

19 July 2024



## Bushfire Resilience - Creamery Road PSP Hazard and BAL Assessment – **Option 2**

### Context

The Interim Bushfire Assessment and Planning Report of May 2022 and the accompanying Ember Hazard Potential Report (Bushfire Environs 2022) detailed the comprehensive bushfire risk assessment undertaken for the Creamery Road Precinct and the Future Urban Structure of 14 April 2022. The Interim Report proposed a suite of bushfire protection measures to mitigate bushfire risk and to inform the development of the precinct.

Several iterations of the Future Urban Structure (FUS) have occurred since April 2022, with the June 2024 version considered final. These changes to the precinct and FUS have necessitated a review of the precinct hazard assessment. As part of this work, the City of Greater Geelong (CoGG) has commissioned an updated precinct Bushfire Attack Level (BAL) assessment and BAL map.

In a large-scale context, the BAL map broadly identifies areas within the precinct with an assessed radiant heat flux of less than 12.5 kW/m<sup>2</sup> (BAL 12.5). The final BAL map will also indicate areas assessed as having a radiant heat flux of less than 4 kW/m<sup>2</sup>, and areas of less than 2 kW/m<sup>2</sup>.

Planning Policy 13.02-1S *Bushfire Planning* applies to planning and decision making for new settlements within a Bushfire Prone Area (BPA), or where the proposed use or development may create a bushfire hazard. This Policy prioritises the protection of human life over all other policy considerations and directs population growth and development to low bushfire risk locations. In accordance with the policy, settlement planning must be directed to locations assessed as having a radiant heat flux of less than 12.5 kW/m<sup>2</sup> under *AS 3959-2018 Construction of Buildings in Bushfire-prone Areas*. Further, this Planning Policy controls for certain uses and developments in a bushfire prone area, including subdivisions, accommodation, education and childcare facilities, hospitals, recreation facilities and places of assembly. The policy contains a full list.

All of the Creamery Road precinct is currently within a BPA. While some of the proposed use will create bushfire hazards, carefully designed precinct development may result in an overall reduction of bushfire hazards. If vegetation is managed as planned in this report, large areas of the precinct will be below 12.5 kW/m<sup>2</sup> with a considerable area under 4 kW/m<sup>2</sup> and under 2 kW/m<sup>2</sup>. Areas below 4kW/m<sup>2</sup> may ultimately be considered for removal from the BPA.

Bushfire Environs has provided two options for precinct vegetation have been provided – Option 1 with an accompanying report on 14 July and Option 2 on 19 July. This report details option 2, which includes the removal of bushfire hazard areas which could impact the IDA of the future Urban Structure.

## Hazard assessment and BAL mapping

### Vegetation assessment

To undertake a precinct-wide BAL assessment and prepare a precinct BAL map, an extensive understanding of the future state of vegetation within and immediately outside the precinct is required. To achieve this, the type and location of all planned and retained vegetation was discussed and agreed upon by CoGG officers, and subsequently updated following production of the Option 1 BAL map. Table 1 describes the vegetation for option 2. All planned and retained vegetation was assessed in accordance with AS3959:2018, with a determination made on its classification or exclusion.

Table 1 CRPSP vegetation classifications

Land use type	Vegetation classification (AS3959:2018)/type
<b>External Vegetation</b>	
External precinct buffer of 150m	Vegetation surrounding the precinct assessed and mapped in June 2024, as indicated on the map. This is likely to change over time and will require updated bushfire assessments
<b>Internal precinct vegetation</b>	
Cowies Creek Conservation Area	All to be AS3959:2018 grassland
Ephemeral waterway corridor	Parcels EW-01 and WW - 01 to be AS3959:2018 grassland. Parcel WW-02 to be low threat vegetation as specified by AS 3959:2018 2.2.3.2.
All drainage assets	Swales and wetlands will be AS3959:2018 grassland or shrubland (BAL setbacks are very similar for each type). With the exception that drainage asset WLRB – 04 with have a 22m buffer of low threat vegetation on its northern boundary.
All areas between classified vegetation and development (to the BAL 12.5 line on map 1)	Established and managed to satisfy the requirements of Table 6 to C53.02.
All other land areas within the precinct	AS3959:2018 low threat vegetation.

Vegetation classification definitions of AS3959:2018 (summarised) and table 6 to C 53.02 are attached.

