Final Report v6

Bushfire Risk Assessment for the rezoning of 39-45 and 40-46 Cyril Beechey Lane, Cranbourne, Victoria

Prepared for

Greenridge Properties Pty Ltd and Maclaw No. 10 Pty Ltd

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1 INTRODUCTION

1.1 Background

Ecology and Heritage were engaged by Greenridge Properties Pty Ltd and Maclaw No. 10 Pty Ltd to prepare a Bushfire Risk Assessment for the proposed rezoning of 39-45 and 40-46 Cyril Beechey Lane, Cranbourne. This report is an assessment of the two properties located at 39-45 and 40-46 Cyril Beechey Lane, Cranbourne.

The purpose of this report is to undertake a bushfire risk assessment of the local and broader landscape and address the legislative implications associated with the proposal against Clause 13.02-1S Bushfire. Clause 44.06 Bushfire Management Overlay (BMO), Clause 53.02 Bushfire Planning and Australian Standard (AS) 3959:2018 Construction of buildings in bushfire prone areas (Standards Australia 2018) are also addressed as part of this report.

1.2 Study Area

The study area is located at 39-45 and 40-46 Cyril Beechey Lane, Cranbourne, Victoria, approximately 65 kilometres south-east of Melbourne's CBD (Figure 1). The study area consists of two sites, including 39-45 Cyril Beechey Lane (henceforth referred to as 'study area west'), which covers approximately four hectares and is bound by residential properties along Sottile Drive to the north, private property to the south, Cyril Beechey Lane to the east and residential properties along Cherry Hills Drive to the west, and 40-46 Cyril Beechey Lane (henceforth referred to as 'study area east'), which covers approximately 3.8 hectares and is bound by residential properties along Grandeur Court to the north, private property to the south, Cemetery Road to the east and Cyril Beechey Lane to the west.

Study area west is generally flat, with no ridges, crests or waterways within or immediately adjacent to the site. Study area east has a slight southerly aspect, towards an ephemeral stream that runs through the study area in the south. In addition, a dam is located on the adjacent property to the south. Study area east is primarily intact, covered by native vegetation and has not been used for any agricultural or residential purpose, as observed during the field assessment. Study area west is highly modified, having been previously cleared for agricultural use, primarily maintaining stock and horse yards.

According to the Department of Energy, Environment and Climate Action (DEECA) Native Vegetation Information Management (NVIM) Tool (DEECA 2022b), the study area occurs within the Gippsland Plain bioregion. It is located within the jurisdiction of the Melbourne Water Catchment Management Authority (CMA) and the City of Casey municipality.

The study area is zoned Farm Zone – Schedule 2 (FZ2) and is covered by Development Plan Overlay – Schedule 1 (DPO1). In consultation with DEECA the fauna corridor will be zoned as Residential, with a development overlay.

The study area was assessed on 17 June 2020.

1.3 Fauna Corridor Management Plan

The purpose of the Fauna Corridor Management Plan was to find a balance between protecting southern brown bandicoot habitat, mitigating bushfire risk and biodiversity concerns. A review of existing data and a summary of recommendations for the development was commissioned by Urbis on behalf of Brown Property Group (Nature Advisory 2022). Based on the letter of advice provided, the most suitable option for the development was determined to be the inclusion of a 20-metre habitat corridor and 14.5 metre road reserve, as this would provide a balance between the proposed land development and the provision of a habitat connectivity corridor for Southern Brown Bandicoot. Through further consultation with the City of Casey and DEECA, the proponent has undertaken to increase the width of the ecological corridor to 30 metres with a 14.5 metre road reserve (Figure 1).

The current condition of the corridor results in a classification of Woodland due to:

- The presence of more than three trees with overlapping canopies;
- An understory that is > 2 metres in height.

The requisite separation distance for Woodland vegetation on Upslope/Flat land is 33-metres. However, this separation distance is not practicable in the context of the proposed development due to the small size of the study area and loss of developable land associated with the magnitude of the separation distance.

Thus, in consultation with the CFA and DEECA, the corridor will be modified and managed in order to meet the criteria for Group C Shrubland under the *AS 3959-2009*. This requires the selective removal of trees with overlapping canopies and gradual replacement of understory weeds with suitable native species.

Additionally, in consultation with DEECA and Council the fauna corridor will be zoned as Rural Conservation Zone (RCZ) and the ongoing maintenance will be managed by Council.

1.3.1 Current Vegetation Condition

Currently, the fauna corridor is representative of a Woodland vegetation classification due to the presence of overlapping canopies across the extent of the fauna corridor.

Native vegetation within the fauna corridor is representative of one EVC: Heathy Woodland (EVC 48). The presence of the EVCs in the study area is generally consistent with the modelled pre-1750s native vegetation mapping (DEECA 2022b).

Heathy Woodland

Heathy Woodland is currently located throughout the majority of fauna corridor and was considered to be contiguous in quality throughout. Heathy Woodland was highly modified, with several Coast Manna Gums *Eucalyptus viminalis* subsp*. pryoriana* constituting the patch. The understory was highly modified, with few native understory species present (Plate 1; Plate 2). Austral Bracken Pteridium esculentum and Heath Tea-tree *Leptospermum myrsinoides* were generally present in these areas. The cover of invasive shrubs (i.e. Montpelier Broom and Sallow Wattle) within the corridor is quite high.

Plate 1. Modified Heathy Woodland within study area with Coast Manna Gum Present (>2-metres in height) (Ecology and Heritage Partners Pty Ltd 19/04/2022).

Plate 2. Heathy Woodland within study area with an understorey of Austral Bracken and Coast Manna Gum present (>2-metres in height) (Ecology and Heritage Partners Pty Ltd 19/04/2022).

