



Appendix K:

Bushfire Risk Assessment

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Bushfire Risk Assessment

Camperdown Battery Energy Storage System (BESS)

Camperdown BESS Pty Ltd

Level 11, 88 Tribune Street, South Brisbane QLD 4101

Prepared by:

SLR Consulting Australia

SLR Project No.: 620.041535.00012

Revision: R12-v2.0

1 May 2026

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Revision Record

Revision	Date	Prepared By	Checked By	Authorised By
R12-v2.0	1 May 2026	Dr Peter Georgiou	Dr Craig Simpson	Katie Yang
R12-v1.1	17 February 2025	Prameena Karunairaj	Dr Peter Georgiou	

Basis of Report

This report has been prepared by SLR Consulting Australia Pty Ltd (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with Camperdown BESS Pty Ltd (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of the Client. No warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR.

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Executive Summary

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Introduction

SLR Consulting Australia Pty Ltd (SLR) has been engaged by Camperdown BESS Pty Ltd to undertake a Bushfire Risk Assessment (BRA) for the proposed Camperdown Battery Energy Storage System (BESS) located at Wire Lane, Camperdown VIC 3260 (Lot 2 LP43716 and Lot 2 PS817143) (the Project).

The Project involves:

- A BESS with capacity of 60 Megawatt (MW) / approximately 240 Megawatt-hour (MWh) at the point of connection, comprising battery units, inverters, transformers, substation and ancillary infrastructure.
- Connection to Powercor's existing Camperdown Zone Substation via a 66kV Sub-Transmission line which runs from the Camperdown Zone Substation to Colac Zone Substation in a Line-In-Line-Out configuration. Powercor, as the network provider, will facilitate effective integration into the existing power grid; this application relates solely to activities occurring within the Subject Site.
- New driveway and crossover access from Wiridgil Road.
- Associated ancillary infrastructure including Operations & Maintenance building/storage warehouse, Switch Room / Control Room, security fencing, CCTV security system, landscaping, access and internal road, water tanks, temporary parking.
- Decommissioning of the BESS facilities at end of life (EOL).

This study forms part of the Planning Permit application for the Project and has been prepared in accordance with the Victorian Planning Provisions 13.02-1S *Bushfire Planning* (March 2023).

Subject Site

The Subject Site lies just over 1 km to the east of the outskirts of Camperdown and is bordered by Wire Lane to the east and the Warrnambool Rail Line to the south.

The Project footprint is located within heavily cropped agricultural land.

Bushfire Risk

A search on the VICPLAN website, using its mapping tool, shows that the Subject Site is identified as being within bushfire prone land – refer **Section 3.1**.

Accordingly, a comprehensive Bushfire Risk Assessment (BRA) has been undertaken for the Project.

The Subject Site however is not covered by a Bushfire Management Overlay (BMO).

Vegetation Characteristics at the Subject Site Relevant to Bushfire Risk

Data available on the VIC NATUREKIT website and the outcomes of the Ecology Assessment of the Subject Site were used to identify the surrounding vegetation types, relevant to the assessment of the Bushfire Attack Level of the Project Area – refer **Section 3.2**.

Based on the above, SLR has conservatively assumed that the vegetation types immediately surrounding the Project Area would be classed as Grassland. This applies in all directions.



BAL (Bushfire Attack Level)

In **Section 4** of this report, BAL calculations were made for the Project Area.

The BAL-12.5 level was chosen for all critical equipment and buildings within the Project Area. This also assists the safety of firefighters and other emergency workers found within the Project Area under threat by a bushfire.

APZ (Asset Protection Zone) / Defendable Space at the Subject Site

The resulting APZ distance for the Project Area (refer **Figure 11**) is:

- The target BAL-12.5 level is achieved at a distance of 19 m.

Bushfire Risk Mitigation

Section 5 of this report details the management and mitigation measures that address bushfire risk at the Project Area – including the following:

- Asset Protection Zones (APZs) to minimise the impact of radiant heat and flame contact – refer **Section 5.1**.
- Construction Standards and Design to minimise building vulnerability to bushfire flames, radiation and embers – refer **Section 5.2**.
- Access and Egress for authorised personnel and for firefighters and their equipment – refer **Section 5.3**.
- Adequate Water Supply for fire suppression – refer **Section 5.4**.
- Landscape Management – refer **Section 5.5**.
- Emergency Response and Management – Preparedness and Planning.

Bushfire Management Plan (BMP)

Section 6 details the requirements of the BMP that will be developed during detailed design stage and the need to align the BMP with other key emergency response plans that would be developed during the detailed design phase of the Project.

Summary

Taking into account the above, SLR has concluded that:

- Bushfire risk issues at the Project can be adequately mitigated; and
- The Project will be adequately protected from the threat of a bushfire event.

In terms of the usual “Risk Matrix” approach adopted for Hazard Studies, SLR considers the residual risk associated with Bushfire hazard to the proposed development to be **LOW/MINOR**, and hence adequately mitigated and managed.

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Appendix A Vegetation Descriptions taken from AS3959:2018

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Acronyms and Abbreviations

APZ	Asset Protection Zone
ARES	Australian Renewable Energy Systems
BAL	Bushfire Attack Level
BESS	Battery Energy Storage System
BRA	Bushfire Risk Assessment
BMO	Bushfire Management Overlay
BMP	Bushfire Management Plan
BPA	Bushfire Prone Area
CFA	(VIC) Country Fire Authority
EMP	Emergency Management Plan
EOL	End of Life
FDI	Fire Danger Index
FRV	Fire & Rescue Victoria
FTE	Full-Time Equivalent
LGA	Local Government Area
SLR	SLR Consulting Australia Pty Ltd
TL	Transmission Line
VMP	Vegetation Management Plan

Units

kL	Kilolitre (1,000 litres)
km	Kilometre (1,000 metres)
kV	Kilovolt (1,000 volts)
kVA	Kilovolt Amps
kW	Kilowatt (1,000 watts)
m	Metre
MW	Megawatt (1 x 10 ⁶ watts)
MWh	Megawatt-Hour

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1.0 Introduction

SLR Consulting Australia Pty Ltd (SLR) has been engaged by Camperdown BESS Pty Ltd (Camperdown BESS) to undertake a desktop Bushfire Risk Assessment (BRA) for the proposed Battery Energy Storage System (BESS) with capacity of 60 Megawatt (MW) / 240 Megawatt Hours (MWh) at the point of connection, and associated infrastructure, located at Wire Lane, Camperdown VIC 3260 (Lot 2 LP34716 and Lot 2 PS817143) (the Project).

This study forms part of the Planning Permit application for the Project and has been prepared in accordance with the Victorian Planning Provisions 13.02-1S *Bushfire Planning* (March 2023).

The Subject Site is located in a Designated Bushfire Prone Area. This study has therefore been undertaken in accordance with the below:

- State Planning Policy Framework
 - Victoria Planning Provisions 13.02 Bushfire
 - Victoria Planning Provisions 53.02 Bushfire Planning
- Planning Practice Note 64 – Local planning for bushfire protection

1.1 Terminology

The areas of investigation and assessment discussed within this report are as follows:

- *Project* – the proposed Camperdown BESS.
- *Subject Site* – consisting of Lot 1 of TP863659 and Lot 2 of TP863659;
- *Project Area* – the area as marked in Figure 1 associated with the Project within the Subject Site, consisting of all compounds, buildings and equipment within the Project boundary fence, including:
 - *BESS Compound* – the area of the BESS battery containers.
 - *Substation Compound* – the area of the Project substation.
 - *Switch Room / Control Room*.
 - *O&M Buildings*.

1.2 Structure of Report

The remainder of this BRA report is structured as follows:

- Section 2 Description of the Project
- Section 3 Subject Site and Surrounds: Vegetation, Ground Slopes, Bushfire History, Prevailing Winds
- Section 4 Determination of the BAL (Bushfire Attack Level) and APZ (Asset Protection Zone) for the Project.
- Section 5 Bushfire Mitigation and Controls
- Section 6 Recommendations for the Project's Bushfire Management Plan
- Section 7 Conclusions

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2.0 Project Description

2.1 Subject Site Location

The Camperdown Battery Energy Storage System (BESS), herein “the Project”, will involve the development, construction, operation, and eventual decommissioning of a BESS with capacity of 60 MW and approximately 240 MWh at the point of connection – refer **Figure 1**.

- The Project is located at Wire Lane, Camperdown VIC 3260, formally known as Lot 2 LP34716 and Lot 2 PS817143.
- The 48.78ha Subject Site is located within the Corangamite Shire Council Local Government Area (LGA).
- The footprint of the Project Area within the Subject Site is approximately 2.2ha.
- The BESS will be connected into the 66 kilovolt (kV) Sub-Transmission line which runs from Camperdown Zone Substation to Colac Zone substation in a Line-In-Line-Out configuration. Powercor, as the network provider, will facilitate effective integration into the existing power grid.

A summary of the site identification information is detailed in **Table 1**.

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Figure 1 and **Figure 2** show an aerial and the cadastral plan for the Subject Site.

Table 1 Subject Site Description

Subject Site Information	Details
Project Address	Wire Lane, Camperdown, VIC 3260
Title Reference	Lot 2 of LP34716 and Lot 2 of PS817143
Local Government	Corangamite Shire
Current Zoning	Farming (FZ1)
Subject Site Area	Approximately 48.8 ha
Project Area Footprint	Approximately 2.2 ha
Current Occupier	Private owners
Current Land Use	Agriculture
Proposed Future Land Use	BESS operations on portions of the Subject Site, with ongoing agricultural use for surrounding lands
Site facilities and key features	The Subject Site is currently undeveloped, agricultural grass land
Summary of surrounding land uses	North: Agricultural/pastoral lots. South: Dennington rail line, then agricultural/pastoral lots. East: Wire Lane, then agricultural/pastoral lots. West: Agricultural/pastoral lots
Environmental Constraints	Designated Bushfire Prone Area. Partially located within an Area of Aboriginal Cultural Heritage Sensitivity.

