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Yangery BESS

Risk Management Plan

Yangery BESS Development Pty Ltd

Reference: 527059

Revision: C

2026-02-03

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Document control record

Document prepared by:

Aurecon Australasia Pty Ltd


ABN 54 005 139 873
 Aurecon Centre
 Level 8, 850 Collins Street
 Docklands, Melbourne VIC 3008
 PO Box 23061
 Docklands VIC 8012
 Australia



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T +61 3 9975 3000
F +61 3 9975 3444
E melbourne@aurecongroup.com
W aurecongroup.com

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Document control						
Report title		Risk Management Plan				
Document code		TBC	Project number		527059	
File path		https://aurecongroup.sharepoint.com/sites/527059/5_WorkingFiles/RMP/Yangery BESS - Risk Management Plan.docx				
Client		Yangery BESS Development Pty Ltd				
Client contact		Client reference				
Rev	Date	Revision details/status	Author	Reviewer	Verifier (if required)	Approver
A	2025-12-16	Draft issued for review	Angelyn Wu	Olivia King	Delene Kock	Bez Hasenfratz
B	2026-01-30	Updated Draft Issued for review	Casey Vu	Olivia King	Ben Parcell	Bez Hasenfratz
C	2026-02-03	Final Draft Update Issued for review	Casey Vu	Olivia King	Ben Parcell	Bez Hasenfratz
Current revision		C				

Approval			
Author signature		Approver signature	
Name	Casey Vu	Name	Bez Hasenfratz
Title	Consultant, Asset Management and Performance	Title	Senior Consultant

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1 Introduction

1.1 Background

Aurecon Pty Ltd (Aurecon) has been engaged by South Energy Pty Ltd, on behalf of Yangery BESS Development Pty Ltd, to undertake the environmental and planning assessments required to support approvals for the proposed Battery Energy Storage System (BESS) in Yangery, Victoria (the Project).

The proposed project site is located at 689 Tower Hill Road, Yangery, Victoria 3283, approximately 250 km west of Melbourne. The site has historically been used for agricultural purposes and covers an area of approximately 23 hectares.

The Project proposes a BESS with a nominal installed capacity of 120 megawatts (MW)/480 megawatt hours (MWh) and will connect to Powercor's Koroit Zone Substation. The Project will support Victoria's transition to renewable energy by providing reliable, accessible and cost-effective energy storage capacity.

The primary Project components are proposed to include:

- BESS modules, inverters and transformers
- Construction of internal access roads and access (and egress) points
- Underground cabling (33kV) to provide a connection between the battery modules and inverters and on-site collector substation
- Underground or overhead cabling (66kV) to connect to the adjoining Powercor substation
- Laydown and hardstand areas
- Site offices
- Water storage (including firefighting water supply and fire water runoff containment)
- Fencing around the perimeter of the BESS facility
- Car parking

As part of these assessments, the Proponent has commissioned Aurecon to prepare a Risk Management Plan (RMP), which includes bushfire risks and hazards. This revision represents a preliminary RMP, reflecting the current stage of Project development. It is expected that the RMP will be further refined and updated during the detailed design stage.

1.2 Purpose

This RMP has been prepared to accompany a planning permit application for the development of the Project to the Minister of Planning via the Development Facilitation Program using the approval pathway provided through Clause 53.22 (Significant Economic Development) of the Warrnambool Planning Scheme [1], the Victorian Planning Provisions [2] and in accordance with the *Planning and Environment Act 1987* (P&E Act) [3]. Under this legislation, a BESS is classified as a 'utility installation' per Clause 73.03 of the Warrnambool Planning Scheme [1]. This classification includes facilities used for the provision of utility services, including the transmission, distribution and storage of power.

The Project is located within an area classified as Farming Zone (FZ) [4]. Pursuant to Clause 35.07 (subclauses 35.07-1, 35.07-3, and 35.07-4) of the Warrnambool Planning Scheme [1], a planning permit is required for a utility installation and building construction of the site.

Clause 35.07-6 (Decision guidelines) and Clause 65.01 (Approval of an application or plan) outline key considerations for the responsible authority in assessing the application. These include, but are not limited to:

- The effect on the environment, human health, and potential agricultural use of the area, and

- The degree of flood, erosion or fire hazard associated with the location of the land and the use, development or management of the land so as to minimise any such hazard.

These requirements have been addressed in the form of a Preliminary Hazard Analysis with a supporting Bushfire Assessment as a combined Risk Management Plan (this report), the proposed scope of which is outlined in Section 1.3.

The purpose of the Bushfire Hazard Assessment is to describe bushfire hazards in the broader landscape and at the site level, the existing and likely future conditions on the land that influence the bushfire risk, and identify the bushfire protection measures that are required for the proposed BESS facility and associated buildings to reduce the risk to life and property from bushfire to an acceptable level.

The Project must also comply with the Country Fire Authority (CFA) *Design Guidelines and Model Requirements for Renewable Energy Facilities v4.4, June 2025* (CFA guidelines) [5], which establishes the risk assessment methodology and key emergency and safety mitigations for renewable energy installations, including BESS facilities. The key legislative and regulatory requirements applicable to facilities in Victoria, as referenced in the CFA Guidelines [5], have also been summarised in Table 1. Refer to Appendix A: Gap Analysis against CFA Renewable Energy Facilities Guidelines for a summary of the gap assessment conducted for the Project against the CFA guidelines [5].

Table 1: Required Regulatory Compliance for the BESS Facility (CFA Guidelines) [5]

CFA Section	CFA Guideline	Relevant Regulation(s)
Section 2.3.1	All buildings on site are required to comply with the National Construction Code (NCC). Where fire safety matters listed under Regulation 129 in the <i>Building Regulations 2018</i> do not meet the 'deemed to satisfy' provisions of the NCC, the report and consent of the fire authority Chief Officer is required.	<i>Building Regulations 2018</i> [6]
Section 2.3.2	Where the facility includes a battery energy storage system or other significant quantities of dangerous goods, a request for emergency services written advice under Regulations 52 and/or 53 of the <i>DG Regulations 2022</i> [7] may be required. Regulation 52 and 53 states that "An occupier of premises where dangerous goods are stored and handled in quantities that exceed the relevant quantities specified" must: <ul style="list-style-type: none"> ■ request written advice of emergency services authority in relation to the design/alteration of the fire protection system ■ ensure that a written plan for dealing with any emergency associated with the storage and handling of dangerous goods on those premises is developed, implemented and maintained; and communicated to the relevant people 	<i>Dangerous Goods (Storage and Handling) Regulations 2022</i> [7]
Section 3.1	Section 28 of the OHS Act [8] states the following in relation to the duty of designers: "A person who designs a building or structure or part of a building or structure who knows, or ought reasonably to know, that the building or structure or the part of the building or structure is to be used as a workplace must ensure, so far as is reasonably practicable, that it is designed to be safe and without risks to the health of persons using it as a	<i>Victorian Occupational Health and Safety Act 2004 (OHS Act)</i> [8] <i>Occupational Health and Safety Regulations 2017</i> [9]

CFA Section	CFA Guideline	Relevant Regulation(s)
	<p>workplace for a purpose for which it was designed.”</p> <p>Persons who have management or control of workplaces have obligations under the OHS Act [8] to ensure the health and safety of people ‘so far as is reasonably practicable’. This legislation requires consideration of risk control measures and safe systems of work, which for renewable energy installations may relate to the development of systems and activities for:</p> <ul style="list-style-type: none"> ■ Housekeeping, including management of vegetation ■ Security (fencing, monitoring, alarms, etc.) ■ Undertaking hot works ■ Ignition source control ■ Vehicle, plant and equipment maintenance requirements. 	
Section 2.4	<p>Sections 113A and 83BA of the Electricity Safety Act 1998 [10] require major electricity companies and specified operators of at-risk electric lines to prepare and submit a Bushfire Mitigation Plan to Energy Safe Victoria for acceptance.</p> <p>Sections 6 and 7 of the <i>Electricity Safety (Bushfire Mitigation) Regulations 2023</i> [11] contain the requirements for Bushfire Mitigation Plans.</p>	<i>Electricity Safety (Bushfire Mitigation) Regulations 2023</i> [11]
Section 4.2.4	<p>Substations should be surfaced to eliminate all vegetation including grasses.</p> <p>The Electricity Safety (Electric Line Clearance) Regulations 2020 [12] prescribe the vegetation clearance requirements for electric lines based on the assigned fire hazard rating for land established under Section 80 of the Electricity Safety Act 1998. Fire hazard ratings are available from CFA by request.</p>	<i>Electricity Safety (Electric Line Clearance) Regulations 2020</i> [12]

1.3 Scope of RMP

This RMP will review the Project against the requirements of the CFA Design Guidelines and Model Requirements: Renewable Energy Facilities V4 August 2024, updated as V4.4 June 2025 [5]. This assessment covers:

- Facility description, including infrastructure details, activities, and operating hours.
- A screening assessment to determine if the BESS facility triggers any specific screening criteria in relation to the storage and handling of dangerous goods and fire risk.
- Identification of CFA guideline requirements [5] requiring conformance for the Project during submission of the planning permit application.
- A desktop Hazard Identification exercise to identify hazards in accordance with the CFA Guideline [5] for renewable energy facilities.
- Assess the associated risks with the proposed BESS facility and potential mitigation measures.
- Review Fire System/Safety design requirements for conformance with good practice for BESS facilities.

- Recommend risk reduction measures to be applied during the design, construction and operations of the BESS.
- Review Fire System/Safety design requirements for conformance with good practice for BESS facilities.
- Description of the existing vegetation and bushfire hazards, including within the site and surrounding landscape.
- A site assessment of the proposed BESS and associated infrastructure to comply with the requirements of the *Australian Standard AS3959 Construction of buildings in bushfire prone areas* [13], captured in the separate Bushfire Hazard Assessment prepared for the Project, provided in Appendix C of this RMP. The site assessment records:
 - categorised vegetation on site, including:
 - vegetation type (e.g. Woodland, Scrub, Grassland etc.)
 - effective slope under vegetation
 - distance and slope between the proposed permanent or temporary buildings (such as any battery storage or construction site offices) and any mapped categorised vegetation.
 - any areas of excluded vegetation (as per Section 2.2.3.2 of AS 3959).
- Undertake a bushfire landscape hazard assessment in accordance with Clause 13.02 (Bushfire) of the Warrnambool Planning Scheme [1] and Chapters 4, 5 and 6 of the CFA Guidelines [5], to provide details of the bushfire hazards in the broader landscape considering bushfire scenarios as well as egress to built-up areas (captured the separate Bushfire Hazard Assessment prepared for the Project, provided in Appendix C of this RMP).
- Outline key bushfire management measures identified in the CFA Guidelines [5] that are applicable to the site (captured the separate Bushfire Hazard Assessment prepared for the Project, provided in Appendix C of this RMP), detailing how the Project will implement these measures, specifically in relation to:
 - The proposed location and design of the infrastructure
 - Defendable space
 - Water supply
 - Access
 - Substation and transmission lines
 - Operational requirements.

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The RMP provides input to key location/siting and layout/design. Fire risks associated with the infrastructure (Section 3.3.2.4 of the CFA guidelines [5]) and several components of the Project relating to construction and commissioning requirements are also beyond the scope of the preliminary assessment. These shall be undertaken for the Project in further consultation with the CFA during further stages of the Project development.

1.4 Assumptions and Limitations

The following assumptions and limitations apply to this RMP:

- The Battery Technology Original Equipment Manufacturer (OEM) selection has been confirmed as Wartsila at this stage of the project. The battery system is anticipated to consist of battery enclosures containing lithium-iron-phosphate (LFP) type batteries. The current design and assumptions are based on Quantum2 EVE BESS.
- For the screening of dangerous goods against placard, manifest, and fire protection thresholds, as per the *Dangerous Goods (DG) Storage and Handling Regulations 2022* [7], the anticipated storage quantities of materials on site are based on a conservative estimate.

- It is assumed that fire suppression, thermal runaway prevention, and emergency response systems will be designed in accordance with best practice for BESS facilities.
- It is assumed that the facility will be managed via risk and emergency management plans. Should further information become available regarding the conditions at the site, the assessment, findings and recommendations in this assessment may change.
- The next steps and recommendations outlined in this RMP are based on publicly accessible information up to the point of its completion.
- The outcomes of this bushfire assessment are limited to the BESS site and immediate surroundings.
- While the measures identified in this assessment, when fully implemented, can help reduce the residual fire risk to the Project, they cannot guarantee that assets will survive a bushfire or grassfire on every occasion due to the unpredictable nature of bushfires and extreme weather. Continual evaluation and review of this document, fire risk conditions at the site and updating management practices may assist in further reducing the residual fire risk over the life of the Project.

1.5 Exclusions

The assessment exclusions are listed below:

- No Fire Safety Study (FSS) has been undertaken for this Project at this stage. However, if any element of the Project design does not conform to the model requirements of the CFA Guideline [5], or if CFA requests an FSS for large-scale BESS installations over 1 MWh, an FSS will need to be completed if the design, capacity, complexity, location, or proposed operations of the BESS necessitate a more detailed analysis of fire and explosion safety systems.
- The development of a site-specific Emergency Plan is excluded and will need to be addressed prior to construction.
- A Fire Management Plan has not been developed as part of this assessment and will need to be addressed prior to construction.

The link between the Project stage and the relevant Assessments and Plan Developments is shown in Figure 1 published by CFA below.

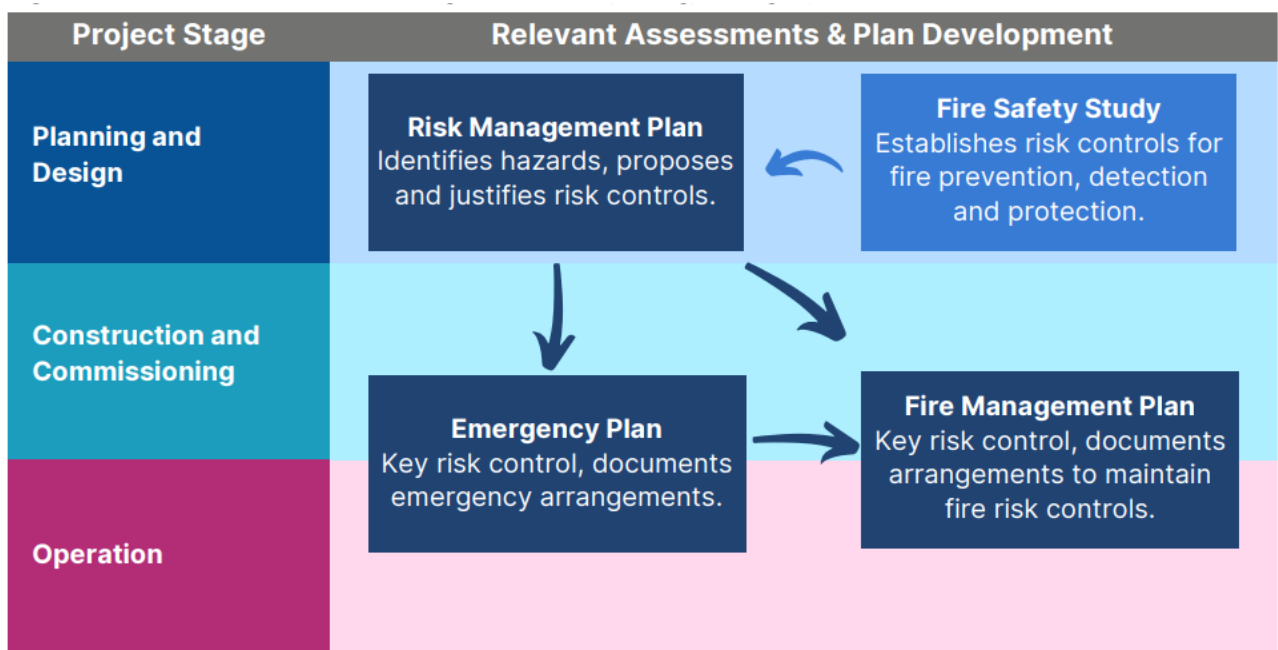


Figure 1: CFA Guideline Plans and Assessments for large-scale battery energy storage systems [5]

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2 Facility Overview

2.1 Location and Project Area

The Project is located at 689 Tower Hill Road, Yangery, Victoria 3283 (Lot 1/PS601769), approximately 250 km west of Melbourne. The Project Area lies in south-western Victoria, approximately 6 km east of Koroit and 9 km north-west of Warrnambool. The site is within the Warrnambool City Council municipality, with Moyne Shire Council directly adjacent to the north and west. The Project Area is immediately adjacent to the Koroit Zone Substation, which is owned and operated by Powercor.

The Project Area comprises privately owned agricultural land that is largely cleared and void of native vegetation. It contains a degraded and eroded drainage line that connects to a small, isolated waterbody within the southern paddock.

Vehicle access to the site is proposed from Conns Lane, which runs north to south along the western site boundary.

The final location and arrangement of BESS infrastructure will be confirmed during detailed design, following appointment of a BESS supplier, and will remain consistent with the commitments outlined in this planning application. The Project Area and indicative layout are shown in Figure 2 below.

The surrounding land uses are predominantly Farming Zone (FZ), with pockets of Rural Living Zone (RLZ) and Special Use Zone (SUZ) in the broader area, refer to Figure 3. The nearest residential zones include:

- General Residential Zone (GRZ) — approximately 4.8 km northwest of the site (Koroit), and approximately 2.4 km south-east (Dennington)
- Low Density Residential Zone (LDRZ) — approximately 3.1 km east (Tower Hill) and 3.6 km north-east (Woodford)

The Fire Rescue Victoria (FRV) Fire Safety Guideline GL-55 for Battery Energy Storage Systems [14], states that for a Utility BESS (>5 MWh), where any BESS unit is located within 200 m of a habitable structure, a fire risk assessment and Preliminary Hazard Analysis (PHA) must be undertaken.

Based on this guideline, habitable structures include residential dwellings, commercial and industrial buildings, public buildings, and other legally habitable premises.

Several habitable structures are located in proximity to the proposed BESS installation (refer to Figure 4 and Figure 5), including:

- Receptor A, approximately 350 m from the nearest BESS Area
- Receptor B, approximately 157 m from the nearest BESS Area
- Receptor C, approximately 220 m from the nearest BESS Area
- Receptor D, approximately 303 m from the nearest BESS Area
- Receptor E, approximately 407 m from the nearest BESS Area
- Existing Koroit Substation, approximately 91 m from the nearest BESS Area
- SWG Building (within site boundary), approximately 43 m from the nearest BESS Area
- Site Office (within site boundary), approximately 25 m from the nearest BESS Area

In addition there are structures (Laydown & Hardstand Areas) within the site boundary as follows:

- Laydown & Hardstand Area A, approximately 12 m from the nearest BESS Area
- Laydown & Hardstand Area B, approximately 8 m from the nearest BESS Area
- Laydown & Hardstand Area C, approximately 23 m from the nearest BESS Area.

As 3 receptors (Receptor B, the Existing Koroit Substation, the site office and the SWG Building) are located within 200 m of the nearest BESS Area, this indicates that additional hazard assessment is appropriate. In

line with the CFA Design Guidelines and Model Requirements [15], this Risk Management Plan includes a Preliminary Hazard Analysis (Task 2 in Section 6) and references the separate Bushfire Hazard Assessment (Refer to Appendix C: Bushfire Hazard Assessment), which together provide the relevant consideration of fire and explosion hazards for the Project.

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Figure 2: Indicative layout design

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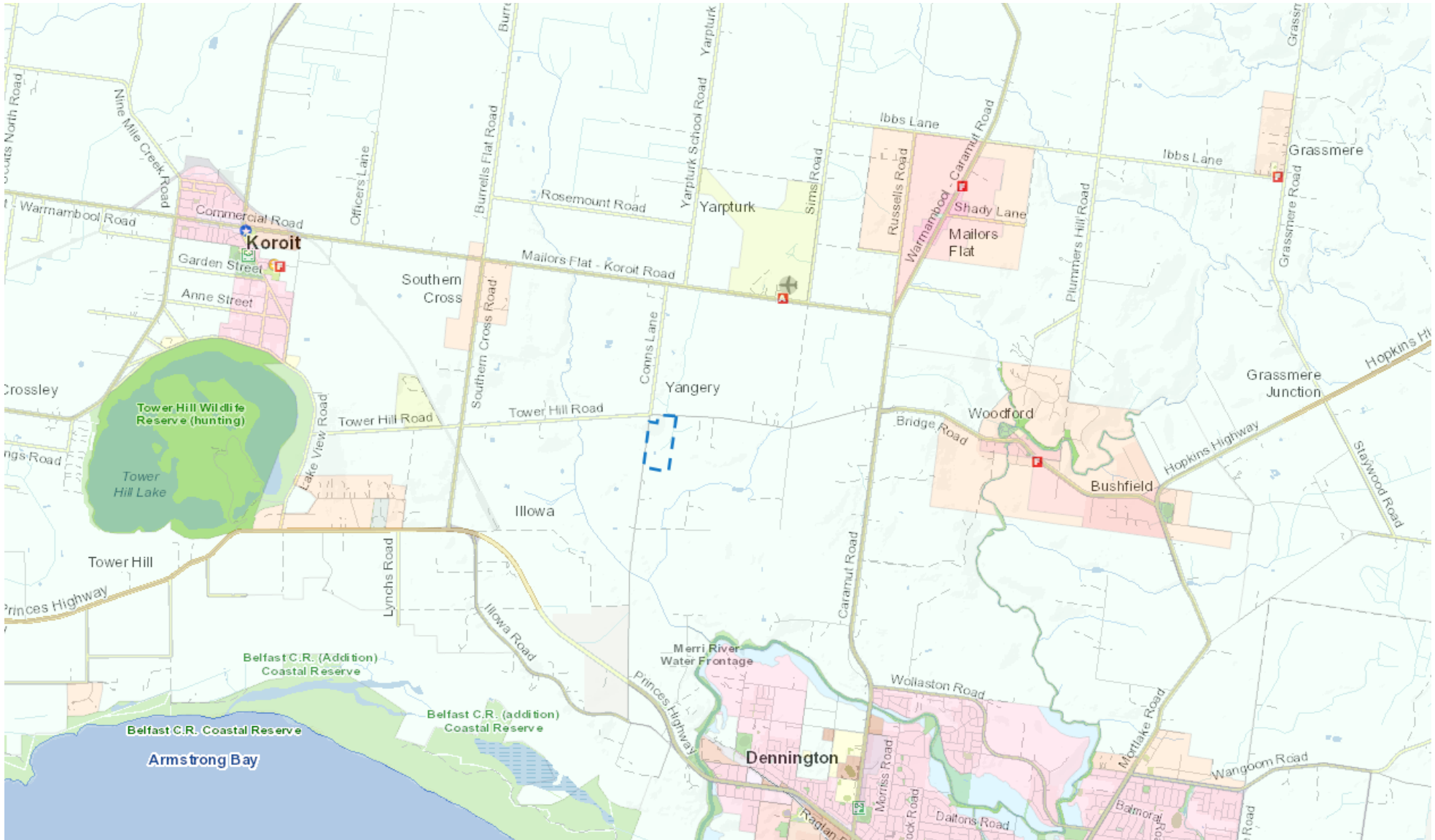


Figure 3: Land Use Zoning

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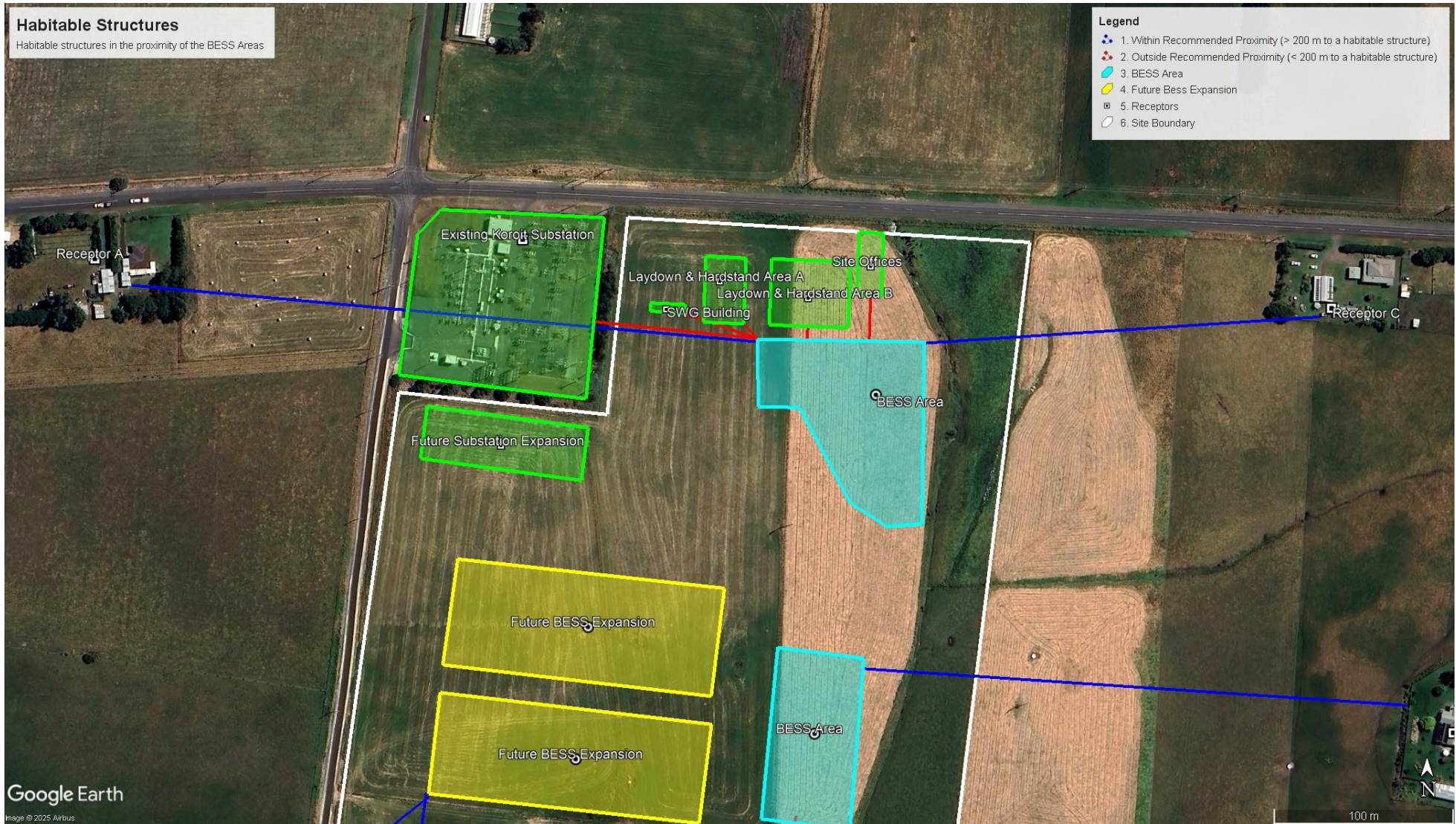


Figure 4: Sensitive Receptors (Top Area)

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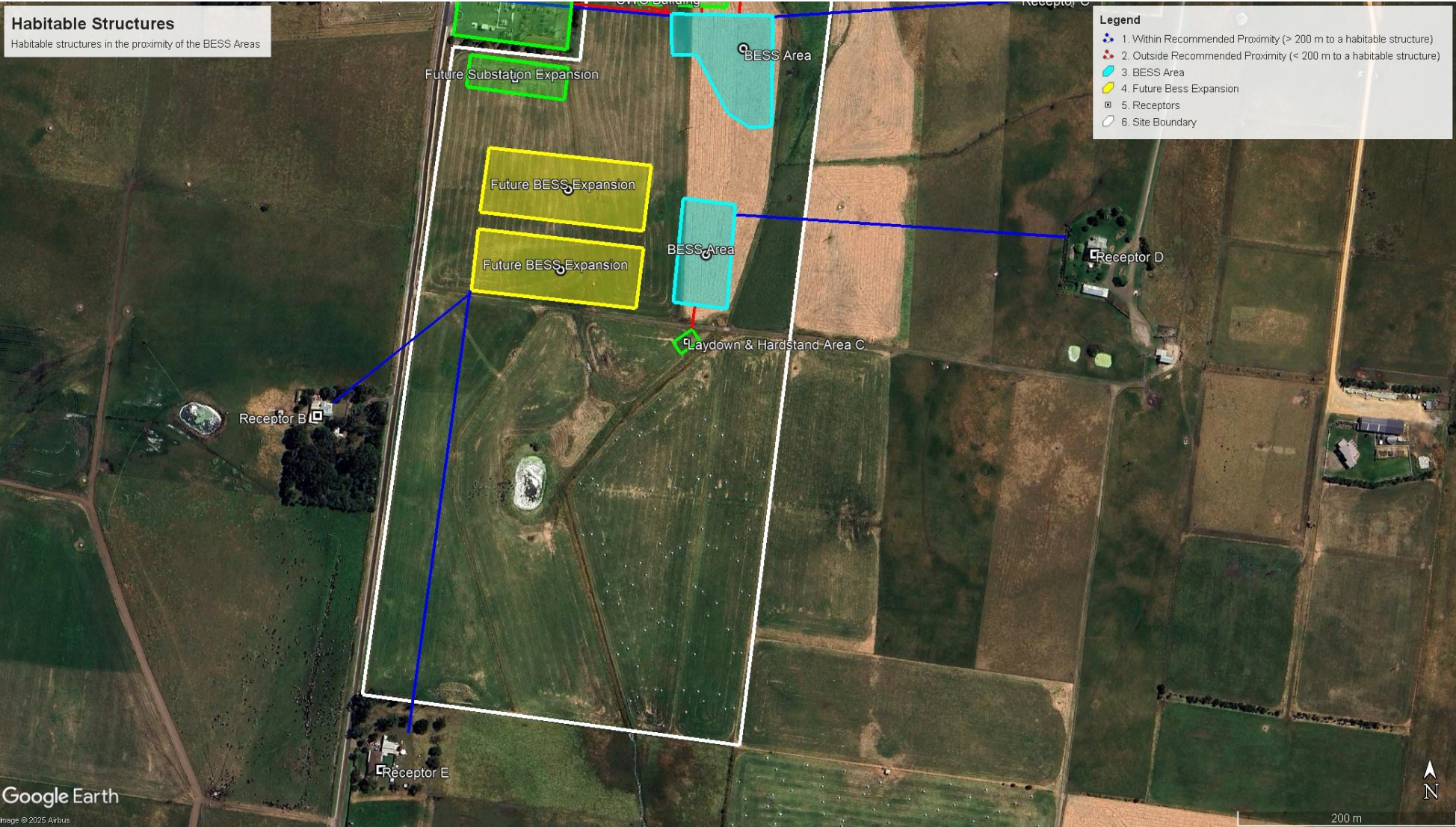


Figure 5: Sensitive Receptors (Bottom Area)

3 Legislative and Policy Context

The following sections detail the legislation and policies applicable to the RMP.

