2021

Bushfire Assessment & Emergency Management and Operations Plan

Proposed Micro Solar Farm

1207 Donald Ross Drive, Coleambally, NSW

Prepared for Greentech Solar Project No 1 Pty Ltd

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1 INTRODUCTION

1.1 OVERVIEW

This assessment has been prepared on behalf of Greentech Solar Project No 1 Pty Ltd (the applicant) to support a Development Application for a micro solar farm to be developed at 1207 Donald Ross Drive, Coleambally, New South Wales (NSW). An aerial image of the site and surrounds is provided in the below figure.

Figure 1 Aerial image of development site and surrounds (Source: NSW Planning Portal)

The micro solar farm model involves the construction of smaller solar farms that integrate into the existing Essential Energy electrical network. As such, the subject site has been chosen due to its abuttal to existing Essential Energy 33KV transmission lines. Due to the existing zone substation and power lines, the site is immediately proximate to assets that service local population centres and commercial operators which ensures electricity is most efficiently transferred from the source facility.

The site is currently utilised for agricultural purposes and contains two dwellings and associated farm structures within the south eastern portion. The development would be located on part of Lot 135 DP750903 only within a previously cultivated portion of the site within the north eastern corner as identified in the below figure.

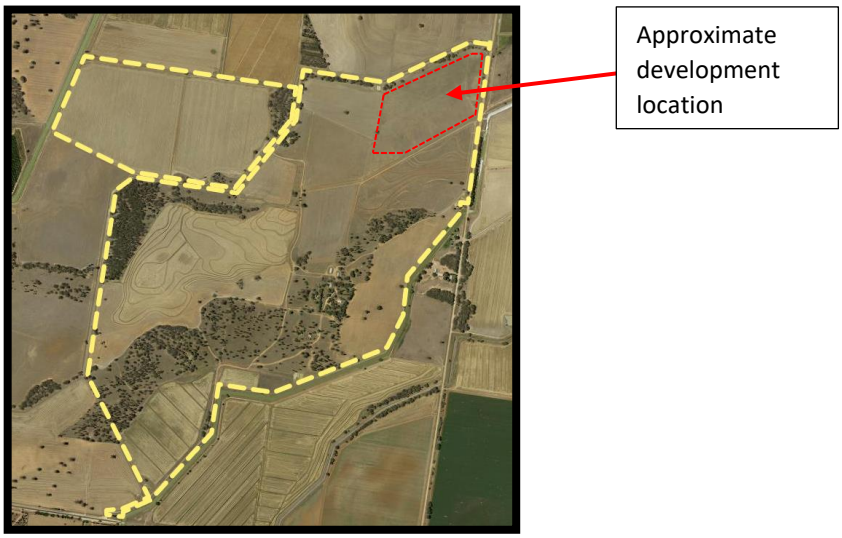

Figure 2 Approximate development proposal area (Source: NSW Planning Portal)

The proposal would include the installation of approximately 16,128 450 watt solar panels which would be mounted on single-axis tracking systems. The solar panels would be supported by ancillary aspects including a power station consisting of an inverter, transformers and switch gear; a HV switchboard consisting of HV switch gear; battery storage; electrical poles; hardstand vehicle areas and site fencing and landscaping.

The solar farm would have a 31 year lifespan from the beginning of construction with the project to be decommissioned and the site rehabilitated at the conclusion of its use which would allow the development footprint area to be re-utilised for agricultural undertakings as appropriate.

The *Environmental Planning and Assessment Act 1979* (EP&A Act) requires the Commissioner of the NSW Rural Fire Service (RFS) to designate and map bushfire prone land (BFPL), which is a trigger for various development assessment provisions. The property is not mapped as bushfire prone land however it is noted that the vegetation within 140 metres of the proposal area would be classified as 'grassland' hazard.

This report has been prepared in accordance with the Rural Fire Service Planning for Bushfire Guide November 2019 (PBP), *Section 8.3.5 Wind and solar farms.*

2 Site Description

2.1 Development Site

The development site is known as 1207 Donald Ross Drive, Coleambally. It is located approximately 25 km north east of the Coleambally township and approximately 23km south east of Darlington Point as shown in the below figures.

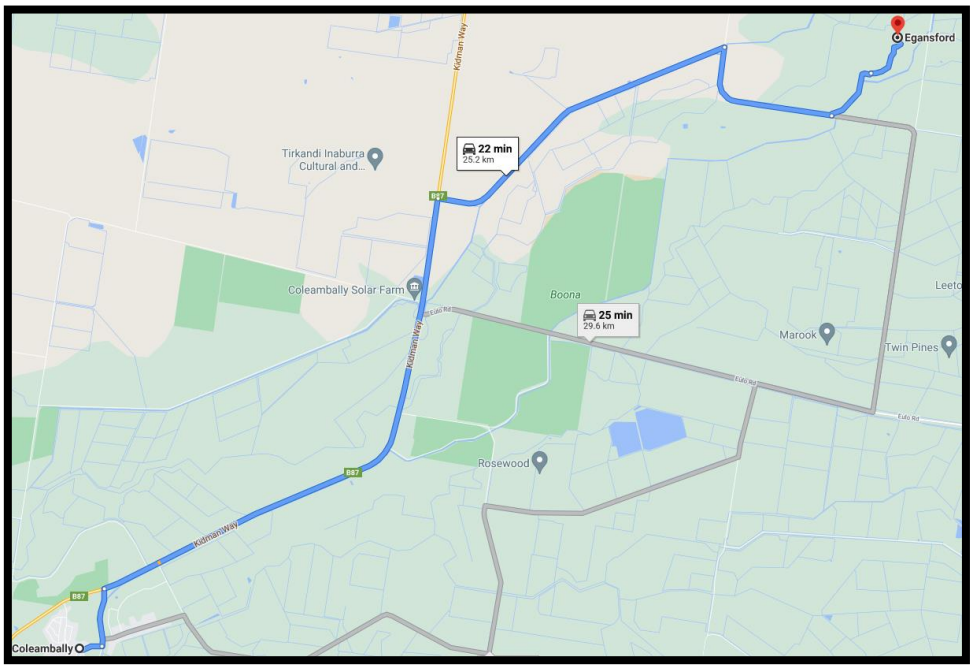

Figure 3 Location of development site from Coleambally township (Source: Google Maps)

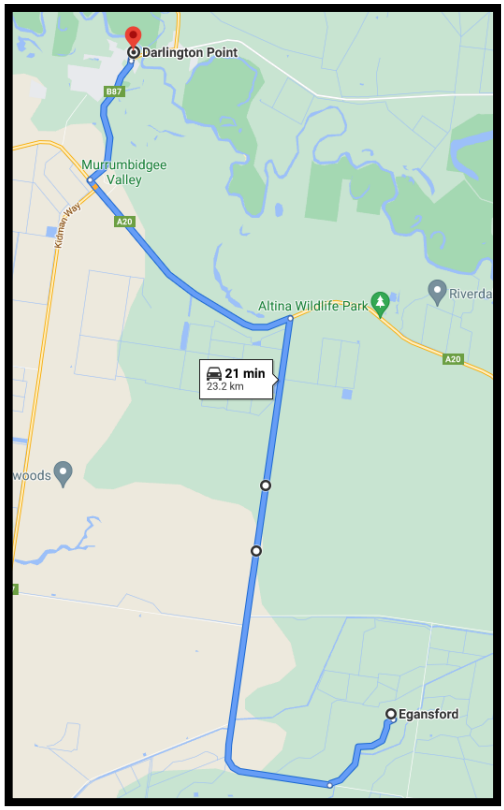

Figure 4 Location of development site from Darlington Point (Source: Google Maps)

It is located on the northern side of Donald Ross Drive and the western side of Cockys Lane as shown in the below locality plan.