### Important notes:

1. For the BAL assessment and BAL map to remain correct, vegetation across the precinct must be managed to be in accordance with the ascribed vegetation classification of table 1.

This includes all internal precinct vegetation and vegetation which is external to the precinct and within 150m of the precinct boundary

2. Changes in vegetation type or location will require an updated BAL assessment which may result in different BAL setbacks and BAL lines

## Slope assessment

A comprehensive slope assessment was undertaken for slopes under classified vegetation. Many classified vegetation patches occurred on more than one slope, and each slope was individually assessed. In accordance with AS3959:2018, the slope resulting in the worst-case BAL determined the effective slope. Effective slopes were categorised in accordance with AS3959 slope categories.

In one instance on the EW drainage corridor, a slope of 23% was measured, requiring application of a BAL method two assessment.

## BAL assessment

The vegetation assessment and the slope assessment were then brought together to generate the 14 bushfire hazard areas described in table 2 and depicted on map 1. These hazard areas identify classified vegetation types on the slope groupings applied in AS3959.

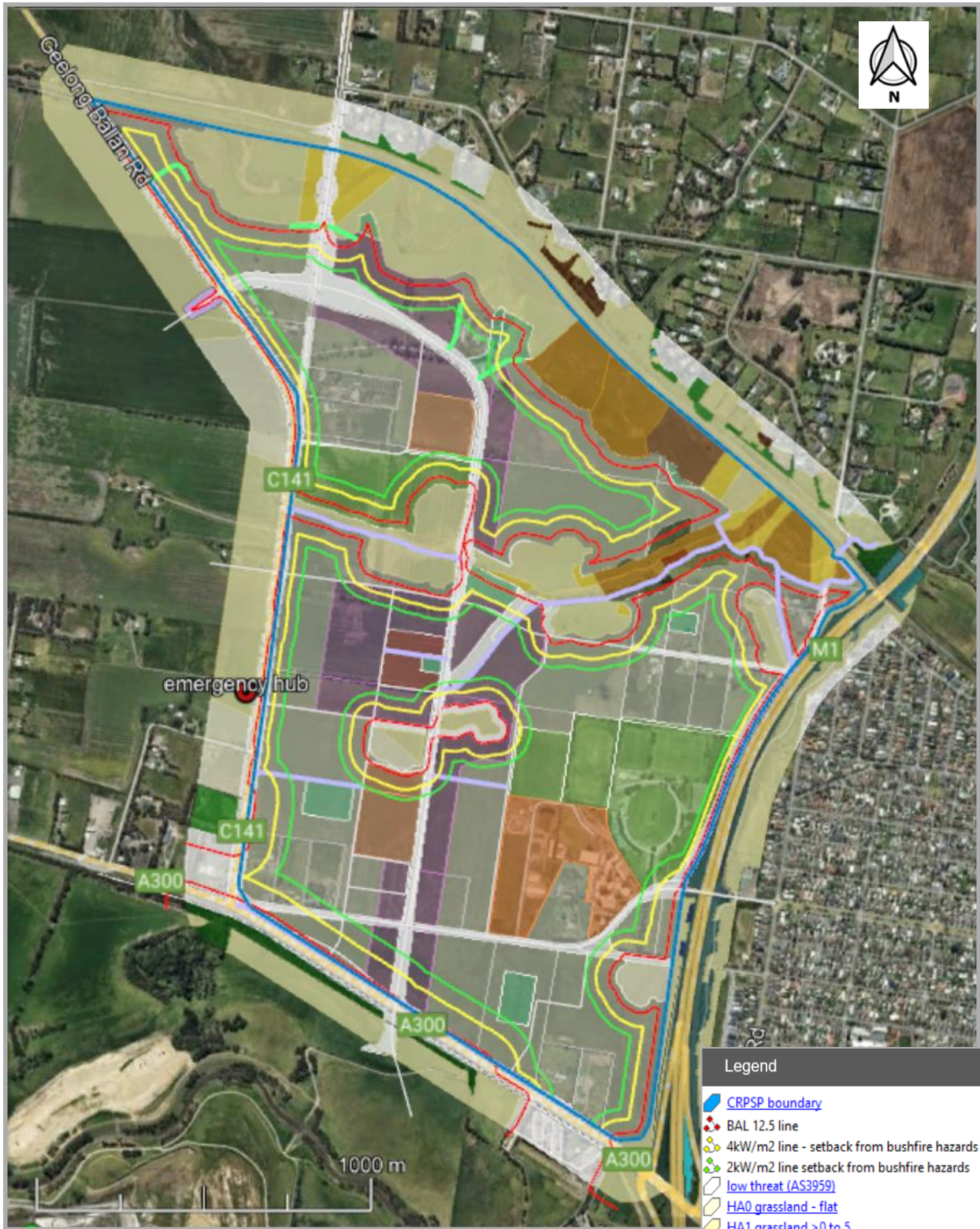
The minimum distance required from each hazard area to achieve a BAL 12.5 line was then determined, in accordance with all requirements of AS3959:2018. A BAL method one with an FDI of 100 was applied over most of the precinct. A BAL method two was used in three determinations, using an FDI of 120 and a flame temperature of 1200K:

