Ordinary Council Meeting 23/03/21

Item 12.1 refers

Attachment 7

Bushfire Management Plan

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Integrated Science & Design

Bushfire Management Plan

Redcliffe Station Activity Centre Plan

Project No: EP20-133(02)

Prepared for City of Belmont
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This document has been prepared primarily to consider the layout of development and/or the appropriate building construction standards applicable to development, where relevant. The measures outlined are considered to be prudent minimum standards only based on the standards prescribed by the relevant authorities. The level of bushfire risk mitigation achieved will depend upon the actions of the landowner or occupiers of the land and is not the responsibility of the author. The relevant local government and fire authority (i.e. Department of Fire and Emergency Services or local bushfire brigade) should be approached for guidance on preparing for and responding to a bushfire.

Notwithstanding the precautions recommended in this document, it should always be remembered that bushfires burn under a wide range of conditions which can be unpredictable. An element of risk, no matter how small, will always remain. The objective of the Australian Standard AS 3959:2018 is to “prescribe particular construction details for buildings to reduce the risk of ignition appropriate to the potential for ignition caused by burning embers, radiant heat or flame and intensity of the bushfire attack on the building” (Standards Australia 2018). Building to the standards outlined in AS 3959 does not guarantee a building will survive a bushfire or that lives will not be lost.

Executive Summary

TBB is progressing an activity centre plan (ACP) on behalf of the City of Belmont (the proponent) for landholdings surrounding the Redcliffe Train Station (herein referred to as the 'the site'). The Redcliffe Station ACP covers a total area of approximately 49 hectares (ha) and is located approximately 8 km east of the Perth Central Business District within the City of Belmont. The site is generally bound by existing residential development to the north-west and south-west, commercial buildings to the north-east and facilities associated with Perth Airport to the south-east.

The western portion of the site is located within a 'bushfire prone area' under the state-wide *Map of Bush Fire Prone Areas* prepared by the Office of Bushfire Risk Management (OBRM 2019). The identification of a site within an area declared as bushfire prone necessitates that a further assessment of the determined bushfire risk affecting the site (in accordance with *Australian Standard 3959:2018 Construction of buildings in bushfire prone areas* (AS 3959)) and the satisfactory compliance of the proposal with the policy measures described in *State Planning Policy 3.7 Planning in Bushfire Prone Areas* (SPP 3.7) (WAPC 2015) and the *Guidelines for Planning in Bushfire Prone Areas Version 1.3* (the Guidelines) (WAPC and DFES 2017).

The purpose of this BMP is therefore to assess the bushfire hazards, both within and nearby the site, and identify the 'management' strategies required to ensure the development of the land is consistent with the intent of SPP 3.7 - *to preserve life and reduce the impact of bushfire on property and infrastructure.*

This BMP has followed the requirements of SPP 3.7 to identify the bushfire risk and the bushfire protection measures that will make the land suitable for its intended purpose. As part of this, a Bushfire Attack Level (BAL) assessment involving the classification and condition of vegetation within 150 m of the site has been undertaken.

The site currently supports existing residential and commercial development, with small patches of forest (Class A) and scrub (Class D) vegetation within the southern portion of the site, in addition to several undeveloped lots which support unmanaged grassland (Class G) vegetation. Forest and grassland vegetation has been identified to the west, south and east of the site, whilst scrub vegetation has been identified to the south and east. Shrubland (Class C) vegetation has been identified to the south and east of the site.

In order to resolve the potential for a bushfire to affect the site, a post-development scenario is proposed in which all classified vegetation within the site will be removed or managed in a 'low threat' standard.

The outcomes of this BMP demonstrate that as development progresses, it will be possible for an acceptable solution to be adopted for each of the applicable bushfire protection criteria outlined in the Guidelines. This includes:

- **Location**: future development can be located within an area that will, on completion, be subject to a low or moderate bushfire hazard, based on the removal or management of existing classified vegetation within the site.

- **Siting and Design**: all future habitable buildings can be sited within the site so that BAL-29 or less can be achieved based on the size of the site. This will require appropriate setbacks and/or asset protection zones to be considered as part of future development, to accommodate the bushfire risks located immediately to the east, south and west of the site. These setbacks can be accommodated through the provision of in-lot setbacks.
- **Vehicular Access**: the site is located within existing urban development, with several roads that connect it to major roads surrounding the site. This includes Great Northern Highway to the north and Dunreath Drive to the east. The ACP utilises these roads, and therefore future development within the site will connect to the public road network.
- **Water**: the site is connected to an existing reticulated water supply, and future development within the site will connect to this network to support onsite firefighting requirements.

The management/mitigation measures to be implemented through the ACP process and associated future subdivision/development process have been outlined as part of this BMP. It is expected that a revised BMP will need to be prepared to support any future subdivision/development application(s) and will need to assess the proposed development design in consideration of the recommendations of this BMP and SPP 3.7.

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Appendices

Appendix A

Redcliffe Station Activity Centre Plan (TBB 2020)

Abbreviation Tables

Table A1: Abbreviations – General terms

Organisations	
AHD	Australian Height Datum
AS	Australian Standard
BAL	Bushfire Attack Level
BEEP	Bushfire Emergency Evacuation Plan
BMP	Bushfire Management Plan
BPAD	Bushfire Planning and Design
FDI	Fire Danger Index
FZ	Flame Zone
SLIP	Shared Location Information Platform

Table A2: Abbreviations – Organisations

Organisations	
DFES	Department of Fire and Emergency Services
DPLH	Department of Planning, Lands and Heritage
OBRM	Office of Bushfire Risk Management
WAPC	Western Australian Planning Commission

Table A3: Abbreviations – Legislation

Legislation	
Guidelines	*Guidelines for Planning in Bushfire Prone Areas Version 1.3 (WAPC and DFES 2017)*
SPP 3.7	*State Planning Policy 3.7 Planning in Bushfire Prone Areas (WAPC 2015)*

Table A4: Abbreviations – Planning and building terms

Planning and building terms	
ACP	Activity centre plan
AS 3959	*Australian Standard 3959:2018 Construction of buildings in bushfire-prone areas (Standards Australia 2018)*
BCA	Building Code Australia
LPS	Local Planning Scheme
MRS	Metropolitan Region Scheme

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1 Introduction

1.1 Background

TBB is progressing an activity centre plan (ACP) on behalf of the City of Belmont (the proponent) for landholdings surrounding the Redcliffe Train Station (herein referred to as the 'the site'). The Redcliffe Station ACP is provided in **Appendix A** and covers a total area of approximately 49 hectares (ha). The site is located approximately 8 km east of the Perth Central Business District within the City of Belmont, as shown in **Figure 1**. The site is bound by residential development to the north-west and south-west, commercial buildings to the north-east and facilities associated with Perth Airport to the south-east.

The western portion of the site is identified within a 'bushfire prone area' under the state-wide *Map of Bush Fire Prone Areas* prepared by the Office of Bushfire Risk Management (OBRM 2019), as shown in **Plate 1**. The identification of a site within an area declared as bushfire prone necessitates that a further assessment of the determined bushfire risk affecting the site (in accordance with *Australian Standard 3959:2018 Construction of buildings in bushfire prone areas* (AS 3959)) (Standards Australia 2018) and the satisfactory compliance of the proposal with the policy measures described in *State Planning Policy 3.7 Planning in Bushfire Prone Areas* (SPP 3.7) (WAPC 2015) and the *Guidelines for Planning in Bushfire Prone Areas Version 1.3* (the Guidelines) (WAPC and DFES 2017).

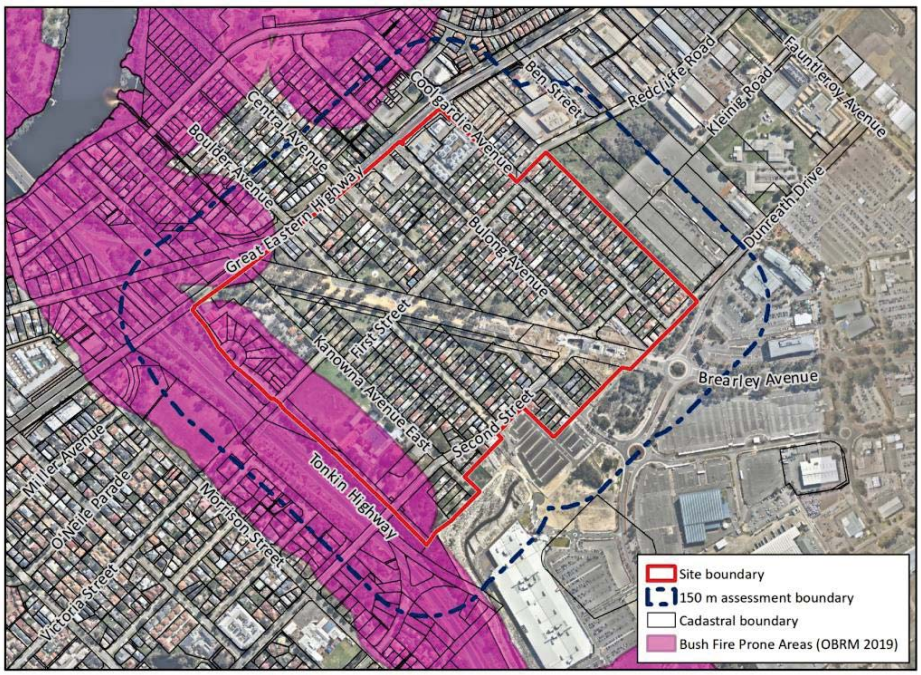

Plate 1: Areas within and surrounding the site identified as 'bushfire prone areas' (as indicated in purple) under the state-wide Map of Bushfire Prone Areas (ORBM 2019)

1.2 Aim of this report

The aim of this Bushfire Management Plan (BMP) is to assess bushfire hazards within the site and nearby areas and ensure that the threat posed by any identified hazards can be appropriately mitigated and managed, and demonstrate satisfaction of clause 6.11 of SPP 3.7, the precautionary principle. It has been prepared to support the proposed Redcliffe Station ACP and addresses the requirements of SPP 3.7 (WAPC 2015), the Guidelines (WAPC and DFES 2017) and (AS 3959) (Standards Australia 2018). This document provides an assessment of the bushfire management strategies to be considered as part of the future development of individual buildings within the site and includes:

- An assessment of the existing classified vegetation in the vicinity of the site (within 150 m) and consideration of bushfire hazards that will exist in the post-development scenario (**Section 3**).
- Commentary on how future development can achieve the bushfire protection criteria outlined within the Guidelines including an indication of BAL ratings likely to be applicable to future dwellings (**Section 5**).
- An outline of the roles and responsibilities associated with implementing this BMP (see **Section 6**).