1.3.2 Future Vegetation Condition

The future vegetation of the Fauna Corridor is proposed to be managed as Group C Shrubland in order to reduce the requisite separation distance for the adjacent development.

Any species used for revegetation works within the Fauna Corridor must meet the following criteria:

a) Correspond to a Heathy Woodland, where possible;

b) Provide suitable habitat for Southern Brown Bandicoot; and

c) Be no more than two metres in height in order to meet the *AS 3959-2009* vegetation classification criteria for Group C Shrubland.

In order to reduce the vegetation classification from Woodland to Shrubland, selective trees will be removed to ensure that there are no more than three trees with overlapping canopies and the understorey is <2-metres in height (Plate 3-4).

Treeless Heathy Woodland

The proposed Fauna Corridor is proposed to be classified as Group C Shrubland in accordance with AS 3959-2009. Future vegetation is condition is proposed to be managed by removing selective trees and managing exotic shrubs, such as Montpelier Broom and Sallow Wattle.

The vegetation structure and will be consistent with Heathy Woodland (EVC 48), however will lack a consistent canopy structure. Recommended species for revegetation are consistent with Heathy Woodland EVC, including Common Heath *Epacris impressa,* Prickly Tea tree *Leptospermum continetale,* Prickly Broom Heath *Monotoca scoparia,* Broom Spurge *Amperea xiphoclad,a* Common Beard Heath *Leucopogon virgatus* ,Variable Sword-sedge *Lepidosperma laterale,* Red-fruit Sword-sedge *Gahnia sieberiana,* Austral Bracken *Pteridium esculentum,* Tussock Grasses *Poa* spp., Wallaby Grass *Rytidosperma* spp., among others. Heathy Woodland is often varying in vegetation condition and modified habitats may contain one or two key flora species, such as

Common Heath. Indicative images of what a Treeless Heathy Woodland may look like once management has commenced is outlined below (Plates 3-10).

Plate 3. Modified Heathy Woodland present within study area with no Large Trees present (<2-metres in height) (Ecology and Heritage Partners Pty Ltd 19/04/2022).

Plate 4. Heathy Woodland present within study area with no Large Trees present (<2-metres in height) (Ecology and Heritage Partners Pty Ltd 19/04/2022).

Plate 5. Example of Heathy Woodland within study area primarily consisting of Heath Tea Tree *Leptospermum myrsinoides* (Ecology and Heritage Partners Pty Ltd 19/04/2022)

Plate 6. Example of Treeless Heathy Woodland with Coastal Tea Tree *Leptospermum laevigatum* and no Large Trees (Ecology and Heritage Partners Pty Ltd).

Plate 7. Example of Heathy Woodland within study area with Coastal Tea Tree *Leptospermum laevigatum* with no Large Trees (Ecology and Heritage Partners Pty Ltd).

Plate 8. Example of Heathy Woodland within study area primarily consisting of Austral Bracken and Coastal Tea Tree *Leptospermum laevigatum* (Ecology and Heritage Partners Pty Ltd).

Plate 9. Example of Heathy Woodland within study area primarily consisting of Coastal Tea Tree *Leptospermum laevigatum* (Ecology and Heritage Partners Pty Ltd).

Plate 10. Example of Treeless Heathy Woodland with Wallaby Grass, Grass Tree *Xanthorrhoea australis* and Banksia present (Ecology and Heritage Partners Pty Ltd).

2 RESPONSE TO CLAUSE 13.02-1S

Clause 13.02-1S has the objective to '*strengthen the resilience of settlements and communities to bushfire through risk-based planning that prioritises the protection of human life*' (p1). This clause applies to land in the Bushfire Prone Area (BPA), Bushfire Management Overlay (BMO) and/or proposed to be used or developed in a way that may create or increase bushfire hazard. The study area falls within the BPA category.

Clause 13.02-1S contains five key strategies to meet the objective, which are:

- Protection of human life;
- Bushfire hazard identification and assessment;
- Settlement planning;
- Areas of biodiversity conservation value; and
- Uses and development in a Bushfire Prone Area.

A detailed assessment against each of the strategies is provided below.

The bushfire hazard risk is assessed at four different levels (Attachments 1 to 5), with a bushfire management plan provided in Attachment 6.

2.1 Protection of Human Life Strategy

These strategies require that the priority be given to the protection of human life.

2.1.1 Prioritising the protection of human life over all other policy considerations

Several mitigation measures will be employed as part of any future development to prioritise the protection of human life. These include adequate opportunities for occupant and emergency vehicle access and egress (i.e. appropriate road width, curve, angle etc.) and ensuring emergency vehicle access to water supply via a hydrant network in accordance with CFA requirements (i.e. hydrants will be positioned within 120 metres of the rear of each dwelling/building). The protection of human life will also be prioritised by ensuring that all dwellings within the development will not be exposed to a radiant heat flux of more than 12.5 kilowatts/square metre, which is commensurate to a Bushfire Attack Level (BAL) 12.5 construction standard (Attachment 6).

A wildlife corridor is proposed to be located on the eastern boundary of the development, which proposes to manage bushfire risk by reducing the requisite Woodland vegetation classification to Shrubland. This is proposed to be completed by removing selective trees in order to reduce the density of trees within the corridor and the associated fuel loads. Approximately 15 trees are proposed for removal to ensure groupings of trees have no more than two overlapping canopies. This area is intended to be retained to provide habitat for Southern Brown Bandicoot populations (Ecology and Heritage Partners 2022).

2.1.2 *Directing population growth and development to low risk locations and ensuring the availability of, and safe access to, areas where human life can be better protected from the effects of bushfire*

The development is in a highly modified and low bushfire risk setting, which is largely characterised by residential areas and intersected by many non-vegetated areas, e.g. highways, suburban streets, rail lines and water bodies. While study area east is currently characteristic of bushland, most of the vegetation is proposed to be removed as part of the development. A 30-metre strip of native vegetation along the eastern boundary is proposed to be retained for fauna habitat and in order to act as a wildlife corridor, which will permit the movement and dispersal of Southern Brown Bandicoot that has been detected during targeted surveys in the study area (Ecology and Heritage Partners 2020).

