STATE COMMISSION ASSESSMENT PANEL
A COMMITTEE OF THE STATE PLANNING COMMISSION

APPLICATION ON NOTIFICATION – CATEGORY 2

Applicant:	Infigen Energy Developments Pty Ltd
Development Number:	894/L001/18
Nature of Development:	Infrastructure – ancillary to existing wind farm
Type of development:	Construction and operation of a 25MW / 52 MWH Battery Energy Storage System and connection to Mayurra substation
Zone / Policy Area:	Primary Production Zone – Wattle Range Council
Subject Land:	17 Lakeview Road, German Flat, SA (CT 6129/170)
Contact Officer:	Sharon Wyatt
Phone Number:	71097132
Start Date:	Monday 14 May 2018
Close Date:	Friday 25 May 2018

During the notification period, hard copies of the application documentation can be viewed at the Department of Planning, Transport and Infrastructure, Level 5, 50 Flinders St, Adelaide, during normal business hours. Application documentation may also be viewed during normal business hours at the local Council office (if identified on the public notice).

Written representations must be received by the close date (indicated above) and can either be posted, hand-delivered or emailed to the State Commission Assessment Panel.

Any representations received after the close date will not be considered.

Postal Address:
The Secretary
State Commission Assessment Panel
GPO Box 1815
ADELAIDE SA 5001

Street Address:
Development Division
Department of Planning, Transport and Infrastructure
Level 5, 50 Flinders St
ADELAIDE SA 5000

Email Address: scapadmin@sa.gov.au

SOUTH AUSTRALIAN DEVELOPMENT ACT 1993
REPRESENTATION ON APPLICATION – CATEGORY 2

Applicant:	Infigen Energy Developments Pty Ltd
Development Number:	894/L001/18
Nature of Development:	Battery storage system – ancillary to existing wind farm
Zone / Policy Area:	Primary Production Zone – Wattle Range Council
Subject Land:	17 Lakeview Road, German Flat, SA (CT 6129/170)
Contact Officer:	Sharon Wyatt
Phone Number:	7109 7132
Close Date:	25 May 2018

My name:_____

My phone number: _____

PRIMARY METHOD(s) OF CONTACT: Email address: _____

Postal address:_____

_____Postcode_____

You may be contacted via your nominated PRIMARY METHOD(s) OF CONTACT if you indicate below that you wish to be heard in support of your submission.

My interests are:

- ☐ owner of local property
- ☐ occupier of local property
- ☐ a representative of a company/other organisation affected by the proposal
- ☐ a private citizen

The address of the property affected is _____ Postcode _____

The specific aspects of the application to which I make comment on are:

- ☐ I support the development;
- ☐ I support the development with some concerns;
- ☐ I oppose the development

(Please tick one)

For the following reasons:

_____

_____

_____

_____

_____

_____

Should the State Commission Assessment Panel conduct a public hearing for this Development Application:

I

- ☐ **wish to be heard in support of my submission**
- ☐ **do not wish to be heard in support of my submission**

(Please tick one)

By

- ☐ **appearing personally**
- ☐ **being represented by the following person:**

(Please tick one)

Date _____ Signature _____

Return Address: The Secretary, State Commission Assessment Panel, GPO Box 1815, Adelaide SA 5001 or scapadmin@sa.gov.au.

DEVELOPMENT APPLICATION FORM

PLEASE USE BLOCK LETTERS

COUNCIL: WATTLE RANGE COUNCIL

APPLICANT: INFIGEN ENERGY DEVELOPMENT PTY LTD

Postal Address: LEVEL 17, 56 PITT STREET

SYDNEY NSW 2000

Owner: INFIGEN ENERGY DEVELOPMENT PTY LTD

Postal Address: LEVEL 17, 56 PITT STREET

SYDNEY NSW 2000

BUILDER: TBA

Postal Address: _____

Licence No: _____

CONTACT PERSON FOR FURTHER INFORMATION

Name: FRANK BOLAND

Telephone: +61 02 8031 9914 [work] 0423 778 125 [Ah]

Fax: _____ [work] _____ [Ah]

EXISTING USE: WIND FARM, INCLUDING CIVIL AND ELECTRICAL INFRASTRUCTURE AND ANCILLARY SERVICES

FOR OFFICE USE

Development No: _____

Previous Development No: _____

Assessment No: _____

☐ Complying	Application forwarded to DA
☐ Non Complying	Commission/Council on
☐ Notification Cat 2	/ /
☐ Notification Cat 3	Decision: _____
☐ Referrals/Concurrences	Type: _____
☐ DA Commission	Date: / /

	Decision required	Fees	Receipt No	Date
Planning:				
Building:				
Land Division:				
Additional:				
Development Approval				

DESCRIPTION OF PROPOSED DEVELOPMENT: CONSTRUCTION AND OPERATION OF A 25MW/52MWH BATTERY SYSTEM

LOCATION OF PROPOSED DEVELOPMENT: _____

House No: 17 Lot No: ___ Street: LAKEVIEW ROAD Town/Suburb: GERMAN FLAT

Section No [full/part] 244 Hundred: MAYURRA Volume: 6129 Folio: 170

Section No [full/part] _____ Hundred: _____ Volume: _____ Folio: _____

LAND DIVISION: Not Applicable

Site Area [m^2] _____ Reserve Area [m^2] _____ No of existing allotments _____

Number of additional allotments [excluding road and reserve]: _____ Lease: YES ☐ NO ☐

BUILDING RULES CLASSIFICATION SOUGHT: 8 Present classification: 8

If Class 5,6,78 or 9 classification is sought, state the proposed number of employees: Male: 1 Female: _____

If Class 9a classification is sought, state the number o persons for whom accommodation is provided: _____

If Class 9b classification is sought, state the proposed number of occupants of the various spaces at the premises: _____

DOES EITHER SCHEDULE 21 OR 22 OF THE DEVELOPMENT REGULATIONS 2008 APPLY? YES ☐ NO ☒

HAS THE CONSTRUCTION INDUSTRY TRAINING FUND ACT 2008 LEVY BEEN PAID? YES ☐ NO ☒

DEVELOPMENT COST [do not include any fit-out costs]: $ 5,500,000

I acknowledge that copies of this application and supporting documentation may be provided to interested persons in accordance with the Development Regulations 2008.

SIGNATURE: F J Boland Dated: 16 / 4 / 2018

FRANK BRENNAN
CONSULTING SERVICES

po box 335 . millicent . south australia . 5280
mobile . 0418 838 152
email . frank@frankbrennanconsulting.com.au
abn 91 376 720 132

INFIGEN ENERGY DEVELOPMENT PTY LTD

Planning Report

for a
25 MW / 52 MWh Battery Energy Storage System
at

Section 244, Hundred of Mayurra
GERMAN FLAT

FRANK BRENNAN
CONSULTING SERVICES

CONTENTS

Page No.

1 Introduction

This document supports the Development Application lodged by Infigen Energy Developments Pty Ltd with the State Commission Assessment Panel for the development and operation of the 25 MW (52MWh) Battery Energy Storage System on Section 244, hundred of Mayurra, Lakeview Road, German Flat (the Subject Land).

This Planning Report has been prepared to support the Development Application and Statement of Effects Report submitted with the Application.

2 The Subject Land

The subject land is Section 244, Hundred of Mayurra, Lakeview Road, German Flat and is owned by Infigen Energy Development Pty Ltd and is contained in Certificate of Title Volume 6129 Folio 170.

A copy of the Certificate of Title is provided with the Development Application.

The subject land is 56.83 hectares (or 140.43 acres) in area.

Located on the subject land are 4 wind turbines (part of the applicant's Lake Bonney Windfarm), the existing Lake Bonney Windfarm site office, windfarm substation and ancillary facilities.

The subject land is shown on Photo 1 below.

Photo 1 – the Subject Land and Snuggery Locality

3 Project Description Overview

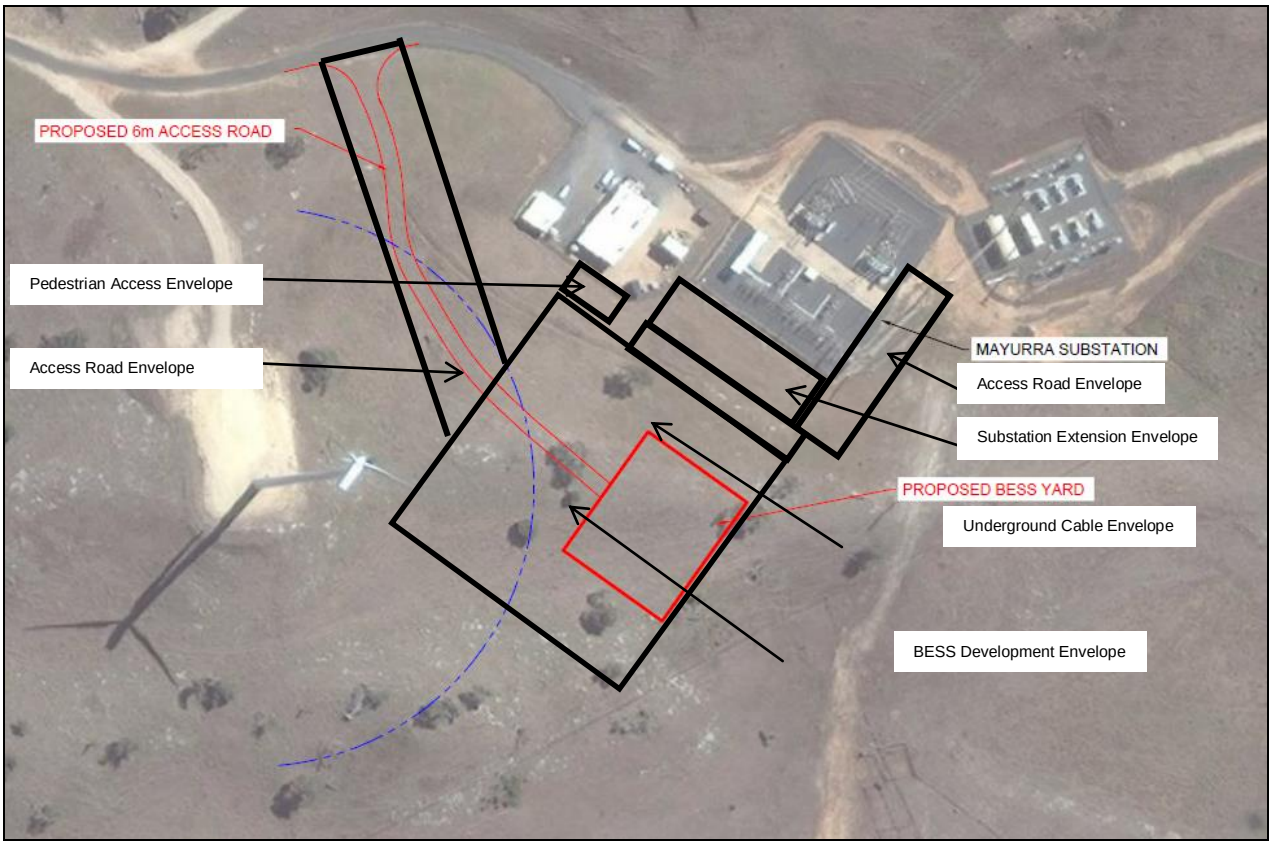
The proposed Battery Energy Storage System will comprise the following components –

- 300 battery units;
- 48 inverters;
- 8 Medium-Voltage transformers;
- Associated cabling and communication systems required for the interconnection of the Battery Energy Storage System; and
- Electrical Balance of Plant (EBOP) components to connect the proposed facility with the existing Mayurra substation.

The Mayurra substation will also be extended to facilitate this connection.

The area to be occupied by the proposed Battery Energy Storage System measures 100 metres x 100 metres (being 10,000 m^2 or 1 hectare) while the area to be occupied for the substation extension works is 60 metres x 25 metres (being 1,500 m^2).

Expanded footprints for further components of the development proposal are shown in Plan 1 below.



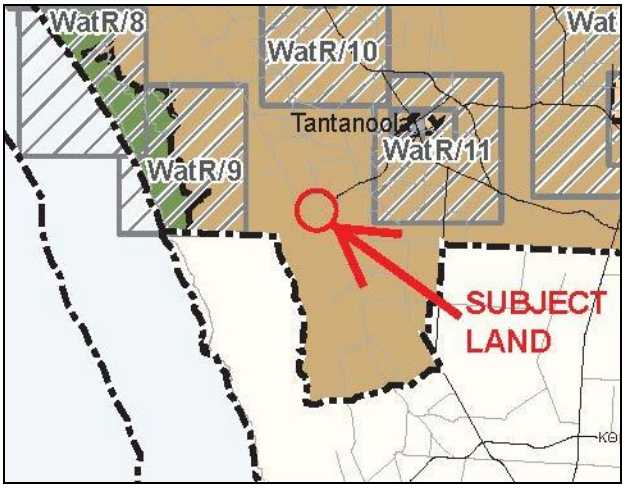
Plan 1 – showing the development footprint of the proposed Battery Energy Storage System and Substation extension

4 Planning Context & Assessment

Development approval is being sought for the development and operation of the 25 MW (52 MWh) Battery Energy Storage System pursuant to the South Australian *Development Act 1993* and the *Development Regulations 2008*.

