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Bushfire Management Plan

Lot 9519 Banrock Drive, Ellenbrook

DRAFT

Prepared for
Roberts Day
by Strategen

February 2017



Bushfire Management Plan

Lot 9519 Banrock Drive, Ellenbrook

DRAFT

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Client: Roberts Day

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1. Introduction

1.1 Background

Roberts Day, on behalf of LWP Property Group Pty Ltd, is facilitating development of Lot 9519 Banrock Drive, Ellenbrook (the project area) in the City of Swan. The proposed subdivision is located within an undeveloped portion of Village 7A, Stage 9 of Lexia Village and will create 61 single housing residential lots, two grouped housing lots and an area of Public Open Space (POS) (Figure 1).

Due to the current extent of adjacent vegetation, a large proportion of the project area is designated as bushfire prone, as outlined on the *WA Map of Bush Fire Prone Areas* (DFES 2017). This triggers bushfire planning and reporting requirements in the form of a Bushfire Management Plan (BMP). Strategen has prepared this BMP to fulfil the following key objective:

1. Accompany proposed subdivision application made to WAPC in order to meet planning requirements triggered under *State Planning Policy 3.7 Planning in Bushfire Prone Areas* (SPP 3.7; WAPC 2015).

Under SPP 3.7 Policy Measure 6.4, the following information is required as part of the BMP to accompany subdivision applications:

- a Bushfire Attack Level (BAL) contour map to determine the indicative acceptable BAL ratings across the project area, in accordance with *Guidelines for Planning in Bushfire Prone Areas* (the Guidelines; WAPC 2017) – refer to Section 2.3 and Figure 4
- identification of any bushfire hazard issues arising from the BAL contour map – refer to Section 2.3.6
- assessment against the bushfire protection criteria contained within the Guidelines demonstrating compliance within the boundary of the subdivision site – refer to Section 4 and Table 3.

This BMP has been prepared in accordance with the Guidelines and addresses all of the above information requirements to satisfy SPP 3.7.

This BMP provides a compliant bushfire management response for proposed development based on the current subdivision design and post-development state of the on-site and surrounding fire environment.

1.2 Purpose and application of the plan

The purpose of this BMP is to provide guidance on how to plan for and manage the bushfire risk to future life and property assets of the project area through implementation of a range of bushfire management measures. The BMP outlines how future on-site assets can be protected during the summer months when the threat from bushfire is at its peak. This is particularly relevant when existing fire appliances in the area may be unable to offer an immediate emergency suppression response; therefore, development planning and design should aim to provide mitigation strategies that protect future life and property from bushfire as a priority.



Source: Roberts Day 2017

Figure 1: Subdivision plan

2. Spatial consideration of bushfire threat

2.1 Existing site characteristics

2.1.1 Location

The project area is located approximately 26 km northeast of the Perth Central Business District and comprises approximately 3.6 ha consisting of Lot 9519 Banrock Drive, Ellenbrook. The project area is bound by the following, as depicted in Figure 2:

- unnamed Nature Reserve (Crown Reserve 46875) to the north
- Helms Loop and residential development to the east
- Banrock Drive, residential development and POS to the south
- Dalgarpur Way and residential development to the west.

2.1.2 Zoning and land use

The project area is currently zoned 'Special Use' under provisions of the City of Swan Local Planning Scheme No 17.

Land to the east, west and south is also zoned 'Special Use' and Crown Reserve 46875 to the north is reserved for 'Parks and Recreation' under the Metropolitan Region Scheme.

The project area is currently undeveloped and has been predominantly cleared. Land to the east, west and south is developed for urban use, including residential lots and POS. Land to the north is fully vegetated as part of the Lexia Wetlands.

2.1.3 Assets

The project area currently contains no life or property assets due to the undeveloped nature of the site. Proposed development will increase the critical assets within the project area in that the number of residents and built assets will be intensified across the subject land.

The project area contains no environmental value due to the predominantly cleared nature of the site.

2.1.4 Access

The project area is currently accessed via Helms Loop from the east, Banrock Drive from the south and Dalgarpur Way from the west. There are also provisions for a pedestrian cycleway along the northern interface of the site.

2.1.5 Water and power supply

Underground power and reticulated water will be extended throughout the project area from surrounding urban development.



2.2 Existing fire environment

2.2.1 Vegetation class

Strategen has assessed vegetation class within the project area and adjacent 100 m through on-ground verification on 7 February 2017.

Vegetation was assessed in accordance with the *Visual guide for bushfire risk assessment in Western Australia* (DoP 2016) and *Australian Standard AS 3959–2009 Construction of Buildings in Bushfire Prone Areas* (AS 3959; SA 2009). The following provides a summary of the site investigation in accordance with current conditions as depicted in Figure 3:

- the project area consists of:
 - * Class C shrubland (Photo 1 and Photo 2)
 - * Class D scrub (Photo 3)
 - * cleared areas or managed grassland (Photo 4)
- adjacent vegetation consists of:
 - * Class A forest within Crown Reserve 46875 to the north (Photo 5 and Photo 6)
 - * Class B woodland within Crown Reserve 46875 to the north (Photo 6, Photo 7 and Photo 8)
 - * vegetation less than 1 ha in size within POS (Lot 7651) to the south excluded from classification under Clause 2.2.3.2 (b) of AS 3959 (Photo 9 and Photo 10)
 - * non-vegetated areas (e.g. roads and buildings) or low threat managed grassland and vegetation excluded from classification under Clause 2.2.3.2 (e) and (f) of AS 3959 (Photo 11, Photo 12, Photo 13, Photo 14, Photo 15 and Photo 16).

Photo point numbers are depicted on Figure 3 to demonstrate the location and direction of each photo. The photo points mentioned above and depicted in Figure 3 relate to the georeferenced site photographs outlined in Appendix 2. Strategen emphasises that the vegetation extent discussed above reflects current site conditions and does not take into account vegetation clearing proposed as part of development.

The area of on-site POS within the northern portion of the project area will be subject to landscaping and ongoing management that will achieve a low threat minimal fuel condition all year round.

POS to the south of the project area is excluded under Clause 2.2.3.2 (b) on the basis that the retained vegetation and revegetation components of the POS combine to being less than 1 ha in size and greater than 100 m from other areas of post development classified vegetation. Detailed analysis of the landscape construction plan (refer to Appendix 1) calculated a total of 9 870 m² of vegetation either being retained or planted within the POS. Low threat areas excluded from classification such as pathways, turf areas and structures such as playgrounds were excluded from the abovementioned calculation.

Therefore, post development vegetation exclusions include:

- vegetation that is currently or will be managed in a low threat, minimal fuel condition excluded from classification under Clause 2.2.3.2 (f) of AS 3959, including the area of on-site POS proposed within the northern portion of the project area
- any non-vegetated areas occupied by roads, dwellings or other infrastructure excluded from classification under Clause 2.2.3.2 (e) of AS 3959, including proposed residential lots and roads within the project area
- existing POS to the south containing vegetation less than 1 ha and not within 100 m of other classified vegetation excluded from classification under Clause 2.2.3.2 (b) of AS 3959.