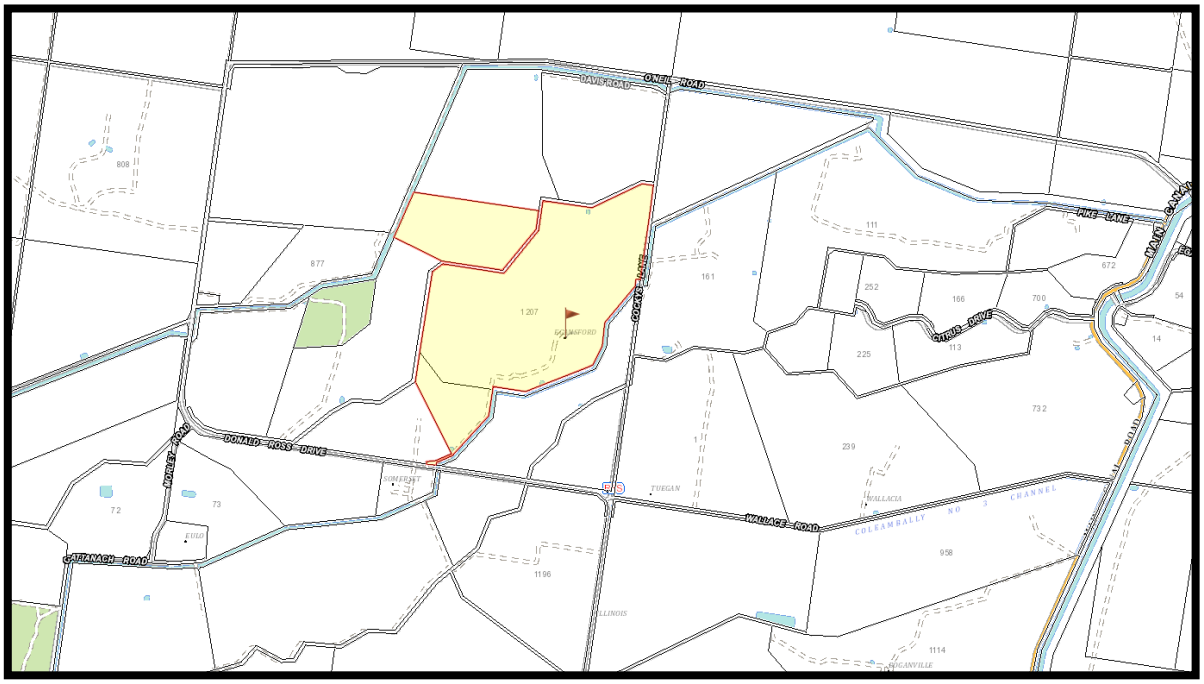

Figure 5 Locality Plan (Source: SixMaps)

The property is legally described as Lots 135, 145 and 146 DP 750903. The site is irregular in shape and approximately 211.7 Ha in size. It has frontage to Donald Ross Drive of approximately 90 metres to the south and a frontage of approximately 860 metres to Cockys Lane to the east.

The site is zoned RU1 Primary Production, consistent with all adjoining land as shown in the below figure.

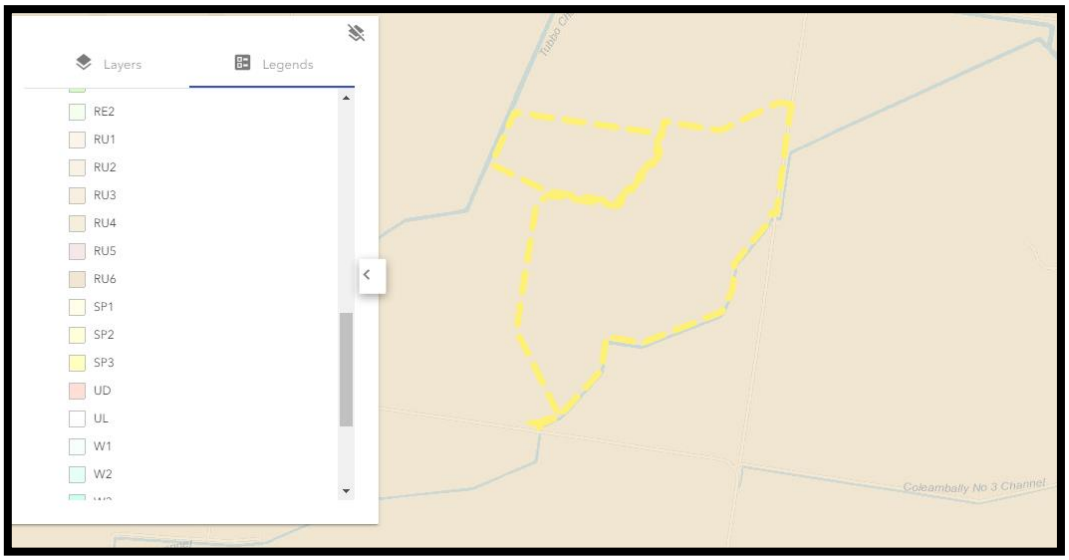

Figure 6 Murrumbidgee Local Environmental Plan 2013 Zoning Plan of subject site and surrounds (Source: NSW Planning Portal)

The property is generally level due to its past and present agricultural use as shown in the below figure.

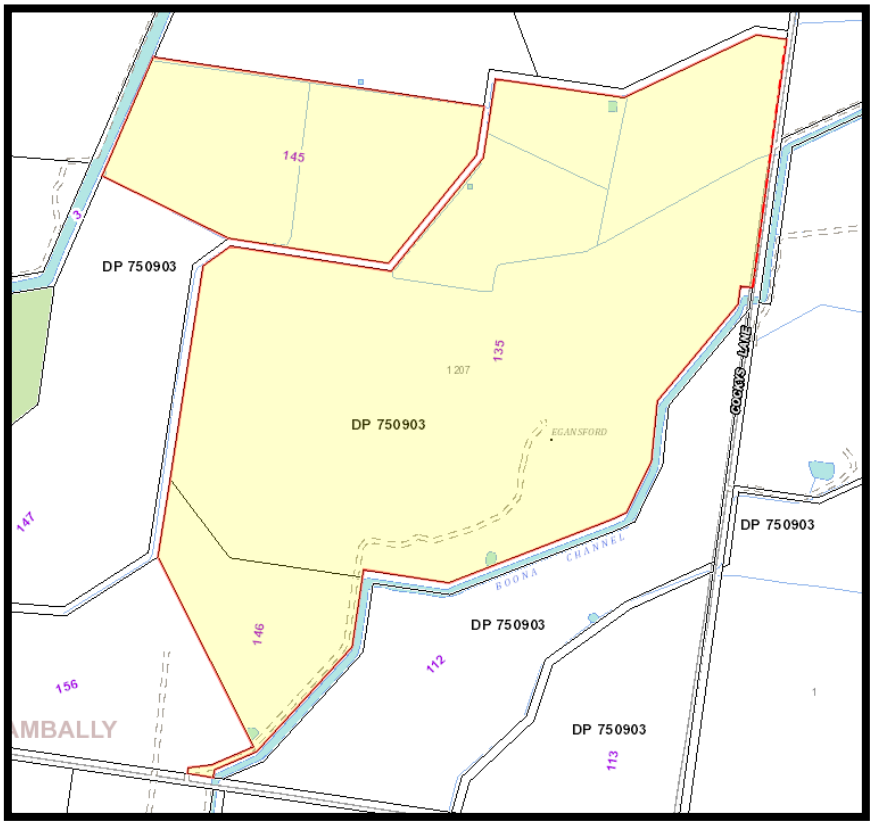

Figure 7 Site topography (Source: SixMaps)

The site is currently utilised for agricultural purposes in the form of grazing and arable cultivation. Due to the past agricultural use the proposal area has been cleared and contains remnant vegetation from previous cultivation activities. The site is not identified as being bushfire prone land however it is noted that the vegetation within 140 metres of the proposal area would be classified as 'grassland' as discussed in this assessment.

Council has advised that the site is not identified as flood prone land.

2.2 SUBJECT LOT

The proposed development would be located within the north eastern portion of Lot 135 DP750903 (subject lot) only as shown in the below figures and accompanying development plans.