The subject land on which the proposed development of the proposed Battery Energy Storage System and Substation extension is to be undertaken is located in the Primary Production Zone of the Development Plan (Wattle Range – consolidated on 7 February 2013) and is not located in a Policy Area.

An extract of Zone Map WatR/1 showing the location of the proposed development is in Plan 2 below.



Plan 2 – Zone Map WatR/1 (Extract)

The proposed Battery Energy Storage System and Substation extension is considered to be ancillary to the Lake Bonney Windfarm development and in the Primary Production Zone a windfarm and ancillary development is a form of development envisaged in eh zone and is categorised as a Category 2 development for the purpose of public notification.

Wattle Range Council will be responsible for the assessment of the development application against the provisions of the Development Plan (Wattle).

The following is an assessment of the proposed development against the relevant key provisions of the Development Plan for the Wattle Range Council area (Consolidated – 7 February 2013).

Primary Production Zone
Objectives & Principles of Development Control

The most directly applicable provisions of the Development Plan in the Primary Production Zone section are discussed below.

Objectives

1 Economically productive, efficient and environmentally sustainable primary production.

3 Protection of primary production from encroachment by incompatible land uses and protection of scenic qualities of rural landscapes.

5 Accommodation of wind farms and ancillary development.

Desired Character

Wind farms and ancillary development such as substations, maintenance sheds, access roads and connecting power-lines (including to the National Electricity Grid) are envisaged within the zone and constitute a component of the zone's desired character.

Principles of Development Control

Land Use

1 The following forms of development are envisaged in the zone:

- ***commercial forestry***
- ***dairy farming***
- ***diversification of existing farming activities through small scale tourist accommodation***
- ***farming***
- ***horticulture***
- ***intensive animal keeping***
- ***wind farm and ancillary development***
- ***wind monitoring mast and ancillary development.***

2 Development listed as non-complying is generally inappropriate and not acceptable unless it can be demonstrated that it does not undermine the objectives and principles of the Development Plan.

7 Wind farms and ancillary development should be located in areas which provide opportunity for harvesting of wind and efficient generation of electricity and may therefore be sited:

(a) in visually prominent locations
(b) closer to roads than envisaged by generic setback policy.

Form and Character

9 Development should be set back at least 30 metres from any road frontage, except where fronting a road identified in Table WatR/1- Building Setbacks from Road Boundaries, where an increased setback may be required to minimise the visual impact of development.

ASSESSMENT

The proposed development of a Battery Energy Storage System and Substation extension will complement the existing use of the subject land for windfarm and ancillary developments (including the Mayurra Substation) in the Primary Production Zone being a form of development envisaged in the Zone by Principle of Development Control # 1.

The proposed development is not listed as a non-complying development.

The proposed development of a Battery Energy Storage System and Substation extension on the subject land will not inhibit or impact on the use of adjoining land for primary production purposes and will not have a detrimental impact on the natural resources in the locality.

The proposed Battery Energy Storage System and Substation extension is to be developed on land that has been previously developed for windfarm and ancillary development and the site contains and existing electricity substation facility that connects the Lake Bonney Windfarm to the national electricity grid.

The existing electricity substation facility is shown in Figure 7.4 of the Statement of Effects Report accompanying the Development Application. The size and scale of the proposed development will be complementary to the existing development on the site in terms of setback from boundaries, size, scale and appearance.

The proposed Battery Energy Storage System and Substation extension is setback approximately 350 metres from the Canunda Frontage Road and 520 metres from Lakeview Road both being a local roads under the care control and management of Wattle Range Council. These setback distances exceed the 50 metre setback requirement in Table WatR/1 for developments in the Primary Production Zone.

The use of the subject land for the proposed Battery Energy Storage System and Substation extension will not be incompatible with the character of the locality and would not undermine the objectives and principles of development control of the Development Plan.

The proposed development and the locality in which it is situated will not unduly impinge of the existing open rural type character in the locality and is not inconsistent with the Objectives and Principles of Development Control for the Primary Production Zone.

General Section
Objectives & Principles of Development Control

The most directly applicable provisions of the Development Plan in the General (Council-wide) section are discussed below.

Design and Appearance

Objectives

1. Development of a high architectural standard that responds to and reinforces positive aspects of the local environment and built form.

2. Roads, open spaces, buildings and land uses laid out and linked so that they are easy to understand and navigate.

Principles of Development Control

Building Setbacks from Road Boundaries

17. The setback of buildings from public roads should:

(a) be similar to, or compatible with, setbacks of buildings on adjoining land and other buildings in the locality

(b) contribute positively to the streetscape character of the locality

(c) not result in or contribute to a detrimental impact upon the function, appearance or character of the locality.

19. Except where otherwise specified in a particular zone or policy area, buildings and structures should be set back from road boundaries having regard to the requirements set out in Table WatR/1 – Building Setbacks from Road Boundaries.

Assessment

The proposed Battery Energy Storage System and Substation extension will not visible from public roadways given they are located in a 'valley' type area on the subject land and are setback 350 metres from the Canunda Frontage Road and 520 metres from Lakeview Road.

The new facilities will be contained in security fenced compounds with security and safety lighting. The lighting will not spill from the site onto adjacent land.

Hazards

Principles of Development Control

1. Development should:

(a) be excluded from areas that are vulnerable to, and cannot be adequately and effectively protected from, the risk of natural hazards

(b) be sited, designed and undertaken with appropriate precautions being taken against fire, flood, coastal flooding, storm surge, landslip, earthquake, toxic emissions or other hazards such as vermin

(c) not occur on land where the risk of flooding is likely to be harmful to safety or damage property.

2. There should not be any significant interference with natural processes in order to reduce the exposure of development to the risk of natural hazards.

3. The location of critical community facilities or key infrastructure in areas of high natural hazard risk should be avoided.

Bushfire

6 The following bushfire protection principles of development control apply to development of land identified as General, Medium and High bushfire risk areas as shown on Bushfire Protection Area BPA Maps - Bushfire Risk.

7 Buildings and structures should be located away from areas that pose an unacceptable bushfire risk as a result of one or more of the following:

(a) vegetation cover comprising trees and/or shrubs
(b) poor access
(c) rugged terrain
(d) inability to provide an adequate building protection zone
(e) inability to provide an adequate supply of water for fire-fighting purposes.

15 Development in a Bushfire Protection Area should be in accordance with those provisions of the Minister's Code: Undertaking development in Bushfire Protection Areas that are designated as mandatory for Development Plan Consent purposes.

Assessment

The subject land is located in the Primary Production Zone and is located in a General Bushfire Risk Area (refer to Development Plan (Wattle Range) – BPA Map WatR/1 – Bushfire Risk).

The subject land is located immediately adjacent to other existing primary production properties and the area in and around the subject land is open and well maintained land that would minimise the threat and impact of bushfires on life and property.

The subject land and the proposed development do not pose an unacceptable bushfire threat with the property maintained to a high standard and clear of inflammable material.

The subject land and the proposed development do not pose an unacceptable bushfire threat. Further the subject land is not subject to flooding, salinity, acid sulfate soils or landslip.

Infrastructure

Objectives

1 Infrastructure provided in an economical and environmentally sensitive manner.

2 The visual impact of infrastructure facilities minimised.

3 The efficient and cost-effective use of existing infrastructure.

Principles of Development Control

1 Development should not occur without the provision of adequate utilities and services, including:

a) electricity supply
b) water supply
c) drainage and stormwater systems
d) waste disposal
e) effluent disposal systems
f) formed all-weather public roads
g) telecommunications services

h) social infrastructure, community services and facilities
(i) gas services.

8 Electricity infrastructure should be designed and located to minimise its visual and environmental impacts.

Assessment

The proposed Battery Energy Storage System and Substation extension is located adjacent existing windfarm turbines and electricity substation and ancillary facilities and will be consistent with the Infrastructure objectives.

The proposed Battery Energy Storage System and Substation extension when completed will not have any visual and environmental impacts.

Interface between Land Uses

Objectives

1. Development located and designed to prevent adverse impact and conflict between land uses.

Principles of Development Control

1. Development should not detrimentally affect the amenity of the locality or cause unreasonable interference through any of the following:

(a) the emission of effluent, odour, smoke, fumes, dust or other airborne pollutants
(b) noise
(c) vibration
(d) electrical interference
(e) light spill
(f) glare
(g) hours of operation
(h) traffic impacts.

2. Development should be designed and sited to minimise negative impact on existing and potential future land uses considered appropriate in the locality.

5. Sensitive uses likely to conflict with the continuation of lawfully existing developments and land uses considered appropriate for the zone should not be developed or should be designed to minimise negative impacts.

Noise

6 Development should be designed, constructed and sited to minimise negative impacts of noise and to avoid unreasonable interference.

7 Development should be consistent with the relevant provisions each of the following documents:

(a) AS 2107 Acoustics - Recommended Design Sound Levels and Reverberation Times for Building Interiors
(b) AS 3671 Acoustics - Road Traffic Noise Intrusion, Building Siting and Construction
(c) the current Environment Protection (Noise) Policy

Rural Interface

8 Traffic movement, spray drift, dust, noise, odour, and the use of frost fans and gas guns associated with primary production activities should not lead to unreasonable impact on adjacent land users.

9 Existing primary production uses and mineral extraction should not be prejudiced by the inappropriate encroachment of sensitive uses such as urban development.

Assessment

The proposed Battery Energy Storage System and Substation extension will be located immediately adjacent to the electricity substation and ancillary development located on the subject land and will not have an adverse impact or cause a conflict between landuses in the general locality.

The issues of noise, traffic management and waste management have been addressed in the Statement of Effects Report supporting the Development Application and the potential impacts on adjoining landowners have been addressed or minimised.

It is not envisaged that the proposed development will create any new impacts and conflicts with primary production or rural living/residential development in the immediate or extended locality.

Natural Resources

Objectives

1 Retention, protection and restoration of the natural resources and environment.

2 Protection of the quality and quantity of South Australia's surface waters, including inland, marine and estuarine and underground waters.

3 The ecologically sustainable use of natural resources including water resources, including marine waters, ground water, surface water and watercourses.

4 Natural hydrological systems and environmental flows reinstated, and maintained and enhanced.

5 Development sited and designed to:

(a) maximise the use of stormwater
(b) protect stormwater from pollution sources
(c) protect or enhance the environmental values of receiving waters
(d) prevent the risk of downstream flooding
(e) minimise the loss and disturbance of native vegetation.

Principles of Development Control

1 Development should be undertaken with minimum impact on the natural environment, including air and water quality, land, soil, biodiversity, and scenically attractive areas.

5 Development should be appropriate to land capability and the protection and conservation of water resources and biodiversity.

Stormwater

18 Development should include stormwater management systems to protect it during a minimum of a 1 in 100 year average return interval flood.

19 Development should, where practical, capture and re-use stormwater.

20 Development should have adequate provision to control any stormwater over-flow run-off from the site and should be sited and designed to improve the quality of stormwater and minimise pollutant transfer to receiving waters.

Assessment

The proposed development will be sympathetic to the natural resources that exist on the subject land and in the general locality and not impact on the natural resources.

Stormwater generated from the development will be directed to the existing stormwater management system and allowed to dissipate over the subject land.

Orderly and Sustainable Development

Objectives

1. Orderly and economical development that creates a safe, convenient and pleasant environment in which to live.

2. Development occurring in an orderly sequence and in a compact form to enable the efficient provision of public services and facilities.

Principles of Development Control

1. Development should not prejudice the development of a zone for its intended purpose.

3. The economic base of the region should be expanded in a sustainable manner.

Assessment

The proposed Battery Energy Storage System and Substation extension on the subject land is an orderly and economic development in this locality as it will take advantage of an existing windfarm development and ancillary facilities (including the electricity substation) and will not have an adverse impact on the amenity of the locality.

Existing services and infrastructure can be efficiently and economically used and will not have an impact on the amenity of the area.

The proposed Battery Energy Storage System and Substation extension will not jeopardise the continuance of other landuses in the locality.

Renewable Energy Facilities

Objectives

1 Development of renewable energy facilities that benefit the environment, the community and the state.

2 The development of renewable energy facilities, such as wind farms and ancillary development, in areas that provide opportunity to harvest natural resources for the efficient generation of electricity.

3 Location, siting, design and operation of renewable energy facilities to avoid or minimise adverse impacts on the natural environment and other land uses.

Principles of Development Control

1 Renewable energy facilities, including wind farms and ancillary development, should be:

(a) located in areas that maximize efficient generation and supply of electricity; and

Wind Farms and Ancillary Development

2 The visual impacts of wind farms and ancillary development (such as substations, maintenance sheds, access roads and wind monitoring masts) should be managed through:

(b) provision of vegetated buffers around substations, maintenance sheds and other ancillary structures.

