

**Gregadoo Solar Farm Pty Ltd**

# **Modification 4 Application**

**GREGADOO SOLAR FARM**

Job No: 222222\_MOD

Rev: 004C



21 October 2024



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Daniel Drum		Daniel Drum		David Walker	

**ABBREVIATIONS**

<b>Abbreviation</b>	<b>Abbreviated term</b>
<b>AHIMS</b>	Aboriginal Heritage Information Management System
<b>ANL</b>	Acceptable Noise Levels
<b>BOM</b>	Bureau of Meteorology
<b>BSAL</b>	Biophysical Strategic Agricultural Land
<b>CEMP</b>	Construction Environmental Management Plan
<b>DA</b>	Development Application
<b>DCP</b>	Development Control Plan
<b>DCCEEW</b>	Commonwealth Department of Climate Change, Energy, the Environment and Water
<b>DPE</b>	Former NSW Department of Planning and Environment
<b>DPI</b>	NSW Department of Primary Industries
<b>DPHI</b>	NSW Department of Planning, Housing and Infrastructure
<b>EEC</b>	Endangered Ecological Community
<b>EIS</b>	Environmental Impact Statement
<b>EPA</b>	NSW Environment Protection Authority
<b>ESD</b>	Ecologically Sustainable Development
<b>FRNSW</b>	Fire and Rescue New South Wales
<b>ICNG</b>	Interim Construction Noise Guideline (2009)
<b>INP</b>	Noise Policy for Industry 2017
<b>LEP</b>	Local Environmental Plan
<b>LGA</b>	Local Government Area
<b>LPI</b>	NSW Land and Property Information
<b>OEH</b>	NSW Office Environment and Heritage
<b>RAP</b>	Registered Aboriginal Parties
<b>RFS</b>	NSW Rural Fire Service
<b>RMS</b>	NSW Roads and Maritime Service
<b>SEARs</b>	Secretary's Environmental Assessment Requirements
<b>SEPP</b>	State Environmental Planning Policy

<b>SSD</b>	State Significant Development
<b>TfNSW</b>	Transport for New South Wales
<b>Units of Measurement</b>	
<b>°C</b>	degrees Celsius
<b>dB(A)</b>	A-weighted decibel
<b>MW</b>	Megawatt
<b>MWh</b>	Megawatt hours
<b>Acronyms</b>	
<b>Ha</b>	Hectare
<b>M</b>	Metres
<b>m/s</b>	Metres per second
<b>ML</b>	Megalitre

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# EXECUTIVE SUMMARY

## Introduction

Premise has been commissioned by Gregadoo Solar Farm Pty Ltd to prepare an application for a modification (Modification 4) to the approved Gregadoo Solar Farm at 123 Redbank Road and 50 Ashfords Road, Gregadoo, being Lot 11 DP1043022 and Lot 1 DP524499 (the development site).

Gregadoo Solar Farm Pty Ltd (the applicant) was established in Australia in 2017 and is a subsidiary of Hanwha Energy Australia. The applicant ABN is 62 621 818 862 and their business address is Suite 101, Level 1, 15 Blue Street, North Sydney, NSW, 2060, Australia.

Modification 4 seeks to optimise the approved Gregadoo Solar Farm. The optimised design has been conceived to utilise the approved development footprint more effectively by incorporating a Battery Energy Storage System ('BESS') while maintaining a power output of 65 MW(AC). The proposed BESS will have a generation capacity of 200 Megawatt<sub>AC</sub> (MW<sub>AC</sub>) and 400 Megawatt hours (MWh). This optimisation assists to ensure the orderly and economic use of land, while assisting to achieve State and Federal renewable energy targets and objectives for renewable energy and grid firming.

In addition, Modification 4 seeks to include an additional access point and internal access track from Boiling Down Road to the approved overhead transmission line between the Gregadoo Solar Farm Substation and the Wagga Wagga Transgrid Substation. The access point and internal access track are required to ensure that the approved overhead and underground transmission line can be constructed and maintained without impacting on Boiling Down Creek or the adjoining riparian corridor.

The approved Gregadoo Solar Farm has a capital investment of approximately \$95 million, and will create jobs, diversify income and increase revenue to ancillary services such as food, lodging and tourism in the local area. The addition of the BESS will result in an overall capital investment value of approximately \$200M.

Estimated project employment generation is approximately 150-200 full time equivalent (FTE) construction jobs at peak construction, approximately 2-3 FTE operational roles, and up to 4 contractors annually.

The Gregadoo Solar Farm will produce approximately 155,000 MWh in year, enough to power around 27,000 homes (assuming average annual household consumption of 5,662 kWh) and offset around 93,000 tonnes of CO<sub>2</sub>-e pa (assuming grid Emissions Intensity of 0.6 tCO<sub>2</sub>-e/MWh).

The original Development Consent for the Gregadoo Solar Farm (SSD 8825) was approved by the (former) Department of Planning and Environment (DPE) under the delegation of the Minister for Planning on 11 December 2018.

Three (3) modifications to the Development Consent have been submitted since the approval of the Gregadoo Solar Farm. Modification 2 and Modification 3 were subsequently approved by the Department of Planning and Environment under the delegation of the Minister for Planning and Public Spaces on 5 March 2021 and the 22 August 2023, respectively. Modification 1 to the project was withdrawn without being determined.

## Proposed Modification

Modification 4 seeks to make the following changes to the approved project:

- > Addition of a BESS with a capacity of 200MW<sub>AC</sub> and 400MWh.
- > Construction of an additional site access point.
- > Construction of an internal access track.
- > Minor changes to the wording of the consent to reflect current terminology.

As a consequence of these changes, Modification 4 seeks to make the following changes to the Development Consent and associated conditions:

- > Amend the definition of EIS to include *Gregadoo Solar Farm Modification 4 Application* dated 27 September 2024.
- > Amend Schedule 3, Condition 1 to remove the restriction on battery storage within the project site.
- > Delete the term "*Over-dimensional vehicle*" and corresponding definition.
- > Introduce the term "*Heavy vehicle/s requiring escort*" including the definition "*Any vehicle that requires a pilot vehicle and/or escort vehicle, as defined by the National Heavy Vehicle Regulator's NSW Class 1 Load Carrying Vehicle Operator's Guide*".
- > Amend Schedule 3, Condition 2 (a) to increase the number of heavy vehicle movements per day from 50 to 120 to during construction, upgrading and decommissioning, and to increase the number of *Heavy vehicle/s requiring escort* per day from 2 to 4.
- > Amend all references to 'over-dimensional vehicle/s' in the Schedule 3 Condition 2 of the Development Consent to 'Heavy vehicles/s requiring escort.'
- > Amend Appendix 1 to include an updated overall layout plan.

All other buildings and works associated with the approved solar farm remain as described in the current Development Consent to SSD 8825, as amended by Modification 2 and 3.

## Environmental Issues

Based on a review of the original EIS, Modification Report 2 & 3 and the assessment reports prepared by DPE, the following key environmental issues have been deemed as requiring additional assessment:

- > The potential noise and vibration impacts associated with construction and operation of the BESS and construction of the internal access track on receivers adjacent to the project; and
- > The potential hazards association with the construction and operation of the BESS on the site and surrounding landscape.
- > The potential impact of the construction of the internal access track and access point on biodiversity;
- > The potential visual impact association with the construction and operation of the BESS on receiver adjacent to the project;
- > The potential impact of the construction of the internal access track and access point on Aboriginal cultural heritage;
- > The potential impact of additional construction traffic on the surrounding local road network;

Each of these matters is addressed in detail in the body of this report.

In summary, it is considered that Modification 4 involves minimal environmental impact on the basis that it will result in only minor changes to the level of impacts associated with the approved Gregadoo Solar Farm.

## **Justification**

The NSW Government has recognised that the NSW electricity system needs to change, acknowledging that traditional generators are ageing, and the State's transmission system is congested. Further, electricity prices are putting pressure on households and businesses. This realisation has informed the preparation of Government policies and documents, the provisions of which have filtered to the local scale and informed local plan making.

The project will contribute to the provision of renewable energy in NSW and facilitate private investment in the state's electricity system over the next decade and beyond, a key consideration of the NSW Electricity Strategy. The Gregadoo Solar Farm has an anticipated lifespan in the order of 30 years and will contribute to the NSW Government's three (3) objectives for the electricity system: reliability, affordability and sustainability.

The project would support the electricity supply market shift from a centralised power generation system, overly reliant on fossil fuels, to a dispersed and smaller scale system.

The project seeks to invest in and contribute to the local economy through the creation of jobs and provision of affordable electricity.

## **Conclusion**

The assessments presented in this report indicate that the proposed Modification 4 should be approved on the basis that it provides a range of benefits to the local region, the state, and the country, in the context of meeting renewable energy targets.

The technical studies and memos supporting this report confirm that the proposed development would not result in any major change to the level of environmental impacts and that residual impacts are manageable through the implementation of standard measures.

The proposed Modification 4 is consistent with the objects and matters for consideration in the EP&A Act and with the principles of Ecologically Sustainable Development.

This report concludes that Modification 4 will not result in any major change to the level of environmental impacts at the local or regional scale and is therefore considered to be in the public interest.



# 1. INTRODUCTION

## 1.1 Overview

Premise has been commissioned by Gregadoo Solar Farm Pty Ltd to prepare an application for a modification (Modification 4) to the approved Gregadoo Solar Farm at 123 Redbank Road and 50 Ashfords Road, Gregadoo, being Lot 11 DP1043022 and Lot 1 DP524499 (the 'development site').

This report has been prepared in accordance with the Department of Planning, Industry and Environment (DPIE) Publication *State significant development guidelines – preparing a modification report – Appendix E* to the State Significant Development Guidelines, which were published in November 2021.

The report is set out in the following format:

- > **Executive summary.**
- > **Section 1:** Introduction of this report provides a general introduction, including the applicants' details, a short summary of the approved project, a description of the proposed modifications and a summary of the environmental issues associated with Modification 4.
- > **Section 2:** Strategic Context of this report provides a description of strategic context relevant to the Gregadoo Solar Farm and Modification 4.
- > **Section 3:** The Proposed Modification outlines the proposed Modification 4.
- > **Section 4:** Statutory Planning Framework details the statutory planning framework applicable to the Gregadoo Solar Farm and Modification 4.
- > **Section 5:** Community Engagement provides a summary of the community engagement process that has been undertaken for Modification 4.
- > **Section 6:** Assessment of Impacts provides a succinct summary of the findings of the further assessment that has been undertaken in relation to the changed proposed by Modification 4.
- > **Section 7:** Justification provides the justification for Modification 4 and conclusion to the report.

## 1.2 The Applicant

Gregadoo Solar Farm Pty Ltd (the applicant) was established in Australia in 2017 and is a subsidiary of Hanwha Energy Australia. The company specialises in the development of utility-scale solar infrastructure. The company aims to create solar generating facilities to contribute to the replacement of fossil fuel energy generation with clean renewable energy.

The applicant ABN is 62 621 818 862 and their business address is Suite 101, Level 1, 15 Blue Street, North Sydney, NSW, 2060, Australia.

### 1.3 The Approved Project

The Development Consent for the Gregadoo Solar Farm (SSD-8825) was approved by the (former) Department of Planning and Environment (DPE) under the delegation of the Minister for Planning on 11 December 2018.

Modification 1 to the Development Consent was lodged in July 2020 and was subsequently withdrawn without being determined.