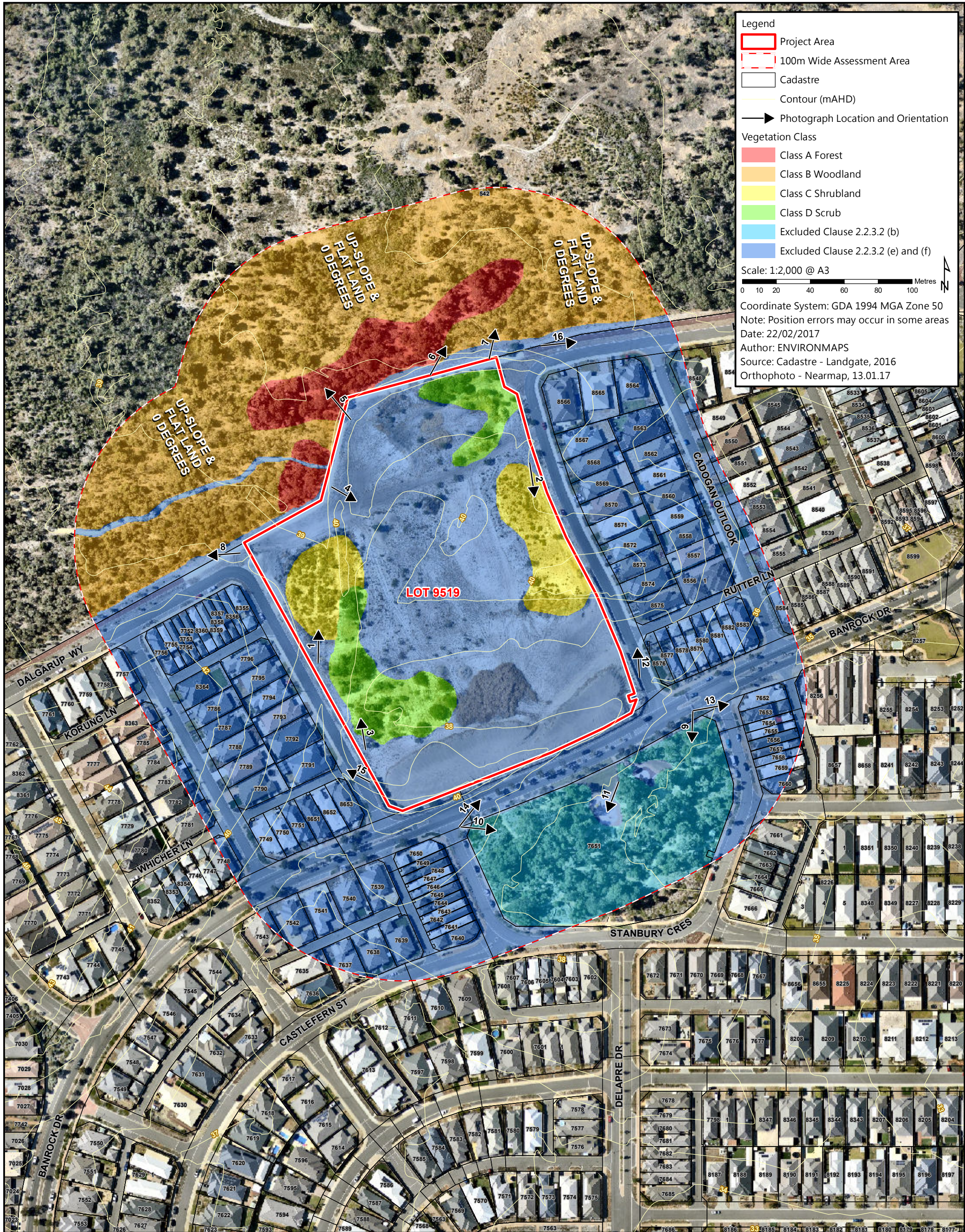
The post development vegetation extent is depicted in Figure 4 and has been used to inform the BAL contour assessment for proposed development areas (refer to Section 2.3).

2.2.2 Site topography and effective slope

Strategen has assessed site topography and effective slope under classified vegetation within the project area and adjacent 100 m through on-ground verification on 7 February 2017 in accordance with AS 3959 methodology (Figure 3).

The project area consists of generally flat land, with topographic elevation across the majority of the site ranging from approximately 37 mAHD (Australian Height Datum) to 39 mAHD. All post development classified vegetation within 100 m of the project area is situated either on flat land or up-slope from proposed development areas.

The effective slope described above has been used to inform the BAL contour assessment for proposed development (refer to Section 2.3).



2.3 BAL contour assessment

Any proposed development that cannot achieve a full 100 m wide low fuel separation distance from post development classified vegetation will require application of AS 3959 via implementation of increased building construction standards in response to the assessed BAL.

Strategen has undertaken a BAL contour assessment across the project area in accordance with the Guidelines and Method 1 of AS 3959. The BAL contour assessment is based on post-development conditions on and adjacent to the site. The Method 1 procedure for calculating the BAL (as outlined in AS 3959) incorporates the following factors:

- state-adopted FDI rating
- vegetation class
- effective slope
- distance maintained between proposed development areas and the classified vegetation.

Based on the specified BAL contours, building construction/separation requirements for proposed buildings can be assigned at the discretion of the City. A Method 1 BAL calculation for proposed development is outlined in the following subsections.

2.3.1 Fire Danger Index

A blanket rating of FDI 80 is adopted for Western Australian environments, as outlined in AS 3959 and endorsed by Australasian Fire and Emergency Service Authorities Council.

2.3.2 Post development classified vegetation

Post development vegetation class is described in Section 2.2.1 and consists of forest (Class A) and woodland (Class B) to the north.

Vegetation exclusions under Clause 2.2.3.2 of AS 3959, based on the post development vegetation extent, include:

- Clause 2.2.3.2 (e): non-vegetated areas, including roads and residential lots within the project area
- Clause 2.2.3.2 (f): low threat vegetation, including managed grassland, gardens, POS and nature strips
- Clause 2.2.3.2 (b): areas of vegetation that are less than 1 ha and not within 100 m of other classified vegetation, including the area of POS south of the project area.

2.3.3 Effective slope

Effective slope is described in Section 2.2.2 and consists of up-slope or flat land (0 degrees).

2.3.4 Distance between proposed development areas and the classified vegetation

Minimum separation distances for a BAL-29 rating or lower can be achieved for all proposed development areas. This equates to a minimum separation distance of 21 m from Class A forest.

The required separation distances will be achieved in the form of a minimum 21 m wide Asset Protection Zone (APZ) comprising low fuel landscaped and managed areas within POS in the northern portion of the project area and a road reserve at the interface with classified vegetation. This will ensure a BAL-29 rating or lower is achieved. Final separation distances between classified vegetation and proposed buildings will need to be confirmed at the building permit stage.

2.3.5 Method 1 BAL calculation

A Method 1 BAL calculation has been completed for the project area in accordance with AS 3959 and Guidelines methodology (Table 1). All proposed development areas situated greater than 100 m from post development classified vegetation are considered BAL–Low, where there will be insufficient risk to warrant specific building construction requirements.

The BAL rating gives an indication of the level of bushfire attack (i.e. the radiant heat flux) that may be received by proposed buildings and subsequently informs the standard of building construction required to increase building tolerance to potentially withstand such impacts in line with the assessed BAL.

The assessed BAL ratings for the project area are depicted as BAL contours in Figure 4.

Table 1: Method 1 BAL calculation

Vegetation class	Effective slope	BAL contours (separation distance)	BAL rating	Comment
Class A forest	All up-slopes and flat land (0 degrees)	<16 m	BAL–FZ	No development is proposed in this area
		16–<21 m	BAL–40	No development is proposed in this area
		21–<31 m	BAL–29	Development may occur in this area
		31–<42 m	BAL–19	Development will occur in this area
		42–<100 m	BAL–12.5	Development will occur in this area
Class B woodland	All up-slopes and flat land (0 degrees)	<10 m	BAL–FZ	No development is proposed in this area
		10–<14 m	BAL–40	No development is proposed in this area
		14–<20 m	BAL–29	No development is proposed in this area
		20–<29 m	BAL–19	Development will occur in this area
		29–<100 m	BAL–12.5	Development will occur in this area

The above BAL contours are based on the vegetation class and effective slope assessed at the time of inspection and take into consideration the proposed clearing extent, resultant vegetation exclusions and separation distances achieved in line with the subdivision plan. Should there be any changes in development design or classified vegetation extent that requires a modified bushfire management response, then the above BAL contours will need to be reassessed for the affected areas and documented in a brief addendum to this BMP prepared to accompany a future planning/building application.

2.3.6 Identification of bushfire hazard issues

The landscape scale bushfire risk or fire run through dense vegetation adjacent to the project area is limited to Crown Reserve 46875 to the north of the project area. Strategen therefore considers a fire front approaching the project area from the north to be the worst case bushfire scenario due to the presence of a maximum 1 km long fire run through intact woodland and forest fuels in this direction.

The predominant bushfire weather conditions (i.e. average January conditions) for the subject locality are from the east and southeast in the morning and from the southwest in the afternoon (BoM 2016). Summer winds from the north are less common and can occur during the bushfire season when a low pressure trough forms off the west coast and strong winds develop from the north or northeast. These conditions are sometimes associated with 'Extreme' or 'Catastrophic' fire dangers, which are consistent with very high temperatures, low relative humidity and strong winds. Based on the predominant summer climatic conditions of the local area, 'Extreme' and 'Catastrophic' fire dangers occur less than 5% of the time during the designated bushfire season, which equates to around six days between December and March (McCaw & Hanstrum 2003).

The bushfire hazard located within Crown Reserve 46875 to the north of the project area will remain post development of the site. The bushfire risk to future life and property assets posed by this hazard can be managed through standard application of acceptable solutions under the Guidelines, including provision for and implementation of APZs, relevant bushfire construction standards, provision of adequate emergency water supply and vehicular access, as well as through a direct bushfire suppression response if required.

On this basis, Strategen considers the bushfire hazards within and adjacent to the project area and the associated bushfire risk is readily manageable through standard management responses outlined in the Guidelines and AS 3959. These responses will be factored in to proposed development early in the planning process to ensure a suitable, compliant and effective bushfire management outcome is achieved for protection of future life and property assets.