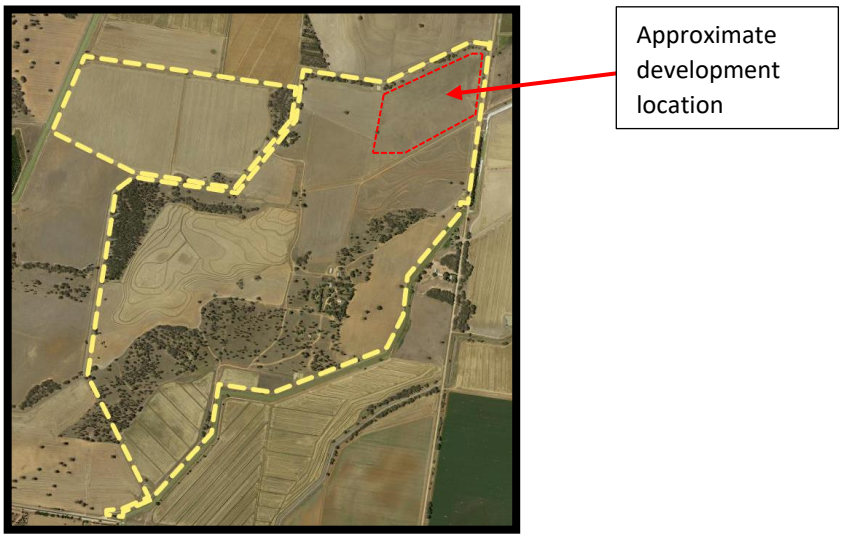

Figure 8 Approximate development proposal area on subject lot (Source: NSW Planning Portal)

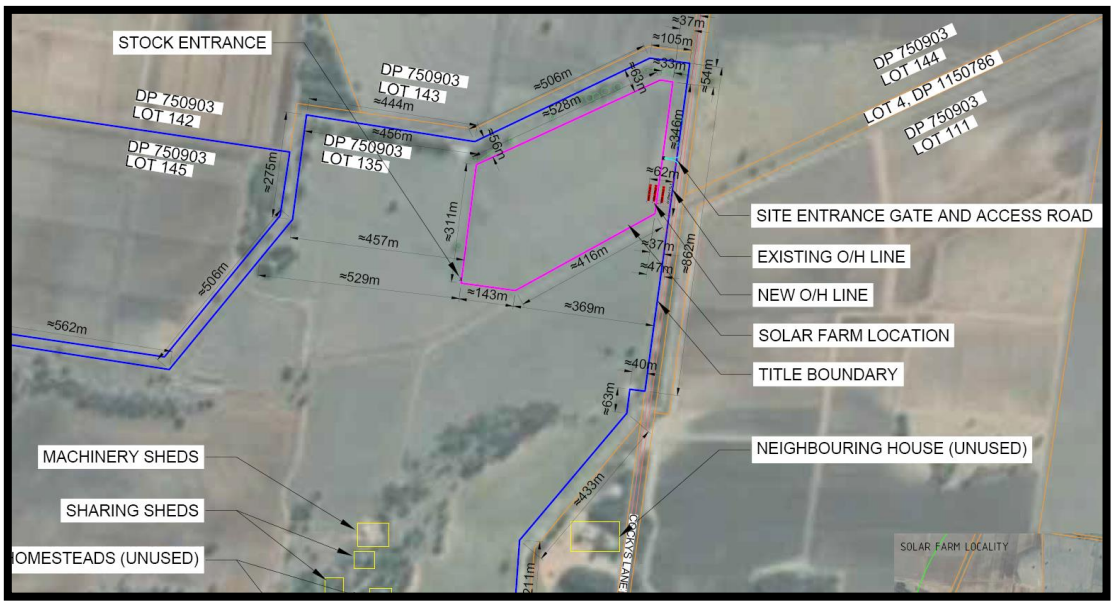

Figure 9 Extract from Location Diagram (Source: ACEnergy)

Two unused dwellings are located on the subject lot with the nearest being located approximately 800 metres to the south of the proposal area. The nearest neighbouring dwelling is located on a property situated on Cockys Lane approximately 860 metres south of the proposal area as shown in the figure on the following page. It is noted that the owner of the neighbouring dwelling has advised it is currently unused.

Figure 10 Surrounding dwelling locations within 2km radius of development area (Source: Google Earth Pro)

As shown in the extract from the site survey on the following page, the development area is relatively level with a difference of only 0.16m between the north eastern and south western corners of the site.

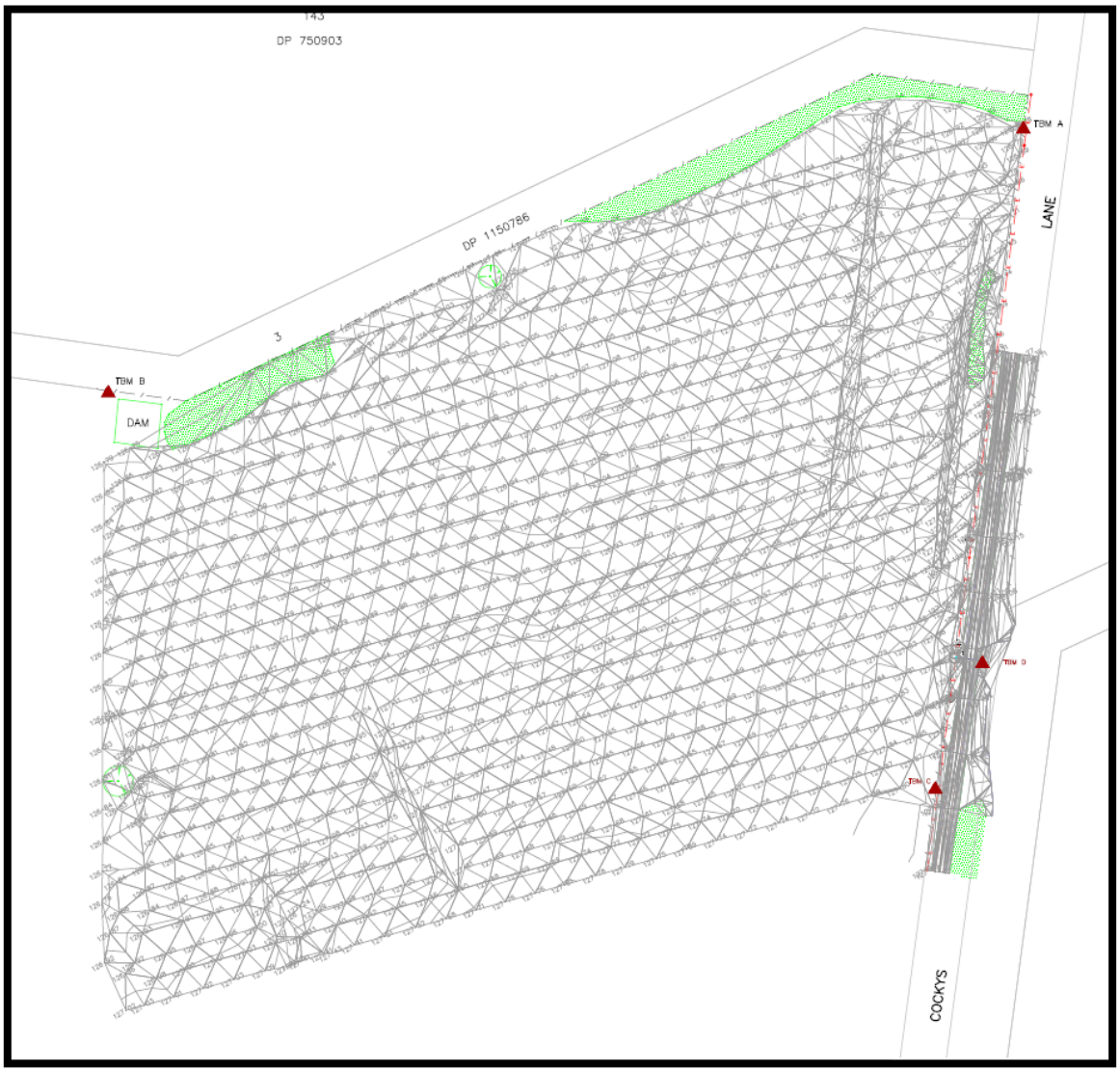

Figure 11 Extract from development area survey (Source: PHL Surveyors)

It is noted that the lot is not identified as bushfire prone land however the vegetation within 140m of the proposal area is identified as 'grassland' and as such this hazard is considered in this assessment.

