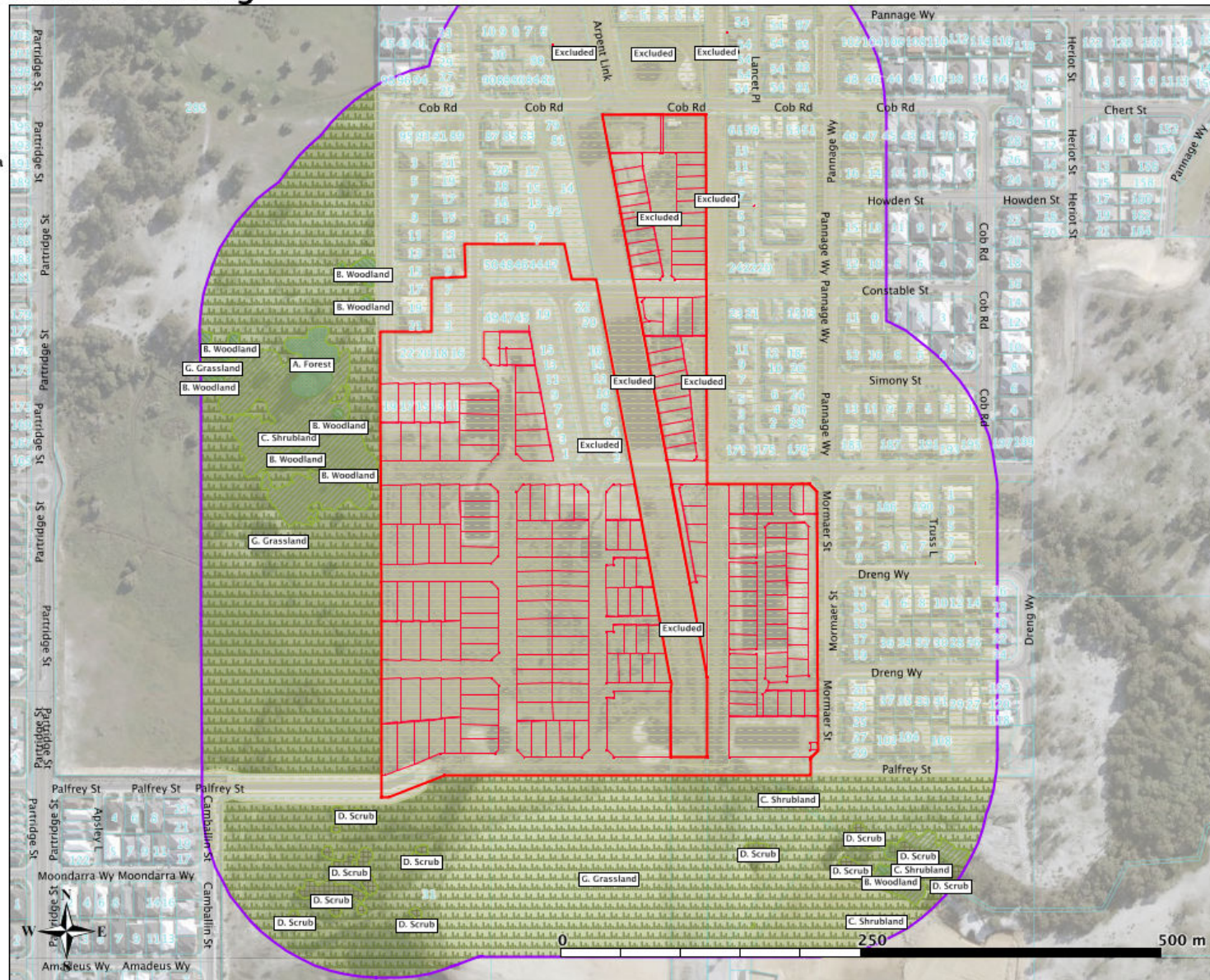
Vegetation 10-15 existing V2a

A. Forest, 0  
B. Woodland, 0  
C. Shrubland, 0  
D. Scrub, 0  
Excluded, a, 0  
Excluded, ef, 0  
Excluded, f, 0  
G. Grassland, 0

Cadastre Address

State Roads

Other Roads



Map Printed from WALGA LGmap on Mon Mar 30 14:26:47 AWST 2020

Figure 4 Vegetation classified existing (as per AS3959:2018)