3 Wind farms and ancillary development should avoid or minimise the following impacts on nearby property owners / occupiers, road users and wildlife:

(b) excessive noise

Assessment

The proposed development of a Battery Energy Storage System and Substation extension on the subject land will enable the renewable energy generated by the Lake Bonney Windfarm to be stored and put into national electricity grid when demand requires.

The development will not inhibit or impact on the use of adjoining land for primary production purposes and will not have a detrimental visual or noise impacts in the locality.

The proposed Battery Energy Storage System and Substation extension is to be developed on land that has been previously developed for windfarm and ancillary development and the site contains and existing electricity substation facility that connects the Lake Bonney Windfarm to the national electricity grid.

The proposed development will not visible from public roadways given they are located in a 'valley' type area on the subject land and are setback 350 metres from the Canunda Frontage Road and 520 metres from Lakeview Road.

Siting and Visibility

Objectives

1 Protection of scenically attractive areas, particularly natural, rural and coastal landscapes.

Principles of Development Control

1 Development should be sited and designed to minimise its visual impact on:

- ***(a) the natural, rural or heritage character of the area***
- ***(b) areas of high visual or scenic value, particularly rural and coastal areas***
- ***(c) views from the coast, near-shore waters, public reserves, tourist routes and walking trails***
- ***(d) the amenity of public beaches.***

4 Buildings and structures should be designed to minimise their visual impact in the landscape, in particular:

- ***(a) the profile of buildings should be low and the rooflines should complement the natural form of the land***
- ***(b) the mass of buildings should be minimised by variations in wall and roof lines and by floor plans which complement the contours of the land***
- ***(c) large eaves, verandas and pergolas should be incorporated into designs so as to create shadowed areas that reduce the bulky appearance of buildings.***

5. The nature of external surface materials of buildings should not detract from the visual character and amenity of the landscape.

7. Driveways and access tracks should be designed and constructed to blend sympathetically with the landscape and to minimise interference with natural vegetation and landforms.

Assessment

The proposed development will not have any significant impact on the open rural character and natural landscape in the area as it has been designed and sited to minimise any visual impact in the landscape.

Transportation and Access

Objectives

2. Development that:

- ***(a) provides safe and efficient movement for all motorised and non-motorised transport modes***
- ***(b) ensures access for vehicles including emergency services, public infrastructure maintenance and commercial vehicles***
- ***(d) is appropriately located so that it supports and makes best use of existing transport facilities and networks.***

5. Safe and convenient freight movement throughout the State.

Principles of Development Control

Land Use

1. Land uses arranged to support the efficient provision of sustainable transport networks and encourage their use.

Movement Systems

2. Development should be integrated with existing transport networks, particularly major rail and road corridors as shown on Location Maps and Overlay Maps - Transport, and designed to minimise its potential impact on the functional performance of the transport networks.

13. Development should make sufficient provision on site for the loading, unloading and turning of all traffic likely to be generated.

Access

22. Development should have direct access from an all weather public road.

23. Development should be provided with safe and convenient access which:

- ***(a) avoids unreasonable interference with the flow of traffic on adjoining roads***
- ***(b) accommodates the type and volume of traffic likely to be generated by the development or land use and minimises induced traffic through over-provision***
- ***(c) is sited and designed to minimise any adverse impacts on the occupants of and visitors to neighbouring properties.***

Assessment

Conventional vehicle access to the proposed development area is primarily along Canunda Frontage Road from Tantanoola or Canunda Frontage from Millicent. These roads are sealed dual carriageway roads that are suitable for the normal local traffic requirements. These existing roads were sufficient for the delivery of 135 turbines around this location and will be adequate to accommodate the proposed development.

The main traffic impacts of the proposed facility will occur during the construction stage of the project primarily due to the additional volume of traffic from site workers and the need for potential use of over-size and over-mass vehicles to transport the various components to the site. The movement of the construction vehicles to the site from public roads, particularly involving the larger vehicles, will be discussed with Wattle

The existing access driveway to the subject land from Lakeview Road is an all-weather access for vehicles entering and exiting the site.

5 Conclusion

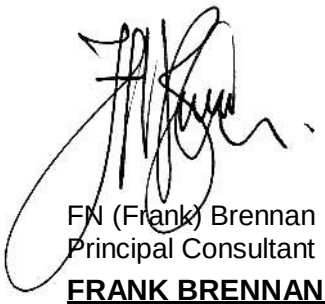
In conclusion, it is submitted that the proposed Battery Energy Storage System and Substation extension is consistent with and not at variance to the various relevant Objectives and Principles of Development Control contained in the Development Plan for the Wattle Range Council.

The proposed development will complement and enhance the subject land and nature of the locality and will not adversely impact on the existing primary production development and character in the area.

The proposed development is logical and orderly, and consistent with other development existing on the subject land.

The development will not have any significant impact on neighbouring properties, or the area in general and when completed will contribute to the general amenity of the area.

The proposed development is not considered to be seriously at variance with the Development Plan for the Wattle Range Council, and therefore warrants the granting of Development Plan Consent.



FN (Frank) Brennan
Principal Consultant
FRANK BRENNAN CONSULTING SERVICES

Dip in Planning
Dip in Local Government Administration
Member Planning Institute of Australia

16 April 2018

Lake Bonney
Battery Energy Storage System

Project Overview

April 2018

Contents

ATTACHMENTS

Attachment Name	Description
A1. BESS Yard Layout	Detailed schematic of the BESS and substation extension
A2. Location Sketch	Layout of BESS relative to the location/topography
A3. BESS Connection Prelim SLD	Preliminary Single Line Diagram between the BESS and the substation
A4. OTR Certificate - Lake Bonney BESS	Certificate from the Office of the Technical Regulator granting approval for the proposed development

1. INTRODUCTION

1.1 Purpose of this Document

Infigen Energy Development Pty Limited (**Infigen**) is proposing the development of a Battery Energy Storage System on land owned by Infigen at the operational Lake Bonney wind farm, which is situated on the Woakwine Range, approximately 2km from the eastern shore of Lake Bonney, near Millicent in South Australia.

The location of the proposed works is shown in Figure 1.1.

This report has been prepared in order to outline the nature of the proposed development and accompany the Development Application to be submitted to the State Commission Assessment Panel (**SCAP**). This document aims to:

- Describe the proposal site and its locality in the context of the proposal;
- Describe the proposed infrastructure and construction, operation and decommissioning requirements;
- Describe the operation of the development once constructed;
- Identify and assess the impacts of the proposal with a focus on key issues; and
- Provide mitigation techniques where required to avoid or minimise these potential impacts.

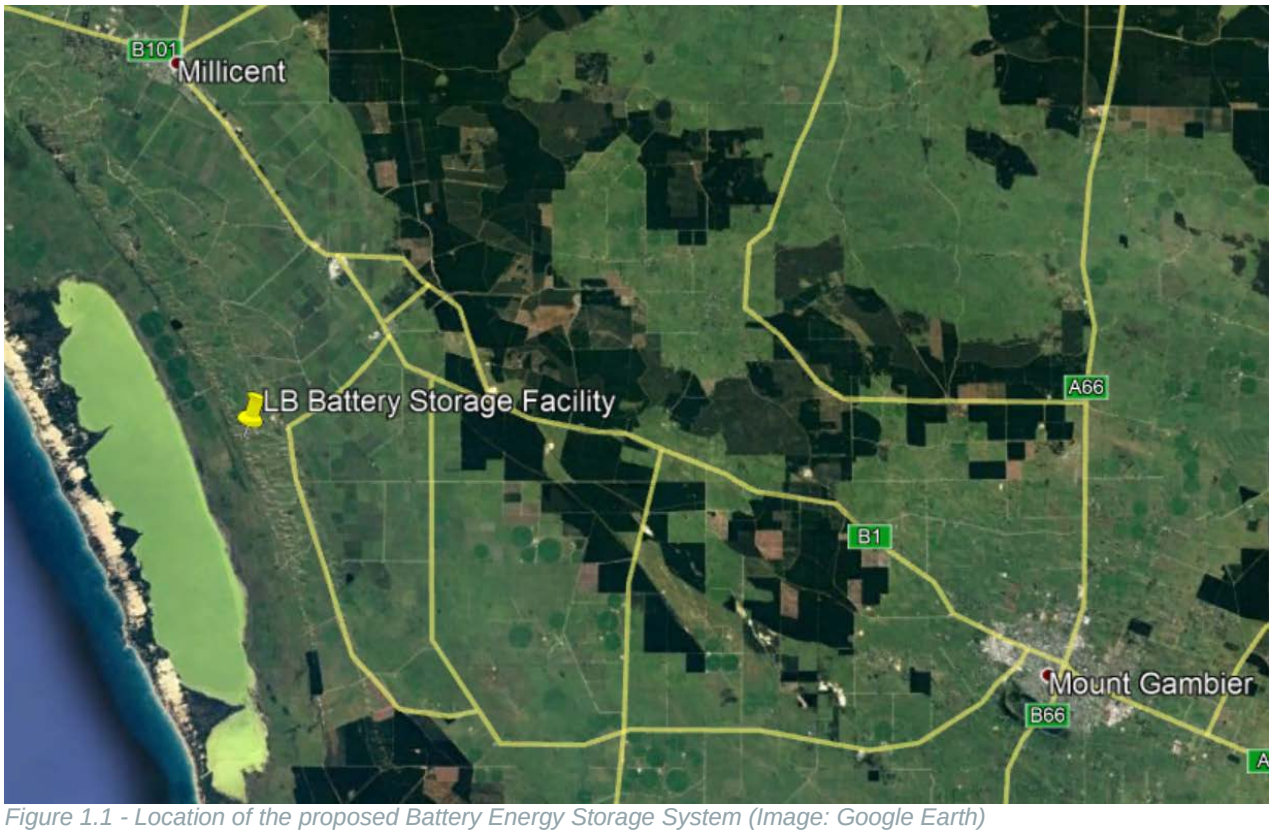


Figure 1.1 - Location of the proposed Battery Energy Storage System (Image: Google Earth)

1.2 The Proponent

Infigen is a business actively participating in the Australian energy market. It is a developer, owner and operator of generation assets delivering energy solutions to Australian businesses and large retailers.

Infigen has 557MW of installed generation capacity across New South Wales, South Australia and Western Australia with a further 113MW under construction in New South Wales. It sells the

electricity and Large-scale Generation Certificates (**LGC**) through a combination of medium and long-term contracts and through the spot market.

1.3 Proposal Outline

Infigen is seeking approval to develop and operate a 25MW/52MWh Battery Energy Storage System (**BESS** or **proposed facility**) on a single land parcel at the existing Lake Bonney wind farm site. This land is owned by Infigen and is the location of the existing Lake Bonney site office, wind farm substation and ancillary facilities.

The proposed BESS will comprise approximately:

- 300 battery units;
- 48 inverters;
- 8 Medium-Voltage transformers;
- the associated cabling and communication systems required for the interconnection of the BESS;
- several electrical Balance of Plant (**EBOP**) components to connect the proposed facility with the existing Mayurra substation;
- the extension of the Mayurra substation to accommodate this connection;
- earthworks and benching (potentially retaining wall) around the extension to the Mayurra substation; and
- a security fence around the BESS facility with a gate for maintenance vehicle access, and an extension of the existing Mayurra substation fence to enclose the extension.

The total development footprint for this application is 100m by 100m for the footprint of the BESS installation and construction works and 60m by 25m for the substation extension works. Expanded footprints for further components of the development proposal are shown in Figure 6.1.

2. THE PROPOSAL

2.1 Proposal Description

Infigen is seeking approval to develop and operate a 25MW/52MWh Battery Energy Storage System (**BESS** or **proposed facility**) on a single land parcel of its existing Lake Bonney wind farm site, located at Section 244, Hundred of Mayurra, Lakeview Road, German Flat. This land is owned by Infigen and is the location of the existing Lake Bonney Windfarm substation and ancillary facilities.

The proposed facility is likely to be comprised of approximately 300 battery units, 48 inverters, 8 Medium-Voltage (**MV**) transformers, the associated cabling and communication systems required for the interconnection of the BESS, and several electrical Balance of Plant (**EBOP**) components to connect the battery storage facility with the Mayurra substation. An indicative layout of these components is shown in Attachment 1 ("BESS Yard Layout"). The Mayurra substation will also need to be extended to facilitate this connection.

The proposed facility will have approximate permanent dimensions of approximately 55m by 45m (2475m^2) and the extension works to the substation will have dimensions of approximately 18m by 22m (396m^2). The micro-sited layout of these two components of the BESS are shown in Attachment 2 ("Location Sketch").

However, the total development footprint considered in this application has been increased for flexibility during construction, giving the BESS compound dimensions of 100m by 100m and the substation extensions dimensions of 60m by 25m. Expanded footprints for further components of the development proposal are shown in Figure 6.1.

Figure 2.1 and Figure 2.2 below show the land parcel on which the proposed BESS will be located (the **Site**) and the pre-existing infrastructure on the Site, as well as the proposed location of the proposed BESS within the Site.

Construction activities will include earthworks to level the ground and construction of access roads, the delivery of the components and their installation, and various EBOP works including connecting the site to the Mayurra substation. The construction phase is expected to take approximately 4-6 months. The proposed BESS will be operated and monitored remotely from Infigen's operational control centre which is staffed 24/7.

