

Bushfire Management Plan

Baru Marnda Renewable Energy Project

terravias

Bushfire Management Plan

Baru Marnda Renewable Energy Project

Document No:
A25.371-RPT-BMP_0_FINAL

Issue Date:
25 Sep 2026

Status:
Final

Prepared For:
Yindjibarndi Energy Corporation

Prepared by:
Terravias
terravias.com.au

INTERNAL REVIEW

Author	Reviewed by	Approved by
Beau Eaton Senior Bushfire Consultant 25-Sep-2026	**Daniel Panickar** Senior Principal 25-Sep-2026	**Daniel Panickar** Senior Principal 25-Sep-2026

REGISTER OF AMENDMENTS

Date	Version	Status	Prepared	Approved	Issued To
21-Sep-2026	A	Draft	Beau Eaton	Daniel Panickar	Shane Durlik
25-Sep-2026	0	Final	Beau Eaton	Daniel Panickar	Neil de Tisi

TERRAVIAS DISCLAIMER STATEMENT

Copyright Statement

© Terravias Pty Ltd (Terravias). The content and layout of this Deliverable are subject to copyright owned by Terravias, except to the extent that copyright has been legally assigned or licenced to Terravias. It is provided in confidence. The Deliverable must not be copied, reproduced, transmitted or distributed without Terravias' prior written consent. It may only be used for the purpose for which it was prepared.

This Deliverable has been prepared by Terravias at the instruction of and for the sole use of Client, for the specific purpose for which it was prepared. It is subject to Client's instructions, supplied information and budgetary constraints. It must not be used or relied upon by any other person or for any other purpose without Terravias' prior written consent. To the extent permitted by law, Terravias accepts no liability to any person other than Client in connection with this Deliverable.

This Deliverable is based on conditions observed, information provided or reasonably available and assumptions reasonably made at the time of preparation. Environmental conditions, site circumstances and regulatory requirements may change over time, and Terravias accepts no responsibility for any such changes occurring after the date of this report.

Approval decisions are made by relevant authorities and are outside Terravias' control. No warranty or guarantee is given that any application or proposal will be approved, or as to the timing or conditions of any approval.

This Deliverable is intended to inform business and operational decision-making. Client must determine whether to act on the recommendations given, and should obtain independent legal, financial or other professional advice as appropriate.

Bushfire behaviour is inherently unpredictable and influenced by factors outside of Terravias' control, including weather, fuel conditions, topography, construction standards and maintenance. Because of this, where Terravias' services include bushfire planning, management and mitigation measures, Terravias does not warrant or guarantee that any recommended measures will prevent or mitigate damage to buildings or infrastructure or prevent personal injury or death. Terravias excludes all liability for loss or damage arising from bushfire events.

Terravias is not responsible for the implementation of any recommendations contained in this Deliverable, or for any construction, remediation or operational activities carried out by others.

Executive Summary

Project Overview and Location

Yindjibarndi Energy Corporation (YEC) is proposing the development of the Baru Marnda Renewable Energy Project, located approximately 50 km south of Karratha in the Pilbara region of Western Australia. The Project covers an area of approximately 26,200 ha and includes:

- 108 wind turbine generators.
- Two proposed solar farms.
- Two Battery Energy Storage Systems (BESS).
- Two electrical substations - located either within or nearby the BESS footprints.
- One Site Office.
- Five satellite offices.
- Two Operations and Maintenance Facilities.
- Access roads.

Bushfire Context and Framework

Given the isolated and undisturbed nature of the Project, the entire Project Footprint and proposed assets occur in a designated bushfire prone area (Area 2) as per the *Western Australia State Map of Bush Fire Prone Areas* (DFES, 2024; Figure 1.2).

This typically triggers bushfire planning requirements under *State Planning Policy 3.7 Bushfire* (SPP 3.7; WAPC, 2024a) and reporting to accompany submission of the DA in accordance with the associated *Planning for Bushfire Guidelines* (the Guidelines; WAPC, 2024b). However, renewable energy facilities are not specifically captured under the current version of SPP 3.7.

Accordingly, each asset has been assessed against the planning framework considered most appropriate to its infrastructure type. Where WA-specific guidance is not yet available, assessment has been undertaken against the Victorian renewable energy facilities guidelines (adapted by Terravias to reflect relevant WA regulatory framework) to demonstrate adequate consideration of bushfire risk. The planning frameworks consulted in this report include:

- *Planning for Bushfire Guidelines* (WAPC, 2024b) - for habitable buildings including offices and operations and maintenance facilities.
- *Draft Renewable Energy Planning Code and Guidelines* (Draft Code; WAPC, 2025) - for wind turbines.
- *Position Statement: Renewable Energy Facilities* (Renewables Statement; DPLH & WAPC, 2020) - for solar arrays.
- *Design Guidelines and Model Requirements for Renewable Energy Facilities Version 4* (CFA Guidelines; State of Victoria, 2023) - for BESS and substations.

Bushfire Assessment Results

Radiant Heat Flux: The Project has adopted a 29 kW/m^2 radiant heat flux threshold (BAL-29) for wind turbines and habitable buildings in accordance with the Draft Code and the Guidelines. A 10 kW/m^2 radiant heat flux threshold at a flame temperature of 1090 K has been adopted as best practice for siting BESS and substations. A minimum 10 m separation to combustible vegetation has been applied for solar arrays, in compliance with the bushfire mitigation advice from the Renewables Statement.

Bushfire Attack Level (BAL): Post-development, wind turbines and habitable buildings will be subject to BAL ratings ≤BAL-29. Substations and BESS will be subject to a radiant heat flux threshold of 10 kW/m^2.

Asset Protection Zones (APZs): These zones will be established around infrastructure to ensure the radiant heat flux does not exceed BAL-29 for wind turbines and buildings, and a radiant heat flux threshold of 10 kW/m^2 for BESS and substations. APZs will be established to a minimum width of 10 m for solar arrays. APZs also serve as exclusion zones for future built assets and indirectly assist in meeting firebreak requirements under the Draft Code and CFA Guidelines.

Key Mitigation Measures

The BMP proposes comprehensive measures to mitigate bushfire risks. These include:

- **Asset Protection Zones (APZs):** Sufficient APZs will be established and managed in perpetuity in a low fuel state around all wind turbines, substations, and buildings in bushfire prone areas.
- **Emergency Vehicle Access:** Internal access tracks will have a minimum width of 7 meters and include turnaround heads to accommodate Type 3.4 firefighting appliances. At least two access points are provided to each part of the Project Footprint including substations, BESS, buildings, and groups of wind turbines.
- **Firefighting Water Supply:**
    - Seven (7) static firefighting water tanks provided in accordance with the Draft Code, plus an additional twelve (12) recommended 45 kL water tanks to service the wind turbines.
    - Multiple water tanks to service the eight habitable buildings. Each building will contain 10 kL water tanks for every 1,500 m^2 of floor space (up to 50 kL). The floor spacing for each building will be confirmed during detailed design.
    - Fifteen (15) 45 kL water tanks to service the two solar farms.
    - Multiple water tanks amounting to a total volume of 2,016,000 L for the two BESS.
- **Fire and Emergency Support Equipment**: Measures such as power disconnection, fire and lightning detection, and aviation obstacle lighting to be considered at detailed design.
- **Emergency Procedures and Management Plans:** Commitments to prepare operation and maintenance plans prior to occupation for the operation phase of the wind farm. As per the Draft Code, it is recommended an Emergency Management Plan is prepared in accordance with the Bushfire Emergency Plan Manual (WAPC, 2024).

Conclusion

The Project satisfies the intent, aim, and objectives of SPP 3.7 and the Planning for Bushfire Guidelines, while also addressing the relevant requirements of the Draft Code, Renewables Statement, and CFA Guidelines (adapted to Western Australia). The BMP is a living document and should be updated during detailed design and operations, with BAL reassessments undertaken if design or vegetation changes occur.

CONTENTS

Executive Summary ..... **iii**

Project Overview and Location iii

Bushfire Context and Framework iii

Bushfire Assessment Results iv

Key Mitigation Measures iv

Conclusion v

1 Introduction **8**

1.1 Proposal Details 8

1.1.1 Planning context 9

1.1.2 Site context 11

1.2 Purpose and Application of the BMP 12

2 Environmental Considerations **15**

2.1 Native Vegetation - Modification and Clearing 15

2.2 Revegetation/Landscape Plans 15

3 Bushfire Assessment Results **17**

3.1 Bushfire Assessment Inputs 17

3.1.1 Fire Danger Index 17

3.1.2 Pre-Development Vegetation Classification and Slope under Vegetation 17

3.1.3 Post-Development Scenario 17

3.2 Bushfire Attack Level Assessment Outputs 18

3.2.1 BAL Assessment 18

3.2.2 Method 1 BAL Assessment 18

3.2.3 Method 2 Radiant Heat Flux Calculations 20

3.2.4 Determined BAL Rating for Proposed Assets 21

4 Identification of Issues Arising from the BAL Assessment **26**

5 Assessment Against the Bushfire Protection Criteria **27**

5.1 Compliance 27

5.1.1 Habitable buildings 27

5.1.2 Wind Turbines 29

5.1.3 Solar Arrays 32

5.1.4 BESS and Substations 33

5.2 Additional Bushfire Mitigation Measures 35

5.2.1 Plans and Reports Recommended as Conditions of Development Approval 35

5.2.2 Water tank requirements 35

5.2.3 Electrical Lines 35

6 Responsibilities for Implementation and Management of Bushfire Management Measures **37**

7 Conclusion **39**

8 References **40**

Datasets Used 40

Vegetation Management 54

References 57

LIST OF TABLES

Table 3.1: Method 1 BAL Calculation (BAL Contours) 20
Table 3.2: Method 2 Radiant Heat Flux and Setback Distances Calculation 21
Table 3.3: BAL Ratings for Assets Within the Subject Site 21
Table 5.1: Assessment Against Bushfire Protection Criteria 7 27
Table 5.2: Assessment Against Wind Farm Element 7 - Natural Hazards 29
Table 5.3: CFA Guidelines Assessment Summary 33
Table 4: Proposed Works Program 37
Table 8.1: Firefighting Water Supply 41
Table 8.2: Fire Detection and Suppression Equipment 44
Table 8.3: Landscape Screening and On-Site Vegetation 45
Table 8.4: Firebreaks 46
Table 8.5: Solar Energy Specific Requirements 48
Table 8.6: BESS Specific Requirements 49
Table 8.7: Facility Construction and Commissioning 51
Table 8.8: Facility Operation 53
Table 8.9: Vegetation Management for Proposed Facilities and Infrastructure 54
Table 8.10: Emergency Planning 55
Table 8.11: Provision of Emergency Information 56

LIST OF FIGURES

Figure 1.1: Site Overview 13
Figure 1.2: Site Plan and Bushfire Prone Areas 14
Figure 2.1: Environmental Considerations 16
Figure 5.1: Bushfire Mitigation Measures 36

LIST OF APPENDICES

Appendix A: CFA Guidelines Assessment (WA Adaptation)
Appendix B: Vegetation Classifications and Bushfire Attack Level (BAL) Contours
Appendix C: Pre-Development Classified Vegetation as per AS 3959: 2018
Appendix D: Classified Vegetation Photos
Appendix E: Method 2 BAL Calculations
Appendix F: Asset Protection Zone Technical Requirements (WAPC, 2024b)
Appendix G: Vehicular Access Technical Requirements (WAPC, 2024b)

1 Introduction

1.1 Proposal Details

Yindjibarndi Energy Corporation (YEC) is seeking to progress a Development Application (DA) and associated environmental approvals for the Baru Marnda Renewable Energy Project (the Project). The renewable energy facility is located approximately 50 km south of Karratha in the Pilbara region of Western Australia, and spans an area of approximately 26,200 ha (hereafter referred to as the Project Footprint, Figure 1.1). The proposed DA will result in an intensification of land use and involves the development of a renewable energy facility, including the following renewable energy infrastructure (hereafter referred to as assets; Figure 1.2):

- 108 wind turbine generators.
- Supporting Infrastructure:
  - Two proposed solar farms.
  - Two Battery Energy Storage Systems (BESS).
  - Two electrical substations - located either within or nearby the BESS footprints.
  - One Site Office
  - Five satellite offices.
  - Two Operations and Maintenance Facilities.

The proposed development will include access roads throughout the Project, which have been considered and assessed within this BMP. Other infrastructure, including foundations and hardstand areas, laydown areas, overhead transmission power lines, temporary concrete batching plants, underground electrical cables and washdown facilities are also proposed. As these components are not addressed by existing bushfire-related guidelines, standards or planning instruments, they have not been depicted in Figure 1.2 and have only been considered where relevant to bushfire risk.

Given the isolated and undisturbed nature of the Project, the entire Project Footprint and proposed assets occur in a designated bushfire prone area (Area 2) as per the *Western Australia State Map of Bush Fire Prone Areas* (DFES, 2024; Figure 1.2). This would typically trigger bushfire planning requirements under *State Planning Policy 3.7 Bushfire* (SPP 3.7; WAPC, 2024a) and reporting to accompany submission of the DA in accordance with the associated *Planning for Bushfire Guidelines* (the Guidelines; WAPC, 2024b). However, renewable energy facilities are not specifically captured under the current version of SPP 3.7.

While renewable energy infrastructure is not subject to the specific requirements of SPP 3.7, an assessment against Bushfire Protection Criteria 7 (Development - Commercial and Industrial) of the Guidelines has been undertaken to mitigate bushfire risk posed to proposed habitable buildings. Renewable Energy Infrastructure, including wind turbines, BESS, substations, and solar farms, has been assessed against other relevant planning frameworks further described in Section 1.1.1.

Terravias Pty Ltd was commissioned to prepare a Bushfire Management Plan (BMP) to support the DA and the environmental approvals pathway. This BMP has been prepared by Senior Bushfire Consultant Beau Eaton and Senior Principal Bushfire Consultant Daniel Panickar (FPAA BPAD Level 3 Certified Practitioner No. BPAD37802).

1.1.1 Planning context

The proposed development includes the construction of habitable buildings, renewable energy facilities, and supporting infrastructure which each have different bushfire planning requirements and associated instruments for assessment. As such, this BMP draws on multiple planning instruments to inform bushfire planning advice, including:

- *Planning for Bushfire Guidelines* (WAPC, 2024b) - for habitable buildings including offices and operations and maintenance facilities.
- *Draft Renewable Energy Planning Code and Guidelines* (Draft Code; WAPC, 2025) - for wind turbines.
- *Position Statement: Renewable Energy Facilities* (Renewables Statement; DPLH & WAPC, 2020) - for solar arrays.
- *Design Guidelines and Model Requirements for Renewable Energy Facilities Version 4* (CFA Guidelines; State of Victoria, 2023) - for BESS and substations.

The applicability of each of the above documents is further explained in the following sections.

Planning for Bushfire Guidelines

In Western Australia (WA), BMPs are typically assessed and prepared in alignment with the bushfire planning guidelines for habitable buildings and land uses. The planning applications and development types which trigger the need for an assessment under SPP 3.7 are displayed in Plate 1.