## BAL contours post development

### Legend

Stages 10-15 boundary

Stage 10-15

Subdivision plan 10-15

Polyline

150m survey

150m contour

Vegetation 10-15 existing V2a

A. Forest, 0

B. Woodland, 0

C. Shrubland, 0

D. Scrub, 0

Excluded, a, 0

Excluded, ef, 0

Excluded, f, 0

G. Grassland, 0

BAL contours existing veg V2

BAL-12.5

BAL-19

BAL-29

BAL-40

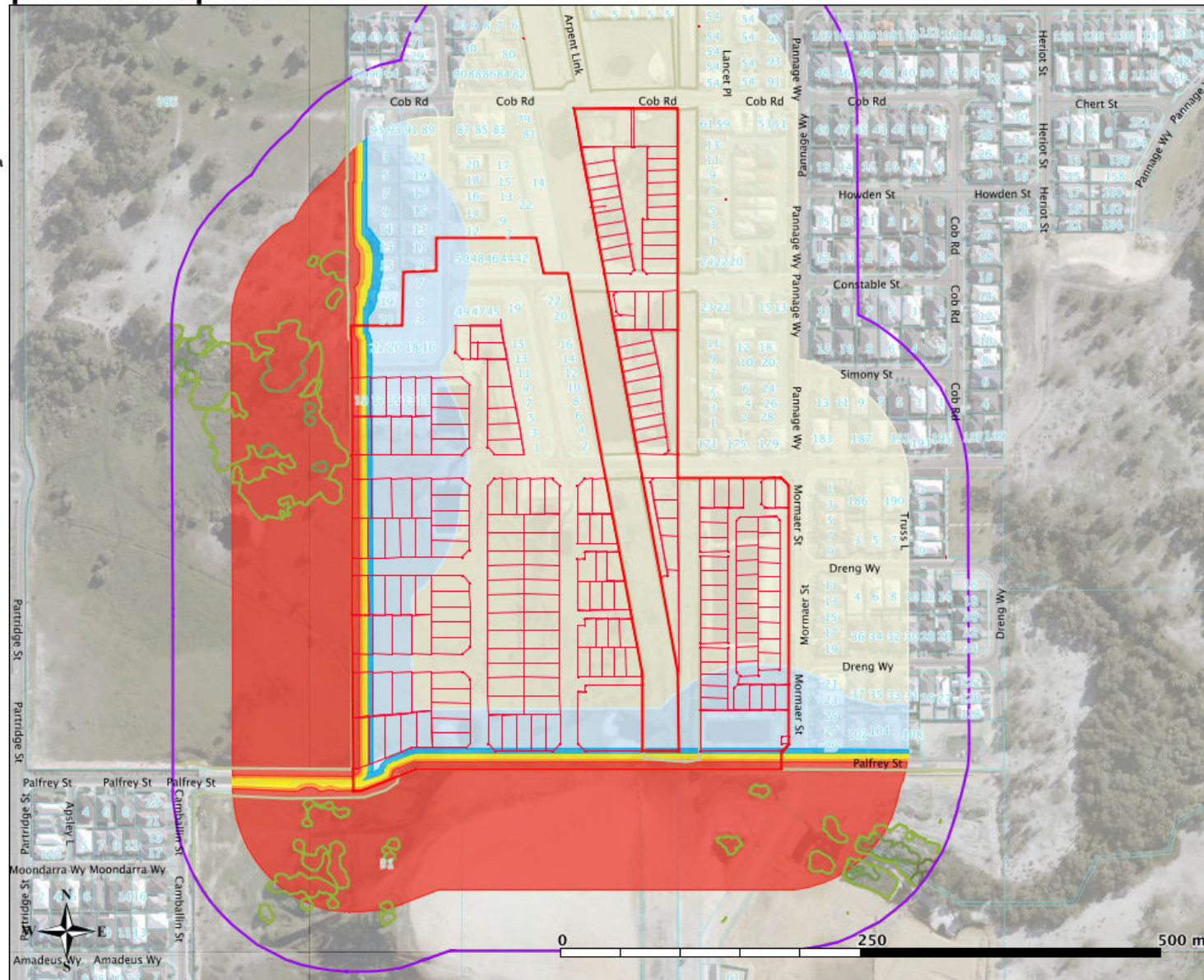
BAL-FZ

BAL-LOW

Cadastre Address

State Roads

Other Roads



Map Printed from WALGA LGmap on Thu Apr 02 15:17:02 AWST 2020

Figure 5 BAL contours post development



## BAL contours post development with Lot numbers

### Legend

Stages 10-15 boundary

Stage 10-15

Subdivision plan 10-15

Polyline

150m survey

150m contour

Vegetation 10-15 existing V2a

A. Forest, 0

B. Woodland, 0

C. Shrubland, 0

D. Scrub, 0

Excluded, a, 0

Excluded, ef, 0

Excluded, f, 0

G. Grassland, 0

BAL contours existing veg close up

BAL-12.5

BAL-19

BAL-29

BAL-40

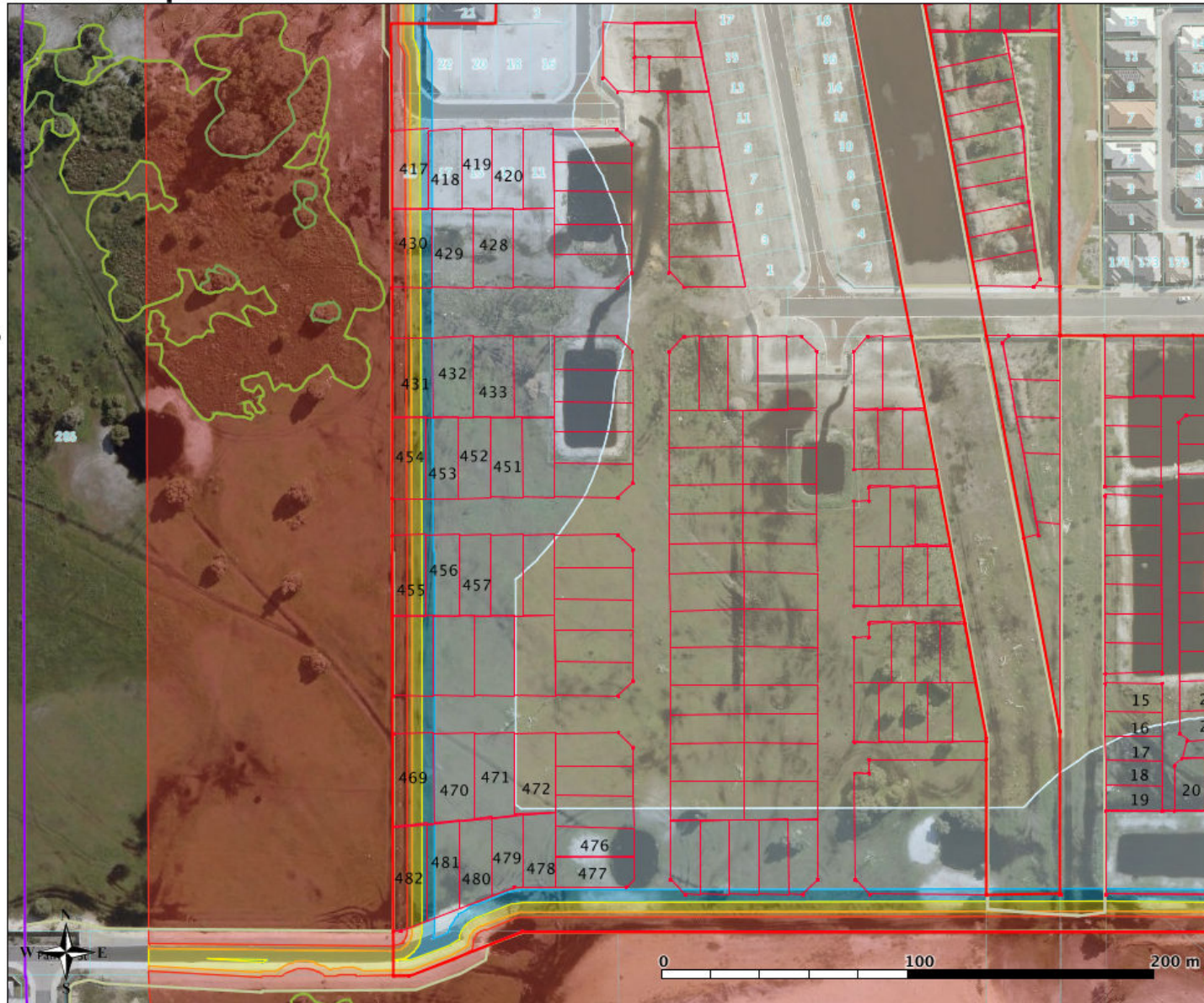
BAL-FZ

BAL-LOW

Cadastre Address

State Roads

Other Roads



Map Printed from WALGA LGmap on Thu Apr 02 15:24:23 AWST 2020

Figure 6 BAL contours post development with Lot numbers

## Sub-section 4.2: Assessment outputs

A BAL contour analysis is presented based on the vegetation after development (Figures 5 and 6), with the entire development footprint being managed as an APZ to the specifications of Schedule 1 (see page 17), and in line with the requirements of the City of Swan’s Bushfire Hazard Reduction Notice (Appendix 1).

There is no requirement for any APZ outside the property boundary. The long-standing 3m perimeter firebreak on the property’s western boundary normally enforced by the City of Swan through its annual firebreak notice was also removed from this assessment and the entire mineral earth area classified as Class G Grassland, under the directions of the City of Swan and DPLH. The row of Lots on the property’s western boundary (Table 2, Figure 6), all currently return a rating of BAL-FZ or Flame Zone because of the unmanaged Grassland on the property to the west.