3. Bushfire management measures

Strategen has identified a range of bushfire management measures that on implementation will enable all proposed areas within the subdivision site to be developed with a manageable level of bushfire risk whilst maintaining full compliance with the Guidelines and AS 3959. The bushfire management measures are discussed in the following subsections and depicted in Figure 4 (where applicable).

3.1 Asset Protection Zones (APZs)

Strategen has designated a 21 m wide APZ along the northern interface of proposed development (Figure 4), determined on the basis of compliance with a BAL-29 rating in accordance with AS 3959 (i.e. Class A forest on flat ground). The APZ will be accommodated within the subdivision site in the following areas:

- road reserve
- POS managed in a low fuel state on a regular and ongoing basis
- minor building setbacks within the first row of lots along the northern development interface.

Alignment and width of the APZ may be reassessed through a BMP addendum in response to any modifications to lot layout or changes to the classified vegetation extent affecting the site.

3.1.1 APZ maintenance requirements

The 21 m wide APZ needs to be maintained on a regular and ongoing basis at a fuel load less than 2 t/ha to achieve a low threat minimal fuel condition in accordance with acceptable solution A2.1 of the Guidelines. This may include regular slashing/weed control of road verges and grassland fuels where applicable. Individual trees can be retained within the APZ provided there is adequate separation between tree canopies (i.e. 5 m) and the understorey is managed through regular slashing/weed control to achieve a low threat minimal fuel condition. Managed gardens, lawns, paved/sealed areas and swimming pools are examples of land uses permitted within the APZ. Timing and responsibilities for APZ implementation and maintenance are outlined below and summarised in Table 4.

Requirements under the Guidelines for APZs include:

- Fine Fuel Load: combustible dead vegetation matter less than 6 mm in thickness reduced to and maintained at an average of 2 t/ha
- Trees (>5 m in height): lower branches should be removed to a height of 2 m above the ground, canopy cover should be less than 15% with tree canopies at maturity well spread to at least 5 m apart as to not form a continuous canopy
- Shrubs (0.5 m to 5 m in height): should not be located under trees, should not be planted in clumps greater than 5 m² in area, clumps of shrubs should be separated from each other by at least 10 m
- Groundcovers (<0.5 m in height): can be planted under trees but must be properly maintained to remove dead plant material and any parts within 2 m of a structure
- Grass: should be managed to maintain a height of 10 cm or less.

3.1.2 Developer responsibilities

The developer will be responsible for implementing APZs prior to subdivision clearance and maintaining APZs until such time that the subject land is purchased by prospective landowners or transferred to the City.

3.1.3 Landowner responsibilities

Following lot purchase, individual landowners will be responsible for maintaining the building setback component of the APZ that exists within their property.

3.1.4 City of Swan responsibilities

Following land transfer, the City will be responsible for maintaining the road reserve and POS component of the APZ, including road verges.

3.2 POS and landscaping

The BAL contours depicted in Figure 4 are based on proposed on-site POS within the northern portion of the project area being subject to landscaping and ongoing management that will achieve a low threat minimal fuel condition all year round.

All landscaping proposed within the project area will consist of low bushfire fuel gardens or lawns/hardstand subject to ongoing management to a low fuel state. The required works may include slashing of understorey grasses and weeds on a regular and ongoing basis to maintain fuel loads at less than 2 t/ha and achieve a low threat minimal fuel condition all year round.

Any landscaping plans for the POS to the north will need to reflect the bushfire management measures required under this BMP.

3.2.1 Developer responsibilities

The developer will be responsible for maintaining the POS until such time that the land is transferred to the City.

3.2.2 City of Swan responsibilities

Following land transfer, the City will be responsible for maintaining the POS to achieve a low threat minimum fuel condition all year round.

3.3 Increased building construction standards

Strategen has assigned BAL contours throughout the project area, as depicted in Figure 4. On the basis of the current subdivision plan and APZs, proposed development can be located in areas of BAL-29 or lower, with no development occurring in areas of BAL-FZ or BAL-40.

All proposed lots situated greater than 100 m from post development classified vegetation are considered to be BAL-Low, where there is insufficient risk to warrant specific building construction requirements. The extent of BAL-Low throughout the site relies on the clearing, separation distances and fuel management measures being implemented.

A BMP revision, addendum or individual lot BAL assessment may be prepared at the building permit stage to demonstrate any change in the assessed BAL or other management measure documented in this BMP which may occur as a result of a change in the separation distance between proposed development and classified vegetation (i.e. as a result of specified location of proposed buildings at the building licence application stage or changes to vegetation extent). Acceptance of the BAL contour assessment to inform the building permit stage is at the discretion of the City.

3.4 Vehicular access

3.4.1 Public access

As all of the proposed residential lots will directly front the existing/proposed public access network, all lots will have at least two different points of vehicular access at all times. Proposed internal roads link with existing surrounding roads to ensure through access is provided to all lots and there are no dead ends or cul-de-sacs.

The public roads created as part of the proposed development are compliant with Guideline requirements as detailed in Table 2.

The BAL assessment for this site has confirmed that the battle-axe lots proposed in the southern portion of the project area are subject to BAL–Low requirements and are therefore unaffected by a bushfire prone area. As such, acceptable solution A3.4 does not apply.

Table 2: Vehicular access requirements for public roads

Technical requirements	Public Road
Minimum trafficable surface	6 m*
Horizontal clearance	6 m
Vertical clearance	4.5 m
Maximum grade <50 m	1 in 10
Minimum weight capacity	15 tonnes
Maximum crossfall	1 in 33
Curves minimum inner radius	8.5
* Refer to E3.2 Public roads: Trafficable surface	

Source: WAPC 2015b

3.4.2 Individual lot firebreaks

The City of Swan annual firebreak notice (Appendix 3) requires 3 m wide (with 4 m vertical clearance) boundary firebreaks on land greater than 5000 m². No proposed lots within the subdivision site exceed 5000 m²; therefore, firebreak requirements under the annual firebreak notice are not applicable.

3.5 Reticulated water supply

All proposed lots will be provided a reticulated water supply. The reticulated system will ensure an all year round supply of water is provided for each lot to meet minimum domestic and emergency water supply requirements.

A network of hydrants will also be provided along the internal road network at locations which meet relevant water supply authority and DFES requirements, in particular the Water Corporation Design Standard DS 63 'Water Reticulation Standard Design and Construction Requirements for Water Reticulation Systems up to DN250'. This standard will guide construction of the internal reticulated water supply system and fire hydrant network, including spacing and positioning of fire hydrants so that the maximum distance between a hydrant and the rear of a building envelope (or in the absence of a building envelope, the rear of the lot) shall be 120 m and the hydrants shall be no more than 200 m apart.

3.6 Additional measures

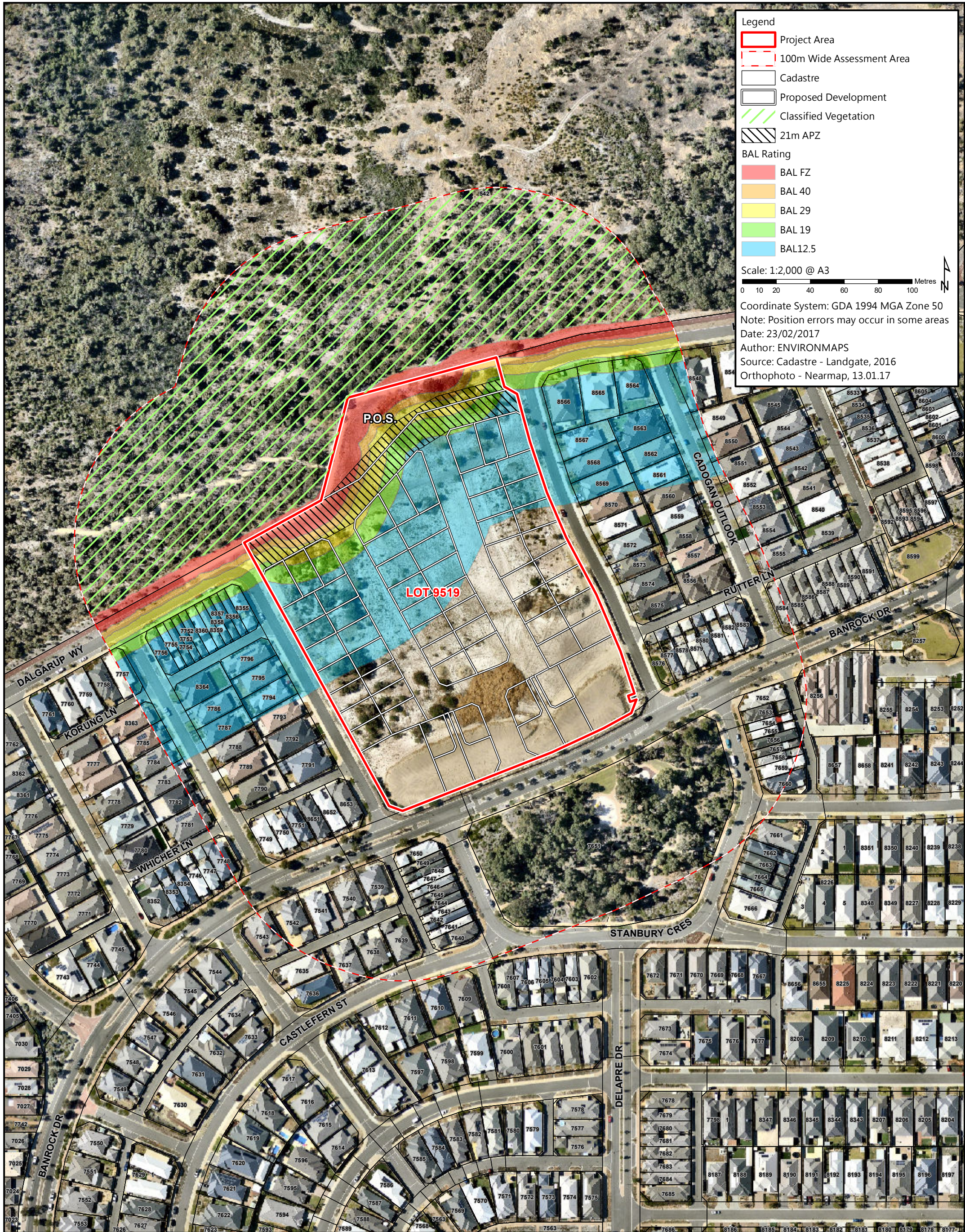
Strategen makes the following additional recommendations to inform ongoing stages of development:

