Bushfire Impact Assessment

Burroway Solar Farm - 1955 Eumungerie Rd, Burroway 2821

24001591

3 January 2024

KLEINFELDER
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Burroway Solar Farm - 1955 Eumungerie Rd, Burroway 2821

Kleinfelder Project: 24001591

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1 INTRODUCTION

Edify Energy Pty Ltd (Edify) has engaged Kleinfelder Australia Pty Ltd to prepare the Bushfire Impact Assessment to support the Environmental Impact Statement (EIS) for the Burroway Solar Farm project, a State Significant Development project (SSD-55968733).

1.1 PROJECT OVERVIEW

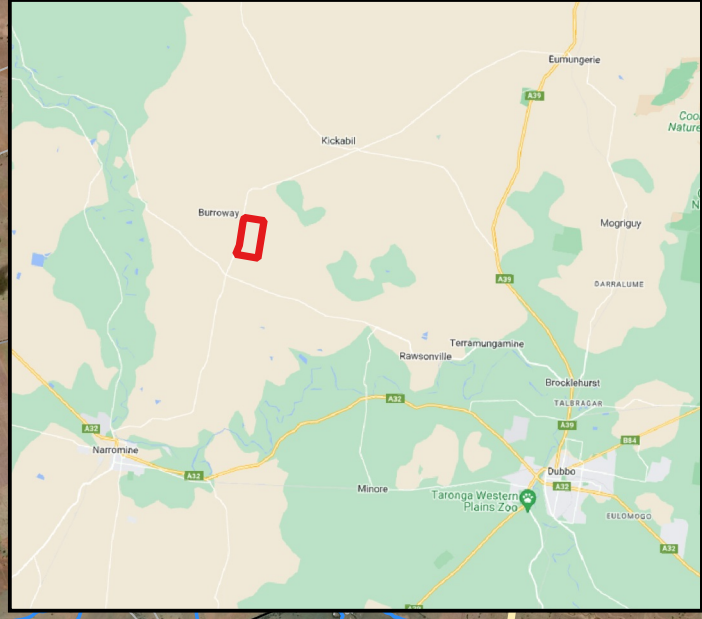
The subject site is located approximately 18 kilometres (km) north of Narromine and 2 km east of Burroway, NSW (Figure 1-1) at Lot 70 DP 1251856, 1955 Eumungerie Road, Burroway. The site is approximately 495 hectares (ha) in size. The site is mostly cleared from its existing agricultural land use. The subject site is zoned RU1 Primary Production under the Narromine Local Environmental Plan (LEP) and is within the Pilliga IBRA Subregion (Brigalow Belt South IBRA region).

The Project involves the construction of an up to 100-megawatt (MW) solar photovoltaic (PV) generator with an estimated 100 MW / 400 MW per hour energy storage capacity. Solar panels will be mounted on frames which are able to track and absorb sunlight to generate energy which is increased to 33 kilovolt (kV) power by integrated transformers. An adjacent substation is proposed to then increase the 33kV electrical current to 132kV. The Project will connect to an existing 132kV transmission line located in the southern part of the subject site. The Project features an option to incorporate batteries into the facility to allow storage of power on site at a future date. Subject to necessary approvals, Edify Energy (Edify), anticipates construction to commence in the financial year of 2026/27.

The following infrastructure will be required as part of the works (Figure 1-2):

- Photovoltaic solar panels/arrays;
- Solar substation;
- Tracking system;
- Piles foundations;
- Internal access tracks;
- Underground medium voltage network;
- Ancillary infrastructure and buildings such as security fencing, parking;
- Substation; and
- Battery energy storage system.

The project will have a capital investment of greater than $30 million and therefore is considered a State Significant Development (SSD) under the *State Environmental Planning Policy (State and Regional Development) 2021* (SRD SEPP). Edify will prepare a Development Application (DA) for the project that is supported by an Environmental Impact Statement (EIS). This will be submitted in accordance with Part 4, Division 4.1 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). The NSW Minister for Planning or the Minister's delegate is the consent authority.



Legend
- Study Area
- hydroline
- ArterialRoad
- LocalRoad
- SubArterialRoad
- Track-Vehicular
- Narromine Council Area

0 0.5 1 1.5 2 km

Project Reference:	
Date Drawn: 2023-10-12	**Locality**
Drawn by: Jake Brown	Figure: **1**

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Data Source:
ESRI - 2023
Edify - 2023
Google - 2023
NSW Government - 2023