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Figure 1 Project Location

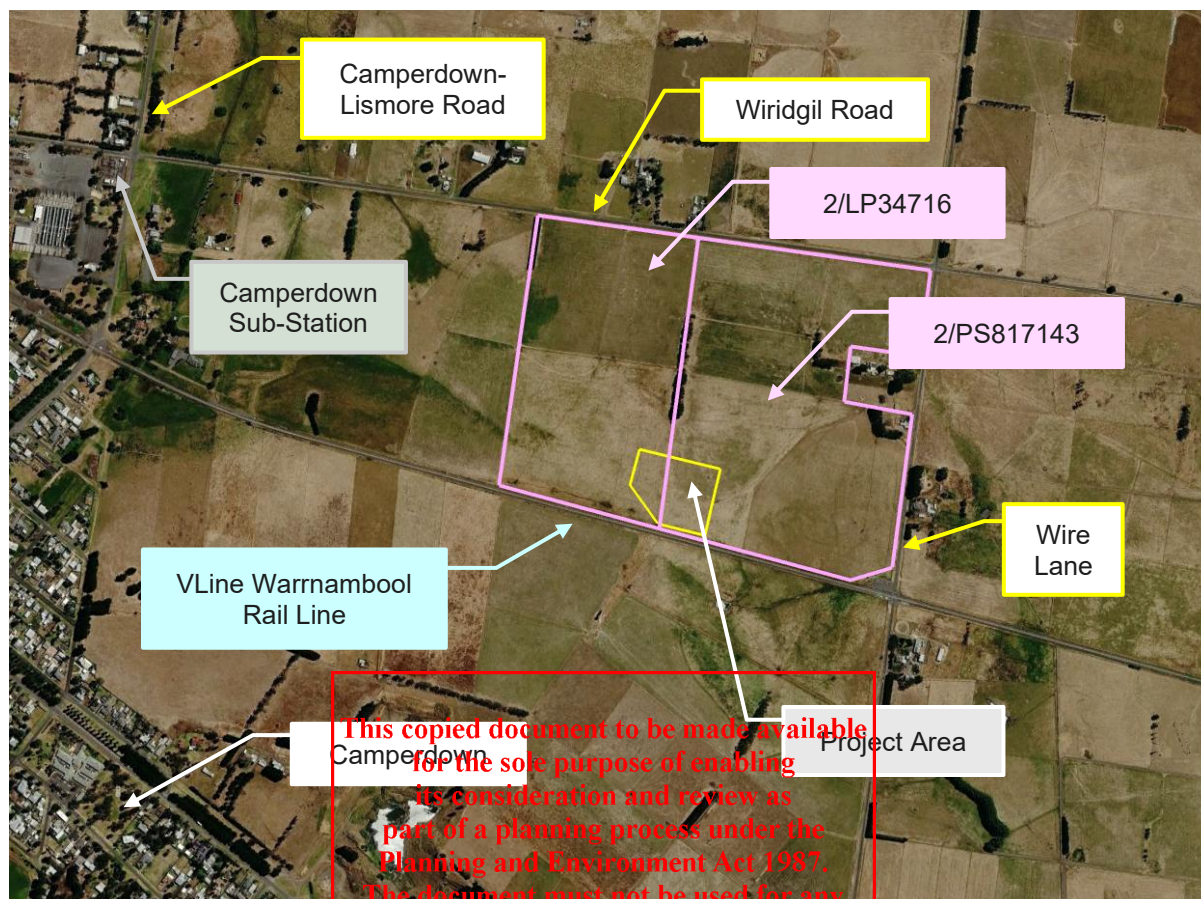


Figure 2 Cadastral Plan (Source: VicPlan)



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2.2 Development Description

The currently proposed layout of the Project Area is shown in **Figure 3**.

Figure 3 Current (Indicative) Project Area Layout



2.2.1 Construction

Construction of the Project would require heavy vehicles, plant, and equipment for the transportation of components and installation of the components on the Subject Site. The Construction laydown areas and temporary buildings may also be established on the Subject Site outside the development area. Earthmoving machinery, cable trenching equipment, forklifts, and cranes will be required, subject to detailed design, to install the BESS and undertake associated civil and ancillary works.

It is anticipated that the construction and commissioning phase will last approximately 24 months.

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Over that time, the main construction activities will include:

- Pre-construction activities including driveway apron.
- Project establishment works including vegetation clearing within the Project Area boundary fence, bulk earthworks, and temporary construction compound.
- Construction of hardstand, gravel all weather access road and Project Area internal roads and drainage;
- Installation of a substation including installation of earthing grid, benching works, transformer bunding, installation of 66/33 kV main transformers, outdoor switchgear, high voltage (HV) busbar and support structure, overhead gantry structures, harmonic filters, and reactive plant;
- Construction of an overhead power line from the Project substation, connecting east to cut into the existing overhead lines located along Wire Lane.
- Installation of underground 33 kV reticulated cabling, auxiliary transformers, battery containers, and the PCS;
- Construction of ancillary works including parking areas, water tank, storage structures, stormwater management infrastructure, water containment infrastructure, and security lighting and fencing, including vegetation screening;
- Construction of the Operations & Maintenance buildings and delivery and installation of Switch Room / Control Room
- Transport of construction personnel, associated heavy and light vehicles, and materials to and from the Subject Site on a day-to-day basis, dependent on construction schedule
- Cold and hot commissioning of BESS and substation equipment;
- Hold point testing and Final Acceptance;
- Removal of temporary construction facilities, and rehabilitation of disturbed areas following completion of construction of the Project.

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2.2.2 Operation

During operation, the Project is proposed to self-operate 24 hours a day 7 days a week and will only require periodic maintenance by authorised staff. The Project Area would otherwise be restricted to the public.

Minimal plant and equipment will be required for operation of the Project, primarily for staff access and maintenance vehicles.

The operation of the Project would involve, but not be limited, to the following general activities:

- Maintenance and management of equipment, site buildings, and landscaping.
- General administrative activities.
- Receipt of equipment or goods.
- Waste removal from maintenance and administration activities.

Emergency responses and maintenance activities may be required to be undertaken out of hours.

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The operational life of the Project will be determined by the evolving nature of the technology. It is currently envisaged that the lifespan will be approximately 25-30 years.

Key Access Characteristics:

- Access to and from the Project Area would be provided via Wiridgil Road located northeast of the Subject Site, with an informal internal road, directed straight toward the south of the Subject Site to the Project Area and future dedicated hardstand area. An additional access driveway is to be provided via Wire Lane.
- Internal roads are proposed to accommodate firefighting access during an emergency situation.

2.2.3 Decommissioning

The Project is proposed to be decommissioned and the infrastructure removed following the End of Life (EOL) of the Project, with works required to return the Subject Site as close as possible to its original state and use.

All decommissioning and restoration activities would be in accordance regulatory requirements at the time.

2.2.4 BESS Units

Essential specifications for the proposed BESS units are shown in **Table 2**, with an example of a BESS module installation show in **Figure 4**.

Table 2 BESS Specifications¹

Specification	Details
No. of Battery Containers	Up to 54
No. of Battery Racks per Enclosure	4-6
Battery Container	20 ft Battery Energy Storage System
Storage Inverter	4600.0 kVA
Power Conversion System	4.6 MVA, 0.69/33.0 kV
Dimensions	L: 6058mm x W: 2438mm x H: 2896mm (20 ft high cube shipping container)
Battery Chemistry	Lithium-iron-phosphate
Inverters	18
MV Transformers	18
Substation	1 x 66/33 kV transformer, 2 x 66 kV lines out

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¹ Final BESS specifications will be subject to detailed design.



Figure 4 Indicative Image of BESS Modules



2.2.5 Grid Connection

The BESS will be connected into the 66 kV sub-transmission line which runs from Camperdown Zone Substation to Colac Zone Substation in a Line-In-Line-Out configuration. Electricity stored within the BESS will be converted from DC to AC by onsite inverters and transferred through underground 33 kV cables to the proposed onsite 66/33 kV substation, where it will be increased to 66 kV for discharge into the electricity network.

The proposed overhead sub-transmission line will originate from the Project substation and connect east to the existing overhead lines located along Wire Lane. Network provider Powercor will facilitate effective integration into the existing power grid. All approvals required outside the Subject Site are the responsibility of Powercor.

The indicative route of the transmission line is shown in **Figure 5**.

2.2.6 Removal of Vegetation

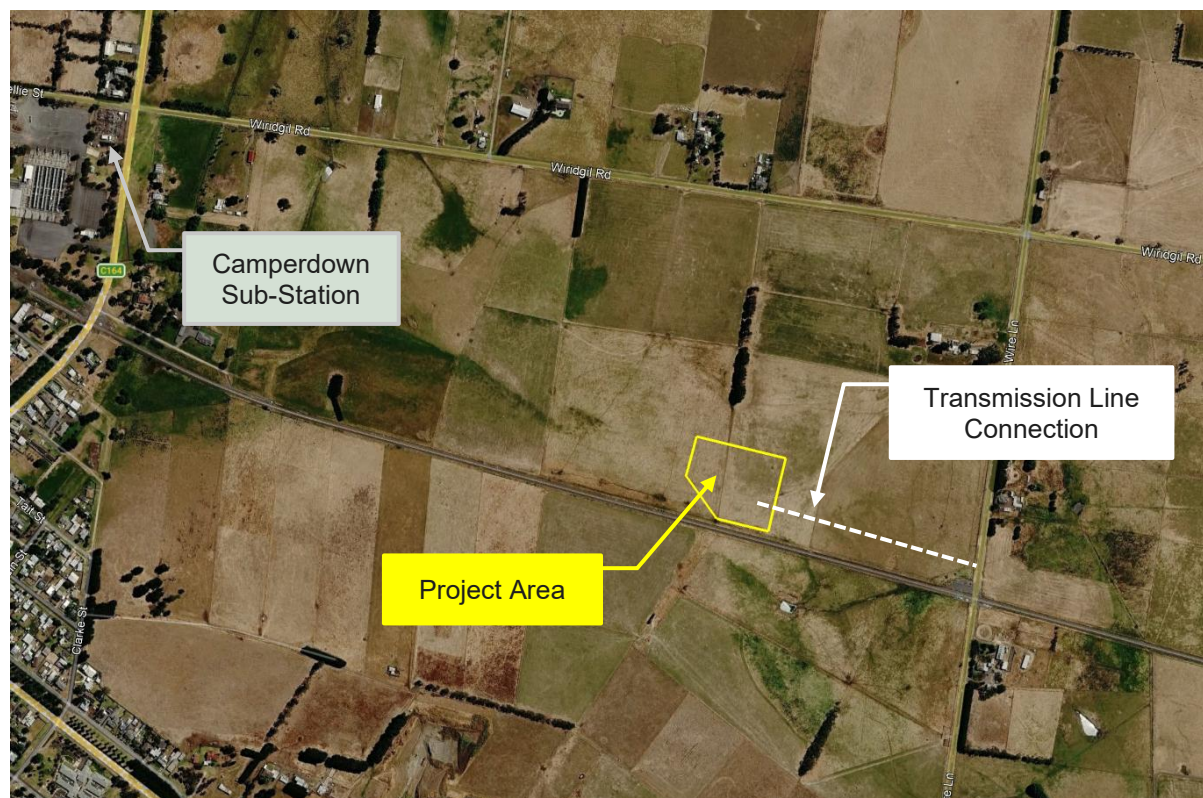
The BESS and Substation compounds, external access and internal roads and connecting transmission line easement will require minimal clearing of Subject Site vegetation.