1. **Notification on Title:** notification is to be placed on the Title of all proposed residential lots (either through condition of subdivision or other head of power) to ensure all landowners/proponents and prospective purchasers are aware that their lot is subject to an approved BMP and BAL contour assessment. If the lot is situated within a designated bushfire prone area (at creation of title), the BAL for proposed buildings may, at the discretion of the City of Swan, need to be confirmed at the building permit stage.

2. BMP addendum, BAL compliance report or individual lot BAL assessment: this BMP and the BAL contour assessment contained within are considered sufficient to inform future planning and development stages such as development application (if required) and building permit application. However, a BMP addendum, BAL compliance report or individual lot BAL assessment may need to be prepared at a later date to demonstrate reassessment of the management measures documented in this BMP (such as the APZ and/or BALs) should there be any change to lot design or the classified vegetation extent currently affecting the site. Any addendum to this BMP or individual lot BAL assessment should be prepared to accompany the relevant planning or building permit application to the City.

Compliance with the City of Swan annual firebreak notice: the developer/land manager and prospective land purchasers are to comply with the current City of Swan annual firebreak notice (Appendix 3) which specifies the following for land under 5001 m²:

- (a) maintain grass to a height no greater than 5 cm.
- (b) install and maintain a Building Protection Zone.
- (c) land that is substantially developed, which may include land that predominantly consists of non-flammable managed vegetation, reticulated lawns and gardens and other non-flammable features or areas that are parkland cleared, may maintain grass to a height no greater than 5 cm in lieu of firebreaks.
- (d) areas of natural vegetation to be maintained at or below 8 t/ha
- (e) where a property is affected by an approved BMP, property owners shall comply with all requirements and responsibilities outlined within that plan.



4. Proposal compliance and justification

Proposed development within the project area is required to comply with SPP 3.7 under the following policy measures:

6.2 Strategic planning proposals, subdivision and development applications

a) Strategic planning proposals, subdivision and development applications within designated bushfire prone areas relating to land that has or will have a Bushfire Hazard Level (BHL) above low and/or where a Bushfire Attack Level (BAL) rating above BAL-LOW apply, are to comply with these policy measures.

b) Any strategic planning proposal, subdivision or development application in an area to which policy measure 6.2 a) applies, that has or will, on completion, have a moderate BHL and/or where BAL-12.5 to BAL-29 applies, may be considered for approval where it can be undertaken in accordance with policy measures 6.3, 6.4 or 6.5.

c) This policy also applies where an area is not yet designated as a bushfire prone area but is proposed to be developed in a way that introduces a bushfire hazard, as outlined in the Guidelines.

6.4 Information to accompany subdivision applications

Any subdivision application to which policy measure 6.2 applies is to be accompanied by the following information in accordance with the Guidelines:

a) a BAL Contour Map to determine the indicative acceptable BAL ratings across the project area, in accordance with the Guidelines. BAL Contour Maps should be prepared by an accredited Bushfire Planning Practitioner

b) the identification of any bushfire hazard issues arising from the BAL Contour Map

c) an assessment against the bushfire protection criteria requirements contained within the Guidelines demonstrating compliance within the boundary of the subdivision site.

This information can be provided in the form of a Bushfire Management Plan or an amended Bushfire Management Plan where one has been previously endorsed.

Implementation of this BMP is expected to meet the following objectives of SPP 3.7:

5.1 Avoid any increase in the threat of bushfire to people, property and infrastructure. The preservation of life and the management of bushfire impact are paramount.

5.2 Reduce vulnerability to bushfire through the identification and consideration of bushfire risks in decision-making at all stages of the planning and development process.

5.3 Ensure that higher order strategic planning documents, strategic planning proposals, subdivision and development applications take into account bushfire protection requirements and include specified bushfire protection measures.

5.4 Achieve an appropriate balance between bushfire risk management measures and, biodiversity conservation values, environmental protection and biodiversity management and landscape amenity, with consideration of the potential impacts of climate change.

In response to the above requirements of SPP 3.7, the bushfire management measures, as outlined in Section 3, have been devised for the proposed development in accordance with acceptable solutions of the Guidelines to meet compliance with bushfire protection criteria. An 'acceptable solutions' assessment is provided in Table 3 to assess the proposed bushfire management measures against each bushfire protection criteria in accordance with the Guidelines and demonstrate that the measures proposed meet the intent of each element of the bushfire protection criteria.

Table 3: Acceptable solutions assessment against bushfire protection criteria

Bushfire protection criteria	Intent	Solution	Proposed bushfire management measures	Compliance statement
Element 1: Location	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	<u>Acceptable solution</u> A1.1 Development location The strategic planning proposal, subdivision and development application is located in an area that is or will, on completion, be subject to either a moderate or low bushfire hazard level, or BAL-29 or below.	Refer to Section 3.3 and Figure 4, which demonstrate that development will only occur in areas of BAL 29 or lower. No development will occur in BAL 40 or BAL FZ areas.	The measures proposed are considered to comply and meet the intent of Element 1 Location.
Element 2: Siting and design of development	To ensure that the siting and design of development minimises the level of bushfire impact	<u>Acceptable solution</u> A2.1 Asset Protection Zone Every building is surrounded by an APZ, depicted on submitted plans, which meets detailed requirements (refer to the Guidelines for detailed APZ requirements).	Refer to Section 3.1 and Figure 4, which demonstrate that a 21 m wide APZ will be maintained between all proposed lots at the interface with classified vegetation.	The measures proposed are considered to comply and meet the intent of Element 2 Siting and design of development
Element 3: Vehicular access	To ensure that the vehicular access serving a subdivision/development is available and safe during a bushfire event	<u>Acceptable solution</u> A3.1 Two access routes Two different vehicular access routes are provided, both of which connect to the public road network, provide safe access and egress to two different destinations and are available to all residents/the public at all times and under all weather conditions.	Refer to Section 3.4.1, which demonstrates a minimum of two different vehicular access routes will be provided for the proposed development at all times.	The measures proposed are considered to comply and meet the intent of Element 3 Vehicular access
		<u>Acceptable solution</u> A3.2 Public road A public road is to meet the requirements in Table 2, Column 1.	Refer to Section 3.4.1, which demonstrates that all proposed public roads will meet minimum requirements of the Guidelines (see Table 2).	
		<u>Not applicable</u> A3.3 Cul-de-sac (including a dead-end-road) A cul-de-sac and/or a dead end road should be avoided in bushfire prone areas. Where no alternative exists (i.e. the lot layout already exists and/or will need to be demonstrated by the proponent), detailed requirements will need to be achieved (refer to the Guidelines for detailed cul-de-sac requirements).	N/A. No cul-de-sacs are proposed as part of the development.	
		<u>Not applicable</u> A3.4 Battle-axe Battle-axe access leg should be avoided in bushfire prone areas. Where no alternative exists, (this will need to be demonstrated by the proponent) detailed requirements will need to be achieved (refer to the Guidelines for detailed battle-axe requirements).	N/A. No battle-axe lots are proposed within bushfire prone areas of the site.	
		<u>Not applicable</u> A3.5 Private driveway longer than 50 m A private driveway is to meet detailed requirements (refer to the Guidelines for detailed private driveway requirements).	N/A. No private driveways longer than 50 m are proposed as part of the development.	