1.3 Statutory policy and framework

The following key legislation, policies and guidelines are relevant to the preparation of a bushfire management plan:

- *Bush Fires Act 1954*
- *Fire and Emergency Services Act 1998*
- *Planning and Development Act 2005* and associated regulations
- *State Planning Policy 3.7 Planning in Bushfire Prone Areas* (WAPC 2015)
- *Guidelines for Planning in Bushfire Prone Areas Version 1.3* (WAPC and DFES 2017)
- *Australian Standard AS 3959 – 2018 Construction of buildings in bushfire prone areas* (Standards Australia 2018)

It is noted that the ACP applies to an existing urban area, and not all existing residential and commercial dwellings will be developed as part of the ACP. In accordance with Section 2.2 of the Guidelines, the policy measures of SPP 3.7 and the Guidelines are not to be applied retrospectively.

Therefore, this BMP is not intended to apply to the existing habitable buildings present within the site, only to the new habitable buildings to be constructed as part of the future development of the site in accordance with the implementation of the ACP, where located within a 'bushfire prone area' as identified *Map of Bush Fire Prone Areas*. However, where possible bushfire risk to life, property and infrastructure associated with the existing buildings will be minimised in accordance with SPP 3.7.

1.4 Description of the proposed development

The site is zoned 'urban' under the Metropolitan Region Scheme (MRS), as shown in **Plate 2**. Under the City of Belmont Local Planning Scheme (LPS) No. 15, the is a mixture of reservations and zonings, as listed below:

- The majority of the site is zoned 'residential'.
- Land running north-west to south-east through the centre of the site adjacent to Brearley Avenue is reserved 'parks and recreation'.
- Areas of 'mixed-use' zoned land are located in the western and north-western portions of the site.
- A single lot adjacent to Great Eastern Highway is zoned 'service station'.
- Redcliffe Primary School is located in the south-western portion of the site, and is reserved for 'public purposes – primary school'.

The Redcliffe Station ACP will facilitate future development within the site, creating areas of greater residential density around the future Redcliffe Station, as shown in **Appendix A**. The existing land uses within the site as described above will be retained as part of future development, noting that areas adjacent to the Redcliffe Station will form the future 'Centre Precinct', which will include mixed-use developments, where land is currently only reserved for residential land uses.

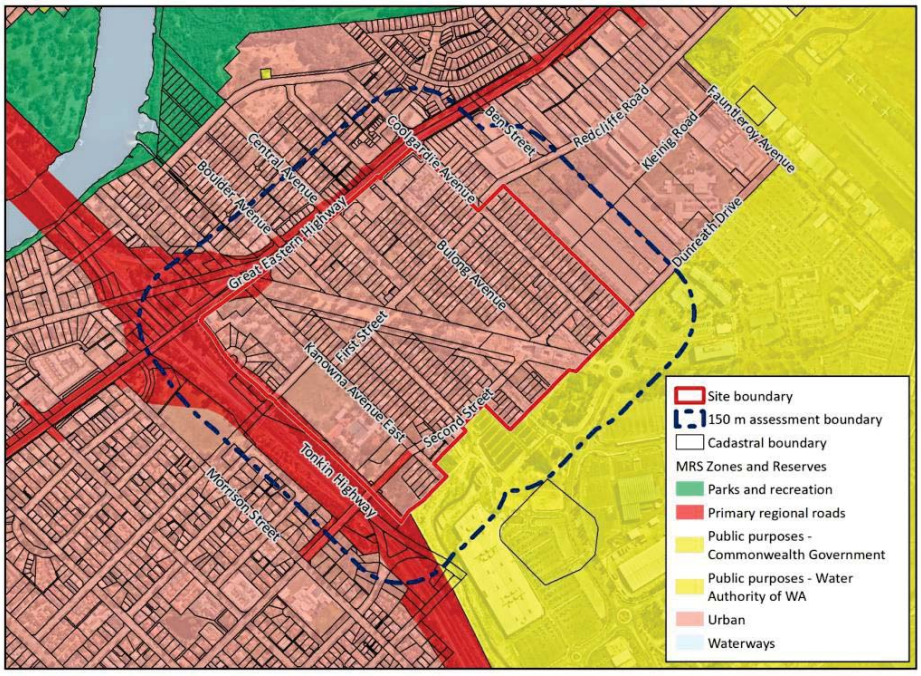

Plate 2: MRS zones and reserves within and surrounding the site

1.5 Description of land characteristics

The natural topographical contours indicate that the site is generally flat, with the majority of the site located at an elevation of between 8 and 11 m Australian Height Datum (m AHD). There is a slight rise located within the southern portion of the site, with the site rising to a height of approximately 19 m AHD.

Based on a review of publicly available historic aerial imagery (Landgate 2020), development within the site commenced prior to 1953, with a mixture of native vegetation and development present in 1953. The majority of native vegetation within the site was removed by 1974, with minimal regrowth occurring since initial clearing occurring. The majority of the existing dwellings within the site were constructed by 1974. Construction associated with the development of the Redcliffe Station commenced in 2017, and is ongoing.

The land uses within and surrounding the site include:

- A mixture of residential and commercial landholdings, public open space and a primary school.
- Existing residential landholdings located to the north-west and south-west of the site.
- Commercial land uses located to the north-east of the site.
- Buildings and infrastructure associated with Perth Airport is located to the south-east of the site.
- The Great Eastern Highway is located adjacent to the north-western boundary of the site, whilst Tonkin Highway is located adjacent to the south-western boundary.

Redcliffe Station is one of three new stations that is being constructed as part of the Forrestfield Airport Link project.

2 Environmental Considerations

In accordance with the *Bushfire Management Plan – BAL Contour* template prepared by the Department of Planning, Lands and Heritage (2018), this BMP has considered whether there are any environmental values that may require specific consideration through either protection, retention or revegetation. To support this, a review of publicly available databases, as well as site-specific information (where available) has been undertaken, with particular reference to the Shared Location Information Platform (SLIP) databases. A summary of the search results has been provided in **Table 1**.

The site has previously been cleared of a majority of native vegetation, with only scattered native trees remaining. The majority of the site supports existing residential and commercial development, with the majority of dwellings constructed prior to 1974.

Table 1: Summary of potential environmental considerations that may be associated with the site (based on a search of the SLIP databases)

Key environmental feature (information in brackets refers to mapping data source)	Yes / no / potentially occurring within the site	If yes / potentially, describe value that may be impacted
Conservation category wetlands and buffer (Geomorphic wetlands, Swan Coastal Plain (DBCA-019))	No	No conservation category wetlands have been mapped within or adjacent to the site.
RAMSAR wetlands (DBCA-010)	No	The site is not mapped as a Ramsar wetland.
Threatened and priority flora (DBCA-036)	No	No species of threatened or priority flora are identified within the mapping as occurring within the site. Additionally, due to the historic clearing, it is considered unlikely that the site supports threatened or priority flora species.
Threatened and priority fauna (DBCA-037)	Potentially	A single historic record of a priority fauna species is identified within the mapping as occurring within the site. This record occurs within the footprint of the Redcliffe Station which is currently cleared of native vegetation. Due to the historic clearing within the site, it is unlikely that the site provides significant habitat for any threatened or priority fauna species.
Threatened ecological communities (TEC) (DBCA-038)	Potentially	Broad-scale mapping shows several threatened ecological communities are identified within or adjacent to the site. Due to the historic clearing, it is considered unlikely that the majority of the site supports any TECs, however it is possible that bankisa vegetation within the south-western portion of the site may represent a Commonwealth-listed TEC, *Banksia Woodlands of the Swan Coastal Plain*. Any impacts to this TEC will require further environmental assessment prior to development occuring.
Bush Forever areas (DOP-071)	No	The site is not mapped as a Bush Forever site.
Clearing regulations – Environmentally Sensitive Areas (DWER-046)	No	The site is not mapped within an environmentally sensitive area.
Swan Bioplan Regionally Significant Natural Areas 2010 (DWER-070)	No	Not applicable.