Burroway Solar Farm
Visual Impact Assessment
Edify Energy

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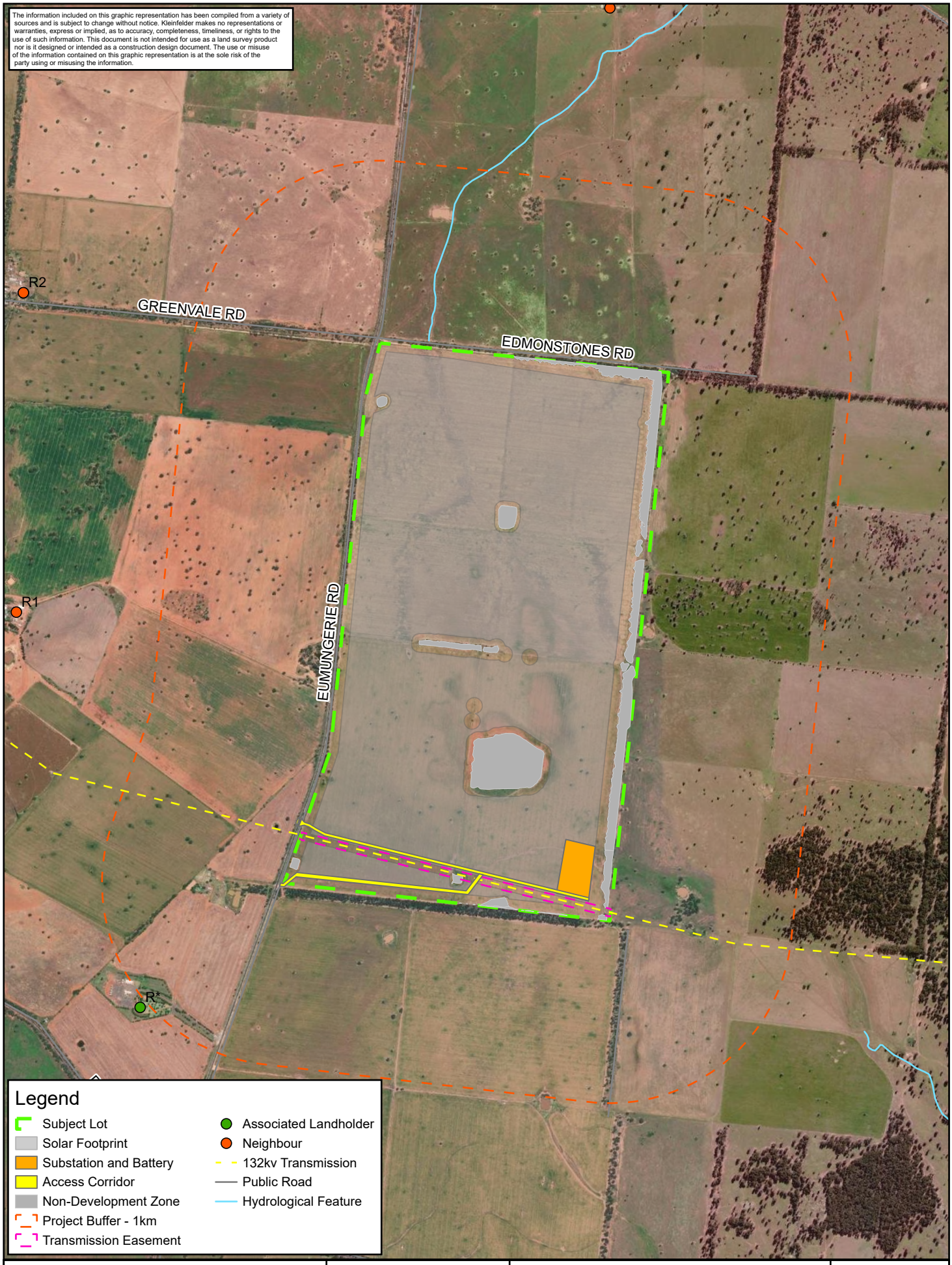

Legend

- Subject Lot
- Solar Footprint
- Substation and Battery
- Access Corridor
- Non-Development Zone
- Project Buffer - 1km
- Transmission Easement
- Associated Landholder
- Neighbour
- 132kv Transmission
- Public Road
- Hydrological Feature

0 125 250 500 750 1,000 1,250

Scale @ A4 1:27,000 Metres

GDA 1994 MGA Zone 56

N

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PROJECT REFERENCE:	24001591
DATE DRAWN: 5/03/2024	Version 1
DRAWN BY:	RHourigan
DATA SOURCE: Esri - 2023	

PROJECT INFRASTRUCTURE LAYOUT

EDIFY ENERGY PTYTD
BURROWAY SOLAR FARM EIS

FIGURE:

Path: J:\00 CLIENT FILES\137540_EdifyEnergyPtytd\BurrowaySolarFarm\Mapping\240222_BurrowaySolarFarm_EIS_v1.aprx (1)

1.2 BUSHFIRE MANAGEMENT AIMS & OBJECTIVES

The bushfire risk assessment aims to address the requirements of the SEARs (SSD-55968733). Key issues of hazards/risks for bushfire state the following:

"Identify potential hazards and risks associated with bushfires / use of bushfire prone land including the risks that a solar farm would cause bush fire and demonstrate compliance with Planning for Bush Fire Protection 2019".

As required under the SEARS, the mapping of the project site as bushfire prone land triggers the requirement to identify potential hazards and risks and demonstrate compliance with Planning for Bushfire Protection 2019 (PBP).

The subject site is located on bushfire prone land, as per NSW Rural Fire Service mapping (see Appendix A). Bushfire risk would be considered in the context of the *Rural Fires Act 1997* at all levels of the development process, from project design, construction, operation through to decommissioning. There is a requirement to understand the following:

- Bushfire history and bushfire risk to the community landscape;
- Does the proposed solar farm change the bushfire risk of the project area;
- What is the potential bushfire risk towards the solar farm asset (life and safety, the infrastructure, and the environment);
- What are the applicable mitigation measures that can be implemented to reduce the bushfire risk of the project area to a level that is deemed acceptable?

As per PBP 2019, bushfire protection measures include:

- Building and construction requirements, commensurate with the purpose/use and constructions of the structures and, where applicable, the quantified bushfire attack level (BAL) ratings;
- Asset Protection Zone (APZs) and easement landscape management actions (including, but not limited to slashing, mowing, landscaping & garden maintenance, and fire breaks) required to protect assets and prevent the spread of fire.
- Access provisions (e.g., public access, property access and fire trails);
- Emergency management arrangements, consistent with the relevant emergency services requirements; and
- Water supply and utilities (power) provisions.