The majority of the vegetation within the wildlife corridor will be modified from its existing state (i.e. Woodland) to a Shrubland state. This will involve the thinning out of exotic and environmental weed species (e.g. Montpellier Broom and Sallow Wattle), which currently form tall, dense stands in the corridor. These species will be gradually replaced with native low shrubs, sedges and groundcover species, as required, that are consistent with the mapped EVC (Heathy Woodland), and the existing native vegetation currently present in the corridor (Ecology and Heritage Partners 2020). A proposed species list is provided in Appendix 1. Tree management for the existing trees will also be implemented to ensure a low density of trees, and canopy connectivity is minimised. As a result, the corridor will allow for bandicoot movement through the site by providing appropriate vegetated cover, while also reducing fuel loads as much as practicable. In addition, the wildlife corridor will include a fire break (indicative location shown on Attachment 6) to mitigate the risk associated with the retained vegetation (pers. comms. Jude Kennedy, CFA). The final location of the wildlife corridor will be determined in consultation with the CFA.

There are also sections of unmanaged Woodland vegetation within the 100-metre assessment zone within local Council reserves (Attachment 5), however, due to the lack of vegetation connectivity in the wider landscape (Attachments 1 to 4), the mitigation measures that will be put in place by any future development (i.e. all dwellings to achieve a BAL-12.5 construction standard and commensurate separation distance) and the immediate access to the built up areas of Cranbourne to the north, west or east, occupants can easily move to areas where life can be better protected from the effects of fire. Furthermore, access to Sladen Street, a major duel carriage way road 400 metres to the north, will provide an effective route to allow for people to disperse into the wider urbanised Cranbourne area.

2.1.3 *Reducing the vulnerability of communities to bushfire through the consideration of bushfire risk in decision making at all stages of the planning process*

Clause 13.02-1S is a strategic state-wide planning policy that provides the first opportunity to consider the bushfire risk in this process. This development addresses the risk by ensuring the following:

- All future dwellings within the study area can be constructed to an appropriate BAL construction standard, being BAL-12.5;

- Access from the existing road network into the study area;
- Any internal road network will ensure adequate occupant egress;
- Emergency vehicle access opportunities to and from the study area will be provided; and,
- A compliant hydrant network will be provided.

2.2 Bushfire Hazard and Identification Assessment Strategies

These strategies require the bushfire hazard be identified and an appropriate risk assessment be undertaken.

2.2.1 *Applying the best available science to identify vegetation, topography and climatic conditions that create a bushfire hazard*

This report identifies the bushfire hazard and applies the Method 2 analysis as specified in Appendix B of AS 3959:2018 (Standards Australia 2018) to the Woodland vegetation, which can be applied within the BPA and BMO in lieu of the standard site assessment methodology. This methodology uses site specific conditions that vary from the default modelling input values used to determine the separation distances in Table 2.4 of AS 3959:2018 (Standards Australia 2018). The bushfire modelling inputs that form the basis for this methodology factor in vegetation type (e.g. Forest, Woodland, Grassland), site-specific fuel-loads, conditions on higher bushfire risk days (e.g. wind speed, fuel moisture content, days since last rainfall) and the effect of slope gradient on the way fire travels through unmanaged vegetation. The default separation distance in Table 2.4 of AS 3959:2018 (Standards Australia 2018) were applied to Grassland and Shrubland.

The site assessment process and desktop assessment using GIS software has determined the most appropriate vegetation type and commensurate slope category for each section/aspect of unmanaged vegetation. This has produced the separation distances for a BAL-12.5 construction standard for the proposed residential subdivision (Attachment 5 and 6).

2.2.2 *Considering the best available information about bushfire hazard including the map of designated bushfire prone areas prepared under the Building Act 1993 or regulations made under the Act*

The BPA applies to the entire study area and wider area due to the presence of pastures (i.e. Grassland) and bushland (i.e. Woodland) across the landscape. The BPA covers an extensive area east of Melbourne across largely agricultural and horticultural landscapes, with the closest area not covered by the BPA being within the residential areas approximately 150-metres to the east and north of the study area.

2.2.3 *Applying the Bushfire Management Overlay to areas where the extent of vegetation can create an extreme bushfire hazard*

The BMO has not been applied to the study area, which highlights that the study area or the surrounding properties are not considered to contain an extreme fire hazard.

2.2.4 *Considering and assessing the bushfire hazard on the basis of:*

- *Landscape conditions – meaning the conditions in the landscape within 20 kilometres from a site;*
- *Local conditions – meaning the conditions in the area within approximately 1 kilometre from a site;*
- *Neighbourhood conditions – meaning conditions in the area within 400 metres of a site; and*
- *The site for the development*

Landscape, local and neighbourhood conditions

The bushfire hazard assessment identifies the broader landscape as being a Landscape Type One in which there is little vegetation beyond the 100-metre assessment zone of the study area, and extreme bushfire behaviour is not possible. The wider landscape is characterised predominately by the presence of existing residential areas, and areas currently undergoing residential development. Patches of unmanaged vegetation are observed at this landscape scale within private residential properties to the north and agricultural properties to the south. The Cranbourne Gardens, which is a large patch of continuous Woodland, is located one kilometre to the south of the study area (Attachment 1).