2.3 PRESENT AND PREVIOUS USES OF THE SITE

The site is currently utilised, and has been for a number of decades, for agricultural purposes in the form of grazing and arable cultivation. It is noted that the subject lot has previously been utilised for irrigated agriculture however has most recently been utilised for dryland cropping and grazing. The site contains two associated dwellings and other ancillary farm structures.

Although the previous and present uses of the site include agricultural activities, these are limited to grazing and arable cultivation. There is no visual evidence on site of contamination and the land is considered to be in a suitable state for solar farm development.

2.4 LOCALITY

The majority of surrounding land is rural in nature with two neighbouring dwellings being located within a two-kilometre radius of the development area as shown previously in Figure 10 on page 7 of this report.

The nearby rural land is mostly cleared for agricultural uses with scattered paddock trees throughout. Some stands of trees exist with the western and southern portions of the site however these would not be affected by the development. The Sturt highway is located approximately 6.5 km north of the site, Kidman Way is located over 6.5km to the west of the site and Main Canal Road is located approximately 4km east of the site.

It is noted that the Coleambally Solar farm is located approximately 8.8km south west of the site with frontage to Kidman Way, and Darlington Point Solar farm is located approximately 4.5km to the north west on another section of Donald Ross Drive. There are no other significant land uses within the vicinity of the overall site or subject lot.

3 PROPOSED DEVELOPMENT

3.1 DEVELOPMENT OBJECTIVE

The objective of the development is to provide renewable energy to regional Australia, where it is most needed, at a scale which is responsive to the surrounding environment including nearby agricultural and other sensitive land uses. The intention is to functionally generate the equivalent output of larger conventional solar farms through a network of smaller facilities that can be rolled out in a site-sensitive manner and deliver renewable energy to different regions of New South Wales. These micro sites can be located on rural land without requiring extensive works to be undertaken on the landform and therefore can avoid the most productive agricultural land.

3.2 DEVELOPMENT DESCRIPTION

The development proposal is for a micro solar farm and associated infrastructure including photovoltaic panels and a power station consisting of inverter, transformer and switchgears. The power station would act as the primary conduit for electricity from the facility prior to it being transferred via overhead powerlines to the nearby Essential Energy transformer.

A 'micro' solar farm differs from a conventional solar farm in that it occupies less land area and has a maximum output of less than 5 megawatts. The project would include the installation of a total of approximately 16,128 PV panels with the entire development having a footprint of approximately 18 hectares. It is noted that the entire property has an area of approximately 211.7 hectares and as such the proposal will still allow agricultural land uses to continue to be undertaken on other areas of the property. The footprint of the solar farm will also be able to be utilised for grazing purposes throughout the life of the development as the compound will be established with ground cover in the form of permanent pasture.

Further to this, the solar farm would have a life span of 31 years from construction, after which it would be decommissioned and all assets removed from the site. The site would then be rehabilitated as required and the development area could easily be returned to agricultural use

should this be desired by the landowner.

The solar farm area would be surrounded by a fully secured 1.8-metre-high steel wire fence with a landscaped vegetation buffer located on the interior of the fencing. The landscape buffer would take the form of two rows of plantings, row one being offset approximately 3.5 metres from the site fence, and row two being offset approximately 1.5 metres from the site fence. The buffer would have an expected combined width at maturity of approximately 5 metres. The vegetation would include shrubs with a mature height of approximately 3 metres, and understorey plantings with a mature height of approximately 1.5 metres which would assist in lessening visual impacts of the proposal on nearby residences.

The solar farm would be remotely monitored allowing for constant surveillance without the requirement of onsite staff, however a maximum of two contractors would attend the site a maximum of three times per month for general inspections and maintenance of equipment or landscaping or for security inspection purposes.

3.2.1 EQUIPMENT

3.2.1.1 TRACKERS AND SOLAR PANELS

A total of approximately 16,128 non-reflective solar panels, with approximate dimensions of 2100mm by 1050mm and a depth of 40mm, would be mounted to array tracking systems. A typical array would comprise approximately 80 – 90 individual solar panels.

The tracking system utilises small electric motors to tilt the arrays to ensure maximum solar radiation is received at all times throughout the day. The solar arrays will be mounted with the central axis being approximately 1.4m from ground level. The array and tilted panel would have a maximum height of approximately 2.5m when tilted to its sharpest angle as shown in the below figure.

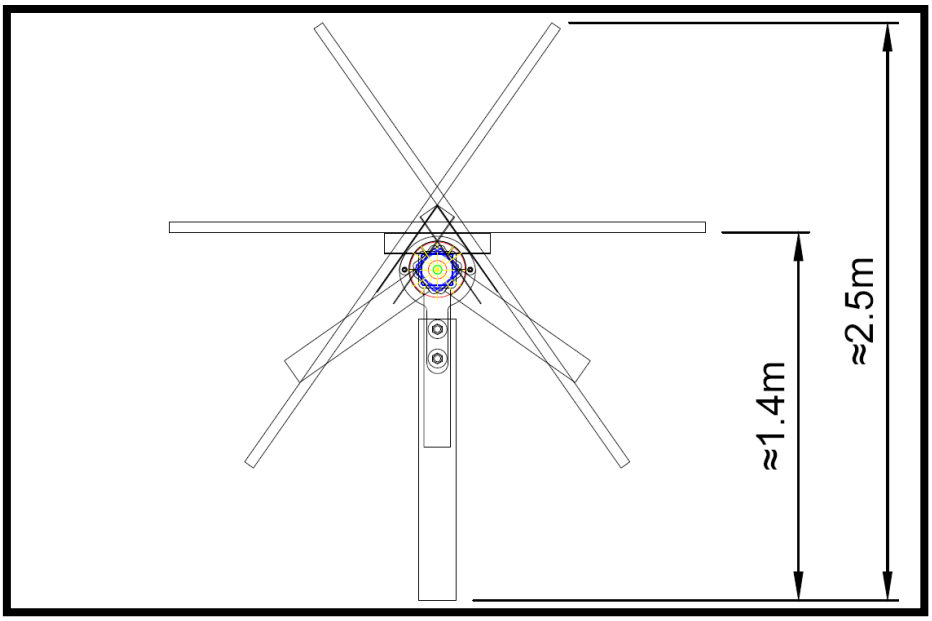

Figure 12 Typical tracker layout (Source: ACEnergy)

A typical solar tracking system including solar panels and arrays is shown in the below figure.

Figure 13 Typical solar tracking system (Source: Google)

3.2.1.2 CENTRAL POWER STATION AND CONNECTIONS

The facility contains a central power station consisting of an inverter, transformer and switchgears similar to that shown in the below figure.

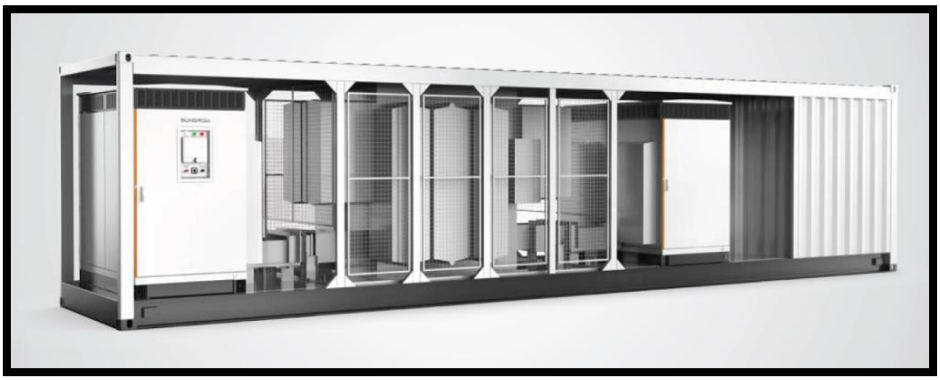

Figure 14 Typical inverter, transformer and switchgears (Source: ACEnergy)

The power station will be prefabricated off-site and have dimensions of approximately 13m long, 3m wide and 3m high. It will be located within the compound, as identified in the accompanying ACEnergy development plans, and will be utilised as the primary conduit for electricity generated from the solar panels to a HV switch board.