Figure 2.1 – The Site of the proposed BESS (parcel ref: CT6129/170) (Image: Google Earth)

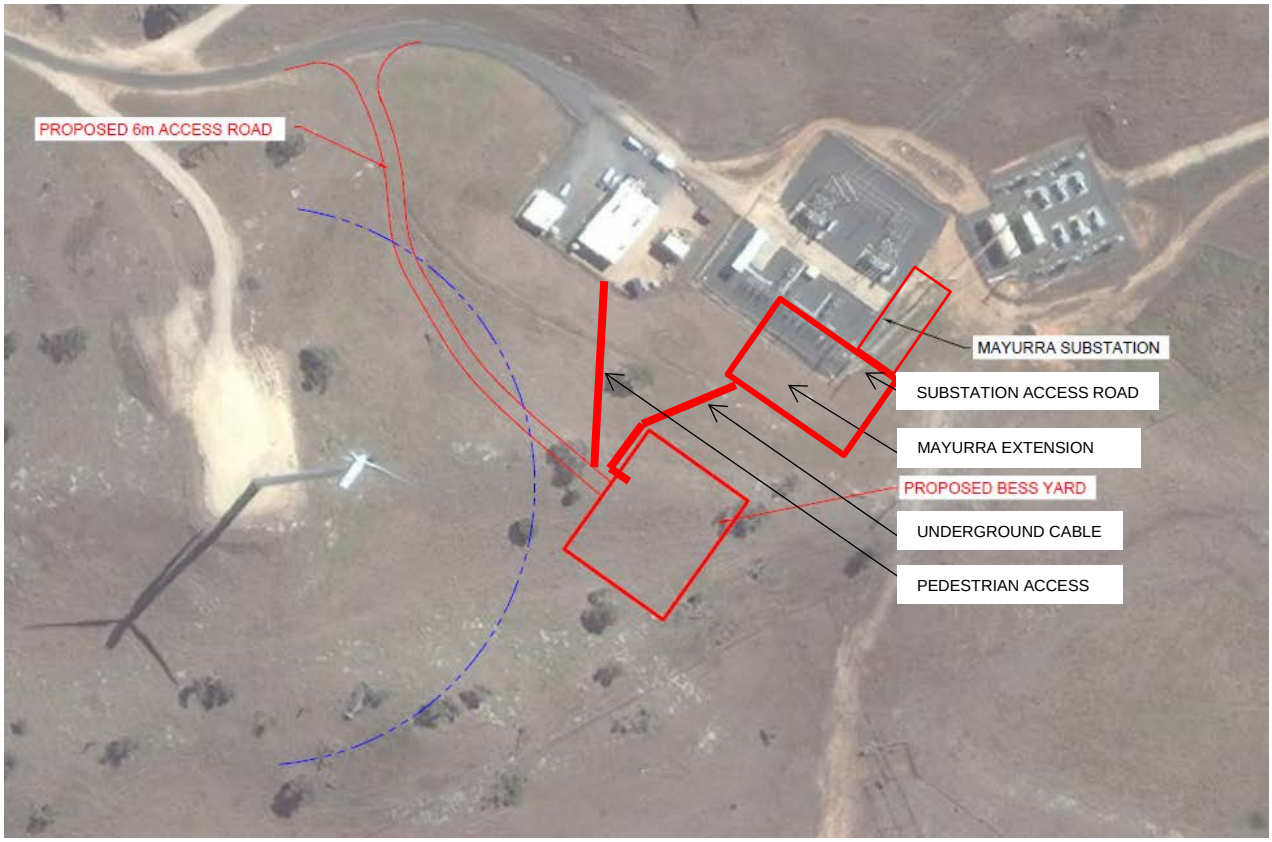


Figure 2.2 – Layout of the proposed BESS

2.2 Site Suitability

The site is considered proposed desirable location for a BESS due to its proximity to existing grid infrastructure and the Lake Bonney wind farm, the availability of cleared land and it's positioning away from any residential dwellings.

The connection between the proposed BESS and the Mayurra substation will be achieved with minimal infrastructure, as the only works necessary for connection are the extension of the substation to include an additional busbar and the trenching and connection of an underground cable between the site and the extended busbar.

The proposed facility is consistent with existing land uses and will have minimal impact on the visual amenity of the region. Being located in the central part of the Infigen property, it is unlikely that the BESS will be visible from any of the wind farm's site boundaries or public vantage points.

The land parcel to be occupied by the proposed facility (see Figure 2.1) is owned by Infigen.

2.3 Infrastructure

The proposed facility will utilise state of the art battery technology, the manufacturer of which has not yet been selected. The indicative BESS will have a power output rating of 25MW, and an energy storage capacity of 52MWh. It will require the installation of approximately 48 inverter blocks, which are likely to be comprised of:

- 6 units (i.e. battery packs, which are made up of approximately 16 individual battery pods)
- 1 inverter (Bi-directional Power Conversion System)
- DC cable harnesses
- Communication cable harnesses

or any other possible configuration of batteries and inverters to achieve the energy storage and power output capabilities required.

The indicative infrastructure list required for the proposed facility is:

- 2 concrete slab foundations with an approximate size of 30m by 15m (450m^2) each (900m^2 total), with mounting bolts for the battery and inverter components;
- Internal site access roads, and a connection road from the proposed facility to the main site access road;
- Around 300 battery pack units;
- 48 inverters;
- 1 battery system controller;
- Associated prefabricated DC wiring and communication cable harnesses;
- 8 Medium Voltage transformers;
- Associated wiring and electrical components required to interconnect the inverter blocks to each transformer (likely 6 inverter blocks per transformer) and all necessary electrical protection equipment;
- Underground connection line and associated trenching from the BESS to the extended Mayurra substation busbar;
- Electrical equipment required to extend the Mayurra substation and construct a new busbar to allow for the facility's connection;
- Earthworks (potentially a retaining wall) around the extension to the Mayurra substation, and potentially around the BESS facility;

- Security fencing around the site and the substation extension, and a gate at the BESS' vehicle access point; and
- Pedestrian access between the BESS and the Lake Bonney Operations & Maintenance (**O&M**) Compound.

2.4 Construction Requirements

As the inverters and unit enclosures selected will be required to be outdoor-rated for all environments, no additional structures or covers are required, simplifying installation and lowering site preparation expenses. Earthworks will be required to level the proposed footprint of the site as the system needs to be installed on flat ground (approx. 55m by 45m) and will have an estimated duration of 4 weeks.

The earthworks to prepare the proposed footprint will be undertaken using a cut and fill method. The gradient of the slope (sloping down from the south-west to north-east) is:

- 7 degrees (9m drop over 70m) above the proposed cut and fill area
- 3 degrees (3m drop over 52.2m) over the proposed cut and fill area
- 12 degrees (11m drop over 52.2m) below the proposed cut and fill area

The 3m change in elevation over the length of the microsited BESS layout will have to be flattened using a cut and fill method. Depending upon the geotechnical analysis, the detailed design and further investigations, there is a possibility that a retaining wall will be established on the higher and/or lower side of the slope.

The excavations for the Mayurra substation extension will involve cutting up to 25m horizontally into the 12-degree slope. The displaced soil from this excavation will be used for the cut and fill of the BESS, as well as any access road construction requirements. A retaining wall, with a height of up to 6m and a length of up to 100m, may be built to support the exposed earth.

All battery components will be delivered to site prefabricated, which greatly reduces the amount of construction work and time required on site, and any potential disturbance to residents. The most significant construction works required on the site will be the connection of the proposed facility to the existing Mayurra substation – this will likely require the construction of an underground line over a short distance (approximately 100m) and extension of the existing substation infrastructure.

The construction of the proposed facility will involve:

- Preliminary earthworks to level the proposed footprint of the site;
- Temporary lay-down areas for equipment/shipping containers;
- Intermittent delivery of facility components;
- Construction of site access roads;
- Construction of the concrete slab foundations with mounting bolts for the battery units and inverters;
- Installation and bolting of battery and inverter units to the concrete slabs and connection of DC wiring and communication cable harnesses;
- Installation of transformers and interconnection with inverter blocks;
- Mayurra substation modification and extension;

- Earthworks (potentially a retaining wall) around the extension to the Mayurra substation area, and potentially around the BESS facility;
- Underground line construction and connection between the BESS and substation; and
- Security fencing construction around facility, with a gate at the access road entrance.

2.5 Operational Requirements

The proposed facility is designed to be remotely operable and monitored, and control of the BESS will be conducted through Infigen's Operations and Control Centre (**OCC**) in Sydney, which is operated 24 hours a day, 365 days per year. The battery manufacturer is also likely to be able to provide monitoring and diagnosis services through its own remote monitoring protocols. The site manager of the Lake Bonney wind farm will be responsible for the onsite monitoring of the BESS, as well as any general site maintenance that is required (e.g. repairs to fencing etc.).

The battery manufacturer will have in place a preventative maintenance plan to ensure efficient operation of the BESS throughout its lifetime.

2.5.1 Annual maintenance

Annual maintenance typically includes:

- Torque checks, calibration checks, visual inspections;
- Harness inspection or replacement in kind if damaged;
- Enclosure integrity - touch up paint and gasket inspection or replacement in kind if damaged;
- Cabinet cleaning; and
- Cabinet ventilation system inspection - radiation area cleaning

and requires approximately 2 hours per inverter block (100 hours total).

2.5.2 5-year maintenance

5-year maintenance typically includes:

- Refrigerant refill
- Pump replacement

and requires approximately 1 hour per battery pack. (300 hours total)

2.5.3 10-year maintenance

10-year maintenance typically includes:

For the industrial inverter	- coolant refill - fan replacement - pump replacement
For the battery	- coolant refill - fan replacement - bypass valve replacement - door gasket replacement

Remote monitoring of the battery system results in streamlined troubleshooting, predictable maintenance, uniform firmware/software upgrades across the entire fleet, and fleet diagnostics.

The battery manufacturer is expected to be able to:

- monitor the system remotely and run diagnostics to identify requirements for unscheduled maintenance;
- provide remote response to unscheduled maintenance within 24 hours;
- provide 24-hour onsite response following fault detection for urgent downtime issues; and
- provide redundancies in the system so that the loss of one unit or inverter has a minimal loss on the energy storage and power output of the BESS.

2.6 Decommissioning and Rehabilitation

At the end of life of the proposed facility, if it is not to be upgraded or expanded, the BESS and site will be decommissioned. This will involve the removal of all batteries and inverters from the site for recycling. .

The rehabilitation of the site will include the follow processes after the site has been decommissioned as described above:

- Removal of all above-ground BESS site infrastructure, including the perimeter fencing and site office;
- Removal and disposal of all surface finishes applied to the BESS facility and access roads to a level that will allow for sustained vegetation growth;
- Covering the two concrete battery foundations, and concrete fencing foundations with top soil to a specified depth to be suitable for revegetation (similar to the agreements made with landholders regarding the Lake Bonney wind farm turbine foundations); and
- Planting site-suitable vegetation in the disturbed areas to rejuvenate the site to the levels present prior to the development.

All the rehabilitation processes will be undertaken with consideration to the relevant environmental guidelines at the time. The decommissioning of the Mayurra substation extension will be incorporated into the decommissioning process of the entire substation compound, which is incorporated into the decommissioning of the Lake Bonney wind farm.

2.7 Battery Energy Storage System Component Dimensions

The indicative dimensions of components that are generally used in utility-scale battery systems similar to the proposed facility are given below.

2.7.1 Battery Units

Typical Battery Unit Dimensions

Height	Width	Length
2m to 2.5m	0.75 to 1.25m	1m to 1.5m

Typical Inverter Dimensions

Height	Width	Length
2m to 2.5m	1m to 1.5m	1m to 1.5m

Typical Transformer Dimensions

Height	Width	Length
3m to 5m	3m to 5m	6m to 8m

Typical Site Office Dimensions

Height	Width	Length
3m to 4m	4m to 6m	5m to 7m

Typical Fencing Dimensions

Height	Width	Length
Up to 3m	Up to 45m	Up to 55m

The proposed fencing for the BESS will be comprised of 2.4m high chainwire with two access gates. The Mayurra substation extension will also be enclosed with a similar type of chainwire fencing to that shown in Figure 2.8.

2.7.2 Retaining Wall

A retaining wall may be required around the substation extension as the slope will be cut into, to a length of up to 25m, exposing up to 6m of bare earth. The length of this retaining wall will be up to 100m. Retaining walls may also be required for the upper and lower side of the BESS compound, although these walls will only have a height of around 2m if necessary (subject to detailed design).

2.7.3 Access Roads

The BESS compound and Mayurra substation extension access roads will be similar in construction to the road shown in Figure 2.8.