All land to the south of the property boundary was directed to be classified as Class G Grassland by the City of Swan and DPLH. This classification made no material difference to the rating of any lots on the property’s southern boundary because of the Palfrey Street’s road reserve being under the control of the developer and is able to be managed to the specifications of Schedule 1.

Table 2 Lots having ratings >BAL-29

Lot No	Stage	Rating	Lot No	Stage	Rating
417	15	BAL-FZ	455	15	BAL-FZ
418	15	BAL-12.5	456	15	BAL-19
419	15	BAL-12.5	457	15	BAL-12.5
420	15	BAL-12.5	469	11	BAL-FZ
430	15	BAL-FZ	470	11	BAL-12.5
429	15	BAL-12.5	471	11	BAL-12.5
428	15	BAL-12.5	472	11	BAL-12.5
431	15	BAL-FZ	482	11	BAL-FZ
432	15	BAL-12.5	481	11	BAL-12.5
433	15	BAL-12.5	480	11	BAL-12.5
454	15	BAL-FZ	479	11	BAL-12.5
453	15	BAL-19	478	11	BAL-12.5
452	15	BAL-12.5	476	11	BAL-12.5
451	15	BAL-12.5	477	11	BAL-12.5

## Section 5: Identification of bushfire hazard issues

There are currently bushfire hazard issues associated with unmanaged grassland and other vegetation on adjoining Lot to the west. The risks posed by these areas have been addressed in this BMP.

NOTE: BAL ratings determined herein based on vegetation observed at the time of the field assessment will need to be updated over time to respond to any changes in vegetation fuel loads and any subsequent changes in bushfire risks.

Once Stages 10-15 of Avonlee have been completed, and the proposed developments to the west on Lot 500 and to the south on Lots 480, 481 and 9002 are also completed, there will be no bushfire hazard issues as the locality will have been converted entirely to urban form. The DFES bushfire prone mapping will need at that time, to be updated, and any bushfire conditions associated with this BMP (other than the normal overarching requirements of the City’s Hazard Reduction Notice), will be voided.