The HV switchboard, which would house the HV switch gear and associated safety features, would receive electricity from the power station via underground cables. The HV switchboard platform would measure approximately 5m wide, 5m long and 4m high. The switchboard would be fixed on the platform beams and the platform would

be placed on footings as identified in the accompanying ACEnergy plans. The figure below depicts a typical HV switchboard and associated platform.

Figure 15 Typical HV switchboard and platform (Source: ACEnergy)

The HV switchboard would connect via underground cables to one of the two new power poles constructed within the compound which would then transfer the electrical load via overhead powerlines to the nearby Essential Energy substation.

As described above, one underground/overhead power pole and one overhead power pole are planned to be installed within the compound, with a third single overhead pole being installed to the east of the compound to support the installation of approximately 62 metres of overhead powerlines which would connect the facility to the existing Essential Energy network infrastructure to the east. Each pole will measure approximately 10 metres in height above ground.

The accompanying development plans prepared by ACEnergy provide additional details of the proposed power station including typical elevations, footings and connection details.

3.2.1.3 BATTERY ENERGY STORAGE SYSTEMS

Five (5) DC-coupled Battery Energy Storage Systems (BESS) would also be included in the development and would be installed on concrete footings as depicted in the accompanying plans prepared by ACEnergy. They would physically resemble a mounted shipping container measuring approximately 13m long, 3m wide and 3m high and will have a powder-coated grey finish similar to that depicted in the figure on the following page.

Figure 16 Typical DC coupled BESS (Source: ACEnergy)

The layout of the BESS is provided in the below figures which confirm the containers cannot be entered by a person and as such would each be classified as 'equipment' rather than as a 'building'.

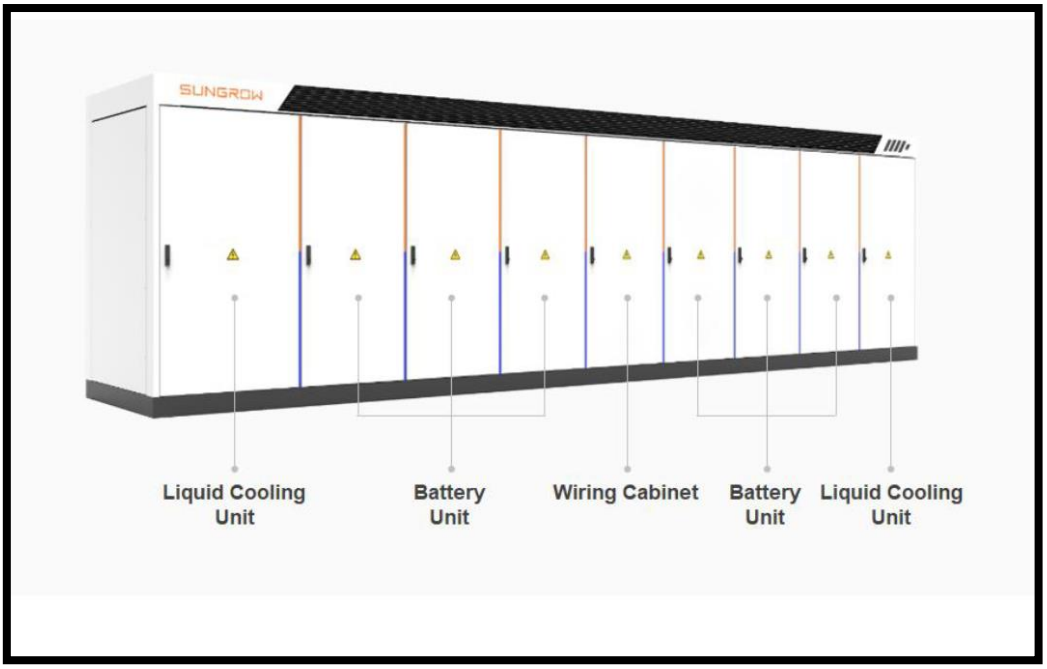

Figure 17 Layout of DC-coupled BESS (Source: ACEnergy)

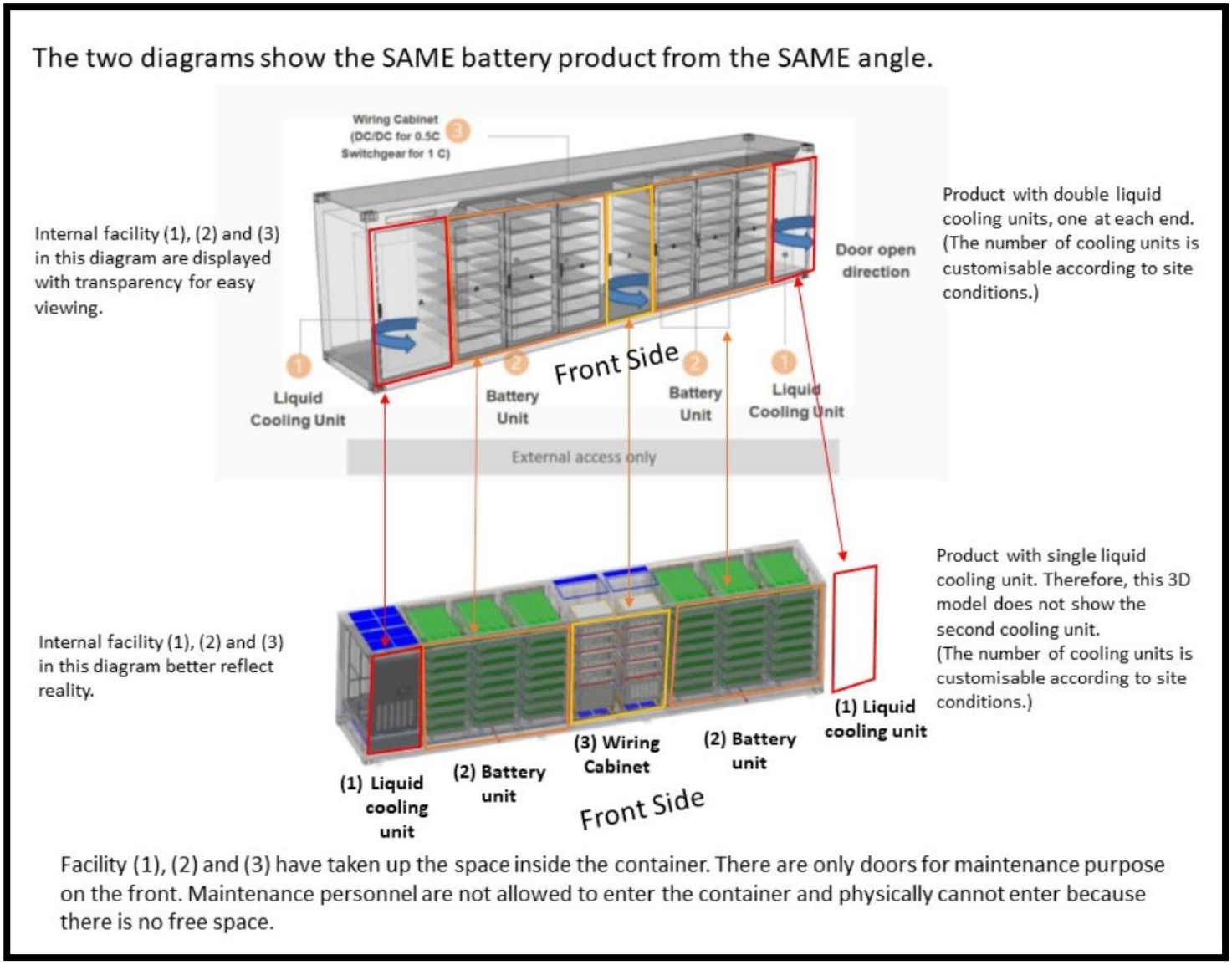

Figure 18 Layout of DC-coupled BESS explained (Source: ACEnergy)

The BESS would allow generated energy to be stored as required and utilised during times of high demand. They can also perform grid management functions such as frequency and voltage control.