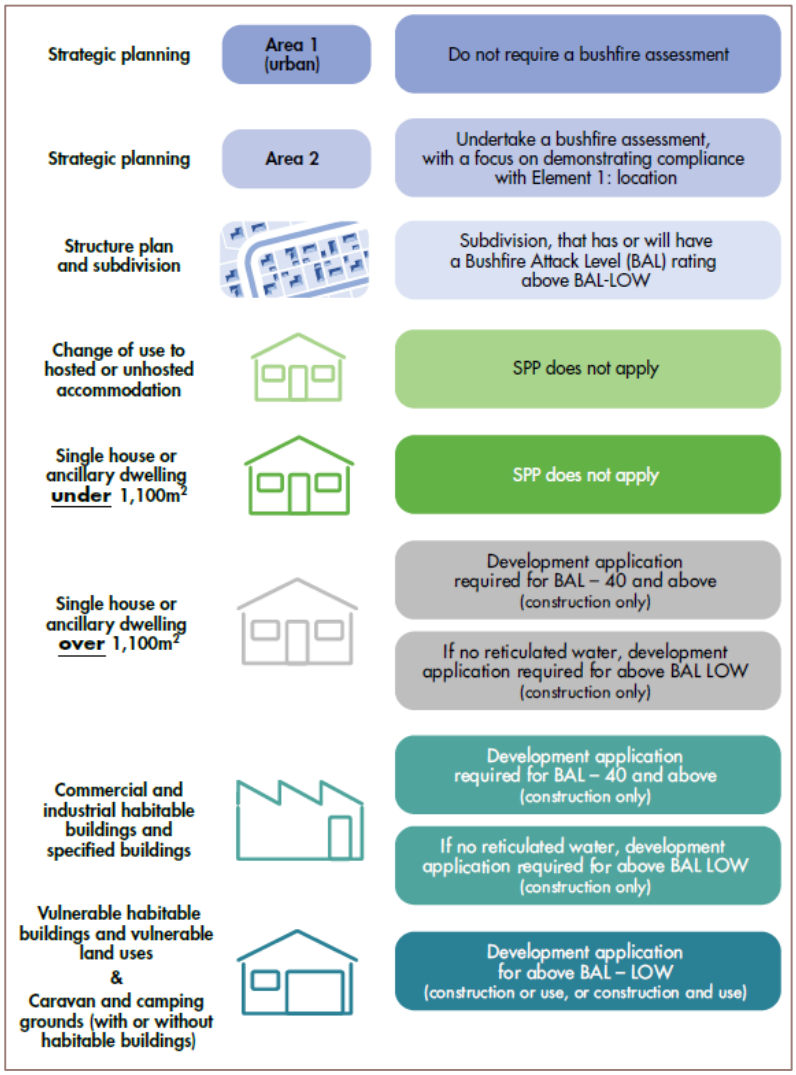


Plate 1: Planning application types and the triggers for assessment under SPP 3.7 and the Guidelines.

Renewable energy infrastructure (e.g. wind turbines, BESS, substations) are not considered to be habitable buildings and are therefore not captured by any of the triggers shown in Plate 1. For the purposes of this DA, only the proposed habitable buildings (site office, satellite offices, and operations and maintenance facilities) are assessed against the Guidelines, with the remaining renewable energy infrastructure assessed in accordance with the Draft Code, Renewables Statement, or CFA Guidelines described below.

Draft Renewable Energy Planning Code and Guidelines

A Renewable Energy Planning Code and Guidelines has been drafted by the Western Australian Planning Commission (WAPC) which includes bushfire planning requirements for renewable energy facilities in WA. The Draft Code was released for public consultation on 12th December 2025. The Draft Code currently only contains bushfire planning measures for wind farms, with its application to transmission systems, solar farms, and BESS yet to be prepared. The wind turbines proposed for this Project have been assessed against this Draft Code, given it is the only WA framework that considers bushfire risk for renewable energy facilities.

Planning Position Statement - Renewable Energy Facilities

A position statement for renewable energy facilities was issued by the WA Government in 2021 (last updated in December 2022). The Renewables Statement primarily covers wind turbines and solar array systems, with no information provided for BESS or substations. The advice towards wind turbines has been superseded by the Draft Code, however the information provided for solar arrays remains relevant. Given the Renewables Statement provides the most up-to-date information in WA for solar array systems in bushfire prone areas, the bushfire mitigation advice from this statement has been applied for proposed solar farms.

Design Guidelines and Model Requirements for Renewable Energy Facilities Version 4

As outlined above, WA-relevant guidelines, codes, and statements (Draft Code and Renewables Statement) only provide bushfire planning frameworks for wind farms and solar arrays. As such, proposed substations and BESS have been assessed against the CFA Design Guidelines and Model Requirements for Renewable Energy Facilities Version 4 (the CFA Guidelines; State of Victoria, 2023). The assessment against the CFA guidelines has been adapted slightly to align with bushfire risk applicable to Western Australia and will guide the detailed design (Appendix A). Adaptations made to the CFA Guidelines are outlined in Appendix A.

1.1.2 Site context

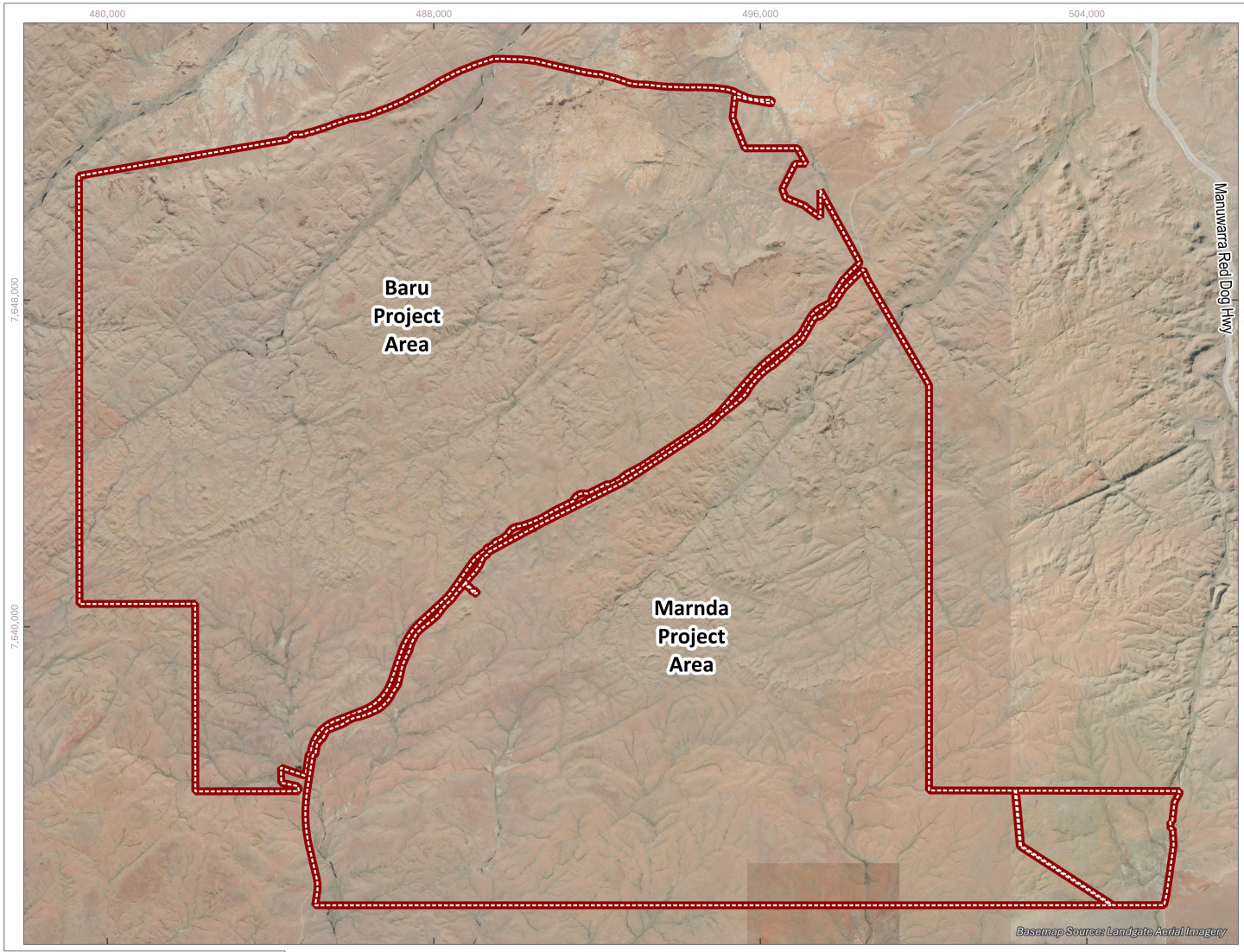
The Project is located in the Shire of Ashburton in unallocated crown land zoned as 'public purposes - water and drainage, and other purposes infrastructure' under the Shire of Ashburton Local Planning Scheme (LPS) No. 7. The Project contains predominantly unmanaged classifiable vegetation, with limited cleared areas and existing infrastructure including gravel roads, railway lines, power lines, and communications towers. The Project is bound by:

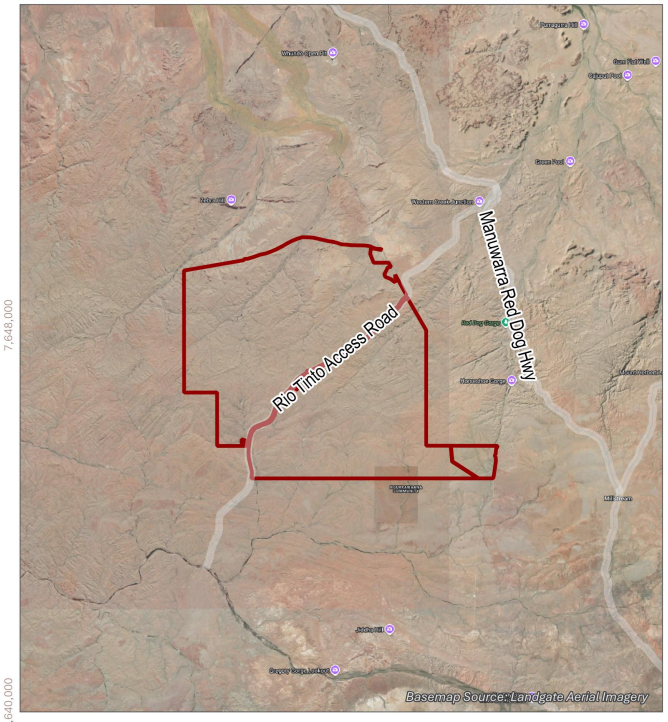
- Zebra Hill and Weymul Aboriginal Community to the north.
- West Creek Junction and Horseshoe Gorge to the east.
- Ngurrawaana Community and Millstream Chichester National Park to the south.
- Unallocated crown land containing remnant vegetation, river channels, and gorges.

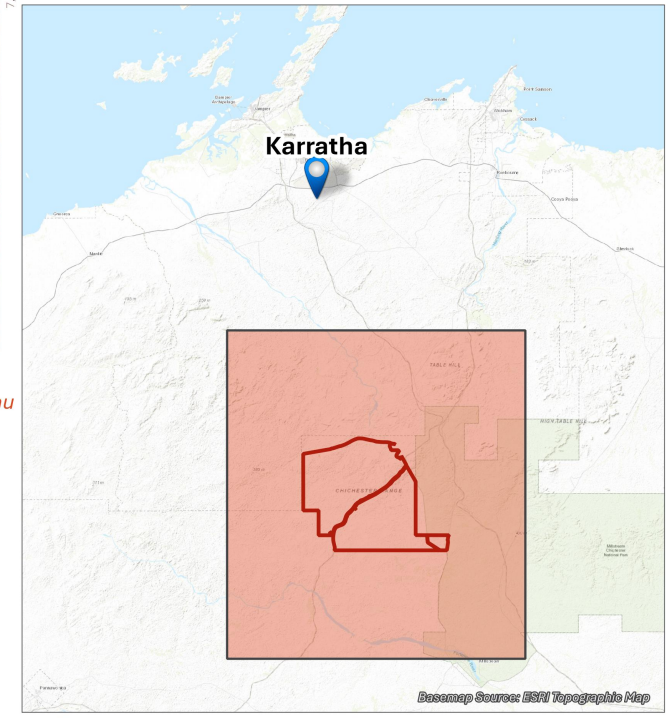
1.2 Purpose and Application of the BMP

This BMP has been prepared in accordance with SPP 3.7 and the Guidelines to support the assessment of the DA by the Shire of Ashburton via the Regional Development Assessment Panel. The BMP may also be used, if required, to support submissions to the Environmental Protection Authority (EPA) or other relevant bodies as part of the Project's broader assessment and approvals pathway. The BMP provides strategies and guidance to reduce the level of bushfire risk exposure for the proposed assets through implementation of a range of bushfire management measures in accordance with the Guidelines.

Consideration has been given to the Shire of Ashburton's LPS No.7, noting that the scheme does not provide recommendations for the establishment of Renewable Energy Facilities.







terravias

0 1 2 3 4 5 km

COORDINATE REFERENCE SYSTEM:
GDA2020 / MGA Zone 50

SCALE: **1:160,000**

PROJECT NUMBER: **A25.371**

DRAWN BY / REVIEWED BY: **SM / BE** **1/9/2026**

N

Figure 1.1: Site Overview

terravias.com.au

Project Footprint

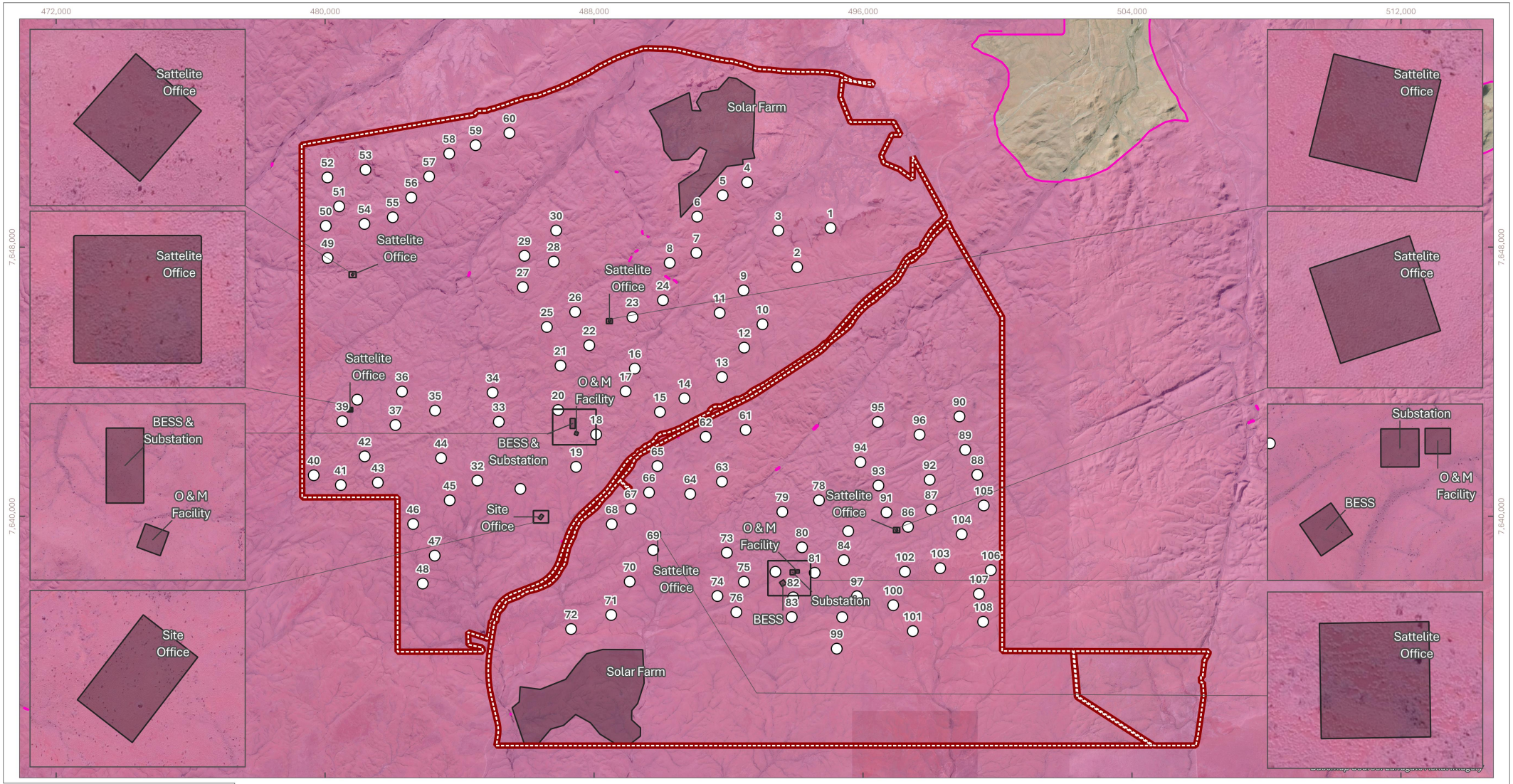


Figure 1.2: Site Plan and Bushfire Prone Areas

terravias.com.au

- Project Footprint
- Wind Turbine
- Supporting Infrastructure

Bush Fire Prone Area Planning (OBRM-023)

- Bushfire Prone Area 2

terravias

0 1 2 3 4 5 km

COORDINATE REFERENCE SYSTEM:
GDA2020 / MGA Zone 50

SCALE: **1:160,000**

PROJECT NUMBER: **A25.371**

DRAWN BY / REVIEWED BY: **SM / BE** **2/9/2026**

N

\\TVSNAS01\DataMgmt\GIS\Project Data\2025\A25_371\3. Projects\2_BMPA\A25.371_BMP_TV.qgz

2 Environmental Considerations

SPP 3.7 policy objective 5.4 recognises the need to consider bushfire risk management measures alongside environmental, biodiversity, and conservation values.