Modification 2 to the Development Consent (SSD-8825-Mod-2) was subsequently approved by the DPE under the delegation of the Minister for Planning and Public Spaces on 5 March 2021. Modification 2 sought to make the following changes:

**Table 1 – Gregadoo Solar Farm – Modification 2**

Proposed change	Description
Change of capacity	Alter capacity from 47MW (undefined) to 43MW <sub>AC</sub>
Change of number of modules	Increase the number of solar panels from 122,000 to 134,618
Change of inverter number and layout	Increase the number of inverter units to a maximum of 12 with 5MVA capacity from 8 inverter units with a capacity of 5.5MVA <b>Note:</b> This change was required to achieve compliance with the National Electricity Rules.
Additional clearing of trees for truck access	Two additional trees were required to be cleared following completion of road and access designs and approval from Wagga Wagga City Council and Transport for NSW (TfNSW).

Modification 3 to the Development Consent (SSD-8825-Mod-3) was approved by the DPE under the delegation of the Minister for Planning on 22 August 2023.

Modification 3 sought to make the following changes:

**Table 2 – Gregadoo Solar Farm – Modification 3**

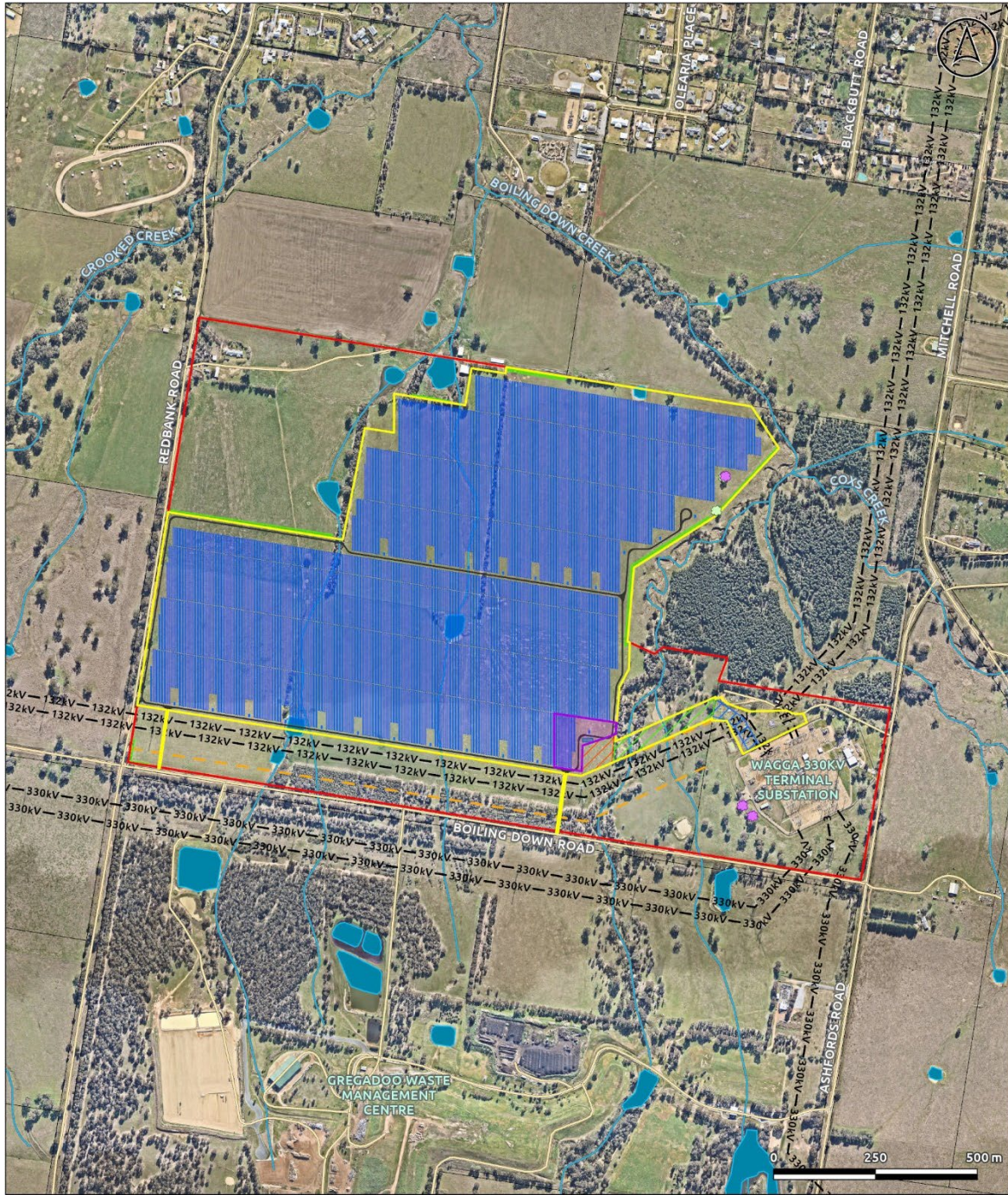
Proposed change	Description
Change of capacity	Increase the AC capacity from 43MW <sub>AC</sub> to 65MW <sub>AC</sub> and increase DC capacity from ~52MW <sub>DC</sub> to ~75MW <sub>DC</sub> .
Spacing between panels	Reduce the spacing between solar panel rows by 55cm from 5.50m to 4.95m (as measured from the centre of bearing columns).
Increase inverters	Increase the number of inverters from 12 to 22.

The overall approved project following the approval of Modification 3 is summarised **Table 3** and illustrated in **Figure 1**.

Table 3 – Gregadoo Solar Farm – Description of Approved Development

Item	Approved Project
Project site	153.70 ha
Development footprint	97.48 ha
Capacity (MW)	65 MW (AC) and 75 MW (DC)
Solar panels	134,618 solar panels (up to 2.8m high with 5.50m to 4.95m spacing)
Inverter units	22
Subdivision	Subdivide Lot 11 DP1043022 and Lot 1 DP524499 (substation)
Transmission line	Overhead and underground
Substation	On-site 132kV with connection to TransGrid's 132kV substation
Screening	Vegetation Screening along the boundaries of the site
Other	Internal access tracks, staff amenities, maintenance and equipment buildings, site offices, on-site car parking and security fencing
Schedule of lands	Lot 11 DP 1043022 and Lot 1 DP524499

Figure 1 – Approved Project



Sources: © State of NSW, Department of Customer Service, Spatial Services 2022  
© Nearmap 2022

GDA2020 MGA Zone 55 File: 222222\_01\_MASTER.aprx Prepared By: adam.davis Date: 29/09/2022

- Legend**
- Development Site
  - Development Footprint
  - Cadastre
  - Road
  - Water Body
  - Watercourse
  - Transgrid 132kV Easement
  - Transgrid 132kV Transmission Lines
  - Transgrid 330kV Transmission Lines
  - PV Tracker Rows
  - Overhead Connection Easement
  - Underground Connection Easement
  - Substation
  - Internal Road
  - Temporary Laydown Area
  - Visual Screening (5m Width)
  - Scar Tree (Retained)
  - Paddock Tree (Retained)

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Gregadoo Solar Farm

## 1.4 Proposed Modification

Modification 4 seeks to optimise the design of the approved Gregadoo Solar Farm.

The optimised design has been conceived to utilise the approved development footprint more effectively by incorporating a Battery Energy Storage System ('BESS') within the existing development footprint while maintaining a power output of 65 MW<sub>AC</sub>.

The BESS includes the following key infrastructure:

- > Enclosed lithium-ion batteries;
- > Power conversion systems including associated switchgear, protection and control equipment, transformers and enclosures for housing equipment;
- > Underground power and fibre optic cabling interconnecting the equipment;
- > Grid connection equipment including switchgear, protection and control equipment, metering, reactive power equipment, filtering equipment, auxiliary/earthing transformers and enclosures/buildings for housing equipment;
- > Underground and overhead 132kV sub-transmission lines to connect the BESS to the Transgrid substation;
- > Earthing and lightning protection systems;
- > Internal access tracks, on-site parking, security fencing, CCTV, lighting;
- > Utilisation of approved site access arrangements.

The approved Solar Farm and proposed BESS will connect to the existing Wagga Wagga Transgrid Substation via a combination of 132kV underground and overhead powerlines. As a result, works will be required within the Wagga Wagga Transgrid Substation to enable connection of the BESS to the grid. However, these works will be aligned to the approved overhead and underground connection from the Gregadoo Solar Farm to the Transgrid substation.

The Gregadoo Solar Farm and BESS has been designed to incorporate two substations, with one substation located within the BESS area and one substation located to the immediate southeast of the solar array area. Detailed design may demonstrate that the Gregadoo Solar Farm and BESS require one, single substation only. In this circumstance one, single substation would be constructed. The final location of the substation would be determined during detailed design.

In addition, Modification 4 seeks to include an additional access point and internal access track. The access point and internal access track are required to ensure that the approved overhead and underground transmission line can be constructed and maintained without impacting on the Boiling Down Creek or the adjoining riparian corridor.

In summary, Modification 4 seeks to make the following changes to the approved project:

- > The addition of a BESS with a generation capacity of 200MW<sub>AC</sub> and 400MWh.
- > The construction of an internal access track from Boiling Down Creek to the approved overhead transmission line between the Gregadoo Solar Farm Substation and the Wagga Wagga Transgrid Substation.

- > The construction of an additional access point to the development site on Boiling Down Road (connecting to the proposed internal access track).
- > Minor changes to the wording of the consent to reflect current terminology.

A revised project description is provided at **Appendix A**.

As consequence of these changes, Modification 4 seeks to make the following changes to the Development Consent and associated conditions:

- > Amend the definition of EIS to include *Gregadoo Solar Farm Modification 4 Application* dated 27 September 2024.
- > Amend Schedule 3, Condition 1 to remove the restriction on battery storage within the project site.
- > Delete the term "Over-dimensional vehicle" and corresponding definition.
- > Introduce the term "Heavy vehicle/s requiring escort" including the definition "Any vehicle that requires a pilot vehicle and/or escort vehicle, as defined by the National Heavy Vehicle Regulator's NSW Class 1 Load Carrying Vehicle Operator's Guide".
- > Amend Schedule 3, Condition 2 (a) to increase the number of heavy vehicle movements per day from 50 to 120 to during construction, upgrading and decommissioning, and to increase the number of over-dimension vehicles movement per day from 2 to 4.
- > Amend all references to 'over-dimensional vehicle/s' in the Schedule 3 Condition 2 of the Development Consent to 'Heavy vehicles/s requiring escort.'
- > Amend Appendix 1 to include an updated overall layout plan.

All other buildings and works associated with the approved solar farm remain as described in the current Development Consent to SSD 8825, as amended by Modification 2 & 3.

## 1.5 The Site & Locality

### 1.5.1 THE SITE

The development site for the Gregadoo Solar Farm and proposed BESS is located in the Wagga Wagga Local Government Area (LGA) approximately 13 kilometres south-east of the Wagga Wagga Central Business District (CBD).

Specifically, the development site includes 123 Redbank Road and 50 Ashfords Road, Gregadoo, being Lot 11 DP1043022 and Lot 1 DP524499.

The development site is generally bound by farm land to the north, Mitchell Road / Ashford Road to the east, Boiling Down Road to the south and Redbank Road to the west. The Gregadoo Waste Disposal Facility is located to the immediate south of the development site, beyond Boiling Down Road.

The majority of the development site has been cleared of native vegetation and cultivated for agriculture, with the exception of the TransGrid Substation located within Lot 1 DP524499.

The development site and its existing conditions are depicted in **Figure 1**.