The BESS would allow generated energy to be stored as required and utilised during times of high demand. They can also perform grid management functions such as frequency and voltage control.

Although the particular brand of the BESS equipment has not yet been selected, any BESS proposed for the project will comply with fire detection and suppression aspects noted below.

An IEC62619 test report accompanies the Development Application as a separate cover attachment and the manufacturer guidelines and standard requirements to transport, install and store the batteries used in the DC coupled battery system will be strictly adhered to. Further to this, any person working on the equipment will wear suitable PPE and install any necessary equipment to minimise and mitigate the fire risk.

The batteries are not placed in outdoor conditions, being stored in a secure lockable steel container/cabinet. Battery cells within the container are sealed in an aluminium enclosure. As such the risk of the spread of fire should a fault occur is extremely low, and by nature the LFP technology does not release hydrogen gas and as such the risk of explosion is greatly reduced.

The BESS equipment will satisfy the safety requirements of relevant Australian standards, accompanied by certified test reports where applicable. It will be pre-fabricated and containerised before shipping to prevent damage to the sensitive components inside. The BESS containers will be provided with appropriate spill containment/bunding including provision for fire water runoff.

Each BESS container will have a built-in ventilation and air/liquid cooling system to prevent thermal runaway in battery cells and will also include an automatic fire detection and extinguishing system. Each container will also be designed to isolate any thermal runaway and fire from adjacent BESS containers.

Further to the above, Fire extinguishers will be provided near the site entrance and BESS installations. A rainwater tank with a capacity of 22,500L will also be provided at site and vegetation within 10 metres of all containers will be managed, including grasses.

Battery installations will be kept free of extraneous materials and combustible materials of all kinds. Regular inspections and housekeeping will be undertaken to ensure materials do not accumulate. Manufacturer's recommended safe operating conditions will be strictly followed. Routine inspection of the electrical equipment will be carried out to avoid potential electrical failure which may cause a fire hazard.

Each BESS container will include a built-in fire extinguishing system which will be checked as per the scheduled maintenance requirement and replaced if necessary, as per Australian standards. Adequate training will be provided to the staff and visitors in order for them to report and monitor the fire safety hazards.

Adequate ventilation of the BESS installation area will be provided where required under Australian Standard 5139 Electrical Installations – Safety of battery systems for use with power conversion equipment; the manufacturer's requirements and/or safety data sheets for battery storage.

The BESS will be fitted with automatic fire detection system which would trigger the fire extinguishing system should thermal runaway escalate and cause a fire within the container.

Should a fire ignite within a BESS container, an alarm signal would be sent to the operation and maintenance (O&M) team that constantly monitors the solar farm via real-time signals and security cameras. Therefore, in the unlikely event where a fire cannot be suppressed by the automatic suppression system, the O&M team would notify local fire authorities immediately.

3.2.2 FENCING AND LANDSCAPING

Although the subject site is fenced by typical rural post and wire fencing, the development area would also be enclosed by a 1.8-metre-high chain mesh fence. A landscape buffer would be included inside the site fencing. The buffer would take the form of two rows of plantings, row one being offset approximately 3.5 metres from the site fence, and row two being offset approximately 1.5 metres from the site fence. The buffer would have an expected combined width at maturity of approximately 5 metres and is anticipated to appear similar to the depiction in the below figure.

Figure 19 Typical vegetation buffer front elevation (Source: Ground Control Landscape Architecture)

The vegetation would include shrubs with a mature height of approximately 3 metres, and understorey plantings with a mature height of approximately 1.5 metres which would assist in lessening visual impacts of the proposal on nearby residences. A Vegetation Management Plan will be provided at Construction Certificate Stage of the development, should consent be forthcoming, however the plant species selected would be compatible with the soil type to ensure the objective if screening the site is met.

In relation to planting of the buffer, prior to expected wet weather the landscape buffer area will be ripped (where plants will be planted) with a 100 hp tractor at a depth of 300mm to 400mm. This encourages root growth for the plant species in the first few years of growth as it allows the rains to penetrate beneath the topsoil. Topsoil will be then ploughed with a rotary hoe attachment on a 2.5t posi track to ensure the soil is adequately de-compacted for planting. Plants will be spaced at 2m spacings as per the plan provided and 1.5m off the fence (middle of the 5m landscape buffer).

Prior to planting the plants will be submerged in a tub of water to ensure moisture is not drawn out of the plant when planted into the newly prepared topsoil. The plants will also be watered in at completion however pre-soaking (submerging) the plants assists in moisture retention.

A 4-inch 2 stroke auger will be used to dig the hole and the plant is then backfilled with topsoil. When roots are slightly tight and stuck together the roots are roughed up prior to being put

in the ground to encourage roots to spread. After planting, a plastic guard with 3 stakes marked out with a template is used to keep the plants safe from rabbits and hares. Mulch is then used (400mm x 400mm x 100mm depth) around each plant to keep moisture in the ground and assist with weed suppression.

A typical watering schedule includes plants being watered on a fortnightly basis, in a manner similar to the photographs provided in the below figures, for a period of three months following planting.

Figure 20a-e Typical watering equipment and procedures (Source: ACEnergy)

Following this period, the plants would likely be maintained by rain events however as the site would be monitored for maintenance purposes two to three times per month, the landscape buffer is able to be watered as per the initial watering schedule in times of low rainfall.

The watering schedule is documented and updated at each site attendance. Plants which have failed to grow or which have been damaged would be noted on each watering visit and replaced as necessary on the following watering visit, typically within the following fortnight.

As shown previous in Figure 20, water for landscaping purposes would not be stored on site nor is an irrigation system proposed. Water would be brought in from external sources and utilised as per the figure photographs for landscape maintenance.

The proposed landscaping is considered appropriate due to the rural location of the development site and the relatively low number of nearby visual receptors. The landscape buffer will be maintained for the duration of operation of the facility as necessary.

3.2.3 SITE ACCESS

Access to the solar farm would be via a security gate with a width of approximately 8 metres on the eastern side of the compound. An all-weather internal access track, with a width of approximately 4 metres and length of approximately 37 metres would connect the development compound to the Cockys Lane proposed property access to the east. The property access to the internal track from Cockys Lane will be modified as necessary to Council requirements to facilitate the development.

A desktop analysis confirms the access is likely to conform to safe sight distance requirements for vehicles leaving the site however this would be able to be confirmed at Construction Certificate application stage through completion of a full site analysis report.

3.2.3.1 LABOUR

Construction is likely to occur over an approximate six (6) month period. Civil earthworks and fencing would begin first, with material delivery, installation, testing, commissioning, and site clean up, landscaping and demobilisation to occur in turn.

During the construction period the amount of workers on the site would depend on the stage of works however a maximum of 50 workers would be on site at any one time. Positions would include Project Manager, Construction Manager, Health and Safety Manager, electrical contractors, plant operators, fencing contractors, heavy vehicle drivers, general labourers and the like.

3.2.4 OPERATION

As described previously in this report, once operational the solar farm would be remotely monitored allowing for constant surveillance without the requirement of onsite staff. As such site offices and facilities are not proposed nor are they required. A maximum of two contractors would attend the site a maximum of three times per month for general inspections and maintenance of equipment or landscaping or for security inspection purposes.