2.1 Native Vegetation - Modification and Clearing

A high-level desktop review has been undertaken for the Project Footprint utilising the following publicly available datasets:

- Native Vegetation Extent (DPIRD-005).
- Directory of Important Wetlands in Australia (DIWA).
- Clearing Regulations - Environmentally Sensitive Areas (ESA) (DWER-046).
- Threatened Ecological Communities (DBCA-038).
- Threatened and Priority Flora (DBCA-036).
- Threatened and Priority Fauna (DBCA-037).

The entire Project Footprint is shown to contain remnant native vegetation, with the on-ground bushfire assessment supporting these findings (DPIRD-005; Figure 2.1). The vegetation on-site was predominantly undisturbed and comprised many native species.

No assets intersect a mapped ESA. The closest ESA is associated with Millstream Chichester National Park, which at its closest point, occurs approximately 320 m east of Site 106 (Figure 2.1).

No publicly available threatened or priority flora or fauna records intersect the proposed assets or 150 m assessment area buffers. YEC has commissioned multiple ecological and detailed flora and fauna surveys for the Project (Mattiske, 2025; RPS, 2025). These surveys recorded several priority flora taxa and identified vegetation considered likely to represent the Cracking Clays of the Chichester and Mungaroona Range Priority Ecological Community (PEC) (Priority 1). It is understood YEC's proposed asset designs and locations consider the findings of these ecological surveys, and where feasible, minimise environmental impacts.

Given the entire Project Footprint is comprised of native vegetation, clearing of native vegetation and/or disturbance of habitat will be required to facilitate the construction of the assets and potentially to implement bushfire mitigation measures (e.g. APZs). Terravias has prescribed bushfire mitigation measures based on the understanding YEC will be obtaining relevant environmental approvals as required.

2.2 Revegetation/Landscape Plans

No revegetation or landscaping is proposed around the wind turbines or other assets. This includes the Asset Protection Zones (APZs) further described in Section 5. At this stage, all proposed assets and APZs will consist of hardscaped areas comprised of concrete, gravel, limestone, or similar material that will suppress the regrowth of vegetation post-clearing. No planting of vegetation for screening purposes is proposed at this stage.

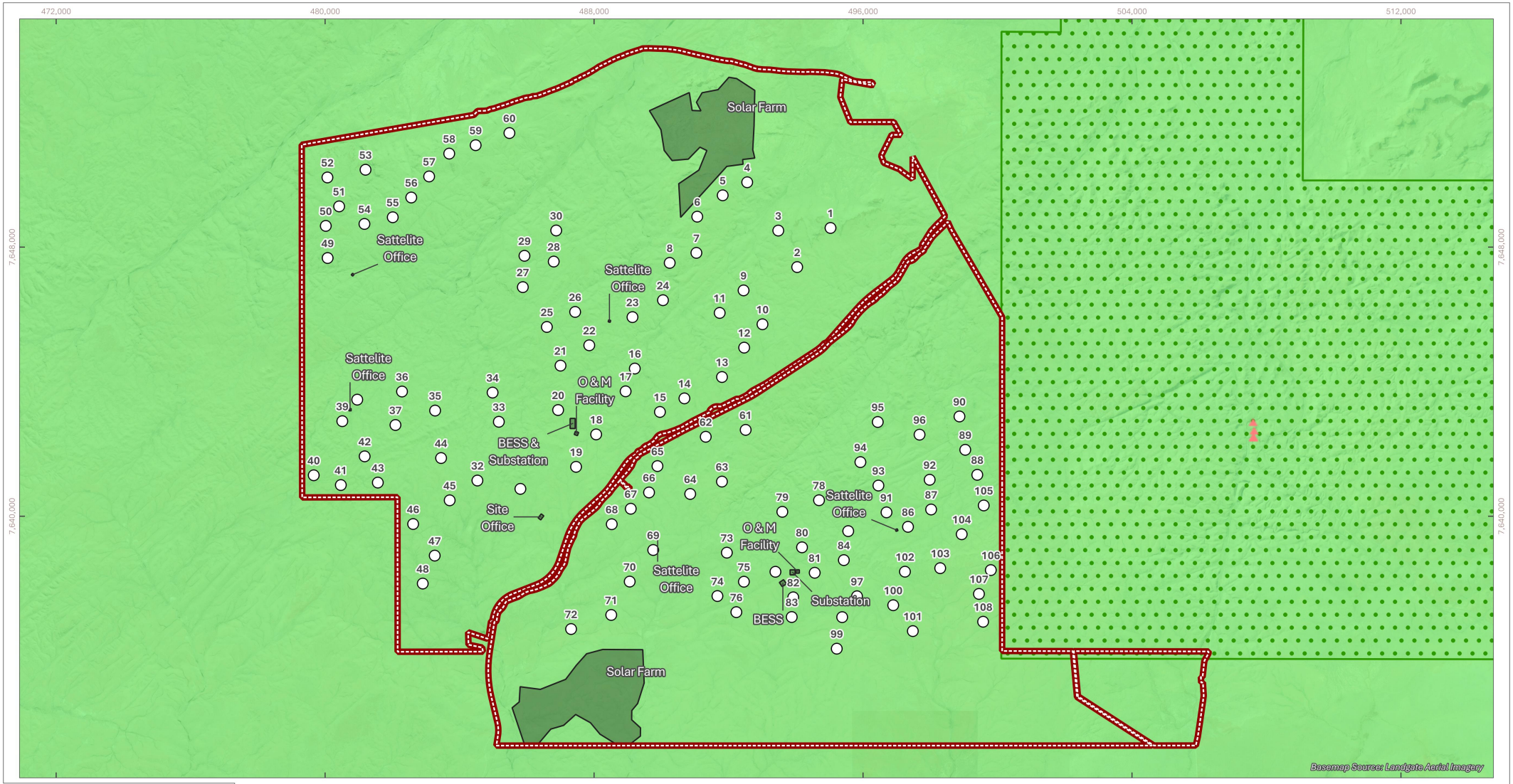


Figure 2.1: Environmental Considerations

terravias.com.au

- Project Footprint
- Wind Turbine
- Supporting Infrastructure
- Native Vegetation Extent (DPIRD-005)
- Environmentally Sensitive Areas (DWER-046)

Threatened and Priority Flora (DBCA-036)

- 3 Priority 3

Threatened and Priority Fauna (DBCA-037)

- Threatened - Endangered

terravias

0 1 2 3 4 5 km

COORDINATE REFERENCE SYSTEM:
GDA2020 / MGA Zone 50

SCALE: **1:160,000**

PROJECT NUMBER: **A25.371**

DRAWN BY / REVIEWED BY: **SM / BE** **2/9/2026**

N

\\TVSNAS01\DataMgmt\GIS\Project Data\2025\A25_371\3_Projects\2_BMPs\A25.371_BMP_TV.qgz

3 Bushfire Assessment Results

3.1 Bushfire Assessment Inputs

A bushfire assessment has been undertaken for the proposed wind turbines and other assets in accordance with the Guidelines. Inputs to this assessment are detailed below. Given the large scale of the Project Footprint, each asset has been assessed as an individual site and assigned a unique site number.

It should be noted that the proposed layout may be subject to design changes that could result in assets being situated in areas not covered by the bushfire assessment. If this occurs, the resituated assets will require a revised bushfire assessment to be undertaken. This would involve remapping the vegetation classifications for these assets and may require additional photographs to be captured at the proposed new locations to verify the vegetation form and associated bushfire risk.

3.1.1 Fire Danger Index

A blanket Fire Danger Index (FDI) 80 is adopted for Western Australia, as outlined in *Australian Standard AS 3959: 2018 Construction of Buildings in Bushfire Prone Areas* (SA, 2018).

3.1.2 Pre-Development Vegetation Classification and Slope under Vegetation

Vegetation and effective slope (i.e. slope under vegetation) at the proposed asset locations and surrounding 150 m (the assessment area) were assessed on 11/02/2026 to 14/02/2026 in accordance with the Guidelines and AS 3959: 2018.

The pre-development classified vegetation and effective slope for each site from the identified vegetation plots are illustrated in Appendix B and described in Appendix C. Photographs depicting the vegetation form present at each site are provided in Appendix D.

3.1.3 Post-Development Scenario

The post-development scenario has been based on the 'permanent disturbance area' layer that was prepared in support of the Project's environmental approvals submission. Terravias has been advised that these areas will be devoid of vegetation for the duration of the project.

Accordingly, each of the sites will have an additional plot excluded in accordance with Clause 2.2.3.2 (e) of AS 3959: 2018, which is associated with the clearing of vegetation to facilitate the construction of internal access tracks, wind turbines, substations, and hardstand areas. Sites that have an APZ prescribed as a bushfire mitigation measure (later outlined in Section 5) will also be excluded under Clause 2.2.3.2 (e).

At a minimum, areas of vegetation will be cleared to ensure:

- Wind turbines and habitable buildings are subject to radiant heat flux of no greater than 29 kW/m^2 in the event of a bushfire.
- BESS, substations, and site office (last resort temporary shelter) are subject to radiant heat flux of no greater than 10 kW/m^2 in the event of a bushfire. The setback distance calculations using

Method 2 of AS 3959: 2018 to achieve a radiant heat flux of no greater than 10 kW/m^2 are provided in Appendix B.

- Solar Arrays maintain a minimum 10 m separation to combustible vegetation.

The assumed post-development vegetation classifications and effective slopes are presented as an inset to each figure in Appendix B.

Where the proposed permanent disturbance provides more clearing than is required to achieve the radiant heat flux or separation distances listed above, the minimum required APZ is still illustrated in Appendix B. This ensures that if the extent of permanent disturbance changes, or areas proposed to remain devoid of vegetation become unmanaged, a baseline minimum separation distance remains for each site to achieve an acceptable level of bushfire risk.

3.2 Bushfire Attack Level Assessment Outputs

A Bushfire Attack Level (BAL) assessment has been undertaken in accordance with SPP 3.7, the Guidelines, AS 3959: 2018 and the bushfire assessment inputs in Section 3.1.

3.2.1 BAL Assessment

All land located within 100 m of the classified vegetation is considered bushfire prone and is subject to a BAL assessment in accordance with AS 3959: 2018.

A Method 1 BAL assessment (as outlined in AS 3959: 2018) has been completed for the proposed development and incorporates the following factors:

- Fire Danger Index (FDI) rating.
- Vegetation class.
- Slope under classified vegetation.
- Distance between proposed subdivision area and the classified vegetation.

Based on the identified BAL, construction requirements for relevant buildings/structures can then be assigned. The BAL rating gives an indication of the expected level of bushfire attack (i.e. radiant heat flux, flame contact and ember penetration) that may be received by proposed buildings and subsequently informs the standard of construction required to increase building survivability.

3.2.2 Method 1 BAL Assessment

Appendix B illustrates the Method 1 BAL assessment (in the form of BAL contours) that has been completed for each asset in accordance with AS 3959: 2018 methodology.

Table 3.1 summarises all mapped variations of vegetation classifications and effective slopes, with Appendix C detailing the plot numbers relative to each site.

Post-development, all assets excluding the solar arrays will be subject to BAL ratings of ≤BAL-29.

Table 3.1: Method 1 BAL Calculation (BAL Contours)

Plot	Vegetation classification	Effective slope	Separation distances (m)				
			BAL-FZ	BAL-40	BAL-29	BAL-19	BAL-12.5
Refer to table in Appendix C	Class B Woodland	All upslopes and flat land (0 degrees)	<10	10-<14	14-<20	20-<29	29-<100
	Class B Woodland	Downslope >0 to 5 degrees	<13	13-<17	17-<25	25-<35	35-<100
	Class B Woodland	Downslope >5 to 10 degrees	<16	16-<22	22-<31	31-<43	43-<100
	Class B Woodland	Downslope >10 to 15 degrees	<21	21-<28	28-<39	39-<53	53-<100
	Class C Shrubland	All upslopes and flat land (0 degrees)	<7	7-<9	9-<13	13-<19	19-<100
	Class C Shrubland	Downslope >0 to 5 degrees	<7	7-<10	10-<15	15-<22	22-<100
	Class C Shrubland	Downslope >5 to 10 degrees	<8	8-<11	11-<17	17-<25	25-<100
	Class C Shrubland	Downslope >10 to 15 degrees	<9	9-<13	13-<19	19-<28	28-<100
	Class D Scrub	All upslopes and flat land (0 degrees)	<10	10-<13	13-<19	19-<27	27-<100
	Class D Scrub	Downslope >0 to 5 degrees	<11	11-<15	15-<22	22-<31	31-<100
	Class G Grassland	All upslopes and flat land (0 degrees)	<6	6-<8	8-<12	12-<17	17-<50
	Class G Grassland	Downslope >0 to 5 degrees	<8	8-<10	10-<16	16-<23	23-<50
	Class G Grassland	Downslope >5 to 10 degrees	<8	8-<10	10-<16	16-<23	23-<50
	Class G Grassland	Downslope >10 to 15 degrees	<9	9-<12	12-<18	18-<26	26-<50
	Class G Grassland	Downslope >15 to 20 degrees	<10	10-<14	14-<21	21-<30	30-<50
	Excluded - clause 2.2.3.2 (e)	-	No separation distances required - BAL-LOW				

3.2.3 Method 2 Radiant Heat Flux Calculations

The Guidelines require assets (particularly habitable buildings) be sited in areas which are subject to a radiant heat flux ≤BAL-29. The Draft Code also requires separation from vegetation to achieve BAL-29 for wind turbines. In lieu of a Western Australian bushfire framework for assessing BESS facilities and transmission systems (i.e. substations), the CFA Guidelines offer further guidance on appropriate siting for these facilities.

The CFA Guidelines state that '*separation* [between classified vegetation and renewable energy infrastructure] *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*'. A 10 kW/m^2 radiant heat flux threshold is widely adopted as best practice to ensure sufficient separation distance is established. This threshold has been applied to BESS and substations.