- grassland hazard area 5 with a slope of 23 degrees
- the small patches of forest - hazard area 7 on the eastern boundary
- shrubland hazard area 11 on the eastern boundary

A small patch analysis (Tolhurst 2016) was also undertaken for hazard area 11. This methodology is described in a separate report.

### Important BAL assessment notes:

1. In this large-scale and generalised approach, identification of the BAL 12.5 line broadly indicates the minimum setback distance from classified vegetation for development, with the area beyond the BAL 12.5 line assessed as having a radiant heat flux of less than 12.5 kW/m<sup>2</sup> (table 2; map 1). A smaller scale, site-specific BAL assessment would deliver a more nuanced result.
2. The hazard and BAL map (Map 1) will only remain accurate while precinct vegetation types remain consistent with those specified in table 1, and vegetation location remains as depicted on this map.



**Map 1. Creamery Road Precinct - Option 2  
Hazard Area and BAL lines** 19 July 2024

Generalised, large-scale BAL assessment with BAL 12.5 line, 4kW/m2 and 2kW/m2 lines, based on vegetation types and locations approved by CoGG 17 July 2024.

FUS GIS parcels provided by CoGG June 2024.

Table 2. Creamery Road Precinct Structure Plan - Bushfire Hazards and BAL 12.5 setback table.  
Setbacks for development from each Bushfire Hazard Area identified on Map 1 to achieve BAL 12.5.

bushfire hazard area (see Map 1)	vegetation classification (AS3959:2018)	effective slope* (degrees)	Minimum BAL 12.5 setback distance (m)
N/A	low threat	N/A	0
HA 0	grassland	flat	19
HA 1	grassland	0 to 5 down	22
HA 2	grassland	5 to 10	25
HA 3	grassland	10 to 15	28
HA 4	grassland	15 to 20	32
HA 5	grassland	20 to 23	38
HA 6	forest	flat	48
HA 7	forest	0 to 5	57
HA 8	woodland	flat	33
HA 9	shrubland	flat	31
HA 10	shrubland	0 to 5	31
HA 11	shrubland	5 to 10	10**
HA 12	shrubland	10 to 15	28
HA 13	scrub	0 to 5	31

\* all slopes are downslopes unless otherwise stated

\*\* BAL method 2 and small patch (Tolhurst 2016) calculation

## Attachment 1. Vegetation definitions

### Relevant vegetation classifications of AS3959: 2018; excerpts and summaries

AS 3959: 2018 categorises vegetation based on its ability to contribute to bushfire spread or intensity. Descriptions of vegetation classifications relevant to the Creamery Rd Precinct are described below. Vegetation is classified on the basis of its structure and composition at maturity.