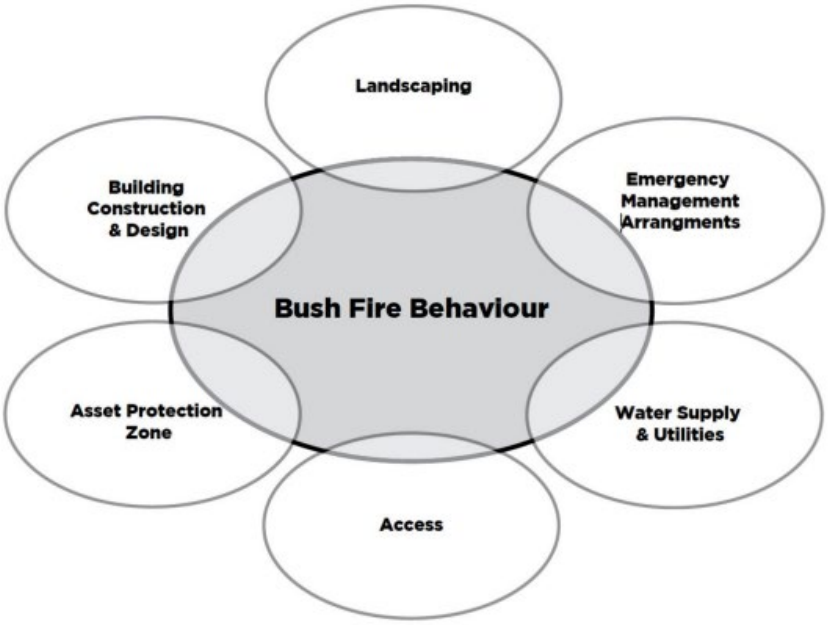

Figure 1-3: Bushfire Protection Measures (NSW RFS, 2019)

1.3 SCOPE

The bushfire impact assessment has been prepared for the Burroway Solar Farm project, covering design and approvals principles, construction, and operations and through to decommissioning. The bushfire protection planning included a desktop assessment and a review of the proposed development against the following guidelines, legislation, and regional information:

- NSW Rural Fires Act 1997;
- Planning for Bushfire Protection 2019;
- Large-Scale Solar Energy Guideline, NSW Government 2022;
- Australian Standard (AS) 3959:2018, Construction of buildings in bushfire-prone areas;
- Bushfire Risk Management Plans (BFRMP) for the Local Government Area (LGA); and
- Bushfire history (SEED geo-mapping).

1.4 APPROVAL PATHWAY

The project will be assessed as a State Significant Development (SSD) under *State Environmental Planning Policy (State and Regional Development) 2011* (SRD SEPP). Accordingly, an Environmental Impact Statement (EIS) for the project is required under the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). Secretary's Environmental Assessment Requirements (SEARS) were issued in February 2023.

A bushfire safety authority under Section 100B of the *Rural Fires Act 1997* will not be required pursuant to Section 4.41 of the EP&A Act. However, a bushfire assessment in accordance with NSW Rural Fire Service Planning for Bushfire Protection 2019 will be carried out.

1.5 LEGISLATION AND GUIDELINES

This bushfire impact assessment acknowledges the *NSW Rural Fires Act 1997* as a legal requirement, and the *Planning for Bushfire Protection 2019* (PBP) as a guideline to assess the suitability/performance of the project.

1.5.1 NSW RFS Planning for Bushfire Protection 2019

PBP is applicable to all development on bushfire prone land (BFPL) in NSW. All development on bushfire prone land must satisfy the aims and objectives of PBP. The overall aim of PBP is to provide for the protection of life (including firefighters) and to minimise impacts on property from the threat of bushfire. To comply with PBP the project would require the following conditions to be met:

- Satisfy the aim and objectives of PBP;
- Consider issues listed within PBP for the specific purpose for the development (Section 8.3.5, Wind and Solar Farms);
- Propose an appropriate combination of Bushfire Protection Measures (BPMs), e.g., Asset Protection Zones (APZs).

Section 8.3.5 of the PBP provides standards, BPMs and guidance specific to solar farms:

- *A minimum 10m APZ for the structures and associated buildings/infrastructure maintained to the standard of an Inner Protection Area (IPA) for the life of the development;*
- *Essential equipment should be designed and housed in such a way as to minimise the impact of bushfires on the capabilities of the infrastructure during bushfire emergencies. It should also be designed and maintained so that it will not serve as a bushfire risk to surrounding bush.*
- *A Bushfire Emergency Management and Operations Plan should identify all relevant risks and mitigation measures associated with the construction and operation of the solar farm including:*
    - *Detailed measures to prevent or mitigate fires igniting;*
    - *Works that should not be carried out during total fire bans;*
    - *Availability of fire- suppression equipment, access, and water;*

- *Storage and maintenance of fuels and other flammable materials;*
- *Notification of the local NSW RFS Fire Control Centre for any works that have the potential to ignite surrounding vegetation, proposed to be carried out during a bushfire danger period to ensure weather conditions are appropriate; and*
- *Appropriate bushfire emergency management planning.*

It is important to be aware of operations that may be carried out on days of Total Fire Ban and any prohibited activities or exemptions that are notified by the Commissioner of the NSW RFS under RF Act s.99.

2 SITE DETAILS

2.1 PROJECT ENVIRONMENT

The project would be entirely within the Narromine Shire Council LGA, on rural landholdings. The proposed Impact Area is agricultural land comprising a large agricultural property which includes paddocks that are generally flat and largely cleared, primarily for agricultural (cropping) purposes.

The hill slopes are generally gentle in gradient and predominantly mixed areas of cleared open grasslands and remnant woodland/forest vegetation on steeper terrain, near rocky outcrops and between saddles. The townships of Narromine and Burroway are the closest population centres to the site, and each township is located a maximum of approximately 18 km from the site.

2.2 LOCAL ENVIRONMENTAL PLAN LAND ZONING

The entire site is zoned RU1 – Primary Production under the Narromine Local Environmental Plan 2011 (Narromine LEP) and is currently and has historically been used for farming (cropping and grazing). The site sits within the Narromine Local Aboriginal Land Council.

The surrounding land is used for agricultural land purposes, such as cropping and grazing.

2.3 FIRE SEASON AND WEATHER

As per the Burroway Solar Farm Scoping Report, the closest weather station to the subject site is Dubbo Airport Automatic Weather Station, approximately 24km south of the site. The subject site experiences warm to hot summers, with the highest mean maximum temperature of 33.6 degrees experienced in January. Winters are mild, with temperatures in the coldest month (July) ranging from a mean minimum of 3.0 degrees to a mean maximum of 15.7 degrees (*Edify, 2023*).