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Figure 5 Indicative Su-Transmission Line Location



2.2.7 Water Usage

As noted above, water will be required during the construction phase for dust suppression, general construction, and maintenance activities.

- This water will be brought to the Subject Site in water tankers.
- Construction water requirements for the Project are anticipated to be sourced from local bulk water supply.

Wastewater during construction will be captured and appropriately removed from the Subject Site and disposed of in accordance with the Council/Water Authority requirements.

Potable water may be transported to the Project in bottles for use by the construction workforce.

If utilised, toilet facilities will involve waterless toilets (or equivalent) that are emptied off-site.

A 288 kL static water supply comprising two 144 kL tanks available for firefighting purposes will be constructed at an early stage of the Construction phase.

- These tanks will remain available for firefighting purposes during the Construction, Operation and De-commissioning phases of the project.

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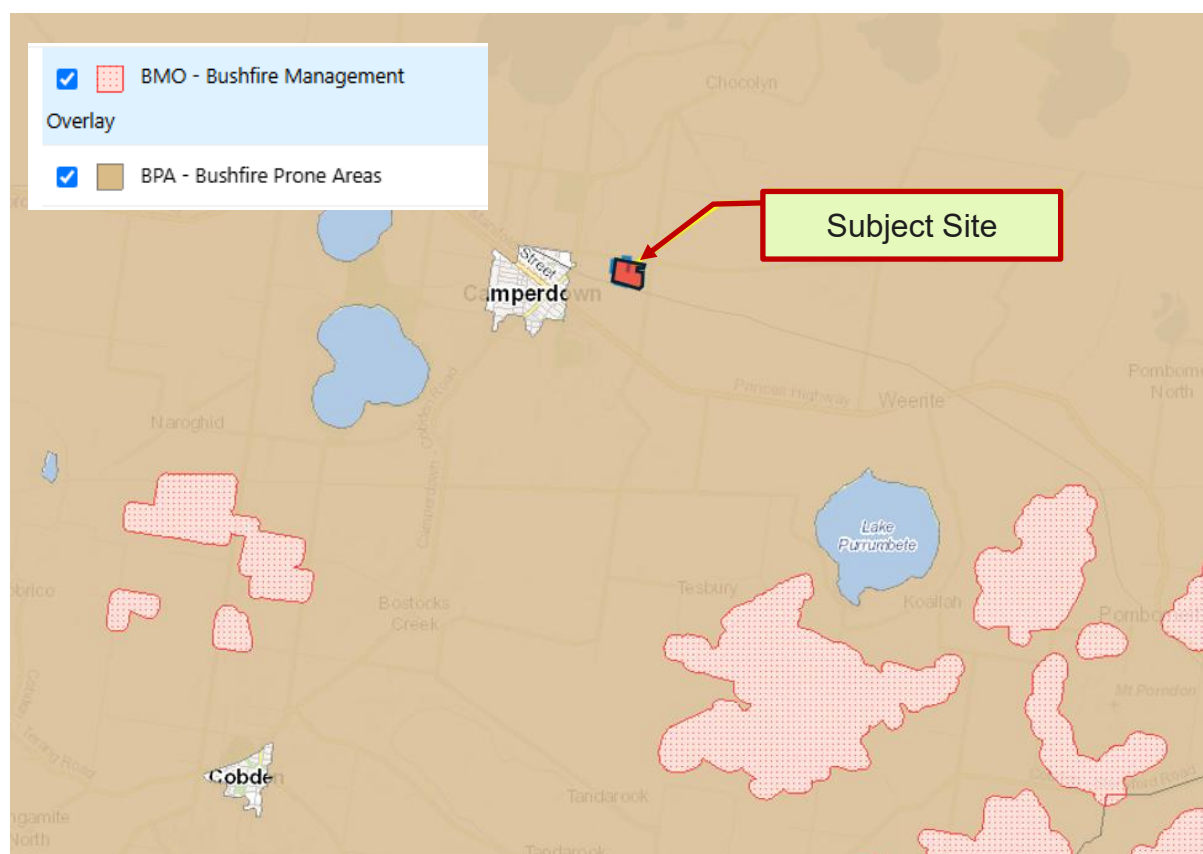
3.0 Characteristics Relevant to Bushfire Risk of the Subject Site and Surrounds

3.1 Bushfire Prone Land

Figure 6, sourced from VicPlan, shows the following:

- The Subject Site is identified as lying within a Bushfire Prone Area (BPA).
- The Subject Site does not lie within a Bushfire Management Overlay (BMO).

Figure 6 VicPlan - Bushfire Management Overlay and Bushfire Prone Area in the Subject Site Vicinity



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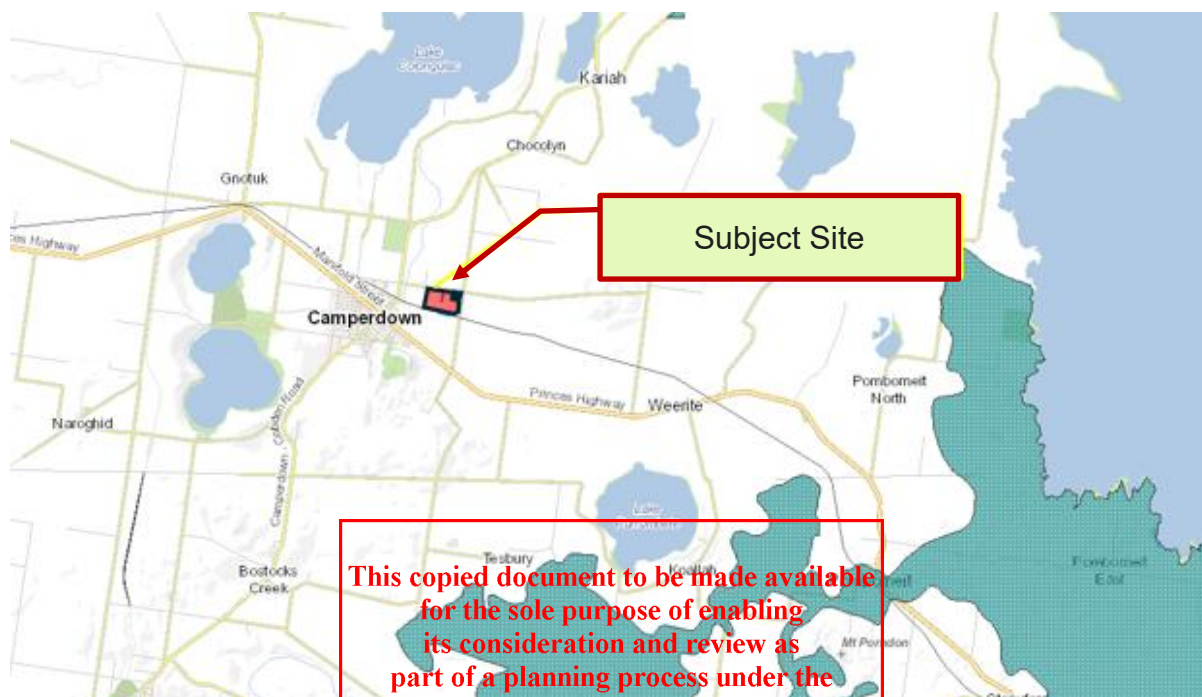
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3.2 Vegetation Characteristics of Subject Site and Surrounds

The vegetation types surrounding the Subject Site have been sourced from VicPlan and are shown in **Figure 7**.

Figure 7 Vegetation Protection Overlay in the vicinity of the Site



The Subject Site is not part of any vegetation protection overlay.

The Subject Site is heavily cropped and has a lack of trees or vegetation in the area. The surrounds consist of predominantly grazed agricultural land to the north, south, east and west, as well as scattered rural dwellings, sheds, dams, and isolated areas of remnant vegetation.

A biodiversity assessment has been undertaken for the Subject Site and noted the following:

- No flora or fauna species, or ecological communities listed under the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) are relevant to the study area.
 - As such, a referral under the EPBC Act is not required;
- No flora or fauna species of conservation significance (as listed under the *Flora and Fauna Guarantee Act 1988*, FFG Act) were recorded within the Subject Site or on adjoining roadside areas, where works are proposed.
 - Targeted surveys are not required to further inform the proposed development, and a permit under the FFG Act is not required;
- A planning permit to remove, destroy or lop native vegetation is required under Clause 52.17 of the Corangamite Planning Scheme (*Planning and Environment Act 1987*) is not required.

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3.3 Bushfire History

The Digital Atlas of Australia provides a historical data of bushfire extents. (Refer - <https://digital.atlas.gov.au/pages/national-bushfire-data>). The data extends back to 1900 and shows the following – refer **Figure 8**:

- The Subject Site has not been subject to a high frequency of significant bushfires.

Figure 8 Bushfire History



The above is in line with the low/medium bushfire risk profile of the Subject Site and surrounds as suggested in previous sections.

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3.4 Topography of the Subject Site and Surrounds

The topography surrounding the Subject Site is relatively level at just below RL160m AHD, gently dropping from the southwest corner to the northeast corner. Contour elevations surrounding the Project Area are shown in **Figure 9**.