3.1 Planning and Environment Act 1987

The *Planning and Environment Act 1987* (P&E Act) [3] establishes the legal framework for land use planning in Victoria. Planning schemes, which operate under this Act, set out the controls governing how land may be used and developed and defines the use category as utility installations. These controls include zones, overlays, particular provisions, and general provisions that determine whether planning approval is required for a given project.

The BESS facility proposed in this RMP requires planning approval under the relevant planning scheme—Warrnambool Planning Scheme [1]—which is implemented under the P&E Act. This RMP supports a planning permit application by addressing the hazard and risk considerations relevant to the responsible authority’s decision-making process.

3.2 Occupational Health and Safety Act 2004

The *Occupational Health and Safety Act 2004* (OHS Act) [8] sets out the legal duties for ensuring workplace health and safety in Victoria. This Act is relevant to the Project as it outlines the obligations for managing risks associated with the construction, operation, and maintenance of the BESS facility.

Under the OHS Act [8], duty holders, including designers, developers, and operators, must:

- Identify hazards associated with the storage and operation of lithium-ion batteries and wind turbines, including fire, structural failure, and electrical hazards.
- Implement risk control measures to eliminate or reduce risks so far as reasonably practicable.
- Ensure that workers, contractors, and emergency responders are adequately trained and informed about site-specific risks and mitigation measures.

The Preliminary Hazard Analysis in this RMP aligns with OHS Act [8] requirements by identifying the hazards and assessing the risks associated with fire safety, dangerous goods handling, and emergency management at the BESS facility.

3.3 Dangerous Goods Act 1985 and Dangerous Goods (Storage and Handling) Regulations 2022

The *Dangerous Goods Act 1985* and the *Dangerous Goods (DG) (Storage and Handling) Regulations 2022* [7] regulate the safe storage, handling, and transport of dangerous goods and hazardous materials, including any spare lithium-ion batteries used in the BESS.

This legislation is relevant as:

- The Project may contain dangerous goods classified under the Act, requiring compliance with storage and handling regulations.
- Operators must ensure safe work practices and emergency response preparedness in accordance with WorkSafe Victoria guidelines.

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3.4 Country Fire Authority Act 1958 and CFA Guidelines for Renewable Energy Facilities

The *Country Fire Authority Act 1958* governs fire risk management in Victoria, particularly in rural and regional areas. The CFA Design Guidelines and Model Requirements for Renewable Energy facilities, v4.4 2025 [5] outlines specific fire risk assessment and mitigation requirements for BESS installations.

This RMP considers fire risk management using the CFA Guideline [5] by:

- Identifying fire hazards associated with BESS facilities.
- Assessing bushfire risks and fire spread potential.
- Reviewing fire system design requirements, including fire breaks, access roads, and emergency response provisions.

The RMP ensures the Project aligns with CFA fire safety requirements, particularly in addressing fire prevention, suppression, and emergency planning measures.

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4 Methodology

The Risk Management Plan is conducted in four tasks. The include

- Section 4.1: Task 1 Methodology used for the Dangerous Goods Screening
- Section 4.2: Task 2 Methodology for the Preliminary Hazard Analysis
- Section 4.3: Task 3 Project Recommendations basis
- Section 4.4: Task 4 Bushfire Hazard Assessment

The recommended process (outlined below) aligns with the WorkSafe Victoria Risk Control Plan Guidelines, as shown in Figure 6.

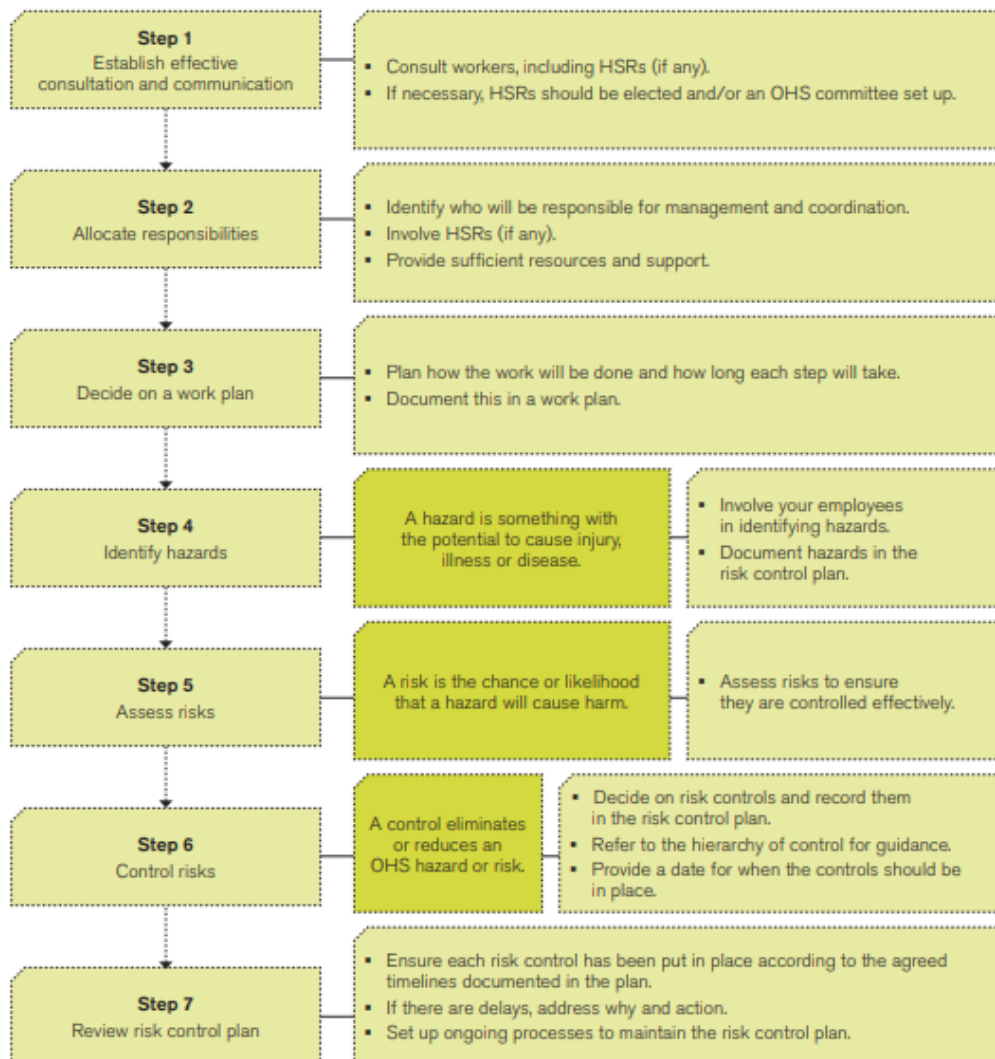


Figure 6: WorkSafe Victoria Risk Control Plan Guidelines

4.1 Task 1: Dangerous Goods Screening

The screening evaluates the storage of dangerous goods against thresholds set by the *Dangerous Goods (Storage and Handling) Regulations 2022* [7]. This screening compares the quantities of Dangerous Goods stored and handled with the Placarding Quantity, Manifest Quantity and Fire Protection Quantity thresholds defined in Schedule 2 of the *Dangerous Goods (Storage and Handling) Regulations 2022* [7]

If the storage quantities exceed the thresholds for placarding, manifests, or fire protection, the relevant Dangerous Goods regulatory requirements will be provided in Section 5.4.

4.2 Task 2: Preliminary Hazard Analysis

Following the screening assessment, a Preliminary Hazard Analysis will be conducted.

The Preliminary Hazard Analysis will focus on major incident scenarios that may result in impacts beyond the facility boundary, defined as “offsite”. In this context, “impact” is defined as the potential to cause fatalities. The analysis will focus on identifying and evaluating these scenarios to ensure that any risks with the potential to extend offsite are appropriately managed and mitigated.

WorkSafe Victoria’s guide, “A Guide to Risk Control Plans” [16], provides a methodology that can be applied to the risk assessment for the proposed facility, refer to Figure 6. The approach includes:

- **Hazard Identification:** Identifying significant on-site and off-site hazards that may pose off-site risks, including potential fire sources and operational risks (e.g. electrical faults, chemical releases, bushfires, floods).
- **Risk Documentation:** Developing a risk assessment table to document key hazards, detailing the nature and characteristics of each risk, and applying controls based on the hierarchy of controls and industry best practices.
- **Consequence Analysis:** Assessing the consequences of identified hazards to determine their potential impact on adjacent facilities or sensitive receptors. Hazards with no significant impacts are screened out, while those with possible impacts are carried forward.
- **Frequency Analysis:** Evaluating the frequency of hazards that have been carried forward from the consequence assessment.
- **Risk Assessment and Evaluation:** Assessing the overall risk by combining the consequence and frequency analyses for hazards with potential off-site impacts.

For this assessment, a qualitative approach was assumed to be appropriate and sufficient to evaluate the potential impacts on neighbouring land uses based on the following:

- The expected types and quantities of chemicals stored and handled at the Project (primarily lithium-ion batteries, diesel, transformer oil and lube oil) are not expected to pose significant off-site risks
- There are no vulnerable surrounding land uses (i.e. no schools, hospitals, aged care and childcare facilities, within 500 m of the Project).

Additionally, risk assessment is a continuous and iterative process. The RMP should be regularly reviewed and updated throughout each stage of the project to address any emerging hazards and ensure ongoing safety management.

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4.3 Task 3: Recommendations

Based on the findings from the Preliminary Hazard Analysis, recommendations will be made, if necessary. These recommendations will be informed by relevant Australian standards and guidelines such as:

- CFA Design Guidelines and Model Requirements: Renewable Energy Facilities V4 August 2023, updated as V4.4, June 2025 [5]
- AS/NZS 5139: Electrical installations – Safety of battery systems for use with power conversion equipment
- AS 1940: The storage and handling of flammable and combustible liquids.

The identified recommendations and mitigation measures should be considered during the detailed design phase and when developing the Emergency Plan for the Project.

4.4 Task 4: Bushfire Hazard Assessment

A detailed Bushfire Hazard Assessment for the Project has been completed separately and is provided in Appendix C: Bushfire Hazard Assessment. The methodology summarised below outlines the information

sources and classification approach used to inform the bushfire hazard considerations within this Risk Management Plan.

The following sources of information were reviewed to inform the preparation of this bushfire hazard assessment:

- VicPlan [17]
- Victorian Planning Provisions [18]
- NatureKit [19]
- *Regional Bushfire Planning Assessment – Barwon South West Region* [20]
- *Design Guidelines and Model Requirements: Renewable Energy Facilities* [21]
- *Planning Permit Application Bushfire Management Overlay – Technical Guide* [22].

For the purposes of bushfire hazard assessment, areas of vegetation considered to pose a bushfire threat are classified according to the vegetation classes defined as per AS3959-2018 [23]. Under Clause 2.2.3 and Table 2.3 of AS3959-2018, vegetation is classified into the following classes:

- **Forest:** includes tall open forest, woodland and low open forests which includes trees up to or over 30m tall and 30%-70% foliage coverage. This category also includes mature pine plantations
- **Woodland:** includes trees up to 30m high with a 10% - 30% foliage coverage.
- **Shrubland:** includes heath that is found in wet areas, poor soil conditions and 1m-2m high as well as low shrubland that is <2m high, 30% foliage coverage and has an understorey.
- **Scrub:** includes closed and open scrub which can range from wet or rocky areas with poor soil conditions and contain a mixed species composition.
- **Mallee/Mulga:** includes low trees or tall shrubs, usually >2m tall with sparse grassy understorey.
- **Rainforest:** includes trees with a >90% foliage cover, mixed species understorey and is not dominated by eucalypts.
- **Grassland:** includes all forms of grasses (except tussock moorlands) and where managed in a minimal fuel condition and non-curing cropland is regarded as a low threat vegetation.
- **Tussock Moorland:** includes all forms of vegetation where the overstorey is dominated by Button-grass.

AS3959-2018 also describes situations where vegetation is classified as 'low threat' due to factors such as flammability, moisture content or fuel load. This includes grassland managed in a minimal fuel condition, maintained lawns, golf courses, maintained public reserves and parklands, nature strips and windbreaks etc.

Details of the bushfire hazards within the project area, including the presence and type of classified vegetation and topography was determined during a field assessment undertaken on 16 July 2024. Bushfire hazards situated beyond the project area were determined based on observations from publicly accessible locations during the site inspection and aerial photo interpretation.

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5 Task 1: Screening Assessment

5.1 Dangerous Goods Storage and Transport Requirements

Dangerous Goods screening of the proposed development was conducted to determine if the development must adhere to specific requirements under Victorian legislation. The following regulations and codes were reviewed against the proposed hazardous materials and quantities:

- *Dangerous Goods (Storage and Handling) Regulations 2022* [7]
- *Occupational Health and Safety Act 2004* [8]
- *Australian Dangerous Goods Code* [24]

The hazardous chemicals on site (i.e. Class 9 lithium-ion batteries, diesel, transformer oil) are not listed in Schedule 14 of the Occupational Health and Safety Regulations 2017 and hence, their storage quantities do not trigger a major hazard facility classification.

The Dangerous Goods (Storage and Handling) Regulations [7] set out the requirements for the use, handling, and storage of hazardous chemicals at a workplace. Specifically, this RMP assesses requirements for exceeding placard, manifest and fire protection quantities found in Schedule 2 of the Regulation.

A summary of the expected hazardous materials to be stored and handled on site for the Project is listed in Table 2 and Table 3. These have been compared to the thresholds provided in Schedule 2 of the Dangerous Goods (Storage and Handling) Regulations 2022 [7] for placarding, manifest, and fire protection.

Where the storage quantities exceed the thresholds for placarding, manifests, or fire protection, the relevant DG regulatory requirements will be provided in Section 5.4.

5.2 Dangerous Goods on Site

The hazardous materials being screened have been separated into two categories; BESS hazardous materials and other possible hazardous materials.

Table 2 below details the hazardous materials associated with BESS battery units.

The current design and assumptions are based on Quantum2 EVE BESS. These units are expected to be delivered pre-assembled, meaning all substances required by the units are built into the battery enclosure and do not need to be added at the time of installation at the Site.

At this stage of Project development, the final operating configuration of the battery systems is not yet confirmed, and it is uncertain whether all battery units will be considered “in use” immediately upon installation. To ensure a conservative approach to risk assessment, all lithium-ion batteries (BESS units) on site have been assumed to be in “storage” during construction for the purposes of screening under the Regulations, regardless of whether they will ultimately be connected and energised in operation.

Table 3 provides a list of non-battery hazardous materials which are expected to be present in various quantities on site and may be part of adjacent infrastructure (e.g. transformers). In cases where the packing group is ambiguous, the worst-case scenario is assumed.

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5.3 Summary of Dangerous Goods and Threshold Quantities

Table 2: Threshold Quantities for BESS Hazardous Materials

Material	UN No.	DG Class	Category	Packing Group	Battery Provider	Project Storage Quantities and Movements	Dangerous Goods Threshold			Exceedance
							Placarding	Manifest	Fire Protection	
Lithium-ion Batteries	3480	9	Miscellaneous dangerous goods and article	II	Quantum2	Battery Storage (construction) 132 x Quantum2 EVE BESS (23,296 kg each) ² Total on site is 3,075,072 kg	1,000 kg	10,000 kg	20,000 kg	Placarding, manifest and fire protection threshold exceeded
						Batteries in Use (operation) All batteries will be connected for use	N/A ¹	N/A ¹	N/A ¹	

Notes:

1. Lithium-ion batteries **in use** are not subject to the requirements of the *Dangerous Goods (Storage and Handling) Regulations 2022* [7] as per Regulation 6 (c) and, hence, do not have a prescribed storage threshold under Schedule 2 of the *Dangerous Goods (Storage and Handling) Regulations 2022* [7].
2. The Quantum2 BESS has 10 racks, each consisting of 8 modules, each module consisting of 52 cells (4160 cells in total, each cell weighs 5.6 kg). Mass of Lithium-ion per Quantum2 BESS is approximately 23,296 kg (4160 x 5.6).
3. The weight provided is conservatively the maximum weight of each BESS enclosure, not the total weight of the lithium-ion battery modules contained inside [25].

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Table 3: Threshold Quantities for Other Possible Hazardous Materials

Material	UN No.	DG Class	Category	Packing Group	Project Storage Quantities and Movements	Dangerous Goods Threshold			Exceedance
						Placarding	Manifest	Fire Protection	
Diesel	1202	N/A – C1 Combustible Liquids are not classified as DGs for transport purposes ¹ . However, they are classified as DGs in the context of storage and handling.		N/A	1 x Standby generator and associated diesel tank Total on site is 1,500 L ³	10,000 L (10 kL)	100,000 L (100 kL)	100,000 L (100 kL)	No thresholds exceeded
Transformer Oil	Various	N/A – C2 Combustible Liquid ²		II	1 × 120 MW power transformer Total on site is 55,000 L ⁴	N/A	N/A	N/A	N/A
Lube Oil	Various	N/A – C2 Combustible Liquid ²		N/A	Total on site is 200 L ⁵	N/A	N/A	N/A	N/A

Notes:

1. No placarding is required by the ADG Code [24] on a portable tank or tank vehicle transporting only C1 liquid.
2. As per Regulation 6(g) of Clause 6(c) of *the Dangerous Goods (Storage and Handling) Regulations 2022* [7], "dangerous goods that are combustible liquids other than C1 combustible liquids;" are exempt from the regulations.
3. The standby generator fuel tank size is not yet confirmed. Typical standby generator tanks range 500 to 2,000 L, a typical conservative volume of 1,500 L has been assumed for DG screening purposes.
4. 120 MW transformer oil volumes range from 50,000 to 60,000 L. The transformer oil volume was assumed to be 55,000 L for DG screening purposes.
5. Minor volumes were assumed to be required for generator and transformer maintenance; 200 L of lube oil was assumed for DG screening purposes.

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5.3.1 Lithium-Ion Batteries

The content of the battery, lithium, poses little threat to people or property. However, the potential of thermal runaway effects may lead to fire and explosion hazards [26]. As such, the risks of lithium batteries in use have been considered as part of this study and mitigation measures of lithium-ion batteries in are further discussed in Section 7.3

5.3.2 Diesel (Combustible Liquid)

Diesel is not classified as a DG by the Australian Dangerous Goods (ADG) Code [24].

Additionally, in accordance with the Special Provision No. AU02 of the *Australian Dangerous Goods Code* (ADG Code) [24], "GAS OIL or DIESEL OIL or HEATING OIL, LIGHT or PETROLEUM DISTILLATE is not subject to this Code if it does not meet the criteria of Chapter 2.3 [of the ADG Code] [24] for assignment to Class 3; i.e., if the flash point is more than 60°C and the substance is not offered for transport at a temperature above its flash point. Such substances will normally be C1 combustible liquids which are not classified as dangerous goods for transport purposes". Thus, diesel will not be considered a dangerous good (DG) for transportation.

Moreover, it is expected that the risk associated with diesel transportation to be low. This is due to the low annual movements expected, as diesel will only be used in generators when back-up power is required. However as per Clause 6(g) and Schedule 2 of the *Dangerous Goods (Storage and Handling) Regulations 2022* [7], C1 combustible liquids are classified as dangerous goods in the context of storage and handling. Recommendations have therefore been made for the storage of diesel in Section 7.4.

5.3.3 Transformer Oil

Transformer oil is classified as C2 combustible liquid. As per Regulation 6 of the Regulation 6(g) of the Clause 6(c) of the *Dangerous Goods (Storage and Handling) Regulations 2022* [7], "dangerous goods that are combustible liquids other than C1 combustible liquids;" are exempt from the regulations and have been excluded from this study (Task 1 and Task 2). However, quantities for anticipated storage have been detailed for completeness.

5.3.4 Lube Oil

Lube oil is classified as C2 combustible liquid. As per Regulation 6 of the Regulation 6(g) of the Clause 6(c) of the *Dangerous Goods (Storage and Handling) Regulations 2022* [7], "dangerous goods that are combustible liquids other than C1 combustible liquids;" are exempt from the regulations and have been excluded from this study (Task 1 and Task 2). However, quantities for anticipated storage have been detailed for completeness.

5.4 Dangerous Goods Regulatory Requirements

5.4.1 Fire Protection Quantities

The trigger fire protection quantity of Class 9 Materials (lithium-ion batteries) as per Schedule 2 of the *Dangerous Goods (Storage and Handling) Regulations 2022* is 20,000 kg [27]. The proposed quantity of lithium-ion batteries (in storage) to be stored at site exceeds the fire protection quantity, therefore:

Under Regulation 52 of *Dangerous Goods (Storage and Handling) Regulations 2022* [27], where dangerous goods are stored and handled in quantities that exceed the relevant fire protection thresholds, the occupier must:

- Request the written advice of CFA in relation to the design of the fire protection system for the premises; and

- In establishing the fire protection system for the premises, have regard to that written advice.

The request would relate to the storage of the BESS units during construction only.

5.4.2 Placard Quantities

The trigger placard quantity of Class 9 Miscellaneous Dangerous Goods as per Schedule 2 of the *Dangerous Goods (Storage and Handling) Regulations 2022* [27] is 1,000 kg. The proposed quantity of lithium-ion batteries (in storage) exceeds the placard quantity, therefore during construction:

- In accordance with Regulation 47, where dangerous goods are stored and handled, any storage of packaged dangerous goods that exceeds the quantity specified in Schedule 2 must be placarded.
 - The placard must be kept clean, in good order and unobstructed
 - The placard must be located so that it is clearly legible by persons approaching the placard; and separate from any other sign or writing that contradicts, qualifies or distracts attention from the placard.
 - The placard must be located:
 - at the entrance to any building in which the dangerous goods are stored; and
 - within a building, at the entrance to each room or other closed or walled section of the building in which the] dangerous goods are stored; and adjacent to any external storage area where the dangerous goods are stored.
 - adjacent to any external storage area where the dangerous goods are stored.
 - For packaged UN Class 9 Miscellaneous Dangerous Goods the placard must have:
 - the form shown in Figure 7; and
 - be of sufficient size to accommodate the labels to be displayed on it.
 - In relation to Figure 7, the Class label must have sides at least 100 mm long.

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Figure 7: Placard for storages of Class 9 packaged dangerous goods

5.4.3 Manifest Quantities

Regulation 64 of the *Dangerous Goods (Storage and Handling) Regulations 2022* [27] states that “An occupier of premises where notifiable goods are present must ensure that the Authority is provided with a notification of the presence of those goods that complies with subregulation (2)”. Under subregulation (2)(c)(viii) and (ix), the operator of the facility has the duty to notify the Authority (WorkSafe Victoria) of dangerous goods exceeding manifest quantities.

The trigger manifest quantity of Class 9 Materials (lithium-ion batteries) as per Schedule 2 of the *Dangerous Goods (Storage and Handling) Regulations 2022* [27] is 10,000 kg. The quantity of lithium-ion batteries (in storage) to be stored at site exceeds the manifest quantity, therefore during construction:

- In accordance with Regulation 44, the occupier of premises must ensure that the manifest is kept on premises in a location or place where it is readily accessible to the emergency services authority (CFA)
- An emergency plan should be prepared for the site and provided to CFA as per the requirements of Regulation 53 of the *Dangerous Goods (Storage and Handling) Regulations 2022* [27].

- WorkSafe Victoria must be notified of lithium-ion battery storage exceeding manifest quantities in accordance with Regulation 64 *Dangerous Goods (Storage and Handling) Regulations 2022* [27].

6 Task 2: Preliminary Hazard Analysis

Section 4(2) of the Victorian Occupational Health and Safety Act 2004 [8] states “*persons who control or manage matters that give rise or may give rise to risks to health or safety are responsible for eliminating or reducing those risks so far as is reasonably practicable*”. This requirement of the Victorian Occupational Health and Safety Act 2004 has been met in the form of the Preliminary Hazard Analysis prepared for the Project and detailed in Section 6 and Appendix B: Preliminary Hazard Analysis.

6.1 Hazard Identification

Hazard Identification (HAZID) aims to identify all reasonably foreseeable hazards and associated events that may arise due to the operation of the facilities and defining the relevant controls through a systematic and structured approach.

All potential significant hazards that may pose a risk to the Project or an off-site risk were identified and documented in a Preliminary Hazard Analysis (Appendix B: Preliminary Hazard Analysis) The consequences of each of the identified hazards were assessed to determine if such consequences may impact off-site adjacent facilities or sensitive receptors.

Hazards are grouped by component; all hazards are listed along with causes and consequences in Appendix B. Hazards at the BESS facility include:

- BESS (Lithium-Ion Battery)
- Transformer and Electrical Network Hazards
- Switchgear Hazards
- Combustible Liquid Hazards
- Natural Hazards
- Other Hazards.

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6.1.1 BESS Hazards (Lithium-Ion Battery Hazards)

Under normal conditions of use, the numerous safeguards designed into the BESS module to ensure that the medium voltage battery is kept safe and secure. However, if the BESS module is damaged, the battery integrity can be compromised, which raises the potential for hazards.

Thermal Events

In reference to DNV’s recommended practice for the *Safety, operation, and performance of grid-connected energy storage systems, dated 2017* [26], the primary hazard for lithium-ion batteries is thermal runaway and overheating which can be controlled with adequate cooling and management of temperature excursions. The greatest operational risk is the possibility of a thermal event within the BESS system. The potential for this could be triggered by structural, electrical, and failure of fire protection characteristics such as a fault related to coolant loss, overcharging, or external damage. In such cases, rapid temperature increases could lead to thermal runaway and fire.

In most cases, the temperature of the lithium-ion batteries should not be higher than 70°C to prevent thermal runaway, which causes propagation of increasing temperatures, pressures, and fire toward neighbouring cells. Similarly, the temperature of the lithium-ion batteries, in most cases, should not drop below 0°C to prevent lithium plating around the anode during charging, which can cause internal shorts.

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Short Circuit

An internal or external short circuit within the battery can cause significant overheating and provide an ignition source resulting in fire, including surrounding materials, or materials within the cell or battery. Under normal conditions of use, the electrode materials and electrolytes they contain are not exposed, provided the battery integrity is maintained, and the seals remain intact. The risk of exposure may occur only in cases of damage (mechanical, thermal, or electrical).

Prolonged exposure of the BESS module to conditions beyond the designed limits may increase the potential of thermal runaway and result in a fire. Exposure of battery packs to localised heat sources such as flames may result in cell thermal runaway reactions and shall be avoided.

Vented Gases

Under normal conditions of use the venting of gases from batteries should not occur.

Causes of vented gases include the following:

- A fault or failure and release of corrosive and/or toxic materials from the battery cell.
- HVAC failure or overcharging of battery causing rapid expansion and confinement of gases.
- Incomplete combustion of gases generated during initial battery cell thermal runaway phase.

If subject to abnormal heating and/or other abuse conditions including fire, vented gases are recognised as a common early indicator of a thermal runaway reaction. Although the choice of anode-cathode chemistry can result in different thermal stability and volatility, all lithium-ion batteries are flammable when exposed to fire.

Lithium-ion fires are a unique class of fire and may result in emissions of toxic or flammable gases, which need to be managed accordingly. Battery toxic gas dispersion modelling will be developed during the detailed design phase to confirm and demonstrate sufficient safeguards are implemented, so there are no adverse offsite risks.

Further details on these hazards are described in Appendix B: Preliminary Hazard .

6.1.2 Transformer and Electrical Network Hazards

The causes of fire hazards relating to transformers are typically categorised as one of the following:

- Plant and equipment containing combustible insulating liquids may rupture due to internal failure; there may be an explosion, and ignition may occur with a serious fire risk.
- Plant and equipment without combustible insulating liquids may rupture due to internal failure; there may be an explosion and modest fire risk.
- Other plant and equipment such as cables, batteries, and drainage pipes may catch fire and spread the fire.