At the local (Attachment 2) and neighbourhood scale (Attachment 3), the landscape context highlights the dominance of existing residential areas. While there is some unmanaged vegetation observed within private properties to the east and south and within Cranbourne Botanic Gardens further to the south. In addition, study area east will retain a 30-metre strip of shrubs along the eastern boundary which will function as a wildlife corridor for Southern Brown Bandicoot that has been previously observed at the site (Ecology and Heritage Partners 2020).

Given the presence of the existing residential areas to the north, northwest and southwest (i.e. the directions most associated with extreme bushfire behaviour in Victoria), the fragmented nature of the unmanaged vegetation within private properties and the presence of intersecting roads, the likelihood of a landscape scale fire building up within the local environment is significantly reduced. Furthermore, residents can easily egress towards the low threat or non-vegetated areas found within the urban areas of the Cranbourne directly adjoining the study area's northern boundary (Attachments 2 to 4).

Site conditions

The bushfire hazard site assessment is an application requirement under AS 3959:2018 (Standards Australia 2018) and describes the bushfire hazard within 100 metres of the study area through vegetation and slope classification in accordance with the site methodology. Classified vegetation within the 100-metre assessment zone comprises Grassland and Woodland. Grassland is located immediately south of the study area within two properties managed by Council (Attachment 5). Woodland is in two Council reserves along Cemetery Road, with one of these reserves immediately adjoining the study areas north-eastern corner. Within the study area itself, the proposed wildlife corridor will consist of Shrubland. The effective slope under the Grassland and Shrubland is classified as Flat land/Upslope, while the slope under the Woodland vegetation is a 1.7-degree Downslope. The remaining land within the assessment zone contains low threat vegetation and non-vegetation areas in the form of urban residential properties to the north and west, and a sports field and Cemetery

Road to the east. The Coast Tea-tree and other shrubby vegetation along Cemetery Road are also considered low threat likened to a windrow, as they are approximately 10 to 15 wide and bordered by a sports field, sealed road and potential future development within study area east. These areas are excluded from vegetation classification as per Section 2.2.3.2 of AS 3959:2018 (Standards Australia 2018).

The proposed development will respond to Grassland to the south and Shrubland to the east using the distance for Flat Land/Upslope in Table 2.4 in AS 3959:2018 (Standards Australia 2018), which is 19 metres for a BAL-12.5 construction standard (Attachment 6).

Method 2 analysis (AS 3959:2018, Standards Australia 2018) has been used to determine the separation distances from the Woodland vegetation within the Council reserve adjoining the north-eastern corner of the study area. This is due to three site-specific input values being less than the default input values used to determine the separation distances in Table 2.4 of AS 3959:2018 (Standards Australia 2018) (Table 1). These include lower surface and overall fuel loads within this reserve compared to the default fuel loads (Table 1) and the effective slope from the north being a 1.7° Downslope (as opposed to a 5° input value). These input values in the Method 2 analysis result in a commensurate separation distance for a BAL-12.5 construction standard in response to Woodland of 32 metres, which is nine metres less than the default distance of 41 metres (Table 2). Flamesol (an online tool produced by Fire Protection Association Australia) was used for the analysis.

Table 1. **Default fuel load under AS 3959:2018 (Standards Australia 2018) and the values measured in Woodland within the reserve adjoining the study area as per the Overall fuel hazard assessment guide (DSE 2010).**

Fuel Load Component	Default values in AS 3959:2018 (t/ha)	Measured in the Council reserve (t/ha)
Surface	15	13
Overall	25	23

Table 2. Method 2 analysis to determine the separation distance from the Woodland vegetation.

Modelling value	Council reserve adjoining the study area's north-east corner
Input values	
Fire Danger Index	100
Vegetation Classification	Woodland
Surface fuel load (t/ha)	13
Overall fuel load (t/ha)	23
Effective slope (°)	1.7 (Downslope)
Site slope (°)	0
Flame width (m)	100
Heat of combustion (kJ/kg)	18,600
Flame temperature (K)	1,090
Output values	
Rate of spread (km/h)	1.75
Flame length (m)	14.16
Flame angle (°)	53, 63, 71, 75, 77, 83
Elevation of receiver (m)	5.65, 6.3, 6.69, 6.83, 6.89, 7.02
Fire intensity (kW/m)	20.845
Transmissivity	0.873, 0.854, 0.829, 0.803, 0.790, 0.728
Viewfactor	0.5990, 0.4450, 0.3012, 0.2044, 0.1661, 0.0450
BAL-12.5 construction standard (m)	32

Any built forms such as dwellings within the study area can therefore be constructed 32 metres from the Council reserve adjoining the north-eastern corner of the study area (Attachment 6). The 19-metre Grassland separation distance along the southern length of the study area in which the vegetation is managed in a low threat state (i.e. grass maintained no more than 100 millimetres in height during the Fire Danger Period) will be applied within the adjoining Council-owned property to the south (Attachment 6). A 19-metre separation distance will also apply along the length of the wildlife corridor on the eastern boundary of the study area. The wildlife corridor will be maintained in a low-threat state and a firebreak is proposed in the centre of the wildlife corridor to mitigate bushfire risk to adjacent developments.

2.2.5 *Consulting with emergency management agencies and the relevant fire authority early in the process to receive recommendations and implement appropriate bushfire protection measures*

The client is currently liaising with council and CFA during the preliminary stages of the development. CFA have deemed the separation distances from Woodland (north of study area) and Grassland (south of study area) to be sufficient for the proposed development (pers. comms. Jude Kennedy, CFA). Additionally, the client has been consulting with CFA regarding the application of a Shrubland vegetation classification along the proposed Fauna Corridor to the east of the study area. During the detailed design phase of the development, the client will continue to liaise with both Council and CFA regarding vegetation management, water and access requirements and how best to implement mitigation measures into the design. This dialogue will continue to ensure that emergency management agencies are aware of the developments progress and are able to discuss certain design aspects and provide guidance where necessary.