Figure 9 Topography of Site and Surrounds



In terms of bushfire risk:

- The immediate land surrounding the Project Area boundary fence can be taken as **essentially flat** (0° slope) at RL160m.

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3.5 Prevailing Winds

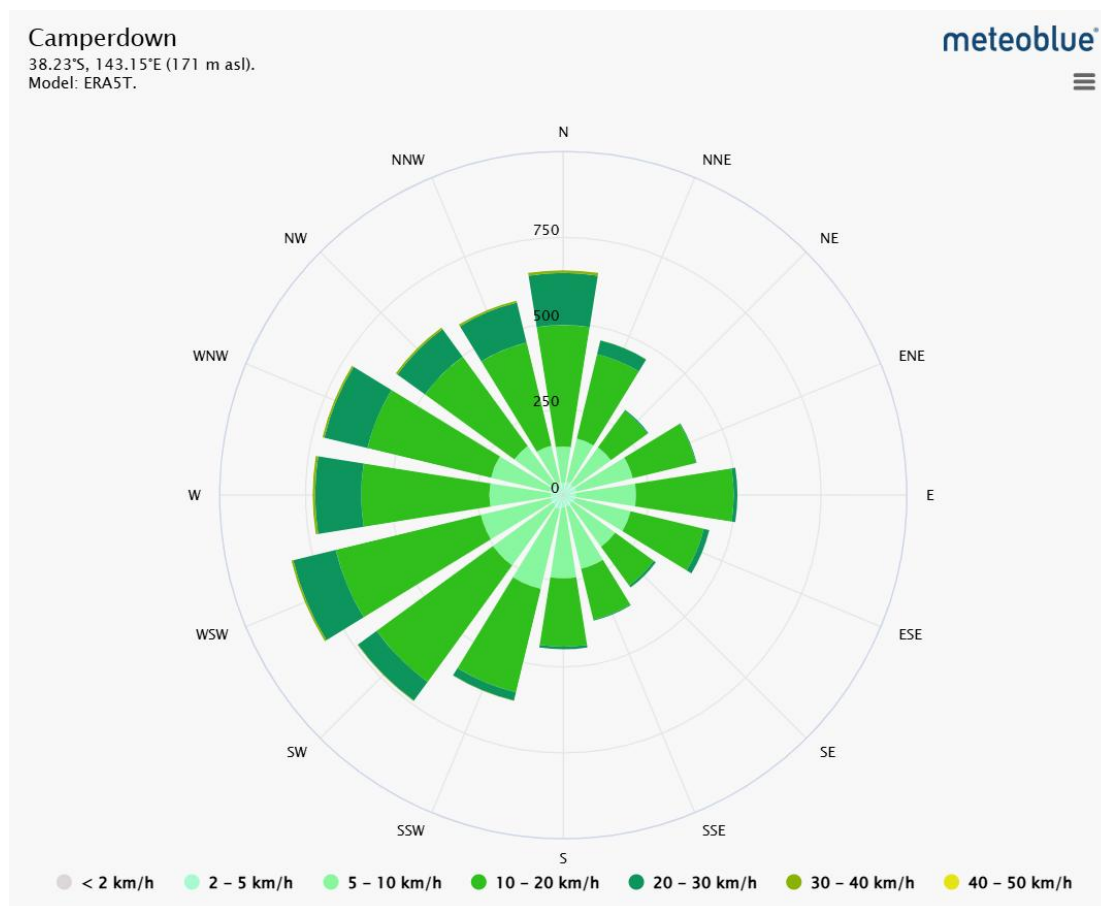
Prevailing winds in the region are shown in **Figure 10**.

Refer:

https://www.meteoblue.com/en/weather/historyclimate/climatemodelled/camperdown_australia_2172562

It can be seen that prevailing winds are overwhelmingly from westerly quadrants, southwest around to northwest. This has implications in terms of access for firefighting vehicles responding to an active fire, i.e. where the safest route to approach the Subject Site would likely be.

Figure 10 Camperdown Area Wind Rose



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4.0 Bushfire Risk

4.1 Bushfire Attack Level (BAL)

A key input in the assessment of bushfire risk is to determine the BAL (Bushfire Attack Level) of the project site of interest. The Camperdown BESS BAL has been assessed according to:

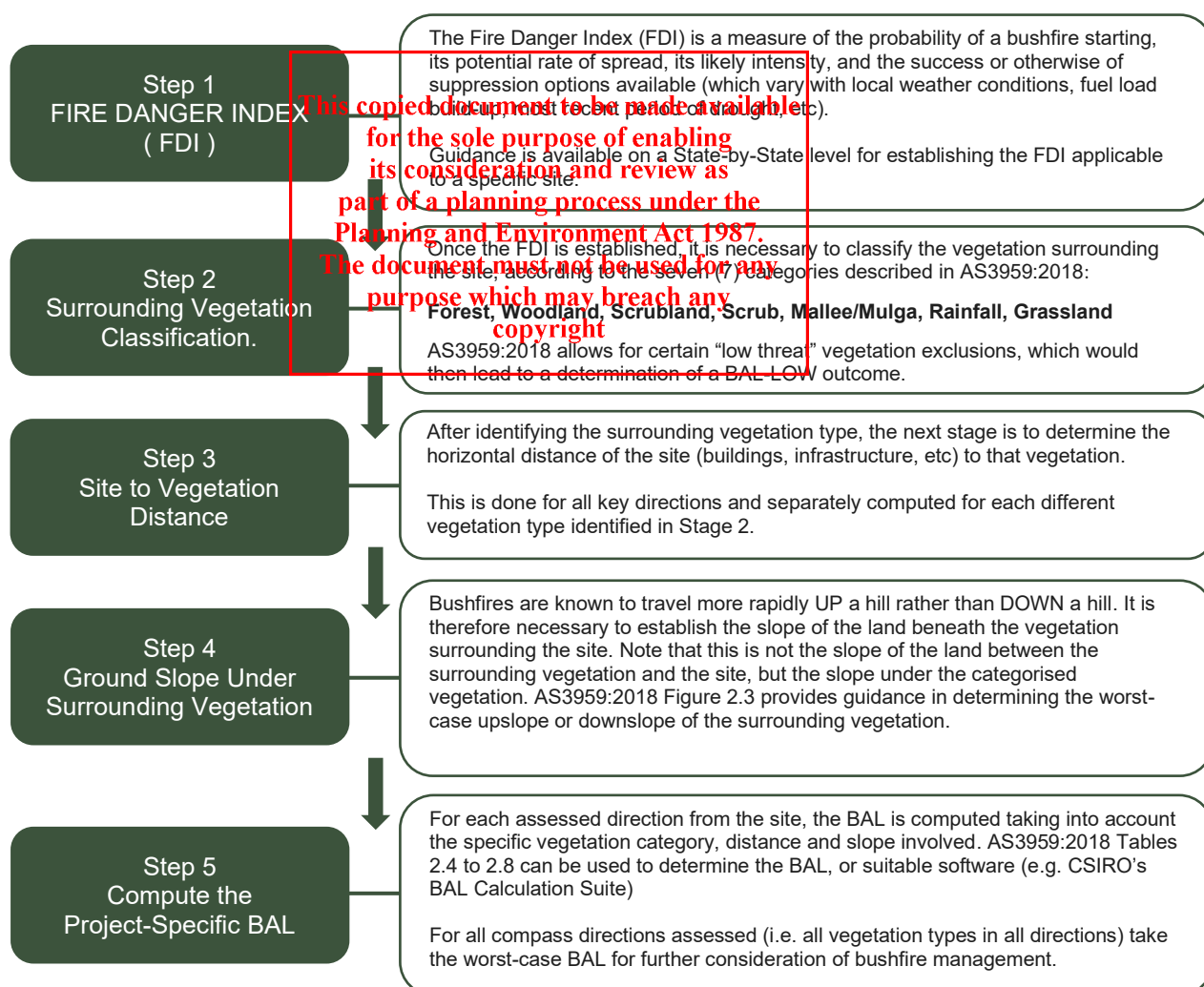
- Australian Standard AS3959:2018, “Construction of Buildings in Bushfire-Prone Areas”.

In AS3959:2018, BAL is defined as:

- A means of measuring the severity of a building's potential exposure to ember attack, radiant heat and direct flame contact, using increments of radiant heat expressed in kW/m², and the basis for establishing the requirements of construction to improve protection of building elements from attack from bushfire.

The steps involved in assessing a site specific BAL are shown in **Figure 11**.

Figure 11 BAL Analysis Methodology



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Table 3 lists the six BALS defined in AS3959:2018.

Table 3 AS3959:2018 Bushfire Attack Levels (BALs)

Bushfire Attack Level (BAL)	Classified Vegetation within 100m of the site and heat flux exposure threshold	Description of Predicted Bushfire Attack and Levels of Exposure
BAL - LOW		There is insufficient risk to warrant specific construction requirements
BAL - 12.5	$\leq 12.5 \text{ kW/m}^2$	Ember Attack
BAL - 19	$> 12.5 \text{ kW/m}^2$ and $\leq 19 \text{ kW/m}^2$	Increasing levels of ember attack and burning debris ignited by windborne embers together with increasing heat flux
BAL - 29	$> 19 \text{ kW/m}^2$ and $\leq 29 \text{ kW/m}^2$	Increasing levels of ember attack and burning debris ignited by windborne embers together with increasing heat flux
BAL - 40	$> 29 \text{ kW/m}^2$ and $\leq 40 \text{ kW/m}^2$	Increasing levels of ember attack and burning debris ignited by windborne embers together with increasing heat flux with the increased likelihood of exposure to flames
BAL - FZ	$> 40 \text{ kW/m}^2$	Direct exposure to flames from fire front in addition to heat flux and ember attack

4.2 BAL Inputs

4.2.1 BAL Assessment Step 1: FDI

The FDI for the Camperdown BESS site has been determined to be 100.

This was based on the Fire Danger Index values found at the CSIRO reference website below and coincides with the FDI values recommended by the Australasian Fire and Emergency Service Authorities Council.

<https://research.csiro.au/bushfire/assessing-bushfire-hazards/hazard-identification/fire-danger-index/>

4.2.2 BAL Assessment Step 2: Vegetation Classification

The vegetation types surrounding the Project were discussed in **Section 3.3**.