### 1.5.2 THE LOCALITY

The development site is located approximately 500m south of the urban interface of the suburb of Gregadoo, within the regional city of Wagga Wagga.



The area in which the development site is located is predominately used for agriculture, with the exception of the Gregadoo Waste Management Centre. The locality of the subject site is depicted in **Figure 2**.



Figure 2 – Locality Plan



Sources: © State of NSW, Department of Customer Service, Spatial Services 2022 © ESRI 2022  
GDA2020 MGA Zone 55 File: 222222\_01\_MASTER.aprx Prepared By: adam.davis Date: 29/05/2022

- Legend**
-  Development Site
  -  Development Footprint
  -  Cadastre
  -  Road
  -  Railway
  -  Water Body
  -  Watercourse

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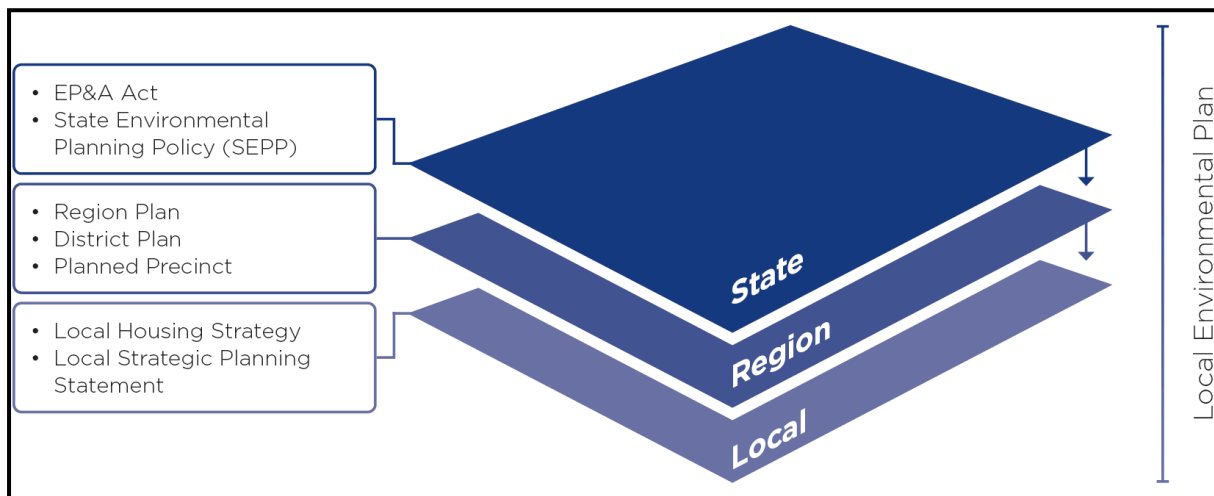
## 2. STRATEGIC CONTEXT

### 2.1 Introduction

During the past decade, the NSW planning system has developed a strong emphasis on integrated strategic planning at a State, regional and local scale, including the introduction of Regional Plans and Local Strategic Planning Statements (LSPS).

The integrated strategic planning framework structure is illustrated in **Figure 3**.

Figure 3 – Strategic Planning Framework



(Source: NSW DPE Strategic Planning Toolkit)

Regional Plans are State-led strategic planning documents which set the direction and establish objectives for delivering the vision for a liveable productive, and sustainable planning framework in NSW.

LSPS sit below Regional Plans in the strategic planning framework and set out the strategic planning ambitions for a Local Government Area as a whole and for specific areas. The LSPS allows councils to translate their strategic planning into local priorities and actions and identifies the need for further local strategic planning work.

With regard to the Gregadoo Solar Farm, the key strategic planning documents include *the Riverina Murray Regional Plan 2041* and the *Wagga Wagga Local Strategic Planning Framework 2040*.

Other recent changes to the strategic planning framework that are specific to the development of solar farms include the introduction of the *Large-Scale Solar Energy Guideline for State Significant Development* (the Guideline), which was introduced in December 2018 and updated in August 2022. Given the timing of their introduction, the original guidelines were not a consideration in the determination of the original application.

## 2.2 Riverina Murray Regional Plan 2041

The *Riverina Murray Regional Plan 2041* (the Regional Plan) is an update to the *Riverina Murray Regional Plan 2036* which outlined a 20-year vision for the Riverina Murray region land uses. This updated Regional Plan provides a new 20-year land use plan with a particular focus on the next five (5) years (2023 to 2028). The overall vision for the region in 2041 is a *diversified economy founded on Australia's food bowl, iconic waterways and a network of vibrant connected communities*.

The vision for the Riverina Murray is underpinned by 18 objectives and a series of strategies, actions, collaboration activities and Council activities which are intended to achieve each objective. The primary objectives of the Regional Plan are:

- > Objective 1: protect, connect and enhance biodiversity throughout the region;
- > Objective 2: manage development impacts within riverine environments;
- > Objective 3: increase natural hazard resilience;
- > Objective 4: support Aboriginal aspirations through land use planning;
- > Objective 5: ensure housing supply, diversity, affordability and resilience;
- > Objective 6: support housing in regional cities and their sub-regions;
- > Objective 7: provide for appropriate rural residential development;
- > Objective 8: provide for short-term accommodation;
- > Objective 9: plan for resilient places that respect local character;
- > Objective 10: improve connections between Murray River communities;
- > Objective 11: plan for integrated and resilient utility infrastructure;
- > Objective 12: strategically plan for rural industries;
- > Objective 13: support the transition to net zero by 2050;
- > Objective 14: protecting and promoting industrial and manufacturing land;
- > Objective 15: support the economic vitality of CBDs and main streets;
- > Objective 16: support the visitor economy;
- > Objective 17: strategically plan for health and education precincts; and
- > Objective 18: integrate transport and land use planning.

Objective 13 and associated strategies are directly relevant to the Gregadoo Solar Farm including Strategy 13.1 seeking to prepare for the transition to net zero emissions by 2050. The Regional Plan seeks to promote well located renewable energy projects located within and outside of Renewable Energy Zones (REZ).

This project remains consistent with objective 13 and intended renewable energy outcomes of the Riverina Murray Regional Plan 2041 by providing capacity to reduce the Region's reliance on fossil fuels and increase electricity storage for reuse during peak consumption periods.



## 2.3 Wagga Wagga Local Strategic Planning Framework (Wagga Wagga 2040)

The Wagga Local Strategic Planning Framework, *Planning for the Future: Wagga Wagga 2040*, sets the long-term strategic framework for planning and development in the City of Wagga Wagga Local Government Area for the 20-year period to 2040.

The LSPS outlines a vision for Wagga Wagga to be a thriving, innovative and connected regional capital city of choice, which will grow sustainably, protecting the natural environment, providing new opportunities and choice in housing, employment, investment and lifestyle.

The vision goes on to state that Wagga Wagga is connected to the world, providing pathways for business, industry and resources to traverse the globe and compete internationally, while providing high speed digital pathways for innovation, expansion, knowledge and research. The vision concludes by stating that the City's attractiveness, liveability, economic diversity and strength will grow the city beyond 100,000 and will be a culturally rich and vibrant city.

The vision for Wagga Wagga is underpinned by three key themes and a series of principles which are intended to guide decision making. The key themes of the LSPS include:

- > Theme 1: The environment;
- > Theme 2: The growing economy;
- > Theme 3: Community place and identity.

Within Theme 2: The growing economy, the LSPS outlines that the State Government has identified renewable energy as an industry with specific potential in or around Wagga Wagga and that renewable energy projects will be supported in the area with the traditional industrial base and other potential industries such as tourism.

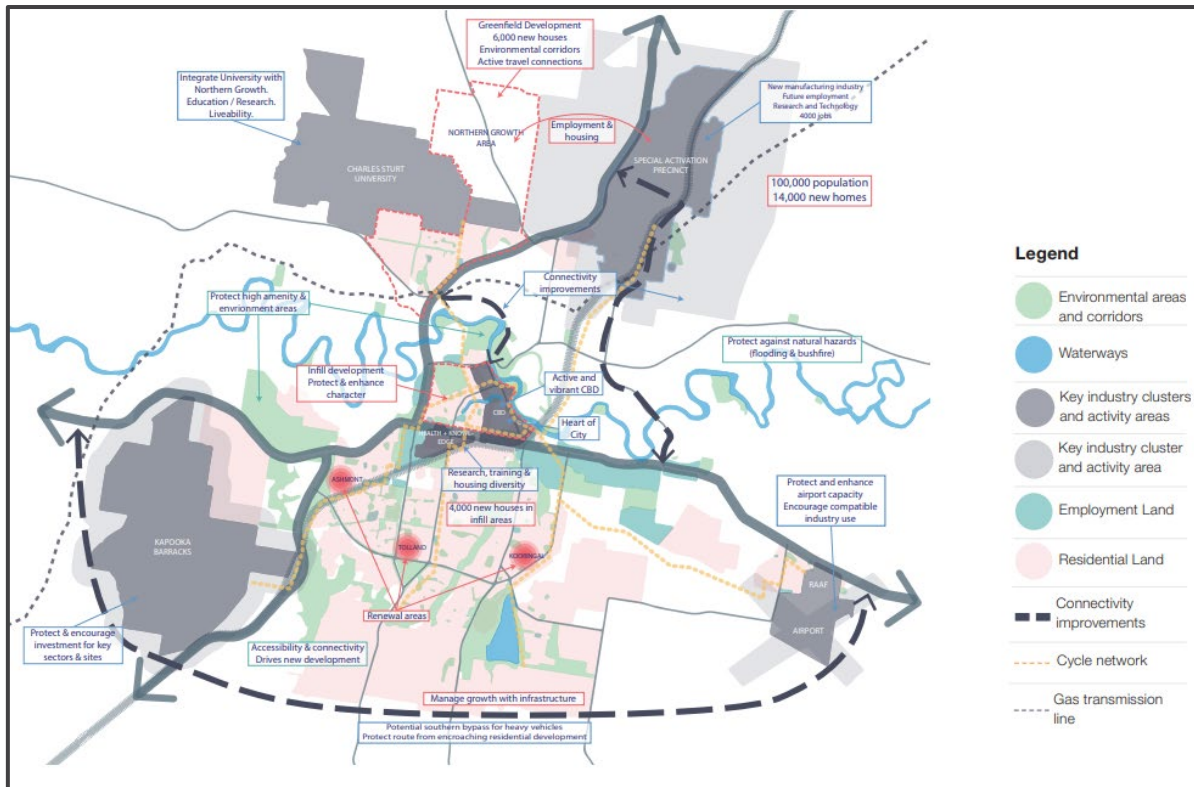
The Wagga Wagga structure plan (refer **Figure 4**) does not identify any specific areas in which renewable energy projects should be located in or around Wagga Wagga.

Notwithstanding, it is pertinent to note that the Gregadoo Solar Farm is located south of the potential southern bypass for heavy vehicles, which is to be protected from encroaching residential development.

Further, it is noted that the Gregadoo Solar Farm is not located within, or in close proximity to, key employment and industry growth sites such as the Bomen Special Activation (SAP) Precinct, Charles Sturt University (CSU) or the Kapooka Defence Barracks or the RAAF Base / airport, which are all identified on the structure plan.



Figure 4 – Wagga Wagga Structure Plan



(Source: Planning for the Future: Wagga Wagga 2040)

## 2.4 NSW Electricity Strategy & Electricity Infrastructure Road Map

In order to address pressing matters around reliability, affordability and the fostering of a sustainable electricity future that supports a growing economy, the NSW Government has formed the NSW Electricity Strategy.