Table 1: Summary of potential environmental considerations that may be associated with the site (based on a search of the SLIP databases) (continued)

Key environmental feature (information in brackets refers to mapping data source)	Yes / no / potentially occurring within the site	If yes / potentially, describe value that may be impacted
DBCA – Legislated Lands and Waters (DBCA-011)	No	Not applicable. No DBCA legislated lands or waters are located within the site.
Aboriginal heritage (DAA-001)	Yes	Two registered Aboriginal heritage sites are present within the site. (sites ID# 4095 and 3866). Both sites are identified as 'not a site' on the Aboriginal Heritage Inquiry System. As part of the environmental works undertaken to support the Forrestfield Airport Link project, the status of the two Aboriginal heritage sites within the site were considered (Waru Consulting 2013). The Aboriginal heritage review concluded that both sites no longer exist within their mapped location. Therefore, these sites will not represent a spatial constraint as part of future development within the site.
Non-indigenous heritage (SHO-003)	No	Not applicable. No non-indigenous heritage sites were identified within or nearby to the site based on the publicly available mapping.

2.1 Native vegetation – modification and clearing

No clearing of native vegetation is proposed as part of the Redcliffe Station ACP. As part of future detailed development within the site associated with the implementation of the Redcliffe Station ACP, some native vegetation may be required to be removed.

Should clearing of native vegetation be undertaken following subdivision of the site, this clearing can be undertaken in accordance with addressing conditions associated with subdivision approval, pursuant to the *Planning and Development Act 2005*, are exempt from requiring a clearing permit pursuant to Schedule 6 of the *Environmental Protection Act 1986* (where approved by a responsible authority).

2.2 Revegetation and landscape plans

No active revegetation of the site is proposed as part of the implementation of the ACP. Existing public open space (POS) has been identified within the central portion from the site, in a north-westerly to south-easterly direction. This POS is managed by the City of Belmont, with ongoing management to align with the typical maintenance requirements for public open space including:

- Regular mowing/slashing of grass/turf to less than 100mm in height (where present).
- Irrigation of grass and garden beds (where required).
- Regular removal of weeds and built up dead material (such as fallen branches, leaf litter etc.).
- Low pruning of trees (branches below 2 m in height removed where appropriate).
- Application/replacement of ground/surface covers such as mulch or non-flammable materials as required.

3 Bushfire Assessment Results

Bushfire risk for the site has been appropriately considered both in context to the site and potential impact upon the site.

Appendix Two of the Guidelines provides a description for undertaking contextual hazard level assessment using the vegetation classifications from AS 3959. The purpose is to identify at the strategic level the Bushfire Hazard Level (BHL) and the likely impact and intensity of a bushfire attack.

AS 3959 has been used to determine the impact on the site. Its objective is to reduce the risk of ignition and loss of a building to bushfire. It provides a consistent method for determining a radiant heat level (radiant heat flux) as a primary consideration of bushfire attack. It measures the Bushfire Attack Level as the radiant heat level (kWm^2) over a distance of 100 m.

AS 3959 also prescribes deemed to satisfy construction responses that can resist the determined radiant heat level at a given distance from the fire. It is based on six Bushfire Attack Level (BAL) ratings: BAL-LOW, BAL-12.5, BAL-19, BAL-29, BAL-40 and BAL-FZ.

3.1 Bushfire Attack Level (BAL) assessment

In accordance with Appendix Five of the Guidelines, a method 1 BAL assessment has been undertaken to support the proposed development of the site and determine the BAL ratings likely to be applicable to future habitable buildings. This has been based on the vegetation classifications and the effective slope under the vegetation, with the result presented on the BAL contour plan.

Not all vegetation is a classified bushfire risk. Vegetation and ground surfaces that are exempt from classification as a potential hazard are identified as a low threat under Section 2.2.3.2 of AS 3959. Low threat vegetation includes the following:

a) Any vegetation that is more than 100 m from the site.
b) Single areas of vegetation less than 1 ha in area and not within 100 m of other areas of vegetation being classified.
c) Multiple areas of vegetation less than 0.25 ha in area and not within 20 m of the site, or each other, or of other areas of vegetation being classified.
d) Strips of vegetation less than 20 m in width (measured perpendicular to the elevation exposed to the strip of vegetation) regardless of length and not within 20 m of the site or each other, or other areas of vegetation being classified.
e) Non-vegetated areas, that is, areas permanently cleared of vegetation, including waterways, exposed beaches, roads, footpaths, buildings and rocky outcrops.
f) Vegetation regarded as a low threat due to factors such as flammability, moisture content or fuel load. This includes grassland managed in a minimal fuel condition, mangroves and other saline wetlands, maintained lawns, golf courses (such as playing areas and fairways), maintained public reserves and parklands, sporting fields, vineyards, orchards, banana plantations, market gardens (and other non-curing crops), cultivated gardens, commercial nurseries, nature strips and windbreaks.

3.1.1 Assessment inputs

Classifying bushfire hazards takes into account the vegetation structure within the site and surrounding area for a minimum of 100 m, in accordance with AS 3959. The assignment of the vegetation classifications is based on consideration of the fuel layers of different vegetation types. This can be separated into five segments as illustrated in **Plate 3** below.

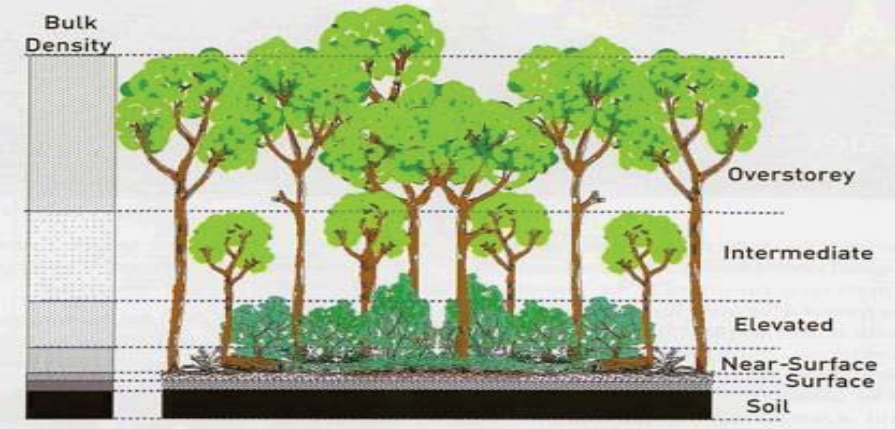

Plate 3: The five fuel layers in a forest environment that could be associated with fire behaviour (Gould et al. 2007)

An assessment of existing vegetation within the site and surrounding 150 m, as well as the effective slope, was undertaken on the 22nd October 2020 in accordance with AS 3959 and the Guidelines.

Table 2 outlines:

- The existing AS 3959 vegetation classifications (and associated photo locations), which are also shown in **Figure 2**.
- The existing bushfire hazard level ratings, which are shown in **Figure 3**.
- The post-development AS 3959 vegetation classifications, which are shown in **Figure 4**.
- The effective slope for each area of classified vegetation present in the post-development scenario, which is shown in **Figure 5**.

Table 2: Vegetation classification, effective slope and future management

Existing conditions (see Figure 2 and Figure 3)			Post-development (see Figure 4 and Figure 5)	
Plot no.	**AS 3959 classification and bushfire hazard rating**	**Site photo/s (location points shown in Figure 2)**	**Plot no.**	**AS 3959 classification, effective slope and assumptions**
1 - 5	**AS 3959 classification (Figure 2):** Forest (Class A) **Bushfire hazard rating (Figure 3):** Extreme Forest vegetation has been identified to the south-west and west of the site, within the Tonkin Highway reserve. In addition, forest vegetation has been identified to the south-east and east of the site. The areas of forest vegetation located within 150 m of the site are characterised by native and non-native species growing to a height of between 8 – 25 m. These areas of forest are not managed and are associated with multiple fuel layers, including near-surface, understorey, elevated and overstorey.	 *Photo location 1: Forest vegetation to the west of the site within the Tonkin Highway reserve, looking south*  *Photo location 2: Forest vegetation to the west of the site within the Tonkin Highway reserve, looking north*  *Photo location 3: Forest vegetation within the southern boundary of the site, looking south*  *Photo location 4: Forest vegetation to the north-east of the site within an undeveloped lot, looking east*	2 - 5	**AS 3959 classification (Figure 4):** Forest (Class A) **Effective slope (Figure 5):** Flat/upslope (Plot 2 – 3, 5) Downslope > 10 – 15° (Plot 4) Forest vegetation located within the western portion of the site, in addition to vegetation outside of the site, will not be impacted as part of future development, and will therefore remain a bushfire risk to the site.
			15	**AS 3959 classification (Figure 4):** Non-vegetated areas (exclusion clause 2.2.3.2(e)) **Effective slope (Figure 5):** Not applicable The forest vegetation within the southern portion of the site is located in an area that will be subject to residential development in the future, as identified in the ACP. Therefore, it has been assumed that this vegetation will be converted to hardstand areas in the form of buildings and carparks and is therefore considered to be a low threat in accordance with exclusion clause 2.2.3.2 (e).

Table 2: Vegetation classification, effective slope and future management (continued)

Existing conditions (see Figure 2 and Figure 3)			Post-development (see Figure 4 and Figure 5)	
Plot no.	**AS 3959 classification and bushfire hazard rating**	**Site photo/s (location points shown in Figure 2)**	**Plot no.**	**AS 3959 classification, effective slope and assumptions**
6 - 7	**AS 3959 classification (Figure 2):** Shrubland (Class C) **Bushfire hazard rating (Figure 3):** Moderate Shrubland vegetation has been identified to the south of the site, within a living stream basin, between the site and a commercial building. In addition, shrubland vegetation has been identified adjacent to Tonkin Highway to the south of the site. Both patches of shrubland vegetation are characterised by planted native vegetation, which is left in an unmanaged condition. These areas of vegetation consist of surface, near-surface and elevated fuels growing to a height of 1.5 m.	 *Photo location 5: Shrubland vegetation to the south-east of the site within an unmanaged living stream basin, looking east*  *Photo location 6: Shrubland vegetation to the south-east of the site, within an unmanaged living stream basin, looking south*  *Photo location 7: Shrubland vegetation to the south of the site, within an unmanaged living stream basin, looking north*  *Photo location 8: Shrubland vegetation to the southof the site, within the Tonkin Highway reserve, looking south*	6 - 7	**AS 3959 classification (Figure 4):** Shrubland (Class C) **Effective slope (Figure 5):** Flat/upslope (Plot 6) Downslope > 0 - 5° (Plot 7) Shrubland vegetation located outside of the site will not be impacted as part of future development within the site, and will therefore remain a bushfire risk to the site.