2.8 Lake Bonney Existing Site Images

Figure 2.3 - Aerial view of the Lake Bonney wind farm (taken in 2004)

Figure 2.4 - View of the Mayurra substation from the bottom of the proposed BESS location

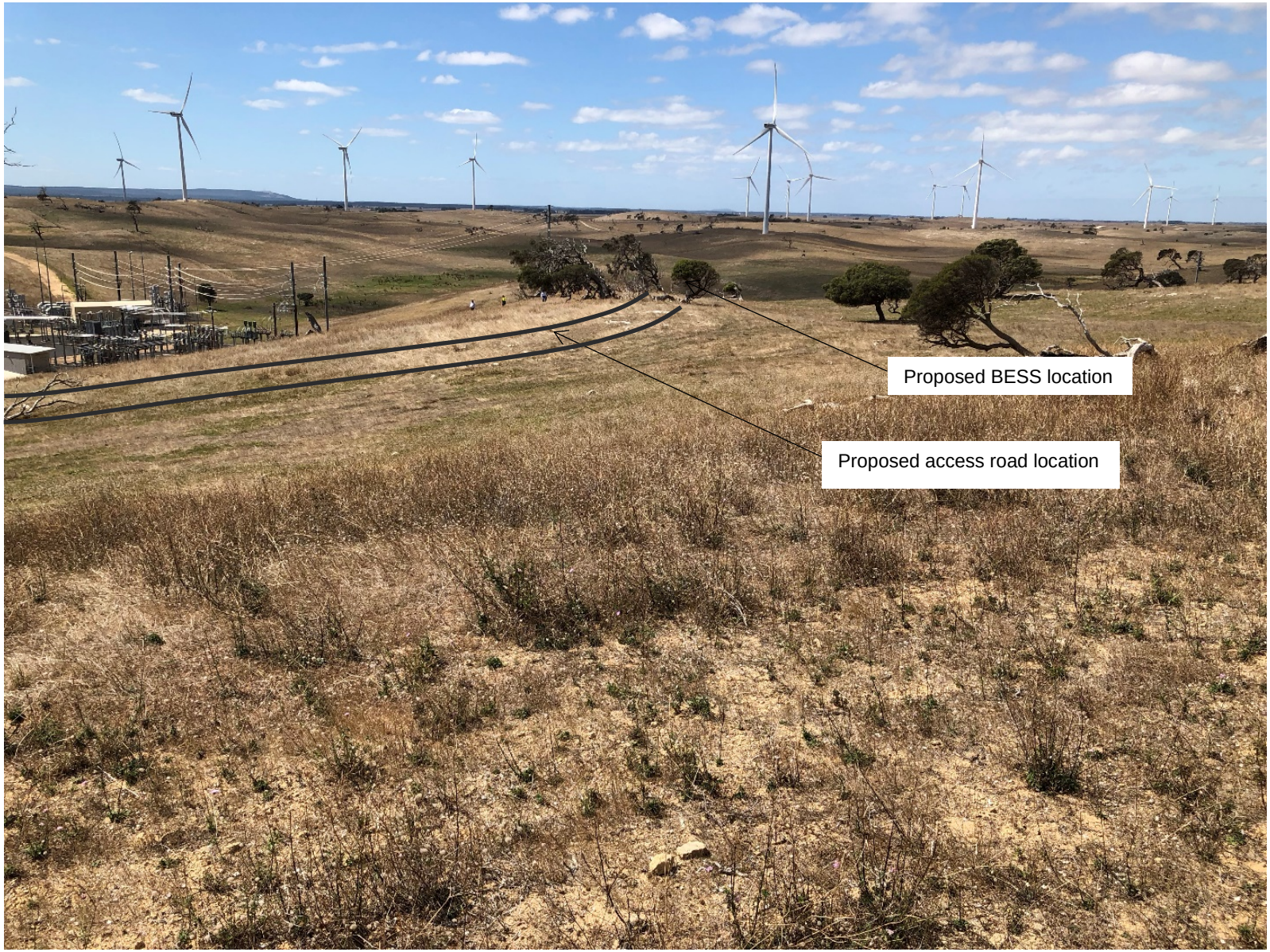


Figure 2.5 - View of proposed BESS location and access road

Figure 2.6 - View of Mayurra substation and the slope that will be cut into

Figure 2.7 - Mayurra substation access road and surface covering

3. JUSTIFICATION OF THE PROJECT

The proposed facility will:

1. *Provide increased infrastructure and security to the national grid and reduce the risk of widespread blackout events.*

As already demonstrated by the Hornsdale Power Reserve, the almost instantaneous response time of the BESS allows for increased grid security during periods of generator or load trips. The BESS can act as either a generator or load to help stabilise the grid and prevent a domino effect of system trips accumulating in a widespread blackout.

2. *Increase the competitiveness of renewable energy technologies in the NEM.*

The BESS will help to increase the competitiveness of renewable technologies in the NEM by allowing for them to reduce their exposure to the increasing FCAS market costs and enabling them to load-shift the generator output to better suit the supply and demand at a given time. This will allow for the intermittent nature of renewable technology generation to be better managed and allow for a more stable national grid.

3. *Further accelerate the widespread deployment of utility-scale batteries in Australia as a facilitator of the new technology.*

The experienced gained by Infigen and the suppliers and contractors involved in the development and construction of the BESS will allow for further deployment of similar technologies around Australia. This is due to the cost reductions that will come from the learnings experienced in these initial projects, along with the insight gained into the operational performance and expected revenue that the BESS could generate.

4. *Increase the competitiveness of electricity prices for C&I Customers by allowing Infigen to 'firm' their own supply.*

The addition of a BESS into the Infigen asset portfolio will allow for it to have greater control over its firm output, with the battery capable of supplying energy while there is reduced output from the Lake Bonney wind farm.

4. INTENDED OPERATION OF THE BATTERY ENERGY STORAGE SYSTEM

4.1 Connection to the NEM

The connection point for the proposed facility to the NEM is to one of the two Lake Bonney wind farm transformers on the 33kV side of the Mayurra substation. The BESS and the substation will be connected by an underground cable.

Approval for the development has also been granted by the Office of the Technical Regulator, which certifies that the proposed development complies with the requirements of the Technical Regulator in relation to the security and stability of the State's power system. This certification is provided as Attachment 4 ("OTR Certificate - Lake Bonney BESS").

4.2 Operational Monitoring and Control

The BESS will be designed to be remotely operable and monitored to enable streamlined troubleshooting, predictable maintenance, uniform firmware/software upgrades across the supplier's entire fleet, and fleet diagnostics.

The supplier will constantly monitor the system remotely and run diagnostics to identify any requirement for unscheduled maintenance. They will provide remote response to unscheduled maintenance within 24-hours. Additionally, for on-site unscheduled maintenance support they will provide 24-hour onsite response following fault detection for urgent downtime issues. Their modular and highly redundant system architecture enables high availability of the overall project as any issues with one individual battery module or inverter only results in a minor reduction in available power.

The BESS can be controlled under various operating modes, including automated responses based on market signals or manual user inputs. The control schemes can be modified in real-time through the communication link with the battery system controller.

Infigen operates a 24-hour OCC and has an on-site manager at Lake Bonney wind farm. The OCC will forecast and monitor the BESS and the opportunities to maximise revenue. Together the OCC and the Lake Bonney Site Manager should ensure the proposed facility is able to respond to either network or market events no matter when they occur. Capturing the revenue opportunities will contribute to ensuring the BESS is successful and sustainable.

4.3 Decommissioning

At the end of the life of the proposed facility, if it is not to be upgraded or expanded, the site will be decommissioned. This will involve the removal of all battery packs and inverters from the site, the removal of foundations (either fully or to a depth to be determined) and the refurbishment of the land.

Equipment suppliers typically recycle much of the returned battery packs and modules (usually more than 60% of the materials are recovered for reuse).

6. RISK ASSESSMENT: SCOPING OF KEY ISSUES

6.1 Approach and Methodology

The potential environmental impacts of battery energy storage systems depend on the size and nature of the project and are frequently site specific. Mitigation of environmental impacts can be easily achieved by avoiding sensitive or significant areas, and considering the siting and effective and layout of the proposed facility.

The areas considered by the risk assessment are outlined in black in Figure 6.1 below.

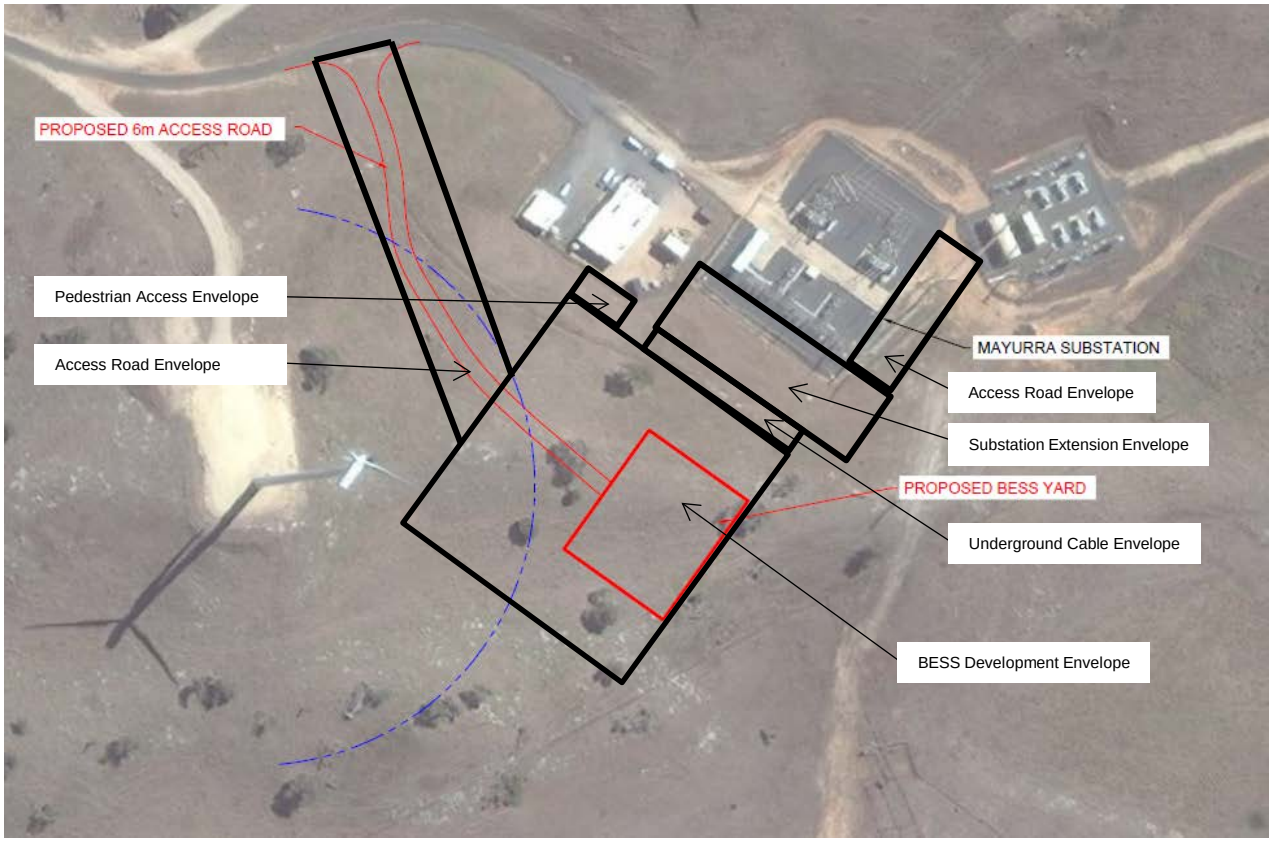


Figure 6.1 – Area that is assessed for risk for the battery energy storage system project

The following risk assessment aims to quantify the environmental risks associated with the construction, operation and decommissioning of the proposal. Environmental risks can be considered in terms of the degree of potential impact, the sensitivity of the environment and the likelihood that an impact would occur. A risk rating between one and five has been developed where one is the lowest risk and five is the highest. The range of risk ratings are shown in Table 6.1.

Table 6.1 - Risk Rating Matrix of environmental aspects

Nature of Impact	Sensitivity of Receiving Environment	Likelihood
1 - Negligible	1 - Low	1 - Never/rare
2 – Minor	2 - Low to Moderate	2 - Unlikely
3 – Moderate	3 - Moderate	3 - Possible
4 – Major	4 - High	4 - Likely
5 - Catastrophic	5 - Very High	5 - Highly likely/certain

The overall risk rating is determined by multiplying the individual risk ratings of:

Overall Risk Rating = Impact x Sensitivity x Likelihood

The level of risk is considered to be either high, moderate or low in accordance with Table 6.2.

Table 6.2 - Level of Risk Identifier

Overall Risk Rating	Level of Risk
1-15	Low
15-30	Moderate
30+	High

6.2 Assessment Results

Table 6.3 summarises the results of the risk assessment.