The project is located within the Orana Bushfire Management Committee region (BFMC) and is covered by the Orana Bush Fire Risk Management Plan 2020. The typical / average climate in the Orana BFMC area is:

- Warm to hot summers, ranging from 17°C to 34°C with some extremes exceeding 38°C for many days; and
- Winter temperatures ranging from -4°C to 16°C with the regular early morning frosts in the southern area of the Dubbo Regional LGA.

Mean average rainfall for the area is between 500-600mm per annum. Rainfall is usually evenly distributed throughout the year with a slightly greater average in the summer months. January is on average, the wettest month with 60mm. The bush fire season generally commences on the 1st of October and concludes 31st March.

Prevailing weather conditions associated with the bush fire season in the Orana BFMC area are North to Westerly winds created by consecutive high-pressure systems causing the high daytime temperatures. Such hot winds are usually very dry with low relative humidity often going below 20% (*Orana Bushfire Management Committee, 2020*).

2.3.1 Fire Danger Rating and Climate Change

Narromine LGA falls within the Lower Central West Plains and has a Fire Danger Index rating (FDI) of 80. (*NSW RFS, 2017).*

Over the next 30-40 years (expected lifespan of the project), the climate is projected to change, potentially resulting in more days of higher fire danger than previously experienced, and projected FFDR and GFDR exceeding current levels (Douglas, G. 2017). Planning for long term infrastructure should include consideration of the potential for increased fire danger and potentially higher fire frequencies.

2.3.2 Bushfire Frequency & Ignition Sources

A desktop assessment was conducted to review the fire history of the site. No results were obtained through relevant mapping (Figure 2-1).

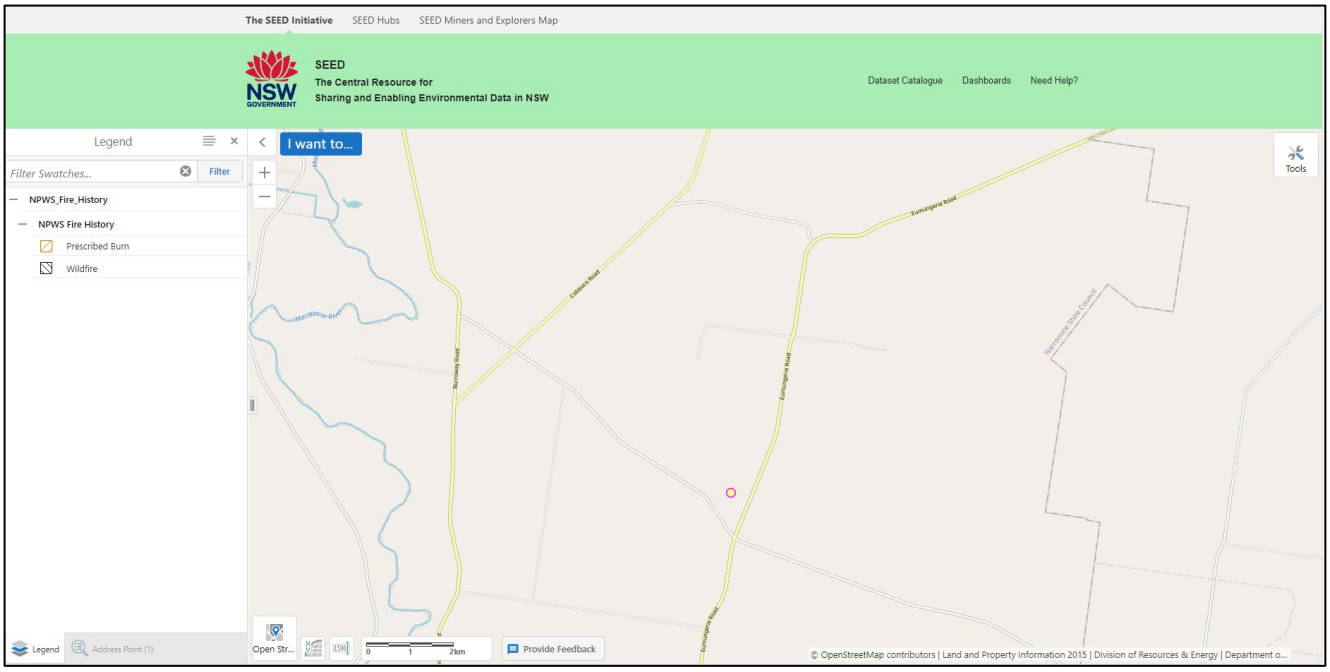

Figure 2-1: Recorded Bushfire History for Project Locality

The Orana BFMC area has on average 200-250 fires per year, of which 10-15 can be considered major fires. Prior to the 1990s, bush fire history records were not kept in any formal way. However, local knowledge has been available to provide necessary information.

Records and local knowledge indicate that seventeen major fire seasons occurred in the Orana Area.

- Dubbo - 1926/27, 1951/52, 1957, 1975/76, 1983/84 (Christmas Day s17 Fire), 1990/91, 1994, 2004 (s44 Fire) and 2007 (Goonoo s44);
- Narromine - 1957, 1964, 1979, 1987 and 2001, (Goobang s44 Fire). Wellington - 1975 (Euchareena s17 Fire), 1990, 1998/99, 2005/06 (Popes s44), 2009 (Hidden Valley Fire) and 2017 (Uungula s44).

These years have generally reflected periods of healthy vegetation growth after good winter and spring rainfall followed by a very hot summer. However severe fires were also experienced during the drought.

The main sources of ignition in the Orana BFMC area are typically from:

- Careless acts by individuals which can include people using welders, angle grinders, dragging implements behind machinery or people playing with matches or fire on days of high to extreme weather conditions;
- Farm machinery;
- Campfire escapes;
- Lightning strikes;
- Electrical Power Supply Lines;
- Burning of stolen vehicles;
- Motor vehicle exhaust systems;
- Escaped controlled permit burns; and
- Arson activity.