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Table 2: Vegetation classification, effective slope and future management (continued)

Existing conditions (see Figure 2 and Figure 3)			Post-development (see Figure 4 and Figure 5)	
Plot no.	AS 3959 classification and bushfire hazard rating	Site photo/s (location points shown in Figure 2)	Plot no.	AS 3959 classification, effective slope and assumptions
8 - 10	**AS 3959 classification (Figure 2):** Scrub (Class D) **Bushfire hazard rating (Figure 3):** Extreme Scrub vegetation has been identified within the southern portion of the site (Plot 3). In addition, scrub vegetation has been identified to the south-west of the site, within the Tonkin Highway reserve (Plot 4), in addition to the east of the site, associated with an undeveloped landholding. Scrub vegetation within and surrounding the site is a mixture of native and non-native species, including planted *Chamelaucium* spp., bamboo and *Acacia* spp., growing to a height of approximately 6 m.	 *Photo location 9: Scrub vegetation within the southern portion of the site, looking south*  *Photo location 10: Scrub vegetation to the west of the site within the Tonkin Highway reserve, looking north*  *Photo location 11: Scrub vegetation to the north-east of the site, looking south-east*  *Photo location 12: Scrub vegetation to the north-east of the site, looking south-east*	9 - 10	**AS 3959 classification (Figure 4):** Scrub (Class D) **Effective slope (Figure 5):** Flat/upslope (Plot 10) downslope > 10 - 15° (Plot 9) Scrub vegetation located outside of the site will not be impacted as part of future development within the site, and will therefore remain a bushfire risk to the site.
			15	**AS 3959 classification (Figure 4):** Non-vegetated areas (exclusion clause 2.2.3.2(e)) **Effective slope (Figure 5):** Not applicable The forest vegetation within the southern portion of the site is located in an area that will be subject to residential development in the future, as identified in the ACP. Therefore, it has been assumed that this vegetation will be converted to hardstand areas in the form of buildings and car parks and is therefore considered to be a low threat in accordance with exclusion clause 2.2.3.2 (e)

Table 2: Vegetation classification, effective slope and future management (continued)

Existing conditions (see Figure 2 and Figure 3)			Post-development (see Figure 4 and Figure 5)	
Plot no.	**AS 3959 classification and bushfire hazard rating**	**Site photo/s (location points shown in Figure 2)**	**Plot no.**	**AS 3959 classification, effective slope and assumptions**
11 - 13	**AS 3959 classification (Figure 2):** Grassland (Class G) **Bushfire hazard rating (Figure 3):** Moderate Several patches of grassland vegetation have been identified within the site, associated with undeveloped residential lots. In addition, grassland vegetation has been identified to the south-east and north-east of the site. Areas of grassland vegetation within and surrounding the site are characterised by non-native grass species. These areas do not appear to have been subject to any regular management and has been identified as a bushfire hazard.	 *Photo location 13: Grassland vegetation within an unmanaged lot adjacent to the southern boundary, looking north-east*  *Photo location 14: Grassland vegetation to the east of the site, looking south-west*  *Photo location 15: Grassland vegetation to the north-east of the site, looking north-east*  *Photo location 16: Unmanaged grassland vegetation within an undeveloped lot in the eastern portion of the site, looking north-east*	12 - 13	**AS 3959 classification (Figure 4):** Grassland (Class G) **Effective slope (Figure 5):** Flat/upslope (Plot 13) Downslope > 10 - 15° (Plot 12) Grassland vegetation located outside of the site will not be impacted as part of future development within the site, and will therefore remain a bushfire risk to the site.
			15	**AS 3959 classification (Figure 4):** Non-vegetated areas (exclusion clause 2.2.3.2(e)) **Effective slope (Figure 5):** Not applicable Grassland vegetation within the site is associated with undeveloped lots that will be converted to hardstand areas in the form of buildings as part of future development and are therefore considered to be a low threat in accordance with exclusion clause 2.2.3.2 (e).

Table 2: Vegetation classification, effective slope and future management (continued)

Existing conditions (see Figure 2 and Figure 3)			Post-development (see Figure 4 and Figure 5)	
Plot no.	AS 3959 classification and bushfire hazard rating	Site photo/s (location points shown in Figure 2)	Plot no.	AS 3959 classification, effective slope and assumptions
14	**AS 3959 classification (Figure 2):** Less than 1 ha in size and not within 100 m of other classified vegetation (exclusion clause 2.2.3.2(b))) **Bushfire hazard rating (Figure 3):** Low. As required under the Guidelines, any areas within 100 m of moderate or extreme hazards have been shown as moderate, to reflect the potential increased risk. A single strip of unmanaged grassland adjacent to the managed POS has been identified within the central portion. This vegetation consists of unmanaged native and non-native grass species growing within a drainage easement. While the vegetation appears to be unmanaged, it is less than 1 ha in size (being XX m^2) and is located more than 100 m from other areas of classified vegetation. Therefore, this vegetation has been excluded in accordance with Clause 2.2.3.2(b) of AS 3959.	 *Photo location 17: Unmanaged drainage channel within the central portion of the site, looking east*  *Photo location 18: Unmanaged drainage channel within the central portion of the site, looking west*	14	**AS 3959 classification (Figure 4):** Less than 1 ha in size and not within 100 m of other classified vegetation (exclusion clause 2.2.3.2(b))) **Effective slope (Figure 5):** Not applicable The existing vegetation associated with the drainage channel is anticipated to remain as future development within the site occurs. This drainage easement may be managed to a low threat standard as part of future development, however as this is currently unknown, it has been assumed to remain in its existing unmanaged state. Given that no revegetation is proposed to occur within the site, and given there is no existing classified vegetation within 100 m of this vegetation, this vegetation will remain excluded under section 2.2.3.2(b) of AS 3959.

Table 2: Vegetation classification, effective slope and future management (continued)

Existing conditions (see Figure 2 and Figure 3)			Post-development (see Figure 4 and Figure 5)	
Plot no.	AS 3959 classification and bushfire hazard rating	Site photo/s (location points shown in Figure 2)	Plot no.	AS 3959 classification, effective slope and assumptions
15	**AS 3959 classification (Figure 2):** Non-vegetated areas (exclusion clause 2.2.3.2(e)) **Bushfire hazard rating (Figure 3):** Low. As required under the Guidelines, any areas within 100 m of moderate or extreme hazards have been shown as moderate, to reflect the potential increased risk. Within and surrounding the site, non-vegetated areas such as existing roads, firebreaks, driveways, buildings and areas of development associated with the Redcliffe Station have been excluded in accordance with Clause 2.2.3.2(e) of AS 3959. It is noted that this area may contain managed grass/garden areas/verges in the future, however, for ease of reference has been excluded as non-vegetated on the basis that these form part of the development.	 *Photo location 19: Non-vegetated Tonkin Highway to the south of the site, looking north*  *Photo location 20: Non-vegetated Boulder Avenue looking south-east*  *Photo location 21: Non-vegetated carpark associated with Perth Airport to the east of the site, looking south-east*  *Photo location 22: Non-vegetated carpark to the east of the site, looking east*	15	**AS 3959 classification (Figure 4):** Non-vegetated areas (exclusion clause 2.2.3.2(e)) **Effective slope (Figure 5):** Not applicable The existing maintenance regimes for all existing non-vegetated areas surrounding the site are assumed to continue in the long term based on current land uses and management arrangements and will remain a low threat.

Table 2: Vegetation classification, effective slope and future management (continued)

Existing conditions (see Figure 2 and Figure 3)			Post-development (see Figure 4 and Figure 5)	
Plot no.	**AS 3959 classification and bushfire hazard rating**	**Site photo/s (location points shown in Figure 2)**	**Plot no.**	**AS 3959 classification, effective slope and assumptions**
16	**AS 3959 classification (Figure 2):** Low threat vegetation (exclusion clause 2.2.3.2(f)) **Bushfire hazard rating (Figure 3):** Low. As required under the Guidelines, any areas within 100 m of moderate or extreme hazards have been shown as moderate, to reflect the potential increased risk. Low threat vegetation has been identified within the western portion of the site, associated with the Redcliffe Primary School, in addition to the central portion, associated with existing managed POS. In addition, managed POS has been identified to the west of the site, associated with Selby Park, and to the north of the site, associated with managed vegetation adjacent to Tonkin Highway. These areas of low threat vegetation are associated with irrigated turf over trees that are managed to a low threat standard, with no low hanging branches.	 *Photo location 23: Low threat vegetation within the Redcliffe Primary School in the western portion of the site, looking west*  *Photo location 24: Low threat vegetation within Selby Park to the west of the site, looking west*  *Photo location 25: Low threat vegetation west of the site, looking west*  *Photo location 26: Managed public open space within the central portion of the site, looking south*	16	**AS 3959 classification (Figure 4):** Low threat vegetation (exclusion clause 2.2.3.2(f)) **Effective slope (Figure 5):** Not applicable The maintenance regimes for all existing managed areas is assumed to continue based on current land uses and management arrangements.