A Method 2 BAL calculation was undertaken to determine the required separation distance for BESS and substations to be sited in areas subject to a radiant heat flux of 10 kW/m^2 or less. Table 3.2 and Appendix E outline the Method 2 BAL assessment and associated setback distances that have been calculated in accordance with AS 3959: 2018 methodology. This Method 2 calculation has not been undertaken to demonstrate compliance with the bushfire protection criteria.

Table 3.2: Method 2 Radiant Heat Flux and Setback Distances Calculation

Vegetation classification	Effective slope	Separation distances required (m) - 10 kW/m^2 @ 1090 K
Class C Shrubland	Downslope 5 degrees	>27
Class C Shrubland	Flat land 0 degrees	>24
Class D Scrub	Flat land 0 degrees	>33
Class G Grassland	Downslope 25.4 degrees	>43
Class G Grassland	Downslope 24 degrees	>42
Class G Grassland	Downslope 5 degrees	>25
Class G Grassland	Flat land 0 degrees	>22
Excluded - clause 2.2.3.2 (e)	-	No separation distances required - BAL-LOW

3.2.4 Determined BAL Rating for Proposed Assets

A summary of the BAL ratings for each asset based on the post-development extent is provided in Table 3.3.

Table 3.3: BAL Ratings for Assets Within the Subject Site

Proposed Building/Asset	Plot Most Affecting BAL Rating[1]	Separation Distance (m)	BAL Rating
Site 1: Wind Turbine	Plot 3	16.09	BAL-19
Site 2: Wind Turbine	Plot 4	16.54	BAL-19
Site 3: Wind Turbine	Plot 4	16.69	BAL-19
Site 4: Wind Turbine	Plot 2	20.01	BAL-12.5
Site 5: Wind Turbine	Plot 3	15.61	BAL-19
Site 6: Wind Turbine	Plot 2	19.33	BAL-19
Site 7: Wind Turbine	Plot 3	16.03	BAL-19
Site 8: Wind Turbine	Plot 1	17.07	BAL-19
Site 9: Wind Turbine	Plot 3	16.14	BAL-19

Proposed Building/Asset	Plot Most Affecting BAL Rating[1]	Separation Distance (m)	BAL Rating
Site 10: Wind Turbine	Plot 4	17.19	BAL-12.5
Site 11: Wind Turbine	Plot 1	19.01	BAL-29
Site 12: Wind Turbine	Plot 4	20.74	BAL-12.5
Site 13: Wind Turbine	Plot 3	17.76	BAL-12.5
Site 14: Wind Turbine	Plot 1	18.15	BAL-19
Site 15: Wind Turbine	Plot 2	17.07	BAL-12.5
Site 16: Wind Turbine	Plot 4	16.4	BAL-19
Site 17: Wind Turbine	Plot 2	17.94	BAL-12.5
Site 18: Wind Turbine	Plot 1	16.81	BAL-29
Site 19: Wind Turbine	Plot 1	15.97	BAL-19
Site 20: Wind Turbine	Plot 4	16.55	BAL-19
Site 21: Wind Turbine	Plot 2	18.31	BAL-12.5
Site 22: Wind Turbine	Plot 3	16.83	BAL-19
Site 23: Wind Turbine	Plot 1	19.55	BAL-19
Site 24: Wind Turbine	Plot 4	17.01	BAL-12.5
Site 25: Wind Turbine	Plot 2	16.4	BAL-19
Site 26: Wind Turbine	Plot 3	17.34	BAL-12.5
Site 27: Wind Turbine	Plot 3	15.81	BAL-19
Site 28: Wind Turbine	Plot 2	18.52	BAL-19
Site 29: Wind Turbine	Plot 1	19.11	BAL-19
Site 30: Wind Turbine	Plot 1	18.89	BAL-19
Site 31: Wind Turbine	Plot 1	19.09	BAL-19
Site 32: Wind Turbine	Plot 1	19.57	BAL-19
Site 33: Wind Turbine	Plot 2	23.47	BAL-12.5
Site 34: Wind Turbine	Plot 1	21.85	BAL-19
Site 35: Wind Turbine	Plot 2	26.21	BAL-12.5
Site 36: Wind Turbine	Plot 1	16.7	BAL-19
Site 37: Wind Turbine	Plot 2	23.6	BAL-12.5
Site 38: Wind Turbine	Plot 3	17.14	BAL-19
Site 39: Wind Turbine	Plot 1	16.4	BAL-19
Site 40: Wind Turbine	Plot 2	16.85	BAL-19
Site 41: Wind Turbine	Plot 1	18.53	BAL-19
Site 42: Wind Turbine	Plot 2	16.6	BAL-29
Site 43: Wind Turbine	Plot 2	17.02	BAL-12.5

Proposed Building/Asset	Plot Most Affecting BAL Rating[1]	Separation Distance (m)	BAL Rating
Site 44: Wind Turbine	Plot 1	21.07	BAL-19
Site 45: Wind Turbine	Plot 1	17.76	BAL-19
Site 46: Wind Turbine	Plot 2	19.44	BAL-12.5
Site 47: Wind Turbine	Plot 1	24.67	BAL-29
Site 48: Wind Turbine	Plot 2	19.36	BAL-12.5
Site 49: Wind Turbine	Plot 2	18	BAL-19
Site 50: Wind Turbine	Plot 1	24.63	BAL-12.5
Site 51: Wind Turbine	Plot 1	21.78	BAL-19
Site 52: Wind Turbine	Plot 2	17.63	BAL-12.5
Site 53: Wind Turbine	Plot 2	18.49	BAL-19
Site 54: Wind Turbine	Plot 1	16.95	BAL-19
Site 55: Wind Turbine	Plot 3	17.4	BAL-12.5
Site 56: Wind Turbine	Plot 2	17.52	BAL-12.5
Site 57: Wind Turbine	Plot 3	18.26	BAL-12.5
Site 58: Wind Turbine	Plot 2	15.64	BAL-19
Site 59: Wind Turbine	Plot 3	21.06	BAL-12.5
Site 60: Wind Turbine	Plot 2	16.17	BAL-19
Site 61: Wind Turbine	Plot 1	17.02	BAL-19
Site 62: Wind Turbine	Plot 1	17	BAL-40
Site 63: Wind Turbine	Plot 1	15.98	BAL-29
Site 64: Wind Turbine	Plot 2	19.01	BAL-12.5
Site 65: Wind Turbine	Plot 2	18.11	BAL-19
Site 66: Wind Turbine	Plot 1	17.97	BAL-19
Site 67: Wind Turbine	Plot 2	16.74	BAL-19
Site 68: Wind Turbine	Plot 3	17.63	BAL-12.5
Site 69: Wind Turbine	Plot 1	18.04	BAL-19
Site 70: Wind Turbine	Plot 1	16.92	BAL-19
Site 71: Wind Turbine	Plot 3	18.51	BAL-12.5
Site 72: Wind Turbine	Plot 3	15.3	BAL-19
Site 73: Wind Turbine	Plot 2	17.79	BAL-19
Site 74: Wind Turbine	Plot 5	18.14	BAL-12.5
Site 75: Wind Turbine	Plot 3	16.89	BAL-19
Site 76: Wind Turbine	Plot 2	18.3	BAL-19
Site 77: Wind Turbine	Plot 1	20.71	BAL-19

Proposed Building/Asset	Plot Most Affecting BAL Rating[1]	Separation Distance (m)	BAL Rating
Site 78: Wind Turbine	Plot 4	18.74	BAL-12.5
Site 79: Wind Turbine	Plot 5	16.93	BAL-19
Site 80: Wind Turbine	Plot 1	20.16	BAL-19
Site 81: Wind Turbine	Plot 1	18.96	BAL-19
Site 82: Wind Turbine	Plot 1	17.55	BAL-19
Site 83: Wind Turbine	Plot 1	17.26	BAL-19
Site 84: Wind Turbine	Plot 3	17.86	BAL-12.5
Site 85: Wind Turbine	Plot 3	17.35	BAL-19
Site 86: Wind Turbine	Plot 2	18.46	BAL-19
Site 87: Wind Turbine	Plot 1	15.58	BAL-29
Site 88: Wind Turbine	Plot 2	18.35	BAL-19
Site 89: Wind Turbine	Plot 2	19.54	BAL-19
Site 90: Wind Turbine	Plot 2	19.42	BAL-19
Site 91: Wind Turbine	Plot 1	15.67	BAL-29
Site 92: Wind Turbine	Plot 4	16.29	BAL-19
Site 93: Wind Turbine	Plot 2	16.27	BAL-19
Site 94: Wind Turbine	Plot 3	17.52	BAL-19
Site 95: Wind Turbine	Plot 2	18.65	BAL-19
Site 96: Wind Turbine	Plot 4	16.94	BAL-19
Site 97: Wind Turbine	Plot 3	17.09	BAL-12.5
Site 98: Wind Turbine	Plot 1	17.14	BAL-12.5
Site 99: Wind Turbine	Plot 3	16.82	BAL-19
Site 100: Wind Turbine	Plot 2	16.24	BAL-19
Site 101: Wind Turbine	Plot 1	16.16	BAL-19
Site 102: Wind Turbine	Plot 4	19.52	BAL-19
Site 103: Wind Turbine	Plot 4	16.78	BAL-19
Site 104: Wind Turbine	Plot 1	20.08	BAL-19
Site 105: Wind Turbine	Plot 2	16.16	BAL-19
Site 106: Wind Turbine	Plot 3	20.9	BAL-19
Site 107: Wind Turbine	Plot 1	15.21	BAL-19
Site 108: Wind Turbine	Plot 1	17.69	BAL-19
Site 109: BESS & Substation	Plot 1	27	BAL-12.5
Site 110: Substation	Plot 1	27	BAL-12.5

Proposed Building/Asset	Plot Most Affecting BAL Rating[1]	Separation Distance (m)	BAL Rating
Site 111: BESS	Plot 2	27	BAL-12.5
Site 112: Solar Farm	Plot 1	10	BAL-40
Site 113: Solar Farm	Plot 2	10	BAL-FZ
Site 114: Sattelite Office	Plot 1	33	BAL-12.5
Site 115: O & M Facility	Plot 1	10	BAL-40
Site 116: Sattelite Office	Plot 2	24	BAL-12.5
Site 117: O & M Facility	Plot 4	10	BAL-29
Site 118: Sattelite Office	Plot 2	29	BAL-12.5
Site 119: Sattelite Office	Plot 1	29	BAL-12.5
Site 120: Sattelite Office	Plot 1	25	BAL-12.5
Site 121: Site Office	Plot 1	35	BAL-12.5

[1] Plot numbering varies between sites given each site has been assessed individually and contains different vegetation classifications and measured slopes.

4 Identification of Issues Arising from the BAL Assessment

Post-development, wind turbines and habitable buildings will be subject to BAL ratings of ≤BAL-29. BESS, substations, and site office (last resort temporary shelter) will be subject to a radiant heat flux not exceeding 10 kW/m^2.

Solar arrays will be positioned a minimum of 10 m from combustible vegetation regardless of the adjacent vegetation classification. This may result in some BAL-FZ and BAL-40 ratings on the solar panels however this is considered acceptable given:

- There is no trigger for solar arrays to be assessed under SPP 3.7 and the Guidelines.
- The Renewables Statement states that only a minimum 10 m separation is required between solar panels and classified vegetation - this has been implemented in the proposed development design.
- Solar panels, in comparison to other renewable energy infrastructure:
    - are considered low risk assets.
    - present a reduced risk of bushfire ignition.
    - can readily be replaced if damaged by a bushfire.
- A 10 m separation distance minimises the required clearing of native vegetation and other environmental values to facilitate the proposed development

Measures to ensure BAL ratings on proposed future assets excluding solar arrays are restricted to ≤BAL-29 are discussed below.

Each wind turbine will have an APZ established with a radius suitable to ensure the asset will not be exposed to a radiant heat flux exceeding 29kW/m^2 (BAL-29) in accordance with the Draft Code. Habitable buildings including the site office, satellite offices, and operations and maintenance facilities will also have APZs established to ensure the buildings can achieve a BAL rating of BAL-29 or lower in accordance with the Guidelines.

BESS and Substations will have APZs established to achieve a radiant heat flux not exceeding 10kW/m^2 in accordance with the CFA Guidelines. The site office, which has been allocated as a last resort temporary shelter, will also have an APZ established to achieve a radiant heat flux not exceeding 10kW/m^2.

APZs will be established in accordance with the Guideline Technical Requirements (Appendix F).

A reassessment of BAL ratings, through either a BMP addendum or revised BMP will be undertaken if changes to development design or classified vegetation within the assessment area which require a modified bushfire management response occur.

5 Assessment Against the Bushfire Protection Criteria

5.1 Compliance

The proposed buildings and renewable energy infrastructure have had compliance assessed against the following relevant Guidelines, Codes, and Statements:

- **Habitable Buildings** - The Guidelines, policy measure 7.1 of SPP 3.7 and Bushfire Protection Criteria 7 (BPC7). Section 5.1.1, Table 5.1 outlines the Acceptable Solutions (AS) that are relevant to the Project and summarises how the intent of each Bushfire Protection Criteria has been achieved through the application of bushfire risk management measures.
- **Wind Turbines** - Draft Code, Wind Farm (WF) Element 7. Compliance with the Draft Code is described in Section 5.1.2, Table 5.2.
- **Solar Arrays** - Renewables Statement. Compliance with the Renewables statement is described in Section 5.1.3. Other bushfire mitigation measures for solar arrays, such as access for emergency services and firefighting water supply, has been further considered under the CFA Guidelines (Appendix A).
- **BESS and Substations** – CFA Guidelines. A summary of the compliance assessment against the CFA guidelines is provided in Section 5.1.4. A more detailed assessment has been undertaken in Appendix A.

Management measures to meet the abovementioned planning instruments are depicted in Figure 5.1 where relevant.

5.1.1 Habitable buildings

Table 5.1: Assessment Against Bushfire Protection Criteria 7

Bushfire Protection Criteria 7	AS	OA	N/A
Element 1: Location **A1.1 Development location**	☐	☐	✓
Not Applicable - This Element does not apply to commercial and industrial developments.			
Element 2: Siting and design **A2.1 Siting and design**	✓	☐	☐
Post-development, all buildings including the site office, satellite offices, and operations and maintenance facilities will be situated in areas subject to BAL ratings of ≤BAL-29. This will be achieved by establishing an APZ around the perimeter of the buildings in alignment with Appendix F. The site office has had an APZ established to achieve a radiant heat flux not exceeding 10kW/m^2 should this area be required as a last resort temporary shelter from bushfire. Proposed APZs for the habitable buildings are illustrated in Appendix B. The proposed habitable buildings are considered to be compliant with A1.1.			
A2.2 Asset Protection Zone (APZ)	✓	☐	☐
The proposed habitable buildings will have APZs sufficient for the potential radiant heat flux to not exceed 29 kW/m^2 (or 10kW/m^2 for the site office) and will be managed in accordance with the requirements of Standards for Asset Protection Zones (WAPC, 2024b; Appendix F). Proposed APZs for the habitable buildings are illustrated in Appendix B. The APZs can be contained within the boundaries of the Project Footprint and managed in perpetuity in a low fuel state.			