The NSW Electricity Strategy strives to:

- > Deliver Australia’s first coordinated Renewable Energy Zone in the Central-West Orana region;
- > Save energy, especially at times of peak demand, via the Energy Security Safeguard;
- > Support the development of new electricity generators;
- > Set a target to bolster the state’s energy resilience; and
- > Make it easier and more efficient to do energy business in NSW.

The strategy encourages new private investment in NSW’s electricity system over the next decade to support an estimated 1200 jobs, primarily in regional NSW. The strategy closely aligns with the NSW Government’s ‘Net Zero Plan Stage 1: 2020–2030’.

In November 2020, the NSW Government released the Electricity Infrastructure Roadmap, enabled by the *Electricity Infrastructure Investment Act 2020*. The Roadmap builds on the foundations of the Electricity Strategy and is expected to attract up to \$32 billion of private investment in regional energy infrastructure by 2030 and support over 9000 jobs, mostly in regional NSW.

The NSW Electricity Strategy acknowledges that firmed renewables are now the most cost-competitive form of new generation and cost less than the current wholesale electricity price.

The Gregadoo Solar Farm will contribute to the provision of renewable energy in NSW and facilitate private investment in the state's electricity system over the next decade and beyond, a key consideration of the NSW Electricity Strategy.

## 2.5 Large-Scale Solar Energy Guideline for State Significant Development

The *Large-Scale Solar Energy Guideline for State Significant Development* (the Guideline) was developed to provide the community, industry, applicants and regulators with general guidance on the planning framework for the assessment and determination of State significant large-scale solar energy projects.

The Guideline recognises that Australia has the highest average solar radiation per square kilometre of any continent in the world and that NSW has an abundance of excellent solar resources and established electrical infrastructure that make it an attractive location for solar energy development.

The Guidelines set out an industry best practice approach for the preparation of Development Applications for large scale solar energy projects. The original version of the guideline was adopted in December 2018, but due to transitional provisions, were not a material consideration in the determination of the original application.

The Guidelines have been taken into consideration as part of the assessment of the Modification 4. The Guidelines are addressed in further detail in **Section 6**. Specifically, a Preliminary Hazard Analysis (PHA) has been prepared to address Hazardous Industry Planning Advisory Paper No 4 – Risk Criteria for Land Use Safety Planning, Hazardous Industry Planning Advisory Paper No 6 – Hazard Analysis. The PHA also includes a Multi-level Risk Assessment.

## 2.6 Conclusion

The NSW planning system has developed a strong emphasis on integrated strategic planning during the past decade, including the introduction of Regional Plans, Local Strategic Planning Statements and industry specific guidance such as the Large-Scale Solar Energy Guideline for State Significant Development.

As the Gregadoo Solar Farm has already been approved, the evolving strategic context is only relevant to any subsequent modification, such as the proposed Modification 4.

In this regard, it is noted that Modification 4 is characterised as a modification only and does not raise any additional issues which are contrary to the applicable strategic planning framework.



### 3. DESCRIPTION OF MODIFICATION

#### 3.1 The Proposed Modification

Modification 4 seeks to optimise the design of the approved Gregadoo Solar Farm by adding a Battery Energy Storage System (BESS). The proposed BESS will have a generation capacity of 200MW<sub>AC</sub> and 400MWh.

In addition, Modification 4 seeks to include an additional access point and internal access track from Boiling Down Road to the approved overhead transmission line between the Gregadoo Solar Farm Substation and the Wagga Wagga Transgrid Substation.

The Gregadoo Solar Farm has a capital investment of approximately \$95M, increased from approximately \$61M at the original capacity. It will create jobs, diversify income, and increase revenue to ancillary services such as food, lodging and tourism for the local area. The addition of the BESS will result in an overall capital investment value of approximately \$200M.

Estimated job numbers are approximately 150-200 full time equivalent (FTE) construction jobs at peak construction, approximately 2-3 FTE operational roles, and up to 4 contractors annually.

The Solar Farm will produce approximately 155,000 MWh in year 1 (up from 94,000 MWh in the original application), enough to power at around 27,000 homes (assuming average annual household consumption of 5662 kWh) and offsets around 93,000 tonnes of CO<sub>2</sub>-e pa (assuming grid Emissions Intensity of 0.6 tCO<sub>2</sub>-e/MWh).

Modification 4 seeks to make the following changes to the approved Gregadoo Solar Farm:

**Table 4 – Modification 4 Summary**

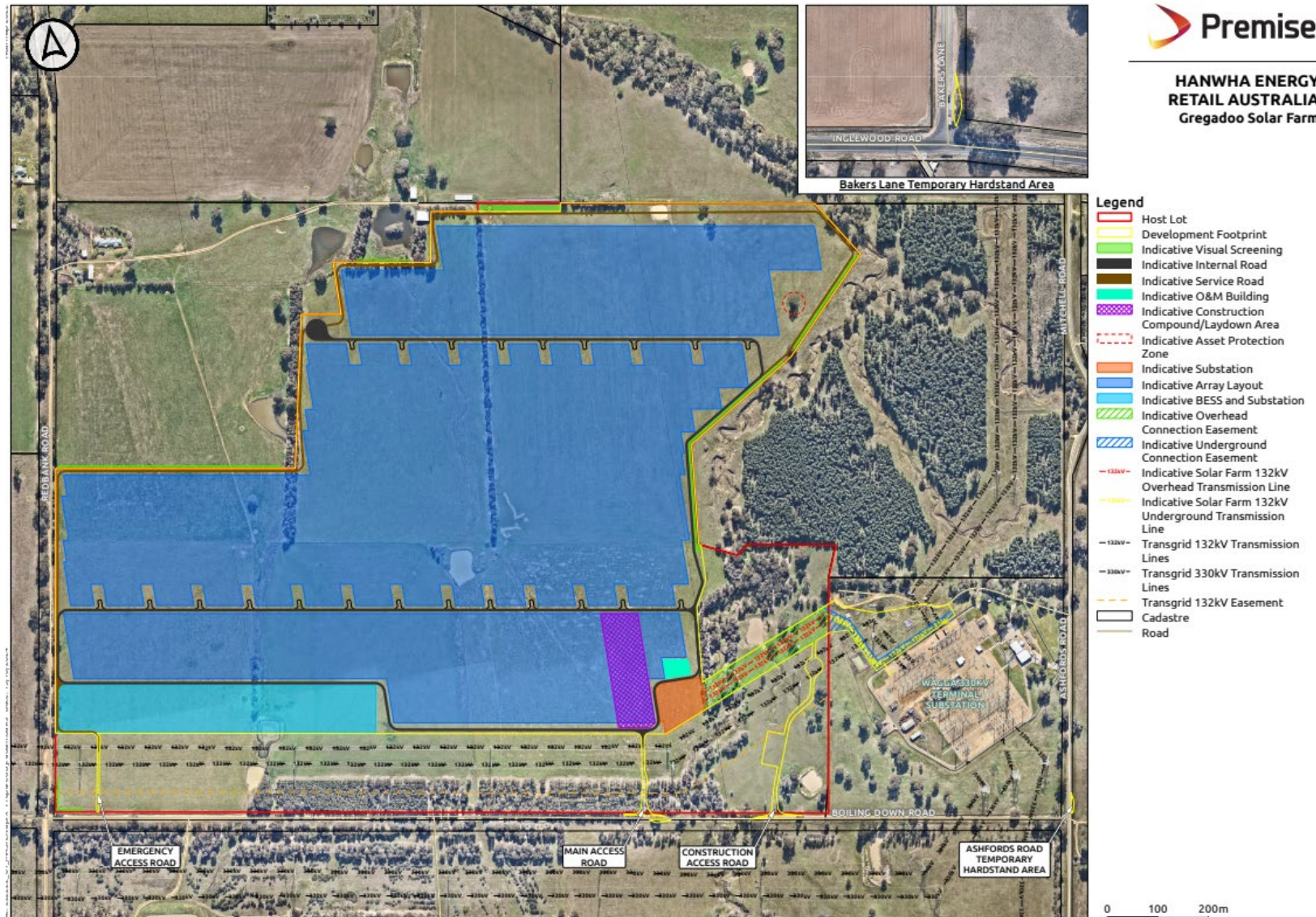
Item	Approved Project	Proposed Modification
Project site	153.70 ha	No change
Development footprint	97.48 ha	102.5 ha
Solar capacity (MW)	65MW(AC)	Solar Farm: 65MW(AC) BESS: 200MWAC and 400MWh
Solar panels	134,618 solar panels (up to 2.8m high)	No change
Solar panel spacing	4.95m (centre to centre of bearing columns)	No change
Inverter units	22	No change
BESS	N/A	200 MW/400 MW hours
Subdivision	Subdivide Lot 11 DP1043022 and Lot 1 DP524499 (substation)	No change

Item	Approved Project	Proposed Modification
Transmission line	Overhead and underground	No change
Substation	On-site 132kV with connection to TransGrid's 132kV substation	Additional on-site 132kV with connection to TransGrid's 132kV substation.  (Detailed design may demonstrate that the Gregadoo Solar Farm and BESS require one, single substation only.)
Screening	Vegetation screening along the boundaries of the site	No change
Other	Internal access tracks, staff amenities, maintenance and equipment buildings, site offices, on-site car parking and security fencing	Additional access point and internal access track from Boiling Down Road to the approved overhead transmission line between the Gregadoo Solar Farm Substation and the Wagga Wagga Transgrid Substation
Schedule of lands	Lot 11 DP 1043022 and Lot 1 DP524499	No change

The proposed Modification 4 drawings are outlined in **Figure 5**.



Figure 5 – Modification 4 Site Layout



## 3.2 Analysis of feasible alternatives

This section provides an analysis of feasible alternatives to the project, having regard to the objectives of the development, including the consequences of not carrying out the development

**Table 5 - Development Alternative**

Development Alternative	Description
Alternative 1 – Do nothing	Alternative 1 would involve not installing and operating a BESS at the site or an alternative site.
Alternative 2 – Different site	Option 2 would involve installing and operating a BESS at an alternative site.
Alternative 3 – Different BESS technology	Option 3 would involve using alternative technology at the site.
Alternative 4 – BESS at the site	Option 4 would involve the installation and operation of a BESS at the existing site.

The following analysis identifies that Alternative 4 – BESS at the existing site is the preferred alternative for the following reasons set out in **Sections 3.2.1- 3.2.4**.

### 3.2.1 ALTERNATIVE 1 – DO NOTHING

Alternative 1 – Do nothing represents the status quo, whereby there is no change to the existing approved Gregadoo Solar Farm or installation and operation of a BESS on an alternative site.

Alternative 1 is not the preferred alternative for the following reasons:

- > Alternative 1 does not achieve the objective of Modification 4 to optimise the approved Gregadoo Solar Farm by utilising the approved development footprint more effectively.
- > Alternative 1 is inconsistent with Goal 22 of the NSW 2021 Plan (NSW Government 2011) which seeks to promote energy security through a more diverse energy mix, reduce coal dependence, increase energy efficiency and move to lower emission energy sources.
- > Alternative 1 is inconsistent with the NSW 2021 Plan (NSW Government 2011).

### 3.2.2 ALTERNATIVE 2 – DIFFERENT SITE

Alternative 2 – Different site would involve the procurement of a new greenfield site or other approved, unconstructed solar farm adjacent to an existing bulk supply substation.