3.1.1.1 Post development assumptions

The BAL assessment, to determine the predicted BAL ratings applicable to the site, has assumed the following:

- **Designated FDI**: 80
- **Flame temperature**: 1090 K
- **Vegetation classification**: forest (Class A), shrubland (Class C), scrub (Class D) and grassland (Class G) vegetation identified within 150 m of the site (see **Figure 4**)
- **Effective slope beneath classified vegetation**: flat/upslope, downslope > 0 - 5° and downslope > 10 - 15° and (see **Figure 5**)
- **Setback distances**: As per Table 2.5 of AS 3959 with the relevant distances used to inform the BAL contour plan provided in **Figure 6** and summarised in **Table 3**.

In addition to the above, the following key assumptions have informed this assessment:

- Existing vegetation that has been identified as a low threat within the site will continue to be managed to a low threat standard in accordance with Section 2.2.3.2(f) of AS 3959.
- All classified vegetation within the site will be removed or modified to achieve low threat in accordance with Section 2.2.3.2 of AS 3959. This may include
  - Clearing of vegetation.
  - Regular mowing/slashing of grass/turf to less than 100mm in height (where present).
  - Irrigation of grass and garden beds (where required).
  - Regular removal of weeds and built up dead material (such as fallen branches, leaf litter etc.).
  - Low pruning of trees (branches below 2 m in height removed where appropriate).
  - Application/replacement of ground/surface covers such as mulch or non-flammable materials as required.
- Classified vegetation that has been identified outside of the site has been assumed to remain in its current state (unless stated otherwise), and will, therefore, remain a bushfire hazard to development within the site.
- Areas of low threat vegetation outside of the site will continue to be managed and/or considered to achieve low threat (in accordance with Section 2.2.3.2 of AS 3959) based on the existing maintenance regimes, and/or as per the City of Belmont' Firebreak Notice.

3.1.2 Assessment outputs

The BAL assessment completed for the site indicates that a BAL rating of BAL-29 or less can be achieved at future habitable buildings across the majority of the site, except for the south-western and eastern portions, where BAL-29 is exceeded. **Table 3** provides a summary of the setback distances necessary from classified vegetation to achieve the indicated BAL ratings, with the BAL Contour Plan (**Figure 6**) being a visual representation of these distances. The setback distances are based on the post-development classified vegetation (**Figure 4**), effective slope (**Figure 5**) and are taken from Table 2.5 of AS 3959.

It is important to note that as part of a future subdivision, should this area still be subject to a BAL rating greater than BAL-29, development can be designed to ensure habitable buildings achieve BAL-

29 or less through in-lot setbacks and through the accommodation of setback distances provided in **Table 3**.

It is noted that the setback distances identified below have been determined through a Method 1 BAL assessment. Given the vegetation adjacent to the western boundary is located on a short, steep slope adjacent to Tonkin Highway, a shallower setback distance may be achieved through a Method 2 BAL assessment, which will need to be undertaken by an accredited Level 3 BPAD practitioner.

Table 3: Setback distances based on vegetation classification and effective slope and Table 2.5 of AS 3959, as determined by the method 1 BAL assessment (excluded plots are not listed)

Plot no.	Vegetation classification (see Figure 4)	Effective slope (see Figure 5)	Distance to vegetation (from Table 2.5 of AS 3959)	BAL rating
2 - 3, 5	Forest (Class A)	Flat/upslope	< 16 m	BAL-FZ
			16 - < 21 m	BAL-40
			21 - < 31 m	BAL-29
			31 - < 42 m	BAL-19
			42 - < 100 m	BAL-12.5
			> 100 m	BAL-LOW
4	Forest (Class A)	Downslope > 10 - 15°	< 33 m	BAL-FZ
			33 - < 42 m	BAL-40
			42 - < 56 m	BAL-29
			56 - < 73 m	BAL-19
			73 - < 100 m	BAL-12.5
			> 100 m	BAL-LOW
7	Shrubland (Class C)	Flat/upslope	< 7 m	BAL-FZ
			7- < 9 m	BAL-40
			9 - < 13 m	BAL-29
			13- < 19 m	BAL-19
			19 - < 100 m	BAL-12.5
			> 100 m	BAL-LOW
6	Shrubland (Class C)	Downslope > 0 - 5°	< 7 m	BAL-FZ
			7 - < 10 m	BAL-40
			10 - < 15 m	BAL-29
			15 - < 22 m	BAL-19
			22 - < 100 m	BAL-12.5
			> 100 m	BAL-LOW

Table 3: Setback distances based on vegetation classification and effective slope and Table 2.5 of AS 3959, as determined by the method 1 BAL assessment (excluded plots are not listed) (continued)

Plot no.	Vegetation classification (see Figure 4)	Effective slope (see Figure 5)	Distance to vegetation (from Table 2.5 of AS 3959)	BAL rating
10	Scrub (Class D)	Flat/upslope	< 10 m	BAL-FZ
			10 - < 13 m	BAL-40
			13 - < 19 m	BAL-29
			19 - < 27 m	BAL-19
			27 - < 100 m	BAL-12.5
			> 100 m	BAL-LOW
9	Scrub (Class D)	Downslope > 10 - 15°	< 14 m	BAL-FZ
			14 - < 19 m	BAL-40
			19 - < 28 m	BAL-29
			28 - < 39 m	BAL-19
			39 - < 100 m	BAL-12.5
			> 100 m	BAL-LOW
13	Grassland (Class G)	Flat/upslope	< 6 m	BAL-FZ
			6 - < 8 m	BAL-40
			8 - < 12 m	BAL-29
			12 - < 17 m	BAL-19
			17 - < 50 m	BAL-12.5
			> 50 m	BAL-LOW
12	Grassland (Class G)	Downslope > 10 - 15°	< 9 m	BAL-FZ
			9 - < 12 m	BAL-40
			12 - < 18 m	BAL-29
			18 - < 26 m	BAL-19
			26 - < 50 m	BAL-12.5
			> 50 m	BAL-LOW

4 Identification of Bushfire Hazard Issues

From a bushfire hazard management perspective, the key issues that are likely to require management and/or consideration as part of future development within the site include:

- Provision of appropriate separation distance from bushfire hazards to the west, south and east of the site to ensure a BAL rating of BAL-29 or less can be achieved at future habitable buildings (built form). This is particularly relevant to the southern and eastern portions of the site where unmanaged grassland is likely to be located immediately adjacent to the boundary of the site and will also be a consideration as part of staged development.
- Ensuring that existing areas of managed POS areas within the site are appropriately designed and managed to achieve a low threat standard in accordance with AS 3959 on an ongoing basis.
- Provision of appropriate vehicular access to ensure that when development within the site is fully constructed, egress to at least two different destinations will be available to future residents and emergency personnel.
- Provision of appropriate water supply and associated fire-fighting infrastructure.

These issues are considered further in **Section 5**.

5 Assessment against the Bushfire Compliance Criteria

This BMP provides an outline of the mitigation strategies that will ensure that as planning and development is progressed within the site, an acceptable solution and/or performance-based system of control can be adopted for each of the bushfire protection criteria detailed within Appendix Four of the Guidelines (WAPC and DFES 2017). The bushfire protection criteria identified in the Guidelines and addressed as part of this BMP are:

- Element 1: Location of the development
- Element 2: Siting and design of the development
- Element 3: Vehicular access
- Element 4: Water supply.

As part of future development, the intent of the bushfire protection criteria can be satisfied through an acceptable solution. A summary of how the bushfire protection criteria can be achieved and any associated compliance statement for each has been provided in **Table 4**.

Table 4: Summary of bushfire protection criteria and compliance statement

Bushfire protection criteria	Intent	Method of compliance		Proposed bushfire management strategies	Compliance Statement
		Acceptable solution	Performance principle		
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.	A1.1 Development location		Based on the bushfire hazard level assessment (**Figure 3**), the site is located in an area of extreme and moderate bushfire hazard level. As development within the site is progressed, classified vegetation will be removed and development will be located within an area subject to a bushfire hazard level of low or moderate. The BAL contour plan (see **Figure 6**), indicates that the majority of the site will be able to achieve a BAL rating of BAL-29 or less. Areas of the site adjacent to the south-western and eastern portions of the site will be subject to a BAL rating of BAL-FZ and BAL-40. As part of future development, should this vegetation still exist, development can be designed to ensure habitable buildings achieve BAL-29 or less through in-lot setbacks. Further planning at the subdivision/development application stage will inform the proposed development within the site, with an updated BMP (and associated BAL assessment) to be prepared to ensure that future habitable buildings are able to achieve a BAL rating of BAL-29 or less, where located within a bushfire prone area.	Based on the outlined management measures, future development would be able to comply with and meet the intent of Element 1: Location.
		Yes	N/A		
Element 2: Siting and design	To ensure the siting and design of development minimises the level of bushfire impact.	A2.1 Asset Protection Zone		One of the most important bushfire protection measures influencing the safety of people and property is to create an Asset Protection Zone (APZ) around buildings. The APZ is a low fuel area immediately surrounding a building and can include non-flammable features such as irrigated landscapes, gardens, driveways and roads. The post-development vegetation classification (**Figure 4**) identifies permanent bushfire hazards to the west, south and east of the site. As development progresses the minimum distances detailed in **Table 3** to achieve BAL-29 or less should be accommodated within future development through public roads, public open spaces or with deeper lots (to accommodate in-lot setbacks) where necessary. This is particularly relevant for the south-western and eastern portion of the site, where BAL-29 is exceeded in areas of future residential development, however, the size and layout of the ACP will allow the bushfire risk to be accommodated appropriately as future development progresses within the site. Overall, the acceptable solution can be satisfied. Class 1, 2 and 3 buildings, where located within a designated bushfire prone area and an area subject to a BAL rating higher than BAL-12.5 will need to satisfy higher construction standards in accordance with AS 3959.	Based on the outlined management measures, future development would be able to comply with and meet the intent of Element 2: Siting and design.
		Yes	N/A		