Bushfire protection criteria	Intent	Solution	Proposed bushfire management measures	Compliance statement
		<u>Not applicable</u> A3.6 Emergency access way An access way that does not provide through access to a public road is to be avoided in bushfire prone areas. Where no alternative exists (this will need to be demonstrated by the proponent), an emergency access way is to be provided as an alternative link to a public road during emergencies. An emergency access way is to meet detailed requirements (refer to the Guidelines for detailed EAW requirements).	N/A. No emergency access ways are required as part of the development.	
		<u>Not applicable</u> A3.7 Fire service access routes (perimeter roads) Fire service access routes are to be established to provide access within and around the edge of the subdivision and related development to provide direct access to bushfire prone areas for fire fighters and link between public road networks for fire fighting purposes. Fire service access routes are to meet detailed requirements (refer to the Guidelines for detailed fire service access route requirements).	N/A. No fire service access routes are required as part of the development.	
		<u>Not applicable</u> A3.8 Firebreak width Lots greater than 0.5 hectares must have an internal perimeter firebreak of a minimum width of three metres or to the level as prescribed in the local firebreak notice issued by the local government	Refer to Section 3.4.2, which demonstrates that firebreaks are not required for this development.	
Element 4: Water	To ensure that water is available to the subdivision, development or land use to enable people, property and infrastructure to be defended from bushfire.	<u>Acceptable solution</u> A4.1 Reticulated areas The subdivision, development or land use is provided with a reticulated water supply in accordance with the specifications of the relevant water supply authority and Department of Fire and Emergency Services.	Refer to Section 3.5, which demonstrates that all proposed lots will be provided a reticulated water supply and network of hydrants in accordance with local water authority, City and DFES requirements.	The measures proposed are considered to comply and meet the intent of Element 4 Water
		<u>Not applicable</u> A4.2 Non-reticulated areas Water tanks for fire fighting purposes with a hydrant or standpipe are provided and meet detailed requirements (refer to the Guidelines for detailed requirements for non-reticulated areas)	N/A The proposed development will not occur within a non-reticulated area.	
		<u>Not applicable</u> A4.3 Individual lots within non-reticulated areas (Only for use if creating 1 additional lot and cannot be applied cumulatively) Single lots above 500 square metres need a dedicated static water supply on the lot that has the effective capacity of 10 000 litres.	N/A The proposed development will not occur within a non-reticulated area.	

5. Implementation and enforcement

Implementation of the BMP applies to the developer, prospective landowners and the relevant land authority/manager (such as the City or future land purchasers) to ensure bushfire management measures are adopted and implemented on an ongoing basis. A summary of the bushfire management measures described in Section 3, as well as a works program, is provided in Table 4. These measures will be implemented to ensure the ongoing protection of proposed life and property assets is achieved. Timing and responsibilities are also defined to assist with implementation of each measure.

Table 4: Proposed works program

Bushfire management measure	Timing for application	Responsibility
Creation of all APZs as per Sections 3.1 and 3.1.1	Prior to subdivision clearance	Developer
Maintenance of APZs within private lots as per Sections 3.1.1, 3.1.2 and 3.1.3	As required to achieve 2 t/ha threshold all year round in accordance with acceptable solution A2.1	Developer through to lot sale, prospective landowners thereafter
Maintenance of APZs within road reserve and POS, including verges as per Sections 3.1.1, 3.1.2 and 3.1.4	As required to achieve 2 t/ha threshold all year round in accordance with acceptable solution A2.1	Developer through to lot transfer, City of Swan thereafter
Fuel management within POS and landscaped areas as per Section 3.2	Prior to development of lots and ongoing thereafter	Developer through to lot transfer, City of Swan thereafter
Implementation of increased building construction standards as per Section 3.3	On development of individual lots (i.e. building construction)	Builder, prospective landowners
Construction of public roads as per approved subdivision as per Section 3.4.1	Prior to development of lots	Developer
Provision of reticulated water supply and fire hydrant network as per Section 3.5	Prior to development of lots	Developer
Notification on Title as per Section 3.6	Following subdivision approval	Developer
Reassessment of the BAL and separation distances as per Section 3.6	As required prior to development application/building construction (i.e. to accompany future planning/building permit applications) to demonstrate reassessment of the management measures documented in this BMP (such as the APZ and/or BALs) in response to any modifications to development design or changes to the classified vegetation extent currently affecting the site	Developer until development is complete, individual landowners thereafter
Compliance with current fire control order as per Section 3.6	All year round as specified in the current fire control order	Developer/land manager/prospective landowners

5.1 Document review

This BMP will be updated as necessary following the date of approval to ensure:

1. Implementation is assessed and corrective actions are applied in cases of non-compliance.
2. The effectiveness and impact of fire prevention work is evaluated and any significant changes in development design or the surrounding environment are reassessed in a BMP addendum.

The developer will be responsible for updating and revising the BMP as required until such time that the development is complete.

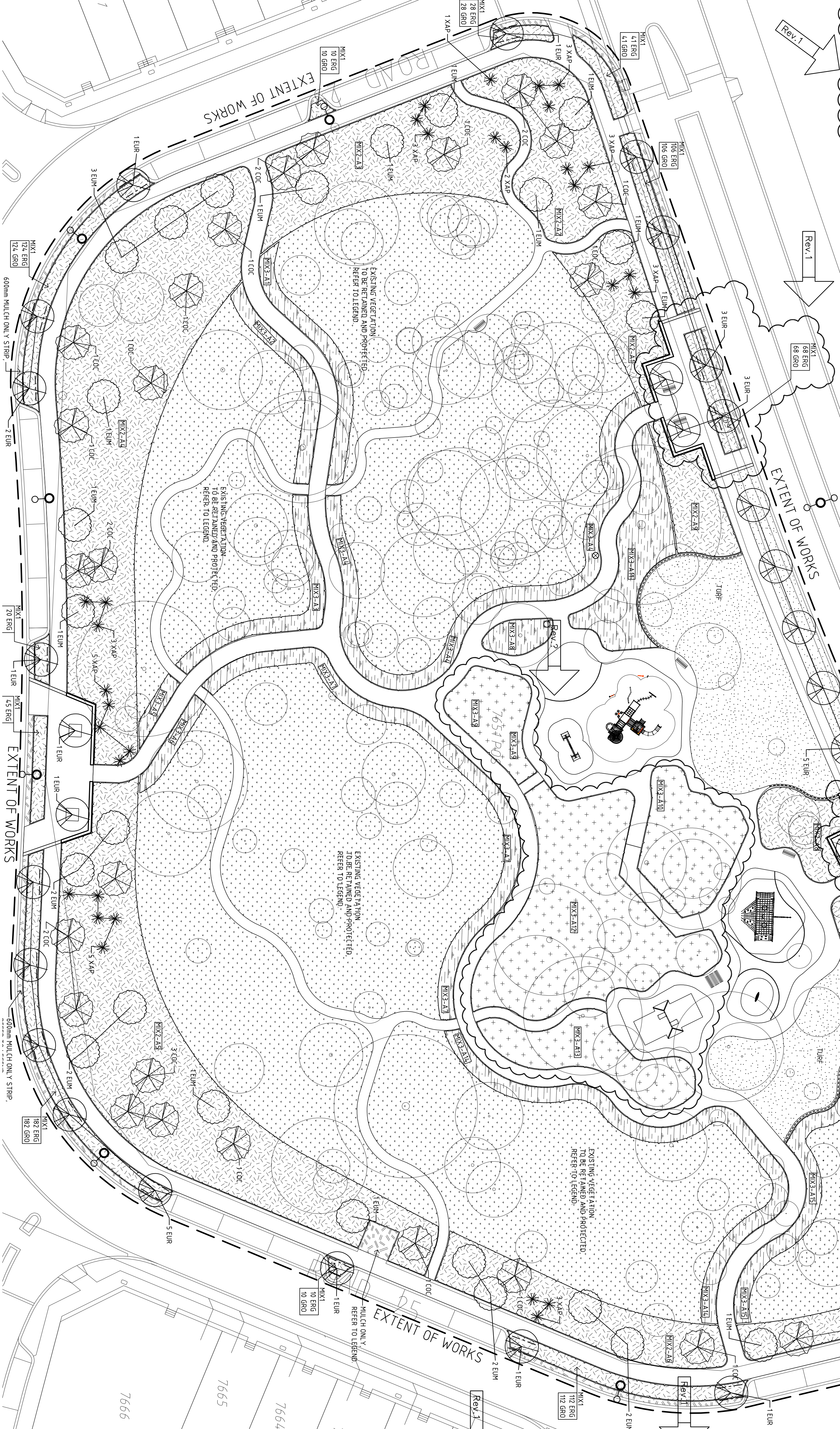
6. References

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Appendix 1
POS Landscape Construction plan