Contact with live parts, arc flashing, and transformer fires are the most common hazards associated with transformers. *AS 2067:2016: Substations and high voltage installations exceeding 1kV a.c.* [28] outlines the risks and safety measures for these hazards.

Consequences of these hazards include electrocution that could result in injuries or fatalities, damage to the transformer, or act as an ignition source for a BESS fire.

As the Project site contains and is in proximity of existing electricity works, the Project must comply with the *Electricity Safety Act 1998* [29]. Access to equipment, safe operation and maintenance, safe personnel egress, equipment clearance, electrical safety, and fire safety systems need to be considered for transformer installations.

6.1.3 Switchgear hazards

Due to the presence of high voltage, the switchgear also poses hazards, such as contact with live parts, arc flashing, explosion, and release of gases, i.e. sulphur hexafluoride (SF₆) in gas-insulated switchgear.

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6.1.4 Combustible Liquid Hazards

Diesel may be present at the Project as a fuel for various pieces of equipment, especially during construction and use in a generator. Diesel is classified as a C1 Combustible Liquid. A Loss of Containment (LOC) of diesel may accumulate and pose a fire risk if ignited. If ignited, the LOC may result in a pool fire; however, given diesel's high flashpoint, the probability of ignition is low.

A similar hazard is present for various oils and lubricants used at the Project Site. However, these are stored in much smaller quantities and are unlikely to cause a significant incident escalation if a LOC is ignited. As per Table 2.1 of AS 1940-2017, the storage of 1,500 L of diesel would be classified as a minor store (for outdoor above ground tanks in open land).

6.1.5 Natural Hazards

Several potential natural hazards may pose a risk to the Project. These hazards include extreme ambient temperatures, bushfires, seismic activity, flooding, wind, subsidence, and lightning.

6.1.6 Other

Other hazards associated with the Project for potential off-site consequence were also considered, including hazards such as vehicle collision / congestion and loss of containment (e.g. of waste, contaminated water, and refrigerant). These hazards are described further in Appendix B: Preliminary Hazard Analysis.

6.2 Risk Analysis

In this study, risk is defined as the likelihood of a specified undesired event occurring within a specified period or in specified circumstances. It may be either a frequency (the number of specified events occurring in a unit of time) or a probability (the probability of a specified event following a prior event) depending on the circumstances.

The matrices set out in Table 4, Table 5, Table 6 are part of Aurecon's management framework and were used to complete a qualitative risk assessment of the identified hazards. Consistent with standard risk assessment methodology, the risk rating for a given hazard is a product of the likelihood and consequence of its occurrence.

As such, the potential consequence for each identified hazard carried forward due to posing significant off-site risk was first assessed (Table 4), followed by an assessment of their estimated likelihood of occurrence (Table 5). Finally, the overall current risk rating was then calculated by using likelihood and consequence as inputs (Table 6).

Table 4: Hazard Consequence Assessment Matrix

Consequence	People	Property	Environment	Community
A – Catastrophic	Single or multiple fatality	Virtual complete loss of plant or system	Permanent / irreversible widespread ecological damage not able to be remediated	Outrage by a sizeable community or many communities. Riots.
B – Major	Disabling injury or illness i.e., amputation and/or permanent loss of bodily function, or any kind of permanent health impact	Extensive damage to plant or system	Extensive ecological damage, lengthy remediation process	Community/NGO legal actions. Pickets, demonstrations.
C – Moderate	Any Lost Time Incident (LTI), i.e., an illness or injury resulting in one or more consecutive days or shifts off work	Significant damage to plant or system	Substantial ecological damage but able to be remediated	Persistent formal community complaints. Formal complaints to politicians or comparable representatives.
D - Minor	A medical treatment case (MTC) / or restricted work case (RWC)	Damages impact on budget and program	Localised ecological damage, easily remediated	Formal complaints from local Community complaints locally

Consequence	People	Property	Environment	Community
E – Incidental	First Aid case, or an injury or illness not requiring treatment	Minor damage to plant or system	Negligible ecological damage, may not require remediation	No Informal community complaints &/or negative comments / views.

Table 5: Hazard Likelihood Assessment Matrix

Likelihood	Descriptor	Likelihood	Industry Incidences
5 – Almost Certain	The threat is expected to be realised.	90% < Likelihood ≤ 100%	Common incident
4 – Likely	The threat is likely to be realised.	5% < Likelihood ≤ 90%	Several incidents nationally
3 – Possible	The threat may be realised.	1% < Likelihood ≤ 5%	One or a few incidents nationally
2 – Unlikely	The threat is not expected to be realised.	0.1% < Likelihood ≤ 1%	No known national incidents. One or a few incidents in comparable international operating regimes.
1 – Rare	The threat may be realised in reasonably foreseeable but exceptional circumstances.	0% < Likelihood ≤ 0.1%	No known incidents in comparable international operating regimes.

Table 6: Risk Rating Matrix

		Likelihood				
		1 – Rare	2 – Unlikely	3 – Possible	4 – Likely	5 – Almost Certain
Consequence	A - Catastrophic	High	Critical	Critical	Critical	Critical
	B – Major	High	High	Critical	Critical	Critical
	C – Moderate	Medium	Medium	High	High	Critical
	D – Minor	Low	Low	Medium	High	High
	E – Incidental	Low	Low	Low	Medium	Medium

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7 Task 3: Recommendations

Several Australian and international standards and guidelines govern the best practice design and installation of BESS facilities. The following recommended technical safeguards are expected to reduce the residual risk to the extent that no identified hazards pose a significant risk.

7.1 Dangerous Goods and Environmental Recommendations

General recommendations for risk reduction due to dangerous goods on site shall include:

- Under Clause 53.10-1 of the Victoria Planning Provisions [30], an application for a utility installation must be referred to the Environment Protection Authority (EPA) as there is no specific land use threshold distance provided in the planning scheme. This referral is required under Section 55 of *Planning and Environment Act 1987* [3], and ensures that the EPA reviews the potential environmental impacts of the proposed use and provides recommendations or conditions for mitigating any adverse effects.
- Buildings shall be designed to the relevant applicable codes for the range of natural hazards listed in Table 7.
- While the ADG code [24] does not classify diesel as dangerous goods, it is a C1 combustible liquid for the purposes of the *Dangerous Goods (Storage and Handling) Regulations 2022* [7]. Given their classification as C1 combustible liquids and the commonplace use of diesel, compliance with AS 1940 *The Storage and Handling of Flammable and Combustible Liquids* is considered sufficient to mitigate this risk.

7.2 CFA Guideline Recommendations

7.2.1 General

In accordance with CFA Design Guidelines and Model Requirements: Renewable Energy Facilities V4 August 2023 updated as V4.4, June 2025 [5], it is recommended that the following requirements shall be met:

- Consultation has been undertaken with CFA's Specialist Risk and Fire Safety Unit during the early stages of project development, and the design has been informed by this feedback (including adoption of CFA's recommended firefighting water storage provision of two tanks per BESS area). Further consultation with CFA will be undertaken as required to support the planning permit application.
- The Risk Management Plan for the facility shall be further developed following detailed design and incorporate risks to and from the BESS FSS (if requested), in consultation with CFA, prior to development commencing
- An Emergency Plan shall be developed for the construction phase of the facility, and the draft plan reviewed by CFA prior to development commencing.
- A Fire Management Plan shall be developed for the facility, in consultation with CFA, prior to development commencing.
- Appropriate demarcation of arc boundaries to at least 10 m from power conversion unit (PCU) arc flash outlet flaps (blow-out panels) shall be provided, where there is a hazard to personnel.
- Appropriate monitoring for facility infrastructure shall be provided, to ensure that any shorts, faults or equipment failures with the potential to ignite or propagate fire are rapidly identified and controlled, and any fire is notified to 000 immediately.
- An Emergency Plan shall be developed for the operational phase, specific to the facility, in consultation with CFA, prior to use commencing.

- An Emergency Information Book shall be developed and available to emergency responders. Emergency Information Books shall be located in Emergency Information Containers, provided at each vehicle entrance the facility.

7.2.2 Facility Design

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Emergency vehicle access

In accordance with CFA Design Guidelines and Model Requirements: Renewable Energy Facilities V4 August 2023 updated as V4.4, June 2025 [5], it is recommended that the following requirements shall be met:

- Construction of a minimum four (4) metre perimeter road within the perimeter fire break.
- Roads shall be of all-weather construction and capable of accommodating a vehicle of fifteen (15) tonnes (e.g. no compacted earth).
- Constructed roads shall be a minimum of four (4) metres in trafficable width with a four (4) metre vertical clearance for the width of the formed road surface. Ensure any fencing along access routes allows for width of fire trucks.
- 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 fifty (50) metres.
- Dips in the road shall have no more than a 1 in 8 (12.5% or 7.1°) entry and exit angle.
- Roads shall incorporate passing bays at least every 600 metres, which shall be at least twenty (20) metres long and have a minimum trafficable width of six (6) metres. Where roads are less than 600 metres long, at least one passing bay shall be incorporated
- Road networks shall enable responding emergency services to access all areas of the facility, including fire service infrastructure, buildings, and battery energy storage systems and related infrastructure.
- The provision of at least two (2) but preferably more access points to each part of the facility.

Firefighting Water Supply

In accordance with CFA Design Guidelines and Model Requirements: Renewable Energy Facilities V4 August 2023 updated as V4.4, June 2025 [5], it is recommended that the following requirements shall be met:

- Water access points shall be clearly identifiable and unobstructed to ensure efficient access.
- Static water storage tank installations shall comply with AS 2419.1-2021: Fire hydrant installations – System design, installation and commissioning.
- The static water storage tank(s) shall be an aboveground water tank constructed of concrete or steel.
- The static water storage tank(s) shall be capable of being completely refilled automatically or manually within 24 hours.
- The static water storage tanks shall be located at vehicle access points to the facility and shall be positioned at least ten (10) metres from any infrastructure.
- The hard-suction point shall be provided with a 150mm full bore isolation valve equipped with a Storz connection, sized to comply with the required suction hydraulic performance.
- The hard-suction point shall be positioned within four (4) metres to a hardstand area and provide a clear access for emergency services personnel.
- An all-weather road access and hardstand shall be provided to the hard-suction point. The hardstand shall be maintained to a minimum of 15 tonne GVM, eight (8) metres long and six (6) metres wide or to the satisfaction of the CFA.
- The road access and hardstand shall be kept clear at all times.

- The hard-suction point shall be protected from mechanical damage where necessary.
- Where the access road has one entrance, an eight (8) metre radius turning circle shall be provided at the tank.
- An external water level indicator shall be provided to the tank and be visible from the hardstand area.
- Signage indicating 'FIRE WATER' and the tank capacity shall be fixed to each tank.
- Signage shall be provided at each vehicle entrance to the facility, indicating the direction to the nearest static water tank(s).

Fire Detection and Suppression Equipment

In accordance with CFA Design Guidelines and Model Requirements: Renewable Energy Facilities V4 August 2023 updated as V4.4, June 2025 [5], it is recommended that the following requirements shall be met:

- Provision of suitable fire detection and suppression equipment for on-site buildings and structures, according to the requirements of the National Construction Code.
- Provision of suitable fire detection and suppression equipment for storage of dangerous goods, according to the requirements of any Australian Standards for the storage and handling of dangerous goods.
- For electrical installations, a minimum of two suitable fire extinguishers shall be provided within 3 m-20 m of each PCU.
- In all vehicles and heavy equipment, each vehicle shall carry at least a nine (9) - litre water stored-pressure fire extinguisher with a minimum rating of 3A, or other firefighting equipment as a minimum when on-site during the Fire Danger Period.

Fire Breaks

In accordance with CFA Design Guidelines and Model Requirements: Renewable Energy Facilities V4 August 2023 updated as V4.4, June 2025 [5] it is recommended that the following provision of fire break facility design requirements shall be met:

- Around the perimeter of the facility, commencing from the boundary of the facility or from the vegetation screening inside the property boundary.
- Around the perimeter of control rooms, electricity compounds, substations and all other buildings onsite.
- Of a width of at least 10m.

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7.2.3 BESS Design

In accordance with CFA Design Guidelines and Model Requirements: Renewable Energy Facilities V4 August 2023 updated as V4.4, June 2025 [5], it is recommended that the following requirements shall be met:

- Where reticulated water is available, the provision of a fire hydrant system that meets the requirements of AS 2419.1: Fire hydrant installations, Clause 3.9: Open Yard Protection, and Table 2.2.5(D): Number of Fire Hydrants Required to Flow Simultaneously - Open Yards.
- Where no reticulated water is available, provision of a fire water supply in static storage tanks, where:
 - i. The fire water supply shall be of a quantity no less than 288,000L or as per the provisions for Open Yard Protection of AS 2419.1: Fire hydrant installations, flowing for a period of no less than four hours at 20L/s, whichever is the greater.
 - ii. The quantity of static fire water storage is to be calculated from the number of hydrants required to flow from AS 2419.1: Fire hydrant installations, Table 2.2.5(D).

- iii. Fire hydrants shall be provided and located so that every part of the battery energy storage system is within reach of a 10m hose stream issuing from a nozzle at the end of a 60m length of hose connected to a fire hydrant outlet.
 - iv. The fire water supply shall be located at vehicle entrances to the facility, at least 10m from any infrastructure (electrical substations, inverters, battery energy storage systems, buildings).
 - v. The fire water supply shall be reasonably adjacent to the battery energy storage system and shall be accessible without undue danger in an emergency. (E.g., Fire water tanks are to be located closer to the site entrance than the battery energy storage system).
 - vi. The fire water supply shall comply with AS 2419.1: Fire hydrant installations, Section 5: Water storage tanks.
- The provision of a fire break around battery energy storage systems and related infrastructure.
 - The design of the facility shall incorporate:
 - a) A separation distance that prevents fire spread between battery containers/enclosures and other site elements.
 - b) A fire break around the battery energy storage system and related infrastructure, of a width of no less than 10m.
 - c) A layout of site infrastructure that:
 - i. Considers the safety of emergency responders.
 - ii. Minimises the potential for grassfire and/or bushfire to impact the battery energy storage system.
 - iii. Minimises the potential for fires in battery containers/enclosures to impact on-site and offsite infrastructure.
 - BESS shall be:
 - a) Located so as to be reasonably adjacent to a site vehicle entrance (suitable for emergency vehicles).
 - b) Located so that the site entrance and any fire water tanks are not aligned to the prevailing wind direction (therefore least likely to be impacted by smoke in the event of fire at the battery energy storage system).
 - c) Provided with in-built fire and gas detection systems.
 - b) Provided with explosion prevention via sensing and venting, or explosion mitigation through deflagration panels.
 - c) Provided with suitable ember protection.
 - d) Provided with suitable access roads for emergency services vehicles.
 - e) Installed on non-combustible surfaces.
 - f) Provided with suitable ventilation.
 - g) Provided with suitable impact protection.
 - h) Provided with enclosed wiring and buried cabling, except where required to be above-ground for grid connection.
 - i) Provided with spill containment that includes provision for management of fire water runoff.

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7.3 Lithium-ion Battery Recommendations

The primary reference standards are *IEC 62619 Safety Requirements for Secondary Lithium Cells and Batteries, for use In Industrial Applications* [31] and *IEC 62485-5: Safety requirements for secondary batteries and battery installations – Part 5: Safe operation of stationary lithium-ion batteries* [32].

These standards outline safety and protection measures for lithium-ion batteries, addressing the major hazards identified in this risk and hazard assessment. They provide requirements for installation, operation, maintenance, and end-of-life management of lithium-ion batteries in BESS. Contractors and suppliers shall adhere to these standards for BESS component installation, operation, maintenance, and disposal.

Design of the Lithium-Ion BESS shall consist of modular, insulated battery cells and the container shall be kept free of extraneous and combustible materials to mitigate the risk of fire or thermal overload spreading to multiple battery cells. These units need to account for adequate separation to prevent fire propagation considering the findings from the 2021 Victorian Big Battery fire incident [33] where fire propagation to the roof of the adjacent BESS sub-unit occurred.

Lithium-ion batteries in storage are to be incorporated into the overall fire safety strategy by the project fire engineer.

7.4 Combustible Liquid Safeguards

While the ADG Code does not classify diesel as a dangerous good, it is a C1 combustible liquid. As such, there is a risk of loss of containment (e.g., fuel spills or leaks) and loss of control over generator operation (e.g., fuel supply disruptions and inconsistent fuel flow). Such disruptions can lead to cascading events affecting the operation of each generator, including unexpected shutdowns or operational failures. The design requirements for a combustible liquids minor store per Section 2 of AS 1940-2017 is outlined below:

- In accordance with AS 1940, the following separation distances apply to a minor store.
 - From the minor store to any other minor store: 20 m (Clause 2.2.3)
 - From the minor store to any other store containing flammable or combustible liquids that is not a minor store: 5 m (Clause 2.2.4)
- In accordance with AS 1940-2017 Clause 2.3.5, at premises where more than 1,000 L of combustible liquids are stored at least one portable fire extinguisher, having a suitable rating for use with the range of materials being kept, shall be readily accessible and adjacent to the minor storage area.
 - Therefore, it is recommended that at least one dry powder type fire extinguisher (rated 2A 60B(E)) with a minimum capacity of 9 kg is provided adjacent to the diesel storage. The extinguisher shall be mounted in accordance with AS 2444.
- In accordance with Clause 2.3.4 in AS 1940-2017, liquids shall not be allowed to reach ignition sources, stores of other chemicals, combustible materials, or flow into any drains.
- In addition, Clause 2.3.4 in AS 1940-2017 requires that all spills and leaks shall be cleaned up immediately. Therefore, it is recommended that a spill kit is provided adjacent to the diesel storage. The spill kit may consist of a readily identifiable, suitable container with a lid or cover containing absorbent materials, suitable PPE, and suitable equipment for cleanup.

7.5 Transformer and Switchgear Recommendations

AS 2067: *Substations and high voltage installations exceeding 1 kV a.c.* [28] outlines the risks and safety measures for primary hazards presented by transformers which includes live contact, arc flashing, and fire and explosions. The BESS (including transformers) shall be designed in line with and comply with this standard. All transformers shall have separation distances away from other transformers, control rooms and office complexes that exceed the required distances in the standard. Details of the requirements for this standard are listed below:

- Protection against live contact of a transformer is generally achieved with the following mitigation measures:
 - protection by enclosure
 - protection by barrier
 - protection by obstacle

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- protection by placing out of reach.
- Protection against arc faults between transformers and other equipment or people is generally achieved with the following mitigation measures:
 - Protection against operating error through:
 - load break switches
 - short-circuit rated fault-making switches
 - interlocking device
 - noninterchangeable key locks.
 - Operating aisles as short, high, and wide as possible
 - Solid covers as an enclosure or protective barrier
 - Equipment tested to withstand internal arc fault
 - Arc protection to be directed away from operating personnel and vented outside the building if necessary
 - Use of current limiting devices
 - Very short tripping time
 - Operating of the plant from a safe distance
 - Prevention of reenergisation by use of manually resettable devices which detect internal equipment faults, and which incorporate pressure relief and provide external indication.
- To mitigate the risks associated with transformer fire, the following steps shall be followed:
 - Minimise the risk of a fire starting:
 - The transformer specification shall consider insulation levels, operating temperatures, cooling systems, protection systems, operation (including the effect of prolonged overloading) and maintenance practices.
 - Minimise the risk of transformer failure developing into an oil fire:
 - Consideration shall be given to insulating liquid type, tank strength, low explosion risk bushings, and pressure relief.
 - Minimise the impact of a transformer fire on the environment, other assets, and humans.
- The following control measures shall always be in place to minimise the damage resulting from a transformer fire.
 - Minimise risk of loss of life and injury to humans by:
 - providing adequate clearance around transformers, particularly those with sound enclosures
 - providing adequate access for firefighting equipment
 - providing adequate egress routes.
 - Minimise the risk of the fire spreading or causing damage to adjacent transformers, control building, structures and other items of plant and equipment.
 - providing passive protection systems in the form of adequate separation distances, fire barriers, construction buildings of fire resisting materials
 - providing active suppression systems such as deluge, water mist, or gas flooding.
 - Minimise contamination and damage to the environment by provision of oil containment systems and bunding.

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7.6 Separation Distances Recommendations

Additional safeguarding includes designing to Australian Standards and industry best practice to minimise the risk of fire through inherently safe design such as onsite separation of BESS units (i.e., obtaining vendor battery enclosure fire test results to determine risk for fire propagation is recommended).

Recommendations for separation distances are as follows:

- The design of BESS and auxiliary infrastructure shall consider:
 - Surface Water and Groundwater Assessment to determine special flood considerations
 - Provision for water retention facility.
- The layout shall be developed to accommodate the anticipated number of BESS enclosures and the necessary separation distances to mitigate the spread of fires. The BESS installation will also adhere to fire and safety codes and standards such as NFPA 855, UL 9540, and UL 9540A.
- The separation of the buildings, including switch rooms, control room and workshop shall be in accordance with AS 2067: *Substations and high voltage installations exceeding 1 kV a.c.* [28] and the National Construction Code. Additional discussion on the separation from the transformers is noted within Section 7.3 of this RMP.
- Lithium-ion batteries are considered DGs while in storage and not connected to the grid. *AS/NZS The Storage and Handling of Class 9 (miscellaneous) Dangerous Goods and Articles* outlines requirements for Class 9 DGs (i.e., lithium-ion batteries and battery enclosures) which shall be followed while battery enclosures are onsite and not connected to the grid.

Since the final dimensions of the enclosures and associated clearances may vary depending on the selected supplier and product type and the final detailed design, the supplier appointed will be required to finalise the detailed design in accordance with the above design considerations for the appropriate management and minimisation of fire risk. The battery enclosure supplier will advise the safe separation demonstrated by tests within battery enclosures to prevent fire propagation should an incident occur involving the battery cells.

7.7 Fire Safety Recommendations

The Model Requirements within the CFA design guideline for renewable facilities [5] are expected to be fully met, and therefore it is unlikely that a Fire Safety Study (FSS) will need to be conducted.

However, in the case where it is requested, CFA recommends that the FSS be conducted in line with the NSW *Hazardous Industry Planning Advisory Paper No. 2 (HIPAP 2) Fire Safety Study Guidelines* [34] as described in *CFA's Fire Safety Studies for Battery Energy Storage Systems* [35] and provided to CFA's Specialist Risk and Fire Safety Unit.

Additionally, the CFA design guideline for renewable facilities [5] states that the management of fire water runoff shall also be addressed. CFA recommends that infrastructure is provided for the containment and management of contaminated fire water runoff from battery energy storage systems. Infrastructure may include bunding, sumps and/or purpose-built, impervious retention facilities. A fire water management plan may consist of the containment and disposal of contaminated fire water.

The CFA guideline [5] also recommends a containment and management capacity equivalent to the on-site fire protection system. Containment is to be provided as per *AS 4681: The storage and handling of class 9 dangerous goods* (Section 7.3.9: Control of run-off) [36].

7.8 Safety Management System Recommendations

The following recommendations relate to Safety Management Systems which shall be implemented to ensure safe operations of the Project.

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7.8.1 Construction Phase Recommendations

The construction contractor is to prepare an adequate safety management system and documentation for the Project construction phase (e.g., various management plans, waste management plan, emergency plans, traffic management plans, procedure for removal of contaminated land and remediation as required) post determination and prior to construction.

The following additional construction phase recommendations were made in the Preliminary Hazard Analysis:

- Construction shall be scheduled during dry season to account for light and heavy vehicles in heavy rain/flooding events.
- A Construction Waste Management Plan shall be developed for the Project.

7.8.2 Operational and Maintenance Recommendations

The BESS shall be installed correctly and commissioned / tested to ensure safe function. The safety testing of the lithium-ion BESS shall be conducted under the guidance of *IEC 62619: Secondary cells and batteries containing alkaline or other non-acid electrolytes – Safety requirements for secondary lithium cells and batteries, for use in industrial applications*.

The following additional operation and maintenance recommendations were made in the Preliminary Hazard Analysis:

- HVAC systems shall be correctly installed and maintained.
- Remote isolation shall be provided for non-manned facility.
- Appropriate signage and site manifest shall be developed to identify hazardous chemicals associated with the contents of BESS.
- Commissioning procedures shall be developed and implemented in accordance with manufacturer's procedures.
- Operating plant manuals (OPM) shall be implemented.
- Strategy for life of plant shall be developed and implemented.
- Regular and appropriate operations and maintenance covering inspections of the facilities shall be conducted.
- The transformers shall be maintained as per OEM recommended regime, including regular insulation and function testing
- The switchgear functionality shall undergo regular maintenance and testing.

7.8.3 Safety Management Plan Recommendations

The assessment recommends that a safety management system is implemented prior to the commencement of commissioning or operation of the Project.

The following safety management plans shall specifically address the BESS and be in place prior to commencement of operation of the Project:

- Work Health and Safety Management Plan, compliant with AS 5577: Electricity network safety management systems.
- Emergency Plan shall be prepared as per the CFA guidelines [5] prior to commissioning and shall consider:
 - Details of the electrical safety hazards
 - Details of the effects of fire on the battery energy storage system
 - The shut-down procedures if the batteries are involved in fire

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- A plan for partial and full decommissioning of the BESS in the event of an emergency incident that renders the facility inoperable or unsafe, prior to its anticipated end-of-life
- A Fire Management Plan to minimise fire risks
- An Emergency Information Book within the Emergency Information (Manifest) Container; including the following:
 - The safe operating conditions (e.g. temperature) of the BESS
 - The details of any emissions or toxic gases, including during a fire,
 - A current Safety Data Sheet (SDS) for all dangerous goods stored on-site.
 - Other manifest requirements as listed in the *Dangerous Goods (Storage and Handling) Regulations 2022* [7] .
- Asset Management Plans and assurance activities. A comprehensive and regular program of maintenance and inspections, covering the BESS and related infrastructure (i.e., transformers, HVAC, civil structures) to ensure the system is serviced and maintained as per the manufacturer’s requirements, including measures to vet contractor appointments to ensure batteries are designed and installed to appropriate standards.
- A stormwater management plan shall be developed.
- Waste management plans for construction and operation of the Project shall be developed.
- Housekeeping procedures shall be developed for construction and operation.
- Development and implementation of plant operating and maintenance procedures.
- Pest control/management is to be implemented.
- Adequate safeguards are to be implemented for hazards related to working in proximity to a HV substation.
- An audit system shall also be developed to ensure regular review and update of the safety management plans.

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7.9 Natural Hazard Recommendations

The following recommendations in Table 7 relate to Natural Hazards which shall be implemented to ensure safe operations of the Project.

Table 7: Natural hazard recommendations

Natural hazard	Description	Recommendation
Extreme Temperatures	The mean maximum and minimum temperatures recorded at the nearest weather station with data available to 2025, the Warrnambool Airport Weather Station (090186), located approximately 2.67 km from the site were 19 °C and 8.6 °C, respectively, for the period 1998 to 2025 [37].	<ul style="list-style-type: none"> ■ Batteries shall be designed to operate beyond the maximum temperature range with allowance for higher maximum temperatures of approximately 1.5 to 2°C to account for the likely effects of global warming. ■ Electrical design in accordance with AS/NZS 3000. ■ Battery enclosures shall have suitable enclosure design for the environment.
Bushfire	The Project is located within a designated Bushfire Prone Area (BPA).	A detailed Bushfire Hazard Assessment for the Project has been completed and is provided in Appendix C: Bushfire Hazard Assessment

Natural hazard	Description	Recommendation
Seismic Activity	<p>According to the National Seismic Hazard Assessment 2023, the peak ground acceleration for a 10% probability of exceedance in 50 years of mean hazard levels is 0.02-0.04 m/s² [38].</p> <p>Risk of seismic activity is assumed to be minimal.</p>	No recommendations are proposed.
Flooding	<p>Flood risk shall be considered in planning to avoid intensifying any impacts of flooding.</p> <p>Design to consider flood planning areas.</p>	<ul style="list-style-type: none"> ■ A Surface Water Assessment shall be conducted to determine special flood considerations. ■ Construction shall occur during dry season, account for light and heavy vehicles in heavy rain/flooding events.
Excessive Wind	The Project Area within the A1 Wind Region as per Figure 3.1(A) of AS/NZS 1170.2 [39].	<ul style="list-style-type: none"> ■ Project infrastructure shall be designed in accordance with AS/NZS 1170.2. ■ Housekeeping schedule shall be maintained regularly to ensure debris is cleared.
Lightning	The average annual ground lightning flash density in Project Area is around 0.2 to 0.5 events / km ² / year [40].	<ul style="list-style-type: none"> ■ A lightning protection study shall be conducted. ■ BESS equipment shall not be located underneath powerlines. ■ An earthing system shall be implemented. ■ The Project shall be designed in accordance with AS 1768.
Subsidence	The Project Area will be located above ground and away from any areas prone to subsidence (e.g. abandoned mines). Other design mitigations (e.g. grouting) will be determined during detailed design if infrastructure cannot be located away from such areas.	Ground surveying shall be completed to confirm risk of subsidence.

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8 Task 4: Bushfire Hazard Assessment

To support effective assessment of fire risk management by the Country Fire Authority (CFA), planning applications for BESS developments are expected to address all relevant aspects of fire safety. This includes consideration of landscape-scale and site-specific bushfire hazards, as well as fire hazards associated with the proposed technologies.