2.2.6 *Ensuring that strategic planning documents, planning scheme amendments, planning permit applications and development plan approvals properly assess the bushfire risk and include appropriate bushfire protection measures*

Clause 13.02-1S, Clause 44.06, Clause 53.02, DELWP (now DEECA) advisory and practice notes (DELWP 2017a, 2017b, 2018), CFA guidance note (CFA 2015) and the building regulations (i.e. AS 3959:2018) regarding bushfire matters have been referred to when assessing the bushfire risk. The standards and requirements provided in these documents have been addressed through several bushfire mitigation measures.

2.2.7 *Not approving development where a landowner or proponent has not satisfactorily demonstrated that the relevant policies have been addressed, performance measures satisfied, or bushfire protection measures can be adequately implemented*

Several bushfire mitigation measures will be implemented as part of the study areas development, which include implementing all the access and water supply requirements stipulated under the planning scheme, constructing all future buildings to a BAL-12.5 construction standard and commensurate separation distance between buildings and the classified vegetation (which will be provided entirely within the study area and within the property adjoining the southern boundary) (Attachment 6) to account for any localised fire event. The management of the separation distance to the south of the study area will occur within the adjoining property, which has been confirmed to be managed by Council (pers. comms. Casey City Council).

Furthermore, most vegetation currently within the development is assumed to be removed as part of the development. The only exception is the 30-metre strip of native vegetation, which will form the wildlife corridor on the eastern boundary to allow for the dispersal of Southern Brown Bandicoot. The vegetation in this area will be modified to reduce fuel loads as much as practicable (i.e. replacement of tall, dense stands of exotic shrubs with low native shrubs, sedges and groundcover, as required, and maintenance of a low density of trees and minimal canopy connectivity). Additionally, some canopy trees are proposed to be removed, which will greatly reduce the potential fuel load and the reduce

the risk for a canopy fire. The inclusion of a 7-metre fire break within this corridor (running east to west) has also been incorporated following consultation with the CFA (pers. comms. Jude Kennedy, CFA). The fire break will consist of grass less than 100 mm in height, with all leaves and vegetation debris removed at regular intervals during the Fire Danger Period. This will further minimise the potential threat posed by the retained vegetation.

Any subsequent vegetation will be maintained in a low threat state (i.e. lawn maintained to less than 100 millimetres in height, ornamental gardens, communal reserve), access will ensure adequate occupant egress and emergency vehicle access opportunities and a compliant hydrant network will be supplied.

The CFA specifies four situations where development should not proceed, which include:

- '*Isolated settlements where the size and/or configuration of the settlements will be insufficient to modify fire behaviour and provide protection from a bushfire;*
- *Where bushfire protection measures will not reduce the risk to an acceptable level;*
- *Where evacuation (access) is severely restricted; and*
- *Where the extent and potential impact of required bushfire protection measures may be incompatible with other environmental objectives or issues, e.g. vegetation protection, land subject to erosion or landslip.*' (CFA 2015, pp.5-6)

Most of these criteria do not apply to the study area. While some biodiversity values are present within the study area east (i.e. Southern Brown Bandicoot), the retention of a 30-metre strip of native vegetation to form a wildlife corridor will ensure that connectivity can be maintained with surrounding habitat in the area.

2.3 Settlement Planning Strategies

These strategies plan to strengthen the resilience of settlements and communities and prioritise protection of human life.

2.3.1 *Directing population growth and development to low risk locations, being those locations assessed as having a radiant heat flux of less than 12.5 kilowatts/square metre under AS 3959:2018 Construction of Buildings in Bushfire-prone Areas (Standards Australia 2018)*

All dwellings within the development will be able to achieve a radiant heat flux of 12.5 kilowatts/square metre (Attachment 5), which aligns with a BAL-12.5 construction standard.

2.3.2 *Ensuring the availability, and safe access to, areas assessed as a BAL-LOW rating under AS 3959:2018 Construction of Buildings in Bushfire-prone Areas (Standards Australia 2018) where human life can be better protected from the effects of bushfire*

Non-vegetated areas such as buildings, roads, carparks and footpaths, and low threat vegetation such as managed lawns, ornamental gardens and public open spaces are considered part of a landscape in which a building would be rated as BAL-LOW (Standards Australia 2018). Moving north from the

development and away from the Grassland, Woodland and Shrubland adjacent to and within the study area, would therefore provide space in which human life would be better protected from the effects of fires.

2.3.3 *Ensuring the bushfire risk to existing and future residents, property and community infrastructure will not increase as a result of future land use and development*

The development of 39-45 and 40-46 Cyril Beechey Lane, Cranbourne is not expected to increase bushfire risk to existing and future residents, property or community infrastructure. The buildings will be separated from unmanaged (Grassland, Woodland and Shrubland) vegetation in accordance with the proposed BAL-12.5 construction standard and the development will contain mostly low threat vegetation (i.e. managed lawns, cultivated gardens and landscaping) and non-vegetated areas (i.e. buildings, roads, carparks, footpaths). While some retained vegetation will be present within the wildlife corridor, it will be modified to consist of low native shrubs, sedges and groundcover plants, and a spare overstorey of trees, which will lower the available fuel loads and potential fire intensity. There's the potential for laddering to occur, whereby a fire in the understorey may spread to the canopy layer; however, given that some of the canopy layer is being reduced (i.e. some trees removed), it's highly unlikely for it to cause a high intensity canopy fire. The inclusion of a fire break within the corridor will also help mitigate the spread of a fire, in the event of one igniting near the study area. Appropriate separation distances will also be applied to allow for a BAL-12.5 construction standard. These measures will reduce the fire risk within the study area and therefore provide fire behaviour and management benefits for the surrounding properties. The removal of the majority of existing vegetation within the study area would also reduce the fire risk to existing neighbouring dwellings.