Bushfire Protection Criteria 7	AS	OA	N/A
The proposed habitable buildings are considered to be compliant with A2.2.			
A2.3 Clearing of native vegetation	✓	☐	☐
The Project intersects native vegetation and potentially other sensitive environmental values. As noted in Section 2, it is understood YEC will obtain relevant environmental approvals where required, including where clearing is required to implement bushfire measures such as APZs. The proposed development is considered to be compliant with A2.3.			
A2.4 Storage of hazardous, flammable and/or combustible materials	✓	☐	☐
There are no significant quantities of hazardous, flammable or combustible materials associated with the proposed habitable buildings. If any significant quantities of hazardous, flammable and/or combustible materials are introduced to the development, they should be sited in areas of BAL-29 or lower as a minimum and protected from bushfire impact, with the final siting and bushfire risk management to be reviewed by an accredited bushfire practitioner. The proposed development is considered to be compliant with A2.4.			
Element 3: Vehicular access **A3.1 Private driveways**	✓	☐	☐
The Project will include a number of internal access tracks which will provide access to the wind turbines and supporting infrastructure, including the habitable buildings (Figure 5.1). These access tracks, excluding the Ngurawaana access track and transmission line access road, are proposed to have a minimum width of 7 m throughout the facility and will have a turnaround head which complies with the specification set out in the Vehicular Access Technical Requirements (WAPC, 2024b; Appendix G). This allows for sufficient vehicular access and egress for Type 3.4 firefighting appliances in the event of an infrastructure fire or bushfire. The exact location and type of turnaround areas will be determined at detailed design stage. Vehicular access design is discussed further in Table 5.2 and Appendix A. The proposed development is considered to be compliant with A3.1.			
Element 4: Water **A4.1 Water supply**	✓	☐	☐
No existing reticulated water is present in the Project Footprint. A 10 kL water tank for every 1,500 m^2 of floor space (up to 50 kL per tank) will be installed at the location of each habitable building for firefighting purposes in accordance with the Guidelines (Figure 5.1). The floor space and subsequently the required water tank capacity for these buildings will be confirmed during detailed design. The proposed development is considered to be compliant with A4.1.			

Note: AS - Acceptable Solution, OA - Outcomes-based Approach, N/A - Not applicable.

5.1.2 Wind Turbines

Table 5.2: Assessment Against Wind Farm Element 7 - Natural Hazards

Wind Farm Element 7	PO	AO	N/A
WF-EO7.1	✓	☐	☐
Wind turbines and associated infrastructure (excluding access tracks) are sited: a. Outside bushfire prone areas where possible; or b. Within bushfire prone areas where the pre-development radiant heat impact does not exceed BAL-29 (29 kW/m2), as shown in pre-development BAL contour mapping; or c. where (a) or (b) cannot be achieved, with asset protection zones (i.e. low fire fuel areas) established around wind turbines and associated infrastructure to reduce the post-development radiant heat impact to BAL-29 or below, while avoiding or minimising native vegetation clearing and ensuring that any additional landscaping or revegetation does not contribute to an unacceptable fire risk.	Given the undisturbed nature of the Project Footprint, all wind turbines are sited within bushfire prone areas, as shown in Figure 1.2. All wind turbines will be subject to BAL ratings not exceeding BAL-29 post development through the construction of hardstand areas and the implementation of APZs as depicted in Appendix B. The proposed wind farm is considered to be compliant with WF-EO7.1.		
WF-EO7.2	✓	☐	☐
Wind turbines and associated infrastructure are spaced apart to: a. reduce the risk of fire spreading between components, considering radiant heat flux as a potential ignition source; and b. enable safe and effective aerial firefighting operations with a minimum separation of 300 metres between turbines.	All wind turbines have at least 300 m separation between them. The closest two wind turbines proposed are 588 m apart from one another, as depicted in Figure 5.1. The proposed wind farm is considered to be compliant with WF-EO7.2.		
WF-EO7.3	✓	☐	☐
Wind turbines and associated infrastructure incorporate features that minimise ignition risk and support emergency response, including: a. fire and lightning detection, power disconnection, and independent shutdown systems that can operate independently of local communications during an emergency; b. non-combustible or fire-resistant materials in construction; c. aviation obstacle lighting; d. safe storage of hazardous, flammable and/or combustible materials consistent with Planning for Bushfire Guidelines (WAPC, 2024), specifically Bushfire Protection Criteria 7: Development - Commercial and industrial A2.4 Storage of hazardous, flammable and/or combustible materials.	Additional bushfire mitigation measures will be considered and implemented at detailed design stage, which will include measures such as power disconnection, fire and lightning detection, aviation obstacle lighting, amongst other items. The proposed wind farm is able to comply with WF-EO7.3.		

Wind Farm Element 7	PO	AO	N/A
WF-EO7.4	✓	☐	☐
Wind farms include vehicular access enabling efficient, safe and reliable emergency response and evacuation, consistent with the Planning for Bushfire Guidelines (WAPC, 2024). This includes: a. at least two ingress/egress points, preferably from two different public roads, and for each part of the development site where the site is divided by a public road(s). b. internal access tracks that: i. have suitable gradients, vertical clearances and all-weather surfaces; ii. provide a minimum four-metre trafficable width to each turbine and key infrastructure components such as substations and control offices; iii. include passing bays at least every 600 metres, with a minimum size of 20 metres long and six metres wide; and iv. provide adequate turn-around areas for emergency vehicle manoeuvring.	The Project is situated in an isolated area that has limited public road access. The closest public road is Manuwarra Red Dog Highway, located approximately 8 km east of the Project. Primary site access will be via the Millstream Access Track that connects to Manuwarra Red Dog Highway to the east. Use of this track as the primary access to the Project has been coordinated with DBCA and the local community. The Rio Tinto Rail Access Road, which also connects back to Manuwarra Red Dog Highway, will provide secondary access to the site if required. The Project proposes several roads connecting to the Millstream Access Track and Rio Tinto Rail Access Road. These provide at least two ingress and egress points to both the Baru and Marnda areas. The proposed roads are shown in Figure 5.1 and include: • Road network to all wind turbines, BESS, substations, solar arrays, and habitable buildings. • Construction and maintenance roads - providing a secondary more direct access route to parts of Baru and Marnda. • Access tracks adjacent to the proposed transmission line for repairs and maintenance. All proposed roads/tracks, excluding the Ngurawaana access track and transmission line access road, will have a minimum trafficable width of 7 m. The design of the transmission line access road, including its width, is yet to be confirmed. The Ngurawaana access track, located south of the Project Footprint, has been deliberately omitted from the Project designs to minimise potential impacts. As such, the use of this access track has not been considered in the bushfire assessment. While the Ngurawaana and transmission line roads may also meet the requirements of this element and provide further emergency response access, neither is necessary to demonstrate compliance given multiple ingress/egress points are already available via		

Wind Farm Element 7	PO	AO	N/A
	the Millstream Access Track and the Rio Tinto Rail Access Road. No passing bays are required given there is sufficient space for vehicles to pass one another across the entire length of the internal access roads. Where no-through roads are proposed, suitable turnaround points will be provided in accordance with the Guidelines (shown as an inset to Figure 5.1). This will be addressed at detailed design. YEC will undertake geotechnical and engineering assessments prior to construction works commencing, to ensure proposed roads will meet the weight capacity requirements (i.e. 15 tonnes) and other specifications as outlined in the Vehicular Access Technical Requirements (Appendix G). If future unanticipated design constraints result in some areas not being able to achieve a minimum 6 m road width, these roads will include passing bays as required under this element of the Draft Code. The proposed wind farm has the ability to be compliant with WF-EO7.4.		
WF-EO7.5	✓	☐	☐
Wind farms provide sufficient, accessible water supply and firefighting infrastructure. The number, size and locations of water tanks is to be determined in consultation with the Department of Fire and Emergency Services and local brigade, and include at a minimum: a. one 45,000-litre static water tank at each property entrance from a public road; b. one additional 45,000-litre static water tank within the development site; c. water tank fittings compliant with relevant Planning for Bushfire Guidelines (WAPC, 2024) standards; and d. a hardstand at each tank for emergency vehicles.	There are no public roads within the Project Footprint. In the absence of public road access, water supply requirements have been assessed based on private road access to demonstrate compliance with this element. Under this approach, the minimum requirements of the Draft Code can be achieved through the provision of seven (7) 45 kL firefighting water tanks, comprising one tank at each primary access point from the Rio Tinto Rail Access Road and Millstream Access Track, in addition to one centrally located tank within the Project Footprint. While this configuration satisfies the minimum requirements of the Draft Code, it is considered insufficient to cover 108 wind turbines, particularly given the Project's scale and associated bushfire risk. To enhance fire protection and emergency response, an additional twelve (12) 45 kL firefighting water tanks are proposed (totalling 19), spaced at a maximum interval of approximately 10 km. This		

Wind Farm Element 7	PO	AO	N/A
	will enable emergency services access to a water supply in approximately 10 minutes, travelling at 30 km/h under worst-case gravel road conditions. This approach exceeds the minimum Draft Code requirements and provides a more practical and responsive firefighting water supply network. The proposed nineteen (19) 45 kL water tanks are considered adequate given emergency services are likely to rely on aerial firefighting due to the Project's isolation and Karratha being the closest fire brigade (1.5-hour drive). Each tank will be provided with a suitable hardstand, with final locations to be confirmed during detailed design. Consultation with the Department of Fire and Emergency Services (DFES) will be undertaken following submission of this BMP. The proposed wind farm is considered to be compliant with WF-EO7.5.		
WF-EO7.6	✓	☐	☐
Wind farm operations support emergency response by: a. maintaining firebreaks, asset protection zones, access tracks, water supply, hardstands and fire equipment; and b. enacting emergency procedures, such as turbine shutdown, blade repositioning, power disconnection, activation of obstacle lighting to support aerial firefighting, and facilitating emergency vehicle and water access.	Operation and maintenance plans will be created prior to occupation and implemented during operation of the wind farm. The proposed wind farm has the ability to comply with WF-EO7.6.		
WF-EO7.7	✓	☐	☐
Any new habitable building associated with the wind farm, located wholly or partly within a bushfire prone area, is sited, designed and constructed in accordance with State Planning Policy (SPP) 3.7 Bushfire (WAPC, 2024) and the Planning for Bushfire Guidelines (WAPC, 2024).	This Performance Outcome has been addressed in Section 5.1.1 of this BMP.		

5.1.3 Solar Arrays

The Renewables Statement recommends a minimum 10 m clearance to combustible vegetation in the form of an Asset Protection Zone (APZ) for solar arrays. The solar array design includes an APZ with a minimum width of 10 m and prescribes management of the APZ in accordance with the Guidelines.

The Renewables Statement does not recommend further bushfire mitigation measures relating to access or firefighting water supply. Having suitable access for emergency services and a dedicated fire water supply in the event of a bushfire near the solar arrays is considered necessary. As such, access

and water supply for the solar arrays have been assessed against the CFA Guidelines, outlined in Appendix A.

5.1.4 BESS and Substations

In the absence of a bushfire assessment framework for BESS and substations in WA, the CFA Guidelines have been adopted and tailored to suit bushfire conditions in WA. A summary of the Project's compliance with the CFA Guidelines is provided in Table 5.3. A more detailed assessment against the CFA guidelines has been provided in Appendix A.

The proposed design aligns with the general objectives and policy requirements of SPP 3.7.

Table 5.3: CFA Guidelines Assessment Summary

Category	Total Assessment Items	Compliant	Has the ability to comply	Not Applicable	Comments
Facility Design					
Emergency Vehicle Access	8	✓	✓	☐	Only relevant to BESS, solar arrays, and substations given habitable buildings and wind turbines are addressed under the Guidelines and Draft Code.
Firefighting Water Supply	14	✓	✓	☐	Only relevant to BESS, solar arrays, and substations given habitable buildings and wind turbines are addressed under the Guidelines and Draft Code.
Fire Detection and Suppression Equipment	1	☐	✓	☐	Only relevant to BESS, solar arrays, and substations given habitable buildings and wind turbines are addressed under the Guidelines and Draft Code. Equipment details are to be determined at detailed design and fitted during the construction stage.
Landscape Screening and On-Site Vegetation	3	☐	☐	✓	No landscape screening proposed as part of this DA.
Firebreaks	5	✓	✓	☐	Only relevant for BESS and substations given habitable buildings, wind turbines, and solar arrays are addressed under the Guidelines, Draft Code, and Renewables Statement.

Category	Total Assessment Items	Compliant	Has the ability to comply	Not Applicable	Comments
Design Specific to Facility Type					
Solar Specific Requirements	1	✓	✓	☐	-
BESS Specific Requirements	13	✓	✓	☐	-
Facility Construction and Commissioning					
Facility Construction and Commissioning	13	✓	✓	☐	-
Facility Operation					
Facility Operation	5	✓	✓	☐	-
Vegetation Management	1	✓	✓	☐	-
Emergency Planning					
Emergency Planning	4	☐	☐	✓	The Draft Code requests an Emergency Plan be prepared in accordance with the Bushfire Emergency Plan Manual (WAPC, 2024). Given the Draft Code applies specifically to WA, the emergency plan will be developed in accordance with the recommendations of this code, with emergency response for BESS, solar arrays, and substations included as relevant.
Provision of Emergency Information					
Provision of Emergency Information	1	✓	✓	☐	-

5.2 Additional Bushfire Mitigation Measures

5.2.1 Plans and Reports Recommended as Conditions of Development Approval

The Draft Code recommends an Emergency Management Plan (EMP) be prepared as a condition of development approval. The EMP should identify the actions to be undertaken in the event of a natural hazard emergency (including structural incidents and bushfire). As per the Draft Code, it is recommended an Emergency Management Plan is prepared in accordance with the Bushfire Emergency Plan Manual (WAPC, 2024).

5.2.2 Water tank requirements

Each water tank and associated stand will be above-ground, constructed of non-combustible material and comply with AS/NZS 3500.1:2018 Plumbing and drainage Water Services.

All exposed water supply pipes and fittings will be metal. Fittings should be located away from the source of bushfire attack.

Each tank will be fitted with a 50 mm male camlock coupling with full flow valve.

As this is a static fire water supply, no pumps will be supplied to accompany the water tanks.

5.2.3 Electrical Lines

The CFA Guidelines state that vegetation management within any electric line easement must ensure that falling [or growing] trees would not impact the transmission lines, towers and associated infrastructure. Vegetation management around electrical lines should be considered to minimise bushfire risk.