A separate Bushfire Hazard Assessment has been prepared for the Project and is provided in Appendix C of this RMP. This RMP provides a tailored response to the requirements outlined in Section 2.2.2 of the CFA Guideline [5] and Clause 13.02 of the Victoria Planning Provisions [30].

The bushfire assessment confirms that the Yangery BESS facility location is considered suitable for the siting of a BESS. The location has a low level of bushfire risk in relation to hazards adjoining the project area and in the wider landscape. The site is also easily accessible, and the topography of the site is generally flat. The proposed access, including emergency access points will need to be confirmed in further consultation with CFA.

The location allows for key design requirements for separation of batteries from potential ignition sources and risks of thermal runaway and allows for separation of emergency access, water supply and other services. Water supply volume of the firefighting water tank is also to be confirmed. However, it is generally considered that the layout complies with the relevant objectives of the *Design Guidelines and Model Requirements: Renewable Energy Facilities* [15]. Noting that there are some requirements the CFA guidelines which will need further design and planning, therefore, these will be addressed when further design information is provided

Further consultation with the CFA will be undertaken to confirm acceptance of the proposed measures, and Emergency Management, Risk Management, and Fire Management Plans will be prepared in alignment with CFA Guidelines prior to Development Commencing.

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9 Applicable Standards

A list of standards and codes applicable to the identified hazards to be applied to the design of the Project are listed below:

- *AS 1530.4: 2014 Methods for fire tests on building materials, components, and structures – Fire-resistance tests for elements of construction.*
- *AS 1554.1:2014 Structural steel welding - Welding of steel structures*
- *AS 1603:2018 Automatic fire detection and alarm systems*
- *AS 1670:2024 Fire detection, warning, control and intercom systems*
- *AS 1725.1:2010 Chain-link fabric security fences and gates*
- *AS 1768:2021 Lightning protection*
- *AS 1940:2017 The storage and handling of flammable and combustible liquids*
- *AS 2067:2016 Substations and high voltage installations exceeding 1 kV a.c.*
- *AS 2374.1.2:2003 Power transformers Part 1.2 Minimum Energy Performance Standard requirements for distribution transformers*
- *AS 3000:2018 Electrical installations (known as the Australian/New Zealand Wiring Rules)*
- *AS 3008.1:2017 Electrical installations – Selection of cables*
- *AS 3011.2:2019 Electrical installations - Secondary batteries installed in buildings Sealed cells*
- *AS 3786:2021 Smoke Detectors*
- *AS 3959:2018 Construction of buildings in bushfire-prone areas*
- *AS 4086.1:1993 Secondary batteries for use with stand-alone power systems General requirements (where applicable)*
- *AS 4417.1:2012 Regulatory compliance mark for electrical and electronic equipment*
- *AS 4428:2020 Fire detection, warning, control and intercom systems Control and indicating equipment*
- *AS 4681:2000 The Storage and Handling of Class 9 (miscellaneous) Dangerous Goods and Articles*
- *AS 2700S: 2011 Colour standards for general purposes*
- *AS / IEC 60076:2014 Power Transformers Package*
- *AS 61558.1:2018 Safety of Power Transformers, Power Supplies, Reactors and Similar Products - General requirements and test*
- *AS / IEC 62271-200:2019 High-voltage switchgear and controlgear - Part 200: AC metal-enclosed switchgear and controlgear for rated voltages above 1 kV and up to and including 52 kV*
- *IEC 63056:2020 Safety requirements for secondary lithium cells and batteries for use in electrical energy storage systems*
- *AS 60529:1989 Degrees of protection provided by enclosures (IP Code)*
- *AS 61439:2016 (Series)- Low-voltage switchgear and control gear*
- *NFPA 855:2025 Standard for the Installation of Stationary Energy Storage Systems*
- *UL 1642 Certification of Lithium-ion Battery*
- *UL 1741 Inverters, converters, controllers and inter-connection system equipment for use with distributed energy resources*
- *UL 9540:2023 ANSI/CAN/UL Standard for Energy Storage Systems and Equipment*

- *UL 9540A:2025 ANSI/CAN/UL Standard for Test Method for Evaluating Thermal Runaway Fire Propagation in Battery Energy Storage Systems.*
- *NFPA 70:2025 National Electrical Code*

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10 Reference

- [1] Victoria State Government, "Warrnambool Planning Scheme," 2025.
- [2] Department of Transport and Planning, "Guide to Victoria's Planning System," 2023.
- [3] The Chief Parliamentary Counsel, "Planning and Environment Act 1987," 2023.
- [4] Victoria State Government, "VicPlan," [Online]. Available: <https://mapshare.vic.gov.au/vicplan/>. [Accessed 1 December 2025].
- [5] Country Fire Authority (CFA), "Design Guidelines and Model Requirements for Renewable Energy Facilities V4.4," June 2025. [Online]. Available: <https://www.cfa.vic.gov.au/plan-prepare/building-planning-regulations/renewable-energy-fire-safety>. [Accessed November 2025].
- [6] State Government of Victoria, "Building Regulations 2018," 2018.
- [7] State Government of Victoria, "Dangerous Goods (Storage and Handling) Regulations," 2022.
- [8] The Parliament of Victoria, "Occupational Health and Safety Act," Authorised Version No. 043, 2004.
- [9] State Government of Victoria, "Occupational Health and Safety Regulations 2017," 2017.
- [10] Department of Energy, "Electricity Safety Act No 13 of 194," NSW Government, 1945.
- [11] V. Parliament, "Electrical Safety (Bushfire Mitigation) Regulations," 2023.
- [12] P. o. Victoria, "Electrical Safety (Electric line Clearance) Regulations," 2020.
- [13] Standards Australia, "AS3959:2018 Construction of buildings in bushfire prone areas," 2018.
- [14] Fire Rescue Victoria, "Fire Safety Guideline GL-55 for Battery Energy Storage Systems," 2025.
- [15] CFA, "Design Guidelines and model requirements for Renewable Energy Facilities v4," Country Fire Authority, Melbourne, 2023.
- [16] WorkSafe Victoria, "A Guide to Risk Control Plans," WorkSafe Victoria, 2017.
- [17] DTP, "VicPlan," 2024. [Online]. Available: <https://mapshare.vic.gov.au/vicplan/>.
- [18] DTP, "Victorian Planning Provisions," 2024a.
- [19] DEECA, "NatureKit," 2024. [Online]. Available: <https://maps2.biodiversity.vic.gov.au/Html5viewer/index.html?viewer=NatureKit>.
- [20] DPCD, "Regional Bushfire Planning Assessment – Barwon South West Region," 2012.
- [21] CFA, "Design Guidelines and model requirements for Renewable Energy Facilities v4," Country Fire Authority, Melbourne, 2023.
- [22] DELWP, "Technical Guidance: Planning permit applications Bushfire Management Overlay," 2017.
- [23] Standards Australia, "AS 3959: Construction of Buildings in Bushfire Prone Areas," Standards Australia, Sydney, 2018.
- [24] National Transport Commission, Australian Code for the Transport of Dangerous Goods by Road & Rail, 2020.
- [25] Wärtsilä Energy Storage, Inc, "Quantum2 EVE Product Guide (Rev B)," 2025.
- [26] DNV-GL, Safety, operation and performance of grid-connected energy storage systems, 2017.
- [27] State Government of Victoria, "Dangerous Goods (Storage and Handling) Regulations," 2022.
- [28] Standards Australia, AS2067 Substations and high voltage installations exceeding 1 kV a.c, Sydney: Standards Australia, 2016.
- [29] Victoria State Government, "Electricity Safety Act," Victoria State Government, 1998.
- [30] State Government of Victoria, "Victoria Planning Provisions," 25 November 2025. [Online]. Available: <https://planning-schemes.app.planning.vic.gov.au/Victoria%20Planning%20Provisions/ordinance/33.01>.
- [31] International Electrotechnical Commission, "IEC 62619:2022 Safety Requirements for Secondary Lithium Cells and Batteries, for use In Industrial Applications," 2022.
- [32] International Electrotechnical Commission, "IEC 62485-5 Safety requirements for secondary batteries and battery installations - Part 5: Safe operation of stationary lithium ion batteries," 2020.
- [33] Fisher Engineering Inc., "Victorian Big Battery Fire," 30 July 2021. [Online]. Available: <https://victorianbigbattery.com.au/wp-content/uploads/2023/10/VBB-Fire-Independent-Report-of-Technical-Findings.pdf>.
- [34] NSW Department of Planning, "HIPAP No. 2: Fire safety study guidelines," State of NSW, Sydney, January 2011.

- [35] State of Victoria (Country Fire Authority), "Fire Safety Studies for Battery Energy Storage Systems," Version 1, June 2025.
- [36] Standards Australia, AS/NZS 4681, "The Storage and Handling of Class 9 (miscellaneous) Dangerous Goods and Atricles," 2000.
- [37] Bureau of Meteorology, "Climate statistics for Australian locations: Warrnambool Airport NBD," 2025.
- [38] Geoscience Australia, "Natural Hazard Scenarios (Beta)," 2025. [Online]. Available: <https://portal.ga.gov.au/persona/hazards>.
- [39] Standards Australia and Standards New Zealand, "AS/NZS 1170.2 Structural design actions - Part 2: Wind actions," 2021.
- [40] Bureau of Meteorology, "Average annual thunder-day and lightning flash density," 2025. [Online]. Available: <http://www.bom.gov.au/climate/maps/averages/thunder-lightning/?maptype=otdg>.
- [41] DTP, "Victorian Planning Provisions," 2025a.
- [42] S. Australia, "AS2419.1 Fire Hydrant Installations Part 1: System design, installation and commissioning," 2021.

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Appendix A: Gap Analysis against CFA Renewable Energy Facilities Guidelines

A gap analysis was conducted against the CFA guideline checklist (within Appendix A of the CFA guidelines [5]) to identify what actions need to be considered to ensure the Project is able to satisfy all CFA requirements.

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CFA Section	Guideline Requirement	Project Assessment
Section 2: Consultation	<u>Consulting with CFA</u> Early consultation with CFA's Specialist Risk and Fire Safety Unit, before developing a planning permit application?	Initial consultation with CFA has commenced prior to preparation of this RMP including preliminary discussions regarding the proposed BESS layout, access provisions and firefighting water supply.
Section 3: Fire Risk Management	<u>Risk Management</u> A Risk Management Plan must be developed for the facility, in consultation with CFA, before development starts	This RMP will be further developed as per CFA guidelines during detailed design, building upon this draft RMP.
Section 4: Facility Location	<u>Landscape Risk to Facility</u> An assessment against policy at VPP Clause 13.02-1S (Bushfire Planning) [41] that considers: <ol style="list-style-type: none"> a) The impact of any ignitions arising from the infrastructure on nearby communities, infrastructure and assets. b) The impact of bushfire on the infrastructure (e.g. ember attack, radiant heat impact, flame contact). 	The Project is within a designated Bushfire Prone Area therefore, Clause 13.02-1S (Bushfire Planning) applies. A Bushfire Hazard Assessment has been prepared and included in this RMP to assist in meeting the requirements of the <i>Design Guidelines and Model Requirements: Renewable Energy facilities v4 August 2023 updated as v4.4 June 2025</i> , including addressing design and model requirements, fire-fighting requirements (such as access and water supply) operational and maintenance requirements. It should be noted that some plans, required before commissioning, are generally not required at the planning stage and are not included.
	<u>Facility Risk to Landscape</u> As assessment of the fire risk from the proposed facility to the landscape.	There is minimal offsite risk (See Appendix B: Preliminary Hazard) and the project area and surrounding land is classified as Farming Zone with the nearest residential area approximately 2.4 km south-east (Dennington). The nearest dwelling (Receptor B) is approximately 157 m from the nearest BESS Area. The facility is not expected to lead to a significant increase in risk to adjacent land.
Section 4: Facility Design	<u>Emergency Vehicle Access</u> <ol style="list-style-type: none"> a) Construction of a minimum four (4) metre perimeter road within the perimeter fire break. b) Roads must be of all-weather construction and capable of accommodating a vehicle of fifteen (15) tonnes (e.g. no compacted earth). c) Constructed roads should be a minimum of four (4) metres in trafficable width with a four (4) metre vertical clearance for the width of the formed road surface. Ensure any fencing along access routes allows for width of fire trucks. d) The average grade should 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 fifty (50) metres. e) Dips in the road should have no more than a 1 in 8 (12.5% or 7.1°) entry and exit angle. f) Roads must incorporate passing bays at least every 600 metres, which must be at least twenty (20) metres long and have a minimum trafficable width of six (6) metres. Where roads are less than 600 metres long, at least one passing bay must be incorporated g) Road networks must enable responding emergency services to access all areas of the facility, including fire service infrastructure, buildings, and battery energy storage systems and related infrastructure. h) The provision of at least two (2) but preferably more access points to each part of the facility 	The model requirements (i.e. accessible fire service infrastructure and safe evacuation points) from Section 4.2.1 (Emergency Vehicle (Fire Truck) Access) of the CFA guidelines [5] shall be incorporated into final design and layout of the facility. Refer to Appendix C: Bushfire Hazard Assessment for compliance assessment with the CFA guidelines
	<u>Additional Requirements for Battery Energy Storage Systems</u> The provision of at least two access points into each section where battery energy storage systems are located.	The model requirements (i.e. accessible fire service infrastructure and safe evacuation points) from Section 4.2.1 (Emergency Vehicle (Fire Truck) Access) of the CFA guidelines [5] shall be incorporated into final design and layout of the facility. Refer to Appendix C: Bushfire Hazard Assessment for compliance assessment with the CFA guidelines
	<u>Firefighting Water Supply</u> <ol style="list-style-type: none"> a) Water access points must be clearly identifiable and unobstructed to ensure efficient access. b) Static water storage tank installations must comply with AS 2419.1 [42]. c) The static water storage tank(s) must be an aboveground water tank constructed of concrete or steel. d) The static water storage tank(s) must be capable of being completely refilled automatically or manually within 24 hours. e) The static water storage tanks must be located at vehicle access points to the facility and must be positioned at least ten (10) metres from any infrastructure. f) The hard-suction point must be provided with a 150mm full bore isolation valve equipped with a Storz connection, sized to comply with the required suction hydraulic performance. g) The hard-suction point must be positioned within four (4) metres to a hardstand area and provide a clear access for emergency services personnel. h) An all-weather road access and hardstand must be provided to the hard-suction point. The hardstand must be maintained to a minimum of 15 tonne GVM, eight (8) metres long and six (6) metres wide or to the satisfaction of the CFA. 	The fire water system is yet to be fully designed. The final design will incorporate the model requirements from Section 4.2.2 of CFA (Firefighting Water Supply) including fire hydrant model requirements [5]. Refer to Appendix C: Bushfire Hazard Assessment for compliance assessment with the CFA guidelines

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CFA Section	Guideline Requirement	Project Assessment
	<ul style="list-style-type: none"> i) The road access and hardstand must be kept clear at all times. j) The hard-suction point must be protected from mechanical damage where necessary. k) Where the access road has one entrance, an eight (8) metre radius turning circle must be provided at the tank. l) An external water level indicator must be provided to the tank and be visible from the hardstand area. m) Signage indicating 'FIRE WATER' and the tank capacity must be fixed to each tank. n) Signage must be provided at each vehicle entrance to the facility, indicating the direction to the nearest static water tank(s). 	
	<p><u>Additional Requirements for Battery Energy Storage Systems - Centralised BESS</u></p> <ul style="list-style-type: none"> a) Where reticulated water is available, the provision of a fire hydrant system that meets the requirements of AS 2419.1 [42]-, Clause 3.9: Open Yard Protection, and Table 2.2.5(D): Number of Fire Hydrants Required to Flow Simultaneously - Open Yards. <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> b) Where no reticulated water is available, provision of a fire water supply in static storage tanks, where: <ul style="list-style-type: none"> i. The fire water supply must be of a quantity no less than 288,000L or as per the provisions for Open Yard Protection of AS 2419.1 [42]: Fire hydrant installations, flowing for a period of no less than four hours at 20L/s, whichever is the greater. ii. The quantity of static fire water storage is to be calculated from the number of hydrants required to flow from AS 2419.1 [42]: Fire hydrant installations, Table 2.2.5(D). iii. Fire hydrants must be provided and located so that every part of the battery energy storage system is within reach of a 10m hose stream issuing from a nozzle at the end of a 60m length of hose connected to a fire hydrant outlet. iv. The fire water supply must be located at vehicle entrances to the facility, at least 10m from any infrastructure (electrical substations, inverters, battery energy storage systems, buildings). v. The fire water supply must be reasonably adjacent to the battery energy storage system and shall be accessible without undue danger in an emergency. (E.g., Fire water tanks are to be located closer to the site entrance than the battery energy storage system). vi. The fire water supply must comply with AS 2419.1 [42]: Fire hydrant installations, Section 5: Water storage tanks. 	<p>The fire water system is yet to be designed. The final design will incorporate the model requirements from Section 4.2.2 of CFA (Firefighting Water Supply) [5] and any additional requirements for BESS.</p> <p>Refer to Appendix C: Bushfire Hazard Assessment for compliance assessment with the CFA guidelines</p>
	<p><u>Fire Detection and Suppression Equipment</u></p> <ul style="list-style-type: none"> a) For on-site buildings and structures, according to the requirements of the National Construction Code. b) For storages of dangerous goods, according to the requirements of any Australian Standards for the storage and handling of dangerous goods. c) For electrical installations, a minimum of two suitable fire extinguishers must be provided within 3m-20m of each PCU. d) In all vehicles and heavy equipment, each vehicle must carry at least a nine (9)-litre water stored-pressure fire extinguisher with a minimum rating of 3A, or other firefighting equipment as a minimum when on-site during the Fire Danger Period. 	<p>The fire detection and suppression system is yet to be designed; however, the final design shall align with the model requirements outlined in Section 4.2.3 of the CFA Guidelines (Fire Detection and Suppression Equipment) [5].</p> <p>Refer to Appendix C: Bushfire Hazard Assessment for compliance assessment with the CFA guidelines</p>
	<p><u>Fire Breaks</u></p> <p>The provision of fire breaks:</p> <ul style="list-style-type: none"> a) Around the perimeter of the facility, commencing from the boundary of the facility or from the vegetation screening inside the property boundary. (N/A for wind energy facilities.) b) Around the perimeter of control rooms, electricity compounds, substations and all other buildings onsite. c) Of a width of at least 10m. 	<p>A 10 m fire break will be included in the site layout around the battery storage area and separate substation and car parking area, in line with Section 4.2.5 of the CFA Guidelines (Fire Detection and Suppression Equipment) [5].</p> <p>Refer to Appendix C: Bushfire Hazard Assessment for compliance assessment with the CFA guidelines</p>
	<p><u>Additional Requirements for Battery Energy Storage Systems</u></p> <p>The provision of a fire break around battery energy storage systems and related infrastructure</p>	<p>A 10 m fire break will be included in the site layout around the battery storage area and separate substation and car parking area, in line with Section 4.2.5 of the CFA Guidelines (Fire Detection and Suppression Equipment) [5].</p> <p>Refer to Appendix C: Bushfire Hazard Assessment for compliance assessment with the CFA guideline</p>
	<p><u>Design Specific to Facility Type - Requirements for Battery Energy Storage Systems</u></p> <ul style="list-style-type: none"> 1. Facility design that incorporates: <ul style="list-style-type: none"> a) A separation distance that prevents fire spread between battery containers/enclosures and other site elements. b) A fire break around the battery energy storage system and related infrastructure, of a width of no less than 10m. c) A layout of site infrastructure that: <ul style="list-style-type: none"> i. Considers the safety of emergency responders. 	<p>The final design shall incorporate the model requirements for a BESS facility type from Section 4.2.6.3 of the CFA Guidelines (Battery Energy Storage Systems) [5].</p> <p>Refer to Appendix C: Bushfire Hazard Assessment for compliance assessment with the CFA guideline</p> <p>Note: BESS fire safety documents have not been assessed in detail and shall be reviewed once final design is available.</p>

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CFA Section	Guideline Requirement	Project Assessment
	<ul style="list-style-type: none"> ii. Minimises the potential for grassfire and/or bushfire to impact the battery energy storage system. iii. Minimises the potential for fires in battery containers/enclosures to impact on-site and offsite infrastructure. <p>4. Battery energy storage systems must be:</p> <ul style="list-style-type: none"> a) Located so as to be reasonably adjacent to a site vehicle entrance (suitable for emergency vehicles). b) Located so that the site entrance and any fire water tanks are not aligned to the prevailing wind direction (therefore least likely to be impacted by smoke in the event of fire at the battery energy storage system.) c) Provided with in-built fire and gas detection systems. d) Provided with explosion prevention via sensing and venting, or explosion mitigation through deflagration panels. e) Provided with suitable ember protection. f) Provided with suitable access roads for emergency services vehicles. g) Installed on a non-combustible surfaces. h) Provided with suitable ventilation. i) Provided with suitable impact protection. j) Provided with enclosed wiring and buried cabling, except where required to be above-ground for grid connection. k) Provided with spill containment that includes provision for management of fire water runoff. 	
Section 5: Facility Construction and Commissioning	<p><u>Emergency Plan</u></p> <p>An Emergency Plan must be developed for the construction and commissioning phase of the facility.</p>	An Emergency Plan shall be developed for the construction and commissioning phase of the facility during detailed design.
Section 6: Facility Operation	<p><u>Fire Management Plan</u></p> <p>A Fire Management Plan must be developed for the facility, in consultation with CFA, before development starts.</p>	A Fire Management Plan shall be developed for the facility, in consultation with CFA, during detailed design.
	<p><u>Bushfire and Grassfire</u></p> <p>If your facility is at-risk of bushfire, prevention and preparedness activities must be detailed in the Fire Management Plan.</p>	The facility is located in a bushfire prone area. The Fire Management Plan for the facility shall detail prevention and preparedness activities.
	<p><u>Vegetation Management</u></p> <p>Facility operators must undertake the following measures during the Fire Danger Period:</p> <ul style="list-style-type: none"> a) Grass must be maintained at or below 100mm in height during the declared Fire Danger Period. b) Long grass and/or deep leaf litter must not be present in areas where heavy equipment will be working, during construction or operation. c) Restrictions and guidance must be adhered to during the Fire Danger Period, days of High (and above) fire danger and Total Fire Ban days (refer to www.cfa.vic.gov.au). 	<p>The final design shall incorporate the model requirements for Vegetation Management from 6.2.2 of the CFA Guidelines (Vegetation Management) [5].</p> <p>Refer to Appendix C: Bushfire Hazard Assessment for compliance assessment with the CFA guideline</p>
	<p><u>Arc Flash Hazard Management</u></p> <p>Where required, appropriate demarcation of arc boundaries to at least 10m from PCU arc flash outlet flaps (blow-out panels) must be provided.</p>	<p>The facility design has not yet incorporated arc flash hazard controls in the initial design phase. The final design shall incorporate appropriate demarcation of arc boundaries, which can be calculated per <i>Energy Safe Victoria's Arc Flash Hazard Management Guideline (2022)</i>. CFA guideline recommends that where there is a hazard to personnel, at least 10 m of arc boundaries from PCU arc flash outlet flaps (blow-out panels) shall be provided. Signage, barriers, and mitigation measures will be implemented during the detailed design phase to reduce personnel exposure and ensure compliance with applicable safety standards.</p> <p>In case of an arc flash event, it is expected that there will be no offsite consequences. However, it may cause some damage to adjacent assets, including the Battery Energy Storage System (BESS). The facility is designed for remote operation, with no permanent onsite personnel anticipated.</p>
	<p><u>Facility and System Monitoring</u></p> <p>Appropriate monitoring for facility infrastructure must be provided, to ensure that any shorts, faults or equipment failures with the potential to ignite or propagate fire are rapidly identified and controlled, and any fire is notified to 000 immediately</p>	<p>The final design shall incorporate the model requirements for Facility and System Monitoring from 6.2.4 of the CFA Guidelines (Facility and System Monitoring) [5].</p> <p>Refer to Appendix C: Bushfire Hazard Assessment for compliance assessment with the CFA guideline</p>
<p><u>Maintenance</u></p> <p>Inspection, maintenance and any required repair activities must be conducted for all infrastructure, equipment and vehicles at the facility. Maintenance must be in line with any relevant Australian Standards and the manufacturer's requirements</p>	<p>Maintenance shall be conducted to meet Australian standards and manufacturers requirements. Any work that may create an ignition source will be under 'hot work' permits.</p> <p>Refer to Appendix C: Bushfire Hazard Assessment for compliance assessment with the CFA guideline</p>	

CFA Section	Guideline Requirement	Project Assessment
Section 7: Emergency Planning	<u>Emergency Plan (Operational)</u> An Emergency Plan must be developed for the operational phase, specific to the facility, in consultation with CFA, before development starts.	An Emergency Plan shall be developed for the operational phase, specific to the facility, in consultation with CFA, before Development Commencing
Section 8. Provision of Emergency Information	<u>Developing an Emergency Information Book</u> An Emergency Information Book must be developed and available to emergency responders. Emergency Information Books must be located in Emergency Information Containers, provided at each vehicle entrance the facility.	An Emergency Information Book shall be developed during detailed design.