Alternative 2 is not the preferred alternative for the following reasons:

- > Alternative 2 does not achieve the objective of Modification 4 to optimise the approved Gregadoo Solar Farm by utilising the approved development footprint more effectively.
- > Procurement of a separate greenfield site is likely to result in a higher cumulative impact on the natural environment insofar as the combined development footprint of the approved Gregadoo Solar Farm and a BESS located on a new greenfield site will exceed the development footprint of Modification 4.

- > Procurement of another approved, unconstructed solar farm adjacent to an existing bulk supply substation is likely to result in a similar cumulative environmental impact to Modification 4. However, the cost of procuring another approved, unconstructed solar farm would not be economically feasible.

### 3.2.3 ALTERNATIVE 3 – DIFFERENT TECHNOLOGY

Alternative 3 – Different technology would require the use of different technologies capable of grid-scale dispatchable energy generation such as pumped hydro and wind.

Alternative 3 is not the preferred alternative for the following reasons:

- > Grid-scale methods of dispatchable energy generation are, such as pumped-hydro and wind, rely on site specific characteristics.
- > The site-specific characteristics of the existing approved Gregadoo Solar Farm include are better suited to the installation of a BESS by comparison to a wind farm, pumped-hydro and other examples of grid-scale dispatchable energy generation.
- > Construction and operation of other forms of grid-scale dispatchable energy generation are likely to require a larger development footprint and are likely to result in higher individual and cumulative impacts on the natural environment.
- > Alternative 3 is inconsistent with the objectives of Modification 4 as different technologies are unlikely to utilise the approved development footprint of the Gregadoo Solar Farm.

### 3.2.4 ALTERNATIVE 4 – BESS AT THE EXISTING SITE

Alternative 4 – BESS at the existing site represents Modification 4.

Alternative 4 is the preferred alternative for the following reasons:

- > Alternative 4 is consistent with the objective of Modification 4 as it will utilise the approved development footprint of the Gregadoo Solar Farm more effectively by incorporating a BESS while maintaining a power output of 65 MW(AC);
- > Alternative 4 is consistent with Goal 22 of the NSW 2021 Plan (NSW Government 2011), which seeks to promote energy security through a more diverse energy mix, reduce coal dependence, increase energy efficiency and move to lower emission energy sources;
- > Alternative 4 is likely to have less individual and cumulative impact on the natural environment by comparison to procurement of a on a new greenfield site.
- > Alternative 4 is likely to be economically feasible by comparison to the costs associated with the procurement of an approved, unconstructed solar farm adjacent to a bulk supply substation;
- > Alternative 4 is likely to be better suited to the characteristics of the existing site by comparison to other different technologies capable of grid-scale dispatchable energy generation such as pumped hydro and wind; and
- > Alternative 4 is likely to result in less individual and cumulative impacts on the natural environment by comparison to the construction and operation of other technologies capable of grid-scale dispatchable energy generation.

## 4. STATUTORY PLANNING FRAMEWORK

### 4.1 Environmental Planning and Assessment Act

#### 4.1.1 INTRODUCTION

In New South Wales (NSW), the relevant planning legislation is the *Environmental Planning and Assessment Act 1979* (EP&A Act). The EP&A Act institutes a system of environmental planning and assessment in NSW and is administered by the Department of Planning, Industry & Environment (DPE).

The applicable statutory planning framework for the proposed modification is consistent with the statutory framework that applied when the Gregadoo Solar Farm (SSD 8825), Modification 2 (SSD 8825 Mod 2) and Modification 3 (SSD 8825 Mod 3) were approved.

The objects of the EP&A Act and statutory planning framework applicable to Modification 4 is addressed below.

##### 4.1.1.1 The Objects of the Act

The objects of the EDP&A Act are as follows

*(a) to promote the social and economic welfare of the community and a better environment by the proper management, development and conservation of the State's natural and other resources,*

*(b) to facilitate ecologically sustainable development by integrating relevant economic, environmental and social considerations in decision-making about environmental planning and assessment,*

*(c) to promote the orderly and economic use and development of land,*

*(d) to promote the delivery and maintenance of affordable housing,*

*(e) to protect the environment, including the conservation of threatened and other species of native animals and plants, ecological communities and their habitats,*

*(f) to promote the sustainable management of built and cultural heritage (including Aboriginal cultural heritage),*

*(g) to promote good design and amenity of the built environment,*

*(h) to promote the proper construction and maintenance of buildings, including the protection of the health and safety of their occupants,*

*(i) to promote the sharing of the responsibility for environmental planning and assessment between the different levels of government in the State,*

*(j) to provide increased opportunity for community participation in environmental planning and assessment.*

Modification 4 is generally consistent with all objects of the Act, except for (d) which is focussed on the delivery and maintenance of affordable housing.

In this instance, the objects (b), (c) and (f) are of particular significance as they seek to encourage the orderly and economic use of land while also protecting the natural environment, including cultural values.

There is a clear synergy between these objects and the optimised design of the Gregadoo Solar Farm which allows power to be stored on site.

In this regard, it should be acknowledged that adding a BESS to the solar farm to achieve a greater power storage without altering the existing environmental impact is fundamentally consistent with the objects of the Act.

#### 4.1.1.2 Modification of Consents

This application is submitted pursuant to Section 4.55(2) of the EP&A Act.

The critical element of Section 4.55(2) that the consent authority must be satisfied of before a development consent may be modified is that the development to which the consent as modified relates is substantially the same development for which the consent was originally granted and before that consent as originally granted was modified (if at all).

The Land and Environment Court has repeatedly described the modification process as being both beneficial and facultative and is designed to assist with the modification process rather than act as an impediment to it, *"It is to be construed and applied in a way that is favourable to those who seek to benefit from the provision"* (North Sydney Council v Michael Standley & Associates Pty Limited (1998)).

Two (2) legal tests apply to a modification, these being alteration without radical transformation and that the development is substantially the same development; these are discussed as follows.

#### 4.1.1.3 Alteration without radical transformation

This is a broad threshold that requires careful consideration. Unpacking these terms, it is sensible to consider their ordinary definitions.

The Macquarie Australian Dictionary defines radical as:

- 1. going to the root or origin; fundamental: a radical change.*
- 2. thorough going or extreme, especially towards reform.*

The Macquarie Australian Dictionary defines transformation as:

- 1. the act of transforming.*
- 2. the state of being transformed.*
- 3. change in form, appearance, nature, or character.*

It is sensible to consider firstly whether Modification 4 represents a transformation; if it is concluded that no transformation has taken place, then the degree (or radicalness) is moot. Taking consideration of the above definition, specifically point 3, it is considered that the development does not represent a transformation on the following basis:

- > Form – overall form of the development is consistent with the approved form;
- > Appearance – no perceivable change to the appearance of the site is proposed;
- > Nature – no change to the nature of the Gregadoo Solar Farm operation is proposed; and
- > Character – no change to the character of the Gregadoo Solar Farm operation is proposed.

On the above basis it is not considered a transformation. Should the alternate view be taken, the question then becomes whether that transformation is considered radical. It is evident from the definition of radical that the change must be one of extremes and must result in an alteration at a fundamental level.

**Section 3** sets out the description of the proposed modification. It is evident from that description that the modification is not radical. The proposed use:

- > would have a negligible impact on the existing disturbance footprint of the project;
- > would not lead to any significant change to operational aspects; and
- > is unlikely, through the effective implementation of existing and proposed mitigation measures, to result in any significant increase in environmental impacts.

On the basis of the above it is considered that the development does not involve radical transformation and therefore satisfies the first test for a modification. Once the consent authority is satisfied that the development is alteration and not radical transformation, they may then turn to the second issue, namely, confirmation that the development remains substantially the same

#### 4.1.1.4 Substantially the same

To determine whether a proposed modification remains substantially the same as the approved development, there are a number of matters that require consideration, including:

- > the numerical differences in all key aspects of the development;
- > non-numerical factors (e.g. in visual impact, traffic impacts or changed land uses); and
- > any changes relating to a material and essential feature of the approved development. .

Modification 4 will result in changes to features of the project through the introduction of the BESS and associated infrastructure and the introduction of an additional access point and a gravel internal access track. However, Modification 4 does not result in any changes to existing material or essential features of the approved development.

The proposed modification will not result in any change to the level of environmental impacts associated with the Gregadoo Solar Farm and does not involve any significant change to quantitative operational aspects.

The proposed modification is therefore considered to be 'substantially the same development'.

#### 4.1.1.5 Evaluation

In determining an application for modification under Section 4.55 of the EP&A Act, the consent authority must consider the matters referred to in Section 4.15 as are of relevance to the development application, including:

- > The provisions of—
  - a. any environmental planning instrument, and
  - b. any proposed instrument that is or has been the subject of public consultation under this Act and that has been notified to the consent authority (unless the Planning Secretary has notified the consent authority that the making of the proposed instrument has been deferred indefinitely or has not been approved), and
  - c. any development control plan, and
  - d. any planning agreement that has been entered into under section 7.4, or any draft planning agreement that a developer has offered to enter into under section 7.4, and
  - e. the regulations (to the extent that they prescribe matters for the purposes of this paragraph),
  - f. that apply to the land to which the development application relates,
- > The likely impacts of that development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality,
- > The suitability of the site for the development,
- > Any submissions made in accordance with this Act or the regulations,
- > The public interest.

In addition to these matters Section 1.7 of the EP&A Act requires consideration of Part 7 of the *Biodiversity Conservation Act 2016* (BC Act). Part 7 of the BC Act relates to an obligation to determine whether a proposal is likely to significantly affect threatened species.

Given the nature of Modification 4 and that it will involve minimal environmental impact, the relevant considerations are restricted to the likely environmental impacts and the suitability of the site for the development, as modified.

An assessment of the environmental impacts is presented in **Section 6**.



## 5. COMMUNITY ENGAGEMENT AND SOCIAL IMPACT

### 5.1 Introduction

bd infrastructure were engaged to undertake community and stakeholder engagement and assess the potential for Modification 4 to alter the predicted social impacts associated with the approved project.

### 5.2 Community Engagement

bd infrastructure prepared a community and stakeholder engagement plan (CSEP) for Modification 4 in February 2024.

The overarching objective for community engagement was to build relationships of trust that provided opportunities for the community to understand the project and to provide feedback about impacts and benefits that could be fed into project development and assessment.

The engagement process for the project aimed to:

- > Provide an update and inform community and stakeholder members about the project, its impacts and benefits.
- > Use quality engagement techniques to develop relationships with the community and understand values relevant to the development of the project.
- > Help the local community understand the project benefits, development approval process and how they can participate in the process.
- > Demonstrate the Gregadoo Solar Farm's commitment to appropriate and responsive engagement, by collecting and presenting information and outlining an engagement approach that demonstrates appropriate effort under relevant guidelines.
- > Respond to community feedback by making relevant changes to the project and including appropriate mitigation measures in the Modification Report.
- > Enable authentic conversations through all stages of the approvals process by using quality engagement and communications materials that enable community members and stakeholders to provide informed feedback.

The CSEP followed engagement principles from the following guidelines:

- > Undertaking Engagement Guidelines for State Significant Projects (DPHI, 2022)
- > Social Impact Assessment Guideline for State Significant Projects (DPHI, 2023)
- > Large-Scale Solar Energy Guideline (DPHI 2022).

Alongside the guidelines, the approach to engagement is based on the Public Participation Spectrum (IAP2 Spectrum) outlined by the International Association of Public Participation (IAP2).