2.4 VEGETATION

The subject site presents various vegetation types within the boundary. The following vegetation formations are mapped to occur within the subject site (*NSW State Vegetation Type Map, 2023)*:

- Semi-arid Woodlands (Grassy sub-formation);
- Grassy Woodlands;
- Dry Sclerophyll Forests (shrub/grass sub-formation); and
- Grasslands (Riverine Plain Grasslands).

Pockets of more open vegetation is deemed a woodland hazard.

Verification of the site vegetation found the following vegetation types to occur in small patches on the site, and in continuous stands surrounding the subject lot (Figure):

- PCT 55 (good & moderate) woodland community (vegetation in remnant corridors to the north, east and south of the lot),
- PCT 55 derived grassland (confined to roadsides on northern and southern extents of lot),
- PCT 55 planted shelterbelt of native understory (single shelterbelt in middle of lot),
- PCT 82 (moderate) open woodland community (confined to roadside corridor)
- PCT 88 (good) open woodland (road corridor and in remnant vegetation on south-eastern boundary)
- PCT 202 (good) woodland (single large patch in southern portion of lot)
- Non-native area used for cropping (accounts for majority of the lot)

The subject site consists of scattered clusters of vegetation categories 1 and 2, in terms of bushfire prone land. There are no existing vegetation buffers.

The vegetation in the Orana BFMC area was classified into fire threshold categories as detailed in Table 2-1.

Table 2-1: Fire Thresholds in Orana BFMC area (Orana BFMC, 2020)

Vegetation formation	Minimum SFAZ Threshold	Minimum LMZ Threshold	Maximum Threshold	Notes
Rainforest	NA	NA	NA	Fires should be avoided
Alpine complex	NA	NA	NA	Fires should be avoided
Wet Sclerophyll forest (shrubby sub formation)	25	30	60	Crown fires should be avoided in the lower end of the interval range
Wet Sclerophyll forest (grassy sub formation)	10	15	50	Crown fires should be avoided in the lower end of the interval range
Grassy woodland	5	8	40	Minimum interval of 10 years should apply in the southern Tablelands area. Occasional intervals greater than 15 years may be desirable.
Grassland	2	3	10	Occasional intervals greater than 7 years should be included in coastal areas. There was insufficient data to give a maximum interval; available evidence indicates maximum intervals should be approximately 10 years.
Dry sclerophyll forest (shrub/grass sub formation)	5	8	50	Occasional intervals greater than 25 years may be desirable
Dry sclerophyll forest (shrub sub formation)	7	10	30	Occasional intervals greater than 25 years may be desirable.
Heathlands	7	10	30	Occasional intervals greater than 25 years may be desirable.

Vegetation formation	Minimum SFAZ Threshold	Minimum LMZ Threshold	Maximum Threshold	Notes
Freshwater wetlands	6	10	35	Occasional intervals greater than 30 years may be desirable
Forested wetlands	7	10	35	Some intervals greater than 20 years may be desirable
Saline wetlands	NA	NA	NA	Fire should be avoided
Semi-arid woodlands (grassy sub formation)	6	9	No max	Not enough data for a maximum fire interval
Semi-arid woodlands (shrubby sub formation)	10	15	No max	Not enough data for a maximum fire interval
Arid shrub lands (chenopod sub formation)	NA	NA	NA	Fire should be avoided
Arid shrub lands (acacia sub formation)	10	15	No max	Not enough data for a maximum fire interval.

2.5 TOPOGRAPHY AND SLOPES

The slope relief class of the subject site is categorized as gently inclined plains (*National Map, 2023*). The elevated contour of the subject site is 285 (mAHD). The proposed area is predominately on slopes 0-5 and 5-10 (downslope) but less than 15 degrees. (*National Map, 2023*).

The geological characteristics for the Pilliga subregion of the Brigalow Belt South Bioregion comprises of stepped sandstone ridges with low cliff faces and high proportion of rock outcrop, however these geological features are not present on site.