The vegetation categories defined in AS3959:2018 are listed in **Appendix A** along with descriptive summaries.

For the BAL calculation relevant to the Project, the following vegetation category has been assumed in all directions:

- Grassland

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4.2.3 BAL Assessment Steps 3 and 4: Distance to Vegetation and Slope Under Vegetation

As shown in **Section 3.4**, the topography surrounding the Subject Site is generally flat, with a slope designation as per AS3959:2018 of: “Flat – 0°”.

Table 3 lists the vegetation type and slope parameters used in the BAL calculations. The nearest vegetation location is taken from the Project Area boundary fence and the sub-transmission line axis for the remaining areas of interest.

Table 4 Vegetation and Slope Parameters used for the BAL Calculations

Direction	Regional Ecosystem Classification	Slope Under Vegetation
All Quadrants	Grassland	Flat 0°

AS3959:2018 allows for “Exclusions” to BAL calculations for “low threat” vegetation and non-vegetated areas.

Specifically, AS3959:2018 Clause 2.2.3.2(a) states that the following shall be excluded from a BAL assessment:

- Vegetation of ANY type that is more than 100 m from the site.

On the basis of the preceding discussions covering vegetation type and fire history, no areas surrounding the site are assumed to qualify for the above AS3959:2018 exclusion.

4.3 BAL Calculations

The BAL Calculation for the Project Area has been carried out using:

- CSIRO’s BALA (Bushfire Attack Level Assessment) Tool

<https://best-practices-assessment-tool.herokuapp.com/calculator?slope=0&vegslope=0&FFDI=60&vegtype=Tussock>

Vegetation categories, and distances and slopes to the nearest vegetation have been based on **Table 3**.

The results are shown in **Figure 12**.

The BAL calculations apply to the BESS Compound, Substation Compound, Switch Room / Control Room and O&M Buildings within the Project Area.

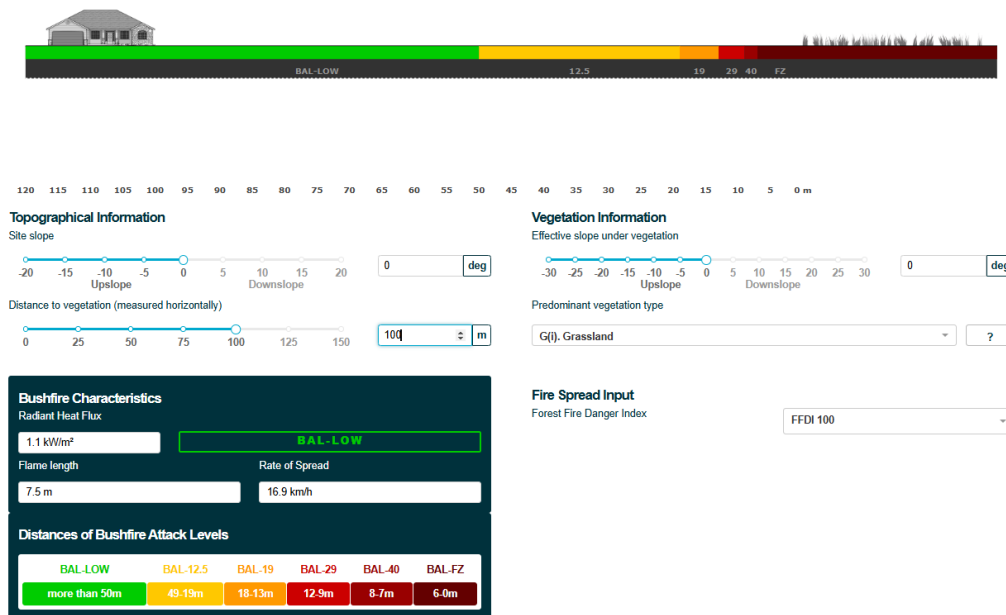
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Figure 12 BAL Calculation using the CSIRO BALA Tool

Subject Site – ALL Directions



4.4 BAL Summary

- The BAL-12.5 zone for the Project would be achieved for a distance of 19 m.

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5.0 Bushfire Risk Mitigation and Management

The Project Area requirements needed to address a potential bushfire attack fall into the following categories:

- Asset Protection Zones (APZs) or Defendable Space to minimise the impact of radiant heat and flame contact;
- Construction Standards and Design to minimise building vulnerability to bushfire flames, radiation and embers;
- Access and Egress for authorised personnel and for firefighters and their equipment;
- Adequate Water Supply for fire suppression;
- Landscape Management; and
- Emergency Response and Management – Preparedness and Planning, including the development of a detailed Bushfire Management Plan.

5.1 Asset Protection Zone (APZ) / Defendable Space

The recommended APZ was developed in accordance with guidance contained in:

- VIC CFA, *Defendable Space*, August 2022.
- Victorian Planning Provisions 13.02-1S *Bushfire Planning* (March 2023).
- AS 3959-2018 *Construction of Buildings in Bushfire-Prone Areas*
- *Building in bushfire-prone areas* - CSIRO & Standards Australia (SAA HB36-1993, 1993)

The recommended APZ for the Project Area is shown in **Figure 13**. It satisfies the following:

- The APZ is situated on cleared ground with minimal gradients.
- The APZ creates a total separation to the nearest vegetation at the Project Area boundary fence as follows:
 - Minimum 19 m from nearest BESS Compound equipment.
 - Minimum 19 m from nearest Substation Compound equipment.
 - Minimum 19 m from the Switch Room / Control Room and Operations & Maintenance Building.
- The APZ will be maintained as either completely cleared land or a mown area with a grass height of less than 100 mm.
- The APZ may overlap with the 10 m Fire Break required by the CFA's "*Design Guidelines and Model Requirements – Renewable Energy Facilities* v4, October 2023.

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Figure 13 Asset Protection Zone for the BESS Site



Benefits of the APZ and Potential Radiant Heat Impact

The recommended APZ achieves the following:

- Equipment and buildings within the Project Area will experience a radiant heat flux level which is at the threshold for piloted ignition of dry timber and failure of plain glass, and more generally is a target maximum exposure at any point of a building wall or façade.
- This is also the threshold where firefighters and other emergency services can operate, for both firefighting and evacuating occupants from threatened buildings – refer Heus & Denhartog (2017) *Maximum Allowable Exposure to Different Heat Radiation Levels in Three Types of Heat Protective Clothing*.
- The Project's APZ will achieve a performance-based outcome relevant to Victorian State and Local Government bushfire management guidelines.

Project Commitment

- The Proponent commits to establishing a management regime to ensure the ongoing integrity of the proposed APZ, including responsibility for ongoing maintenance, etc.

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5.2 Construction Standards and Design

The National Construction Code (NCC) is a performance based code which comprises the Building Code of Australia (BCA) as Volumes 1 and 2 and the Plumbing Code of Australia as Volume 3.

- The NCC contains Performance Requirements and Deemed-to-Satisfy provisions relating to the construction of buildings in bush fire prone areas.

The construction requirements of AS3959:2018 and the National Association of Steel-framed Housing (NASH) Standard contain Deemed-to-Satisfy solutions in the NCC, (can be varied State-to-State), for buildings in designated bush fire prone areas.

The general requirements for the construction of buildings specified in AS3959:2018 are separated according to the relevant BAL at the site of interest.

For the Project, and hence for BAL-12.5, the relevant code sections are Sections 3 and 5.

Relevant Areas of AS3959:2018 Section 3

The guidance in AS3959:2018 pertains mainly to standard building construction, with a focus on external features prone to ember attack, covering items such as attached structures, garages, carports, external mouldings, bushfire shutters, glazing, etc. None of these is relevant to the BESS design.

Relevant Areas of AS3959:2018 Section 5 (Clauses 5.2 to 5.8)

The guidance in AS3959:2018 Section 5 pertains mainly to standard building construction for structures located in a BAL-12.5 zone, with a focus on external features prone to ember attack, covering items such as attached exposed floor supports, floor slabs, walls, external glazing, doors, roofs, verandas, etc.

This would apply to the Switch Room / Control Room for the Project.

Of relevance:

- Clause 5.8 states that any above-ground, water supply pipes **shall be metal**.
- Clause 5.8 also covers gas pipes and fittings – not relevant to the BESS design.

5.3 Access

Access requirements are crucial to the enabling of adequate firefighting capability and for emergency planning purposes (e.g. emergency evacuation).

Reference is made to:

- VIC Country Fire Authority (CFA), *Design Guidelines and Model Requirements for Renewable Energy Facilities*, v4 (August 2023), CFA Specialist Risk and Fire Safety Unit.

The following general principles and CFA-compliant design apply to ensure that firefighting vehicles are provided with safe, all-weather access to the Project Area.

- The Project firefighting access roads should be two-wheel drive, all-weather roads and appropriately sign-posted.
- The road network must enable responding emergency services to access all areas of the Project, including fire service infrastructure, buildings, BESS units and related infrastructure, substations and grid connection areas.
- Equipment compounds and buildings within the Project Area should be accessible by a minimum 4 m wide internal perimeter road.



- All Project roads must be capable of accommodating a vehicle of 15 t.
 - All roads need to have a minimum of 4 m in trafficable width with a 4 m vertical clearance for the width of all formed road surfaces.
 - There shall be no obstruction from any fencing along access routes needed by fire fighting vehicles.
 - The average grade shall be no more than 1 in 7 (14.4% or 8.1°) with a maximum of no more than 1 in 5 (20% or 11.3°) for no more than 50 m.
 - Dips in the road shall have no more than a 1 in 8 (12.5% or 7.1°) entry and exit angle.
 - Passing bays need to be provided at least every 600 m, with a minimum 20 m length and a minimum trafficable width of 6 m. At least one passing bay must be incorporated where roads are less than 600 m long.
- It is recommended that each part of the Project Area have at least two access points where practicable. The design of access points should be informed through a risk management process, in consultation with CFA.
- Vehicle access to a hardstand should be designed to allow for a fire truck to leave the hardstand in a forward direction. This can be achieved with loop roads, perimeter roads and the like. Where this cannot be achieved, the maximum distance that a fire truck can be expected to reverse safely is 60 m.
- Where vehicle access to a hardstand is greater than 60 m, such as dead-end roads or a single access, a turning area complying with one of the following options should be provided. No parking is permitted in the turning area and appropriate 'NO PARKING' signage is to be provided.