## Section 6: Assessment against the bushfire protection criteria

Bushfire protection criteria	Method of compliance	Proposed bushfire management strategies
	Acceptable solutions	
Element 1: Location	<p>A1.1 Development location</p> <p>The development is to take place in an area previously zoned for residential living.</p> <p>This meets the intent of Element A1.1.</p>	
Element 2: Siting and design	<p>A2.1 Asset Protection Zone</p> <p>The entire development footprint will be managed as an APZ.</p> <p>This meets the intent of Element A2.1.</p>	<p>All areas within the development will be managed in a Low-threat condition.</p> <p>Any future landscaping / plantings in POS will be consistent with Schedule 1.</p>
Element 3: Vehicular access	<p>A3.1 Two access routes.</p> <p>The proposed public road network provides for egress to two separation destinations. This meets the intent of Element A3.1</p>	
	<p>A3.2 Public road.</p> <p>All public roads will meet the specifications of Table 6, column 2. This meets the intent of A3.2.</p>	
	<p>A3.3 Cul-de-sac (including a dead-end-road)</p> <p>Temporary cul-de-sacs (dead-end roads) are unavoidable for this development until the adjoining subdivision at Lot 500 is realised.</p> <p>This meets the intent of A3.3.</p>	The unavoidable temporary cul-de-sacs are all <100 m, and will meet the specifications of Table 6, column 2.
	A3.4 Battle-axe <b>N/A</b>	There is no Battle-axe lots.
	A3.5 Private driveway longer than 50 metres. <b>N/A</b>	There are no private driveways >50 m.
	A3.6 Emergency access way <b>N/A</b>	Existing private road provides adequate emergency access.
	A3.7 Fire service access routes (perimeter roads) <b>N/A</b>	Existing private road provides adequate fire service access.
	<p>A3.8 Firebreak width. <b>N/A</b></p> <p>All residential Lots are proposed to be &lt;5,000 m<sup>2</sup>. Reserves &gt;5,000 m<sup>2</sup> are surrounded by dual-use paths or sealed roads. Firebreaks as such are therefore not required. This meets the intent of Element A3.8.</p>	The proposed urban form and its APZs, together with the public road network will provide the function of perimeter firebreaks.
Element 4: Water	<p>A4.1 Reticulated areas</p> <p>All Lots within the development will be provided with a reticulated water supply. Fire hydrants will also be provided as specified. This meets the intent of Element A4.1</p>	Reticulated water supplies and associated infrastructure will be provided as per the Water Corporation's Design Standard DS63
	A4.2 Non-reticulated areas <b>N/A</b>	
	A4.3 Individual lots within non-reticulated areas. <b>N/A</b>	



## Section 7: Photographs

GROUND PHOTO 69

DIRECTION: SE

Date & Time: Sun Aug 27 14:29:43 AWST 2017  
Position: 50 S 402879 6479595  
Altitude: 39m  
Datum: WGS-84  
Azimuth/Bearing: 135° S45E 2400mils (Error)  
Elevation Angle: +17.7°  
Horizon Angle: -06.6°  
Zoom: 1X  
Avantree 31



Gas pipeline easement

GROUND PHOTO 37

DIRECTION: N

Date & Time: Sun Aug 27 13:21:45 AWST 2017  
Position: 50 S 402968 6479497  
Altitude: 38m  
Datum: WGS-84  
Azimuth/Bearing: 356° N04W 6329mils (Error)  
Elevation Angle: -04.9°  
Horizon Angle: -00.4°  
Zoom: 1X  
Avantree 1



GROUND PHOTO 40

DIRECTION: SW

Date & Time: Sun Aug 27 13:24:55 AWST 2017  
Position: 50 S 402971 6479446  
Altitude: 43m  
Datum: WGS-84  
Azimuth/Bearing: 341° N19W 5062mils (Error)  
Elevation Angle: -01.6°  
Horizon Angle: -01.2°  
Zoom: 1X  
Avantree 3



GROUND PHOTO 41

DIRECTION: E

Date & Time: Sun Aug 27 13:25:14 AWST 2017  
Position: 50 S 402971 6479447  
Altitude: 41m  
Datum: WGS-84  
Azimuth/Bearing: 226° S46W 4018mils (Error)  
Elevation Angle: -04.6°  
Horizon Angle: -00.4°  
Zoom: 1X  
Avantree 4





## Bushfire Management Plan – Complex Development Application

GROUND PHOTO 42

DIRECTION: SW

Date & Time: Thu, 29 May 2019, 15:14:36 AWST  
Position: 80 S 482712 4479824  
Altitude: 31m  
Datum: WGS-84  
Azimuth/Bearing: 210° S00W 8768mils (True)  
Elevation Angle: +14.1°  
Horizon Angle: -06.5°  
Zoom: 1X  
SW



GROUND PHOTO 43

DIRECTION: W

Date & Time: Thu, 29 May 2019, 15:14:36 AWST  
Position: 80 S 482701 4479826  
Altitude: 31m  
Datum: WGS-84  
Azimuth/Bearing: 260° S00W 4628mils (True)  
Elevation Angle: +15.1°  
Horizon Angle: -06.3°  
Zoom: 1X  
NW



GROUND PHOTO 44

DIRECTION: N

Date & Time: Thu, 29 May 2019, 15:15:05 AWST  
Position: 80 S 482710 4479824  
Altitude: 31m  
Datum: WGS-84  
Azimuth/Bearing: 285° N72W 5120mils (True)  
Elevation Angle: +4.5°  
Horizon Angle: -09.7°  
Zoom: 1X  
N



GROUND PHOTO 45

DIRECTION: NE

Date & Time: Thu, 29 May 2019, 15:15:15 AWST  
Position: 80 S 482712 4479824  
Altitude: 31m  
Datum: WGS-84  
Azimuth/Bearing: 095° N78E 1367mils (True)  
Elevation Angle: +13.5°  
Horizon Angle: -07.5°  
Zoom: 1X  
N2