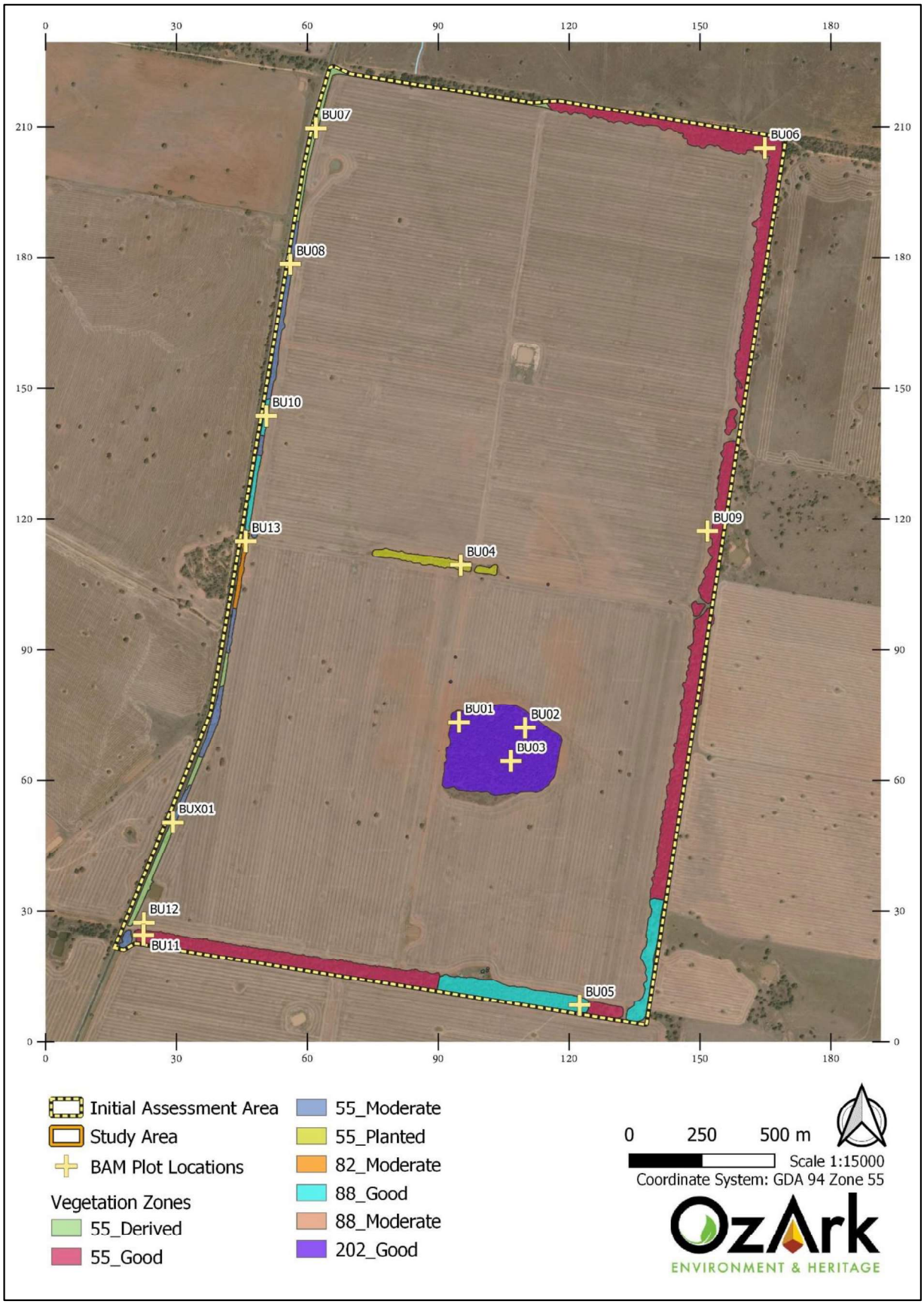

Figure 4-3. Vegetation zones and BAM Vegetation Integrity plots within the assessment area covered by the initial survey.

3 RECOMMENDED BUSHFIRE MITIGATION STRATEGIES

The owner and operator are responsible for the actions associated with fire management and risk mitigation associated with solar farm construction, operations and decommissioning across the landholdings. The following risk mitigation actions for the project have been developed to achieve compliance with the specifications and requirements of Section 8.3.5 of PBP 2019 for solar farms.

3.1 ASSET PROTECTION ZONES

An APZ provides a buffer zone between a bushfire hazard and an asset that allows suppression of a fire and aims to avoid possible flame contact and/or excessive radiant heat. An APZ allows emergency services access and provides a relatively safe area for firefighters to defend assets.

It is recommended that an APZ be established around all solar array assets, substation and permanent operations and maintenance buildings. APZ specifications for solar farms must be as per Section 8.3.5 of PBP:

- A minimum 10m APZ around the development footprint (to protect all structures and associated buildings/infrastructure);
- The APZ must be installed and maintained for the life of the development to the standard of an Inner Protection Area (IPA) as outlined within Appendix 4 of PBP and the NSW RFS document standard for Asset Protection Zones e.g.:
    - **A Fuel Free Area –** APZ to be maintained free from fuel (e.g., APZ to be comprised of sand, gravel, etc.)
    - **Grass –** Grass to be short, mown and maintained to a height <10cm.
    - **Trees –** Where possible, avoid any tree canopy in the APZ. If tree canopy cannot be avoided in the APZ, then ensure:
        - Canopy cover is less than 15%;
        - Branches do not touch or overhang any infrastructure buildings;
        - Lower limbs are removed up to a heigh of 2m above ground;
        - Canopies are separated by at least 2m; and
        - Preference should be given to smooth barked and evergreen trees.

A Preliminary Hazard Analysis (PHA) was conducted by Arup in August 2023. The report recommended a 20 m setback distance from the outermost battery unit to the site boundary irrespective the results of the fire tests. The models assume a conservative worst-case scenario and it is expected that the ultimate technology selection will provide further detail that can be used as the basis to reduce the recommended spacing requirements. *(Arup, 2023).*

More information on APZ's can be found in Standards for APZ (NSW RFS).

3.2 LANDSCAPE MAINTENANCE

The Landscape Character and Visual Impact Assessment, and the Glint and Glare Impact Assessment found private and public receivers for the Project will not experience visual impacts from the project infrastructure and as such no landscaping or screening is currently proposed.

It is expected that retention of all vegetation on site will fragment and alleviate views of the development throughout the Projects life.

The Project site was subject to a site verification assessment of land and soil capability (LSC), in accordance with the LSC Guideline. Approximately 55% of the Subject land was classed as LSC 3 (high capability), 17% was LSC 4 (moderate capability), 19% was LSC 5 (moderately low capability) and 8.5% was LSC 6 (low capability).

The Project will decommission and rehabilitate the land to the pre-existing agricultural land use.

3.3 BUILDING DESIGN

The PHA conducted by Arup (2023) included a Battery Fire Consequence analysis. The investigation deducted that in order to meet acceptance criteria for reduced fire propagation risk, separation distances required for both types of modular and cabinet unit. In addition to the separation distances required, the following is recommended:

- Provision of adequate standoff distances for batteries from other BESS units and PV units (as shown in Section 6 or as outlined in UL 9540A test report).
- Provision of adequate ventilation to relieve the off gassing of combustible gases from thermal runaway in line with NFPA 69.
- Inclusion of a battery monitoring system in BESS units and an off-gas detection system. (Arup, 2023).

Arup also recommended the following explosion prevention measures:

- Deflagration vents in accordance with NFPA 68; and/or
- Exhaust system in accordance with NFPA 69.

Furthermore, this report recommends the BESS, substation, and associated buildings to be built to the appropriate Bushfire Attack Level (BAL) as per Australian Standard (AS) 3959:2018.