2.3.4 *Achieving no net increase in risk to existing and future residents, property and community infrastructure, through the implementation of bushfire protection measures and where possible reducing bushfire risk overall*

The development of the study area will result in a reduction in the overall fuel available in the landscape due to the replacement of paddocks and bushland within the study area with a residential subdivision, which will contain associated low threat vegetation (e.g. nature strips, landscaping) and non-vegetated areas (e.g. buildings, roads, carparks, footpaths). There will be no net increase in risk to infrastructure as a result of the development, as appropriate bushfire mitigation measures will be implemented. These include providing enough separation distance to facilitate BAL-12.5 construction, access/egress points and hydrants.

2.3.5 *Assessing and addressing the bushfire hazard posed to the settlement and the likely bushfire behaviour it will produce at a landscape, settlement, local, neighbourhood and site scale, including the potential for neighbourhood-scale destruction*

This report addresses the bushfire hazard posed to the study area at a range of scales in Section 2.2.4.

Urban development paddocks and fragmented bushland characterises the broader landscape, which results in large areas of low threat vegetation (i.e. manicured/landscape gardens, nature strips and sporting ovals) and excluded area such as roads, buildings and other related infrastructure. As such, it is considered that the potential for neighbourhood-scale destruction is low. If a fire were to approach from the north-west, i.e. the most likely direction of fire attack on severe fire weather days, it would be moderated by the low threat vegetation present around dwellings in the surrounding area and several roads. Further, although there is Grassland vegetation immediately to the south of the study area, it is also unlikely that a long and intense fire would extend into the study area from the south, given the extent of previous land clearance to facilitate urban and rural development. In the future, as this area to the south is developed, the potential impacts from bushfire are likely to be further reduced.

There is the potential for a local intense fire to develop within the existing modified vegetation of study area east (both during and outside of the bushfire season). However, the majority of this vegetation will be removed as part of the development, with only a 30-metre strip of native vegetation being retained and modified (i.e. the wildlife corridor). The gradual replacement of tall, dense exotic shrubs with low native shrubs, sedges and groundcover plants, as required, will reduce available fuel loads as much as practicable while still providing connectivity between areas of suitable habitat to the north and south of the study area for Southern Brown Bandicoot. A fire break will also be included within the corridor, thereby further reducing the risk of the retained vegetation. The fire break will be 7-metres wide (i.e. that is, the maximum width possible without compromising on the functionality of the wildlife corridor for Southern Brown Bandicoots; pers. comms. Nature Advisory). As a result, fire threat to the development or surrounding area will be largely reduced.

2.3.6 *Assessing alternative low risk locations for settlement growth on a regional, municipal, settlement, local and neighbourhood basis*

No alternative low risk locations have been assessed as part of this proposal as the proponents own these properties.

2.3.7 *Not approving any strategic planning document, local planning policy, or planning scheme amendment that will result in the introduction or intensification of development in an area that has, or will on completion have, more than a BAL-12.5 rating under AS 3959:2018 Construction of Buildings in Bushfire-prone Areas (Standards Australia 2018)*

All dwellings within the subdivision will achieve a BAL-12.5 rating under AS3959:2018 (Standards Australia 2018).

2.4 Areas of Biodiversity Conservation Value Strategy

2.4.1 Ensure settlement growth and development approvals can implement bushfire protection measures without unacceptable biodiversity impacts by discouraging settlement growth and development in bushfire affected areas that are of high biodiversity conservation value

Study area west consists of unmanaged exotic pasture grasses with very little biodiversity value, while study area east contains unmanaged bushland vegetation. Study area east does contain some biodiversity values, with Southern Brown Bandicoot being observed in this parcel during targeted surveys undertaken by Ecology and Heritage Partners (2020). Southern Brown Bandicoot is listed as Endangered under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999. Consequently, a 30-metre wildlife corridor will be retained in study area east in order to permit the movement and dispersal of the species into suitable habitat in the surrounds.

2.5 Use and Development Control in a Bushfire Prone Area Strategy

These strategies require certain developments in the BPA to consider the bushfire risk and potential impacts.

2.5.1 In a bushfire prone area designated in accordance with regulations made under the Building Act 1993, bushfire risk should be considered when assessing planning applications for the following uses and development:

- *Subdivisions of more than 10 lots.*
- *Accommodation*
- *Child care centre*
- *Education centre*
- *Emergency services facility*
- *Hospital*
- *Indoor recreational facility*
- *Major sports and recreation facility*
- *Place of assembly*
- *Any application for development that will result in people congregating in large numbers*

The development is entirely within the BPA. A residential subdivision of more than ten lots has been proposed. The site assessment methodology and commensurate separation distances in AS 3959:2018 (Standards Australia 2018) have been applied to ensure any potential future dwellings will achieve a BAL-12.5 construction standard.

2.5.2 When assessing a planning permit application for the above uses and development:

- *Consider the risk of bushfire to people, property and community infrastructure*

- *Require the implementation of appropriate bushfire protection measures to address the identified bushfire risk*
- *Ensure new development can implement bushfire protection measures without unacceptable biodiversity impacts*

These considerations have been discussed throughout Section 2. The risk of a bushfire and/or grassfire impacting the study area is minimal given the local landscape context. While the adjacent unmanaged properties provide a certain level of fuel, the likelihood of ignition by natural causes (such as ember attack and/or lightning strike) is very unlikely. If these areas were to ignite, it would likely be from human induced activities such as illegal bonfires and/or arson. Furthermore, given the limited fuel available and the fragmented nature of the vegetation, the likelihood of a fire reaching the severity required to impact the development is extremely unlikely.