Table 6.3 - Battery Storage Facility Risk Analysis

Environmental Impact	Nature of Impact	Sensitivity of Receiving Environment	Likelihood	Risk Rating
Biodiversity	3	3	1	9
Visual amenity	3	2	2	12
Noise	3	2	2	12
Erosion and Sedimentation	3	2	2	12
Indigenous heritage	3	2	1	6
Traffic and access	2	2	3	12
Fire/bushfire risks	4	3	1	12
Historical heritage	2	2	2	8
Hydrology and water quality	3	3	1	9
Soils, land use and mineral resources	1	3	3	9
Socioeconomic and community impacts	2	2	2	8
Waste management	3	2	1	6

The low risk rating calculated for each of the environmental impacts identified is attributable to the fact that the site has already been surveyed before the construction of Lake Bonney wind farm stages, the existing processes that Infigen employ to maintain the site, and the low area of impact of the proposed facility development.

7. RISK ANALYSIS

7.1 Biodiversity

7.1.1 Existing Environment

The proposed Site comprises rural land that has been extensively cleared in a region that is used primarily for grazing and wind energy production. The Site was previously assessed during the permitting phase of the three stages of the Lake Bonney wind farm.

Figure 7.1 - Desktop assessment of planned development footprint

Recent site visits have confirmed that the vegetation types and conditions have not changed since previous assessments and approvals. The dominant vegetation type remains introduced pasture. It is predominantly used for cattle grazing and occasionally sheep.

7.1.2 Proposed Development Impacts

The footprint of the proposed facility is shown in black in Figure 7.2.

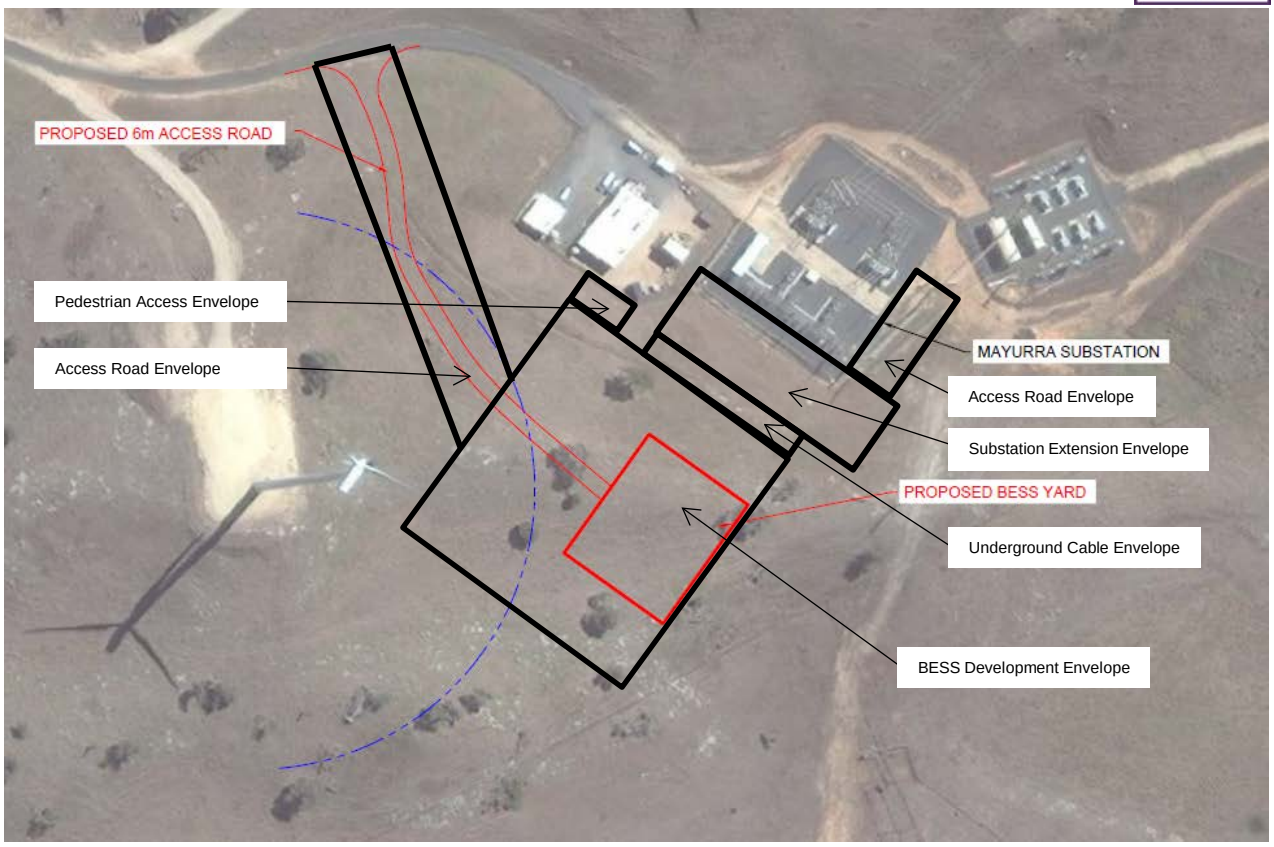


Figure 7.2 – Development footprint for the BESS

The proposed BESS has been micro-sited to avoid clearing of any trees and the worst case if it was moved within the buffer zone would result in the removal of four small shrubs/trees. The grass being removed is all introduced pasture and that would be cleared.

Figure 7.3 and Figure 7.4 show the vegetation present in the proposed BESS footprint and substation extension.

This information was used to complete Table 7.1 and indicate the proposed impacts of the development on the loss of vegetation and habitat.

Figure 7.3 - Proposed BESS footprint

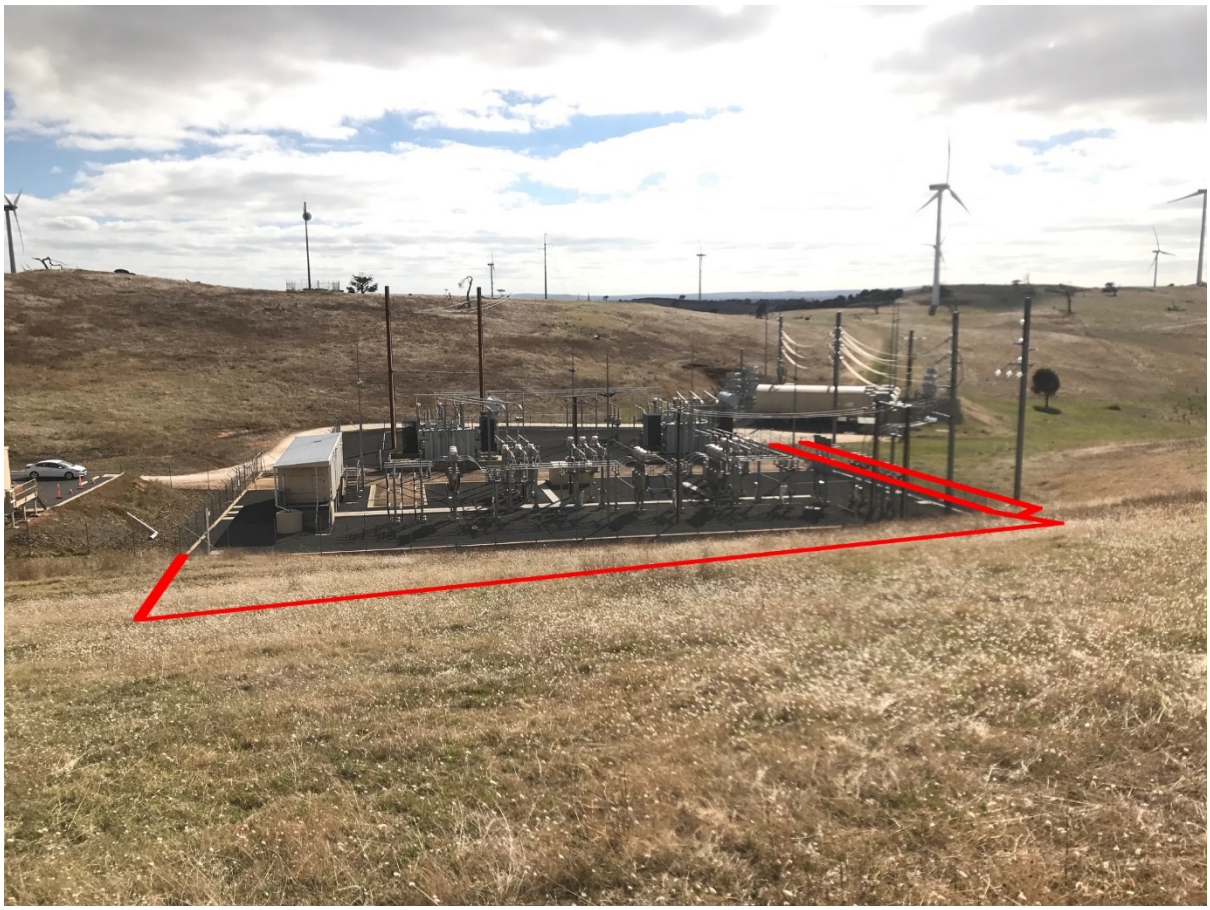


Figure 7.4 - Proposed substation extension and access road footprint

Table 7.1 - Biodiversity Impacts

Species	Common Name	Status	Habitat	Habitat impacted by development?	Impact Level
Birds					
Botaurus poiciloptilus	Australasian Bittern	Endangered	shallow, vegetated freshwater or brackish swamps	No	None
Calidris canutus	Red Knot, Knot	Endangered	strictly coastal, frequenting tidal mudflats or sandflats, sandy beaches of sheltered coasts, rocky shelves, bays, lagoons and harbours, occasionally also oceanic beaches and saltmarshes	No	None
Calidris ferruginea	Curlew Sandpiper	Critically Endangered	tidal mudflats, salt marshes, salt fields: fresh, brackish or saline wetlands. Summer migrant to coastal and inland Australia	No	None
Lathamus discolor	Swift Parrot	Critically Endangered	seasonal foraging in Eucalyptus leucoxylon woodland or scattered trees	No	None
Limosa lapponica	Northern Siberian Bar-tailed Godwit,	Critically Endangered	marshy, swampy areas in lowland moss and shrub tundra	No	None
Limosa lapponica	Western Alaskan Bar-tailed Godwit	Vulnerable	marshy, swampy areas in lowland moss and shrub tundra	No	None
Neophema chrysogaster	Orange-bellied Parrot	Critically Endangered	salt marshes, coastal dunes, pastures, shrub lands, estuaries, islands, beaches and moorlands within 10 km of the coast	No	None
Numenius madagascariensis	Eastern Curlew, Far Eastern Curlew	Critically Endangered	coastal, occurring at estuaries, mangrove swamps, saltmarshes and intertidal flats	No	None
Pedionomus torquatus	Plains-wanderer	Critically Endangered	sparse grasslands with c.50% bare ground	No	None
Rostratula australis	Australian Painted Snipe	Endangered	shallow inland wetlands, either freshwater or brackish	No	None
Fish					
Galaxiella pusilla	Eastern Dwarf Galaxias, Dwarf Galaxias	Vulnerable	freshwater	No	None
Frogs					
Litoria raniformis	Growling Grass Frog, Southern Bell Frog, Green and Golden Frog, Warty Swamp Frog	Vulnerable	emergent vegetation, edges of still water bodies such as lagoons, swamps, lakes, ponds and farm dams	No	None

Mammals					
Antechinus minimus maritimus	Swamp Antechinus (mainland)	Vulnerable	damp areas of forest, woodland, heathland, tussock grassland, and sedgeland	No	None
Isoodon obesulus	Southern Brown Bandicoot (eastern), Southern Brown Bandicoot (south-eastern)	Endangered	heathy forest, heath and coastal scrub	No	None
Miniopterus schreibersii bassanii	Southern Bent-wing Bat	Critically Endangered	roosting caves located near coastal cliffs, foraging areas include forested areas, volcanic plains, wetlands and coastal vegetation including beaches	No	None
Pteropus poliocephalus	Grey-headed Flying-fox	Vulnerable	tropical moist forest, open forest, closed and open woodlands, Melaleuca swamps, Banksia woodlands, mangroves	No	None
Plants					
Glycine latrobeana	Clover Glycine, Purple Clover	Vulnerable	woodland, open woodland, grassy woodland and low open forest	No	None
Ixodia achillaeoides subsp. arenicola	Sand Ixodia, Ixodia	Vulnerable	windswept, exposed limestone headlands in low coastal shrublands, often on steep slopes	No	None
Pterostylis chlorogramma	Green-striped Greenhood	Vulnerable	moist well drained soils in open forest and woodland	No	None
Pterostylis cucullata	Leafy Greenhood	Vulnerable	coastal sand dunes under open to closed scrub with an open ground stratum.	No	None
Thelymitra epipactoides	Metallic Sun-orchid	Endangered	heathland and heathy forests in well-drained to moist sandy soils	No	None

7.1.3 Assessment of Impacts and Proposed Mitigation Methods

A preventative mitigation approach has been undertaken to limit the disturbance to the existing environment. Due to the limited size of the development, vegetation removed and the fauna impacted during construction are deemed negligible.

The project will update the Construction Environmental Management Plan (**CEMP**) and an Operational Environmental Management Plan (**OEMP**) to accommodate the BESS and to minimise the overall impact of the site and ensure best practices are followed.