## Bushfire Management Plan – Complex Development Application

### GROUND PHOTO 51

DIRECTION: E



### GROUND PHOTO 52

DIRECTION: BEARING SAMPLE POINT: SAMPLE



### GROUND PHOTO 53

DIRECTION: W



### GROUND PHOTO 54

DIRECTION: NE





## Bushfire Management Plan – Complex Development Application

**GROUND PHOTO 47**

**DIRECTION: S**



**GROUND PHOTO 48**

**DIRECTION: W**

**SAMPLE  
POINT:**

**SAMPLE**



**GROUND PHOTO 49**

**DIRECTION: NW**



**GROUND PHOTO 50**

**DIRECTION: N**





## Bushfire Management Plan – Complex Development Application

### GROUND PHOTO 30

DIRECTION: SE

Date & Time: Thu, 23 May 2019, 15:03:45 AWST  
Position: 50 S 402745 6479031  
Altitude: 22m  
Datum: WGS-84  
Azimuth/Bearing: 189° S11E 3086mils (True)  
Elevation Angle: +12.2°  
Horizon Angle: +37.8°  
Zoom: 1X  
SE



### GROUND PHOTO 31

DIRECTION: NE

SAMPLE  
POINT:

SAMPLE

Date & Time: Thu, 23 May 2019, 15:26:20 AWST  
Position: 50 S 402892 6479265  
Altitude: 30m  
Datum: WGS-84  
Azimuth/Bearing: 194° S14W 3249mils (True)  
Elevation Angle: +03.2°  
Horizon Angle: +06.6°  
Zoom: 1X  
S



### GROUND PHOTO 32

DIRECTION: W

Date & Time: Thu, 23 May 2019, 15:04:07 AWST  
Position: 50 S 402742 6479033  
Altitude: 22m  
Datum: WGS-84  
Azimuth/Bearing: 287° S87W 4214mils (True)  
Elevation Angle: +10.8°  
Horizon Angle: +06.5°  
Zoom: 1X  
W



### GROUND PHOTO 33

DIRECTION: NW

Date & Time: Thu, 23 May 2019, 15:04:15 AWST  
Position: 50 S 402741 6479031  
Altitude: 22m  
Datum: WGS-84  
Azimuth/Bearing: 292° N88W 4886mils (True)  
Elevation Angle: +11.3°  
Horizon Angle: +06.2°  
Zoom: 1X  
NW





## Bushfire Management Plan – Complex Development Application

### GROUND PHOTO 55

DIRECTION: E



### GROUND PHOTO 56

DIRECTION: S

SAMPLE  
POINT:

SAMPLE



### GROUND PHOTO 57

DIRECTION: W



### GROUND PHOTO 58

DIRECTION: N



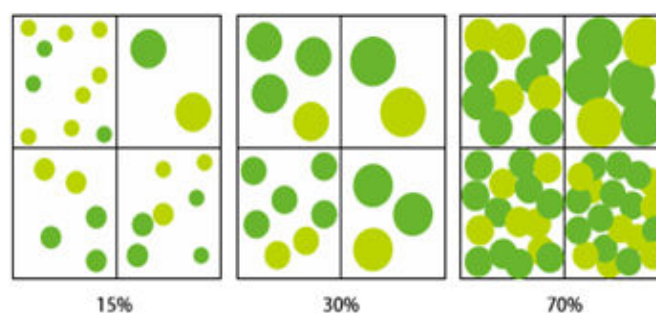
## Section 8: Additional management strategies

There are no additional management strategies required.

### Schedule 1. Specifications for Asset Protection Zone

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

Figure 18: Tree canopy cover – ranging from 15 to 70 per cent at maturity



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

Source: WAPC Guidelines for planning in bushfire prone areas V1.3 (Dec 2017), Appendices

Table 6 Vehicular access technical requirements

TECHNICAL REQUIREMENTS	1 Public road	2 Cul-de-sac	3 Private driveway	4 Emergency access way	5 Fire service access routes
Minimum trafficable surface (m)	6*	6	4	6*	6*
Horizontal clearance (m)	6	6	6	6	6
Vertical clearance (m)	4.5	N/A	4.5	4.5	4.5
Maximum grade <50 metres	1 in 10	1 in 10	1 in 10	1 in 10	1 in 10
Minimum weight capacity (t)	15	15	15	15	15
Maximum crossfall	1 in 33	1 in 33	1 in 33	1 in 33	1 in 33
Curves minimum inner radius (m)	8.5	8.5	8.5	8.5	8.5
*Refer to E3.2 Public roads: Trafficable surface					

Source: WAPC Guidelines for planning in bushfire prone areas V1.3 (Dec 2017), Appendices



## Section 9: Responsibilities for implementation and management

DEVELOPER/LANDOWNER – PRIOR TO SALE / HANDOVER	
No.	Implementation action
1	Construct all roads/egress routes as per approved deposited plans
2	Install scheme water supplies to each Lot, and establish Fire Hydrants as per the Water Corporation's (2017) Design Standard DS63 Version 3, Rev 12 or later.
3	Remove all threatening Forest, Woodland, Scrub or Shrubland within the development footprint, apart from any that is to be retained as POS.
4	Slash and mow to $\leq 5$ cm, any grasses and weeds that may have volunteered across cleared portions of the development as per the City's Fire Hazard Reduction Notice. Manage through thinning, pruning or removal, any other vegetation in a Low-threat condition, consistent with Schedule 1 of the WAPC guidelines V1.3.
5	Review the BAL ratings of Lots, particularly those along the property's western boundary at the subdivision clearance stage.