Table 4: Summary of bushfire protection criteria and compliance statement (continued)

Bushfire protection criteria	Intent	Method of compliance		Proposed bushfire management strategies	Compliance Statement
		Acceptable solution	Performance principle		
Element 3: Vehicular access	To ensure vehicular access serving a subdivision/ development is available and safe during a bushfire event.	A3.1 Two access routes		The site currently has egress options available to the north-west of the site, via Great Eastern Highway, and to the south-east of the site, via Dunreath Drive. Great Eastern Highway provides egress to the north-east and south-west of the site, whilst Dunreath Drive provides egress to the south of the site. Both roads connect to Tonkin Highway, which is located adjacent to the south-western boundary of the site, which provides further egress options to the north and south. As part of future development within the site, these egress options will remain available to residents and emergency services.	Based on the outlined management measures, future development would be able to comply with and meet the intent of Element 3: Vehicular access.
		Yes	N/A		
		A3.2 Public road		Existing public roads within the site and surrounds comply with the minimum standards outlined in Appendix Four of the Guidelines (WAPC and DFES 2017). There are currently three new roads proposed for construction as part of the development within the site, which can and will meet the minimum standards as outlined within the Guidelines, and will include a minimum 6 m-wide trafficable surface.	
		Yes	N/A		
		A3.3 Cul-de-sac (including dead-end-road)		No new cul-de-sacs are proposed as part of the activity centre plan. Three existing cul-de-sacs located within the site will be retained as part of the ACP. It is noted that whilst SPP 3.7 and the Guidelines should not be applied retrospectively, the cul-de-sac located in the north-western portion of the site (The Court) is approximately 290 m long, which exceeds the maximum length identified in the Guidelines, which specifies cul-de-sacs should not exceed 200 m. This cul-de-sac meets the other minimum requirements for a cul-de-sac as specified in the Guidelines, including an appropriate turning-head width, and is located in an urbanised area and connects to the broader road network. This cul-de-sac provides appropriate egress options for residents and emergency vehicles. Given no new cul-de-sacs are proposed, the Redcliffe Station ACP meets the acceptable solution. However, should any future subdivision occur adjacent to the cul-de-sac which requires an upgrade to The Court, the length of the cul-de-sac should be appropriately considered, and emergency access options provided as required.	
		Yes	N/A		
		A3.4 Battle-axe		The activity centre plan does not provide for a new development layout, and therefore no battle-axe lots are proposed as part of future development. It is noted that there are several existing battle-axe lots within the site, which are considered to meet the acceptable solution given the location of the site in an urbanised area and connection to the broader road network.	
		Yes	N/A		

Table 4: Summary of bushfire protection criteria and compliance statement (continued)

Bushfire protection criteria	Intent	Method of compliance		Proposed bushfire management strategies	Compliance Statement
		Acceptable solution	Performance principle		
Continued from above.	Continued from above.	A3.5 Private driveway longer than 50 m		Not applicable. There are currently no private driveways longer than 50 m within the site, and the ACP does not identify an alternative lot layout that will introduce private driveways longer than 50 m.	Continued from above.
		N/A	N/A		
		A3.6 Emergency access way		Not applicable. Given the proposed development plan provides for egress to at least two different destinations, emergency access ways are not required as part of the proposed development of the site.	
		N/A	N/A		
		A3.7 Fire service access routes (perimeter roads)		Not applicable. Future development within the site will be provided with appropriate vehicular access, as outlined above, and therefore fire service access routes are not required.	
		N/A	N/A		
		A3.8 Firebreak width		Due to the typical lot sizes associated with the proposed residential land use, the requirement for firebreaks is not required to be met. Instead, landholdings will be required to manage landholdings as per the City of Belmont Firebreak Notice.	
		Yes	N/A		
Element 4: Water	To ensure water is available to the subdivision, development or land use to enable people, property and infrastructure to be defended from bushfire.	A4.1 Reticulated areas		The site supports existing reticulated water infrastructure, including at least 15 existing water hydrants that can be used for emergency services purposes. Future development within the site will be able to connect to the existing reticulated water supply.	Based on the outlined management measures, future development would be able to comply with and meet the intent of Element 4: Water.
		Yes	N/A		
		A4.2 Non-reticulated areas		Not applicable.	
		N/A	N/A		
		A4.3 Individual lots within non-reticulated areas (only for use if creating 1 additional lot and cannot be applied cumulatively)		Not applicable.	
		N/A	N/A		

5.1 Additional management strategies

5.1.1 Future approval considerations

The BAL assessment within this document is considered to be a conservative assessment of potential bushfire risk posed to the future urban and commercial development within the site based on the assumptions outlined in **Section 3**.

The measures to be implemented through this ACP and associated future subdivision/development process have been outlined as part of this BMP and can be used to support future planning and development approval processes. A revised BMP is likely to be required to support any future subdivision/development applications for development within an area mapped as bushfire prone within the *Map of Bush Fire Prone Areas.* This is particularly relevant if the development layout is different to that outlined within this document, or classified vegetation within the site that has been identified for removal as part of future development hasn't been removed.

5.1.2 Landscape management

5.1.2.1 Within the site

The existing public open space and road reserves should continue to be maintained to achieve low threat vegetation in accordance with Section 2.2.3.2 of AS 3959, as shown in **Figure 4**, and will be the responsibility of the City of Belmont. Management of the site will be typical for the public road reserves and public open space and include (but is not limited to):

- Regular mowing/slashing of grass/turf to less than 100 mm in height (where present).
- Irrigation of grass and garden beds (where required).
- Regular removal of weeds and built up dead material (such as fallen branches, leaf litter etc.).
- Low pruning of trees (branches below 2 m in height removed where appropriate).
- Application/replacement of ground/surface covers such as mulch or non-flammable materials as required.

In addition, it is anticipated that Redcliffe Primary School will continue to maintain their landholding to a low threat standard, as per the above management methods.

5.1.2.2 Surrounding the site

Living stream basin

The living stream basin to the south of the site has been revegetated with native vegetation species, and it is understood that no maintenance (fuel load management) is likely to occur in this area. Given the nature of vegetation planted within the living stream basin, the vegetation has been classified as shrubland.

Within private landholdings

The private landholdings surrounding the site are assumed to be managed by the applicable landowners in accordance with the City of Belmont Firebreak Notice in perpetuity and/or in accordance with existing maintenance regimes.

All other classified vegetation is assumed to remain in its existing state.

5.1.3 City of Belmont Firebreak Notice

The City of Belmont releases a fire break notice annually (or as required) to provide a framework for bushfire management within the City. The City of Belmont is able to enforce this notice in accordance with Section 33(1) of the *Bush Fires Act 1954* and landowners will need to ensure compliance with the fire break notice, as published, or any directions provided by the City of Belmont. This is likely to include (but is not limited to):

- Particular standards for firebreaks, including the location of the firebreak and horizontal and vertical clearances.
- Particular standards for the height that vegetation can be maintained at within the site.
- Maintenance of appropriate asset protection zones around buildings and fixed assets within a landholding.

Where there is conflict in the requirements of this BMP or the City of Belmont Firebreak Notice, the higher level of bushfire protection should prevail.

5.1.4 Vulnerable or high-risk land uses

The existing service station within the northern portion of the site would meet the definition of a 'high-risk' land use under SPP 3.7, and Redcliffe Primary School located within the western portion of the site is considered to be a 'vulnerable' land use. In accordance with Section 2.2 of the Guidelines, the policy measures of SPP 3.7 and the Guidelines are not to be applied retrospectively, and the preparation of a risk management plan (for high-risk land uses) and bushfire emergency evacuation plan (for vulnerable land uses) will only be required should development occur within these landholdings, where identified within a bushfire prone area as mapped within the *Map of Bush Fire Prone Areas*.

The ACP doesn't outline the introduction of any vulnerable or high-risk land uses. Should vulnerable or high-risk land uses be proposed in the future, the requirements of SPP 3.7 may need to be addressed at future development approvals (i.e. subdivision/development application) (when specific detail on the land use is known) and may include the preparation of an emergency evacuation plan and/or risk assessment for onsite flammable materials where applicable. This is generally only a consideration where a BAL rating greater than BAL-LOW applies.

5.1.5 Public education and preparedness

Community bushfire safety is a shared responsibility between individuals, the community, government and fire agencies. DFES has an extensive Community Bushfire Education Program including a range of publications, a website and Bushfire Ready Groups. The DFES publication '*Prepare. Act. Survive.'* (DFES 2014) provides excellent advice on preparing for and surviving the bushfire season. Other downloadable brochures are available from http://www.dfes.wa.gov.au/safetyinformation/fire/bushfire/pages/publications.aspx

The City of Belmont provides bushfire safety advice to residents available from their website https://www.belmont.wa.gov.au/live/your-health-and-safety/rangers/fire-management. Professional, qualified consultants also offer bushfire safety advice and relevant services to residents and businesses in high-risk areas in addition that that provided in this BMP.