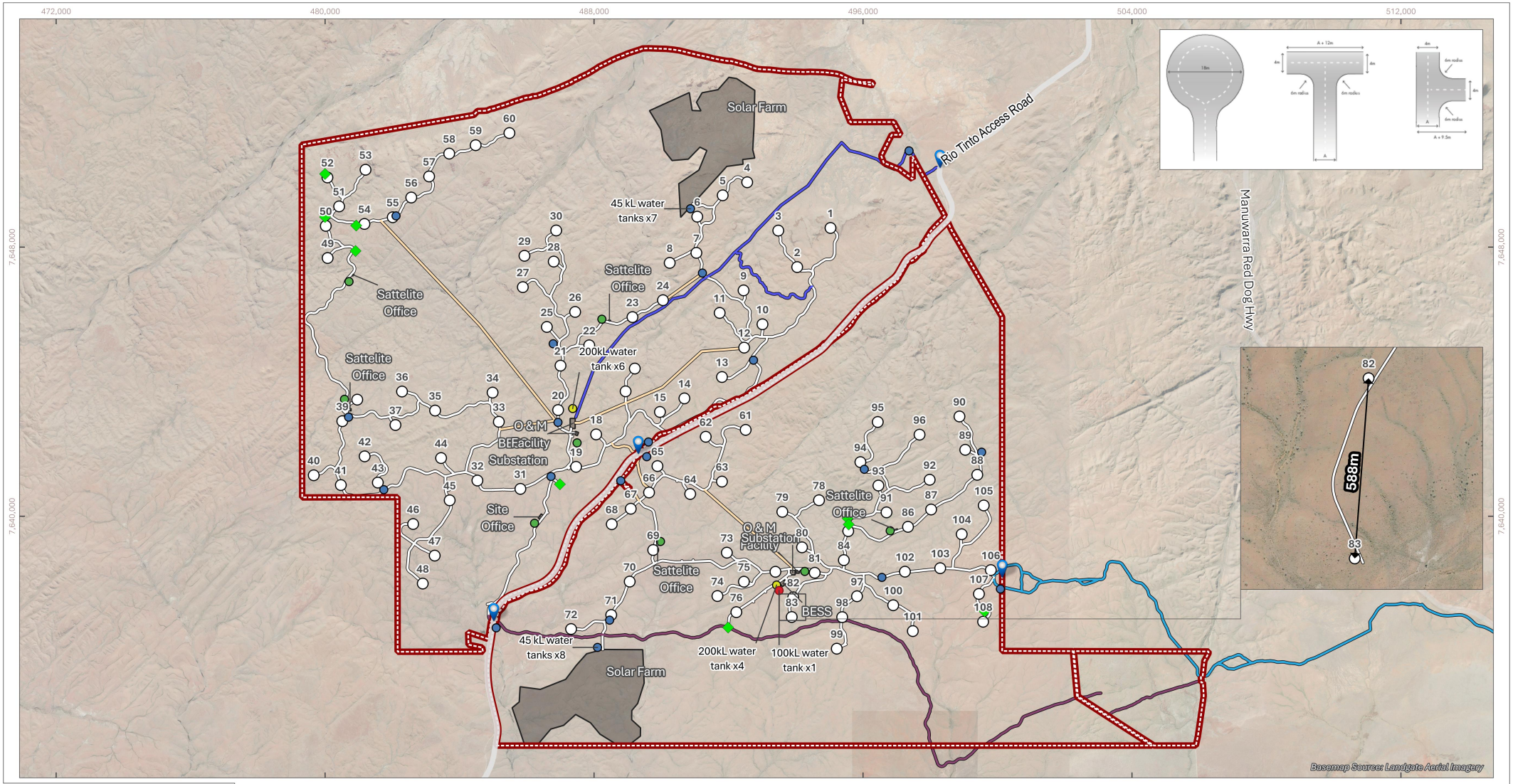


Figure 5.1: Bushfire Mitigation Measures

terravias.com.au

- Project Footprint
- Wind Turbine
- Supporting Infrastructure
- Access point
- Turnaround point
- 45 kL water tank
- Up to 50kL water tank
- 200kL water tank
- 100kL water tank

Proposed Roads

- Wind Turbine and Infrastructure Access Road
- Construction and Maintenance Road
- Transmission Line Access Road
- Millstream Access Track
- Ngurawaana Access Track

terravias

0 1 2 3 4 5 km

COORDINATE REFERENCE SYSTEM:
GDA2020 / MGA Zone 50

SCALE: **1:160,000**
PROJECT NUMBER: **A25.371**

DRAWN BY / REVIEWED BY:
SM / BE **16/9/2026**

N

\\TVSNAS01\DataMgmt\GIS\Project Data\2025\A25_371\3_Projects\2_BMP\A25.371_BMP_TV.qgz

6 Responsibilities for Implementation and Management of Bushfire Management Measures

Responsibility for implementation of the bushfire risk management measures outlined in Section 5 of this BMP applies to the developer, future owners/builders within the subject site, and the local government. Table 6.1 provides a works program detailing these measures, timing of implementation, and responsibility.

Table 6.1: Proposed Works Program

No.	Bushfire management measure
Developer responsibilities - Prior to commencement of use	
1	Ensure that Asset Protection Zones (APZs), as shown in Appendix B are established and maintained as per the design in Appendix F.
2	For **wind turbine firefighting water supply** - Provide seven (7) 45 kL water tanks for firefighting purposes, distributed across the site as follows: • One tank at each connection to the Rio Tinto Rail Access Road. • One tank at the connection to the Millstream Access Track. • One additional tank in a centralised location (Figure 5.1).
3	For **wind turbine firefighting water supply** (recommended) - Provide an additional twelve (12) 45 kL water tanks (totalling 19 tanks), at the locations shown in Figure 5.1 to further aid on-ground firefighting response.
4	For **habitable building firefighting water supply** - Provide a water tank for firefighting purposes at each habitable building - 10 kL per 1,500 m^2 of floor space, up to 50 kL per tank (Figure 5.1).
5	For **solar array firefighting water supply** – Provide seven (7) 45 kL water tanks at Site 112 and eight (8) 45 kL water tanks at Site 113, as shown in Figure 5.1.
6	For **BESS firefighting water supply** – Provide firefighting water tanks to the total volume of 1,152,000 L for Site 109 and firefighting water tanks to the total volume of 864,000 L for Site 111 (Figure 5.1).
7	Ensure each water tank is: • Installed above-ground on a hardstand base. • Constructed of non-combustible material Complies with AS/NZS 3500.1:2018 Plumbing and drainage Water Services. • Fitted with metal water supply pipes if exposed. Fittings should be located away from the source of bushfire attack. • Fitted with a 50 mm male camlock coupling with full flow valve.
8	Undertake geotechnical and engineering assessments for proposed roads to ensure they meet the Vehicular Access Technical Requirements (Appendix G), including weight capacity (i.e. 15 tonnes).
9	Design and construct private driveways and internal access roads in accordance with the Guidelines and the Draft Code (Figure 5.1).
10	Provide suitable turnaround points in accordance with the Guidelines, as shown in Figure 5.1 and detailed in Appendix G.
11	Include additional bushfire mitigation measures in accordance with WF-EO7.3 of the Draft Code when selecting wind turbine models and undertaking detailed design.
12	Revise or prepare an addendum to this BMP if future design changes result in the relocation of assets to areas that have not been assessed and/or have the potential to increase bushfire risk.

No.	Bushfire management measure
13	Prepare an Emergency Management Plan in accordance with the Bushfire Emergency Plan Manual (WAPC, 2024), as recommended by the Draft Code.
14	Update this BMP to ensure consistency with the detailed design, including re-assessment against the provisions of the CFA Guidelines, as outlined in Appendix A.
Facility operator responsibilities - Prior to Occupation	
11	Develop an operations and maintenance plan (or similar) to meet the requirements of the CFA Guidelines and WF-EO7 in the Draft Code.
Facility operator responsibilities - Ongoing	
12	Maintain APZs to the standard in the Guidelines (Appendix F).
13	Maintain and operate the facility in accordance with WF-EO7.6 of the Draft Code.
14	Ensure designated firefighting water tanks are filled to their effective capacity year-round. Refill tanks immediately after use in a bushfire event (within 24 hours).
15	Maintain firebreaks in accordance with the Draft Code, CFA Guidelines, and Shire of Ashburton annual firebreak notice requirements.
16	Implement, update, and maintain operations and management plans (including this BMP) as necessary to support emergency bushfire response.

7 Conclusion

In the professional opinion of the author, the proposed development satisfies the intent, aim and objectives of SPP 3.7 and the Guidelines, the Draft Code, the Renewables Statement, and relevant aspects of the CFA Guidelines. The proposed development is recommended for approval, subject to a condition of development approval requiring the measures outlined in Appendix A of this BMP to be reassessed and confirmed prior to commencement of use.

8 References

Country Fire Authority (CFA). (2023). *Design Guidelines and Model Requirements for Renewables Energy Facilities Version 4*. State of Victoria.

Department of Planning, Lands and Heritage (DPLH) and Western Australian Planning Commission (WAPC). (2020). *Position Statement: Renewable energy facilities*. Published March 2020.

Mattiske. (2025). *Desktop and Detailed Flora & Vegetation Assessment*: *Yindjibarndi Renewable Energy Project*. Prepared for Yindjibarndi Energy Corporation.

RPS. (2025). *Baru – Preliminary ecological survey findings for access options (Memo)*.

Standards Australia (SA). (2018). *Construction of buildings in bushfire-prone areas* (AS 3959: 2018).

Western Australian Planning Commission (WAPC). (2024a). *State Planning Policy 3.7 Bushfire*. Government of Western Australia.

Western Australian Planning Commission (WAPC). (2024b). *Planning for Bushfire Guidelines*. Government of Western Australia.

Western Australian Planning Commission (WAPC). (2025). *Renewable Energy Planning Code and Guidelines - Prepared under Part 3A of the Planning and Development Act 2005*. Draft Code and Guideline for Public Consultation. December 2025.

Datasets Used

Department of Biodiversity, Conservation and Attractions (DBCA). (2017). *Ramsar Sites (DBCA-010)*. Retrieved on 18 June 2024 from https://catalogue.data.wa.gov.au/dataset/ramsar-sites.

Department of Biodiversity, Conservation and Attractions (DBCA). (2026). *Directory of Important Wetlands in Australia – Western Australia (DBCA-045). Government of Western Australia, data.wa.gov.au*. Retrieved on 09 February 2026 from https://catalogue.data.wa.gov.au/dataset/geomorphic-wetlands-cervantes-eneabba.

Department of Biodiversity, Conservation and Attractions (DBCA). (2022). *Threatened and Priority Flora (DBCA-036)*. Retrieved on 09 February 2026 from https://catalogue.data.wa.gov.au/dataset/threatened-and-priority-flora.

Department of Biodiversity, Conservation and Attractions (DBCA). (2024). *Threatened and Priority Fauna (DBCA-037)*. Retrieved on 09 February 2026 from https://catalogue.data.wa.gov.au/dataset/threatened-and-priority-fauna.

Department of Biodiversity, Conservation and Attractions (DBCA). (2024). *Threatened Ecological Communities (DBCA-038)*. Retrieved on 09 February 2026 from https://catalogue.data.wa.gov.au/dataset/threatened-ecological-communities.

Department of Fire and Emergency Services (DFES). (2024). *Bush Fire Prone Areas (OBRM-001)*. Retrieved on 29 September 2025 from https://catalogue.data.wa.gov.au/dataset/bushfire-prone-areas-obrm-001.

Department of Primary Industries and Regional Development (DPIRD). (2023). *Native Vegetation Extent (DPIRD-005)*. Retrieved on 09 February 2026 from https://catalogue.data.wa.gov.au/dataset/native-vegetation-extent.

Department of Primary Industries and Regional Development (DPIRD). (2019). *2 metre contours (DPIRD-072)*. Retrieved on 09 February 2026 from https://catalogue.data.wa.gov.au/dataset/dpird-2-metre-contours.

Department of Planning, Lands and Heritage (DPLH). (2019). *Bush Forever Areas 2000 (DPLH-019)*. Retrieved on 09 February 2026 from https://catalogue.data.wa.gov.au/dataset/bush-forever-areas-2000-dop-071.

Department of Water and Environmental Regulation (DWER). (2021). *Clearing Regulations - Environmentally Sensitive Areas (DWER-046)*. Retrieved on 09 February 2026 from https://catalogue.data.wa.gov.au/dataset/clearing-regulations-environmentally-sensitive-areas-dwer-046.

Appendix A:
CFA Guidelines Assessment (WA Adaptation)

Background

New and emerging renewable energy technology has outpaced the development of fire and emergency management standards and guidance, especially in Western Australia. The *Draft Renewable Energy Planning Code and Guidelines* (Draft Code; WAPC, 2025) aims to rectify this however is still a draft iteration only applying to wind farms.

The Country Fire Authority (CFA) *Design Guidelines and Model Requirements for Renewable Energy Facilities Version 4* (CFA Guidelines; State of Victoria, 2023) is considered the most appropriate framework for the assessment of renewable energy infrastructure not covered by the Draft Code (e.g. BESS, substations, solar arrays). The proposed BESS, substations, and some aspects of the solar farms have been assessed against the requirements of the CFA Guidelines tailored to the Western Australian planning system in this appendix. As wind turbines have already been assessed against the Draft Code, requirements in the CFA Guidelines pertaining to wind farms have been omitted.

The Bushfire planning requirements for habitable buildings have been assessed and sufficiently addressed under the existing Western Australian Standards and Guidance, including AS 3959: 2018, SPP 3.7, and the Guidelines. Bushfire requirements for proposed wind turbines have been assessed against the Draft Code since this has been drafted specifically for consideration and use in WA. The APZ aspect of the proposed solar arrays have been assessed against the Renewables Statement with other bushfire mitigation measures such as access for emergency services and firefighting water supply considered in this appendix.

Scope, Exclusions, and Adaptations

Given the CFA Guidelines were written for application in Victoria, there are certain provisions that have been intentionally modified or omitted to suit the WA planning and bushfire context. Modified or omitted content is described below:

- **Assets assessed against CFA Guidelines** - As previously noted, the CFA Guidelines have only been applied for assets that are not covered by WA Planning instruments, including BESS, solar arrays, and substations.
- **CFA Guidelines 'all facilities' consideration** - Compliance against 'all facilities' for guideline requirements relevant the Project have been considered. The response to these requirements either describes how the proposed design complies or provides an explanation and justification as to why the requirement is not applicable – e.g. in instances where compliance has already been demonstrated for a similar requirement under WA planning guidance.
- **Requirement of Additional Documentation** - Only tangible and spatial considerations from the CFA Guidelines have been incorporated into the assessment. As such, a Risk Management Plan, Fire Safety Study, and other supporting documents referenced in the CFA Guidelines have not been included as a requirement under this BMP, unless also required in accordance with the Draft Code.
- **Low/High-Risk Environments** – The CFA Guidelines indicate that additional bushfire mitigation measures may be required for Projects located within high-risk environments. The identification of high-risk environments under the Guidelines relies, in part, on Victorian-specific planning

scheme datasets, including the 'Land Subject to Inundation Overlay' and 'Bushfire Management Overlay'. As these datasets do not apply in Western Australia, the Project has been conservatively considered to occur in a high-risk environment on the basis that it is in a mapped bushfire prone area. Notwithstanding this, additional or strengthened bushfire mitigation measures are not considered necessary having regard to the predominant vegetation types (e.g. spinifex and sparse trees) and Project's isolation. On this basis, the Project is considered to present a relatively low bushfire risk.

Facility Location

As stated above, the facility is considered to occur in a high-risk environment as per the CFA Guidelines. Renewable energy facilities proposed in high-risk environments must address the following:

- An assessment against SPP 3.7 and the associated Guidelines.
- The impact of any ignitions arising from the renewable energy infrastructure on nearby communities, infrastructure and assets.
- The impact of bushfire on the renewable energy infrastructure (e.g. ember attack, radiant heat impact and flame contact).
- Assessment of whether the proposal will lead to an increase in risk to adjacent land and how the proposal will reduce risks on site to an acceptable level.

The above requirements have been appropriately addressed through the preparation of this BMP and information provided by the Proponent.

Terravias is not aware of peat soils within 10 m of the proposed infrastructure.

Facility Design

Compliance has been demonstrated for facility design in the following tables:

- Table 8.1: Firefighting Water Supply.
- Table 8.2: Fire Detection and Suppression Equipment.

- Table 8.3: Landscape Screening and On-Site Vegetation.
- Table 8.4: Firebreaks.
- Table 8.5: Solar Energy Specific Requirements.
- Table 8.6: BESS Specific Requirements.
- Table 8.7: Facility Construction and Commissioning.
- Table 8.8: Facility Operation.
- Table 8.9: Vegetation Management for Proposed Facilities and Infrastructure.
- Table 8.10: Emergency Planning.
- Table 8.11: Provision of Emergency Information.

Facility design relating to emergency vehicle access, and wind turbine specific requirements has not been assessed against the CFA Guidelines given these aspects are covered within the Draft Code.