CFA Vehicle Specifications and Access Requirements

Further information regarding access requirements for CFA vehicles can be found in:

- VIC CFA (BMO) *Access Requirements*, March 2023.

Given current trends in the latest firefighting appliances, it is recommended that road carrying capacity, turning circles, etc, into and within the site be designed for greater than the currently mandated 15 t – subject to consultation with CFA.

“Internal” Project Area Access

Access provisions to the Project Area are shown in **Figure 14A**.

- Two access points are available, via entry from Wiridgil Road straight to the Project Area.

“External” Project Area Access

Where practical and feasible, “back-up” access roads to a Project Area are recommended for consideration.

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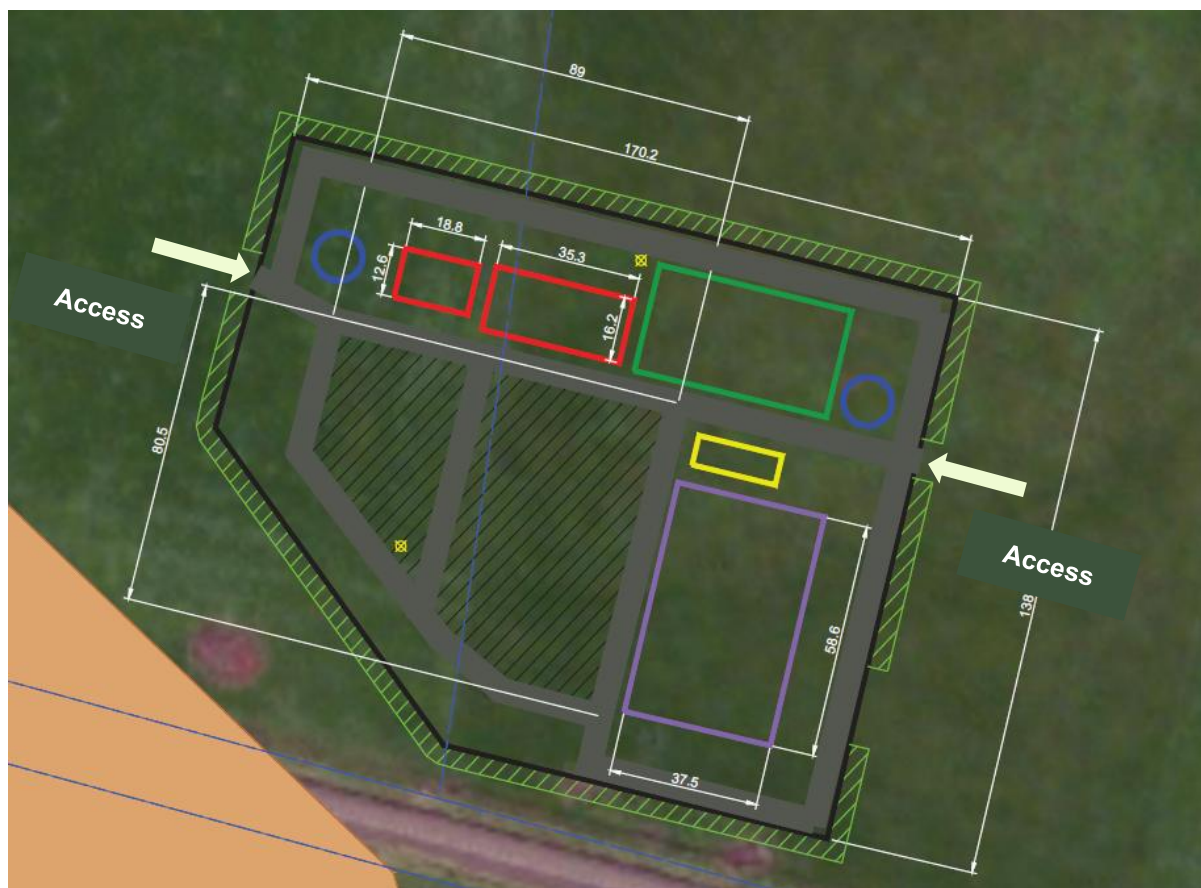
The off-site approach paths and access to the Subject Site are shown in **Figure 14B**.

- Primary access would be via Wiridgil Road, from both the east and west.
- Secondary access would be via Wire Lane, from both the north and south.

Accordingly, firefighting resources have multiple approach paths to access the Subject Site in the advent of an emergency situation.

Figure 14 Project Access Roads

A. "Internal" Access



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(Fig.12 cont'd)

B. "External" Access



5.4 Water Supply

A reticulated water supply is NOT available at the Subject Site.

In this instance, an appropriate static water supply must be provided to support effective emergency services response.

The water tank(s):

- Will be clearly identified by directional signage at all access points to the Project Area.
- Must be readily accessible by firefighting appliances.
- Should be located as close as possible to the Project's security perimeter.
- Shall have a volume in accordance with AS 2419-1 (2021).
- Shall be constructed of concrete or metal; all connecting above-ground water service pipes and taps being metal.
- Will be located in an area such that medium rigid vehicles (e.g. a 15-tonne fire appliance) have clear access within 4 m of the tank and with sufficient parking adjacent for other emergency service vehicles.



- Is provided with IPA-rated rural fire brigade tank fittings including a 65 mm Storz outlet valve and relevant coupling.
 - Ball valves and pipes should be adequately sized for water flow and shall be constructed of metal. The supply pipes from the tank to the ball valve should have the same bore size to ensure flow volume.

Project Commitments:

Given the size of the development footprint, the Proponent has committed to the following:

- Ensure that the above water tank requirements are met.
- Provide a minimum 288 kL dedicated water supply for firefighting purposes for the Project, comprising two 144 kL water tanks close to the two access points to the Project Area – refer **Figure 15**.

Figure 15 Location of Proposed Firefighting Water Tanks



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5.5 Vegetation Management

The critical areas for vegetation management at the Project Area are the proposed 19 m APZs around the BESS Compound, Substation Compound and Project Area buildings. The ecology studies for the Subject Site have indicated that any clearing required (expected to be negligible) will be permissible.

- The Bushfire Management Plan for the Project (refer **Section 6**) shall contain a provision pertaining to the management of all cleared areas in the Project Area.
- In relation to the Project Area, the BMP shall contain a provision preventing any vegetation from taking hold within the proposed 19 m APZ zone (refer **Figure 13**), thereby reducing the bushfire hazard risk and maintaining adequate access to firefighting personnel and equipment.

It is understood that landscape screening is being considered for the Project.

- Guidance as to suitable planting can be found in:
 - “*Landscaping for Bushfire: Garden Design and Plant Selection*”, Version 3, VIC CFA.
 - “*Online Plant Selection Key*”, VIC CFA.
- Its management should be included within the Bushfire Management Plan to be developed for the Project and should include the following elements:
 - Fire-wise plant species with fire resilience characteristics should be chosen. Low flammability species are characterised by high moisture content and low oil/resin content with smooth bark. These species shed bark and leaves infrequently.
 - The landscaping should be maintained regularly to remove dead branches, and the areas beneath cleared of fallen branches and other leaf litter.
 - Consider replacing organic mulch with inorganic or low flammability groundcover plants.

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5.6 Management of Bushfire Risk Initiators

Potential “internal” bushfire risk initiators are summarised in **Table 5**, according to the stage of the Project.

Table 5 Potential Bushfire Initiators

Project Phase	Impact
Construction	Clearing activities (e.g. slashing, mowing and diesel-powered tool use), lightning strikes, storage of fuels/chemicals, hot welding activities, cigarette butts thrown from cars travelling within the site, traffic accidents, etc.
Operational	Ground cover/vegetation within site, ignition of electrical equipment, especially during repairs and maintenance activities, traffic accidents.
De-Commissioning	Decommissioning activities would have similar impacts to that for construction.

The Project BMP will include mitigation measures designed to address the risks detailed in **Table 5**.

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6.0 Bushfire Management Plan (BMP)

During the detailed design phase of the Project, and prior to construction commencing, a detailed Bushfire Management Plan (BMP) will be prepared for the Project.

Key elements within the BMP will be:

- APZ locations and management details;
- Schedule of BAL-related requirements and building footprints as well as any specific construction details;
- Access provisions such as locations, passing bays and alternate emergency access;
- Water supplies and bushfire suppression systems;
- Landscaping management requirements; and
- A Bushfire Emergency Management and Evacuation Sub-Plan within the overall BMP, aligned with the Project EMP (Emergency Management Plan).

6.1 Detailed Requirements of the BMP

The following is a more detailed listing of the BMP.

- The BMP will identify specific responsibilities for actions required within the BMP for the Proponent and Ultimate Operator, as well as Corangamite Shire Council.
- The BMP will contain a detailed Project layout plan identifying the locations of all Project infrastructure, APZs, access routes and water supply details.
- The BMP will identify key bushfire risks associated with the Project Area and the strategies developed to mitigate them, including minimum APZ calculations, access requirements, fire fighting water supply quantity and other design details aimed at facilitating an effective response to bushfire.
- The BMP will include site-specific factors relevant to the Project's protection from bushfire: the likely direction of bushfire attack if historic evidence indicates a bias in prevailing wind conditions during the fire season, location of evacuation routes and safety zones and identification of secondary risks, e.g. from nearby sites (if relevant).
- The BMP will include: a description of the activities to be conducted on the Project and in particular personnel movements covering both regular staff, maintenance staff and irregular visitors.
- The BMP will list the storage or handling of any hazardous chemicals in quantities that would be equivalent to or exceed the threshold quantities set out in the relevant standards.
- The BMP will show all transportation routes into and out of the Project Area covering personnel, delivery of materials, access routes for emergency services or disaster response, etc. Details will be provided covering road layout, accessways, passing bays, evacuation routes, easements on site, designated routes for fire-fighting appliances, etc. These will be detailed in an Emergency and Evacuation Sub-Plan.
- The BMP will clearly indicate the total extent of clearing, revegetation and landscaping proposed for the Project Area, which is to be indicated on a Project plan, including the APZ for the Project Area. The means by which the APZ will be maintained, including who responsible, will be clearly enunciated.
- The BMP will include information covering fire maintenance trails, if relevant.