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Appendix B: Preliminary Hazard Analysis

No.	Source	Hazard	Cause	Consequence	Does the Hazard have the Potential to pose Offsite or to a receptor on site Significant Risk?	Inherent Risk			Proposed Controls – Technical / Design	Proposed Controls – Safety Management	Residual Risk			Does the Hazard result in an Offsite or to a receptor on site Significant Risk?
						Likelihood	Consequence	Risk Rating			Likelihood	Consequence	Risk Rating	
1.	Lithium-ion Battery	Arcing or short-circuit	Cable or equipment fault. Cable Thermal Failure Dust ingress	Electrocution resulting in injury or fatality	No Potential (in terms of electrical shock hazard is expected to be localised)									
2.	Lithium-ion Battery	Battery cell fire	Equipment fault and ignition of combustible materials used in the storage system. BESS module arc flash induced fire. A installation error – reverse polarity connection. Dust ingress.	Personnel injury due to burns or smoke/chemical inhalation. Damage/ destruction of battery cell. Overheating/ electrical fault potentially leading to thermal runaway.	Potential	C – Possible	4 – Major	High	HVAC systems AS compliant. Battery enclosures will be located outdoors Battery enclosures include a thermal management system that provides active cooling and heating to the internal battery enclosure components. Battery systems modular and compartmentalised to minimise damage. Battery enclosures minimum distancing applied Adequate spacing of battery modules. Batteries and associated balance of plant certified and designed to Australian Standards, particularly IEC 62485-5, IEC 62933-5-1, IEC 62933-5-2, AS/NZS 5139 and AS 4681. Battery Management System to provide functional safety of electronic safety-related systems certified to IEC 61508 e.g., fail safe function. BESS design location sufficient distance from other infrastructure. Fire protection and suppression system to be included in BESS design. Emergency shutdown incorporated into BESS design. Containers/infrastructure for BESS located to be directly accessible to emergency responders. Thermal overtemperature detection and prevention in battery enclosures design. Cell overpressure detection and protection in battery enclosures design. Remote monitoring.	HVAC systems correctly installed and maintained. Safety system maintenance, testing and inspections. Safety Management Plans. Trained operators/maintainers. Plant operating and maintenance procedures. Remote isolation for non-manned facility. Appropriate signage and site manifest to identify hazardous chemicals associated with the contents of BESS.	E – Rare	4 – Major	Medium	Unlikely

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No.	Source	Hazard	Cause	Consequence	Does the Hazard have the Potential to pose Offsite or to a receptor on site Significant Risk?	Inherent Risk			Proposed Controls – Technical / Design	Proposed Controls – Safety Management	Residual Risk			Does the Hazard result in an Offsite or to a receptor on site Significant Risk?
						Likelihood	Consequence	Risk Rating			Likelihood	Consequence	Risk Rating	
								High	Access controls for HV areas (arc flash risk). Hydrant to be located proximal to BESS. Dangerous goods risk assessment. Storage and handling of BESS / Li-batteries according to AS 4681. Fire modelling study to be conducted as part of design to ensure fire radiation effects do not impact on adjacent infrastructure. Fire Risk Evaluation to be conducted to provide fire safety recommendation and required firefighting equipment. Electronic safety-related systems should be installed at both a hardware and software level, designed to applicable standards, to allow for safe isolation of electrical energy in the event of a failure.					
3.	Lithium-ion Battery	Battery cell thermal hazard	Chemical properties of the battery materials and thermal runaway. Propagation of adjacent battery fire (escalation event).	Personnel injury due to burns or smoke/chemical inhalation. Damage/ destruction of battery cell.	Potential	C – Possible	4 – Major	High	HVAC systems AS compliant. Battery enclosure will be located outdoors Battery enclosure includes a thermal management system that provides active cooling and heating to the internal battery enclosure components Battery systems modular and compartmentalised to minimise damage. Adequate spacing of battery modules. Battery enclosures minimum distancing applied Batteries and associated balance of plant certified and designed to Australian Standards, particularly IEC 62485-5, IEC 62933-5-1, IEC 62933-5-2, AS/NZS 5139 and AS 4681. Battery Management System to provide functional safety of electronic safety-related systems certified to IEC 61508 e.g., fail safe function. BESS design location sufficient distance from other infrastructure. Fire protection and suppression system to be included in BESS design.	HVAC systems correctly installed and maintained. Safety system maintenance, testing and inspections. Safety Management Plans. Trained operators/maintainers. Plant operating and maintenance procedures. Remote isolation for non-manned facility. Lessons learnt from previous battery fire incidents.	E – Rare	4 – Major	Medium	Unlikely

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No.	Source	Hazard	Cause	Consequence	Does the Hazard have the Potential to pose Offsite or to a receptor on site Significant Risk?	Inherent Risk			Proposed Controls – Technical / Design	Proposed Controls – Safety Management	Residual Risk			Does the Hazard result in an Offsite or to a receptor on site Significant Risk?	
						Likelihood	Consequence	Risk Rating			Likelihood	Consequence	Risk Rating		
								High	<p>Emergency shutdown incorporated into BESS design.</p> <p>Containers/infrastructure for BESS located to be directly accessible to emergency responders.</p> <p>Thermal overtemperature detection and prevention in Battery enclosure design.</p> <p>Cell overpressure detection and protection in Battery enclosure design.</p> <p>Remotely accessible fire, smoke and flammable gas leak monitoring.</p> <p>Access controls for HV areas (arc flash risk).</p> <p>Hydrant to be located proximal to BESS.</p> <p>Fire Safety Study to be conducted as part of design to ensure fire radiation effects do not impact on adjacent infrastructure.</p> <p>Fire Risk Evaluation to be conducted to provide fire safety recommendation and required firefighting equipment.</p> <p>Electronic safety-related systems should be installed at both a hardware and software level, designed to applicable standards, to allow for safe isolation of electrical energy in the event of a failure.</p>						
4.	Lithium-ion battery	Battery cell equipment failure	Loss of cooling fluid/ Coolant leak from equipment attributable to design fault/. Improper installation/commissioning. Lack of maintenance or collision or impact on the BESS.	Battery overheats and thermal runaway. (refer to thermal hazard)	Potential	C – Possible	4 – Major	High	<p>Installation of coolant leak alarms.</p> <p>Ensure all telemetry, fault monitoring and electrical safety protection devices remain active regardless of keylock switch position or system state.</p> <p>Active monitoring and control of the pyro disconnect's power supply circuit.</p> <p>Required clearance between Battery enclosures for maintenance access as per BESS provider recommendations.</p> <p>Electronic safety-related systems should be installed at both a hardware and software level, designed to applicable standards, to allow for safe isolation of electrical energy in the event of a failure.</p>	<p>Development and implementation of commissioning procedures in accordance with manufacturer's procedures.</p> <p>Safety system maintenance, testing and inspections.</p> <p>Development and implementation of safety management plans.</p> <p>Trained operators/maintainers.</p> <p>Plant operating and maintenance procedures.</p> <p>Implementation of operating plant manuals.</p>	E – Rare	4 – Major	Medium	Unlikely	

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No.	Source	Hazard	Cause	Consequence	Does the Hazard have the Potential to pose Offsite or to a receptor on site Significant Risk?	Inherent Risk			Proposed Controls – Technical / Design	Proposed Controls – Safety Management	Residual Risk			Does the Hazard result in an Offsite or to a receptor on site Significant Risk?
						Likelihood	Consequence	Risk Rating			Likelihood	Consequence	Risk Rating	
5.	Lithium-ion battery	Battery cell operational hazard	Control breakdown from equipment fault; design fault/error. Improper installation/commissioning Lack of maintenance or collision or impact on the BESS.	Battery overheats and thermal runaway. (refer to thermal hazard)	Potential	C – Possible	4 – Major	High	Ensure all telemetry, fault monitoring and electrical safety protection devices remain active regardless of keylock switch position or system state. Active monitoring and control of the pyro disconnect's power supply circuit. Required clearance between battery enclosures for maintenance access as per BESS provider recommendations. Electronic safety-related systems should be installed at both a hardware and software level, designed to applicable standards, to allow for safe isolation of electrical energy in the event of a failure.	Development and implementation of commissioning procedures in accordance with manufacturer's procedures. Safety system maintenance, testing and inspections. Development and implementation of safety management plans. Trained operators/maintainers. Plant operating and maintenance procedures. Implementation of operating plant manuals.	E – Rare	4 – Major	Medium	Unlikely
6.	Lithium-ion Battery	Battery cell chemical hazard	Fault or failure and release of corrosive and/or toxic materials	Personnel injury from burns or gas inhalation. Environmental damage.	Potential (biophysical damage)	D – Unlikely	4 – Major	Medium	Equipment designed to be compliant with applicable Australian/International Standards, particularly IEC 62485-5, IEC 62933-5-1, IEC 62933-5-2, AS/NZS 5139 and AS 4681. Preferably modular design. Spill containment design.	Material SDS to be consulted. Emergency Response Plan to be developed to define actions in unlikely event of potential hazards. Trained operators/maintainers. Plant operating and maintenance procedures.	E – Rare	4 – Major	Medium	Unlikely
7.	Lithium-ion Battery	Explosion Hazard	HVAC failure (loss of cooling system) and/or overcharging of battery causing rapid expansion and confinement of gases	Personnel injuries or fatalities. Damage / destruction of battery cell.	Potential	D – Unlikely	5 – Catastrophic	High	Batteries and associated balance of plant certified to relevant international standards (e.g. UL1976, UL9540). BESS installed outdoors with sufficient distance from infrastructure and people. Explosion risk assessment to be undertaken on selected BESS plant as part of the Fire Safety Study to ensure overpressure does not impact adjacent infrastructure. Battery Management System to provide functional safety of electronic safety-related systems certified to IEC 61508 e.g., fail safe function. Emergency shutdown incorporated into BESS design. Containers/infrastructure for BESS located to be directly accessible to emergency responders. Thermal overtemperature detection and prevention in battery enclosure design.	HVAC systems correctly installed and maintained. Safety system maintenance, testing and inspections. Safety Management Plans. Trained operators/maintainers. Plant operating and maintenance procedures.	E – Rare	5 – Catastrophic	Medium	Unlikely

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No.	Source	Hazard	Cause	Consequence	Does the Hazard have the Potential to pose Offsite or to a receptor on site Significant Risk?	Inherent Risk			Proposed Controls – Technical / Design	Proposed Controls – Safety Management	Residual Risk			Does the Hazard result in an Offsite or to a receptor on site Significant Risk?
						Likelihood	Consequence	Risk Rating			Likelihood	Consequence	Risk Rating	
									Cell overpressure detection and protection in battery enclosure design. Remote monitoring. Electronic safety-related systems should be installed at both a hardware and software level, designed to applicable standards, to allow for safe isolation of electrical energy in the event of a failure.					
8.	Lithium-ion battery	Release and dispersion of flammable and toxic gases	Fire hazard arising from combustible materials used in the storage system. Incomplete combustion of gases generated during initial battery cell thermal runaway phase.	Personnel injury due to burns or smoke/chemical inhalation. Vapour cloud explosion. Environmental contamination (Hydrogen Fluoride contacts with water)	Potential	D – Unlikely	5 – Catastrophic	High	HVAC systems AS compliant. BESS installed outdoors. Battery cooling systems. Battery components isolated. Battery systems modular and compartmentalised to minimise damage. Adequate spacing of battery modules and heat shields. Remote emergency shutdown and monitoring of the BESS. ESD buttons located at the BESS and site office. Fire detection and protection/suppression included in the design of the BESS. BESS designed in accordance with UL 9540. Batteries and associated balance of plant certified and designed to Australian Standards, particularly IEC 62485-5, IEC 62933-5-1, IEC 62933-5-2, AS/NZS 5139 and AS 4681. Battery Management System to provide functional safety of electronic safety-related systems certified to IEC 61508 e.g., fail safe function. BESS design location sufficient distance from other infrastructure. 24-hour monitoring and installation of alarms. Access controls for HV areas (arc flash risk). Hydrant to be located proximal to BESS. Dangerous goods risk assessment. Storage and handling of BESS / Li-batteries according to AS 4681.	HVAC systems correctly installed and maintained. Safety system maintenance, testing and inspections. Development and implementation of safety management plans. Trained operators/maintainers. Plant operating and maintenance procedures. Implementation of operating plant manuals (OPM). Develop and implement strategy for life of plant. Pest control/management.	E – Rare	5 – Catastrophic	Medium	Unlikely

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No.	Source	Hazard	Cause	Consequence	Does the Hazard have the Potential to pose Offsite or to a receptor on site Significant Risk?	Inherent Risk			Proposed Controls – Technical / Design	Proposed Controls – Safety Management	Residual Risk			Does the Hazard result in an Offsite or to a receptor on site Significant Risk?
						Likelihood	Consequence	Risk Rating			Likelihood	Consequence	Risk Rating	
									Fire Safety Study to be conducted as part of design to ensure fire radiation effects do not impact on adjacent infrastructure. Fire Risk Evaluation to be conducted to provide fire safety recommendation and required firefighting equipment.					
9.	Lithium-ion battery	Exposure to EMF	Differences in electric or magnetic fields around the BESS (transformer, powerlines).	Danger to personnel.	No Potential (local impact)									
10.	Lithium-ion Battery	Dropping of battery cell(s) during installation	Faulty equipment or procedure during battery installation	Personnel injury. Damage to battery cell.	No Potential (local impact)									
11.	Lithium-ion Battery	Malicious damage to BESS	Unauthorised access, few staff onsite. Compromised cybersecurity system.	Damage to battery cell and/or other infrastructure. Electrolyte emission. Electrocution resulting in injury or fatality. Mal-operation from external digital access of control systems.	Potential	D – Unlikely	5 – Catastrophic	High	BESS and auxiliary equipment to be surrounded by fencing as per AS 1725, locked gates and other security measures as necessary (e.g. CCTVs, continuous remote monitoring). Consultation with cybersecurity experts should also be conducted to implement appropriate security measures for the computer control systems.	Regular and appropriate operations and maintenance covering inspections of the facilities.	E – Rare	5 – Catastrophic	Medium	Unlikely
12.	Transformer	Transformer arcing / fire / explosion	Insufficient insulating oil maintenance, equipment fault	Electrocution resulting in injury or fatality. Damage to transformer. Ignition source for BESS fire.	Potential	D – Unlikely	5 – Catastrophic	High	Transformers to be designed to AS 2067:2016. Sufficient separation between transformers and the BESS, other transformers, and structures / fence. Transformers to be self-bunded. Using dry type transformer oil is recommended Fire modelling to be conducted as part of the Fire Safety Study to ensure fire radiation effects do not impact on adjacent infrastructure.	Maintain transformer as per OEM recommended regime, including regular insulation and function testing.	E – Rare	5 – Catastrophic	Medium	Unlikely
13.	Transformer	Loss of containment (oil)	Maintenance operations (failure of pipe). Equipment fault or arc fault Design fault/error.	Pool fire (if ignited). Personnel injury due to burns or smoke/chemical inhalation.	Potential	D – Unlikely	4 – Major	Medium	Transformers to be designed to AS 2067:2016. Transformers are self-bunded. Fire modelling to be conducted as part of the Fire Safety Study to ensure fire radiation effects do not impact on adjacent infrastructure / fence. Security fencing around transformer.	Safety system maintenance, testing and inspections. Safety procedures (training, PPE). Works undertaken by authorised personnel (inducted, licenced and trained). Development and implementation of safety management plans.	E – Rare	4 – Major	Medium	Unlikely

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No.	Source	Hazard	Cause	Consequence	Does the Hazard have the Potential to pose Offsite or to a receptor on site Significant Risk?	Inherent Risk			Proposed Controls – Technical / Design	Proposed Controls – Safety Management	Residual Risk			Does the Hazard result in an Offsite or to a receptor on site Significant Risk?
						Likelihood	Consequence	Risk Rating			Likelihood	Consequence	Risk Rating	
									Safeworks system. Remote operation of equipment. Non HV-transformer oil is FR3 which has higher fire point.	Trained operators/maintainers. Plant operating and maintenance procedures. Implementation of operating plant manuals.				
14.	Transformer	Live contact with transformer	Insufficient enclosure or barricading	Electrocution causing injury or fatality.	No Potential									
15.	Transformer	Transformer fire	Transformer cooling system/s failure Cooling system/s control system failure	Damage to infrastructure Injury Loss of life	Potential	D - Unlikely	5 - Catastrophic	High	Transformers to be designed to AS2067. Fire modelling to be conducted as part of the Fire Safety Study to ensure fire radiation effects do not impact on adjacent infrastructure. Non HV-transformer oil is FR3 which has higher fire point.	Maintain transformer as per OEM recommended regime, including regular insulation and function testing.	E – Rare	5 – Catastrophic	Medium	Unlikely
16.	Transformer / switchgear	Loss of containment (sulphur hexafluoride [SF6]).	Maintenance operations (failure of pipe). Equipment fault. Design fault/error.	Release toxic gas. Personnel injury.	Potential	D – Unlikely	3 – Moderate	Medium	Design transformers and switchgear in accordance with AS IEC 62271.4. Gas leak and high/low pressure alarms. Continuous monitoring of gas flow.	Safety system maintenance, testing and inspections. Safety procedures (training, PPE). Works undertaken by authorised personnel (inducted, licenced and trained). Development and implementation of safety management plans. Trained operators/maintainers. Plant operating and maintenance procedures. Implementation of operating plant manuals.	E – Rare	3 – Moderate	Low	Unlikely
17.	Switchyard	Live contact with conductor	Insufficient enclosure or barricading around conductor	Electrocution causing injury or fatality.	No Potential									
18.	Switchgear	Outdoor switchgear failure	Arc-flashing induced fire Switchgear insulator failure Operation failure causing continued arcing Surge arrester failure	Damage to infrastructure Electrocution Injury Loss of life	Potential	D - Unlikely	5 - Catastrophic	High	The design should comply with the Electricity Supply Act 1995 No 94 [10] and Regulations 2013 AS 5139 Electrical installations - Safety of battery systems for use with power conversion equipment should be consulted for design. Fire modelling to be conducted as part of the Fire Safety Study to ensure fire radiation effects do not impact on adjacent infrastructure.	Regular maintenance and testing of switchgear functionality	E – Rare	5 – Catastrophic	Medium	Unlikely
19.	Natural Hazard	Grass or mallee fire Stray ember induced fire	Bushfire Hot work Lightning strike	Damage to BESS. Significant environmental damage.	Potential	C – Possible	4 – Major	High	10 m wide defensible space surrounding the BESS development footprint.	Development of a Fire Management Plan with appropriate mitigations to minimise risks.	D – Unlikely	4 – Major	Medium	Unlikely

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No.	Source	Hazard	Cause	Consequence	Does the Hazard have the Potential to pose Offsite or to a receptor on site Significant Risk?	Inherent Risk			Proposed Controls – Technical / Design	Proposed Controls – Safety Management	Residual Risk			Does the Hazard result in an Offsite or to a receptor on site Significant Risk?
						Likelihood	Consequence	Risk Rating			Likelihood	Consequence	Risk Rating	
			Vandalism						<p>Minimum 20 kL water tank or other reticulated water source designed in accordance with the requirements of AS 2419.1 [42] and CFA for fire-fighting purposes.</p> <p>Remote monitoring.</p> <p>BESS and auxiliary equipment to be surrounded by fencing as per AS 1725, locked gates and other security</p> <p>Lightning protection design for BESS and electrical equipment, transformers etc</p> <p>Fire Safety Study to be conducted as part of design to ensure fire radiation effects do not impact on adjacent infrastructure.</p> <p>Fire Risk Evaluation to be conducted to provide fire safety recommendation and required firefighting equipment.</p> <p>Ensure the layout of site infrastructure that minimises the potential for grassfire and/or bushfire to impact the BESS.</p> <p>Fire protection system must incorporate at least one static firewater storage tank of at least 45,000L effective capacity at each site entrance.</p> <p>Install additional static fire water storage tanks of at least 45,000L effective capacity must also be incorporated..</p>	Development and implementation of safety management plans (e.g., permit to work).				
20.	Natural Hazard	Extreme ambient temperature (high humidity)	Extreme temperatures	Personnel injury due to burns or smoke/chemical inhalation. Damage/ destruction of battery cell.	Potential	D – Unlikely	4 – Major	Medium	<p>Batteries designed to operate beyond maximum temperature range with allowance for higher maximum temperatures of approximately 1.5 to 2°C to account for the likely effects of global warming.</p> <p>Electrical design in accordance with AS/NZS 3000.</p> <p>Battery enclosures have suitable enclosure design for the environment.</p>	-	D – Unlikely	4 – Major	Medium	Unlikely

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No.	Source	Hazard	Cause	Consequence	Does the Hazard have the Potential to pose Offsite or to a receptor on site Significant Risk?	Inherent Risk			Proposed Controls – Technical / Design	Proposed Controls – Safety Management	Residual Risk			Does the Hazard result in an Offsite or to a receptor on site Significant Risk?
						Likelihood	Consequence	Risk Rating			Likelihood	Consequence	Risk Rating	
21.	Natural Hazard	Seismic activity	Failure to design the BESS to the correct earthquake loading code to account for seismic activity Earthquake	Damage to battery casings, cells and other infrastructure.	No Potential									
22.	Natural Hazard	Flooding	Drainage system failure Fire-fighting activity Failure to account for flooding during foundation construction	Damage to battery casings, cells and other infrastructure.	Unlikely	E – Rare	4 – Major	Medium	Surface Water and Groundwater Assessment to be conducted to determine special flood considerations.	Schedule construction during dry season to account for light and heavy vehicles in heavy rain/flooding events.	E – Rare	4 – Major	Medium	Unlikely
23.	Natural Hazard	Excessive wind	Storms (hail and extreme winds).	Damage to battery casings, cells and other infrastructure.	Unlikely	E – Rare	3 – Moderate	Low	The site is located in an A1 wind region. The BESS should be designed in accordance with AS/NZS 1170.2.	Housekeeping schedule should be maintained to ensure debris is cleared	E – Rare	3 – Moderate	Low	Unlikely
24.	Natural hazard	Ambient weather (lightning) striking	Failure to design the BESS to the correct isokeraunic level to account for lightning strikes	Resulting in structural damage, fires and tower collapse ¹	Potential	E – Rare	5 – Catastrophic	Medium	Conduct a lightning protection study. Ensure no BESS equipment is located underneath powerlines. Implement an earthing system. Design the BESS facility in accordance with AS 1768.	-	E – Rare	5 – Catastrophic	Medium	No
25.	Natural Hazard	Subsidence	Collapse of pillars within abandoned underground mine and mine roof	Ground instability resulting in damage to BESS units and infrastructure.	Potential	D – Unlikely	3 – Moderate	Medium	Ground surveying shall be completed to confirm risk of subsidence.		E – Rare	3 – Moderate	Low	Unlikely
26.	Other	Loss of containment (contaminated water)	Spent fire water runoff. Runoff from site. Failure of process waste piping.	Harm to the environment (flora and fauna).	Potential	D – Unlikely	3 – Moderate	Medium	Installation of oily water interceptors. Design and Installation of containment infrastructure/impervious retention facilities, ponds and such with adequate capacity. Bunded transformers. Use of mineral oils.	Stormwater Management Plan. Operations and maintenance of retention facilities/ponds. Continuous monitoring and alarms. Emergency response plan/procedure	E – Rare	3 – Moderate	Low	Unlikely
27.	Other	Exposure to contaminated land	Construction activities exposing contaminated	Harm to personnel and the environment.	Potential	D – Unlikely	3 – Moderate	Medium	-	Identification and testing of any contaminated land. Development and implementation of procedure	E – Rare	3 – Moderate	Low	Unlikely

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No.	Source	Hazard	Cause	Consequence	Does the Hazard have the Potential to pose Offsite or to a receptor on site Significant Risk?	Inherent Risk			Proposed Controls – Technical / Design	Proposed Controls – Safety Management	Residual Risk			Does the Hazard result in an Offsite or to a receptor on site Significant Risk?
						Likelihood	Consequence	Risk Rating			Likelihood	Consequence	Risk Rating	
			material from legacy works.							for removal of contaminated land and remediation. Removal of contaminated land before construction. Tracking of contaminated land removal.				
28.	Other	Vehicle collision / congestion	Construction activities (increased heavy vehicles). Driver fatigue.	Personnel injury/fatality.	Potential	D – Unlikely	5 – Catastrophic	High	-	Traffic Management Plan, including fatigue management.	E – Rare	5 – Catastrophic	Medium	Unlikely
29.	Other	Loss of containment (waste/fuel)	Commissioning activities.	Harm to personnel and the environment.	Potential	D – Unlikely	3 – Moderate	Medium	BESS and auxiliary equipment to be surrounded by fencing as per AS 1725, locked gates and other security	Waste Management Plan Construction Waste Management Plan Emergency Management Plan	E – Rare	3 – Moderate	Low	Unlikely
30.	Other	Fire	Other dangerous goods / incompatible materials	Impinged fire to BESS/Fire propagation from BESS Harm to personnel and the environment	Unlikely	D – Unlikely	3 – Moderate	Unlikely	Adequate separation from BESS to fence/ other DGs Minor storage quantities of other DG Dangerous Goods risk assessment to be conducted. Fire Safety Study to be conducted as part of design to ensure fire radiation effects do not impact on adjacent infrastructure. Fire Risk Evaluation to be conducted to provide fire safety recommendation and required firefighting equipment Where reticulated water is available for centralised BESS, the provision of a fire hydrant system that meets the requirements of AS 2419.1 [42] Clause 3.9 and Table 2.2.5(D). Where no reticulated water is available for centralised BESS, provision of a fire hydrant system water supply in static storage tanks that complies with AS 2419.1 [42], where: i. The fire water supply must be of a quantity no less than 288,000L or as per the provisions for Open Yard Protection of AS 2419.1 [42]: Fire hydrant installations, flowing for a period of no less	Safety system maintenance, testing and inspections. Safety Management Plans. Remote isolation for non-manned facility. Emergency response plan/procedure	E – Rare	3 – Moderate	Low	Unlikely

No.	Source	Hazard	Cause	Consequence	Does the Hazard have the Potential to pose Offsite or to a receptor on site Significant Risk?	Inherent Risk			Proposed Controls – Technical / Design	Proposed Controls – Safety Management	Residual Risk			Does the Hazard result in an Offsite or to a receptor on site Significant Risk?
						Likelihood	Consequence	Risk Rating			Likelihood	Consequence	Risk Rating	
									<p>than four hours at 20L/s, whichever is the greater.</p> <p>ii. The quantity of static fire water storage is to be calculated from the number of hydrants required to flow from AS 2419.1 [42] Table 2.2.5(D).</p> <p>iii. Fire hydrants must be provided and located so that every part of the battery energy storage system is within reach of a 10 m hose stream issuing from a nozzle at the end of a 60 m length of hose connected to a fire hydrant outlet.</p> <p>iv. The fire water supply must be located at vehicle entrances to the facility, at least 10 m from any infrastructure (electrical substations, inverters, battery energy storage systems, buildings).</p> <p>v. The fire water supply must be reasonably adjacent to the battery energy storage system and shall be accessible without undue danger in an emergency. (Eg., Fire water tanks are to be located closer to the site entrance than the battery energy storage system).</p> <p>vi. The fire water supply must comply with AS 2419.1 [42], Section 5. A fire break must be established and maintained around BESS and related infrastructure.</p> <p>A fire break must be established and maintained around the base of wind turbines.</p>					

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Appendix C: Bushfire Hazard Assessment

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Yangery BESS

Bushfire Hazard Assessment

Yangery BESS Development Pty Ltd

Reference: 527059

Revision: 1

2026-01-16

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Document control record

Document prepared by:

Aurecon Australasia Pty Ltd

ABN 54 005 139 873

Aurecon Centre
Level 8, 850 Collins Street
Docklands, Melbourne VIC 3008

PO Box 23061
Docklands VIC 8012
Australia

T +61 3 9975 3000

F +61 3 9975 3444

E melbourne@aurecongroup.com

W aurecongroup.com

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Document control		aurecon				
Report title		Bushfire Hazard Assessment				
Document code		527059-W00001-REP-EN-0004	Project number		527059	
File path		https://aurecongroup.sharepoint.com/sites/527059/3_Develop/For Delivery/527059-W00001-REP-EN-0004.docx				
Client		Yangery BESS Development Pty Ltd				
Client contact		Tarek Osman	Client reference		-	
Rev	Date	Revision details/status	Author	Reviewer	Verifier (if required)	Approver
0	2024-11-01	Draft for client review	L. Mann	A. Rigg		G. Thraves
1	2026-01-16	Updated with new site layout details	L. Smyth	A. Rigg		B. Hasenfratz
Current revision		1				

Approval			
Author signature		Approver signature	
			
Name		Name	
Leah Smyth		Bez Hasenfratz	
Title		Title	
Senior Consultant, Environment & Planning		Senior Consultant, Environment & Planning	

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Figure 2 Regional Bushfire Planning Assessment Barwon South West Area (DPCD, 2012)

Figure 3 Bushfire hazard landscape assessment

Figure 4 Classification of Vegetation: Grassland (Standards Australia, 2018)

Figure 5 Classification of Vegetation: Woodland (Standards Australia, 2018)

Figure 6 Site bushfire hazard assessment

Tables

Table 1 Addressing information requirements within Clause 13.02-1S of the Victoria Planning Provisions in relation to bushfire hazard identification

Table 2 Summary of measures to manage fire risk

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Executive Summary

Aurecon was commissioned by Yangery BESS Development Pty Ltd on behalf of South Energy Pty Ltd to undertake a bushfire hazard assessment to inform the design of the proposed Yangery Battery Energy Storage System (BESS) (the project) within an existing farm site in Yangery, Victoria. This bushfire hazard assessment has been prepared to support a future planning permit application for the project, by assessing the proposal against the requirements of Clause 13.02 (Bushfire) of the Warrnambool Planning Scheme and Chapters 4, 5 and 6 of the Country Fire Authority (CFA) *Design Guidelines and Model Requirements: Renewable Energy Facilities* (CFA Guidelines) (CFA, 2023).

The project area falls within a designated Bushfire Prone Area (BPA) but is not subject to the Bushfire Management Overlay (BMO). The project area is a modified landscape that has been used for agriculture and includes an existing substation. A field investigation confirmed the land in the project area is predominately sown pasture paddocks, planted strips of native and exotic trees and shrubs. The site also contains a channel drain running in a north-south direction from the northern boundary and a farm dam in the centre of the site.

An assessment of the surrounding landscape found it to be in a low-risk bushfire landscape, particularly in key bushfire directions to the north, north-west and south-west. This is due to the surrounding agricultural land comprising mainly of exotic sown pasture paddocks and thin linear strips of planted tree rows. There are no extensive patches of wooded or scrub vegetation that would carry a significant bushfire risk, particularly within 150 m of the site, and extreme bushfire behaviour is not possible (DELWP, 2017).

The site is also well situated, noting:

- There are existing major access roads that provide safe entry and egress
- The township of Warrnambool is readily accessible from multiple road options in the event of a fire
- The site and surrounding landscape are generally flat, including between the site and Warrnambool township.

This assessment confirms that the proposal would comply with the relevant objectives of the CFA Guidelines, in terms of defendable space, access, water supply, vegetation management and location of services. While initial engagement with CFA has occurred, further consultation is required with CFA to confirm the proposed site layout and measures to comply with the Guidelines.

A Risk Management Plan has been prepared for the project (*Yangery BESS Risk Management Plan, Aurecon 2025*), however, it should be noted that prior to the planning application, additional plans would need to be drafted, which may include an Emergency Management Plan and a Fire Management Plan. These plans will need to be updated prior to development and use commencing, to address any potential changes identified through the design and consultation process with CFA. This is in accordance with the requirements of Chapters 2, 3, 6, and 7 of the CFA Guidelines. Subsequent consultation will occur with CFA in the preparation of these documents.

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1 Introduction

1.1 Project background

Aurecon Pty Ltd (Aurecon) was commissioned by Yangery BESS Development Pty Ltd on behalf of South Energy Pty Ltd to undertake a bushfire hazard assessment to inform the design of the proposed Battery Energy Storage System (BESS) in Yangery, Victoria (the project). This assessment will support a future planning permit application for the project.

The BESS is proposed to have a capacity of 120 megawatts (MW)/480 megawatt hours (MWh) and includes a connection to Powercor's Koroit zone substation. The project will support the transition to renewable energy, ensuring reliable, accessible and cost-effective energy options for Victoria. The primary project components are proposed to consist of:

- a 120 MW/480 MWh BESS facility including inverters and transformers
- Construction of internal access roads and access (and egress) points
- Underground cabling (33kV) to provide a connection between the battery modules and inverters and on-site collector substation
- Underground or overhead cabling (66kV) to connect to the adjoining Powercor substation
- Laydown and hardstand areas
- Site offices
- Water storage (including firefighting water supply and fire water runoff containment)
- Fencing around the perimeter of the BESS facility
- Car parking

This bushfire hazard assessment has been prepared to understand the risk to the facility, site personnel, firefighters and the surrounding community from bushfire hazards at the site and surrounding landscape, and to inform design of the site for protection from bushfire or spread of fire in the event of a fire starting from the facility or site.