- > For the CSEP, stakeholders were identified through various methods, including:
- > inclusion of all stakeholders referenced in the EIS Report and previous Modifications
- > review of the EIS to capture stakeholders and community from other engagement
- > consideration of the local and wider community including:

- the project's location and proximity to the township of Wagga Wagga
- the potential direct operation and construction impacts of the project limited to Wagga Wagga
- the potential indirect impacts and operational benefits contributing to the Wagga Wagga area
- > networking with different individuals and community organisations
- > discussion with Wagga Wagga City Council.
- > Stakeholders are categorised based on their impact and/or interest and grouped into four main categories and ten subgroups (**Table 6**).

**Table 6 – Modification 4 engagement summary**

Stakeholder Group	Individual stakeholder subcategory	Description	Key focus
Government authorities	Local council	Wagga Wagga City Council	<ul style="list-style-type: none"> <li>• Detailed consultation</li> <li>• Direct impacts on Council assets and constituents during construction, operation and decommissioning</li> <li>• Interest in Voluntary Planning Agreements and community benefits.</li> </ul>
	State regulator	Department of Planning, Housing and Infrastructure (DPHI)	<ul style="list-style-type: none"> <li>• Detailed consultation</li> <li>• Regulatory compliance and impact assessment</li> <li>• Interest in Voluntary Planning Agreements and community benefits.</li> </ul>
Relevant departments and agencies	Government agencies and departments	<ul style="list-style-type: none"> <li>• NSW Office of Environment and Heritage (OEH)</li> <li>• Environment Protection Agency (EPA)</li> <li>• Transport for NSW</li> <li>• Department of Industry – Division of Resources and Energy</li> <li>• Riverina Local Land Services</li> <li>• Rural Fire Service (RFS)</li> </ul>	<ul style="list-style-type: none"> <li>• Detailed consultation</li> <li>• Compliance and feedback on social and environmental impacts of the project.</li> </ul>



Stakeholder Group	Individual stakeholder subcategory	Description	Key focus
Infrastructure and service providers	Infrastructure owners	Transgrid	<ul style="list-style-type: none"> <li>• Detailed consultation</li> <li>• Connection to the relevant electricity infrastructure and connection capacity</li> <li>• Impacts to Transgrid infrastructure.</li> </ul>
Community	Affected landowners surrounding the development	<ul style="list-style-type: none"> <li>• Surrounding residential landowners on streets within a 1km radius:                             <ul style="list-style-type: none"> <li>– Boiling Down Road</li> <li>– Ashfords Road</li> <li>– North side of Redbank Road</li> <li>– Veronica Place</li> <li>– Olearia Place</li> <li>– Blackbutt Road</li> <li>– Portions of Mitchell Road</li> <li>– Portions of Gregadoo E Road</li> <li>– East side of Butterbush Road.</li> </ul> </li> <li>• Surrounding business landowners: Kurrajong Hildasid Farm.</li> </ul>	<ul style="list-style-type: none"> <li>• Detailed consultation</li> <li>• Impacts during construction and operation including visual, noise, traffic and vibration</li> <li>• Social and environmental impacts and benefits associated with the project.</li> </ul>
	Community groups	<ul style="list-style-type: none"> <li>• South Wagga Apex Club</li> <li>• Rotary Club of Wagga Wagga</li> <li>• Wagga Wagga South Lions Club</li> <li>• Wagga Wagga Urban Landcare Group</li> <li>• Sustainable Wagga Wagga -</li> <li>• Country Women's Association Wagga Wagga Branch (CWA)</li> <li>• Wagga Wagga Chamber of Commerce</li> </ul>	<ul style="list-style-type: none"> <li>• Concerns about the direct and indirect environmental and social impacts of the project.</li> <li>• Interest in operational benefits such as Voluntary Planning Agreements, benefit schemes, and employment opportunities.</li> </ul>



Stakeholder Group	Individual stakeholder subcategory	Description	Key focus
		<ul style="list-style-type: none"> <li>Riverina Murray Industry Capability Network.</li> </ul>	
	Aboriginal stakeholders	<ul style="list-style-type: none"> <li>Registered Aboriginal Parties (RAPs), including:                             <ul style="list-style-type: none"> <li>Mark Sadler</li> <li>Peter Ingram</li> <li>Yalmambirra</li> </ul> </li> <li>Local Aboriginal Land Council (LALC) – Wagga Wagga</li> </ul>	<ul style="list-style-type: none"> <li>Cultural significance or connection to Country impacted by the project.</li> </ul>
	Broader community	Wagga Wagga township	<ul style="list-style-type: none"> <li>General interest about the project among including environment, benefit sharing, energy supply, general impacts on the town.</li> </ul>

Throughout the preparation of Modification 4, Gregadoo Solar Farm consulted with relevant local, State, and Commonwealth Government entities, as well as infrastructure providers, community groups and landowners who may be potentially impacted by the project.

These engagement efforts, which occurred during the preparation of the EIS Modification Report, were designed to facilitate discussions with stakeholders and communities, address potential concerns, identify opportunities, and develop strategies for mitigation.

The engagement strategy for the project utilised a variety of communication channels and activities to enhance community and stakeholder participation and feedback relevant to the project’s scale, size and impact. Community engagement methods included both in-person and online approaches to reach a wider range of individuals and cater to their preferred mode of communication (**Table 7**).

Collateral prepared as part of the engagement strategy is provided at **Appendix D**.

**Table 7 – Summary of engagement activities**

Engagement Activity	Content and timing	Target stakeholders and reach
Introductory newsletter (letterbox drop)	The newsletter, distributed 24 July 2024, provided project information, notice of upcoming consultation programs, and included a community survey.	Distributed to 75 properties within a 1km radius of the project site, based on previous engagement, modifications, and predicted impacts.



Engagement Activity	Content and timing	Target stakeholders and reach
Introductory email	An email was sent on 26 July 2024 to introduce the project and offer an online briefing for interested parties.	<ul style="list-style-type: none"> <li>• Aboriginal Stakeholders:</li> <li>• Wagga Wagga - Local Aboriginal Land Council</li> <li>• Community groups:</li> <li>• South Wagga Apex Club</li> <li>• Rotary Club of Wagga Wagga</li> <li>• Wagga Wagga South Lions Club</li> <li>• Wagga Wagga Urban Landcare Group</li> <li>• Sustainable Wagga Wagga</li> <li>• Country Women's Association Wagga Wagga Branch (CWA)</li> <li>• Wagga Wagga Chamber of Commerce</li> <li>• Riverina Murray Industry Capability Network.</li> </ul>
Door knock	The project team door knocked 42 properties on 30-31 July 2024 within a 1km radius of the BESS location.	The project team spoke to 16 individual properties; follow-up emails were sent to 5 properties, including Kurrajong Hildasid Farm.
Print and digital media advertising	Print and digital media advertising ran on 26 July 2024 in the Daily Advertiser.	<ul style="list-style-type: none"> <li>• 26,773 - Weekly Print Audience</li> <li>• 156,998 - Monthly Digital Audience</li> </ul>
Online community drop-in session	An online community information session was held on 7 August 2024 and advertised as above.	<ul style="list-style-type: none"> <li>• Surrounding landowners and occupiers</li> <li>• Broader community</li> <li>• Community organisations</li> <li>• Aboriginal stakeholders</li> </ul>
Community feedback survey	An online survey to identify social and economic impacts associated with the project, open from 18 July 2024 until 30 August 2024. Accessible through the newsletter, website update, and online drop-in session.	<ul style="list-style-type: none"> <li>• Surrounding landowners and occupiers</li> <li>• Broader community</li> <li>• Community organisations</li> <li>• Aboriginal stakeholders</li> </ul>



Engagement Activity	Content and timing	Target stakeholders and reach
Briefings and ongoing communication	Briefings were offered to provide targeted information and gather feedback.	Briefing held with Wagga Wagga Council 16 August 2024 Ongoing communication continues with Kurrajong Hildasid Farm.
Toll-free phone number, project email and website	A project email address, phone line, and website have been available for inquiries and feedback since 2018. The website serves as a central repository of information relating to the project.	One phone call and two emails were received.

This scaled and diverse range of engagement methods contributes to a more fulsome range of data collection, ultimately aiding in more informed decision-making for the project. A summary of issues raised with each stakeholder group are outlined in **Table 8**



Table 8 – Consultation summary

Stakeholder category	Individual stakeholder category	How this group was consulted	Consultation summary	Project response
Government Authorities	Local Government - Wagga Wagga Council	<ul style="list-style-type: none"> <li>• Introductory email sent 16 July 2024 seeking feedback and advice.</li> <li>• Briefing held on 16 August 2024.</li> </ul>	<p>Feedback was provided during the briefing on the BESS modification to support design and planning. Key points included:</p> <ul style="list-style-type: none"> <li>• Clarification is needed on the new access via Boiling Down Road to prevent construction traffic from crossing the creek.</li> <li>• Potential accommodation crunch during peak operations due to ongoing major projects in the region.</li> <li>• Potential local procurement challenges as there are many State Significant projects in the area.</li> <li>• Interest in the timeline and submission date for the EIS Modification report.</li> <li>• Council acknowledges the focus was on the BESS modification, not the approved solar farm.</li> </ul> <p>Council thanked the team for the briefing and indicated that they will also provide formal feedback later through DPHI and the Major Projects portal.</p>	<ul style="list-style-type: none"> <li>• Issues raised by Wagga Wagga Council are acknowledged and have been addressed within the Modification Report, particularly the new access via Boiling Down Road to prevent construction traffic from crossing the creek.</li> <li>• Other issues raised by Wagga Wagga Council are associated with the existing approved project, with limited additional impact due to Modification 4. This matter was discussed and agreed with Council staff during the briefing.</li> </ul>
	State Regulator - DPHI	Introductory emails sent on 9 September 2023 seeking feedback and advice.	DPHI and Premise discussed and agreed the key issues to be addressed in the Modification Report.	<ul style="list-style-type: none"> <li>• Key issues addressed in the Modification Report.</li> </ul>



Stakeholder category	Individual stakeholder category	How this group was consulted	Consultation summary	Project response
		Briefings and ongoing consultation from 9 September 2023.		
Community	Affected landowners (1 km from site)	<ul style="list-style-type: none"> <li>• Newsletter distributed to 75 properties on 24 July 2024 via mail.</li> <li>• Print and digital media advertising ran on 26 July 2024 in the Daily Advertiser.</li> <li>• Door knock on 30 and 31 July 2024</li> <li>• Online information session 7 August 2024.</li> <li>• Community survey open from 18 July 2024 to 30 August 2024</li> <li>• Toll-free information line, project website, and email</li> </ul>	<p><b>Traffic and Roads</b></p> <p>Concerns were raised regarding traffic movements and road conditions, particularly on Mitchell Road and Redbank Road. Landowners inquired about potential road upgrades and the volume of truck movements during construction. Specific concerns were mentioned about the safety of children in areas with increased traffic, such as around Veronica and Redbank, where trucks and utes from Secure Energy and TransGrid are known to speed. Some landowners also noted that the dirt roads in these areas might be challenging to navigate.</p> <p><b>Visual and Aesthetic Impacts</b></p> <p>Landowners expressed concerns about the visual impact of the project, particularly regarding whether it would be visible from their properties. Specific inquiries were made about potential screening measures to reduce visual impact, especially along Mitchell Road and Ashfords Road, where commercial pine trees were removed by Kurrajong Hildasid and Forestry NSW.</p> <p><b>Safety and Hazard Management</b></p>	<ul style="list-style-type: none"> <li>• Newsletter distributed to 75 properties on 24 July 2024 via mail.</li> <li>• Print and digital media advertising ran on 26 July 2024 in the Daily Advertiser.</li> <li>• Door knock on 30 and 31 July 2024.</li> <li>• Online information session 7 August 2024.</li> <li>• Community survey open from 18 July 2024 to 30 August 2024.</li> <li>• Toll-free information line, project website, and email.</li> </ul>