LANDOWNER/OCCUPIER – ONGOING MANAGEMENT	
No.	Management action
1	Maintain individual properties, to the standard specified in City of Swan annual Hazard Reduction Notice issued under S33 of the <i>Bush Fires Act 1954</i> .
2	Construct all habitable buildings to the BAL ratings identified in this BMP or those determined in a future review at the subdivision clearance stage.

LOCAL GOVERNMENT	
No.	Management action
1	Provide annual firebreak and hazard reduction notices.
2	Monitor land owner compliance with regulations.
3	Promote education and awareness of bushfire prevention and preparation measures.

## **Appendices:**

Appendix 1 City of Swan Hazard Reduction Notice.



# Bush Fires Act 1954

## City of Swan

### 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 bush fires, 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 the 1st day of November, 2019, or within 14 days of becoming an owner or occupier of land after that date, you must meet the fire hazard reduction conditions described in this notice and maintain these conditions up to and including the 30th day of April, 2020.

**1. All land up to 5,000m<sup>2</sup> (0.5 Hectares or 1.2 Acres)**

- 1) Install and maintain an asset protection zone in accordance with the requirements specified in clause 13 of this notice.
- 2) Maintain all grass to a height of no greater than 5cm.
- 3) Areas of natural vegetation to be maintained at or below 8 tonnes per hectare.
- 4) 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.

**2. All land between 5,000m<sup>2</sup> and 25,000m<sup>2</sup> (0.5 - 2.5 Hectares) or (1.2 - 6.2 Acres)**

- 1) Install and maintain an asset protection zone in accordance with the requirements specified in clause 13 of this notice.
- 2) Install firebreaks immediately inside and adjacent to all external property boundaries. Firebreaks need to be 3 metres wide with a 4 metre vertical height clearance free from flammable materials and overhanging branches (see section 10 in this notice for further details).
- 3) Maintain all grass to a height of no greater than 10cm.
  - a) If the land is stocked, the grass must be reduced and maintained to a height of no greater than 10cm by the 1st day of December.
- 4) Natural vegetation within 100 metres of buildings including attached and adjacent structures and essential infrastructure shall be maintained at or below 8 tonnes per hectare, by passive methods of fuel reduction that does not permanently remove or reduce the quantity or occurrence of the native plants, shrubs and trees within the subject area.
- 5) 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.

**3. All land with an area greater than 25,000m<sup>2</sup> (2.5 Hectares or 6.2 Acres)**

- 1) Install and maintain an asset protection zone in accordance with the requirements specified in clause 13 of this notice.
- 2) Install firebreaks immediately inside and adjacent to all external property boundaries. Firebreaks need to be 3 metres wide with a 4 metre vertical height clearance free from flammable materials and overhanging branches (see section 10 in this notice for further details).
  - a) Properties over 100 hectares require additional firebreaks to divide the land into areas not exceeding 100 hectares.
- 3) Slash or mow grass to a height no greater than 10cm immediately adjacent to firebreaks to a minimum width of 3 metres.
  - a) If the land is stocked, this grass must be reduced and maintained to a height of no greater than 10cm by the 1st day of December.
- 4) Natural vegetation within 100 metres of buildings including attached and adjacent structures and essential infrastructure shall be maintained at or below 8 tonnes per hectare, by passive methods of fuel reduction that does not permanently remove or reduce the quantity or occurrence of the native plants, shrubs and trees within the subject area.
- 5) 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. Plantations**

- 1) Install and maintain external and internal firebreaks, firebreaks that form compartments (cells), firebreaks and hazard reduction measures that protect neighbouring communities and essential infrastructure in accordance with the requirements of a fire management plan approved in writing by the City; or
- 2) Where no such approved fire management plan exists,
  - a) Unless the City approves an alternative plan in writing in accordance with clause 4(2)(b), install and maintain external and internal firebreaks and firebreaks that form compartments (cells), and carry out all other firebreaks and hazard reduction measures which are required in accordance with the requirements and specifications within the Department of Fire & Emergency Services 'Guidelines for Plantation Fire Protection' 2011 publication; or
  - b) If it is considered impractical for any reason to carry out the plantation requirements outlined above in clause 4 (2)(a), plantation owners and managers may apply in writing to the City to implement an alternative plan or measures in accordance with clause 4 of this notice. A Fire Management Plan may be required to be developed and submitted as part of the application.

#### **5. Application to Vary Firebreak and Hazard Reduction Requirements**

- 1) 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 the 15th day of October, 2019 for approval to provide firebreaks in alternative positions or to take alternative measures to abate fire hazards on the land. Alternative firebreak application forms can be downloaded from the City of Swan website.
- 2) If permission is not granted in writing by the City prior to the 1st day of November, 2019 you shall comply with the requirements of this notice.
- 3) When permission for alternative firebreaks or fire hazard reduction measures has been granted, you shall comply with all conditions on the endorsed permit and maintain the land to the required standard throughout the period specified by this notice.
  - a) Where a property is affected by an approved bushfire management plan, property owners must comply with any additional requirements and responsibilities outlined within that plan.

#### **6. Fuel Dumps and Depots**

Remove all flammable material within 10 metres of fuel dumps, fuel ramps or where fuel drums, whether containing fuel or not, are stored.

#### **7. Hay Stacks**

Clear and maintain a firebreak completely surrounding any haystack on the land, within 60 metres of the haystack.