In the case of a bushfire in the area, advice would be provided to residents and businesses by DFES, Department of Biodiversity Conservation and Attractions (DBCA) and/or the City of Belmont on any specific recommendations with regard to responding to the bushfire, including evacuation if required. However, it is highly recommended that future residents and land users make themselves aware of their responsibilities with regard to preparing for and responding to a potential bushfire that may impact them, their family and property, regardless of the BAL rating their properties are subject to.

6 Responsibilities for Implementation and Management of Bushfire Measures

Table 5 outlines the future responsibilities of the City of Belmont associated with implementing this BMP with reference to ongoing bushfire risk mitigation measures for existing land uses through compliance with the City of Belmont Firebreak Notice. These responsibilities will need to be considered as part of the subsequent planning process. Management measures for future developers has been provided to inform future development within the site.

Additional bushfire mitigation responsibilities will be outlined as part of future BMP/s prepared to support detailed subdivision/development for the site, including responsibilities for future lot owners.

Table 5: Responsibilities for the implementation of this BMP

Management action	Timing
City of Belmont	
Provide a copy of this BMP to the relevant decision makers to support approval of the proposed ACP.	To support the ACP approval process.
Monitoring vegetation fuel loads in private landholdings against the requirements of the City's Firebreak Notice (and/or existing maintenance regimes outlined in this BMP) and liaising with relevant stakeholders to maintain fuel loads at minimal/appropriate fuel levels.	Ongoing, as required.
Maintaining fuel loads in existing public road reserves and public open space (under their management) to appropriate standards to minimise fuel loads (as per current maintenance regimes). Where public open space is maintained to a low threat standard, this should include: • Clearing/modification of vegetation • Regular removal of weeds and built up dead material (such as fallen branches, leaf litter etc.) • Low pruning of trees (i.e. removal of branches less than 2 m in height) if individual trees are proposed for retention, particularly where these are located in future road reserves or public open space). • Application/re-application of ground/surface covers such as mulch or non-flammable materials as required. • Where grass is present, this should be regularly cut so that the grass is maintained at or below 100 mm in height.	Ongoing, as required.
Future developers	
Ensure that the bushfire mitigation measures identified within this BMP are applied to future development within the ACP. This includes ensuring additional bushfire risks are not introduced into the site as part of future development. If the bushfire risk is to be increased as part of future development, a revised bushfire management plan and/or bushfire attack level assessment should be undertaken.	As part of future development within the site.
Ensure future habitable buildings are able to be located so that BAL-29 or less applies. Separation distances should be in accordance with the minimum distances outlined in **Table 3** of this BMP for the corresponding vegetation plot/classification, or as determined in subsequent BMPs/BAL assessments. This may include the provision of public roads and/or managed public open space between habitable buildings and bushfire hazards, or by ensuring lots are an adequate depth or width to ensure BAL-29 is not exceeded at future habitable buildings.	As part of future development within the site.

7 Application Declaration

7.1 Accreditation

This BMP has been prepared by Emerge Associates who have a number of team members who have undertaken BPAD Level 1 and Level 2 training and are in the processing of gaining formal accreditation. Emerge have been providing bushfire risk management advice for more than seven years, undertaking detailed bushfire assessments (and associated approvals) to support the land use development industry.

Anthony Rowe is a Fire Protection Association of Australia (FPAA) Level 3 Bushfire Planning and Design (BPAD) accredited practitioner (BPAD no. 36690) with over nine years' experience and has provided a review of this BMP.

7.2 Declaration

I declare that the information provided is true and correct to the best of my knowledge.

Signature:

Name: Anthony Rowe

Company: Envision Bushfire Protection/Emerge Associates

Date: 16 November 2020

BPAD Accreditation: Level 3 BPAD no. 36690

8 References

8.1 General references

The references listed below have been considered as part of preparing this document.

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8.2 Online references

Department of Water 2008, *LIDAR derived 1 m elevation contours* dataset, Government of Western Australia.

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Office of Bushfire Risk Management (OBRM) 2019, Map of Bush Fire Prone Areas, viewed October 2020, https://maps.slip.wa.gov.au/landgate/bushfireprone/

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Figure 2: Existing Site Conditions – AS 3959 Vegetation Classification

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Figure 6: Bushfire Attack Level Contour Plan

Figure 1: **Site Location and Topographic Contours**

Project:	Bushfire Management Plan Redcliffe Station Activity Centre Plan
Client:	City of Belmont

Plan Number:
EP20-133(02)--F02

Drawn:	SCM
Date:	11/11/2020
Checked:	ADB
Approved:	AJR
Date:	16/11/2020

N

0 100 200 300
Metres

Scale: 1:10,000@A4

GDA 1994 MGA Zone 50

emerge ASSOCIATES

A502

Figure 2: **Existing Site Conditions - AS 3959 Vegetation Classification**

Project:	Bushfire Management Plan Redcliffe Station Activity Centre Plan
Client:	City of Belmont

Plan Number:
EP20-133(02)--F03

Drawn:	SCM
Date:	11/11/2020
Checked:	ADB
Approved:	AJR
Date:	16/11/2020

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Scale: 1:8,000@A4
GDA 1994 MGA Zone 50

emerge ASSOCIATES

A503

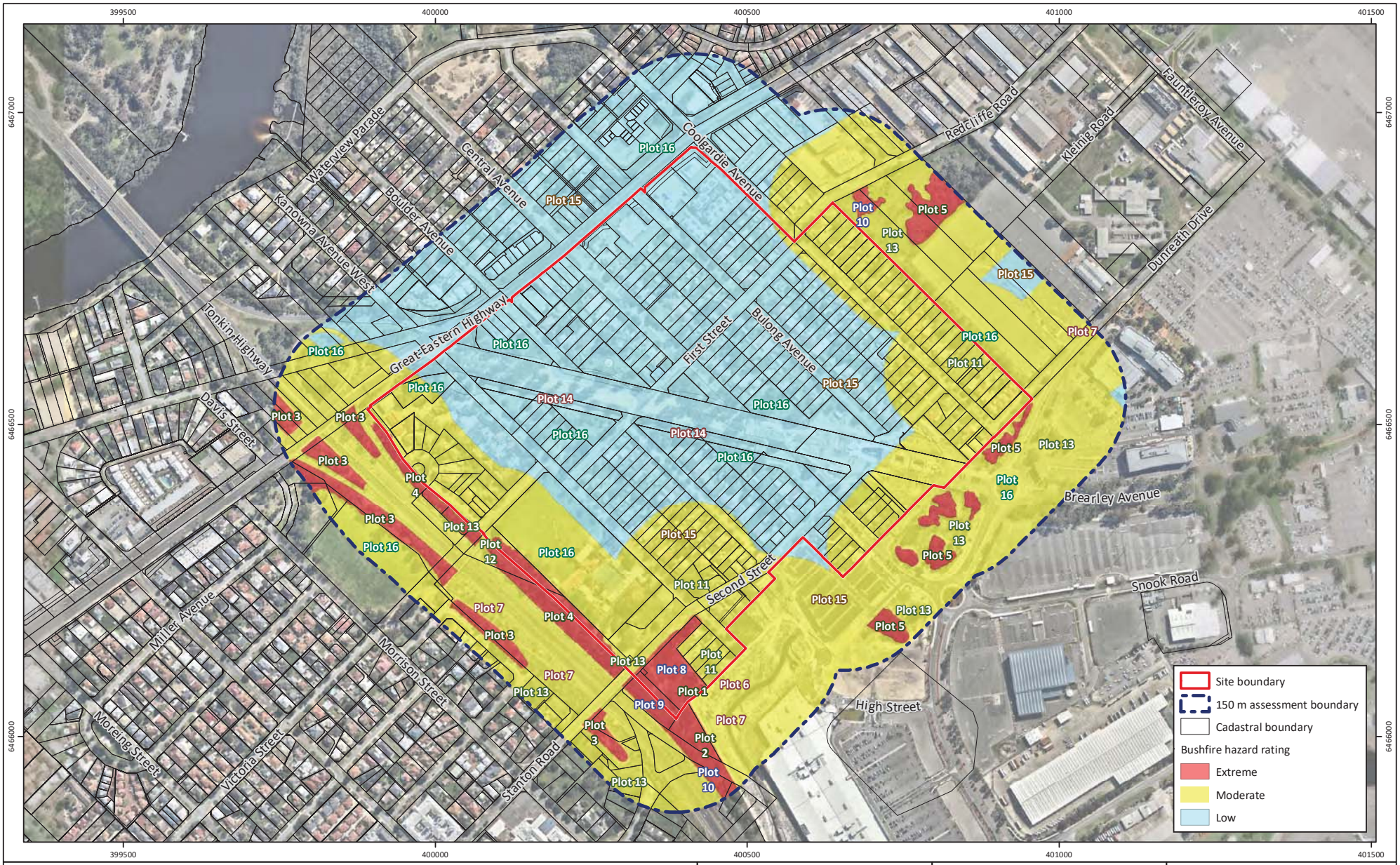

Figure 3: Existing Site Conditions - Bushfire Hazard Level

Project:	Bushfire Management Plan Redcliffe Station Activity Centre Plan
Client:	City of Belmont

Plan Number:
EP20-133(02)--F04

Drawn:	SCM
Date:	11/11/2020
Checked:	ADB
Approved:	AJR
Date:	16/11/2020

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Metres

Scale: 1:8,000@A4

GDA 1994 MGA Zone 50

emerge ASSOCIATES

A504

Figure 4: **Post Development Conditions - AS 3959 Vegetation Classification**

Project:	Bushfire Management Plan Redcliffe Station Activity Centre Plan
Client:	City of Belmont