Stakeholder category	Individual stakeholder category	How this group was consulted	Consultation summary	Project response
			<p>Questions were raised about the safety and potential hazards associated with the Battery Energy Storage System (BESS), including fire risks and noise pollution. Landowners asked about the safety measures in place, particularly in areas close to children, and the overall safety and security of the site, including fencing and cameras.</p> <p><b>Property Values</b></p> <p>Some landowners expressed concerns that the project might negatively impact property values in the area. Specific questions were asked about whether property values might decrease as a result of the project, particularly for properties near the proposed development.</p> <p><b>Construction and Operations</b></p> <p>Landowners showed interest in the details of the project’s construction and operation. They requested information about the timeline and start date, the lifespan of the project, decommissioning plans, and recycling processes for solar panels and batteries. There was also curiosity about the overall layout of the project, including the location of the BESS and solar panels.</p> <p><b>Local Employment</b></p> <p>Several landowners were interested in potential local employment opportunities related to the</p>	



Stakeholder category	Individual stakeholder category	How this group was consulted	Consultation summary	Project response
			<p>project. Specific inquiries were made about job availability for electrical contractors and apprenticeships, particularly from landowners who own local businesses, such as the geotechnical company near Redbank. There was also interest in how the project might contribute to regional benefits, including affordable energy and youth retention through training opportunities. One individual indicated they are running the scrap metal bin business and could support with recycling.</p> <p><b>General Interest in the Solar Farm</b></p> <p>Some landowners expressed general curiosity about the solar farm, asking for more information about its components and how it would operate. This included questions about the lifespan of the project, the recycling process for batteries, and the overall benefits to the local community.</p> <p><b>Specific Project Details</b></p> <p>Inquiries were made about specific aspects of the project, such as the location of the Battery Energy Storage System (BESS) and the placement of solar panels. Landowners also questioned the reasoning behind certain activities, such as Kurrajong Hildasid and Forestry NSW’s removal of commercial pine trees near Mitchell and Ashfords Road, and</p>	



Stakeholder category	Individual stakeholder category	How this group was consulted	Consultation summary	Project response
			<p>sought clarification on the construction timeline.</p> <p><b>Communications and Information Sharing</b> Some landowners preferred to receive project updates via email, noting that they had received newsletters that provided helpful information about the project’s progress.</p> <p><b>Neutral or No Concerns</b> A number of landowners indicated they had no significant concerns about the project. These landowners generally did not foresee any major impacts on their properties or daily lives.</p> <p><b>Providing feedback</b> A stakeholder emailed in to ask about how to make a formal comment on the proposed modification.</p>	
	Community groups, peak bodies	<ul style="list-style-type: none"> <li>• Project update email and briefing offer sent on 26 July 2024.</li> <li>• Print and digital media advertising ran on 26 July 2024 in the Daily Advertiser.</li> <li>• Community survey open from 18 July 2024 to 30 August 2024</li> </ul>	<p>Riverina Murray Industry Capability Network expressed interest in providing a briefing on the local labour market, including data on business capacity, competing projects, key contacts, and the regional project pipeline.</p> <p>No other responses were received.</p>	<ul style="list-style-type: none"> <li>• The Gregadoo Solar Farm will continue to reach out to Community groups, peak bodies and other relevant stakeholders throughout the planning process. Updates and information will be provided through</li> </ul>



Stakeholder category	Individual stakeholder category	How this group was consulted	Consultation summary	Project response
		<ul style="list-style-type: none"> <li>• Toll-free information line, project website, and email operational since 2018.</li> <li>• Online information session held on 7 August 2024</li> </ul>		<p>newsletters, emails, and briefings.</p>
	<p>Registered Aboriginal Parties (RAPs) and District LALC</p>	<ul style="list-style-type: none"> <li>• Invitation for RAPs to provide feedback on AHDDA sent 9 August and 29 August 2024.</li> <li>• Email regarding amendment to the BDAR was sent 30 August 2024</li> <li>• Project update email and briefing offer sent 30 August 2024.</li> <li>• Print and digital media advertising 26 July 2024 in the Daily Advertiser.</li> <li>• Community survey open from 18 July 2024 to 30 August 2024</li> <li>• Toll-free information line, project website, and email</li> <li>• Online information session held on 7 August 2024</li> </ul>	<p>No response was received.</p>	<ul style="list-style-type: none"> <li>• RAPs will be provided with a final copy of the AHDDA.</li> </ul>



Stakeholder category	Individual stakeholder category	How this group was consulted	Consultation summary	Project response
	Broader community (Wagga Wagga township)	<ul style="list-style-type: none"> <li>• Community survey open from 18 July 2024 to 30 August 2024</li> <li>• Print and digital media advertising ran on 26 July 2024 in the Daily Advertiser.</li> <li>• Toll-free information line, project website, and email.</li> <li>• Online information session held on 7 August 2024.</li> </ul>	One phone call and two emails were received. Potential visual impact of the project raised as an issue.	<ul style="list-style-type: none"> <li>• Key issues addressed in the Modification Report.</li> <li>• The Gregadoo Solar Farm will continue to reach out to Community groups, councils and other relevant stakeholders throughout the planning process.</li> </ul>



Community and stakeholder engagement was used to gain a balanced understanding of community and stakeholder views relevant to perceived project benefits, and the construction and operation of the proposal. The

Generally, the engagement process demonstrates that the sentiment of the wider Wagga Wagga community towards Modification 4 is positive. Notwithstanding, it is acknowledged that some concerns were raised. The key planning issues raised are consistent with the key issues addressed in the Modification report at **Section 6**, including traffic and transport, visual impact, hazards, construction and operations. These matters are addressed in further detail in **Section 5.3**.

The Gregadoo Solar Farm is dedicated to fostering ongoing relationships with the local community and impacted neighbours. This commitment to responsive and effective engagement will continue throughout all stages of the project.

For the public display of the Environmental Impact Statement (EIS) modification, the Gregadoo Solar Farm, in collaboration with bd infrastructure, will:

- > distribute a newsletter addressing key community queries raised during previous planning phases
- > host online information sessions for community members, organisations, and representatives, with events advertised in local media outlets
- > conduct ongoing consultations with regulatory agencies to address issues raised during the EIS exhibition phase and prepare for the Response to Submissions (RTS)
- > monitor a dedicated community phone line and email for complaints and feedback
- > maintain the project website and social media channels
- > proactively engage with the media to increase awareness about the project within the community.

By maintaining open lines of communication with stakeholders, we aim to address and mitigate any identified impacts from the project planning stage and maximise the benefits of the project for all involved.

## 5.3 Community Issues

### 5.3.1 TRAFFIC AND ROADS

Concerns were raised regarding traffic movements and road conditions, particularly on Mitchell Road and Redbank Road.

Landowners inquired about potential road upgrades and the volume of truck movements during construction. Specific concerns included safety of children in areas with increased traffic, such as around Veronica and Redbank, where trucks and utes from Secure Energy and TransGrid are known to speed. Some landowners also noted that the dirt roads in these areas might be challenging to navigate.

The approved Gregadoo Solar Farm is subject to the approved *Traffic Management Plan Gregadoo Solar Farm* (NGH, 2020) (TMP). The TMP will be updated to reflect additional works associated with Modification 4, subject to approval.

Critically, Section 6.9 of the TMP identifies that a community information and awareness program will be implemented to assist in managing road impacts on residents.



Further, Section 6.10 of the TMP identifies that traffic conditions will be monitored during construction, upgrade and decommissioning works to ensure that appropriate management measures will be implemented reduce traffic impacts.

Specific potential impacts and issues that will be monitored on a daily or weekly basis include:

- > Intersection congestion – queuing and platooning (monitored weekly during the AM and PM peak);
- > Network congestion associated with heavy vehicles (monitored during heavy vehicle arrivals daily)
- > Complaints associated with traffic (monitored weekly)
- > Road dust (monitored daily) and
- > Accidents (monitored as required).

The TMP also addresses other traffic management strategies intended to minimise potential impacts associated with the development include:

- > Traffic Control Plans (TCPs) will be prepared prior to works which may impact on traffic on public roads.
- > Road upgrades, including:
  - The intersection of Mitchell Road and Ashfords Road will be upgraded to provide a new Basic Right Turn (BAR).
  - The intersection of Ashfords Road and Boiling Down Road will be upgraded to a sealed road with a minimum length of 30 m from the intersection with Ashfords Road.
  - The site access point off Boiling Down Road will be upgraded with a Rural Property Access type treatment to accommodate for the largest vehicle accessing the site
- > Requirements for on-site parking;
- > Maintenance and emergency repairs
- > Driver fatigue;
- > Road conditions, including:
  - Fog, dust and rain.
  - Speed.

It is noted that the TIA submitted Modification 4 states that a TMP implemented in accordance with Schedule 3, Condition 8 of the development consent would appropriately manage the traffic impacts of the Solar Farm and BESS.

### 5.3.2 VISUAL AND AESTHETIC IMPACTS

Landowners expressed concerns about the visual impact of Modification 4, particularly regarding whether it would be visible from their properties.

Specific inquiries were made about potential screening measures to reduce visual impact, especially along Mitchell Road and Ashfords Road, where commercial pine trees were removed by Kurrajong Hildasid and Forestry NSW.

The approved Gregadoo Solar Farm is subject to the approved *Landscaping Plan Gregadoo Solar Farm* (NGH, 2020) (Landscaping Plan). The Landscaping Plan will be updated to reflect additional works associated with Modification 4, subject to approval.

The Landscaping Plan identifies that sections of perimeter plantings would be established along the development site boundary, with the aim of minimising views of infrastructure for sensitive receivers expected to experience a medium visual impact. As shown in Appendix A of the Landscaping Plan, perimeter landscaping will be established along the eastern boundary of the site, adjacent to the recently harvested commercial pine plantation.

Further, the Landscaping Plan identifies that the materials and colour of on-site infrastructure will, where practical, be non-reflective and in keeping with the materials and colours of existing infrastructure, or of a colour that will blend with the landscape to reduce potential for glare and reflection.

The VIA submitted with Modification 4 identifies that the visibility of the project, including the proposed BESS, would not noticeably change from the description provided in the original EIS. Further, the VIA submitted with Modification 4 identifies that the existing mitigation measures identified in the development consent would effectively screen the proposed BESS with no additional mitigation measures required. The VIA submitted with Modification 4 does however recommend additional mitigation measures to avoid visual impacts associated with nighttime lighting of the BESS and noise walls. Given that noise walls are not required, the recommended mitigation measures are not relevant.

### 5.3.3 SAFETY AND HAZARD

Landowners questioned the safety and potential hazards associated with the BESS, including fire risks and noise pollution. Landowners asked about the safety measures in place, particularly in areas close to children, and the overall safety and security of the site, including fencing and cameras.

The approved Gregadoo Solar Farm is subject to the approved Fire Management and Emergency Response Plan (NGH, 2020) (FMERP). The FMERP has been prepared to identify the fire risks and controls of the development and all procedures that would be implemented if a fire occurs on site or in the vicinity of the site. The FMERP applies to construction, operational and decommissioning phases. The FMERP will be updated to address Modification 4, subject to approval.