It is noted that the majority of technical issues which could arise during operation are able to be solved remotely by engineers who oversee the remote monitoring of the site. Any aspects which require on site attention would be attended by a local contractor who would also undertake the regular maintenance described above.

3.2.5 DECOMMISSIONING

Decommissioning of the facility would occur at the end of the useful life of the infrastructure, anticipated to be approximately 31 years from commencement of construction. At the end of the project lifecycle the facility will be decommissioned in a manner to ensure the land is left in a suitable state for a return to primary production purposes based on the current zoning.

It would be proposed that not later than 12 months prior to the proposed cessation of operation a decommissioning plan be prepared and provided to Council for review and approval. The objective of such a plan would be to restore the land to its pre-existing state suitable for

agricultural use. It would include, but not be limited to, the following details:

- Expected timeline for rehabilitation completion;
- Decommissioning of all solar panels, above and below the ground infrastructure, inverter stations, fencing and any other structures or infrastructure relating to the approved development; and

Programme of site restoration to return the land back to a suitable state for agricultural production.

4 VEGETATION FORMATION

The vegetation formations for each aspect within 140 metres of the development boundary includes vegetation both within and external to the site boundaries in accordance with Keith (2005). Within the area of assessment, the dominant vegetation formation in all directions would be classified as **grasslands (Western Slopes Grasslands)** as defined in accordance with Figure A1.2 of the PBP. An aerial image of the approximate development location and 140 metres in each direction (white outline) is provided in the below figure.

Figure 21 Vegetation within 140 metres of development area (Source: Google Earth Pro)

5 Section 8.3.5 of the PBP

Section 8.3.5 of the PBP refers specifically to wind and solar farms. It specifies that a minimum 10m APZ must be provided for the structures and associated buildings/infrastructure associated with such developments. The APZ must be maintained to the standard of an Inner Protection Zone IPA for the life of the development as specified under A4.1.1 of the PBP. It is noted that road access to the site and other services to the site and associated fencing is not classified as infrastructure which requires an APZ to be provided.

Section 8.3.5 also states that essential equipment should be designed and housed in such a way as to minimise the impact of bush fires on the capabilities of the infrastructure during bush fire emergencies. It should also be designed and maintained so that it will not serve as a bush fire risk to surrounding bush.

A Bush Fire Emergency Management and Operations Plan should identify all relevant risks and mitigation measures associated with the construction and operation of the wind or solar farm. This should include:

- detailed measures to prevent or mitigate fires igniting;
- work 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 bush-fire fire danger period to ensure weather conditions are appropriate; and
- appropriate bush fire 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 the RF Act s.99.

As shown in the accompanying development plans, a 10 metres APZ has been provided within the boundary of the development area between the landscape vegetation buffer/fencing and the development assets. A Bush Fire Emergency Management and Operations Plan is included in the following section of this assessment.

6 BUSHFIRE EMERGENCY MANAGEMENT AND OPERATIONS PLAN

6.1 INTRODUCTION

Section 8.3.5 of the Planning for Bushfire 2019 guide advises that a Bushfire emergency management and operations plan should be prepared for wind and solar farms to identify all relevant risks and mitigation measures associated with the construction and operation of the facility.

The subject development takes the form of a micro solar farm to be located at 1207 Donald Ross Drive, Coleambally, NSW. This Bush Fire Emergency Management and Operations Plan outlines the management of hazard reduction and ignition management and prevention strategies to enable adequate preparation and emergency management response before and during a grass fire event.

This plan has been prepared in accordance with:

- AS3745:2010 Planning for emergencies in facilities.
- NSW RFS Development Planning – A guide to developing a Bush fire Emergency Management and Evacuation Plan.
- NSW Rural Fire Service, Planning for Bushfire Protection 2019 (PBP 2019).

The risk of bushfire impacting the site was assessed in previous sections of this report, noting the rural location and surrounding grassland hazard.

A copy of this plan should be available for staff and visitors of the site during construction, operation and decommissioning stages. A copy shall be provided to the Emergency Services to assist in their pre-incident planning. Individuals identified in this plan have the responsibility to annually review and maintain the plans relevance to the site characteristics as change occurs.

6.2 PLAN OBJECTIVES

This plan has been developed to meet the bushfire planning requirements NSW Rural Fire Service (RFS) Planning for Bushfire Protection 2019 (PBP). As such it will:

- detail measures to prevent or mitigate fires igniting;
- identify strategies to suppress unplanned fires;
- identify activities which should not be undertaken during certain fire danger ratings;
- identify strategies to minimise the potential spread of bushfires;
- identify bushfire mitigation treatments;
- identify bushfire emergency management procedures; and
- identify general emergency procedures.

6.2.1 STRATEGIES TO PREVENT IGNITION

All Employees of ACLE Services and Contractors are responsible for reporting and monitoring fire hazards and for the prevention of fires.

The key to minimising fire ignition is to increase the awareness of the risks of ignition. The main sources of ignition in the area are:

- Harvesting operations and farm machinery.
- Lightning.
- Escape from legal and illegal burning operations.
- Accidental.

The below table identifies potential ignition risks and associated actions should fires ignite.

Table 1 Ignition risk and actions

IGNITION RISK	ACTIONS
Deliberate / arson	Promoting cooperative surveillance programs with fire agencies and community. Promoting staff, community education and awareness programs. Limiting public access during severe and catastrophic fire weather conditions. Cooperatively assist NSW Police and the Rural Fire Service to investigate all fires believed to have been deliberately lit.
Camp fires	Promoting staff, community education and awareness programs.
Debris burning	Ensure neighbours obtain appropriate permits to implement Debris burns.
Machinery use	Maintain high level of employee awareness (e.g. toolbox talks). Ensure adequate buffer zone between activities and fuel source. All hot work activities to have a spotter and a fire extinguisher within work zone when required. Hot works to be avoided during total fire bans or on FDR days of Very High or greater. Do not undertake mechanical clearing works on Extreme and Catastrophic fire danger days Removal of some visual rocks before slashing. Avoid driving on/through long grass (vehicle exhaust systems are known to igniting grass fires)
Electrical and lightning	Liaise with electricity providers to ensure maintenance of powerlines.

6.2.2 STRATEGIES TO SUPPRESS UNPLANNED FIRES

Fire suppression actions start from the time the fire is detected until it is extinguished. The solar farm facilities priorities in bush fire suppression operations are:

- The safety of all staff and visitors;
- The effective protection of human life, facility and community assets; and
- The reduction of ignition potential on site to acceptable levels.

All staff should **be prepared for ignition** by monitoring Fire Danger Indexes and synoptic conditions on a continuous basis daily throughout the fire season. They should be aware of pre-emptive incident management and be aware of response procedures.

All staff should be able to **respond to ignition** by identifying triggers and implementing appropriate actions.

The below table identifies activities which should not be undertaken during certain fire danger ratings.

Table 2 Activities and fire danger ratings

ELEMENT	LOW/MODERATE	HIGH	VERY HIGH	SEVERE	EXTREME	CATASTROPHIC
Minimise hot works through appropriate work scheduling	No requirements	If deemed appropriate. Hot works should be accompanied by a spotter and a fire extinguisher.	If deemed appropriate. Hot works should be accompanied by a spotter and a fire extinguisher.	If deemed appropriate. Hot works should be accompanied by a spotter and a fire extinguisher.	No hot works	No hot works
Minimise vegetation maintenance activities through appropriate work scheduling	No requirements	No requirements	No requirements	If deemed appropriate. Vegetation management should be accompanied by a spotter and a fire extinguisher.	If deemed appropriate. Vegetation management should be accompanied by a spotter and a fire extinguisher.	No vegetation maintenance activities
Bushfire PPE and firefighting equipment	No requirements	No requirements	Ensure equipment is functional and readily available	Ensure equipment is functional and readily available	Ensure equipment is functional and readily available	Ensure equipment is functional and readily available

On 'Total Fire Ban' days no vegetation management or hot works will be undertaken unless notification and approved through s99 by NSW RFS is obtained. Only general maintenance works that do not require mechanical machinery that can create an ignition source will be permitted during 'Total Fire Ban' days.