#### **8. Fire Service Access (Strategic Firebreaks)**

- 1) Where under a written agreement with the City, or where depicted on an approved bushfire management plan Fire Service Access (Strategic Firebreaks) are required on the land, you are required to clear and maintain the Fire Service Access (Strategic Firebreaks) a minimum of 6 metres wide along the agreed alignment to provide restricted vehicular access to emergency services and authorised vehicles.
- 2) Fire Service Access (Strategic Firebreaks) must be unimpeded by obstructions including boundary fences unless fitted with gates and signage approved in writing by the City.
- 3) Gates may only be secured with City of Swan Fire Service padlock.
- 4) Fire Service Access (Strategic Firebreaks) shall be graded to provide a continuous 4 wheel drive trafficable surface a minimum of 4 metres wide with a 1 metre shoulder on either side.
- 5) All branches must be pruned and obstacles removed to maintain a 4 metre vertical height clearance above the full 6 metre width of the trafficable surface.

#### **9. Emergency Access Ways**

- 1) Where under a written agreement with the City, or where depicted on an approved bushfire management plan, Emergency Access Ways are required on private land, you are required to clear and maintain a vehicular access way to a minimum of 6 metres wide along the agreed alignment.
- 2) Emergency access ways must be unimpeded by obstructions including boundary fences unless fitted with gates and signage approved in writing by the City.
- 3) Gates on Emergency Access Ways must remain unlocked at all times.
- 4) Emergency Access Ways shall be graded and have suitable drainage to provide a minimum 6 metre wide continuous trafficable surface suitable for all types of 2 wheel drive vehicles.



- 5) All branches must be pruned and obstacles removed to maintain a 4 metre vertical height clearance above the full 6 metre width of the trafficable surface.

#### **10. Firebreak Construction**

- 1) Firebreaks are to be developed and maintained clear of all obstacles and flammable materials to create a minimum of 3 metres wide trafficable surface suitable for 4 wheel drive vehicles.
- 2) Overhanging branches must be pruned to provide a 4 metre vertical clearance above the full width of the firebreak surface.
- 3) Boundary firebreaks must be aligned immediately inside and adjacent to the external property boundaries.
- 4) Alternative Firebreaks that are approved in writing by the City, or as depicted within a bushfire management plan approved in writing by the City, are to be constructed to the same standard as general firebreaks and must be constructed along the specified alignment.
- 5) Firebreaks must not terminate in a dead end.
- 6) Firebreaks may be constructed by ploughing, grading, raking, burning, chemical spraying or any other approved method that achieves the required standard.

#### **11. Driveways**

Where building sites are situated more than 50 metres from a public road,

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

#### **12. Fuel Reduction – Natural Vegetation**

- 1) Available bushfire fuels must be maintained at or below:
  - a) Asset Protection Zones - 2 tonnes per hectare
  - b) Hazard Separation Zones - 8 tonnes per hectare

\*This requirement only applies where HSZs are depicted within a Fire Management Plan approved in writing by the City.

  - c) Natural Vegetation - 8 tonnes per hectare for areas of natural vegetation within 100 metres of buildings, attached and adjacent structures and essential infrastructure
- 2) Passive Fuel Reduction within natural vegetation may be achieved by burning, raking, pruning, weed management, removal of dead materials and any other approved method.
- 3) Permanent removal or partial clearing of natural vegetation including individual or groups of native grasses, shrubs or trees may only be carried out in accordance with the minimum requirements of this notice.
- 4) Permanent clearing of natural vegetation structures including individual plants, shrubs or trees, that exceeds the requirements of this notice or the specifications outlined within a bushfire management plan approved in writing by the City, is only permitted in accordance with the provisions and exemptions outlined within the Environmental Protection Act 1986, or with the approval of the Department of Water and Environmental Regulation and the City of Swan.

Note: Advice and resources on how to measure and manage native vegetation fuel loads are available from the Department of Fire and Emergency Services or the City of Swan.

#### **13. Asset Protection Zones Specification**

Asset protection zones for habitable buildings and other assets must meet the following requirements:

- 1) Extend 20 metres out from any external walls of the building, attached structures, or adjacent structures within 6 metres of the habitable building, unless varied under an approved bushfire management plan.
- 2) On sloping ground the asset protection zone distance shall increase with 1 metre for every degree in slope on the sides of the building/ structure that are exposed to down slope natural vegetation.
- 3) Asset protection zone requirements only apply within the boundaries of the lot on which the asset is located and cannot be enforced across boundaries.
- 4) Recommendation Only - Asset protection zones predominantly consist of non-flammable managed vegetation, reticulated lawns and gardens and other non-flammable features.
- 5) All grass is maintained to or under 5cm.
- 6) Fuel loads must be reduced and maintained at 2 tonnes per hectare or lower.
- 7) The crowns of trees are to be separated where possible to create a clear separation distance between adjoining or nearby tree crowns. The separation distance between tree crowns is not required to exceed 10 metres. Clearing or thinning existing trees to create distances greater than 10 metres separation between tree crowns within an asset protection zone is not required or supported by this notice and requires approval from the Department of Water and Environmental Regulation and the City of Swan.

- 8) A small group of trees within close 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.
- 9) Trees are to be low pruned (or under pruned) to at least a height of 2 metres from ground.
- 10) No tree, or shrub over 2 metres high is planted within 2 metres of a building, especially adjacent to windows.
- 11) There are no tree crowns or branches hanging over buildings.
- 12) Clear and prune scrub to reduce to a sparse density (able to walk through vegetation with relative ease with minimal deviation around trees and shrubs).
- 13) Install paths or clear flammable or dry vegetation, debris and materials immediately adjacent to the building.
- 14) Wood piles and flammable materials stored a safe distance from buildings.

#### 14. Burning

All burning must be carried out in accordance with the relevant provisions of this notice and the Bush Fires Act 1954, Health Act 1911 and the City's Consolidated Local Laws 2005.