MIX-2-A1	101 ANM	MIX-2-A2	253 ANM	MIX-2-A3	637 ANM	MIX-2-A4	586 ANM	MIX-2-A5	166 ANM	MIX-2-A6	475 ANM	MIX-2-A7	67 ANM	MIX-2-A8	71 ANM
101 COA	90 COA	126 COA	319 COA	293 COA	83 COA	11 COC	1 COC	1 COC	3 COC	0 COC	0 COC	0 COC	0 COC	0 COC	0 COC
1 EUR	1 EUR	2 EUR	4 EUR	4 EUR	1 EUR	1 EUR	1 EUR	1 EUR	0 EUR	0 EUR	0 EUR	0 EUR	0 EUR	0 EUR	0 EUR
0 EUR	1 EUR	2 EUR	2 EUR	2 EUR	1 EUR	1 EUR	1 EUR	1 EUR	0 EUR	0 EUR	0 EUR	0 EUR	0 EUR	0 EUR	0 EUR
57 GPO	11 HAP	129 GPO	375 GPO	85 GPO	36 GPO	36 GPO	36 GPO	36 GPO	36 GPO	36 GPO	36 GPO	36 GPO	36 GPO	36 GPO	36 GPO
6 HAP	35 HIR	62 HIR	88 HIR	221 HIR	16 HAP	10 HAP	58 HIR	14 HIR	23 HIR	25 HIR	4 HAP	4 HAP	4 HAP	4 HAP	4 HAP
76 PAO	13 KEP	22 KEP	80 KEP	73 KEP	13 KEP	21 KEP	25 KEP	31 PAO	50 PAO	53 PAO	9 KEP	9 KEP	9 KEP	9 KEP	9 KEP
6 VEN	11 VEN	18 VEN	169 PAO	478 PAO	37 VEN	10 VEN	26 VEN	26 VEN	26 VEN	26 VEN	26 VEN	26 VEN	26 VEN	26 VEN	26 VEN
MIX-3-A1	43 ANM	MIX-3-A2	53 ANM	MIX-3-A3	125 ANM	MIX-3-A4	13 ANM	MIX-3-A5	20 ANM	MIX-3-A6	116 ANM	MIX-3-A7	24 ANM	MIX-3-A8	20 ANM
38 COA	32 COA	40 COA	94 COA	94 COA	10 COA	10 COA	10 COA	10 COA	10 COA	10 COA	10 COA	10 COA	10 COA	10 COA	10 COA
39 GPO	33 GPO	41 GPO	95 GPO	10 GPO	10 GPO	10 GPO	10 GPO	10 GPO	10 GPO	10 GPO	10 GPO	10 GPO	10 GPO	10 GPO	10 GPO
18 HIR	15 HIR	18 HIR	43 HIR	5 HIR	7 HIR	8 HIR	8 HIR	8 HIR	8 HIR	8 HIR	8 HIR	8 HIR	8 HIR	8 HIR	8 HIR
6 KEP	5 KEP	7 KEP	16 KEP	10 PAO	15 PAO	15 PAO	15 PAO	15 PAO	15 PAO	15 PAO	15 PAO	15 PAO	15 PAO	15 PAO	15 PAO
38 PAO	32 PAO	40 PAO	94 PAO	10 PAO	10 PAO	10 PAO	10 PAO	10 PAO	10 PAO	10 PAO	10 PAO	10 PAO	10 PAO	10 PAO	10 PAO
MIX-3-A10	102 ANM	MIX-3-A11	100 ANM	MIX-3-A12	30 ANM	MIX-3-A13	111 ANM	MIX-3-A14	74 ANM	MIX-3-A15	56 COA				
20 COA	77 COA	80 COA	20 COA	83 COA	20 COA	83 COA	20 COA	83 COA	20 COA	83 COA	20 COA				
20 GPO	78 GPO	80 GPO	20 GPO	85 GPO	20 GPO	85 GPO	20 GPO	85 GPO	20 GPO	85 GPO	20 GPO				
15 HIR	36 HIR	80 HIR	30 HIR	39 HIR	15 HIR	26 HIR	15 HIR	26 HIR	15 HIR	26 HIR	15 HIR				
5 KEP	13 KEP	10 KEP	10 KEP	14 KEP	9 KEP	9 KEP	9 KEP	9 KEP	9 KEP	9 KEP	9 KEP				
30 PAO	77 PAO	80 PAO	30 PAO	83 PAO	30 PAO	83 PAO	30 PAO	83 PAO	30 PAO	83 PAO	30 PAO				



MIX 1

Key	Botanic Name	Qty	Spacing	Pot
ERG	EUPHORBIA GILGARA	107	500mm	TUBE
ERG	GREVILLEA OBUSIFOLIA GN GN GEP	107	500mm	TUBE

MIX 2

Key	Botanic Name	Qty	Spacing	Pot
ANM	ANGUZYANTHOS MANGESII	215	500mm	TUBE
COA	CONOSTYLIS ACULEATA	327	500mm	TUBE
COA	CORYMBIA CALOPHYLLA	16	200	TUBE
EIM	EULALYPTUS MARGATA	8	200	TUBE
EIM	EULALYPTUS RUDIS	8	200	TUBE
ERG	GREVILLEA OBUSIFOLIA GN GN GEP	124	700mm	TUBE
ERG	GREVILLEA OBUSIFOLIA GN GN GEP	154	100	TUBE
HAP	HAKA PROSTRATA	860	600mm	TUBE
HIR	HIBBERTIA BAILENSA	370	100	TUBE
KEP	KENNEDIA PROSTRATA	187	500mm	TUBE
PAO	PATTERSONIA OCCIDENTALIS	154	100	TUBE
VEN	VERTICORDA NIENS	154	100	TUBE

MIX 3

Key	Botanic Name	Qty	Spacing	Pot
ANM	ANGUZYANTHOS MANGESII	1388	500mm	TUBE
COA	CONOSTYLIS ACULEATA	1042	500mm	TUBE
COA	GREVILLEA OBUSIFOLIA GN GN GEP	1063	700mm	TUBE
HR	HIBBERTIA BAILENSA	483	600mm	TUBE
KEP	KENNEDIA PROSTRATA	173	100	TUBE
PAO	PATTERSONIA OCCIDENTALIS	1042	500mm	TUBE

TREE PLANTING - PREPARED SOIL TO ALL TREES (SUPPLY & INSTALL)

Key	Botanic Name	Qty	Spacing	Pot
COA	CORYMBIA CALOPHYLLA	34	AS SHOWN	15L
ERG	EULALYPTUS MARGATA	28	AS SHOWN	15L

TREE PLANTING - BY GTA

Key	Botanic Name	Qty	Spacing	Pot
ERG	EULALYPTUS RUDIS	35	AS SHOWN	200L

Key	Botanic Name	Qty	Spacing	Pot
XAP	XANTHORHIZA PRENSI	41	AS SHOWN	TRANS

LEGEND:

SYM.	DESCRIPTION	QTY.
[Symbol]	GARDEN BED AREA TYPE A - NO PREPARED SOIL. MULCHED 75mm THK WITH SITE BY OTHERS.	
[Symbol]	GARDEN BED AREA TYPE B - NO PREPARED SOIL. MULCHED 75mm THK WITH SITE BY OTHERS.	
[Symbol]	GARDEN BED AREA TYPE C - NO PREPARED SOIL. MULCHED 75mm THK WITH SITE BY OTHERS.	
[Symbol]	GARDEN BED AREA TYPE D - NO PREPARED SOIL. MULCHED 75mm THK WITH SITE BY OTHERS.	
[Symbol]	TURF GRASSING - BY OTHERS.	
[Symbol]	PREPARED SOIL TO TURF AREA. SAND PATTERNS INCLUDING PERIPHERY AREA. MULCHED 75mm THK WITH SITE BY OTHERS.	
[Symbol]	MULCH ONLY TYPE A - MULCHED 75mm THK WITH SITE MULCH INSTALL ONLY. NO IRRIGATION.	
[Symbol]	EXISTING VEGETATION TO BE RETAINED AND PROTECTED.	
[Symbol]	ROOT CONTROL BARRIER - 600MM DEEP. REFER TO SPEC.	
[Symbol]	EXISTING TREES TO BE RETAINED & PROTECTED.	