1.2 Scope and purpose of the assessment

The purpose of this Bushfire Hazard Assessment is to demonstrate compliance with the requirements of the Country Fire Authority (CFA) *Design Guidelines and Model Requirements for Renewable Energy Facilities* (Version 4, August 2023) (CFA guidelines) (CFA, 2023) and Clause 13.02-1S of the Victorian Planning Provisions (Bushfire Planning). This includes:

- providing information to the CFA as per Section 2.2.2 of the guidelines (refer to Section 1.3 of this report)
- addressing bushfire risk through the identification of hazards at a site and landscape level in accordance with Section 2.2.2 of the CFA guidelines and Clause 13.02 (Bushfire Planning) of the Victoria Planning Provisions (refer to Section 3)
- identifying how the facility will meet the requirements of the guidelines, specifically Chapters 4, 5 and 6, including specific requirements for BESS facilities (refer to Section 4).

The scope of the bushfire risk assessment is to:

- undertake a bushfire site hazard assessment, which considers all bushfire hazards within 150 m of the site, including any classified vegetation identified as per the *Australian Standard AS3959:2018 Construction of buildings in bushfire-prone areas* (AS 3939:2018) (Standards Australia, 2018).
- undertake a bushfire landscape hazard assessment, which provides details of the bushfire hazards in the broader landscape considering bushfire scenarios as well as egress to built-up areas.

- outline key bushfire management measures identified in the CFA guidelines that are applicable to the project, detailing how the project will implement these measures, specifically in relation to:
 - the proposed location and design of the BESS
 - defensible space (fire breaks and vegetation offset areas)
 - water supply
 - access
 - substation and transmission lines
 - operational requirements.

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The information provided in response to key location/siting and layout/design is included in the Risk Management Plan for the project, and intended to be included in the proposed Fire Management Plan. Fire risks associated with the infrastructure (Section 3.3.2.4 of the CFA guidelines) and several components of the project relating to construction and commissioning requirements are also beyond the scope of this assessment. These will need to be undertaken for the project in consultation with the CFA.

1.3 Location and project area

The BESS site (project area or site) is approximately 23 hectares (ha) in size and is located at 689 Tower Hill Road, Yangery, approximately 8 km north-west of Warrnambool. The project area is located within the Warrnambool Local Government Area (LGA) and forms part of the Barwon South West region, Victoria (Figure 1). The site occurs within a rural area within the Farming Zone (FZ) with parts of the site also covered by the Design and Development Overlay (DDO) associated with Warrnambool Airport. The project area is bordered in all directions by farmland with scattered dwellings and outbuildings. One major road, Tower Hill Road, occurs along the northern boundary, and one minor road, Conns Lane, occurs along the western boundary.

The project area is currently used for farming and rural lifestyle purposes, comprising mainly of sown pasture grasses. There is an existing substation and a dwelling directly adjacent to the north-eastern corner and south-western corner of the site, respectively. There is a farm dam approximately 0.8 ha in size within the centre of the site, and a small drainage line and vehicle access tracks dissecting portions of the site.

The surrounding land is also used for farming purposes comprising mostly of sown pasture grasses with areas of roadside vegetation and riparian vegetation along waterways. The closest core area of native vegetation is located in Tower Hill Wildlife Reserve, approximately 5 km to the west.

The project area is located within a designated Bushfire Prone Area (BPA). The project area is not affected by a Bushfire Management Overlay (BMO) (Figure 1).

1.4 Assumptions and limitations

The outcomes of this bushfire assessment are limited to the BESS site and immediate surrounds, and the proposed project definition as outlined in Section 1.1.

It is assumed that the BESS facility will be managed via risk and emergency management plans. Should further information become available regarding the conditions at the site, the assessment, findings and recommendations in this assessment may change.

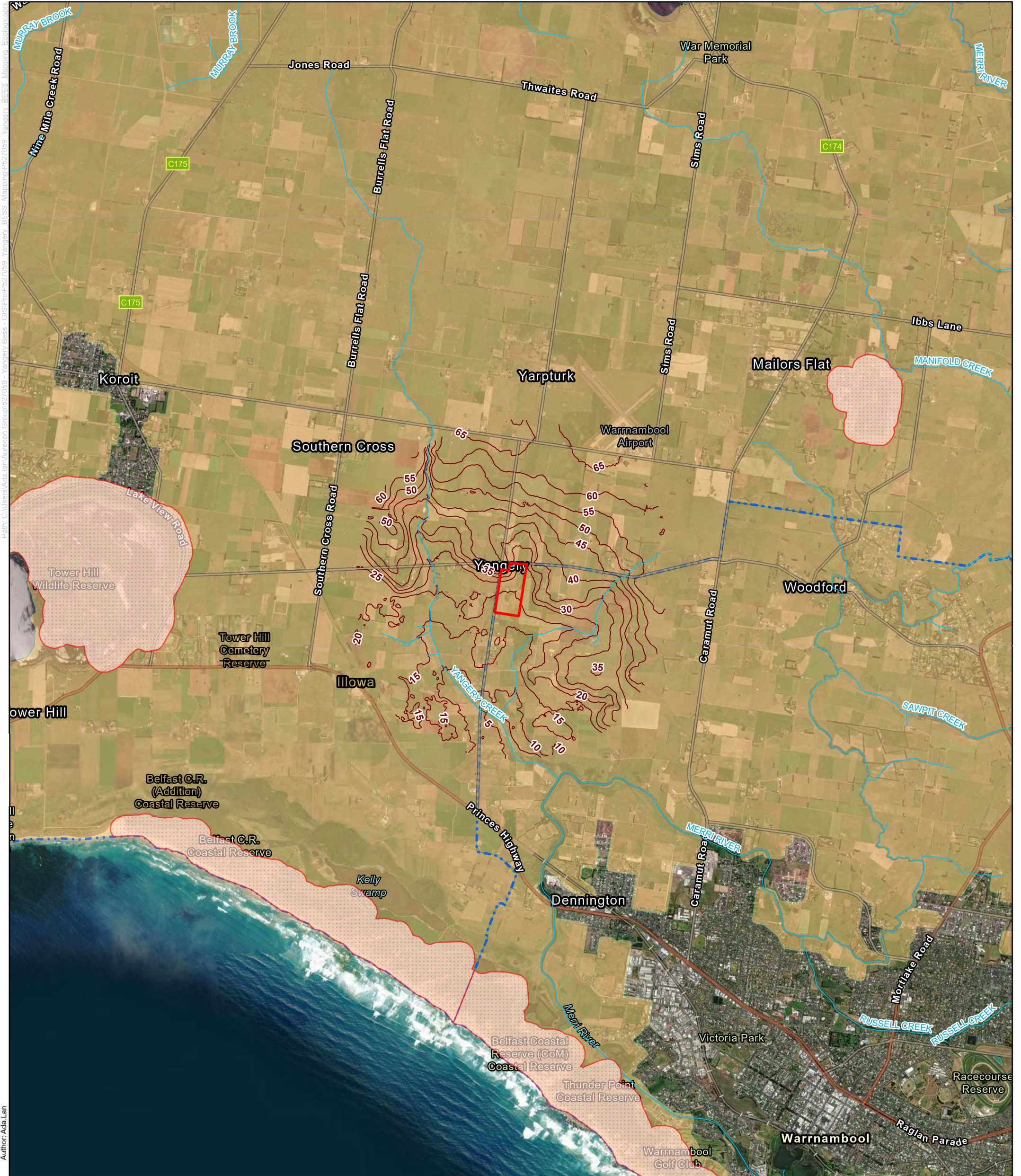
While the measures identified in this assessment when fully implemented can assist in reducing the residual fire risk to the project, they cannot fully guarantee assets will survive a bushfire or grassfire on every occasion due to the unpredictable nature of bushfires and extreme weather. Continual evaluation and review of this document, fire risk conditions at the site and updating management practices, may assist in further reducing the residual fire risk over the life of the project.

There has been no fire study undertaken for this project. However, the CFA guidelines state that the Risk Management Plan needs to incorporate a Fire Safety Study which outlines risks to and from BESSs.

The following requirements of the CFA guidelines have not been addressed as part of this assessment. These additional plans will be prepared before development starts in consultation with the CFA:

- Fire Safety Study (Chapter 3 of the CFA Guidelines)
- Fire Management Plan (Chapter 6 of the CFA Guidelines)
- Emergency Plan (Chapter 7 of the CFA Guidelines).

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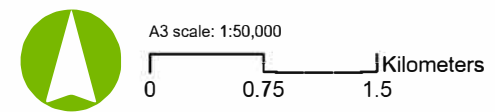
- Legend**
- Watercourse
 - Contour
 - Project area
 - Local government area
 - Bushfire Prone Areas
 - Bushfire Management Overlay (BMO)

Basemap: Vicmap, Esri, TomTom, Garmin, FAO, NOAA, USGS, Maxar, Vicmap, Esri, TomTom, Garmin, Foursquare, MET/NASA, USGS

Other data: DELWP, Aurecon

Date: 23/06/2022

Version: 1



Job No: P527059
 Coordinate System: GDA2020 MGA Zone 54

Figure 1 Yangery BESS project area, topography and wider local context

2 Methodology

The following sources of information were reviewed to inform the preparation of this bushfire hazard assessment:

- VicPlan (DTP, 2024)
- Victorian Planning Provisions (DTP, 2024a)
- NatureKit (DEECA, 2024)
- *Regional Bushfire Planning Assessment – Barwon South West Region* (DPCD, 2012)
- *Design Guidelines and Model Requirements: Renewable Energy Facilities* (CFA, 2023)
- *Planning Permit Application Bushfire Management Overlay – Technical Guide* (DELWP, 2017).

For the purposes of bushfire hazard assessment, areas of vegetation considered to pose a bushfire threat are classified according to the vegetation classes defined as per AS3959-2018 (Standards Australia, 2018). Under Clause 2.2.3 and Table 2.3 of AS3959-2018, vegetation is classified into the following classes:

- **Forest:** includes tall open forest, woodland and low open forests which includes trees up to or over 30m tall and 30%-70% foliage coverage. This category also includes mature pine plantations
- **Woodland:** includes tress up to 30m high with a 10% - 30% foliage coverage.
- **Shrubland:** includes heath that is found in wet areas, poor soil conditions and 1m-2m high as well as low shrubland that is <2m high, 30% foliage coverage and has an understorey.
- **Scrub:** includes closed and open scrub which can range from wet or rocky areas with poor soil conditions and contain a mixed species composition.
- **Mallee/Mulga:** includes low tress or tall shrubs, usually >2m tall with sparse grassy understorey.
- **Rainforest:** includes trees with a >90% foliage cover, mixed species understorey and is not dominated by eucalypts.
- **Grassland:** includes all forms of grasses (except tussock moorlands) and where managed in a minimal fuel condition and non-curing cropland is regarded as a low threat vegetation.
- **Tussock Moorland:** includes all forms for vegetation where the overstorey is dominated by Button-grass.

AS3959-2018 also describes situations where vegetation is classified as 'low threat' due to factors such as flammability, moisture content or fuel load. This includes grassland managed in a minimal fuel condition, maintained lawns, golf courses, maintained public reserves and parklands, nature strips and windbreaks etc.

Details of the bushfire hazards within the project area, including the presence and type of classified vegetation and topography was determined during a field assessment undertaken on 16 July 2024. Bushfire hazards situated beyond the project area were determined based on observations from publicly accessible locations during the site inspection and aerial photo interpretation.

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3 Assessment of the planning scheme requirements

The following sections provide a tailored response to requirements set out in Section 2.2.2 of the CFA guidelines and Clause 13.02 of the Victoria Planning Provisions based on the project description in Section 1.1.

3.1 Victorian Planning Provisions

Clause 13.02-1S (Bushfire Planning) outlines the State’s objectives in managing bushfire risk to life and property through appropriate hazard identification and strategic planning. Clause 13.02 (Bushfire) includes strategies for bushfire hazard identification and applies to all development in a designated BPA, BMO or any development that may create a bushfire hazard. The CFA Guidelines also require appropriate consideration of Clause 13.02-1S. Table 1 below and subsequent sections provide responses to each of the strategies within Clause 13.02-1S.

Table 1 Addressing information requirements within Clause 13.02-1S of the Victoria Planning Provisions in relation to bushfire hazard identification

Bushfire hazard identification and assessments	Response
Applying the best available science to identify vegetation, topographic and climatic conditions that create a bushfire hazard.	A site visit was conducted on 16 July 2024 to support a desktop assessment and vegetation was assessed in accordance with AS 3959:2018.
Considering the best available information about bushfire hazard including the map of designated bushfire prone areas prepared under the <i>Building Act 1993</i> or regulations made under that Act.	Mapping confirms that the project area <u>is within</u> a BPA (refer to Figure 1) and fire history maps have been sourced from DEECA.
Applying the Bushfire Management Overlay to areas where the extent of vegetation can create an extreme bushfire hazard.	Not applicable as the project area is <u>not within</u> the BMO.
Considering and assessing the bushfire hazard on the basis of: <ul style="list-style-type: none"> ■ Landscape conditions - meaning conditions in the landscape within 20 kilometres (and potentially up to 75 kilometres) of a site; ■ Local conditions - meaning conditions in the area within approximately 1 kilometre of a site; ■ Neighbourhood conditions - meaning conditions in the area within 400 metres of a site; and ■ The site for the development. 	A description of the project area and the surrounding landscapes are provided below. <ul style="list-style-type: none"> ■ Landscape conditions (refer to Section 3.1.1) ■ Local conditions (refer to Section 3.1.2) ■ Neighbourhood conditions (refer to Section 3.1.2) ■ The site for development (refer to Section 3.1.3 and 3.1.4) Note: DELWP (2017) requirements on landscape and site bushfire hazard assessment have been used in providing a response to these conditions.
Consulting with emergency management agencies and the relevant fire authority early in the process to receive their recommendations and implement appropriate bushfire protection measures.	The CFA was initially consulted on the project in May 2024, with ongoing engagement since then, including the incorporation of CFA recommendations into the design, particularly concerning access points and BESS unit separation distances. This plan will be submitted to the CFA, followed by continued consultation during the planning application process and throughout the development of documentation prior to the facility’s commissioning.

Bushfire hazard identification and assessments	Response
Ensuring that strategic planning documents, planning scheme amendments, planning permit applications and development plan approvals properly assess bushfire risk and include appropriate bushfire protection measures.	This assessment identifies the bushfire risks within the project area and surrounding landscape and includes bushfire protection measures that should be employed in the site layout and design (Section 4).
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.	<p>The project area is considered to have a low bushfire risk and contains suitable access and egress options (refer to Section 3.1.4).</p> <p>The facility can also incorporate fire protection measures through design (Section 4.1), construction (Section 4.2) and operation (Section 4.3).</p>

3.1.1 Landscape condition and bushfire hazards

The broader landscape comprises largely of cleared agricultural land, established settlements, industrial infrastructure, roads and easements. The landscape is characteristic of the Barwon South West region with farm paddocks that are occasionally separated by planted tree lines with no dense forested or bush blocks present nearby. The site is located approximately 7 km north-west of Warrnambool.

No significant bushfire hazards are identified near Warrnambool in the Regional Bushfire Planning Assessment of Barwon South West (DPCD, 2012) (Figure 2 below).

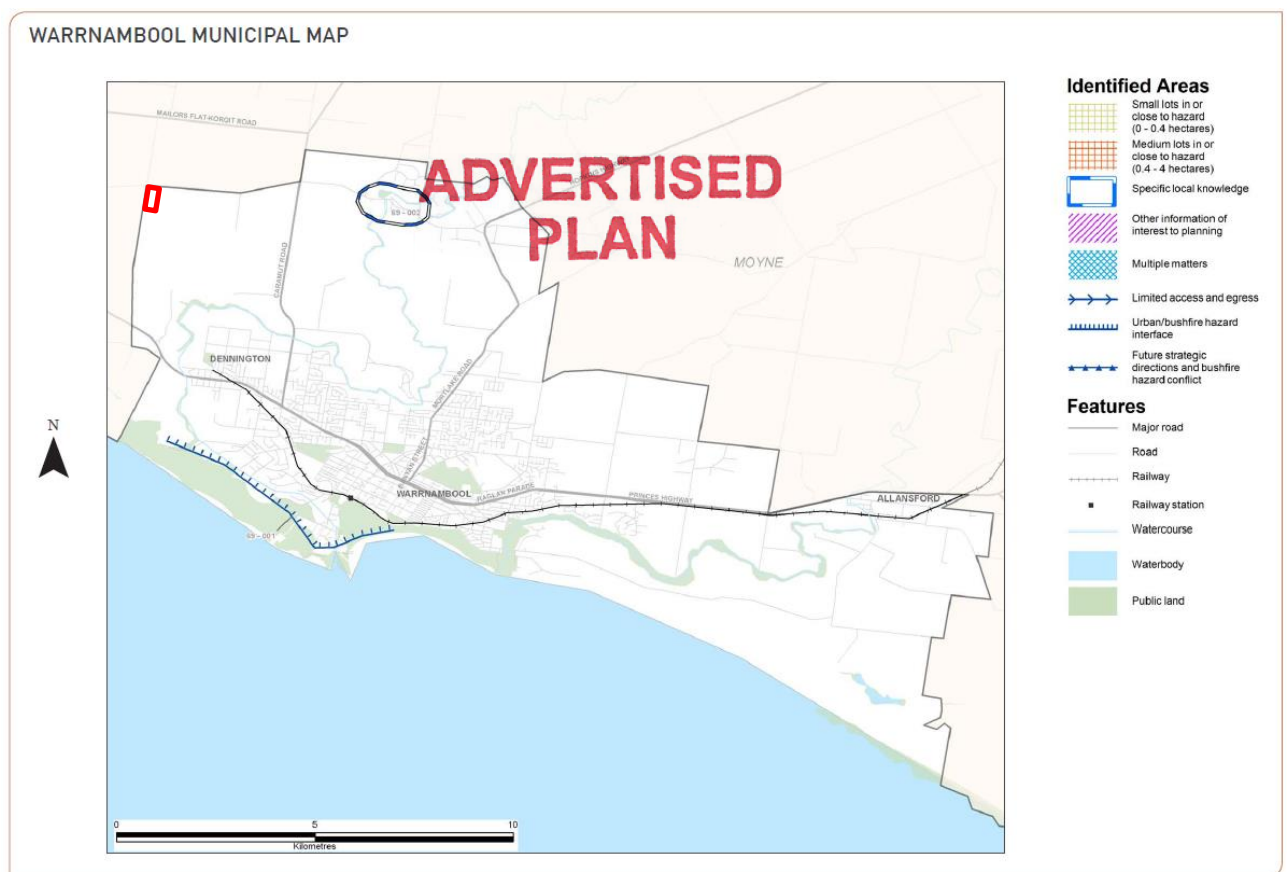


Figure 2 Regional Bushfire Planning Assessment Barwon South West Area (DPCD, 2012), approximate site location outlined in red

The primary landscape bushfire risk to the project area is from grassfire due to the absence of treed or scrub vegetation in the landscape which has been cleared for farming and energy generation and transmission. Particularly from the prevailing bushfire directions of the north-west and south-west (DELWP, 2017), there is no treed or scrub vegetation that would pose a significant fire risk. Grasslands occur immediately around the project area in all directions. Overall, there are minimal bushfire hazards in the surrounding landscape.

Based on the condition of the landscape and limited patches of vegetation, extreme bushfire behaviour is not considered possible. The broader landscape type is Type One (DELWP, 2017) and the closest known core area of vegetation (not grassland or low threat vegetation) is the Tower Hill Wildlife Reserve, approximately 5 km to the west. There are minimal large patches of forest in the surrounding area, with grassed paddocks the predominant vegetation in the region. The site also has ready access and egress to safe areas around Warrnambool that would provide safety in the event of a fire.

A landscape bushfire hazard assessment in accordance with CFA guidelines has been developed and is provided below in Figure 3.

3.1.2 Local and neighbourhood conditions bushfire hazards

The local and neighbourhood conditions surrounding the project area are similar and therefore can be considered by one assessment. The project area is bordered in all directions by farmland with scattered dwellings and outbuildings, with the exception of the Koroit substation which occurs adjacent to the north-western corner of the site. One major road, Tower Hill Road, occurs along the northern boundary and one minor road, Conns Lane, occurs along the western boundary.

Approximately 5 km south of the site is the Belfast Coastal Reserve and Kelly Swamp which run adjacent to the coastline. The reserve extends for approximately 7 km until it meets the township of Warrnambool. Vegetation here comprises of coastal shrubland and swampland. Approximately 5 km to the west of the site is Tower Hill Wildlife Reserve which sits in a large volcanic crater. This reserve is known for its significant geological formations and comprises of lakes surrounding the crater and significant areas of revegetation, which has occurred since the 1960s.

To the east of site, the landscape is a mix of agricultural land and small townships, notably Woodford and Bushfield. To the north is more agricultural land and small townships and Warrnambool Airport, located approximately 2 km to the north of the site.

Overall, the surrounding local and neighbourhood conditions are considered a low bushfire risk and extreme bushfire behaviour is not possible, although there is potential for grassfires to occur.

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Author: Ada.Lan

Legend

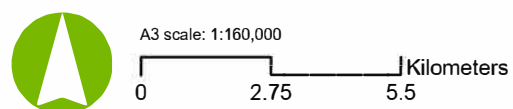
- | | | |
|-----------------------|------------------------------|---------|
| Project area | Wetland | Other |
| Site Buffer | Fire history | Burn |
| Watercourse | Bushfire | Unknown |
| Local government area | Bushfire direction of travel | |

Basemap: Vicmap, Esri, TomTom, Garmin, FAO, NOAA, USGS, Earthstar Geographics, Vicmap, Esri, TomTom, Garmin, Foursquare, METI/NASA, USGS

Other data: DELWP, Aurecon

Date: 23/06/2022

Version: 1



Job No: P527059
Coordinate System: GDA2020 MGA Zone 54

Figure 2 Bushfire Hazard Landscape Assessment

3.1.3 Site for development

Site description

The project area comprised two fenced paddocks that have been improved to support grazing cattle and crop (Photo 1, Photo 2). The ground layer across the entire site has been cleared of native vegetation and supports a mixture of non-native flora species, namely Toowoomba Canary-grass (*Phalaris aquatica*), Kikuyu (*Cenchrus clandestinus*), Clover (*Trifolium spp.*) and Curled Dock (*Rumex crispus*). The surrounding landscape is also characterised by agricultural farmland, with much of the ground flora comprising crop or improved pasture. The majority of the project area is flat, however, the section just south of the substation occurs on a slope of approximately 5 degrees (Photo 3).

Two rows of planted vegetation were observed along in the eastern and southern boundaries of the substation (Photo 4, Photo 5). Planted vegetation included a mixture of native trees and shrubs over an understorey exclusively dominated by introduced flora. Planted vegetation mainly comprised of Manna Gum (*Eucalyptus viminalis*), Golden Wattle (*Acacia pycnantha*), Wirilda (*Acacia provincialis*) and Paperbark (*Melaleuca spp.*).

The project area is intersected by an existing drainage line that adjoins a small waterbody in the southernmost paddock (Photo 6, Photo 7). The drainage line is heavily degraded. Similarly, the small waterbody located east of the drainage line is degraded due to persistent cattle pugging and ground disturbance (Photo 8). The waterbody and drainage line both lack native vegetation and abundance of submergent, emergent and fringing vegetation.

Outside of the study area, there was a patch of planted vegetation on the western side of Conns Lane (Photo 9), and a row of planted trees adjacent to the southern boundary of the site (Photo 10).

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Photo 1 Current site conditions showing agricultural farmland, facing south-west



Photo 2 Current site conditions showing agricultural farmland, facing south-west



Photo 3 Current site conditions showing the 5 degrees slope up toward the substation, facing south-west



Photo 4 Row of planted vegetation adjacent to the substation, facing south-east



Photo 5 Row of planted vegetation adjacent to the substation, facing east



Photo 6 Drainage line running north-south through the site, facing north

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Photo 7 Drainage line running north-south through the site, facing north-west



Photo 8 Farm dam towards the centre of the site, facing north



Photo 9 Planted vegetation on the western side of Conns Lane not within the site boundary, facing south-east



Photo 10 Row of planted trees adjacent to the southern boundary of the site, facing south-west

Existing access and fire breaks

The project area is accessible from two roads, Conns Lane and Tower Hill Road. Conns Lane and Tower Hill Road are both two-lane bitumen roads, running north-south and east-west along the western and northern boundaries, respectively. Conns Lane is accessible from the south via the Princes Freeway and from the north via Mailors Flat-Koroit Road. Tower Hill Road is accessible from the east via Caramut Road and from the west via Southern Cross Road. One access point is proposed from each of Conns Lane and Tower Hill Road.

3.1.4 Site bushfire assessment

Using AS3959:2018, classified vegetation in and adjacent to the project area is comprised of grassland and woodland. Grassland, considered dense sown pasture (Figure 4), is the predominant vegetation category found through the farmland where grass is considered unmanaged in accordance with AS3959:2018. Woodland (Figure 5) includes the two rows of planted trees within the site, row of planted trees adjacent to the southern boundary of the site, and patch of planted vegetation on the western side of Conns Lane mentioned in Section 3.1.3. Due to the young age of the vegetation, it can be classified as low woodland (07), with the potential to be a woodland (05) at maturity. Due to the current poor soils and surrounding land use, these are unlikely to reach forest densities and heights.