**Prohibited Period:** All burning, including garden refuse and camping fires are prohibited.

**Restricted Period:** All burning requires a permit except for the burning of garden refuse and camping fires which are subject to the following conditions:

- 1) The fire must not be lit if the Fire Danger Rating is Very High or above, or if a Total Fire Ban or a Harvest and Vehicle Movement Ban is declared.
- 2) Only one fire is allowed at any time and it does not exceed 1 cubic metre in size.
- 3) A 5 metre wide area clear of flammable material surrounds the pile.
- 4) The fire is only lit between 6 pm and 11 pm and completely extinguished by midnight.
- 5) At least one person capable of controlling the fire is in attendance at all times with adequate means of extinguishing the fire.

#### 15. Cooking Fires

Fires for the purpose of cooking are exempt from burning period restrictions subject to the following conditions:

- 1) The fire must not be lit if the Fire Danger Rating is Very High or above, or if a Total Fire Ban or a Harvest and Vehicle Movement Ban is declared.
- 2) The fire is contained in a purpose built appliance and
  - a) at a person's home; or
  - b) an area is set aside for that purpose by the State Authority or City of Swan
- 3) A 5 metre wide area clear of flammable material surrounds the fire.
- 4) At least one person capable of controlling the fire is in attendance at all times with adequate means of extinguishing the fire.

#### 16. Compliance

- 1) 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 land owner.
- 2) 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 land owner, the City of Swan may enter onto the land with workmen, contractors, vehicles and machinery to carry out the requisitions of the notice at the expense of the land owner.
- 3) 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 land owner
- 4) 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.

#### 17. Definitions

**'Alternative Firebreak'** is a firebreak that is in an alternative position or alignment to the external boundaries of a property.

**'Alternative Firebreak Application'** is an application that may be made by a land owner to install firebreaks in an alternative position, or to carry out alternative measures in lieu of general firebreaks.

**'Available Fuel'** is the bush fuel consisting of live and dead vegetation such as stubble, mulch, leaf litter, twigs, trash, scrub and other vegetation less than 6mm in diameter capable of carrying a running fire and will actually burn under prevailing conditions.

**'City'** means the City of Swan.



**'Buildings, Attached and Adjacent Structures'** means habitable buildings that are used as a dwelling, workplace, place of gathering or assembly, a building that is a car park, or a building used for the storage

or display of goods or produce for sale by whole sale in accordance with classes 1-9 of the Building Code of Australia. The term building includes attached and adjacent structures like garages, carports verandas or similar roofed structure(s) that are attached to, or within 6 metres of the dwelling or primary building.

**'Asset Protection Zone (APZ)'** is a low fuel area that is reduced of flammable vegetation and materials surrounding buildings and essential infrastructure 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. This area must extend out from the external walls of a building or asset a minimum of 20 metres.

**'Bushfire Management Plan'** or 'Fire Management Plan' is a comprehensive plan that may be placed on the certificate of title(s) of land that has been developed as a condition of development or subdivision. Bushfire Management Plans may become out dated and it's the responsibility of the property owner to review and keep them current. Where a property is affected by an approved bushfire management plan, property owners must still comply with all requirements in the Annual Fire Hazard Reduction Notice and with any additional requirements outlined within that plan.

**'Emergency Access Way'** is a two wheel drive trafficable, 6 metre 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.

**'Essential Infrastructure'** or **'Critical Infrastructure'** means assets, infrastructure, systems and networks that provide essential services necessary for social and economic wellbeing and is typically public infrastructure. Assets and infrastructure, usually of a public nature, that generate or distribute electricity, water supply, telecommunications, gas and dams are typical assets that are essential to society and are often located in, or traverse areas that are prone to bushfires.

**'Firebreak'** is an area of land cleared of flammable material (see available fuel above) to minimise the spread of a bushfire and to provide access for firefighting services. For the purpose of this notice the term firebreak is a strip of land at minimum 3 metres with a 4 metres vertical clearance, constructed to provide a 4 wheel drive trafficable surface for access by emergency and authorised vehicles. Boundary firebreaks are installed immediately adjacent the external boundaries of a property.

**'Fire Hazard'** means accumulated fuel (living or dead) such as leaf litter, twigs, trash, bush, dead trees and scrub capable of carrying a running fire, but excludes standing living trees and isolated shrubs.

**'Hazard Separation Zone (HSZ)'** if required by this notice and in accordance with a Fire Management Plan, means an area extending out from an asset protection zone a distance of 80 metres unless otherwise specified, to create a graduated fuel reduction and separation from natural vegetation.

**'Natural Vegetation'** means natural areas of forest, woodland, shrubland, scrub, mallee and mulga. 'Parkland Clearing' means areas of natural vegetation that has been significantly cleared of understory and tree density reduced to create a grassland or low vegetation area that can be walked through unimpeded with isolated, grouped or well-spaced trees.

**'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 an treated area. This is typically achieved by undertaking a cool, controlled burn of an area during cooler, damper months, or by physical removal of built up leaf litter, dead materials, weeds and slashing long dry grasses without damaging live native plants within the area.

**'Plantation'** is any area of native or exotic planted trees that exceeds three hectares in a gazetted town site, or elsewhere a stand of trees of 10 hectares or larger that has been planted and managed intensively for their commercial and environmental value. A plantation includes roads, firebreaks and small areas of native vegetation.

**'Fire Service Access (Strategic Firebreaks)'** is a firebreak that is 6 metres wide established to provide strategic access and links to road networks whilst providing a wider control/ containment line to protect town sites, estates and similar exposures during bushfire operations.

By order of the Council,

MJ Foley

Chief Executive Officer

City of Swan