7.2 Visual Amenity

7.2.1 Existing Environment

The wind farm is located in a sparsely populated, remote area of limited scenic interest. The proposed location of the facility is in the same land parcel as the majority of the Lake Bonney wind farm's civil and electrical infrastructure. This includes the Infigen site office, the operations and maintenance contractor's site office, a warehouse for spare parts, Lake Bonney transformers and the Mayurra substation.

The extended area around the proposed facility encompasses the Lake Bonney wind farm, located along the ridges 2km east of Lake Bonney, while the surrounding region is rural and has been substantially cleared for use in pastoral farming.

Images of the existing condition of the site are shown in Section 2.9.

7.2.2 Proposed Development Impacts

Using a desktop analysis, houses close to the proposed facility were identified in order to assess the impact that the proposed facility may have upon these residents. 1km and 2km zones around the proposed location are shown in Figure 7.5 below. One dwelling was inside the 2km radius of the site, at a distance of 1.8km. Due to the topography of the landscape, and the protruding ridges in the area, the proposed site is not considered to be visible from any of the identified houses.

Figure 7.5 - Location of houses near the proposed BESS (Image: Google Earth)

The visual impact of the proposed facility from the Lake Bonney wind farm site boundary was also undertaken, to ensure that the site would not impact on or distract drivers on the adjacent roads. Five potential viewpoints of the proposed site were visited as shown in Figure 7.6. The BESS will not be visible from any of these viewpoints.

Figure 7.6 - Viewpoints used to analyse the visual impact of the proposed site (Image: Google Earth)

Viewpoint 1

Viewpoint 2

Viewpoint 3

Viewpoint 4

Viewpoint 5

7.2.3 Assessment of Impacts and Proposed Mitigation Methods

The possible visual impacts, especially in the context of the other infrastructure already present on site, is deemed to be negligible. The site will not be visible from any of the adjoining roads, local residences or wind farm site boundaries. The use of an underground cable between the BESS and substation further reduces the potential visual impact of the development.

The location of the BESS is separate from main tourist localities and is set back from the coast and National Parks. However, the technology is a relatively new form of electricity generation for Australia and provides a point of interest with tourists. Wattle Range council has shown interest in

the possibility of a local viewing platform that would incorporate the entire Lake Bonney facility as a tourist attraction and educational piece.

7.3 Noise Analysis

7.3.1 Existing Environment

The proposed Site is situated within the boundaries of the Lake Bonney wind farm. The turbines located in the Lake Bonney site and have demonstrated compliance with the applicable noise standards at receptors. The rural nature of the region also indicates that there would be regular noise from heavy machinery/farming equipment.

7.3.2 Proposed Development Impacts

The noise impacts from the proposed facility will be applicable to both the construction or operational phases. The construction phase noise impacts will primarily come from the increased traffic on the site, of delivery trucks, heavy machinery, concrete trucks and worker vehicles, and from the construction works undertaken on site. These works should not produce much noise, as most components arrive prefabricated and simply require mounting and installation. The loudest works are assumed to be the initial earthworks to level the ground, which are estimated to last for approximately four to six weeks.

The operational noise impact of the proposed facility will be limited as the maximum noise produced by each battery is around 80dBA, and 70dBA for each inverter. This is significantly lower than the wind turbines installed at Lake Bonney. It is also very unlikely that the BESS will attain these maximum noise levels on a regular basis, as this volume is attributed to the thermal management system and its fans running at full capacity and would therefore only be attained during a maximum charge/discharge of the system at the maximum ambient temperature rating of 50^{o}C. The site is also located further from any resident than the closest wind turbine in the Lake Bonney wind farm.

7.3.3 Assessment of Impacts and Proposed Mitigation Methods

Noise impacts during construction will be managed by adhering to standard working hour limits to minimise the disturbances to nearby residents and by limiting loud works to less sensitive times of day.

Increased car traffic will temporarily create more noise than normal and will be managed, if necessary, through the traffic management plan to ensure minimal disturbance to local residents. The minimal maintenance activities required on site are deemed to be negligible in terms of their noise impacts (see Section 2.5 for scope of maintenance works).

7.4 Erosion and Sedimentation

The proposed development will be located on a slope with a gradient ranging from 3 to 12 degrees. There is a broad coverage of introduced vegetation on the slope, and no apparent natural drainage pathways along the slope. No erosion or sedimentation issues have been identified on the slope during the operation of the Lake Bonney wind farm.

The potential for the proposed development to cause erosion or sedimentation to occur on the site is apparent during the construction and operation of the BESS. During construction, the large amounts of disturbed topsoil from excavation works will be prone to sedimentation. To mitigate this risk, the CEMP will make provisions for establishing bundings/silt fences, or a technique with a similar effect, to prevent the disturbed soil from being displaced by wind and/or water before the surface finish materials are applied as appropriate to hold the soil in place.

During operation, there is a risk of erosion and sedimentation due to the altered slope of the hill (where the cut and fill BESS footprint is established) and the minor loss of vegetation. Monitoring

of the slope's condition, particularly after periods of heavy rainfall, will be incorporated into the Lake Bonney Erosion Management Plan. Following regular visual inspections, if required, mitigation techniques will be employed to control the movement of topsoil to prevent further erosion in areas identified as being at risk. Access roads will also be constructed with suitable drainage standards to minimise the impacts of erosion and sedimentation.

7.5 Indigenous Heritage

No Aboriginal heritage sites or artefacts have been detected during the three stages of Lake Bonney construction works and there are no identified Aboriginal heritage sites within the area of the proposed facility.

If any items are discovered during the construction works, the works will be stopped and the appropriate authorities notified. If necessary, a strategy will be developed to address any significant findings of heritage items within the proposed Site.

7.6 Traffic and Access

Conventional vehicle access to the proposed development area is primarily along Poonada Road from Tantanoola or Canunda Frontage from Millicent. These roads are sealed dual carriageway roads that are suitable for the normal local traffic requirements. The existing roads were sufficient for the delivery of 135 turbines around this location and will be adequate to accommodate the BESS components.

The main traffic impacts of the proposed facility will occur during the construction stage of the project. This is mainly due to the additional volume of traffic from site workers and the need for potential use of over-size and over-mass vehicles to transport the BESS components to the site. The movement of the construction vehicles to the site from public roads, particularly involving the larger vehicles, will be discussed with the relevant Councils. During the realisation of the proposed facility, Infigen will ensure that all relevant traffic regulations are complied with.

7.7 Fire and Bushfire Risks

The facility will be located in pastures with varying thickness of grass cover. Generally, the site presents a low risk of bush fire, however dry conditions increase the risk of bush fire.

During hot and dry periods, precautions will be required for any construction works that involve hot works, in line with the procedures already established in Infigen's Lake Bonney OEMP. Construction contractors will also be required to implement appropriate precautions in their work procedures.

The risk of fire and bushfire at the facility will be further minimised through the control of vegetation around the proposed facility fence lines. Provisions will also be made to ensure that all relevant fire authorities are updated on the required procedures in the event of a fire event at the facility to ensure safety even in an emergency.

Infigen undertakes to consult with the local fire authority to discuss and develop site-specific procedures, if required.

7.8 Non-indigenous Heritage

The District Development Plan does not list any non-indigenous heritage items within the area of the construction works. The 1:50,000 mapping shows a number of "ruins" of historical settlement in the vicinity of the site and these are readily evident when visiting the locality. None of these are located such that they could be affected by the proposed facility. If necessary, a strategy will be

developed to address any significant findings of heritage items within the proposed development area.

7.9 Hydrology and Water Quality

The proposed facility will have negligible impact on surface or ground water. If the proposed development works are identified as influencing the natural drainage of the slope or creating ruts and causing areas of the slope to erode, mitigation techniques will be provided to minimise this impact and direct the water flow in a manner consistent with the site before the development. However, water runoff on the slope is not regarded as being a large potential issue, as the substation at the bottom of the slope does not have any issues with water drainage, suggesting that either heavy flows of water are extremely rare on the site or that the natural drainage limits the amount of water runoff down the area of the slope where the development will be located.

The design of the BESS and effective management of the construction works will ensure that any potential for pollution, for example from sediment, fuels or chemicals, are minimised or eliminated.

7.10 Soils, Land Use and Mineral Resources

The local geology comprises calcareous sandstone that is observed in exposed road cuttings to be friable and weathered. A geotechnical assessment has been undertaken for previous construction at Lake Bonney's turbine sites to confirm adequate foundation bearing capacity and to investigate the presence of any solution cavities that can potentially exist in limestone geology. Over one hundred turbines have now been constructed along the Woakwine Range and footing conditions are relatively well known. Further geotechnical studies will be undertaken before the construction of the BESS, to reduce the risk of disturbing a possible limestone cavity region.

The current land use in the vicinity of the wind farm involves grazing. Lease arrangements exist between the proponent and landowners for the construction and operation of the wind farm that will incorporate the additional BESS. There is no public access or recreational or tourist use of the site.

The south-eastern part of South Australia is affected by local area petroleum exploration titles. There is some potential for sub-surface hydrocarbon at significant depth below the site. The development need not affect the potential to develop any such resources should they be identified.

7.11 Socioeconomic and Community Impacts

The Limestone Coast Region in the south east of South Australia supports a diverse range of enterprises that are indicated to contribute $5 billion to the State's GDP. The development of a utility-scale battery energy storage system in the region provides further diversification and strengthens the region's infrastructure. It also provides additional income across parts of the community without detracting from the existing enterprises or placing excessive strains on local resources.

The location of the BESS is separate from main tourist localities and is set back from the coast and National Parks. However, the technology is a relatively new form of electricity generation for Australia and provides a point of interest with tourists. Wattle Range council has shown interest in the possibility of a local viewing platform that would incorporate the entire Lake Bonney facility as a tourist attraction and educational piece.

There is likely to be a further requirement for local services including accommodation, food and service activities during the construction stage. However, given the levels of employment on such projects the impact is expected to be easily manageable and a positive element of the project.

7.12 Waste Management

During construction, all displaced excavated materials will be used to create the bench on which the BESS will be situated. If the material excavated is deemed to be unsuitable for use, then the displaced materials will be disposed of either at a suitable location on the site or offsite via a licensed contractor.

Minimal waste will be generated from the components of the BESS, as they are shipped prefabricated and only need to have their electrical and communication connections attached before commissioning. The only waste likely to need to be properly disposed of on site during construction will be the material packaging and any scrap metal from cabling or fencing.

At the end of the facility's life, if it is not to be upgraded or expanded, it will be decommissioned and waste will be managed as described in Section 4.3.

8. CONCLUSIONS

The proposed facility represents an extension to the existing Lake Bonney wind farm's infrastructure, consisting of a compound that houses battery units, inverters, MV transformers and the necessary electrical balance of plant components to connect the site with the extended Mayurra substation. Civil balance of plant works will also include the construction of an access road and the levelling of the site prior to construction.

The potential impacts of the proposed facility have been assessed to inform this Project Overview and are considered to be either positive or readily manageable using identified avoidance and mitigation measures. This is mainly due to the small area impacted by the development, the limited construction works required, Infigen's established management plans for the Lake Bonney wind farm site, and the fact that the proposed development area is an established wind farm.

The location selected for the BESS is well suited to the proposed facility and, with the appropriate design, and management of construction and operational activities, the proposed facility will be built and operated with minimal impact on the local environment and community.