- The BMP will provide warning and evacuation procedures, plans and routes including capacity of public roads especially perimeter roads and traffic management treatments, and responsibility for their maintenance.
- The BMP will detail all fire-fighting requirements including infrastructure and water supply, design standards for tanks, fittings and connection details, etc.

6.2 CFA Engagement

- The BMP should be developed in consultation with the CFA with final approved copies stored locally within an appropriate “emergency cabinet” securely located within the Project Area.

6.3 Community Engagement

- The BMP will include recommendations to be passed on to the ultimate Project Operator (if not the Proponent) covering surrounding resident/neighbour education and awareness.

6.4 Local Firefighting Resources

- The BMP will provide a listing of the nearest local firefighting resources, phone/email contacts, etc, namely
 - CAMPERDOWN Brigade – 34 Ferguson Street, Camperdown

<https://www.cfa.vic.gov.au/about-us/your-cfa/where-we-are>

6.5 Bushfire Initiator Risk Management – refer Table 6

Project Stage – Construction

- Bushfire risks during construction will be managed through the implementation of a Construction Bushfire Management Sub-Plan (CBMP), to be prepared by the successful Project Contractor and signed off by all appropriate authorities.
- The CBMP will ensure adequate Project access for CFA along with the resources needed to manage any fire within the Project Area.

Project Stage – Operational

- Bushfire risks once the Project is fully operational will be managed through the implementation of the BMP as described above, to be prepared by the successful Project Operator and signed off by all appropriate authorities.

Project Stage – De-Commissioning

- The BMP will detail De-Commissioning phase management strategies similar to those deployed for the Construction phase to address the similar risks expected during this last phase of the Project.

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6.6 Other Management and Mitigation Aspects

In addition to the above measures, the BMP will:

- Recommend a system for the continuous monitoring of the CFA website and other critical emergency service related web-based resources (Bureau of Meteorology, ABC Radio, etc) for bushfire alerts (especially during the bushfire season).
- Ensure that smoking is prohibited throughout the Project Area and that all employees receive training and instruction on the relevant fire procedures as part of their induction training.

6.7 Alignment of the BMP with Other “Plans”

Finally, it is important that the Project BMP is aligned with other related (detailed design stage) plans, including:

- Project Emergency Management Plan (EMP) – so there is no conflict between activities such as the risk control measures adopted for minimising electrical hazards for firefighters attending emergency situations on-site.
- A Fire Safety Study (FSS) for the Project which aligns the relevant firefighting elements (e.g. access routes, water supply etc) for both an (external) bushfire response and (internal) fire response.

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7.0 Conclusions

Section 2 of this report described essential elements of the Project.

Section 3 of this report described key characteristics of the Subject Site and surrounds in relation to bushfire risk.

Section 4 of this report assessed the bushfire risk, in terms of the Bushfire Attack Level of the Project.

Section 5 of this report described risk mitigation and management measures associated with the bushfire hazard.

Section 6 of this report described the key elements to be included in the detailed Bushfire Management Plan (BMP) to be developed for the Project during detailed design.

On the basis of the above, SLR has concluded that:

- Bushfire risk issues can be adequately mitigated; and
- The Project will be adequately protected from the threat of a bushfire event.

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Appendix A Vegetation Descriptions taken from AS3959:2018

Bushfire Risk Assessment

Camperdown Battery Energy Storage System (BESS)

Camperdown BESS Pty Ltd

SLR Project No.: 620.041535.00012

Revision: R12-v1.4

1 May 2026

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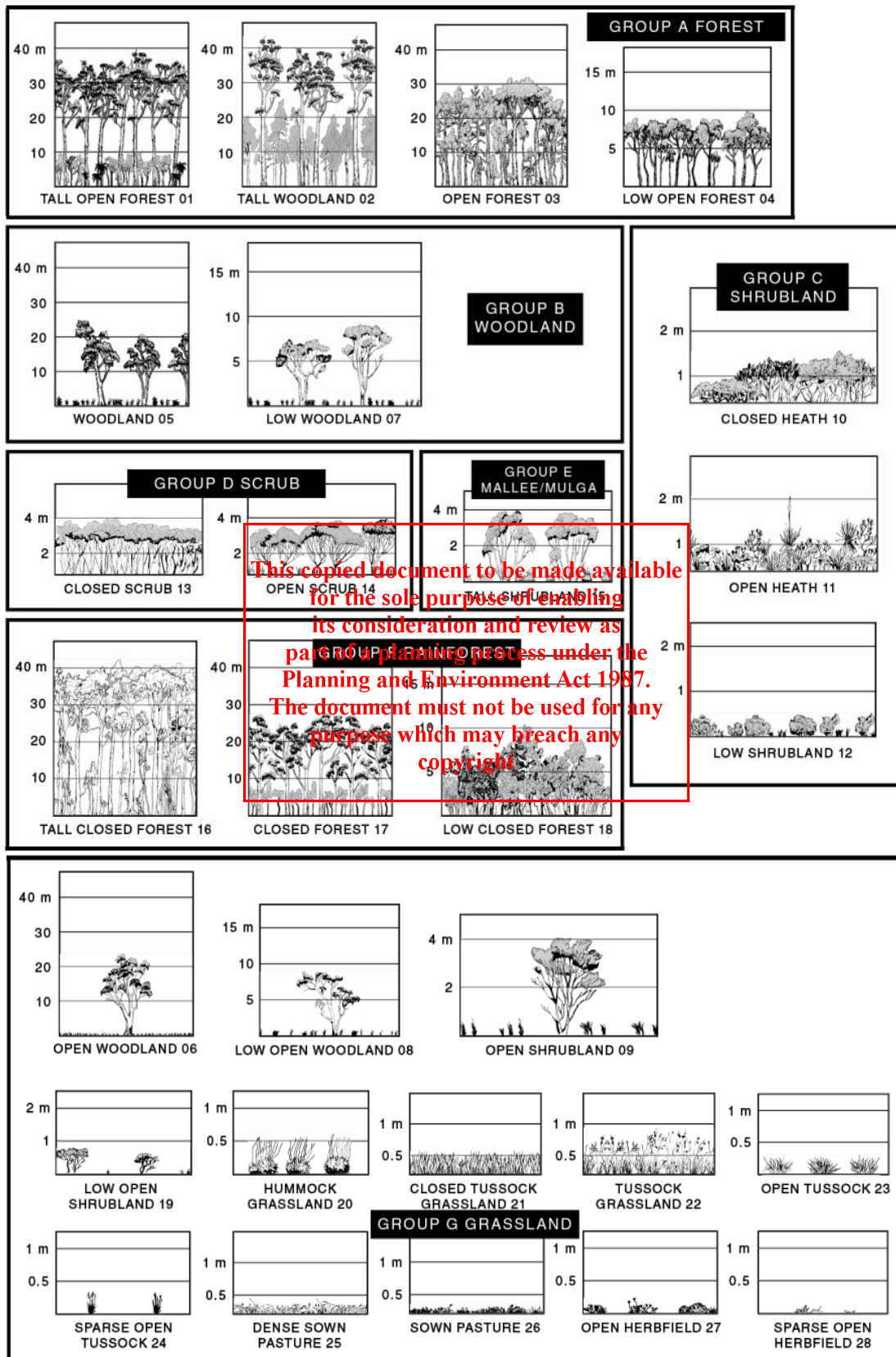


AS3959:2018 - Table 2.3 CLASSIFICATION OF VEGETATION

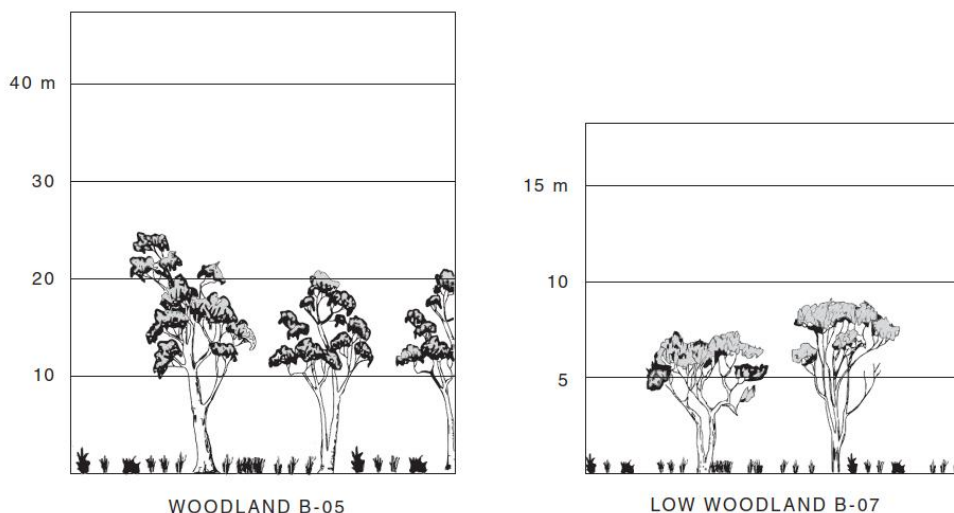
Vegetation classification	Vegetation type	Figure No. in Figures 2.4(A) to 2.4(H)	Typical characteristics
A Forest	Tall open forest Tall woodland	01 02	Trees over 30 m high; 30%–70% foliage cover (may include understorey ranging from rainforest species and tree ferns to low trees and tall shrubs). Found in areas of high reliable rainfall. Typically dominated by eucalypts with a sub-dominant tree layer.
	Open forest Low open forest	03 04	Trees up to 30 m high; 30%–70% foliage cover (may include understorey of sclerophyllous low trees or shrubs). Typically dominated by eucalypts, melaleuca or callistemon (may include riverine and wetland environments) and callitris. Includes eucalypt plantations.
	Pine plantation	Not shown	Trees 30 m in height at maturity, generally comprising Pinus species or other softwood species, planted as a single species for the production of timber.
B Woodland	Woodland Low woodland	05 07	Trees up to 30 m high; 10%–30% foliage cover dominated by eucalypts and/or callitris with a prominent grassy understorey. May contain isolated shrubs.
C Shrubland	Closed (low) heath Open heath	10 11	Found in wet areas and/or areas affected by poor soil fertility or shallow soils. Shrubs 1 m–2 m high. Wet heaths occur in sands adjoining dunes of the littoral (shore) zone. Montane heaths occur on shallow or water-logged soils.
	Low shrubland	12	Shrubs <2 m high; greater than 30% foliage cover. Understoreys may contain grasses. Acacia and Casuarina often dominant in the arid and semi-arid zones.
D Scrub	Closed scrub (Tall heaths)	13	Found in wet areas and/or areas affected by poor soil fertility or shallow soils; >30% foliage cover. Dry heaths occur in rocky or sandy areas. Shrubs >2 m 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 metres.
	Open scrub	14	Shrubs greater than 2 m high; 10%–30% foliage cover with a mixed species composition.
E Mallee/Mulga	Tall shrubland	15	Vegetation dominated by low trees or tall shrubs (especially eucalypts and acacias) some with a multi-stemmed habit (mallee); usually greater than 2 m in height; <30% foliage cover. Understorey of widespread dense low shrubs or sparse grasses and generally found in the arid and semi-arid zones, but not within the rangelands.
F Rainforest	Tall closed forest	16	Trees >90% foliage cover; understorey may contain a large number of species with a variety of heights. Not dominated by eucalypt species.
	Closed forest	17	
	Low closed forest	18	
G Grassland	Open woodland	06	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: Grassland managed in a minimal fuel condition and non-curing cropland is regarded as low threat vegetation for the purposes of Clause 2.2.3.2.
	Low open woodland	08	
	Open shrubland	09	
	Low open shrubland	19	
	Hummock grassland	20	
	Closed tussock grassland	21	
	Tussock grassland	22	
	Open tussock	23	
	Sparse open tussock	24	
	Dense sown pasture	25	
H Tussock Moorland	Sown pasture	26	All forms of vegetation where the overstorey is dominated by the species Buttongrass (<i>Gymnoschoenus sphaerocephalus</i>). Only occurs as a significant vegetation type in Tasmania.
	Open herbfield	27	
	Sparse open herbfield	28	