3.4 WATER SUPPLY

A dedicated static water supply of 20,000L for bush firefighting purposes is recommended at strategic locations within the solar farm, having consideration for essential equipment and accessibility e.g., near the main entrance. A steel tank supply for the solar farm would provide suitable emergency water supplies. Water supply infrastructure is to be located and installed during the initial phase of the construction process and site mobilization scope.

Fast fill options and easily accessible fill points should be provided. (e.g., 65mm Storz outlet with ball valve fitted to outlet). All specifications are to be in accordance with Table 7.4a PBP 2019.

Furthermore, from the PHA, Arup recommended that the following fire water containment system is designed in one of two ways:

- Permanent containment system: the civil design of the site can be scoped such that it is possible to contain all runoff in a designated catchment area (e.g., a bund or some form of holding basin);
- Temporary containment: the site can be designed such that, in the event of a fire brigade response that may lead to contaminated runoff, drainage can be thoroughly sealed, and firewater contained on-site. In essence, this is a temporary bund. (Arup, 2023).

3.5 ACCESS MANAGEMENT

Access is critical for bushfire emergency response, safe firefighting, and evacuation. Main site access will be provided from Eumungerie Road.

These are public roads and will provide a >4m wide carriageway for the life of the project.

The solar farm construction phase requires heavy vehicle access to support the transportation and storage of the solar farm infrastructure. It is assumed and recommended that this construction access is maintained for the life of the development. As such the access (including internal access roads and infrastructure perimeter road) will be inherently capable of supporting Cat-1 fire vehicle access consistent with the following NSW RFS Fire Trail Standard (NSW RFS 2019):

- the width and capacity of the access provides for safe, reliable, and unobstructed passage by a Cat 1 firefighting vehicle within acceptable operational limits:
    - *the trafficable surface has a minimum width of 4m (planned double lane access);*
    - *the access has a minimum 4m height clearance overhead, free from any obstructions;*
    - *curves inner radius 6m;*
    - *crossfall less than 6 degrees;*
    - *surfaces and crossing structures can carry vehicles with a gross vehicle mass of 15 tonnes and an axle load of 9 tonnes;*
    - *turnaround provisions of 22m diameter or T junction at the termination of each access track and in position of the dedicated water supply tanks; and*
    - *drainage and wet areas crossing are trafficable (where possible) or avoided.*

3.6 EMERGENCY MANAGEMENT PLANNING

In accordance with Section 8.3.5 of PBP 2019, the construction environmental management plan (and ongoing operational plan) should include the following:

- Detailed measures of to prevent or mitigate fires igniting:
  E.g., hot works permits for works which may result in the ignition of fire.
- Work that should not be carried out during total fire bans;
  E.g., hot works not to be carried out on total fire ban days, or any prohibited activities or exemptions that are declared and notified by the Commissioner of NSW RFS under RF Act s.99.
- Availability of fire-suppression equipment, access and water;
- Appropriate storage and maintenance of fuels and other flammable materials;
- Notification of the local NSW RFS Fire Control Centre for any works that have the potential to ignite surrounding vegetation, proposed to be carried out during a bushfire fire danger period to ensure weather conditions are appropriate;
- Any additional matters as agreed and required by the NSW RFS District Office.

3.6.1 Monitor Fire Mitigation Works

Annual monitoring of the recommended fire mitigation actions will ensure the actions are maintained to the specified performance criteria (if relevant). The operational environmental management plan (or similar) for the site should include annual monitoring of the fire mitigation works for the solar farm and will involve the following:

- Access performance criteria (against the recommended performance criteria detailed in this report and NSW Fire Trail Standards);
- APZ/setbacks and landscaping performance criteria (managed areas and surrounding fuel loads) as per the recommended performance criteria detailed in this report; and
- Water supplies and water supply access conditions.

Monitoring should be conducted ahead of the annual declared bushfire season by appropriately qualified staff or contractor and reported to the proponent's Site Environmental Manager.

3.6.2 Communication – Key Stakeholders

It is recommended that bushfire mitigation and safety be communicated with relevant stakeholders outlined in Table 3-1.

Table 3-1: Key Stakeholder Contact Information

Stakeholder	Contact/Name	Phone
NSW RFS Orana Bushfire Management Committee		1800 679 737
Narromine Shire Council	mail@narromine.nsw.gov.au	6889 9999
NSW Fire and Rescue Narromine		6889 1203

3.7 BUSHFIRE MANAGEMENT PLAN - SUMMARY OF RECOMMENDATIONS

3.7.1 Asset Protection Zones and Setbacks

Table 3-2 provides the indicative APZ and setback dimension.

Table 3-2: Indicative APZ Setbacks

Vegetation formation	Slope	Minimum APZ required
Forest	>5°-10° downslope	10 metres
Woodland	>5° - 10° downslope	10 metres
Grassland	>5 ° - 10° downslope	10 metres

The maximum radiant heat flux should not exceed 29 kW/m². This offers a higher level of protection for BESS, substation, and associated infrastructure. At the commencement of building works, and for the life of the project, all land associated with the APZ of the subject site is to be managed as APZ in accordance with the requirements of Asset Protection Zone Standards - Appendix 4 of PBP (2019).

4 CONCLUSION

The report establishes the level of bushfire threat to the subject site and examines protection measures for the proposal to satisfy the broad aims and objectives of PBP 2019 as well as specific considerations detailed in Chapter 8 of PBP 2019 such as asset protection zones, landscaping, access, water supplies, construction and emergency management.

The recommendations proposed are in accordance with PBP 2019 and are to inform the upcoming EIS and therefore, assist the overarching SSD approval pathway. The subject site consists largely of open spaces with clusters of vegetation, which is deemed a viable opportunity for compliant bushfire protection measures and requirements in accordance with PBP 2019.

With the provisions of these recommendations, the solar farm project would comply with the aims, objectives, and specific performance criteria of PBP 2019 (Table 3-3).