Classification	Description summary (elements relevant to CR PSP) – detail in AS3959:2018
<b>Low threat vegetation (excluded from BAL assessment) AS3959: 2018 2.2.3.2</b>	<p>To classify vegetation as exempt, there must be an assurance that the vegetation will continue to be managed in its low-threat state in perpetuity.</p> <p>Low threat vegetation as defined in AS3959:2018 will be met if any one of the vegetation categories (a) to (f) below are achieved:</p> <ul style="list-style-type: none"> <li>(a) Vegetation of any type that is more than 100m from the site [note that a 150m assessment zone is required by 53.02 in the BMO, and will be applied to CR PSP].</li> <li>(b) Single areas of vegetation less than 1 ha in area and not within 100m of other areas of vegetation being classified vegetation.</li> <li>(c) Multiple areas of vegetation less than 0.25ha in area and not within 20m of the site, or each other or of other areas of vegetation being classified vegetation.</li> <li>(d) Strips of vegetation less than 20m in width (measured perpendicular to the evaluation exposed to the strip of vegetation) regardless of length and not within 20m of the site or each other, or other areas of vegetation being classified vegetation.</li> <li>(e) Non-vegetated areas, that is, areas permanently cleared of vegetation including waterways, exposed beaches, roads, footpaths, buildings and rocky outcrops.</li> <li>(f) Vegetation regarded as low threat due to factors such 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, banana plantations, orchards, market gardens (and other non-curing crops), cultivated gardens, commercial nurseries, nature strips and windbreaks.</li> </ul> <p>Notes:</p> <ol style="list-style-type: none"> <li>1 Minimal fuel condition means there is insufficient fuel available to significantly increase the severity of the bushfire attack (recognizable as short cropped grass for example to a nominal height of 100mm)</li> <li>2 A windbreak is considered a single row of trees used as a screen or to reduce the effect of wind on the leeward side of the trees</li> </ol>
<b>Grassland</b>	<p>All forms (except tussock moorlands), including situations with shrubs and trees, if the overstorey foliage cover is less than 10%. Includes pasture and cropland. Note that grassland managed in minimal fuel conditions and non-curing crops are regarded as low threat vegetation for the purpose of Clause 2.2.3.2 (AS3959)</p> <p><b>Forms:</b> Open Woodland/Low Open Woodland/Open Shrubland/Low Open Shrubland/ Hummock Grassland/Closed Tussock Grassland/Tussock Grassland/Open Tussock/Sparse Open Tussock/Dense Sown Pasture/Sown Pasture/Open Herbfield/Sparse Open Herbfield.</p>
<b>Scrub</b>	<p>Found in wet areas and/or areas affected by poor soil fertility or shallow soils: &gt; 30% foliage cover. Dry heaths occur in rocky or sandy areas. Shrubs &gt; 2m high. Typical of coastal areas and tall heaths up to 6 metres in height. May be dominated by Banksia, Melaleuca or Leptospermum with heights of up to 6 meters</p>
<b>Woodland</b>	<p>Trees 10m to 30m high; 10% to 30% foliage cover dominated by eucalypts and/or Callitris with a prominent grassy understorey. May contain isolated shrubs.</p>
<b>Forest</b>	<p>Trees 30m high; 30% to 70% foliage cover (may include understorey of sclerophyllous low trees or shrubs). Typically dominated by eucalypts, melaleuca or callistemon (may include riverine or wetland environments) and Callitris. Includes eucalypt plantations.</p> <p>Trees over 30m high; 30% to 70% foliage cover (may include understorey ranging from rainforest species and tree ferns to low trees and tall shrubs). Found in areas of high reliable rainfall. Typically dominated by eucalypts with a sub-dominant tree layer.</p>

## Vegetation management standards of table 6 to Clause 53.02

The table below is Table 6 to Clause 53.02 Bushfire Planning, within the local planning scheme.

Vegetation Management Requirement
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Defendable space is provided and is managed in accordance with the following requirements:

- Grass must be short cropped and maintained during the declared fire danger period.
- All leaves and vegetation debris must be removed at regular intervals during the declared fire danger period.
- Within 10 metres of a building, flammable objects must not be located close to the vulnerable parts of the building.
- Plants greater than 10 centimetres in height must not be placed within 3 metres of a window or glass feature of the building.
- Shrubs must not be located under the canopy of trees.
- Individual and clumps of shrubs must not exceed 5 square metres in area and must be separated by at least 5 metres.
- Trees must not overhang or touch any elements of the building.
- The canopy of trees must be separated by at least 5 metres<sup>1</sup>.
- There must be a clearance of at least 2 metres between the lowest tree branches and ground level.

Unless specified in a schedule or otherwise agreed in writing to the satisfaction of the relevant fire authority.

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<sup>1</sup> Several LGAs have negotiated with CFA for a reduced tree canopy separation distance to be adopted in Table 6 of c53.02, some at 2m. Given that CR PSP is generally of lower bushfire risk, a similar outcome could be explored.