AS3959:2018 – Figure 2.4(A) Classification of Vegetation - SUMMARY



AS3959:2018 – Figure 2.4(C) Classification of Vegetation – WOODLAND (Group B)

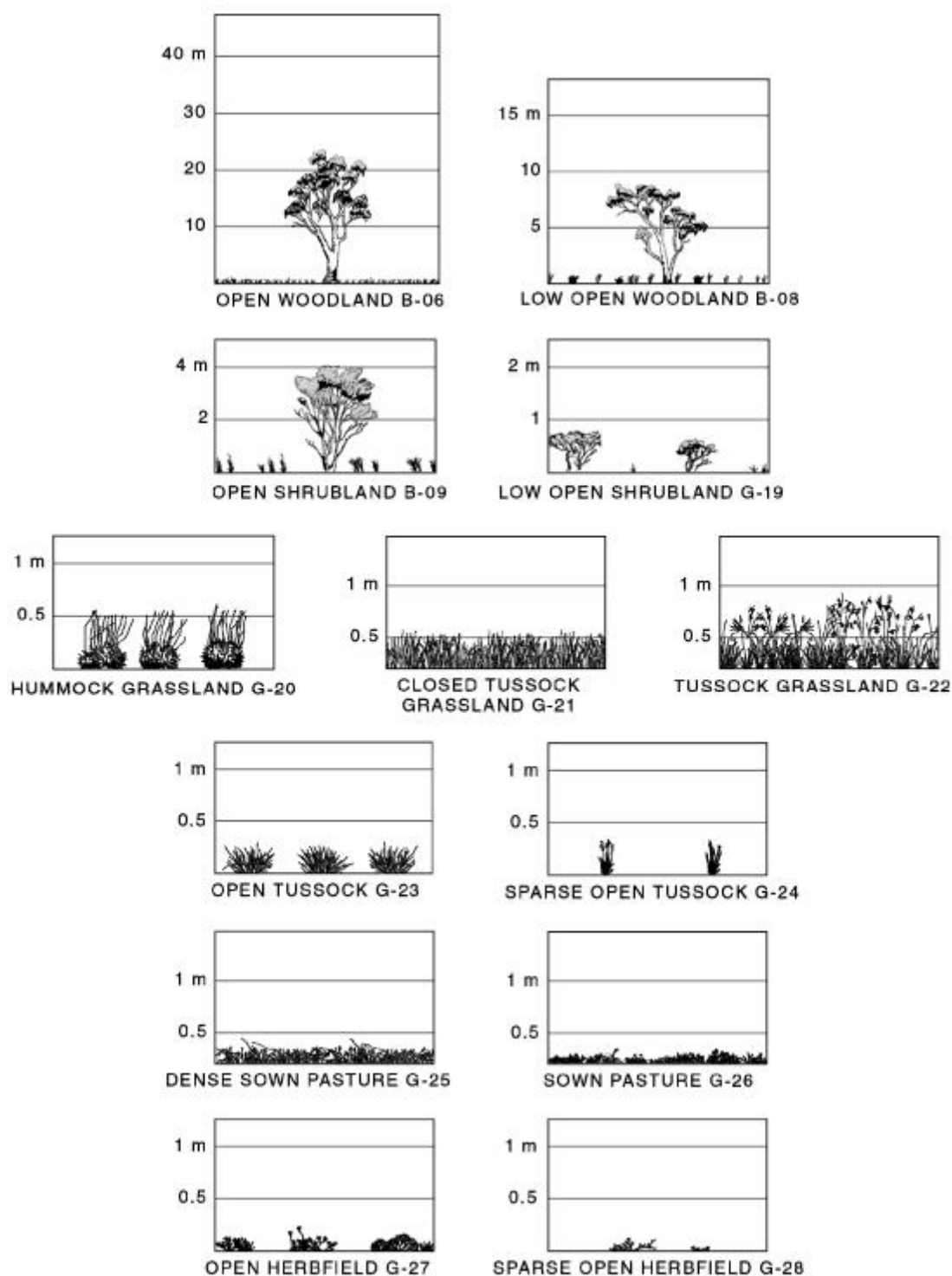


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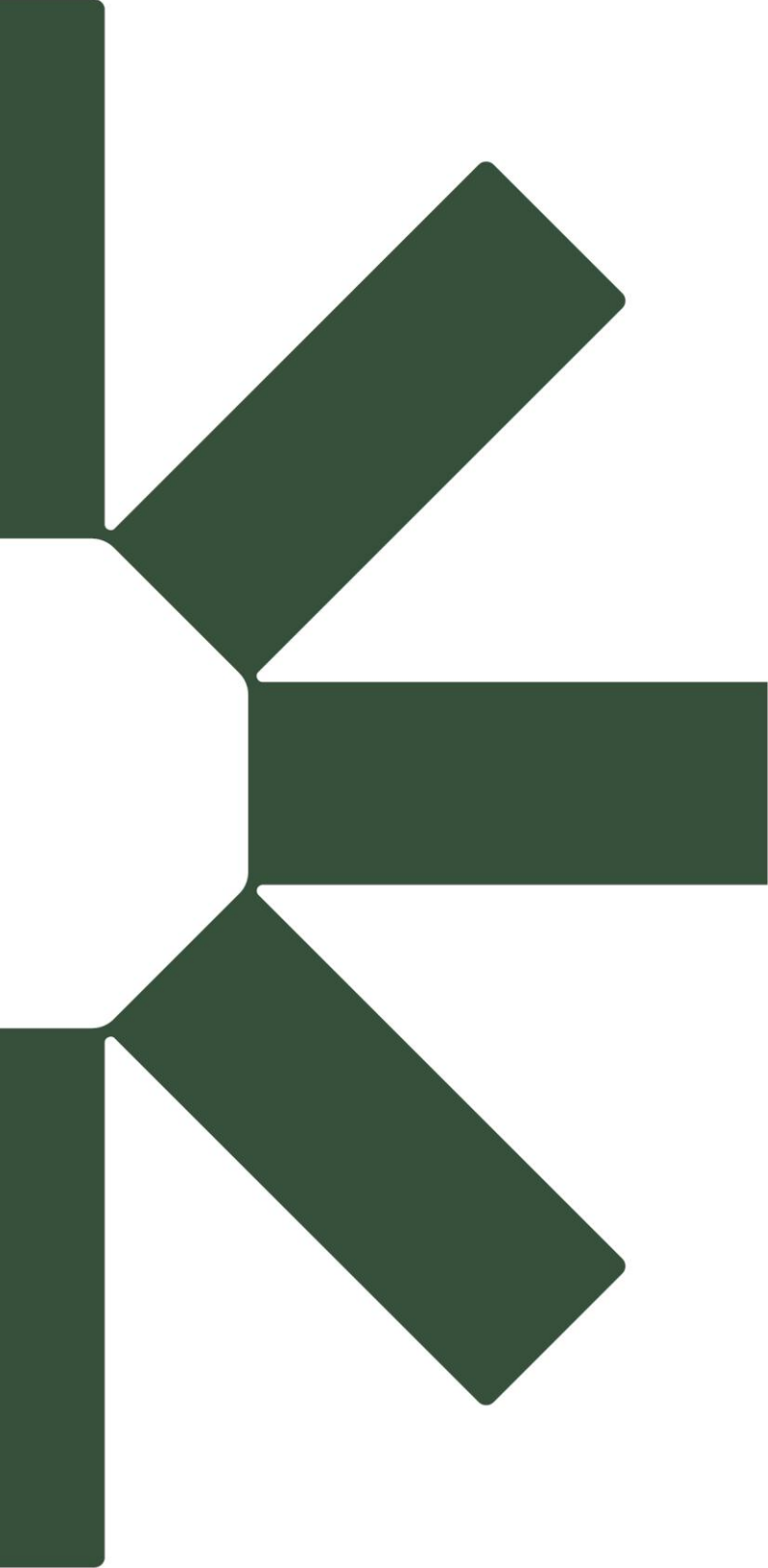
AS3959:2018 – Figure 2.4(H) Classification of Vegetation – GRASSLANDS (Unmanaged)



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