NOTE:
PLANTS USED IN MIXED PLANTING ARE TO BE SPACED AS SHOWN & PLACED WHERE NO MORE THAN THREE (3) PLANTS OF THE SAME SPECIES ARE ADJACENT TO EACH OTHER.
STREET TREES ARE TO BE LOCATED AT A MIN CLEARANCE OF 8m FROM STREET LIGHTS & 35m FROM SITE ENTRY DRAINAGE PITS AS PER CITY OF SWAN REQUIREMENTS. LANDSCAPE CONTRACTOR IS TO PEG ALL TREE LOCATIONS TO THE SUPERINTENDENT'S APPROVAL PRIOR TO INSTALLATION.
LANDSCAPE CONTRACTOR IS TO ALLOW FOR THE COLLECTION & DELIVERY TO SITE OF ALL 200L E. RUIDS AVAILABLE FROM ELLENBURY TREE FARM (BULLSBROOK).
LANDSCAPE CONTRACTOR IS TO ALLOW FOR THE COLLECTION & DELIVERY 100 SITE OF SITE MULCH FROM WITHIN 5KM OF SITE.

SPACED AS SHOWN & PLACED WHERE NO MORE THAN THREE (3) PLANTS OF THE SAME SPECIES ARE ADJACENT TO EACH OTHER.

STREET TREES ARE TO BE LOCATED AT A MIN. CLEARANCE OF 8m FROM STREET LIGHTS & 3.5m FROM SITE ENTRY DRAINAGE PIT'S AS PER CITY OF SWAN REQUIREMENTS. LANDSCAPE CONTRACTOR IS TO PEE ALL TREE LOCATIONS TO THE SUPERINTENDENT'S APPROVAL PRIOR TO INSTALLATION.

LANDSCAPE CONTRACTOR IS TO ALLOW FOR THE COLLECTION & DELIVERY TO SITE OF ALL 200L E. RIDGS. AVAILABLE FROM ELLENBY TREE FARM (BULLSBOOK).

LANDSCAPE CONTRACTOR IS TO ALLOW FOR THE COLLECTION & DELIVERY TOO SITE OF SITE MULCH FROM WITHIN 5KM OF SITE.

Appendix 2

Georeferenced site photos

South West Elevation

☼ 33°NE (T) LAT: -31.751825 LON: 115.988907 ±5m ▲ 43m



Photo 1: On-site Class C shrubland



Photo 2: On-site Class C shrubland



Photo 3: On-site Class D scrub



Photo 4: On-site cleared/managed areas excluded from classification (Clause 2.2.3.2 e and f)



Photo 5: Off-site Class A forest north of project area



Photo 6: Off-site Class A forest (left of photo) and Class B woodland (right of photo) north of project area



Photo 7: Off-site Class B woodland north of project area



Photo 8: Off-site Class B woodland (in background) and cleared areas excluded from classification (Clause 2.2.3.2 e) north of project area



Photo 9: Off-site vegetation excluded from classification (Clause 2.2.3.2 b) within POS to the south

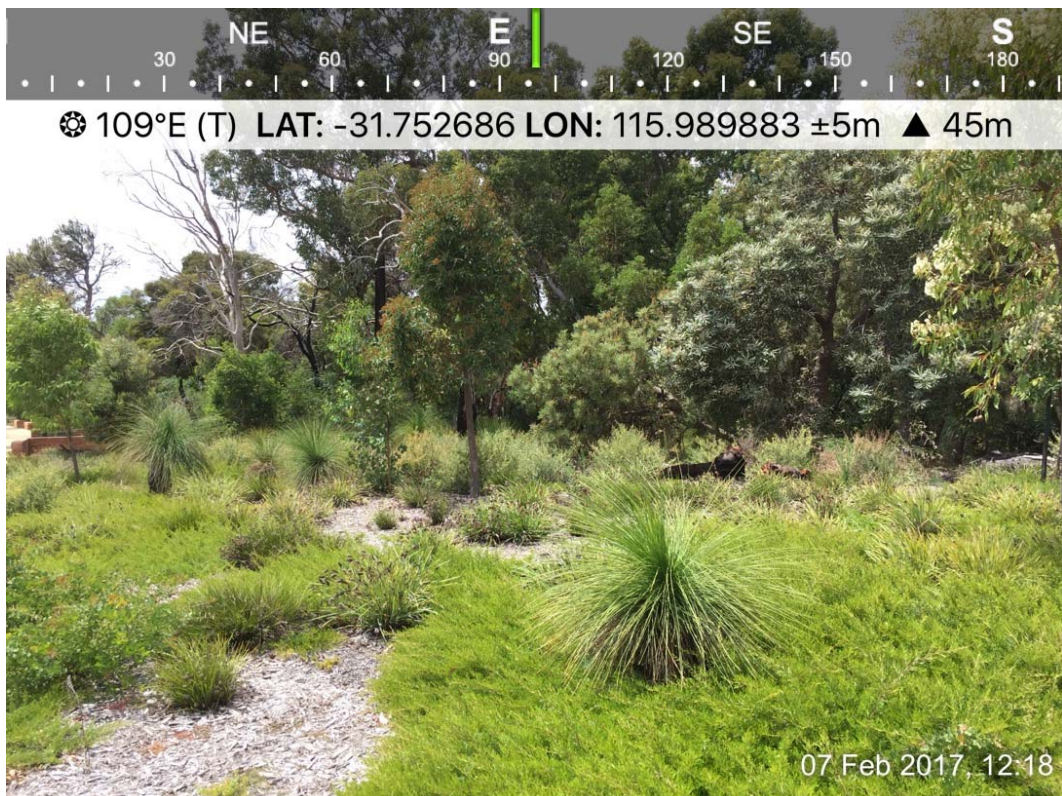


Photo 10: Off-site vegetation excluded from classification (Clause 2.2.3.2 b) within POS to the south

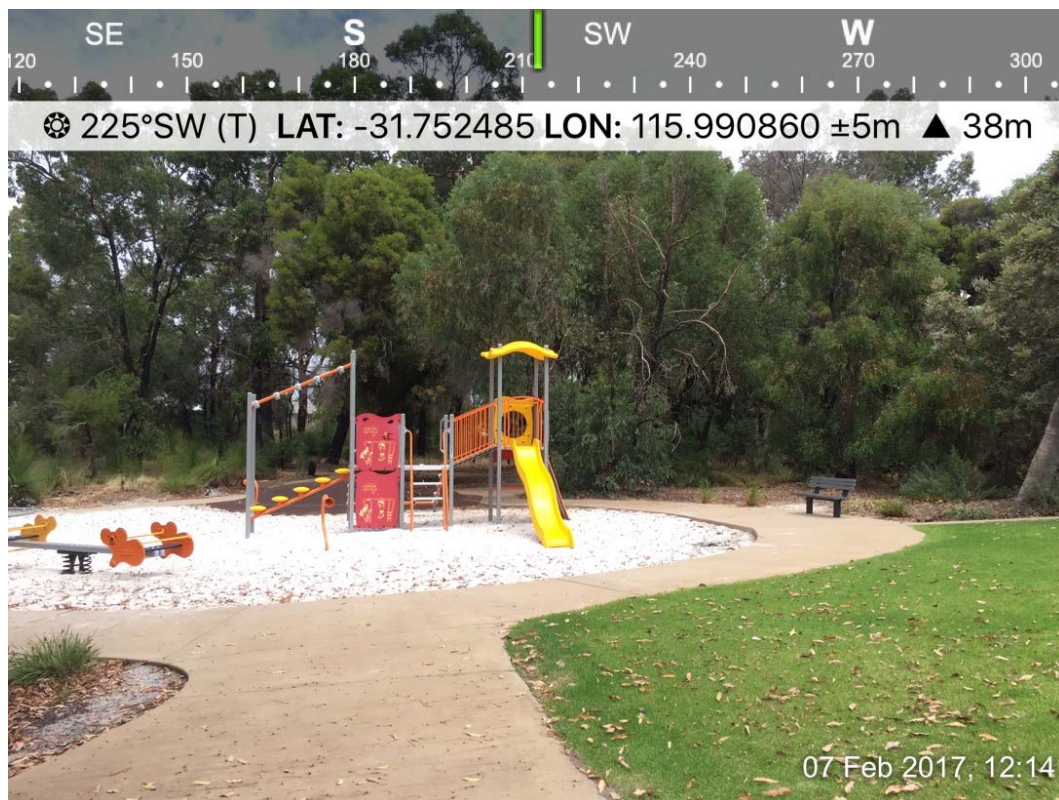


Photo 11: Off-site areas excluded from classification (Clause 2.2.3.2 e and f) within POS to the south



Photo 12: Off-site areas excluded from classification (Clause 2.2.3.2 e and f) to the east



Photo 13: Off-site areas excluded from classification (Clause 2.2.3.2 e and f) to the south



Photo 14: Off-site areas excluded from classification (Clause 2.2.3.2 e and f) within Banrock Drive reserve



Photo 15: Off-site areas excluded from classification (Clause 2.2.3.2 e and f) to the west



Photo 16: Off-site areas excluded from classification (Clause 2.2.3.2 e and f) within Helms Loop reserve

Appendix 3

City of Swan annual firebreak notice

BUSHFIRES 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.