That being said, bushfire mitigation measures have been adequately implemented to allow any future development to account for any potential hazard by achieving a BAL construction standard of BAL-12.5, providing suitable opportunities for access and egress from the site and the provision of a hydrant system to ensure adequate water supply for firefighting purposes.

3 CONCLUSION

This report has assessed the bushfire hazard within the study area and in the wider landscape in accordance with Clause 13.02-1S of the Casey Planning Scheme and the bushfire site assessment methodology provided in AS 3959-2018 (Standards Australia 2018).

The wider landscape is largely characterised by existing residential areas, with several fragmented parcels of classified unmanaged Woodland and Grassland vegetation. The main shopping area of Cranbourne is located one kilometre north-east of the study area. Contiguous Woodland vegetation is found approximately one kilometre to the south within the Cranbourne Botanic Gardens and immediately adjacent to the study area to the north-east, with Grassland in the adjoining southern Council-owned land. A 30-metre strip of native vegetation is also proposed to be retained along the eastern boundary of the study area. The majority of this area will be modified and managed as Shrubland, which will partially reduce the potential fire threat of the vegetation (compared to the current state of classified Woodland vegetation). There's the potential for laddering to occur, whereby a fire in the understorey may spread to the canopy layer; however, given that some of the canopy layer is being reduced (i.e. some trees removed), it's highly unlikely for it to cause a high intensity canopy fire. In addition, given the presence of the existing residential areas to the north, north-west and south-west (i.e. the directions most associated with extreme bushfire behaviour), the fragmented nature of the unmanaged vegetation within private properties, and the presence of intersecting roads, the likelihood of a landscape scale fire building up within the local environment is significantly reduced. Residents are also able to easily egress towards the low threat or non-vegetation areas found immediately north of the study area.

Classified Grassland and Woodland vegetation were found within the 100-metre assessment zone. Based on the vegetation and slope classifications observed, a Method 2 analysis was undertaken to determine the separation distance from the Woodland within the Council reserve adjacent to the north-eastern corner of

the study area. This analysis determined that the commensurate separation distance required to achieve a BAL-12.5 construction standard is 32-metres, which is nine metres less than the default distance of 41 metres. Any built forms within the study area can therefore be constructed 32-metres from the Council reserve adjoining the north-eastern corner of the study area. The 19-metre Grassland separation distance along the southern boundary of the study area, in which the vegetation is managed in a low threat state (i.e. grass maintained no more than 100 millimetres in height during the Fire Danger Period), will be applied within the adjoining Council-owned property to the south.

Several other mitigation measures have also been engaged to reduce the bush and grassfire risk to an acceptable level. These include the provision of access/egress points for the study area from the established road network, ensuring the internal study area road network meets CFA access requirements, the installation of a hydrant network, and the inclusion of a 7-metre wide fire break within the wildlife corridor.

The proposed subdivision will decrease the bushfire risk to the surrounding areas, as the construction of buildings, roads, carparks, footpaths and managed vegetation will reduce the fuel available to burn.

4 REFERENCES

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5 APPENDIX 1

Table A5.1. Proposed species list for planting and native vegetation retention within Southern Brown Bandicoot Wildlife Corridor

Scientific name	Common Name	Typical height of plant (m)
Epacris impressa	Common Heath	<1
Leptospermum continetale	Prickly Tea tree	<2
Monotoca scoparia	Prickly Broom Heath	<1
Amperea xiphoclada	Broom Spurge	<1
Leucopogon virgatus	Common Beard Heath	<1
Lepidosperma laterale	Variable Sword-sedge	<1
Gahnia sieberiana	Red-fruit Sword-sedge	<1
Lomandra longifolia	Spiny-headed Mat Rush	<1
Dillwynia glaberrima	Smooth Parrot-pea	<1
Pteridium esculentum	Austral Bracken	<1
Hibbertia sp.	Guinea flower	<1
Poa spp.	Tussock Grasses	<1
Rytidosperma spp.	Wallaby Grass	<1
Themeda triandra	Kangaroo Grass	<1

6 ATTACHMENTS

Legend

- Study Area
- 20km Landscape Assessment Zone
- Freeway and Major Roads
- Collector Road
- Minor Road
- Minor Watercourse
- Permanent Waterbody
- Land Subject to Inundation
- Wetland/Swamp

Attachment 1

Bushfire Hazard Landscape Assessment

39-45 and 40-46 Cyril Beechey Lane, Cranbourne

N

0 2.5 5

Kilometres

Map Scale: 1:215,000 @ A4
Coordinate System: GDA2020 MGA Zone 55

ecology & heritage partners

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Legend

- Study Area
- 5km Assessment Zone
- Freeway and Major Roads
- Collector Road
- Minor Road
- Minor Watercourse
- Permanent Waterbody
- Land Subject to Inundation
- Wetland/Swamp
- Contour (10m)

Neigbourhood Safer Place

- Neighbourhood Safer Place
- Access to Neighbourhood Safer Place

Attachment 2

Fire History and Neighbourhood Safer Place Assessment

39-45 and 40-46 Cyril Beechey Lane, Cranbourne

0 750 1,500

Metres

Map Scale: 1:54,000 @ A4
Coordinate System: GDA2020 MGA Zone 55

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Legend

- Study Area
- 1km Lpcal Assessment Zone
- Freeway and Major Roads
- Collector Road
- Minor Road
- Minor Watercourse
- Permanent Waterbody
- Wetland/Swamp
- Contour (10m)

Attachment 3

Bushfire Hazard Local Assessment

39-45 and 40-46 Cyril Beechey Lane, Cranbourne

N

0 150 300

Metres

Map Scale: 1:12,000 @ A4
Coordinate System: GDA2020 MGA Zone 55

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Legend

- Study Area
- 400m Neighbourhood Assessment Zone
- Property Boundaries
- Freeway and Major Roads
- Collector Road
- Minor Road
- Minor Watercourse
- Permanent Waterbody
- Wetland/Swamp
- Contour (10m)