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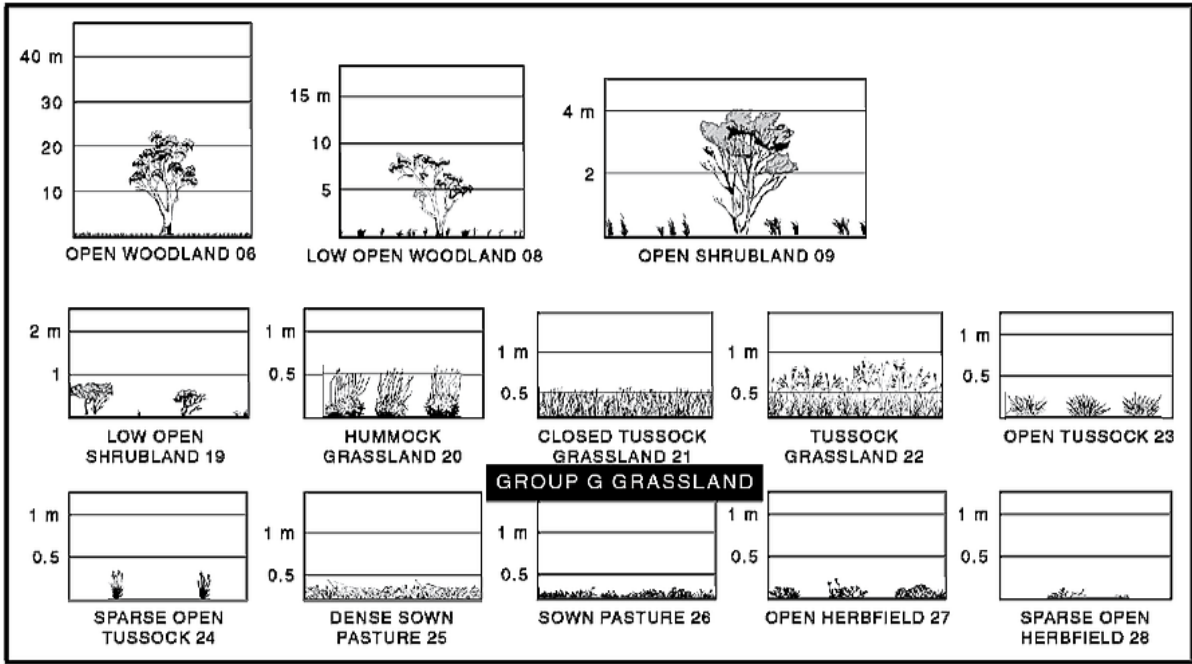


Figure 4 Classification of Vegetation: Grassland (Standards Australia, 2018)

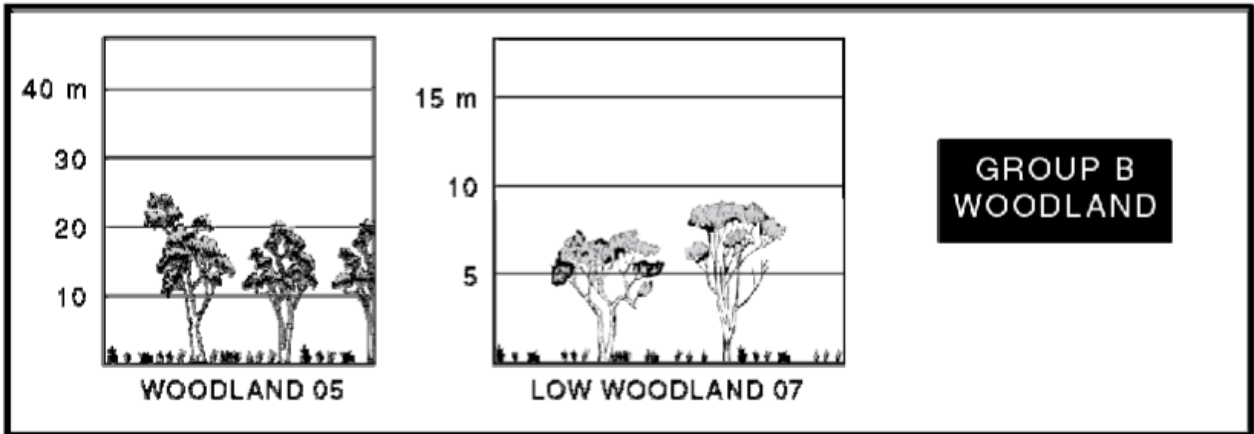


Figure 5 Classification of Vegetation: Woodland (Standards Australia, 2018)

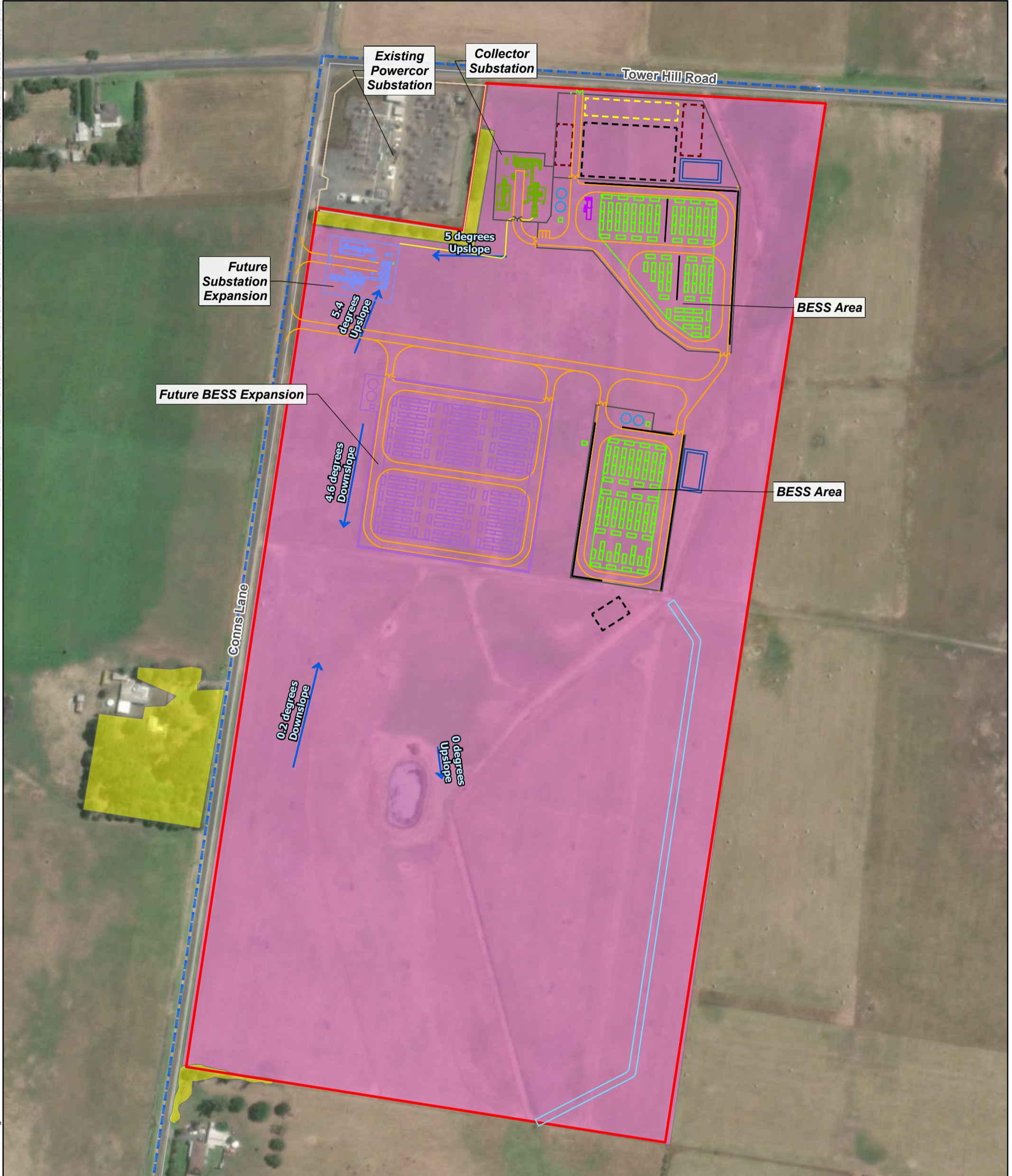
Within 150 m of the BESS the vegetation is considered to be either grassland or is cleared of vegetation, which is considered low threat or non-vegetated areas (Figure 6).

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Author: Ling Hsu



Legend		
Project area	Laydown & Handstand Area	Collector Substation Components
Local government area	Site Office	Future Substation Expansion Components
Road	Layout Design	Holding Pond
Slope	66kV Cable	Optional Realigned Water Course
BAL classified vegetation	Access Roadway	O&M Building
Grassland	Future BESS Expansion Components	Other Design Components
Woodland	Existing Powercor Substation	Sound Wall
Temporary Ancillary Infrastructure	Fencing	Water Tank
Construction Carpark		

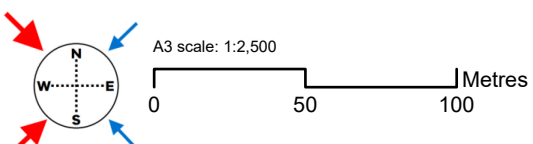
Basemap: Source: Esri, Vantor, Earthstar Geographics, and the GIS User Community, Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

Other data: DELWP, Aurecon

Date: 15/01/2026 Version: 3



Notes:



Job No: P527059
Coordinate System: GDA2020 MGA Zone 54

Figure 3- Site Bushfire Hazard Assessment

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3.2 Addressing risk to the BESS from the landscape (bushfire/grassfire)

3.2.1 Overall bushfire/grassfire risk

Due to the modified nature of the site and the surrounding landscape the overall potential bushfire risk is considered low.

Potential bushfire hazards in and around the project area is largely limited to grassland associated with agriculture. The risk is of grass fires in the landscape are reduced as any grass fires that may spread through or from the surrounding agricultural properties would have to cross multiple fuel breaks, such as roads, waterways and other hardstands. The level of grass is also often low with limited vegetation hazard present as the adjoining agricultural lands are cropped and actively grazed.

The small and narrow strips of planted woodland vegetation will not support an extended fire run towards the site due to the sparse nature of the tree rows, the presence of adjoining roads, a lack of woody understorey with managed ground layer limited to grasses and weeds. It is of insufficient dimensions to enable a fire to burn at maximum intensity directly towards the BESS.

The slope across the majority of the project area is noted as flat. The vegetation around the site does not pose a substantial bushfire risk to the project area.

While the overall bushfire/grassfire risk to or from the project is relatively low, the measures adopted from the CFA Guidelines outlined in the following section will:

- further reduce the likelihood of a fire starting at the BESS
- mitigate and manage the risk to life and property in the event of a fire entering or spreading from the BESS.

Overall, no significant bushfire hazards are identified within the project area.

3.2.2 Addressing bushfire risks to the BESS

Table 2 provides a description of control measures to address bushfire/grassfire risk to the proposed BESS facility. Further information is provided in Section 4 and detailed responses for compliance with CFA guidelines are provided in Appendix B – Compliance with the CFA guidelines.

Table 2 Summary of measures to manage fire risk

Consideration	Project design response
Location	<p>The facility is located in a low-risk environment to reduce the risk of external fire impacting the facility. The site is currently undeveloped and is used for farming practices. The immediate surrounds are generally low bushfire risk, with the site consisting of grassed paddocks with strips of amenity planting. The site is easily accessible via Conns Lane and Tower Hill Road. The site is within a BPA, but not affected by a BMO.</p> <p>The site environment meets the attributes described in Section 4.1 of the CFA Guidelines, namely:</p> <ul style="list-style-type: none"> ■ primarily grassland ■ no continuous other vegetation types within 1-20km of the project site ■ generally flat topography, some undulation may be present ■ slopes are less than 5 degrees ■ good road access with multiple routes available to and from the project site ■ no BMO applies ■ no Land Subject to Inundation Overlay applies.

Consideration	Project design response
Design	The facility will be designed to withstand ember attack.
Layout	A 10 m wide firebreak around the perimeter of the site, with access track, will be incorporated into the site layout.
Administration, permits and training	<p>Fire risk management is to be implemented by adhering to any conditions during the Fire Danger Period. Conditions include remaining on designated tracks for driving and restricted smoking areas. Appropriate permits (such as hot work permit) to be obtained if required.</p> <p>Site personnel to be equipped with first aid and fire mitigation training including CFA's training modules for bushfire safety.</p> <p>An Emergency Management Plan should be prepared as per the CFA guidelines.</p>
Emergency vehicle access	<p>Access will be provided from Conns Lane and Tower Hill Road.</p> <p>A perimeter access road around the battery storage area and substation will be included within the 10 m firebreak.</p> <p>Access roads will be constructed as per CFA guidelines, including for construction type, width and grade.</p>
Firefighting water supply	<p>The current design includes four firewater storage tanks, two per BESS area. The final arrangement of firefighting equipment will be confirmed as the detailed design progresses, with the following potential options recommended by CFA during initial engagement currently under consideration:</p> <p><u>Option 1</u></p> <ul style="list-style-type: none"> ■ a minimum 576 kilolitre (kL) fire water supply, in 2 interconnected 288 kL tanks in a single location, in accordance with Australian Standards <i>AS 2419.1-2021 Fire Hydrant Installations – System Design, Installation and Commissioning (AS 2419.1-2021)</i> (Standards Australia, 2021), and ■ a single fire hydrant system in accordance with <i>AS 2419.1-2021</i> that provides coverage to the entirety of both (north and south) BESS areas. <p><u>Option 2</u></p> <ul style="list-style-type: none"> ■ a minimum 576 kL fire water supply, across two min. 288 kL locations (e.g., 2 x 144 kL interconnected tanks at each of the north and south BESS areas) in accordance with <i>AS 2419.1</i>, and ■ two separate fire hydrant systems in accordance with <i>AS 2419.1-2021</i>, one for each of the north and south BESS areas, providing full coverage to each area.
Firebreaks	<p>A 10 m wide firebreak around the perimeter of the site, with access track, will be incorporated into the site layout.</p> <p>Firebreaks will be maintained to be free of flammable materials.</p>
Landscape	There is limited vegetation in the Project Area, mostly grassland. No screening vegetation is currently proposed. If required during stakeholder consultation any screening will consider vegetation with fire-retardant properties as per CFA planting guidelines at a suitable distance from the facility. Fire breaks may need to be expanded to at least 20 m to allow for screening vegetation.
Vegetation and fuel management	<p>The grass on site will be maintained at or below 100 mm during Fire Danger Period.</p> <p>All vehicles will be equipped with appropriate firefighting equipment.</p>

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4 Compliance with Renewable Energy Facility Guidelines

To reduce the risk of bushfire and the likelier occurrence of grass fires associated with the surrounding landscape, design and operation of BESS, the CFA have outlined specific details for siting, water supply, vegetation and operational management (CFA, 2023). Recommendations proposed for implementation during the design, construction and operation of the proposed BESS to accommodate requirements in Chapters 4, 5 and 6 of the CFA Guidelines are detailed in the following sections.

The proposed layout to inform the below responses to the CFA guidelines is provided in Appendix A – Proposed site layout. Noting that further design and planning is required to address some of the design, construction and operational requirements. Detailed responses of current compliance to each individual requirement within each of the Chapters is provided in Appendix B – Compliance with the CFA guidelines.

4.1 Facility location and design requirements

4.1.1 Location

Renewable energy facilities must be designed to eliminate or reduce the risk of fire occurring at, or entering, the facility and its consequences. Wherever possible, BESSs must be sited in low-risk environments where vegetation can be managed during the fire danger period. The site chosen meets these requirements as it is within Landscape Type 1, which is a low risk bushfire area (DELWP, 2017) and within grassed paddocks and low threat vegetation. Additionally, there is good road access; no presence of a Bushfire Management Overlay on surrounding land, and no continuous vegetation types within 1-20 km of the site.

4.1.2 Design requirements

The design of the facility must incorporate the following designs:

- A separation distance that prevents fire spread between battery containers/enclosures
- A fire break around the BESS and related infrastructure, of a width of no less than 10m, or greater where determined from the Fire Safety Study and stated in the Risk Management Plan. Fire breaks must be non-combustible, constructed of concrete, mineral earth or non-combustible material such as crushed rock. The width must be calculated based on the ignition source being radiant heat of surrounding vegetation, including landscaping.
- A layout of site infrastructure that:
 - considers the safety of emergency responders
 - minimises the potential for grassfire and/or bushfire to impact the battery energy storage system
 - minimises the potential for fires in battery containers/enclosures to impact on-site and offsite infrastructure.

Battery energy storage systems must be:

- Located so as to be reasonably adjacent to a site vehicle entrance (suitable for emergency vehicles)
- Located so that the site entrance and any fire water tanks are not aligned to the prevailing wind direction (therefore least likely to be impacted by smoke in the event of fire at the battery energy storage system)
- Provided with in-built detection and suppression systems. Where these systems are not provided, measures to effectively detect and/or suppress fires within containers must be detailed within the Risk Management Plan
- Provided with suitable ember protection to prevent embers from penetrating battery containers/enclosures

- Provided with suitable access roads for emergency services vehicles, to and within the site, including to battery energy storage system(s) and fire service infrastructure
- Installed on a non-combustible surface such as concrete
- Provided with adequate ventilation
- Provided with impact protection to prevent mechanical damage to battery containers/enclosures
- Provided with enclosed wiring and buried cabling, except where required to be above-ground for grid connection
- Provided with spill containment that includes provision for management of fire water runoff.

Non-combustible, floor to ceiling partition walls (thermal barriers between battery racks stacked modules) within battery containers will be considered.

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4.1.3 Emergency vehicle access

Section 4.2.1 of the CFA Guidelines states all battery infrastructure is located as such that it is directly accessible to emergency responders. The CFA Guidelines also detail requirements to move across the site by emergency response vehicles.

The location of access tracks, perimeter roads and emergency access are provided in Appendix A – Proposed site layout. As the site is generally flat with some undulations, some earthworks may be required to manage changes in grade.

Access roads will be designed and constructed to the following requirements:

- be of all-weather construction and capable of accommodating a vehicle of fifteen (15) tonnes
- be a minimum of four (4) metres in trafficable width with a four (4) metre vertical clearance for width of the formed road surface.
- contain passing bays at locations agreed with CFA.

Details of compliance CFA Guidelines on internal access requirements are provided in Table B1 in Appendix B – Compliance with the CFA guidelines.

4.1.4 Firefighting water supply and fire protection system

Sufficient water must be available and safely accessible to emergency responders and trucks to allow for fire suppression activities that are safe, timely, effective and not hindered in any way. In addition, a fire protection system suitable for the risks and hazards at the facility must be provided. For a BESS, the water supply quantity must:

- enable effective cooling of surrounding infrastructure
- account for reasonable duration of fire events based on the proposed battery chemistry
- account for local weather conditions and potential fire weather conditions
- provide for the safety of firefighters.

The location of firefighting water tanks is indicated in Appendix A – Proposed site layout. The final arrangement of firefighting equipment will be confirmed as the detailed design progresses, with the following potential options recommended by CFA during initial engagement currently under consideration:

Option 1

- a minimum 576 kilolitre (kL) fire water supply, in 2 interconnected 288 kL tanks in a single location, in accordance with Australian Standards *AS 2419.1-2021 Fire Hydrant Installations – System Design, Installation and Commissioning (AS 2419.1-2021)* (Standards Australia, 2021), and
- a single fire hydrant system in accordance with *AS 2419.1-2021* that provides coverage to the entirety of both (north and south) BESS areas.

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Option 2

- a minimum 576 kL fire water supply, across two min. 288 kL locations (e.g., 2 x 144 kL interconnected tanks at each of the north and south BESS areas) in accordance with AS 2419.1, located as depicted in the above plans, and
- two separate fire hydrant systems in accordance with AS 2419.1-2021, one for each of the north and south BESS areas, providing full coverage to each area.

Details of compliance with Section 4.2.2 of the CFA Guidelines are provided in Table B2 in Appendix B – Compliance with the CFA guidelines.

4.1.5 Landscape screening, on-site vegetation and fire breaks

The combination of grassland, the siting of the BESS and additional hardstanding and perimeter access roads provides the bases for fire hazard mitigation measures.

The areas of planted woodland are greater than 50 m from the proposed location of the BESS units. Therefore, heat flux from a fire within these woodland areas would not pose an ignition risk to the facility (noting that the structure is designed to withstand ember attack). Currently there is no provision for landscaping or screening vegetation within 100 m of the BESS. However, if through further consultation, screening is required on site, plantings should be located at a distance beyond 20 m and consider the CFA planting guidelines, utilising species that have low flammability.

Vegetation is predominately grassed paddocks. During the fire season, the surrounding grassed areas, at least to 100 m from the facility, are required to be maintained at a height no greater than 100 mm.

The CFA requirements related to vegetation management and firebreaks are outlined below in Section 4.3.1. Statements to address the requirements of Section 4.2.5 of the CFA Guidelines are included in Table B4 in Appendix B – Compliance with the CFA guidelines.

4.1.6 BESS Specific requirements

Facilities with BESSs must be designed with an ultimate goal of fire prevention. Facility design can reduce the potential for ignition and the consequences of fire should it occur. The CFA has acknowledged that battery technologies are continually evolving, and that not all BESS have the same level of fire risk.

Considerations for design of the Yangery BESS include:

- separation of batteries from other buildings, substations, site boundaries, access for emergency responders and vegetation
- access and firefighting water supply is not aligned to the prevailing wind direction
- provided with in-built detection and suppression systems
- provided with ember protection
- installed on a non-combustible surface
- protected from mechanical damage
- provided with enclosed wiring and buried cabling
- spill containment for fire water runoff.

These design requirements have been incorporated into the BESS. The layout, access and separation requirements are indicated in the site layout (Appendix A – Proposed site layout). Other key items for protection of the batteries at Yangery include:

- battery layout will include containment, fire detection and suppression systems
- non-combustible, floor to ceiling partition walls (thermal barriers between battery racks stacked modules) within battery containers will be considered during design and in consideration of battery technology selection

- fencing and battery containment barriers will be designed and installed to prevent mechanical damage to batteries.

Statements to address the requirements of Section 4.2.6 of the CFA Guidelines are included in Table B5 in Appendix B – Compliance with the CFA guidelines.

4.1.7 Peat

There is no identified presence of peat near or on the site. If identified there is the requirement of an exclusion zone of at least 10 m for the facilities infrastructure as the high carbon content decomposed vegetation is extremely difficult to extinguish.

4.1.8 Substation and transmission lines

All powerline infrastructure within the BESS site extent will be buried or on the surface in racks. All vegetation adjacent to and below above ground powerlines will be managed in accordance with National Industry standards.

4.2 Facility construction and commissioning requirements

During construction and commissioning phases, appropriate risk controls are to be implemented by construction and commissioning contractors. Construction Management Plans will further enforce safety requirements that must be adhered to while on site. In accordance with the CFA Guidelines for Renewable Energy Facilities during the construction phase a risk management process will be undertaken to identify risks and develop and implement controls. Risk controls will include the following:

- fire detection and suppression systems
- fire risk management
- personnel training
- development of an Emergency Management Plan for the construction and commissioning phase
- development of safe work procedures.

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4.3 Facility operations requirements

In accordance with Section 6.1 of the CFA Guidelines prior to commissioning, a Fire Management Plan must be developed. A Fire Management Plan should be based on sound risk management processes, documented in the draft Risk Management Plan (*Yangery BESS Risk Management Plan, Aurecon 2025*). A Fire Management Plan must be developed for the facility, in consultation with CFA, before development starts.

As the site has been identified as at-risk of bushfire (due to presence in a BPA), this must include prevention and preparedness activities as per Section 6.2.1 Bushfire and Grassfire Risk of the CFA Guidelines. The Fire Management Plan will also need to be regularly reviewed and updated, in accordance with Section 6.3 of the CFA Guidelines.

The below responses are for facility and operation requirements not specific to a Fire Management Plan.

4.3.1 Vegetation management

It is important that vegetation and fuel is managed effectively to reduce both the risk of fire entering the facility, as well as minimise the consequences of fire. Given that the BESS site is within a BPA, it is a priority to allow for fire risks to be managed for the duration of the operational life of the facility.

The current site is predominately grassed paddocks. Therefore, the primary management action is to maintain grass height during the fire danger period. Throughout the year, long grass should also be reduced

where possible, particularly if there is long grass in and adjacent to work areas that will utilise heavy equipment or machinery.

Additionally, during the fire danger period, restrictions should be adhered to, and it is recommended that vehicles, particularly maintenance vehicles and machinery, carry a fire-extinguisher.

Statements to address the requirements of Section 6.2.2 of the CFA Guidelines are included in Table B6 in Appendix B – Compliance with the CFA guidelines.

4.3.2 Facility and system monitoring

For facility infrastructure, particularly the BESS, it is safe practice to have appropriate monitoring systems in place that rapidly identify operational faults or equipment failures with the potential to ignite or propagate fire.

In the case of a facility or system failure, the Emergency Management Plan will identify the protocol and arrangements for such scenarios. For the BESS, these documents will be developed in consultation with Fire Rescue Victoria (FRV).

Statements to address the requirements of Section 6.2.2 of the CFA Guidelines are included in Table B7 in Appendix B – Compliance with the CFA guidelines.

4.3.3 Maintenance

The BESS is to include maintenance procedures that provide for facility infrastructure, equipment and vehicles to be maintained in safe, effective working order contributes to efficiency, reliability and importantly, fire safety. This includes for all required design measures and features provided in design to comply with standards and guidelines, which are to be serviced and inspected/maintained in accordance with manufacturer requirements.

Statements to address the requirements of Section 6.2.5 of the CFA Guidelines are included in Table B8 in Appendix B – Compliance with the CFA guidelines.

4.3.4 Arc Flash Hazard Management

The CFA Guidelines include requirements on controlling risks associated with arc flash hazards. This is beyond the scope of this assessment and should be considered further in the facility design.

4.3.5 Housekeeping

Housekeeping inspections are to be conducted at least three months and again one month prior to the Fire Danger Period and include all infrastructure, plant and equipment, facility access, vegetation management and security measures. These inspections should be included in the final Risk Management Plan for the facility, to be developed in accordance with CFA.

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5 Summary

This bushfire assessment confirms the Yangery BESS facility location is considered suitable for the siting of a BESS. The location has a low level of bushfire risk in relation to hazards adjoining the project area and in the wider landscape. The site is also easily accessible and the topography of the site is generally flat.

The location allows for key design requirements for separation of batteries from potential ignition sources and risks of thermal runaway and allows for separation of emergency access, water supply and other services. Water supply volume of the firefighting water tank is also to be confirmed. However, it is generally considered that the layout complies with the relevant objectives of the *Design Guidelines and Model Requirements: Renewable Energy Facilities* (CFA, 2023). Noting that there are some requirements of the CFA guidelines which will need further design and planning, therefore, these will be addressed when further design information is provided.

The design will incorporate appropriate fire detection and suppression systems and include fencing and battery containment barriers to prevent mechanical damage. Further consideration will be given to non-combustible, floor to ceiling partition walls (thermal barriers between battery racks stacked modules) within battery containers to further mitigate risk of fire spread through the facility.

While initial engagement with CFA has already occurred, further consultation with the CFA is required to confirm the acceptance of measures included in this assessment. Additionally, to comply with the CFA Guidelines, an Emergency Management Plan and Fire Management Plan should also be prepared prior to the planning application and in consultation with the CFA.

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6 References

Aurecon 2025, Yangery BESS Risk Management Plan. Aurecon, Melbourne, VIC.

CFA 2023, Guidelines for Renewable Energy Installations (Version 4), Community Infrastructure Department, State Infrastructure and Dangerous Goods Unit, Country Fire Authority (CFA).

DTP 2024, VicPlan. Government of Victoria, Department of Transport and Planning, Melbourne, Victoria, viewed 12th July 2024, <<https://mapshare.vic.gov.au/vicplan/>>

DTP 2024a, Victorian Planning Provisions. Government of Victoria, Department of Transport and Planning, Melbourne, Victoria, viewed 12th July 2024, < <https://planning-schemes.app.planning.vic.gov.au/Victoria%20Planning%20Provisions/ordinance>>

DPCD 2012, Regional Bushfire Planning Assessment – Barwon South West (then) Department of Planning and Community Development, Melbourne, Victoria.

National Fire Protection Association 2023, NFPA 855 - Standard for the Installation of Stationary Energy Storage Systems, Edition: 2023

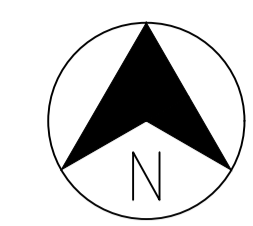
Standards Australia 2021, AS 2419.1-2018 Fire Hydrant Installations – System Design, Installation and Commissioning. Standards Australia, Sydney, NSW.

Standards Australia 2018, AS 3959:2018 Construction of buildings in bushfire-prone areas. Standards Australia, Sydney, NSW.

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Appendix A – Proposed site layout

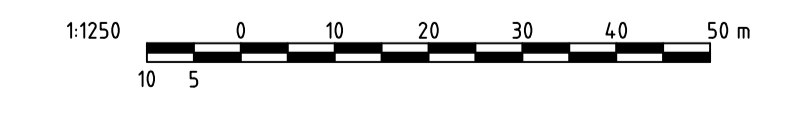
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- NOTES**
- ANY ELECTRONIC FILE IS PROVIDED WITHOUT WARRANTY AND SHOULD BE USED ONLY IN CONJUNCTION WITH THE SUPPLIED PDF/PAPER COPY OF THIS PLAN.
 - NO BOUNDARY SURVEY HAS BEEN UNDERTAKEN. BOUNDARIES SHOWN ARE FROM KMZ FILE ONLY AND ARE SUBJECT TO CONFIRMATION BY BOUNDARY SURVEY.
 - THE SURVEY HAS BEEN CONDUCTED USING AERIAL IMAGING. ACCURACY IS +/-50mm VERTICAL IN OPEN, HARD FLAT AREAS AND +/-150mm ON GROUND FEATURES IN OPEN, HARD FLAT AREAS.
 - SERVICES SHOWN ARE INDICATIVE ONLY. POSITIONS ARE BASED ON SURFACE INDICATOR(S) LOCATED DURING FIELD SURVEY. CONFIRMATION OF THE EXACT POSITION SHOULD BE MADE TO THE RELEVANT AUTHORITIES PRIOR TO ANY EXCAVATION WORK. OTHER SERVICES MAY EXIST WHICH ARE NOT SHOWN.
 - BUILDINGS HAVE BEEN PLOTTED FOR DIAGRAMMATIC PURPOSES ONLY.
 - MAPPING SYSTEM IS MGA/20CD-55 (ZONE 55, MGA 2020)
 - THE FIRE HYDRANT SYSTEM TO BE CONFIRMED WITH THE PROGRESS OF THE DESIGN
 - THE ROAD DESIGN TO BE CONFIRMED WITH THE PROGRESS OF THE DESIGN
 - REFER TO DRAWING EHV-YGB-EL-DR-0002 FOR OVERALL LAYOUT.
 - FINAL FIRE SERVICE ARRANGEMENT TO BE CONFIRMED WITH THE PROGRESS OF DETAILED DESIGN WITH THE BELOW POTENTIAL ARRANGEMENT FOR WATER TANKS:
 - OPTION 1**
 - A MINIMUM 576kl FIRE WATER SUPPLY, IN 2 INTERCONNECTED 288kl TANKS IN A SINGLE LOCATION, IN ACCORDANCE WITH AS2419.1 AND
 - A SINGLE FIRE HYDRANT SYSTEM IN ACCORDANCE WITH AS2419.1-2021 PROVIDES COVERAGE TO THE ENTIRETY OF BOTH (NORTH AND SOUTH) BESS AREAS.
 - OPTION 2**
 - A MINIMUM 576kl FIRE WATER SUPPLY, ACROSS TWO MIN 288kl LOCATIONS (EG 2x144kl INTERCONNECTED TANKS AT EACH OF THE NORTH AND SOUTH BESS AREAS) IN ACCORDANCE WITH AS2419.1-2021, ONE FOR EACH OF THE NORTH AND SOUTH BESS AREAS, PROVIDING FULL COVERAGE TO EACH AREA.