Table 3-1: Bushfire Management Recommendations Summary

Bushfire Protection Measures	Section	Summary of Recommendations
Asset Protection Zone (APZ)	3.1	Minimum APZ 10m wide to be installed around the development footprint. APZ to be managed as Inner Protection Area (IPA) for the life of development.
Landscaping	3.2	APZ management to fuel loads by potential grazing/slashing as required. Operational management plan to guide landscape management, monitor and reduce potential fuel loads surrounding the solar farm and APZ areas via ongoing rural activities (e.g., slashing, grazing).
Building Design	3.3	All buildings (BESS, substation buildings, management hub, etc.) will provide for minimum ember protection consistent with BAL 12.5 construction standards (AS3959:2018)
Water Supplies	3.4	An on site tank will have fast fill water connections (65mm stortz fittings) and suitable access provisions for Cat 1 fire fighting vehicles (weight load and maneuverability).
Electrical services	3.5	Provide and maintain electrical services in accordance with Table 7.4a PBP 2019.
Access	3.6	Main access and internal roads to provide for safe, reliable, and unobstructed passage by a Cat 1 firefighting vehicle as per Section 3.5 of this document and maintained for the life of the development.
Emergency Management	3.7	Emergency Management Plan to be prepared for the operations of the solar farm to be developed in consultation with the local NSW RFS District Office and communicated to relevant stakeholders.

REFERENCES

Arup, (2023). Burroway Solar Farm: Preliminary Hazard Analysis.

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NSW RFS Fire Trail Standards V1.1. (March 2019).

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NSW RFS Planning for Bushfire Protection 2019.

Orana Bush Fire Management Committee (2020). Bush Fire Risk Management Plan

SEED (2023). Bushfire Prone Land Dataset

SEED (2023). NSW State Vegetation Type Map Dataset

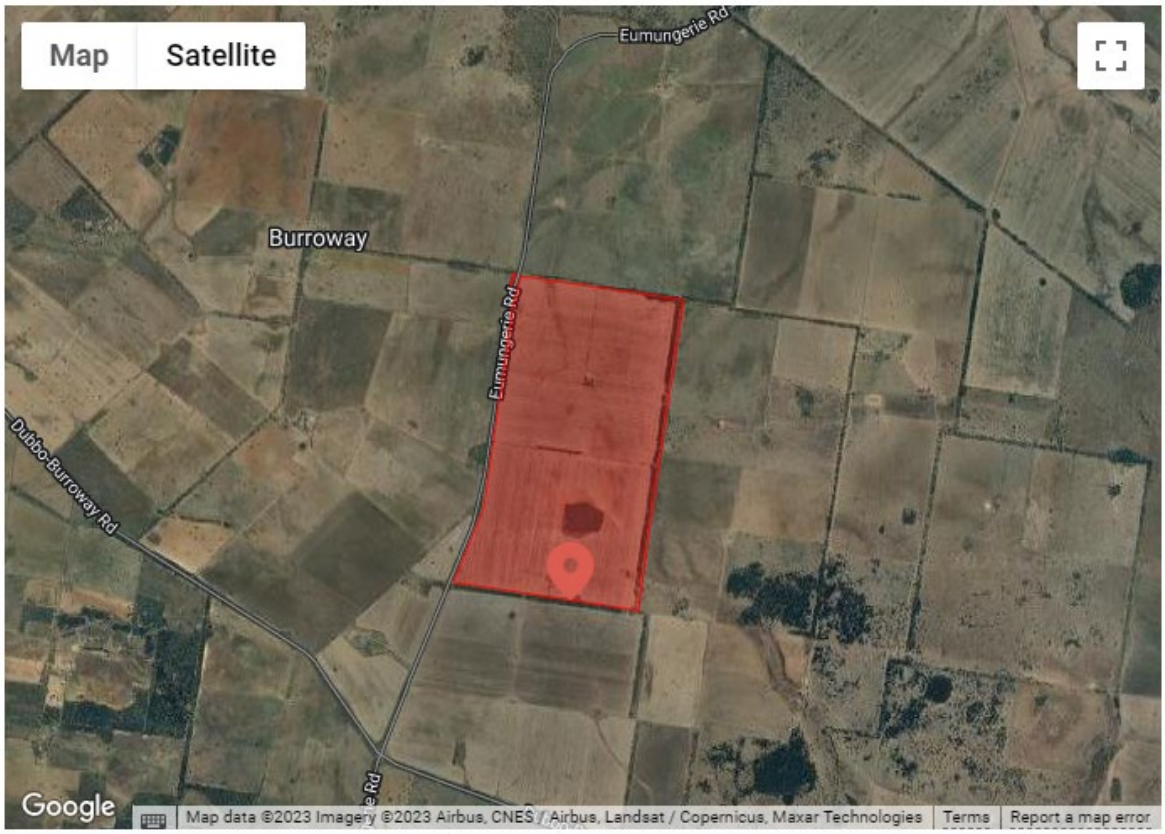
APPENDIX A BUSHFIRE PRONE LAND MAPPING

Check if you're in bush fire prone land

You can check here if your land is in a bush fire prone area.

- Enter your address including house number, street and suburb or town. Select your address from the drop down options provided.
- Check the map has correctly located your property. If not drag and drop the red marker on to your property.
- Click the 'Get Results' button to see if you're in a designated bush fire prone area.
- You should consider seeking expert advice before commencing any development.

Your Property



Your search result

You have conducted a search of the online bush fire prone land tool for the land in the map above. This search result is valid for the date the search was conducted. If you have any questions about the Bush Fire Prone Land Tool please contact bushfireprone.mapping@rfs.nsw.gov.au

The parcel of land you have selected is within a designated bush fire prone area.

Make sure you have completed the four simple steps to prepare for bush fires

In a bush or grass fire, minutes can matter. You need to take action now. Getting ready for a bush fire is easier than you think. By taking 20 minutes with your family to discuss what you'll do during a fire, you could save their lives, as well as your home.