Attachment 4

Bushfire Hazard Neighbourhood Assessment

39-45 and 40-46 Cyril Beechey Lane, Cranbourne

N

0 75 150

Metres

Map Scale: 1:6,000 @ A4
Coordinate System: GDA2020 MGA Zone 55

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Aerial source: Nearmap 2020

Legend

- Study Area
- 100m Site Assessment Area
- Bushfire Management Overlay
- Development area

Other features

- Property boundaries
- Wetland/Swamp
- Minor Watercourse
- Contour (10m)
- Collector Road
- Minor Road

Classified vegetation

- Grassland
- Woodland
- Shrubland
- Excluded (7m fire break - nominal location)

Attachment 5

Bushfire Hazard Site Assessment

39-45 and 40-46 Cyril Beechey Lane, Cranbourne

Site Size: 8.169 ha

N

0 40 80

Metres

Map Scale: 1:3,000 @ A4
Coordinate System: GDA2020 MGA Zone 55

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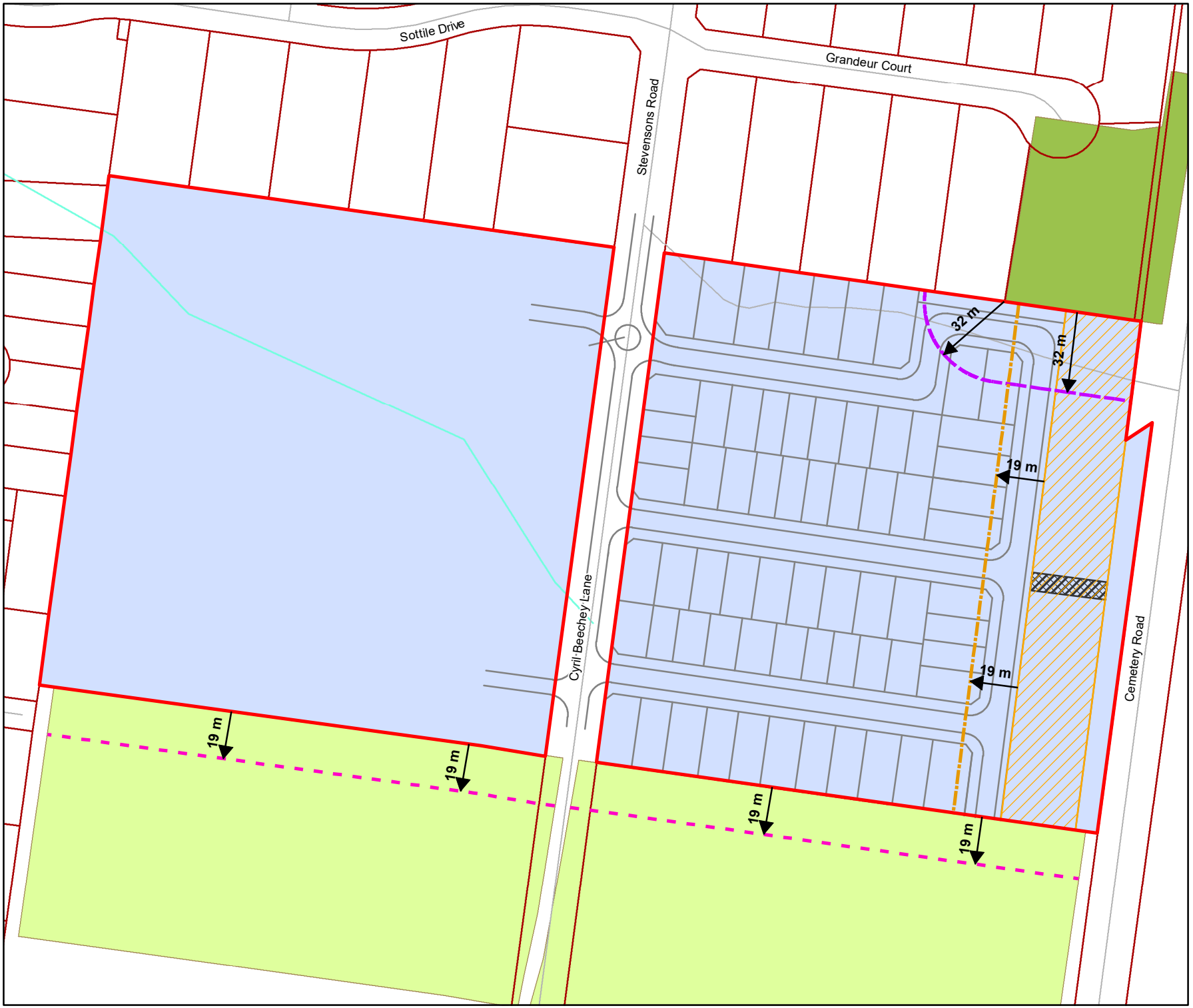
Aerial source: Nearmap 2020



Legend

- Study Area
- Development area
- Development plan

Building separation distances from classified vegetation

- BAL-12.5 from Woodland using Method 2 analysis (32m)
- BAL-12.5 from Shrubland (19m)
- BAL-12.5 from Grassland – within adjoining southern property (19m)

Other features

- Property boundaries
- Minor Watercourse
- Minor Road

Classified vegetation

- Grassland
- Woodland
- Shrubland
- Excluded (7m fire break - nominal location)

Attachment 6

Bushfire Management Plan

39-45 and 40-46 Cyril Beechey Lane, Cranbourne

N

0 25 50

Metres

Map Scale: 1:2,000 @ A4
Coordinate System: GDA2020 MGA Zone 55

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Aerial source: Nearmap 2020