Plan Number:
EP20-133(02)--F05

Drawn:	SCM
Date:	11/11/2020
Checked:	ADB
Approved:	AJR
Date:	16/11/2020

N

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Metres
Scale: 1:8,000@A4
GDA 1994 MGA Zone 50

emerge ASSOCIATES

A505

Figure 5: **Post Development Conditions - Effective Slope**

Project:	Bushfire Management Plan Redcliffe Station Activity Centre Plan
Client:	City of Belmont

Plan Number:
EP20-133(02)--F06

Drawn:	SCM
Date:	11/11/2020
Checked:	ADB
Approved:	AJR
Date:	16/11/2020

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Metres

Scale: 1:8,000@A4

GDA 1994 MGA Zone 50

emerge ASSOCIATES

A506

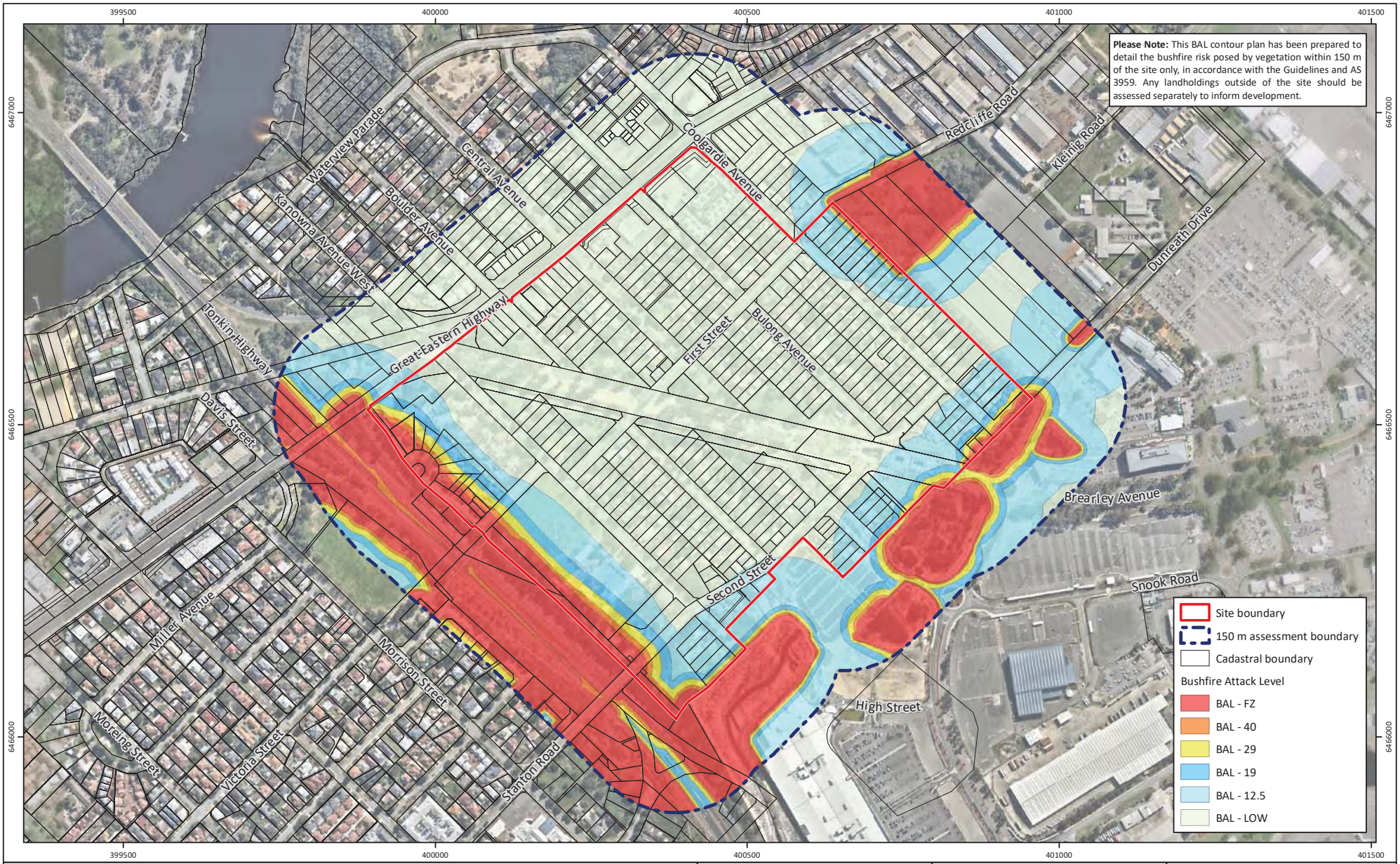

Figure 6: Bushfire Attack Level Contour Plan

Project: Bushfire Management Plan
Redcliffe Station Activity Centre Plan
Client: City of Belmont

Plan Number:
EP20-133(02)--F07
Drawn: SCM
Date: 11/11/2020
Checked: ADB
Approved: AJR
Date: 16/11/2020

N

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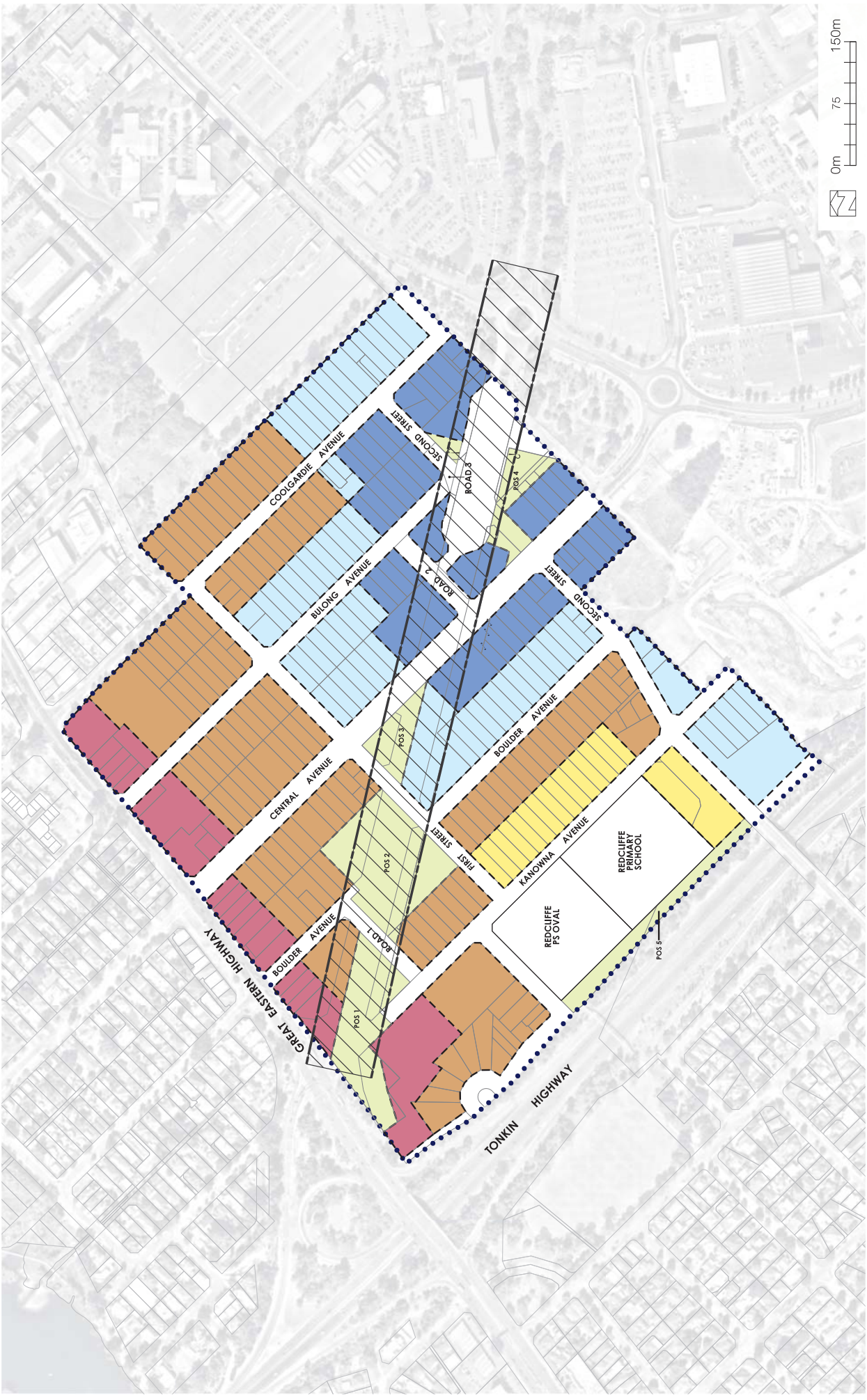
Metres
Scale: 1:8,000@A4
GDA 1994 MGA Zone 50

emerge ASSOCIATES

A507

Appendix A

Redcliffe Station Activity Centre Plan (TBB 2020)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75
0m
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BULONG AVENUE
CENTRAL AVENUE
BOULDER AVENUE
KANOWNA AVENUE
SECOND STREET
FIRST STREET
ROAD 3
ROAD 2
ROAD 1
POS 1
POS 2
POS 3
POS 4
POS 5
REDCLIFFE PS OVAL
REDCLIFFE PRIMARY SCHOOL
GREAT EASTERN HIGHWAY
TONKIN HIGHWAY