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- LEGEND**
- SWG BUILDING - DEMOUNTABLE BUILDING CONTAINING 33kV SWITCHGEAR & CONTROL EQUIPMENT
 - HV SWG - 66kV SWITCHGEAR
 - AUX TRFR - AUXILIARY TRANSFORMER
 - PTFR - 66/33kV POWER TRANSFORMER
 - GEN - DIESEL GENERATOR
 - RPC - 33kV REACTIVE POWER COMPENSATION EQUIPMENT
 - BESS - BATTERY ENERGY STORAGE SYSTEM
 - PCS - POWER CONVERSION SYSTEM
 - PH - PUMP HOUSE
 - O&M - OPERATIONS AND MAINTENANCE BUILDING
 - FENCE
 - ARTIFACT SCATTER
 - VEGETATION OUTSIDE YANGERY BESS PROJECT
 - SOUND WALL UP TO 8.0m



DRAWING STATUS
PRELIMINARY ISSUE

No	DESCRIPTION	DRAWN	CHKD	APPRD	DATE	DESCRIPTION	DRAWING No.
C	ISSUED FOR REVIEW	G.L.S.	K.R.G.	P.N.	08/01/26		
B	ISSUED FOR REVIEW	G.L.S.	K.R.G.	P.N.	18/12/25		
A	ISSUED FOR REVIEW	G.L.S.	K.R.G.	P.N.	10/12/25		

EHV CONSULTING AND DESIGN
POINT COOK VIC 3030 AUSTRALIA
ABN 74 675 402 447
Telephone: +61 3 9395 6713
Facsimile: +61 3 9395 6713
Email: info@ehvdesign.com.au
Web: www.ehvdesign.com.au

South Energy
LEVEL 35
360 COLLINS STREET
MELBOURNE
VIC 3000
AUSTRALIA
Telephone: +61 3 9067 2673
Email: info@southernenergy.com.au
Web: www.southernenergy.com.au

DRAWING TITLE
YANGERY BESS 120MW COLLECTOR STATION & BESS PROPOSED CONSTRUCTION SITE PLAN

DESIGN	G.L.SMITH	DRAWN	G.L.SMITH	DATE	10/12/25
A1 SCALE	1:1250	CAD FILE	EHV-YGB-EL-DR-0011	FOLDER	YGB
DRAWING NUMBER	EHV-YGB-EL-DR-0011	SHEET NUMBER	1	OF	1
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Appendix B – Compliance with the CFA guidelines

Emergency vehicle access

Section 4.2.1 of the *CFA Guidelines for Renewable Energy Facilities* (CFA 2022) states all battery infrastructure is located as such that it is directly accessible to emergency responders. The CFA Guidelines for Renewable Energy Facilities also detail requirements to move across the site by emergency response vehicles.

Details of compliance and internal access requirements are provided in Table B1 below.

Table B1 CFA emergency vehicle access requirements

CFA Guideline requirement	Compliance can be achieved	Note
<i>Construction of a four (4) metre perimeter road within the ten (10) metre perimeter fire break.</i>	✓	A 10 m firebreak will be included around the perimeter of the BESS and substation area. A 5 m perimeter road has been included in this area.
<i>Roads must be of all-weather construction and capable of accommodating a vehicle of fifteen (15) tonnes</i>	✓	During detailed design these surface and load requirements will be included, with minimum CFA standards to be met.
<i>Constructed roads should be a minimum of four (4) metres in trafficable width with a four (4) metre vertical clearance for width of the formed road surface.</i>	✓	Access roads will be built to these specifications. Vertical clearance should be achieved as there are no proposed enclosed areas on the perimeter roads and there is no existing or proposed tree vegetation along the access routes.
<i>The average grade should 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 nor more than (50) metres.</i>	✓	The site itself is relatively flat with some undulations. Some earthworks may be required to manage changes in grade.
<i>Dips in the road should have no more than a 1 in 8 (12.5% or a 7.1°) entry and exit angle.</i>	✓	As above there is some topography change across the site, however, it's unlikely there will be any unsafe dips in the road.
<i>Roads must incorporate passing bays at least every 600 metres, which must be at least twenty (20) metres long and have a minimum trafficable width of six (6) metres. Where roads are less than 600 metres long, at least one passing bay must be incorporated.</i>	✓	At least one passing bay will be incorporated into the perimeter track design during concept design. The site has adequate spacing to meet this requirement.
<i>Road networks must enable responding emergency services to access all areas of the facility, including fire service infrastructure, building, and battery energy storage system and related infrastructure.</i>	✓	The road networks to the site provide adequate access for emergency vehicles via Conns Lane and Tower Hill Road, which are sealed two-way roads that can accommodate large vehicles. On site, a series of access roads will be included to the BESS areas and between the northern BESS area and the substation area.
<i>The provision of at least two (2) but preferably more access points to the facility, to ensure safe and efficient access to and egress from areas that may be impacted or involved in fire. The number of access points must be informed through a risk management process.</i>	✓	Two access points are proposed, one off Conns Lane and one off Tower Hill Road.

CFA Guideline requirement	Compliance can be achieved	Note
<i>At least two access points are to be provided into each section where battery energy storage systems are located. The number and location of vehicle access points must be determined in consultation with CFA.</i>	✓	As above.

Firefighting water supply

Section 4.2.2 of the CFA Guidelines state that sufficient water must be available and safely accessible to emergency responders and trucks to enable fire suppression activities that are safe, timely, effective and not hindered in any way. Compliance with the requirements are detailed in Table B2 below.

Table B2 CFA firefighting water supply and fire protection requirements

CFA Guideline requirement	Compliance can be achieved	Note
<p><i>Water access point must be clearly identifiable and unobstructed to ensure efficient access.</i></p> <p style="text-align: center;">ADVERTISED PLAN</p>	✓	<p>The current design includes four firewater storage tanks, two per BESS unit, with access tracks surrounding both locations. The final arrangement of firefighting equipment will be confirmed as the detailed design progresses, with the following potential options as recommended by CFA during initial engagement currently under consideration:</p> <p><u>Option 1</u></p> <ul style="list-style-type: none"> a minimum 576 kilolitre (kL) fire water supply, in 2 interconnected 288 kL tanks in a single location, in accordance with Australian Standards AS 2419.1-2021 <i>Fire Hydrant Installations – System Design, Installation and Commissioning</i> (AS 2419.1-2021) (Standards Australia, 2021), and <p><u>Option 2</u></p> <ul style="list-style-type: none"> a minimum 576 kL fire water supply, across two min. 288 kL locations (e.g., 2 x 144 kL interconnected tanks at each of the north and south BESS areas) in accordance with AS 2419.1.
<p><i>Static water storage tank installations must comply with AS 2419.1-2005: Fire hydrant installations – System design, installation, and commissioning</i></p>	✓	<p>The final arrangement of firefighting equipment will be confirmed as the detailed design progresses, with the following potential options currently under consideration:</p> <p><u>Option 1</u></p> <ul style="list-style-type: none"> a single fire hydrant system in accordance with AS 2419.1-2021 that provides coverage to the entirety of both (north and south) BESS areas. <p><u>Option 2</u></p> <ul style="list-style-type: none"> two separate fire hydrant systems in accordance with AS 2419.1-2021, one for

CFA Guideline requirement	Compliance can be achieved	Note
		each of the north and south BESS areas, providing full coverage to each area.
<i>The static water storage tank(s) must be an above-ground water tank constructed of concrete or steel.</i>	✓	TBC what material will be used for the tanks.
<i>The static water storage tank(s) must be capable of being completely refilled automatically or manually within 24 hours.</i>	✓	The water storage tank will be designed to meet minimum volume requirements.
<i>The static water storage tank(s) must be located at vehicle access points to the facility and must be positioned at least ten (10) metres from any infrastructure.</i>	✓	The proposed water storage tanks have been located beyond the 10 m firebreak and positioned between the BESS storage area and the substation for the northern BESS unit.
<p><i>The hard-suction point must be provided, with a 150mm full bore isolation valve, equipped with a Storz connection, sized to comply with the required suction hydraulic performance.</i></p> <p><i>Adapters that may be required to match the connection are: 125mm, 100mm, 90mm, 75mm, 65mm Storz tree adapters with a matching blank end cap to be provided.</i></p> <p><i>The hard-suction point must be positioned within four (4) metres to a hardstand area and provide a clear access for emergency services personnel.</i></p> <p><i>An all-weather road access and hardstand must be provided to the hard-suction point. The hardstand must be maintained to a minimum of 15 tonne GVM, eight (8) metres long and six (6) metres wide or to the satisfaction of the CFA.</i></p> <p><i>The road access and hardstand must be kept clear at all times.</i></p> <p><i>The hard-suction point must be protected from mechanical damage (e.g. bollards) where necessary.</i></p>	✓	<p>These design requirements will be included in the water storage tank.</p> <p>Access roads have been provided as per requirements in Table B1. There is sufficient room for a hardstand to be provided adjacent to the water storage tank.</p>
<i>Where the access road has one entrance, a eight (8) metre radius turning circle must be provided at the tank.</i>	N/A	The access has more than one entrance and access to the water storage tanks. However, there is sufficient room for a turning circle to be incorporated into the road network.
<i>An external water level indicator must be provided to the tank and be visible from the hardstand</i>	✓	To be provided.
<i>Signage indicating 'FIRE WATER' and the tank capacity must be fixed to each tank.</i>	✓	To be provided.
<i>Signage must be provided at the front entrance to the facility, indicating the direction to the static water tank.</i>	✓	To be provided.
<p><i>For facilities with battery energy storage system, the fire protection system must include at a minimum:</i></p> <p><i>a) Where no reticulated water is available, a fire hydrant system that complies with AS 2419.1-2021 must be provided:</i></p> <p><i>The fire water supply must be of a quantity no less than 288,000L or as per the provisions for Open Yard Protection of AS 2419.1-2005</i></p>	✓	<p>The current design includes four firewater storage tanks, two per BESS unit. The final arrangement of firefighting equipment will be confirmed as the detailed design progresses, with the following potential options as recommended by CFA during initial engagement currently under consideration:</p> <p><u>Option 1</u></p>

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CFA Guideline requirement	Compliance can be achieved	Note
<p><i>flowing for a period of no less than four hours at 20L/s, whichever is the greater.</i></p> <p>i. <i>The fire water supply must be of a quantity no less than 288,000L or as per the provisions of AS 2419.1-2021: Fire hydrant installations, Table 2.2.5(D) for open yards flowing for a period of no less than four hours at 20L/s, whichever is the greater.</i></p> <p>ii. <i>The quantity of static fire water storage is to be calculated from the number of hydrants required to flow from AS 2419.1-2021: Fire hydrant installations, Table 2.2.5(D). (E.g., For battery installations with an aggregate area of over 27,000m², 4 (four) hydrant outlets are required to operate at 10L/s for four hours, which equates to a minimum static fire water supply of 576kL.)</i></p> <p>iii. <i>Fire hydrants must be provided and located so that every part of the battery energy storage system is within reach of a 10m hose stream issuing from a nozzle at the end of a 60m length of hose connected to a fire hydrant outlet.</i></p> <p>iv. <i>The fire water supply must be located at vehicle entrances to the facility, at least 10m from any infrastructure (electrical substations, inverters, battery energy storage systems, buildings).</i></p> <p>v. <i>The fire water supply must be reasonably adjacent to the battery energy storage system and shall be accessible without undue danger in an emergency. (E.g., Fire water tanks are to be located closer to the site entrance than the battery energy storage system).</i></p> <p>vi. <i>The fire water supply must comply with AS2419.1-2021: Fire hydrant installations, Section 5: Water storage tanks.</i></p>		<ul style="list-style-type: none"> ■ a minimum 576 kilolitre (kL) fire water supply, in 2 interconnected 288 kL tanks in a single location, in accordance with Australian Standards AS 2419.1-2021 <i>Fire Hydrant Installations – System Design, Installation and Commissioning</i> (AS 2419.1-2021) (Standards Australia, 2021), and ■ a single fire hydrant system in accordance with AS 2419.1-2021 that provides coverage to the entirety of both (north and south) BESS areas. <p><u>Option 2</u></p> <ul style="list-style-type: none"> ■ a minimum 576 kL fire water supply, across two min. 288 kL locations (e.g., 2 x 144 kL interconnected tanks at each of the north and south BESS areas) in accordance with AS 2419.1, and ■ two separate fire hydrant systems in accordance with AS 2419.1-2021, one for each of the north and south BESS areas, providing full coverage to each area.

Fire detection and suppression systems

The 2023 CFA Guidelines for Renewable Energy Facilities note the need for additional fire detection and suppression to be available within facilities. This includes first-aid fire protection equipment such as fire extinguishers. such as Responses to design requirements as outlined in Section 4.2.3 Fire Detection and Suppression Equipment of the CFA Guidelines for Renewable Energy Facilities are included in Table B3, below.

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Table B3 Fire detection and suppression equipment requirements (CFA, 2023)

Section 4.2.3 requirement	Compliance can be achieved	Response
<p><i>Suitable fire detection and suppression equipment must be provided:</i></p> <p><i>a) For on-site buildings and structures, according to the requirements of the National Construction Code.</i></p> <p><i>b) For storages of dangerous goods, according to the requirements of any Australian Standards for storing and handling of dangerous goods.</i></p> <p><i>c) For electrical installations, a minimum of two (2) suitable fire extinguishers must be provided within 3m-20m of each PCU.</i></p>	✓	<p>Fire detection and suppression equipment in accordance with the National Construction Code will be provided for the control room/switch room building. To be specified in the detailed design.</p> <p>Requirements for the storage of dangerous goods are provided in the Risk Management Plan for the project (<i>Yangery BESS Risk Management Plan, Aurecon 2025</i>)</p> <p>Appropriate fire extinguishers will be provided on site within the specified distance of each PCU. To be specified in the detailed design.</p>
<p><i>In all vehicles and heavy equipment, each vehicle must carry at least a nine (9)-litre water stored-pressure fire extinguisher with a minimum rating of 3A, or other firefighting equipment as a minimum when on-site during the Fire Danger Period.</i></p>	N/A	<p>During operation, there will be very few vehicles accessing the BESS beyond routine maintenance. However, all vehicles on-site during the fire danger period will carry appropriate firefighting equipment.</p>

Landscape screening, on-site vegetation and fire breaks

The requirements of Section 4.2.4 and Section 4.2.5 of the CFA Guidelines are summarised in Table B4 below.

Table B4 CFA landscape screening, on-site vegetation and fire breaks requirements

CFA Guideline requirement	Compliance can be achieved	Note
Landscape Screening and On-Site Vegetation		
<p><i>Any vegetation, proposed or existing, must be considered in the Risk Management Plan for its potential to intensify and propagate fire within and away from the site.</i></p>	✓	<p>This initial assessment shows existing vegetation on site poses a relatively low risk as it is grass, with two patches of woodland greater than 50 m from the BESS site. Furthermore, there is currently no proposal for any new or screening vegetation to be included on site.</p>
<p><i>Where landscape screening is required, for example, to screen visual impacts or to prevent visual glare from a solar energy facility, the design must consider any potential increase in fire risk due to the type (species), density, height, location and overall width of the screening.</i></p>	N/A	<p>Additional landscape screening is not proposed.</p>
<p><i>Facilities must be designed so that the radiant heat flux (output) from vegetation does not create the potential for ignition of on-site infrastructure or other vegetation.</i></p>	✓	<p>Existing vegetation on site poses a relatively low risk as it is grass. Grassed areas will be maintained below 100 mm height during the Fire Danger Period.</p> <p>The two patches of woodland are greater than 50 m from the BESS site and pose minimal risk in terms of heat flux. However, it is noted that the facility will be built and designed with ember protection.</p>

CFA Guideline requirement	Compliance can be achieved	Note
<p><i>Radiant heat impact leading to ignition may be mitigated through:</i></p> <ul style="list-style-type: none"> ■ <i>Vegetation removal (where permitted).</i> ■ <i>Separation from nearby infrastructure (e.g., fire breaks; refer below).</i> ■ <i>The provision of thermal barriers at nearby infrastructure.</i> ■ <i>Other means in consultation with FVR.</i> 	✓	<p>The BESS has been positioned in low-risk area and there is sufficient space in between the BESS facility and existing wooded vegetation types to manage risk without removing vegetation. In addition, the BESS will be situated on non-combustible hard standing to further prevent a fire run.</p> <p>A 10 m fire break has been allowed for around the perimeter of the site.</p> <p>The battery design will incorporate appropriate separation in the layout and consider inclusion of concrete barriers.</p>
<p><i>Consultation with CFA is required regarding landscape screening in high-risk environments.</i></p>	✓	<p>This initial assessment has found the landscape is of relatively low risk. Currently, there is no proposal to include screening vegetation.</p>
Fire Breaks		
<p><i>A fire break must be established and maintained around:</i></p> <p>a) <i>The perimeter of the facility, commencing from the boundary of the facility or from the vegetation screening inside the property boundary.</i></p> <p>b) <i>The perimeter of control rooms, electricity compounds, substations and all other buildings on-site.</i></p>	✓	<p>A 10 m fire break is included in the site layout around the battery storage area and separate substation and car parking area. No screening vegetation is proposed.</p>
<p><i>The width of fire breaks must be a minimum of 10m, and at least the distance where radiant heat flux (output) from the vegetation does not create the potential for ignition of on-site infrastructure.</i></p>	✓	<p>The design and siting of the BESS will consider radiant heat; however, this is low risk due to grassed areas within 100 m of the BESS. Grass will be maintained to a height of 100 mm during the fire danger period to reduce risk of radiant heat from a grass fire.</p> <p>A 10 m wider perimeter fire break will be included in the site layout.</p>
<p><i>Where screening or other vegetation is a width of 20m or less (open density as per AS 3959-2018), or 15m or less (closed density as per AS 3959-2018), a fire break of 10m may be appropriate to prevent radiant heat from vegetation fully involved in fire becoming an ignition source for on-site infrastructure.</i></p> <p><i>Outside of these parameters, separation must be at least the distance where radiant heat flux (output) from the vegetation does not create the potential for ignition of on-site infrastructure.</i></p>	✓	<p>A 10 m wide perimeter fire break will be included in the site layout as there are only grassed areas surrounding the BESS.</p>
<p><i>Fire breaks must be:</i></p> <ul style="list-style-type: none"> ■ <i>Non-combustible, constructed of concrete, mineral earth or non-combustible mulch such as crushed rock.</i> ■ <i>Free of vegetation and obstructions at all times. No plant or equipment of any kind is to be stored in fire breaks.</i> 	✓	<p>Specification such as these standards and safety requirements will be a mandatory requirement for operation of the BESS.</p>

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CFA Guideline requirement	Compliance can be achieved	Note
<i>A fire break must be established and maintained around battery energy storage systems and related infrastructure</i>	✓	The fire break will be maintained around the BESS facility.
<i>In addition to radiant heat flux (output) from vegetation, the width of fire breaks between vegetation and battery energy storage systems must be at least the distance where the radiant heat flux (output) from the battery energy storage system fully involved in fire does not create the potential for ignition of vegetation.</i>	✓	The design and siting of the BESS will consider radiant heat; however, this is low risk due to grassed areas within 100 m of the BESS. Grass will be maintained to a height of 100 mm during the fire danger period to reduce risk of radiant heat from a grass fire. A 10 m wide perimeter fire break is included in the site layout.

BESS Specific requirements

Facilities with battery energy storage systems must be designed with an ultimate goal of fire prevention. Facility design can reduce the potential for ignition and the consequences of fire should it occur. Responses to design requirements as outlined in Section 4.2.6 Design Specific to Facility Type of the CFA Guidelines are included in Table B5 below.

Table B5 CFA BESS Requirements

CFA Guideline requirement	Compliance can be achieved	Note
<p><i>The design of the facility must incorporate:</i></p> <p>a) <i>A separation distance that prevents fire spread between battery containers/enclosures and:</i></p> <ul style="list-style-type: none"> ■ <i>Other battery containers/enclosures.</i> ■ <i>On-site buildings.</i> ■ <i>Substations.</i> ■ <i>The site boundary.</i> ■ <i>Any other site buildings.</i> ■ <i>Vegetation.</i> <p><i>Separation must be at least the distance where the radiant heat flux (output) from a battery energy storage system container/enclosure fully involved in fire does not create the potential for ignition of these site elements.</i></p>	✓	<p>At present, the site itself is considered low risk give the composition of the site and space for the development to allow for adequate separation distances.</p> <p>The site administrative buildings and car parks will be built with adequate separation from the battery farm and adequate fire mitigation equipment and evacuation points will be in place.</p> <p>Battery layout will comply with NFPA 855 (NFPA 2023) which outlines battery separation, containment, fire detection and suppression systems and explosion control system requirements.</p> <p>Non-combustible, floor to ceiling partition walls (thermal barriers between battery racks stacked modules) within battery containers will be considered.</p>

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CFA Guideline requirement	Compliance can be achieved	Note
<p>b) <i>A fire break around the battery energy storage system and related infrastructure, of a width of no less than 10m, or greater where determined in the Risk Management Plan.</i></p> <p><i>Fire breaks must be non-combustible, constructed of concrete, mineral earth or non-combustible mulch such as crushed rock.</i></p> <p><i>The width must be calculated based on the ignition source being radiant heat of surrounding vegetation, including landscaping.</i></p>	✓	<p>Due to lack of surrounding wooded vegetation, a 10 m wide firebreak is incorporated into the site layout. The design of the fire break will comply with these requirements.</p>
<p>c) <i>A layout of site infrastructure that:</i></p> <ul style="list-style-type: none"> ■ <i>Considers the safety of emergency responders.</i> ■ <i>Minimises the potential for grassfire and/or bushfire to impact the battery energy storage system.</i> ■ <i>Minimises the potential for fires in battery containers/enclosures to impact on-site and offsite infrastructure.</i> 	✓	<p>The access track around the site should provide safe movement to and from the site for emergency responders. Access tracks in between the BESS enclosures and substation area and car parking will allow access across the site.</p> <p>In addition, the BESS configuration will be at a safe distance to minimise risk of radiant heat flux therefore reducing risk to emergency responders on site. Signage around the facility will help emergency responders navigate the site and access to water supply.</p> <p>Grass will be maintained to 10 cm or less as per the CFA Guidelines.</p>
<p><i>Battery energy storage systems must be:</i></p> <p>a) <i>Located so as to be reasonably adjacent to a site vehicle entrance (suitable for emergency vehicles).</i></p>	✓	<p>There are two access points into the site off of Conns Lane and Tower Hill Road which will provide direct access to the BESS perimeter access roads and will allow large vehicles to access the site safely.</p>
<p>b) <i>Located so that the site entrance and any fire water tanks are not aligned to the prevailing wind direction (therefore least likely to be impacted by smoke in the event of fire at the battery energy storage system.)</i></p>	✓	<p>The water tanks have been located on western side of the northern BESS unit and on the northern side of the southern BESS unit, with access tracks surrounding both locations.</p> <p>The two site entrance points from the north and west are positioned such that they do not align with the prevailing north-westerly winds. Therefore, smoke from the BESS units is unlikely to affect these locations, as south-easterly winds are uncommon.</p>
<p>c) <i>Provided with in-built detection and suppression systems. Where these systems are not provided, measures to effectively detect and/or suppress fires within containers must be detailed within the Risk Management Plan.</i></p>	✓	<p>The BESS will be equipped with a Battery Management System.</p> <p>Battery layout will comply with NFPA 855 (NFPA 2023) which outlines battery separation, containment, fire detection and suppression systems and explosion control system requirements.</p>
<p>d) <i>Provided with explosion prevention via sensing and venting, or explosion mitigation through deflagration panels.</i></p>	TBC	<p>TBC. This will be considered during design development.</p>

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CFA Guideline requirement	Compliance can be achieved	Note
e) <i>Provided with suitable ember protection to prevent embers from penetrating battery containers/enclosures.</i>	✓	Ember protection management and technology to minimise penetration can be incorporated into the design and installation.
f) <i>Provided with suitable access roads for emergency services vehicles, to and within the site, including to battery energy storage system(s) and fire service infrastructure.</i>	✓	The two access roads will be provided and constructed to CFA standards.
g) <i>Installed on a non-combustible surface such as concrete.</i>	✓	The BESS will be constructed on a non-combustible surface to provide hardstanding and reduce fire risk.
h) <i>Provided with adequate ventilation.</i>	✓	Adequate ventilation will be included in detailed design.
i) <i>Provided with impact protection to at least the equivalent of a W guardrail-type barrier, to prevent mechanical damage to battery containers/enclosures.</i>	✓	Fencing and battery containment barriers to be designed as per NFPA 855 (NFPA 2023) to prevent mechanical damage to batteries.
j) <i>Provided with enclosed wiring and buried cabling, except where required to be above-ground for grid connection.</i>	✓	The connection from the proposed 66 kV powerline to connect the BESS units to the proposed transformers will be enclosed or buried depending on the final configuration. Where practicable, wiring will be enclosed.
k) <i>Provided with spill containment that includes provision for management of fire water runoff.</i>	✓	Appropriate spill containment has been incorporated into the site layout.

Vegetation management

It is important that vegetation and fuel is managed effectively at the Yangery BESS to reduce both the risk of fire entering the facility, as well as minimise the consequences of fire below outlines how these can be achieved. Responses to design requirements as outlined in Section 6.2.2 of the CFA Guidelines for are included in Table B6, below.

Table B6 CFA vegetation and fuel management requirements

CFA Guideline requirement	Compliance can be achieved	Note
<i>Facility operators must undertake the following measures during the Fire Danger Period:</i>	✓	Grasses will be maintained at or below 100 mm during the Fire Danger Period to at least 100 m from the BESS.
a) <i>Grass must be maintained at or below 100mm in height during the declared Fire Danger Period.</i>		
b) <i>Long grass and/or deep leaf litter must not be present in areas where heavy equipment will be working, during construction or operation.</i>	✓	Management of long grass and deep leaf litter will be in accordance with CFA guidelines.
c) <i>Restrictions and guidance must be adhered to during the Fire Danger Period, days of High (and above) fire danger and Total Fire Ban days (refer to www.cfa.vic.gov.au).</i>	✓	Activities during Fire Danger Period, days of high (and above) fire danger and Total Fire Ban days will be restricted on site and any permits required sought from FVR.

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CFA Guideline requirement	Compliance can be achieved	Note
<i>Containers/enclosures and infrastructure for battery energy storage systems must be maintained to be clear of vegetation, including grass, for at least ten (10) metres on all sides, or greater as informed by the Risk Management Plan</i>	✓	A 10 m fire break has been incorporated into the site layout.

Facility and system monitoring

For facility infrastructure it is safe practice to have appropriate monitoring systems in place that rapidly identify operational faults or equipment failures with the potential to ignite or propagate fire.

In the case of a facility or system failure, the Emergency Management Plan will identify the protocol and arrangements for such scenarios. For the Yangery BESS, these documents will be developed in consultation with FVR.

Responses to design requirements as outlined in Section 6.2.4 Maintenance of the CFA Guidelines are included in Table B7, below.

Table B7 CFA facility and system monitoring requirements

CFA Guideline requirement	Compliance can be achieved	Note
<p><i>For battery energy storage systems, appropriate monitoring and intervention measures must be provided to ensure that the following are rapidly identified and notified to 000 immediately:</i></p> <ul style="list-style-type: none"> ■ <i>Any shorts, faults, temperature increases above normal parameters (eg. precursor to thermal events/runaway).</i> ■ <i>Equipment failures with the potential to ignite or propagate fire.</i> ■ <i>Off-gassing, smoke or fire.</i> 	✓	<p>Battery facilities must provide specifications for safe operation and safety information relevant to the operation of the Yangery BESS is to be stored on site at the facilities entrance and is to be easily accessible to responding firefighting resources</p> <p>Ongoing monitoring will be undertaken to identify emerging risks from the operation of the BESS and the Emergency Management Plan updated if required. This will be prepared in consultation with CFA.</p>
<i>The provision for direct alarm monitoring to the fire brigade for battery energy storage system automatic detection systems must be considered.</i>	✓	The proposed BESS seeks to install fire detection equipment. This will be detailed in the Emergency Management Plan.

Maintenance

Maintenance contributes to efficiency, reliability and importantly, fire safety within the facility. Responses to design requirements as outlined in Section 6.2.5 Maintenance of the CFA Guidelines are included in Table B8, below.

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Table B8 CFA maintenance requirements

CFA Guideline requirement	Compliance can be achieved	Note
<p><i>Inspection, maintenance and any required repair activities must be conducted for all infrastructure, equipment and vehicles at the facility. Maintenance must be in line with any relevant Australian Standards and the manufacturer's requirements.</i></p>	<p>✓</p>	<p>Regular inspections will check for any signs of mechanical damage to the external containers/enclosures as well as any accumulation of combustible materials inclusive of leaf litter in or within ten metres of any BESS and related infrastructure. The BESS facility must be serviced and maintained as per the manufacturer's requirements</p>
<p><i>Battery energy storage systems, including the battery management system and any associated safety systems, must be regularly serviced to the manufacturer's specifications.</i></p>	<p>✓</p>	<p>The BESS is to be serviced and maintained as per the manufacturer's requirements.</p>
<p><i>A procedure, including a schedule and relevant personnel accountabilities, must be developed in relation to the inspection of battery energy storage systems.</i></p>	<p>✓</p>	<p>A BESS procedure including a schedule and relevant personnel accountabilities in relation to regular inspections is to be developed. This will be stored onsite and easily accessible.</p>
<p><i>Battery energy storage systems are to be regularly inspected for:</i></p> <ul style="list-style-type: none"> ■ <i>Any signs of mechanical damage to the external containers/enclosures.</i> ■ <i>Any accumulation of combustible materials (including leaf litter) in or within ten (10) metres of any battery energy storage systems and related infrastructure.</i> <p><i>Any identified issues must be immediately rectified.</i></p>	<p>✓</p>	<p>The BESS is to be regularly inspected to check for any signs of mechanical damage to the external containers/enclosures as well as any accumulation of combustible materials inclusive of leaf litter in or around any BESS and related infrastructure.</p>

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Document prepared by

Aurecon Australasia Pty Ltd

ABN 54 005 139 873

Aurecon Centre

Level 8, 850 Collins Street

Docklands, Melbourne VIC 3008

PO Box 23061

Docklands VIC 8012

Australia

T +61 3 9975 3000

F +61 3 9975 3444

E melbourne@aurecongroup.com

W aurecongroup.com

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