Table 8.1: Firefighting Water Supply

CFA Guideline Requirements (Adapted to WA)	Compliance can be achieved	Compliance comments
All Facilities		
Water access points must be clearly identifiable and unobstructed to ensure efficient access.	✓	Water tanks will be provided on site for the storage static water for firefighting purposes. Water access points will be clearly identifiable through signage. All water tanks will be located in areas that will remain unobstructed.
Static water storage tank installations must comply with AS 2419.1-2021: Fire hydrant installations – System design, installation and commissioning.	✓	The water supply system will be designed in accordance with AS 2419.1-2021. This will be documented at detailed design stage.
The static water storage tank(s) must be an above-ground water tank constructed of concrete or steel.	✓	The static water storage tanks will be above ground and constructed from concrete or steel.
The static water storage tank(s) must be capable of being completely refilled automatically or manually within 24 hours.	✓	The static water storage tanks will be refilled within 24 hours either automatically via a groundwater bore or manually through a local water supply contractor. This will be documented at detailed design stage.
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 (solar panels, wind turbines, battery energy storage systems, etc.).	✓	Water tanks are proposed to be stationed at least 10 m from infrastructure. A water tank at each vehicle access point is proposed as per the Draft Code (refer to Table 5.2, WF-EO7.4).

CFA Guideline Requirements (Adapted to WA)	Compliance can be achieved	Compliance comments
The hard-suction point must be provided, with a 150 mm full bore isolation valve equipped with a Storz connection, sized to comply with the required suction hydraulic performance.	✓	The static water storage system is subject to detailed design however it is expected that each tank will be fitted with the required connection valves and adapters, including a Storz connection.
The hard-suction point must be positioned within four (4) metres to a hardstand area and provide a clear access for emergency services personnel.	✓	The static water storage tanks and connection points will be located within 4 m of the internal access roads for ease of access. This will be documented at detailed design stage.
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, 15m long and 6m wide, in accordance with GL-11: DFES Site Planning and Fire Appliance Specifications.	✓	A hardstand will be provided to the water connection points for fire service access. The hardstands will be designed to DFES specifications, including minimum 15 tonne GVM, 15 m in length and 6 m wide. This will be documented at detailed design stage.
The road access and hardstand must be kept clear at all times.	✓	The internal roads and hardstands will be kept clear at all times.
The hard-suction point must be protected from mechanical damage (e.g. bollards) where necessary.	✓	The static water supply system is subject to detailed design. It is likely that bollards will be installed to protect the water connection points from damage.
Where the access road has one entrance, an eight (8) metre radius turning circle must be provided at the tank.	✓	All access roads with one entrance terminate at a proposed wind turbine location. Each wind turbine has approximately 70 m of hardstand proposed, providing sufficient turn-around space.
An external water level indicator must be provided to the tank and be visible from the hardstand area.	✓	All static water storage tanks will be fitted with a level indicator, visible from the hardstand area. This will be documented at detailed design stage.
Signage indicating 'FIRE WATER' and the tank capacity must be fixed to each tank.	✓	Signage will be installed on each static water storage tank.
Signage must be provided at each vehicle entrance to the facility, indicating the direction to the nearest static water tank(s).	✓	Signage will be installed at each of the entrances to the renewable energy facility.
Solar Energy Specific Requirements		
The fire protection system for solar energy facilities must incorporate at least one (1) x 45,000 L static water tank at the primary vehicle entrance to each part of the facility.	✓	One 45 kL static fire water storage tanks will be installed at the entrance to each solar farm.



CFA Guideline Requirements (Adapted to WA)	Compliance can be achieved	Compliance comments
Additional static fire water tanks of at least 45,000 L effective capacity must also be incorporated for every 100 ha.	✓	There are two solar farms proposed in the Project Footprint. These are shown as Site 112 and Site 113 in Figure 5.1. Site 112 is approximately 660 ha, while Site 113 is approximately 740 ha in size. Therefore, an additional seven (7) 45 kL water tanks will be provided for Site 112, and an additional eight (8) 45 kL water tanks will be provided for Site 113.
BESS Specific Requirements		
For standalone BESS facilities where there is no reticulated water available, the fire hydrant system that complies with AS 2419.1-2021 must provide: the fire water supply must be of a quantity no less than 288,000L or as per the provisions of AS2419.1-2021: Fire hydrant installations, Table 2.2.5 (D) for open yards flowing for a period no less than four hours at 20L/s, whichever is the greater. 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). Fire hydrants must be provided and located so that every part of the BESS 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 (70 m coverage). The fire water supply must be located at vehicle entrances to the facility, at least 10m from any infrastructure (electrical substations, inverters, BESS, buildings, etc). The fire water supply must be reasonably adjacent to the BESS 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 BESS). The fire water supply must comply with AS 2419.1-2021: Fire hydrant installations, Section 5: Water storage tanks.	✓	The Project Footprint includes two proposed BESS. These are shown as Site 109 and Site 111 in Appendix B. Site 109 has a BESS yard measuring 45,000 m^2, and Site Site 111 has a BESS yard measuring 22,500 m2. In accordance with AS 2419.1-2021: Fire hydrant installations (SA, 2021), Site 109 will require four fire hydrant outlets, while Site 111 will require three fire hydrant outlets - able to flow simultaneously. As per the CFA BESS Requirements (i.), this means Site 109 will need a water tank volume of 1,152,000 L and Site 111 will need a water tank volume of 864,000 L. The CFA BESS Requirements (ii.) also state that fire hydrants must be located so that every part of the BESS can be covered by a combined hose length and stream of 70 m. As the current design only prescribes footprints for the proposed BESS, the number of hydrant outlets and their locations to cover all parts of the BESS will be determined at detailed design stage. The proposed firewater supply will be located 10 m from any infrastructure. Figure 5.1 provides indicative water tank locations which may change subject to detailed design. The fire water supply will remain accessible, unobstructed, and will comply with AS 2419.1-2021.



Figure 9: *Best-practice arrangement of fire service infrastructure at facilities with centralised battery energy storage systems without reticulated water supply, or a reticulated water supply that does not meet the performance requirements of AS 2419.1-2021: Fire hydrant installations.*

Table 8.2: Fire Detection and Suppression Equipment

CFA Guideline Requirements (Adapted to WA)	Compliance can be achieved	Compliance comments
All Facilities Suitable fire detection and suppression equipment must be provided: For on-site buildings and structures, according to the requirements of the National Construction Code (NCC). For storage of dangerous goods, according to the requirements of any Australian Standards for storing and handling dangerous goods. For electrical installations, a minimum of two (2) suitable fire extinguishers must be provided within 3m - 20m of each Power Conversion Unit. 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.	✓	Fire detection and suppression equipment will be provided in accordance with the relevant legislation. Each power conversion unit will be fitted with aerosol fire extinguishing device along with smoke detectors, heat detectors, combustible gas detectors, water fire suppression system and audible alarm. All authorised vehicles will be required to carry a fire extinguisher which will be confirmed during site inductions as part of the operational management plan.

Table 8.3: Landscape Screening and On-Site Vegetation

CFA Guideline Requirements (Adapted to WA)	Compliance can be achieved	Compliance comments
All Facilities		
Any proposed or existing vegetation must be considered in the BMP for its potential to intensify and propagate fire within and away from the site.	✓	The BMP considers all existing and proposed vegetation within 150 m of the subject site.
Where landscape screening is required, for example, to screen visual impacts, the design must consider any potential increase in fire risk due to the type (species), density, height, location and overall width of the screening.	✓	No screening vegetation is proposed as part of the development. Landscape screening may be incorporated at detail design stage. In such a case, the BMP will be updated to ensure no intensification of bushfire risk.
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.	✓	The proposed assets within the Project Area will be surrounded by an APZ to ensure the radiant heat flux from vegetation is maintained at 29 kW/m^2 or less. Acceptable radiant heat flux levels have determined in accordance with SPP 3.7 and the Guidelines, the Renewables Statement, and Draft Code as required. BESS and substations will be positioned and have APZs established to ensure the radiant heat flux from vegetation does not exceed 10 kW/m^2. This is a conservative value that is widely used within industry to reduce ignition potential to an acceptable level.
Radiant heat impact leading to ignition may be mitigated through: Vegetation removal (where permitted). Separation from nearby infrastructure (e.g., fire breaks; refer below). The provision of thermal barriers at nearby infrastructure.	✓	The radiant heat impact has been reduced through the establishment of APZs to maintain separation between infrastructure and retained vegetation.
Solar Energy Specific Requirements		
Where practicable, low flammability vegetation (such as root vegetables) may be planted under solar panels provided foliage does not extend beyond the panel footprint.	✓	No vegetation is proposed to be planted below solar panels. If this is considered at later stages in the design and operation process, the facility operator will ensure the foliage does not extend beyond the panel footprint.
Substation Specific Requirements		
Substations should be surfaced to eliminate all vegetation including grasses.	✓	All substations will be non-vegetated and surfaced, post-development.

Table 8.4: Firebreaks

CFA Guideline Requirements (Adapted to WA)	Compliance can be achieved	Compliance comments
All Facilities		
A firebreak must be established and maintained around the perimeter of the facility, commencing from the boundary of the facility or from the vegetation screening inside the property boundary.	✓	A perimeter firebreak with minimum width of 3 m will be maintained along the boundary of the external boundaries of properties within the Project Footprint, in accordance with the Shire of Ashburton annual firebreak notice requirements.
A firebreak must be established and maintained around the perimeter of controls rooms, electricity compounds, substations and all other buildings onsite.	✓	Internal access roads will provide perimeter access around the BESS, substations and all other associated infrastructure and buildings. This will be documented at detail design stage.
The width of fire breaks must be a minimum of 10 m, and at least the distance where radiant heat flux (output) from the vegetation does not create the potential for ignition of on-site infrastructure.	✓	A minimum 10 m wide cleared buffer will be provided inside the boundary of BESS yards and solar farms. The firebreak buffer will contain non-combustible retaining walls, internal access roads and/or cleared land (non-vegetated) managed as part of the APZ. The APZs have been calculated in relation to the 10 kW/m2 radiant heat threshold which well exceeds the 10 m minimum requirement.
BESS Specific Requirements		
A firebreak must be established and maintained around battery energy storage systems and related infrastructure.	✓	A minimum 10 m wide cleared buffer will be provided inside the boundary of BESS yards. The firebreak buffer will contain hardstand areas, internal access roads and/or cleared land (non-vegetated) managed as part of the APZ. The APZs have been calculated in relation to the 10 kW/m2 radiant heat threshold.
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.	✓	A minimum 10 m wide cleared buffer will be provided inside the boundary of BESS yards. The firebreak buffer will contain hardstand areas, internal access roads and/or cleared land (non-vegetated) managed as part of the APZ. The APZs have been calculated in relation to the 10 kW/m2 radiant heat threshold.

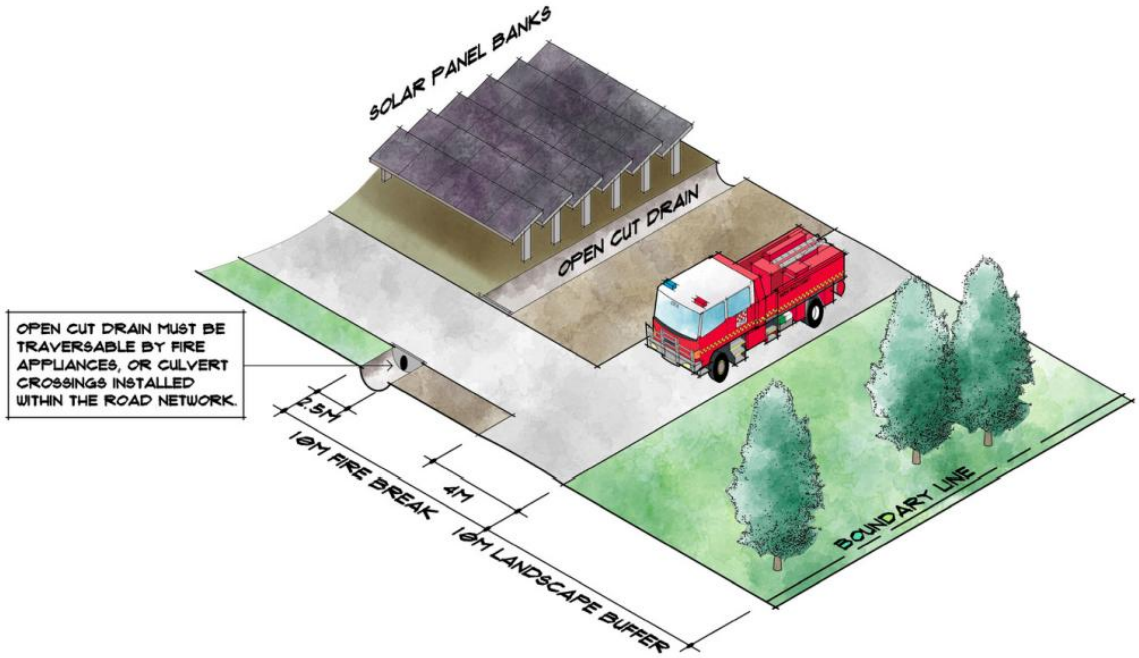


Figure 10: *Typical cross-section indicating fire break requirements at a solar energy facility.*

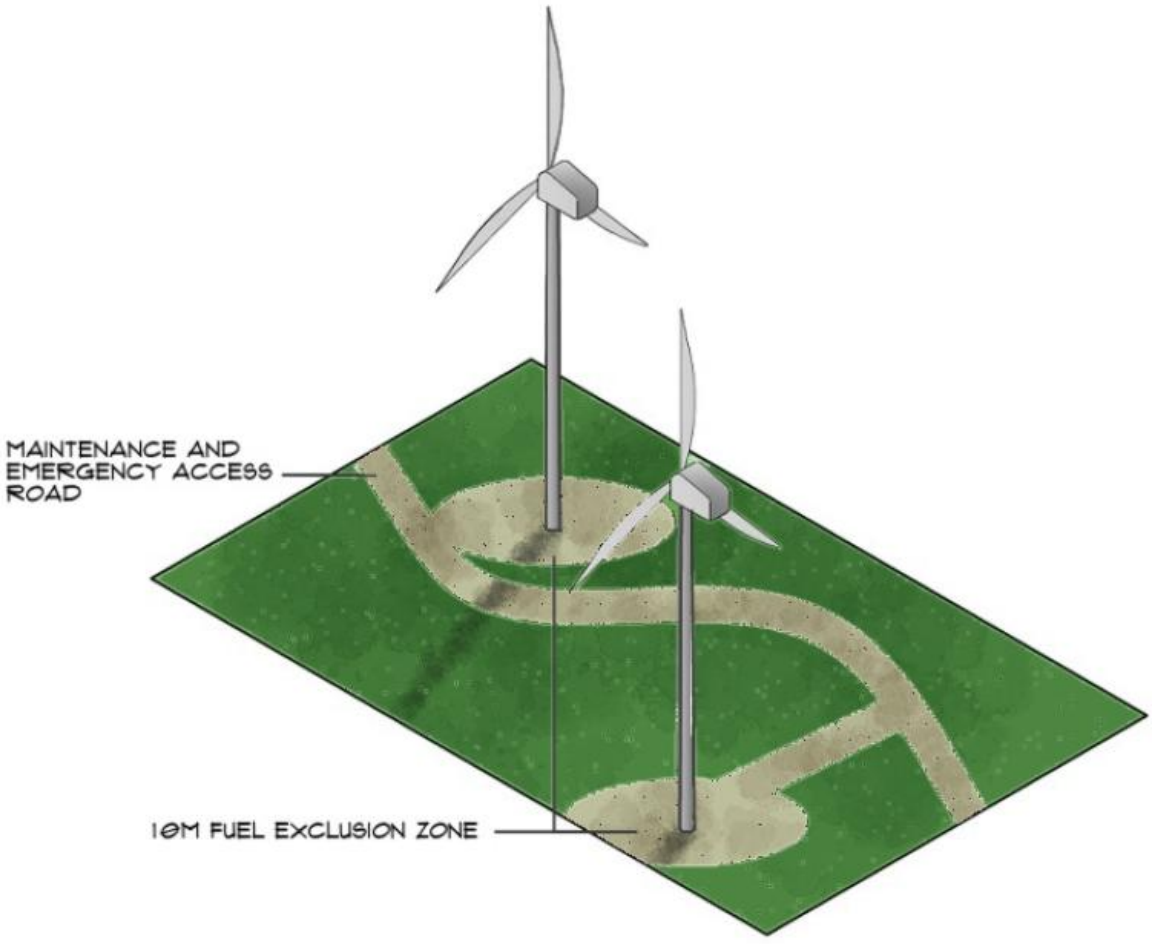


Figure 11: *Typical wind turbine arrangement with fuel exclusion zone and access roads.*

Table 8.5: Solar Energy Specific Requirements

CFA Guideline Requirements (Adapted to WA)	Compliance can be achieved	Compliance comments
Solar energy facilities are to have a minimum six (6) metre separation between solar panel banks.	✓	A 6 m separation between solar panel banks will be incorporated in the detailed design following planning approval.