As a measure 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 **2nd day of November 2016**, or within 14 days of becoming an owner or occupier of land if after that date, to clear firebreaks or take measures in accordance with this notice and maintain those firebreaks and measures to the required condition up to and including the **30th day of April 2017**.

1. All Land with an area under 5,001m² (land under ½ Hectare)

- 1) Maintain grass to a height of no greater than 5cm.
- 2) Install and maintain a Building Protection Zone, in accordance with the requirements specified in clause 13 of this notice.
- 3) Any parcel of land having an area less than 5,001m² that is substantially developed that may include land that:
 - a) Predominantly consists of non-flammable managed vegetation, reticulated lawns and gardens and other non-flammable features; or
 - b) Areas that are sufficiently Parkland Clearedmay maintain grass to a height of no greater than 5cm, or remove all flammable materials in lieu of clearing firebreaks.
- 4) Areas of natural vegetation to be maintained at or below 8 tonnes per hectare.
- 5) Where a property is affected by an approved Bushfire Management Plan as a condition of subdivision or development, property owners shall comply with all requirements and responsibilities outlined within that plan.

2. All land with an area of 5,001m² or greater (land over ½ Hectare)

- 1) Install 3 metre wide firebreaks immediately inside and adjacent to all external property boundaries which are free from flammable materials with a 4 metre vertical height clearance free from overhanging branches
- 2) Properties over 100 hectares require additional firebreaks to divide the land into areas not exceeding 100 hectares.
- 3) Slash or mow unmanaged grass (grass that is 50cm or higher) to a height no greater than 10cm immediately adjacent firebreaks to a minimum width of 3 metres.
- 4) Install and maintain a Building Protection Zone, in accordance with the requirements specified in clause 13 of this notice.
- 5) Natural Vegetation within 100 metres of Buildings, 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.
- 6) Where a property is affected by an approved Bushfire Management Plan as a condition of subdivision or development, property owners shall comply with all requirements and responsibilities outlined within that plan.

3. 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 3(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 3(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.

4. 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 on the land any fire hazard reduction work or measures required by this notice, you may apply in writing on or before the **15th day of October, 2016** for approval to provide firebreaks in alternative positions or to take alternative measures to abate fire hazards on the land.
- 2) If permission is not granted in writing by the City prior to the **2nd day of November, 2016** you shall comply with the requirements of this notice.
- 3) When permission to provide 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.
- 4) Where the City has in writing approved a Bushfire Management Plan as a condition of subdivision and the Bushfire Management Plan depicts an array of alternative firebreak positions and alignments, a property owner may, as an alternative to general boundary firebreaks, elect to provide an alternative firebreak(s) depicted on the Bushfire Management Plan. However, if the alternative firebreak is not constructed by the date required by this notice, then general firebreak requirements shall apply.

5. 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.

6. Hay Stacks

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

7. Strategic Firebreaks

- 1) Where under a written agreement with the City, or where depicted on an approved Bushfire Management Plan strategic firebreaks are required on the land, you are required to clear and maintain strategic firebreaks a minimum of 6 metres wide along the agreed alignment to provide restricted vehicular access to emergency and authorised vehicles, unimpeded by obstructions including boundary fences unless fitted with gates and signage approved in writing by the City.
- 2) Gates may only be secured with City of Swan Fire Service padlocks.
- 3) Strategic firebreaks shall be graded to provide a continuous 4 wheel drive trafficable surface a minimum of 4 metres wide.

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

8. 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.

9. Firebreak Construction

- 1) Firebreaks are to be developed and maintained clear of all obstacles and flammable materials to create a minimum of 3 metre 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.

10. 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 a minimum 3 metre width over the driveway.

11. Fuel Reduction - Unmanaged Grasses

- 1) All grass within Building Protection Zones, and on all land less than 5,001m² in area, is required to be mowed and maintained under 5cm in height over the entire area.
- 2) On land 5,001m² or greater, and not including Building Protection Zone areas,
 - a) Maintain grass under 10cm within Hazard Separation Zones.
 - b) Slash or mow unmanaged grass (grass that is 50cm or higher) to a height no greater than 10cm immediately adjacent firebreaks to a minimum width of 3 metres.
 - c) If the land described above in 10(2)(b) is stocked, the grass must be reduced to a height of no greater than 10cm high by the **1st day of December 2016**.

Subject to clause c), all grassed areas required by this notice to be maintained at or below a required height must be maintained in that condition between **2nd day of November until the 30th day of April the following year**.

12. Fuel Reduction - Natural Vegetation

- 1) Available bushfire fuels must be maintained at or below:
 - a) Building 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 Environment 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. Building Protection Zones Specification

The Building Protection Zone for habitable buildings and related structures must meet the following requirements:

- 1) Building Protection Zones for habitable buildings must extend a minimum of 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 Building Protection Zone distance shall increase at least 1 metre for every degree in slope on the sides of the building/structure that are exposed to down slope natural vegetation.
- 3) Recommendation Only - Building Protection Zones predominantly consist of non-flammable managed vegetation, reticulated lawns and gardens and other non-flammable features.
- 4) All grass is maintained to or under 5cm.
- 5) Fuel loads must be reduced and maintained at 2 tonnes per hectare or lower.
- 6) 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 a Building Protection Zone is not required or supported by this notice and requires approval from the Department of Environment and Regulation and the City of Swan.
- 7) 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.
- 8) Trees are to be low pruned (or under pruned) to at least a height of 2 metres from ground.
- 9) No tree, or shrub over 2 metres high is planted within 2 metres of a building, especially adjacent to windows.
- 10) There are no tree crowns or branches hanging over buildings.
- 11) 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).

- 12) Install paths or clear flammable or dry vegetation, debris and materials immediately adjacent to the building.
- 13) 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*.

Prohibited period: All burning, including garden refuse is prohibited during this period.

Restricted period: All burning requires a permit. Garden refuse is exempt and may be burnt without a permit after 6pm subject to conditions within the Bush Fires Act 1954, Health Act 1911 and compliance with the City's Consolidated Local Laws 2005. Conditions of burning include:

- 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 pile of refuse being burnt does not exceed 1 cubic metre and only one pile is alight at any time.
- 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 and adequate means of extinguishing the fire is available at all times (e.g. garden hose or a fire appliance).
- 6) You notify your neighbours of your intention to burn and the smoke from your fire doesn't cause a nuisance to neighbours or obscure the vision of motorists.
- 7) You do not burn household or commercial waste, any noxious materials or any damp, wet or green material which could cause excessive smoke at any time.

15. 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) Adherence to measures outlined within an approved Bushfire Management Plan developed as a condition of subdivision does not provide land owners and occupiers with any exemptions to the requirements of this notice unless this notice specifically states otherwise.

16. 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 an alternative measures in lieu of general firebreaks.

'Available Fuel' is the bush fuel consisting of live and dead vegetation and debris that will actually burn under prevailing conditions. Fuel available for burning depends on temperature, moisture in the air and within the vegetation and curing of vegetation. In summer there is a significant increase in available fuel.

'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.

'Building Protection Zone (BPZ)' 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 primarily for the purpose of determining the land suitability, design features and infrastructure that will increase bushfire safety within the location. Bushfire Management Plans may become outdated with regards to property owner fire safety advice and responsibilities due to seasonal changes and evolving fire safety strategies. Up to date advice and strategies are administered within local government areas as a legal requirement through the annual firebreak notice regulation. Fire Management Plans are not a legal requirement unless specifically referenced as a requirement within this notice, or a written notice addressed directly to a land owner.

'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 to minimise the spread or extension of a bushfire. For the purpose of this notice the term firebreak is a strip of land 3 metres wide that also provides a trafficable surface and 4 metres vertical clearance for emergency and authorised vehicle access. Boundary firebreaks are installed immediately adjacent the external boundaries of a property.

'Fire Hazard or Bushfire 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 a Building Protection Zone a distance of 80 metres unless otherwise specified, to create a graduated fuel reduction and separation from natural vegetation that is unmodified in structure and density.

'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.

'Strategic Firebreak' 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.

'Unmanaged Grasses' is undisturbed or very lightly grazed grasses with a height of 50cm or greater.

By order of the Council,

MJ Foley
CHIEF EXECUTIVE OFFICER
CITY OF SWAN