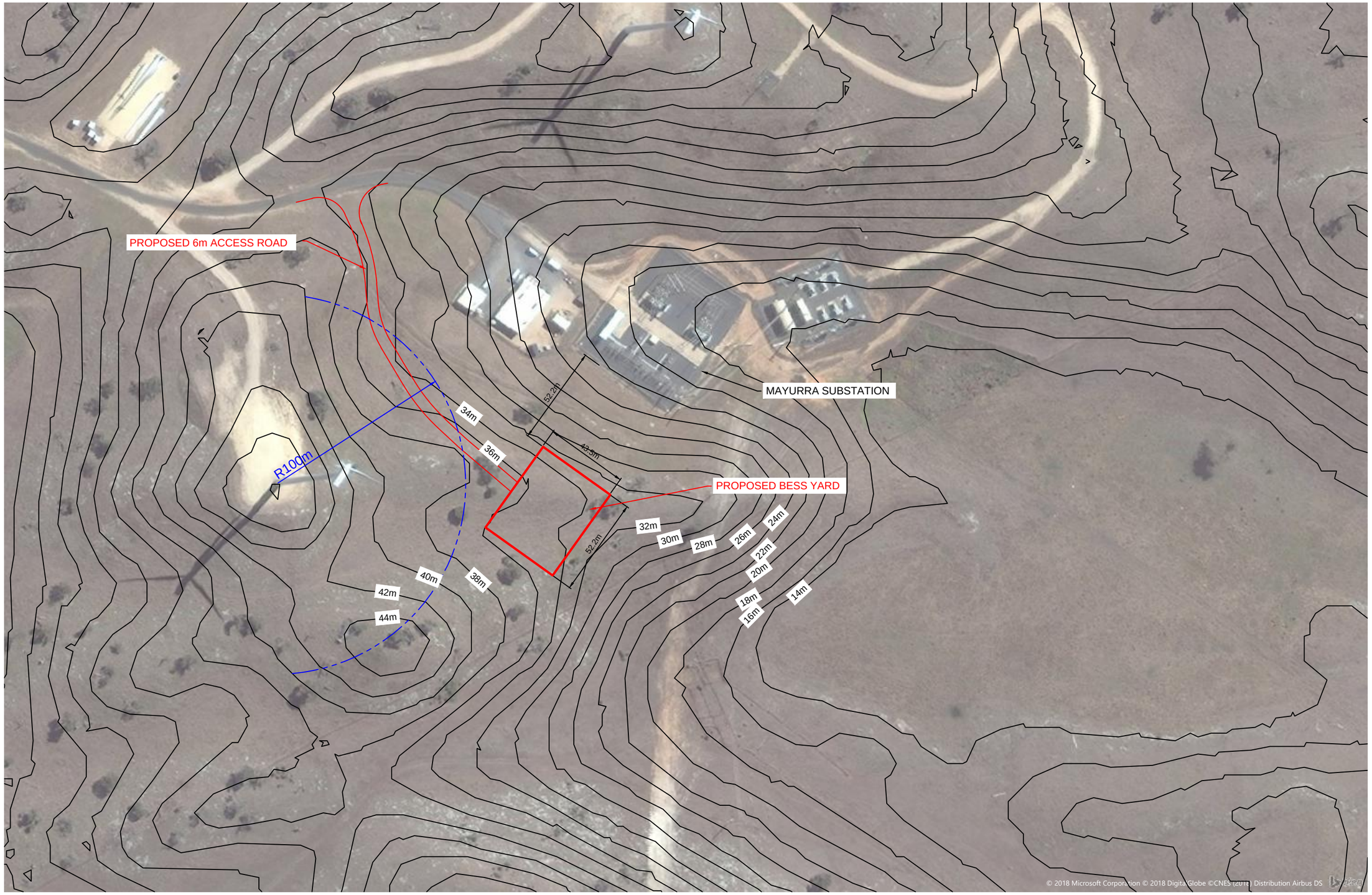
9. REFERENCES

Department of the Environment and Energy (DEE) (2018) *Species Profile and Threats Database* http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl accessed 16/03/18

Department of the Environment and Energy (DEE) (2018) *Protected Matters Search Tool* http://www.environment.gov.au/webgis-framework/apps/pmst/pmst.jsf accessed 16/03/18

International Union for Conservation of Nature (IUCN) (2018) *The IUCN Red List of Threatened Species* http://www.iucnredlist.org/ accessed 16/03/18


PROPOSED 6m ACCESS ROAD
MAYURRA SUBSTATION
PROPOSED BESS YARD
R100m
34m
36m
32m
30m
28m
26m
24m
22m
20m
18m
16m
14m
40m
38m
42m
44m



1:1000 0 20 40 60 80 100m
20 10 AT A1

No	DESCRIPTION	DRAWN	CHKD	APPRVD	DATE
A-01	ISSUED FOR TENDER PURPOSES ONLY	CM	BSH	EW	27/02/18

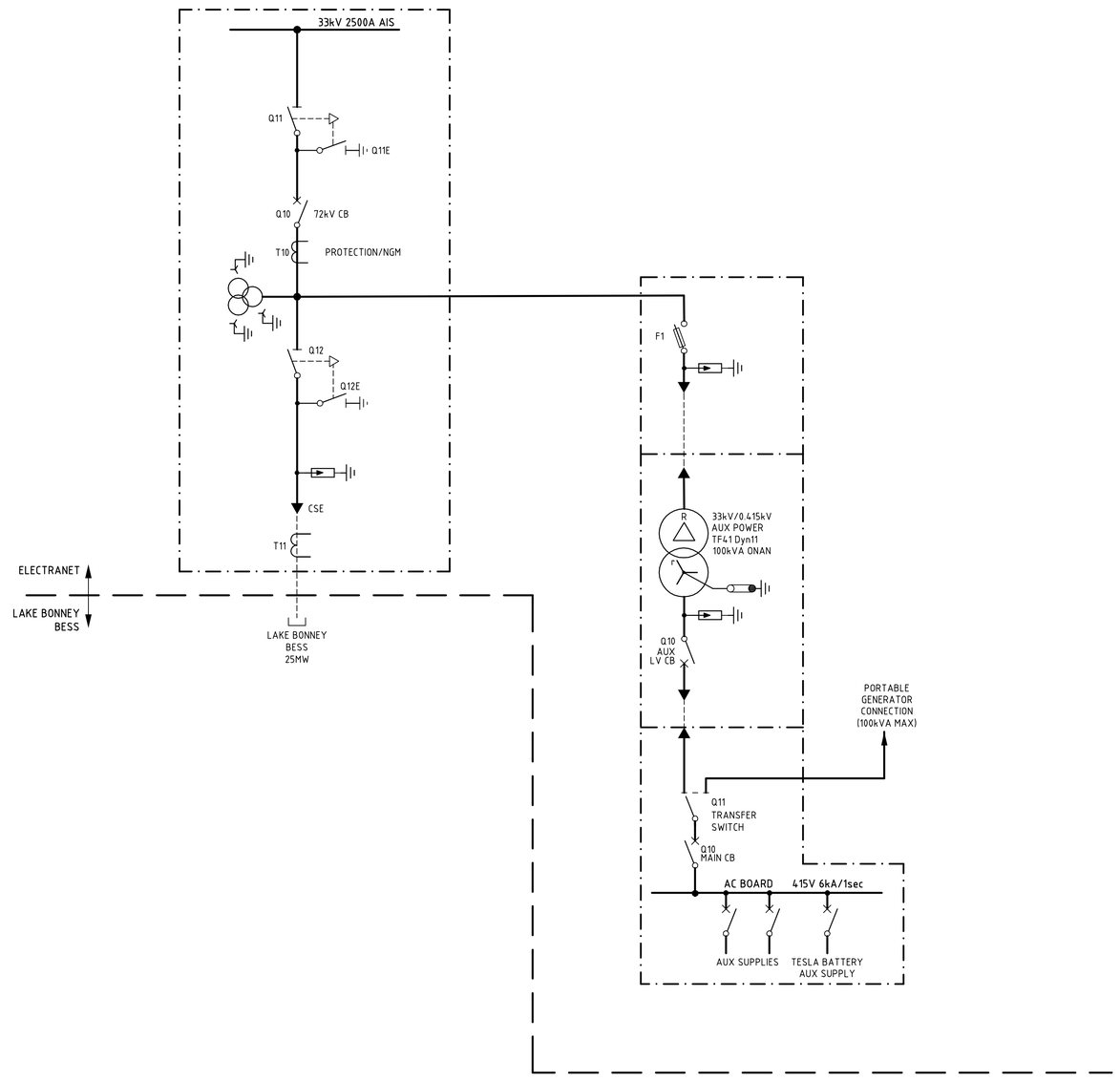
REVISIONS

PROJECT
LAKE BONNEY
BATTERY ENERGY STORAGE SYSTEM

DRAWING TITLE
33kV SUBSTATION
PROPOSED
SUBSTATION LOCATION
SKETCH

DRAWN	C. METTNER	27/02/18	A1 SCALE 1:1000	PROJECT No. -
DESIGN	B.STUART-HILL	27/02/18	DRAWING No. 11017(T)-P-2050	
APPVD	E.WINN	27/02/18	A1	SHEET No. - / REV A-01

DIMENSIONS IN MILLILMETRES DO NOT SCALE



No	DESCRIPTION	DRAWN	CHKD	APPRVD	DATE
A-01	ISSUED FOR TENDER PURPOSES ONLY	RC	BSH	EW	28/02/18

REVISIONS

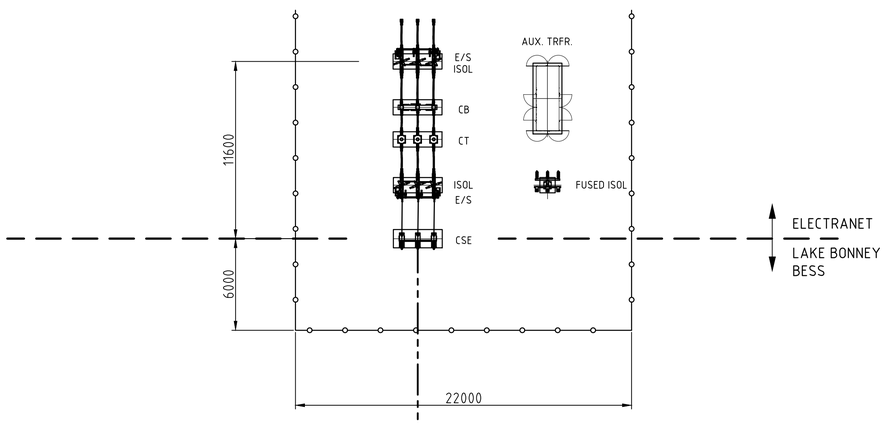
CONSOLIDATED POWER PROJECTS
A DOWNER SERVICES COMPANY

PROJECT
LAKE BONNEY
BATTERY ENERGY STORAGE SYSTEM

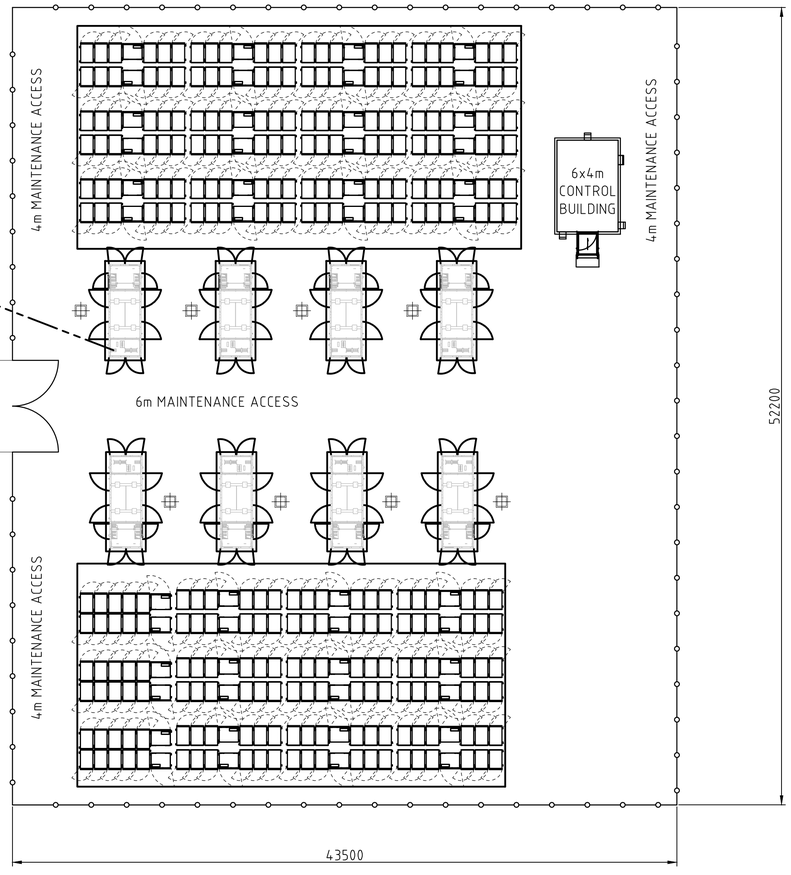
DRAWING TITLE
33kV SUBSTATION
SIMPLIFIED
SINGLE LINE DIAGRAM

DRAWN	R.CLARK	07/12/17	A1 SCALE N.T.S.	PROJECT No. 11017
DESIGN	B.STUART-HILL	07/12/17	DRAWING No. 11017(T)-S-6001	
APPVD	E.WINN	07/12/17	A1	SHEET No. – / REV A-01

DIMENSIONS IN MILLILMETRES DO NOT SCALE



3 x 1 CORE 1000mm² Al DIRECT BURIED
CABLE APPROXIMATELY 70m IN LENGTH.



THE BENCH FOR THE BATTERIES WILL BE APPROXIMATELY 10m HIGHER THAN THE EXISTING SUBSTATION.

6m ACCESS TRACK APRROX.
100m TO NEAREST WIND
TURBINE

1:200 0 4 8 12 16 20m
4 3 2 1 AT A1

No	DESCRIPTION	DRAWN	CHKD	APPRVD	DATE
A-01	ISSUED FOR TENDER PURPOSES ONLY	CM	BSH	EW	28/02/18

REVISIONS

PROJECT
LAKE BONNEY
BATTERY ENERGY STORAGE SYSTEM

DRAWING TITLE
33kV SUBSTATION
PROPOSED SUBSTATION
AND BESS YARD LAYOUT

DRAWN	M. PHILLIPS	08/12/17	A1 SCALE 1:200	PROJECT No. 11017
DESIGN	B.STUART-HILL	08/12/17	DRAWING No. 11017(T)-P-2001	
APPVD	E.WINN	08/12/17	A1	SHEET No. – / REV A-01

DIMENSIONS IN MILLILMETRES DO NOT SCALE