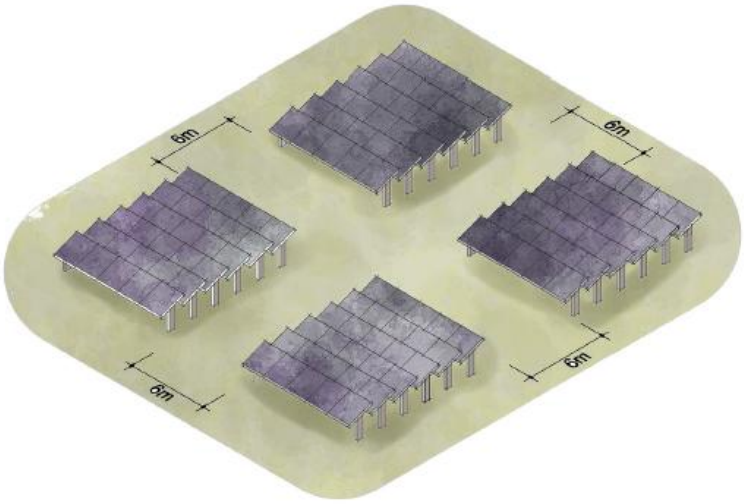


Figure 12: Six metre separation between solar panel banks (indicative only).

Table 8.6: BESS Specific Requirements

CFA Guideline Requirements (Adapted to WA)	Compliance can be achieved	Compliance comments
The design of the BESS facility must incorporate a separation distance that prevents fire spread between battery containers / enclosures and: Other battery containers / enclosures. On-site buildings. Substations. The site boundary. Any other site buildings. Vegetation.	✓	All components of the BESS facility will be designed to prevent fire spread. Detailed design will ensure separation distances within the subject site are in line with globally accepted standard NFPA 855 - Standard for Installation of Statutory Energy Storage Systems (NFPA, 2023) and manufacturers specifications.
The design must incorporate a firebreak around the BESS and related infrastructure, of a width of no less than 10 m.	✓	A 10 m firebreak will be provided (refer above).
The design must incorporate a layout of site infrastructure that: Considers the safety of emergency responders. Minimises the potential for grassfire and/or bushfire to impact the BESS. Minimises the potential for fires to battery containers / enclosures to impact on-site and off-site infrastructure.	✓	The proposed APZs provide permanent separation between the proposed BESS facility and areas of vegetation. The BESS yards will utilise infrastructure that integrates fire prevention systems and controls to prevent potential fires. This will be finalised in detailed design. The BESS yards are accessible via multiple access tracks for ease of emergency responders' access and egress in the event of a fire. Further designs to minimise the fire risk, including battery positioning and hydrant locations, will be considered during detailed design.
The BESS must be located reasonably adjacent to a site vehicle entrance suitable for emergency vehicles.	✓	The entrances to the BESS are considered suitable for Type 3.4 firefighting appliances. Geotechnical and engineering assessments will be undertaken prior to the construction of access roads to ensure weight capacity requirements (i.e. 15 tonnes) and other specifications as outlined in the Vehicular Access Technical Requirements (Appendix G) are met.
The BESS must be 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 a fire at the BESS). The BESS must be provided with in-built fire and gas detection systems. Where these systems are not provided, measure to effectively detect fires within	✓	Both of the BESS yards can be accessed from multiple entrances and as such, different sides depending on the approach of bushfire. The exact locations of BESS units and water tanks will be documented at detailed design stage. Locations will

CFA Guideline Requirements (Adapted to WA)	Compliance can be achieved	Compliance comments
containers must be detailed within the Risk Management Plan.		ensure that firefighting water will be accessible under differing wind conditions. The BESS will be provided with in-built smoke detectors, heat detectors and combustible gas detectors.
The BESS must be provided with explosion prevention via sensing and venting, or explosion mitigation through deflagration panels.	✓	The BESS will be provided with in-built smoke detectors and hydrogen gas detectors to prevent explosions.
The BESS must be provided with suitable ember protection to prevent embers from penetrating battery containers / enclosures.	✓	Any external gaps or ventilation systems can be fitted with ember protection. This will be documented at detailed design stage.
The BESS must be provided with suitable access roads for emergency services vehicles, to and within the site, including to BESS and fire service infrastructure.	✓	The access arrangements enable emergency service vehicles to effectively manoeuvre the site and access the fire service infrastructure, as demonstrated in the Emergency Vehicle Access section.
The BESS must be installed on a non-combustible surface such as concrete.	✓	The BESS will be installed on a non-combustible surface.
The BESS must be provided with suitable ventilation.	✓	The BESS will be fitted with automatic ventilation system.
The BESS must be provided with impact protection to at least the equivalent of a W guardrail-type barrier, to prevent mechanical damage to battery containers / enclosures.	✓	Suitable impact protection measures may be developed, subject to final hazard risk assessment to be completed during detailed design stage.
The BESS must be provided with enclosed wiring and buried cabling, except where required to be above-ground for grid connection.	✓	All wiring will be enclosed and all cabling connecting the individual components will be underground.
The BESS must be provided with spill containment that includes provision for management of fire water runoff.	✓	BESS containers will be equipped with spill containment. Fire water runoff will be managed through detailed hydrology design.

Table 8.7: Facility Construction and Commissioning

CFA Guideline Requirements (Adapted to WA)	Compliance can be achieved	Compliance comments
All Facilities		
Install and commission fire detection and suppression for the facility at the earliest possible stage of construction.	✓	A construction programme is yet to be prepared for the project. Fire detection and suppression systems will be included as part of the construction programme when prepared.
Provide first-aid firefighting equipment, such as fire extinguishers (and where possible, portable fire hose reels), appropriate to the identified emergency scenarios, at all construction portables / buildings onsite, in the vicinity of all construction activities, and in site-based vehicles.	✓	Transportable buildings used during the construction phase of the project will include first-aid firefighting equipment.
Provide the required fire protection equipment for any storage of dangerous goods as per the relevant Australian Standards.	✓	Fire protection equipment will be provided in accordance with the relevant standards for the storage of dangerous goods.
Obtain appropriate permits for work during the restricted and prohibited burning periods and ensure that any conditions on the permits are adhered to.	✓	The proponent will be responsible for obtaining any necessary permits during restricted burn periods.
Adhere to restrictions on Total Fire Ban or days of elevated fire danger according to Emergency WA website.	✓	The proponent will adhere to the restrictions of Total Fire Ban days.
During the restricted and prohibited burning periods, ensure vehicle operators are instructed to remain on tracks and are not permitted to drive through paddocks.	✓	Vehicles will only be permitted on designated access roads.
Restrict smoking to prescribed areas and provide suitable ash and butt disposal facilities.	✓	Smoking will be restricted to a prescribed area, away from all fire hazards.
Provide remotely accessible site/system security monitoring at the facility.	✓	Security within the Project Footprint will be determined during the detailed design phase.
Provide training for personnel in the use of on-site first aid firefighting equipment, and responsibilities during emergencies.	✓	Personnel nominated as part of the emergency response team will be required to undertake first aid and firefighting equipment training.
Develop an Emergency Plan for the construction and commissioning phase of the project.	✓	A construction management plan will be developed for the project which will include emergency procedures during the construction and commissioning phase of the project. The preparation of an emergency plan is also required under the Draft Code.
Provide an emergency communication system that is reliable and will operate in the event of power failure.	✓	All vehicles will be fitted with two-way radios to enable communication during an emergency. YEC vehicles

CFA Guideline Requirements (Adapted to WA)	Compliance can be achieved	Compliance comments
		are fitted with a Starlink device to enable remote communications.
Notify DFES at least seven days prior to the commissioning of any renewable energy infrastructure at the facility.	✓	DFES will be notified prior to commissioning of the Project.
Develop safe work procedures for the facility, including but not limited to: Electricity and chemical management. Vegetation management. Site security. Ignition source control, including hot works. Infrastructure, equipment and vehicle maintenance. Emergency management.	✓	The proponent will develop an operational management plan which will include safe work procedures for the facility.

Table 8.8: Facility Operation

CFA Guideline Requirements (Adapted to WA)	Compliance can be achieved	Compliance comments
All Facilities		
A BMP must be developed for the facility, in consultation with DFES, before development starts.	✓	A BMP has been prepared in accordance with SPP 3.7 and the Guidelines. The BMP will be referred to DFES for advice as part of the assessment process. This is at the discretion of the Shire of Ashburton.
Undertake bushfire prevention and preparedness activities.	✓	An emergency plan will be prepared which will outline bushfire prevention and preparedness activities. In addition, bushfire prevention and preparedness activities will be undertaken in accordance with the Shire of Ashburton annual firebreak notice.
Facility operators must undertake the following measures: Grass must be maintained at or below 100 mm in height. Long grass and/or deep leaf litter must not be present in areas where heavy equipment will be working, during construction or operation. Restrictions and guidance must be adhered to during days of high (and above) fire danger or Total Fire Ban days.	✓	The proposed renewable energy infrastructure will be surrounded by an APZ to ensure the radiant heat flux from vegetation is maintained at 10 kW/m2 for BESS and substations, and 29 kW/m2 or lower for all other infrastructure and buildings. All grass in the APZ will be maintained at or below 100 mm with plant litter removed as necessary.
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.	✓	The facility will be subject to routine monitoring to identify any shorts, faults or equipment failures. The monitoring regime will be detailed in the operational management plan.
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 manufacturers requirements.	✓	Inspection, maintenance and repairs will be undertaken in accordance with the relevant Australian Standards and manufacturers requirements.

Vegetation Management

Effective vegetation management can reduce both the risk of fire entering your facility, and the consequences of fire if it does occur.

- Gutters, roof surfaces and valleys, kerbs, traps, sumps, bunds, drains, rooves or any other accumulation points for leaf litter, dry vegetation, or any other combustible materials must be cleared, and the debris removed from site.
- Vegetation management activities must be conducted across the entire facility (e.g. grass slashing or mowing, removal of dead/fallen vegetation).
- Extraneous materials or vegetation in fire breaks at the site perimeter, at external building walls, and at other any site plant/assets must be cleared and removed from site.
- Extraneous or unnecessary materials (fuel loads) must be removed from site, e.g. mulch piles; dilapidated/stored vehicles, plant or equipment; excess fuel/chemicals; any combustible waste materials. Vehicles must not be parked on unmanaged vegetation.

Table 8.9: Vegetation Management for Proposed Facilities and Infrastructure

All Facilities	Solar Energy Facilities	BESS Facilities	Substations and Electric Lines
Facility operators must undertake the following measures during the Fire Danger Period: Grass must be maintained at or below 100mm in height during the declared Fire Danger Period. Long grass and/or deep leaf litter must not be present in areas where heavy equipment will be working, during construction or operation. Restrictions and guidance must be adhered to during the Fire Danger Period, days of High (and above) fire danger and Total Fire Ban days.	Solar energy facilities must have grass maintained to no more than 100 mm under solar panels during the Fire Danger Period. Operators of solar energy facilities on grazed paddocks must ensure that if additional measures to maintain grass to this level are required, they are implemented prior to, and for the duration of the Fire Danger Period.	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 BMP.	Vegetation management within any electric line easement must ensure that falling trees would not impact the transmission lines, towers and associated infrastructure.

Table 8.10: Emergency Planning

CFA Guideline Requirements (Adapted to WA)	Compliance can be achieved	Compliance comments
All Facilities		
An Emergency Plan must be developed specific to the facility before the development starts.	✓	An emergency plan will be prepared and approved prior to operation of the development. The emergency plan and procedures will be prepared for wind turbines in accordance with the Draft Code (Table 5.2, WF-EO7.6) and will include emergency response for BESS, solar arrays, and substations as relevant.
The Emergency Plan should be developed in accordance with AS 3745-2010: Planning for emergencies in facilities and include the following: Emergency prevention, preparedness and mitigation activities. Activities for preparing for emergencies. Control and coordination arrangements for emergency response (e.g. Evacuation procedures, shelter-in-place arrangements, emergency assembly areas and emergency response procedures). The agreed roles and responsibilities of on-site personnel (e.g. equipment isolation, fire brigade liaison, evacuation management, shelter-in-place management, if applicable).	✓	The Draft Code requests an Emergency Plan be prepared in accordance with the Bushfire Emergency Plan Manual (WAPC, 2024). Given the Draft Code applies specifically to WA, the emergency plan will be developed in accordance with the recommendations of this code, with emergency response for BESS, solar arrays, and substations included as relevant.
Solar Energy Specific Requirements		
A solar energy facility Emergency Plan must additionally include: Emergency procedures for isolation and shut-down where solar panels and/or related infrastructure are involved in fire. Emergency procedures for fires within the vicinity of solar energy facilities. Specifications for safe operating conditions for temperature, and the hazards related to electricity generation at the facility.	✓	The emergency plan will be prepared in consultation with relevant experts, taking into consideration the hazards identified in the risk assessment.
BESS Specific Requirements		
The Emergency Plan for a BESS facility should also include: The contact information for specialist technical support for the BESS. Emergency response procedures based on identified risks and hazards of the BESS and related infrastructure. Details of the elements monitored / controlled by the Battery Management System (BMS), including internal temperature, state of charge, voltage, etc. and the locations this information is available (e.g.	✓	The emergency plan will be prepared in consultation with relevant experts, taking into consideration the hazards identified in the risk assessment.



CFA Guideline Requirements (Adapted to WA)	Compliance can be achieved	Compliance comments
BESS containers, in an on-site control room, off-site monitoring facility). A plan for partial or full decommissioning of the BESS in the event of an emergency incident that renders the facility inoperable or unsafe, before its anticipated end-of-life.		

Table 8.11: Provision of Emergency Information

CFA Guideline Requirements (Adapted to WA)	Compliance can be achieved	Compliance comments
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 to the facility.	✓	The emergency plan will be provided in accordance with the Draft Code and include emergency response procedures in relation to BESS, solar arrays, and substations as relevant. The proponent will be responsible for printing and distributing emergency information, including providing booklets to emergency responders and making these available at the BESS, solar arrays, and substation vehicle entrances.

References

Country Fire Authority (CFA). (2023). *Design Guidelines and Model Requirements for Renewables Energy Facilities Version 4*. State of Victoria.

National Fire Protection Association (NFPA). (2023). Standard for the Installation of Stationary Energy Storage Systems (NFPA 855).

Standards Australia (SA). (2021). Fire hydrant installations (AS 2419.1-2021).

Standards Australia (SA). (2010). Planning for emergencies (AS 3745-2010).