6.2.3 STRATEGIES TO MINIMISE POTENTIAL SPREAD OF BUSHFIRES

ACLE Services will ensure the solar farm facility is maintained to minimise the potential for the spread of fires from or into the compound. In general they will:

- Prioritise the maintenance of the Asset Protection Zone;
- Maintain the Asset Protection Zone to standards in accordance with PBP2019; and
- Ensure water availability; and
- Site and facility access is maintained.

Water availability will take the form of a non-combustible minimum 20,000 litre dedicated water tank with Storz fitting and other fire-fighting equipment in compliance with Australian Standards. This tank should be specifically for fire tanker refilling/on site fire-fighting. A petrol, diesel or solar powered fire-fighting pump and 30m hose reel with steel nozzle is recommended and can be mounted on a 4WD with water tank. This can be used for grass fire/ember attack fighting by the proponent in a bushfire event.

6.2.4 BUSHFIRE MITIGATION TREATMENTS

Bushfire mitigation treatments are strategic in nature as they prioritise protection of life and property. The principle elements of the bushfire mitigation treatments are:

- Establishing and maintain landscape maintenance schedules;
- Implementation of this Plan; and
- Establishing a staff and visitors education program.
- The below table identifies bushfire mitigation measures based on the specific bushfire period being either before, during or after a bushfire event.

Table 3 Bushfire action statement

PERIOD	TRIGGER	ISSUE	ACTION	RESPONSIBILITY
Preparation	Planning requirement	Risk assessment	Review Maintenance schedules for landscaping and ground maintenance Review site 'fire hygiene' and treat as required	Facility Manager
Preparation	Planning requirement	Response capacity	Contact local rural fire brigades and NSW Fire and Rescue and undertake familiarisation of the facility	Facility Manager
Preparation	Planning requirement	Response capacity	Maintain inspection of APZ and aesthetic tree row adjacent to APZ	Facility Manager
Preparation	Planning requirement	Risk assessment	Undertake annual review of this Plan and hold fire scenario training and simulation as required for new staff.	Facility Manager
Preparation	Planning requirement	Evacuation	Prepare emergency evacuation plan in	Facility Manager

			liaison with RFS prior to construction beginning on site	
Response	Severe – extreme – catastrophic fire danger index	Evacuation response triggered	Unlock access gate for emergency service access.	Facility Manager
Response	Confirmed bushfire event	Hazardous materials	Ensure all hazardous materials are protected and secured.	Facility Manager
Recovery	Following passage of fire	Site safety	Contact utility providers to re-establish services.	Facility Manager
Recovery	Following passage of fire	Facility safety	Contact RFS to establish notification to re-enter site to undertake access and tree safety assessments. Engineers to undertake assessment of solar panel infrastructure	Facility Manager

6.2.5 BUSHFIRE EMERGENCY MANAGEMENT PROCEDURES

Procedures for both sheltering and evacuation should be developed, with one identified as the Primary Action to be followed during a bushfire. In this case, shelter-on-site is not a feasible emergency management option due to the lack of appropriately designed structure. Furthermore, the site will not be occupied, and people present on-site will be only for maintenance and operational requirements.

Emergency services may decide to evacuate areas for public safety. For this reason, procedures to evacuate are required to ensure the necessary planning and coordination arrangements are in place.

An important factor when planning for emergency procedures is that under intense conditions it is common for people to behave irrationally and this may increase the time taken to move people.

Pre-emptive closure

The lead time for a planned closure varies depending on weather patterns, but every attempt is made to give the facility and attending staff as much notice as possible to prepare and respond.

Once the decision is made that the facility is to undertake pre-emptive closure, information needs to be disseminated quickly and expectations of staff need to be clearly identified.

Potentially, between declaration of the closure and the day of closure, weather conditions may improve sufficiently to remove the need to close and the facility can therefore stand down its pre-emptive closure plans. Triggers for these decisions need to be clear and concise.

Due to the location of the site, pre-emptive closure for the facility is possible.

Staff attending the site to undertake maintenance and operational management should only attend when a bushfire will not impede evacuation from the site.

Evacuation from the site is via Cockys Lane with various available routes as outlined in the below table.

Table 4 Potential evacuation routes

	ROUTE 1	ROUTE 2	ROUTE 3	ROUTE 4
	North onto Cockys Lane	North onto Cockys Lane	South onto Cockys Lane	South onto Cockys Lane
	East onto O'Neils Road	West onto O'Neils Road	West onto Donald Ross Drive	East onto Wallace Road
	North east onto Main Canal Road	South onto Donald Ross Drive	West onto Ringwood Road	North onto Main Canal Road
	Sturt Highway	West onto Ringwood Road	Kidman Way	Sturt Highway
		Kidman Way		
TRAVEL TIME	10 mins	9 mins	12 mins	12 mins

All routes identified enable crews to depart the site and arrive at safe refuge within approximately 10 minutes. This ability to quickly relocate enables staff to attend the site on day of severe fire danger days.

Pre-emptive site closure should occur on extreme and catastrophic fire danger days.

Shelter

Facilities with sheltering as their Primary Action will have evacuation procedures in case they can no longer shelter, or emergency services call for a pre-emptive evacuation due to catastrophic or extreme bush fire conditions. Shelter-on-site is not possible for this facility as no built structure is provided for shelter purposes.

Evacuation

Facilities with evacuation as their Primary Action that have no shelter-on-site mechanisms will have clear and concise decision triggers for staff to follow. Pre-emptive site closures become more critical in these situations ensuring staff are not placed in any danger when they are required to consider evacuation as an emergency response option.

Safe access arrangements for people to evacuate an area whilst emergency service personnel are accessing the same area to suppress a bushfire are essential. Alternative access/way out routes will also assist if part of the road system is cut by bushfire or bush fire related activities, such as fallen tree of firefighting appliances.

Evacuation can be by foot or vehicle, or both depending on the availability and location.

The principle Primary Action for this facility is Evacuation.

Once staff are satisfied that all people have evacuated the site, an assessment should be performed to establish an off-site meeting point that is considered safe in terms of air quality (smoke), ember attack and further ignition potential. Notification of this off-site meeting point should be relayed to management.

The options for consideration depend on the dominate weather and fire direction. Evacuating vehicles can travel north and south on Kidman Way, east or west on the Sturt Highway or relocate to Darlington Point to the north on Kidman Way.

Decision triggers

Developing a clear set of triggers will increase the ability to react quickly and make decisions when a bush fire event occurs. The table on the following page provides the triggers and actions to be implemented prior and during a bush fire event.

Awareness of trigger events are initially determined by knowledge of Daily Fire Danger Categories and the predominant weather (specifically wind) conditions. It is essential that staff maintain daily awareness of these categories to ensure they are informed and aware of trigger requirements.

Table 5 Emergency Management Decision Triggers

CATEGORY	FDI	WIND DIRECTION	CONFIRMED IGNITION (<5KM)	ACTION	BUSHFIRE SPECIFIC ARRANGEMENTS	RESPONSIBILITY
Extreme & catastrophic	>74	All directions	No	Monitor Fire Near Me, undertake preliminary preparations	Consider pre-emptive closure, delay management works to following days with lower FDIs	ACLE Services
			Yes	Implement emergency management arrangements.	Notify fire authorities and ACLE Services management Evacuate site Leave access gates unlocked Program to return to site (following day) to re-establish access controls (lock gates)	ACLE Services
Low to severe	<74	All directions	No	Monitor Fire Near Me Undertake preliminary preparations	Normal operations	ACLE Services
			Yes	Determine if maintenance work can be safely completed prior to leaving site. If fire I within 1km of site implement emergency management arrangements and evacuate site.	Notify fire authorities and ACLE Services management Evacuate site Leave access gates unlocked Program to return to site (following day) to re-establish access controls (lock gates)	ACLE Services