The PHA submitted with Modification 4 has been prepared in accordance with the Hazard Industry Planning Advisory Paper No. 4 - Risk Criteria for Land Use and Safety Planning, Hazard Industry Planning Advisory Paper No. 6 – Guidelines for Hazard Analysis (DOP, 2011) and Multi-Level Risk Assessment (MLRA) (DOP, 2011)

The PHA includes a hazard identification table that was developed to identify potential hazards associated with Modification 4 (i.e. a co-located BESS and solar farm). Based on the identified potential hazards, scenarios that may result in an incident with potential off-site impacts were considered.

The PHA concluded that the identified potential hazards and scenarios would not result in an off-site impact and that risks at the site boundary are not considered to exceed the acceptable risk criteria. Notwithstanding, the PHA made a number of recommendations based on correspondence the NSW DPHI:

- > End-to-end spacing (short side) of BESS containerised units shall be a minimum of 600 mm
- > Back-to-back spacing (long side) of BESS containerised units shall be a minimum of 150 mm
- > Spacing between BESS container accumulations (i.e. 4 containerised units) shall be a minimum of 2.5 m.

- > Prior to construction, the total area required for the BESS units shall be verified against the available space to demonstrate there is adequate area to achieve the required spacing.
- > The BESS containerised units shall be provided with the fire protection system specified by the BESS manufacturer.
- > Prior to commissioning, the UL test data for the selected battery units shall be made available to the DPE.
- > The vent covers of the BESS shall be constructed of non-combustible material.
- > The vents shall not be located above battery packs within the BESS container.

These recommendations have been incorporated as mitigation measures as part of Modification 4 and will be incorporated into the FMERP.

#### 5.3.4 PROPERTY VALUES

Some landowners expressed concerns that the project might negatively impact property values in the area.

Specific questions were asked about whether property values might decrease as a result of the project, particularly for properties near the proposed development.

The concerns expressed by some landowners are acknowledged. Notwithstanding, it should be acknowledged that the Land and Environment Court has ruled on several occasions that the assessment of the impacts of projects on individual property values is not generally a relevant consideration under the EP&A Act, unless the project would have significant and widespread impacts on the locality.

Modification 4 is unlikely to have significant and widespread impacts on the locality, and is unlikely to result in impacts on individual property values. In particular, the following is noted:

- > Detailed assessment of the merits of Modification 4 identifies that it is unlikely to generate significant environmental, economic or social impacts;
- > The impacts of Modification 4 can be further minimised through the implementation of suitable mitigation measures; and
- > The visual impact of Modification 4 would not noticeably change from the description provided in the original EIS.

#### 5.3.5 LOCAL EMPLOYMENT

Several landowners were interested in potential local employment opportunities related to the project.

Specific inquiries were made about job availability for electrical contractors and apprenticeships, particularly from landowners who own local businesses, such as the geotechnical company near Redbank.

There was also interest in how the project might contribute to regional benefits, including affordable energy and youth retention through training opportunities. One individual indicated they are running the scrap metal bin business and could support with recycling.

Existing mitigation measures (SE3) include the preparation of an Accommodation and Employment Strategy which would be implemented prior to construction commencing. The Accommodation and Employment Strategy would be developed in partnership with key stakeholders and would address local participation.

### 5.3.6 OTHER INTEREST IN THE PROJECT

Landowners showed interest in the details of the project's construction and operation. They requested information about the timeline and start date, the lifespan of the project, decommissioning plans, and recycling processes for solar panels and batteries. There was also curiosity about the overall layout of the project, including the location of the BESS and solar panels.

Some landowners expressed general curiosity about the solar farm, asking for more information about its components and how it would operate.

Where possible, all relevant information was provided to landowners during the consultation process.

In terms of ongoing community engagement, existing mitigation measures (SE1) include the preparation of a Community Consultation Plan which would be implemented prior to construction commencing to manage impacts to community stakeholders. The objectives of the Community Consultation Plan are to:

- > Ensure ongoing and transparent engagement with those who are directly impacted, as well as the broader community and other key stakeholders.
- > Build trust and relationships with those who are directly impacted, and well as other key stakeholders
- > Develop a sense of local ownership of the Project
- > Deliver an agreed and clear Community Benefits Scheme through a participatory approach with Council and the broader community
- > Ensure provision of an effective complaints process
- > Adaptively respond to emerging community concerns and changes in the social environment.

Implementation of a Community Consultation Plan will ensure that landowners are well informed of the key stages of development and operation of the Gregadoo Solar Farm and BESS.

## 5.4 Social Impact

In addition to community engagement, bd infrastructure were engaged to review of the previous Social Impact Assessment (NGH, 2022) (SIA) against the features of Modification 4 and determine whether the modification would create new or materially alter social impacts forecast in the social locality.

The methodology adopted is presented in **Table 9**.

Table 9 – SIA review methodology

Method	Details
<p><b>Step 1:</b> Meeting between NSW DPHI and Premise</p>	<p>During September 2023 the project’s EIS Lead from Premise Pty Ltd requested a meeting with a NSW DPHI representative to present details of the modification 4 and seek pre-lodgement planning advice. The requirement for a SIA was discussed and NSW DPHI advised that the scale of the modification would not warrant a comprehensive SIA.</p>
<p><b>Step 2:</b> Review of the original SIA report</p>	<p>The original SIA report (NGH, 2022) was reviewed to understand the social impacts the project was predicted to yield for people living in the social locality.</p> <p>In recognition of the demand for accommodation and shortages occurring across the nation, workforce accommodation required for the project was also given consideration as part of this review, despite it being a minor consideration in the original SIA.</p>
<p><b>Step 3:</b> Internal project team meeting</p>	<p>The meeting enabled an identification and discussion of the modification 4 details, and a comparison of those details with the project and predicted social impacts described in the original SIA. Although the internal desktop assessment of the modification 4 undertaken at the meeting suggested that impacts to people in social locality would be immaterial, it was decided that a community and stakeholder consultation program be conducted as a precaution.</p>
<p><b>Step 4:</b> Infrastructure developed and implemented a Community and Stakeholder Engagement Plan (CSEP)</p>	<p>The CSEP was developed and implemented between February and August 2024. A range of community and stakeholder engagement activities were conducted to describe modification 4 to the project’s stakeholders and seek feedback about potential social impacts. The activities included:</p> <ul style="list-style-type: none"> <li>• A modification introductory newsletter (letterbox drop) distributed to properties within a 1km radius</li> <li>• A modification introductory email notification</li> <li>• A door knock of approximately 42 properties within a 1km radius of the site</li> <li>• Print and digital media advertisements about the project</li> <li>• An online community drop-in session</li> <li>• A community feedback survey</li> <li>• Briefings and ongoing communication</li> <li>• A toll-free phone number, project email, and website.</li> </ul>
<p><b>Step 5:</b> A review of the EIS technical assessment reports commissioned by Premise for the modification 4</p>	<p>The technical reports commissioned for modification 4 were reviewed to understand if the project might yield material social impacts additional to those identified in the original SIA (refer NGH, 2022). The specialist studies reviewed included:</p> <ul style="list-style-type: none"> <li>• Aboriginal Heritage Assessment Due Diligence Report (Premise, 2024)</li> </ul>

Method	Details
	<ul style="list-style-type: none"> <li>• Noise Impact Assessment (AE, 2024)</li> <li>• Preliminary Hazard Analysis (Riskcon, 2024)</li> <li>• Gregadoo Solar Farm and BESS Traffic Impact Assessment (Amber, 2024)</li> <li>• Visual Impact Assessment Review (Iris, 2024)</li> </ul>

The review first considered whether or not Modification 4 would warrant a revision of the social locality and project stakeholders nominated in the original SIA. Following this, the social impacts identified in the original SIA were considered individually.

### 5.4.1 SOCIAL LOCALITY

The social locality nominated in the original SIA is the Wagga Wagga LGA.

The *Social Impact Assessment Guideline* (NSW DPHI, 2023) identifies a number of features that should be considered when developing the social locality. These features were considered in relation to Modification 4 to determine if, compared to the approved project, a revision of the social locality was warranted. The details are in **Table 10**.

**Table 10 – Social Impact Summary**

Social locality feature	Influence of Modification 4 compared to the approved project
Scale and nature of the Project	<p>All infrastructure would remain within the approved 'development site' defined in the consent. Therefore, modification 4 would not alter the scale of the social locality.</p> <p>Modification 4 would introduce a BESS and an additional access point and internal access track to the site within the existing development site boundary, however those changes are not substantial and would not influence the social locality nominated in the original SIA.</p>
Who may be affected (including vulnerable or marginalised people)	<p>In its assessment of the project's potential impact on livelihoods in the social locality, NGH (2022) cited unidentified vulnerable people as being affected. This reference was made in the scoping worksheet and there was no further analysis in the original SIA report.</p> <p>bd infrastructure did not identify any vulnerable people during the community engagement program it conducted for modification 4.</p> <p>Noting the scale and nature of the modification 4 would remain generally consistent with the approved project, there is confidence it would not affect additional people.</p>
Built and natural features	<p>Modification 4 would result in the development of the BESS and minor additional supporting infrastructure within the approved development site. It would not create substantive changes to natural features, additional to those associated with the approved project or considered in the original SIA.</p>



Social locality feature	Influence of Modification 4 compared to the approved project
	Therefore, the influence of modification 4 on built and natural features valued by people in the social locality is predicted to be immaterial.
Relevant social, cultural, and demographic trends, and other change processes	As stated above, it is recognised that a shortage of residential accommodation exists nationally. The scenario in the Wagga Wagga LGA is consistent with that in other regional LGAs. By employing approximately 50 staff more than the approved project, modification 4 would not exacerbate accommodation pressures in the social locality.
The history of the project	<p>Premise explains that the Wagga Wagga LGA forms part of the Murray Darling region which is home to some of the oldest recorded Aboriginal sites in Australia. Aboriginal history is therefore most prominent when considering the project site.</p> <p>Compared to the approved project, the proposed internal access track is a new feature of modification 4 which received attention in the Aboriginal Due Diligence Assessment (Premise, 2024). The assessment recommended that proposed internal access track be shifted to the west to allow a minimum of 10m buffer between the potential Ring Tree and the proposed internal access track.</p> <p>On this basis, modification 4 would not interfere with the history of the site or the region more than the approved project.</p>

#### 5.4.2 PROJECT STAKEHOLDERS

Given the approved project and its external requirements (e.g. construction and workforce traffic) are generally consistent with those proposed in Modification 3, it is considered unlikely that Modification 4 would attract additional stakeholders.

As described in **Table 8**, there is also confidence that Modification 4 would not affect additional vulnerable people given the outcomes of infrastructure’s community engagement activities, and the scale and nature of the minor changes it proposes.

#### 5.4.3 SOCIAL IMPACTS

The original SIA (NGH, 2022) predicted the social impacts associated with the approved project. The potential for Modification 4 to alter those impacts was considered to determine whether a revision of the original SIA is warranted. The details are provided in **Table 11**.



Table 11 – Social Impacts, Original SIA v Modification 4

Relevant social impacts	Project’s potential social impact described in the original SIA	Likelihood that Modification 4 would alter findings of original SIA
Community	<b>Positive impact</b> in providing a local response to climate change, during operations.	Low. Modification 4 would not alter the potential local response to climate change described in the original SIA.
Community	<b>Positive impact</b> from increased community investment, during operations.	Low. Modification 4 would not influence the proponent’s ability to establish community partnerships and investments.
Community	<b>Negative impact</b> from loss of agricultural land, during operations.	Low. Modification 4 would utilise the approved development site and therefore, it would not create a loss of additional agricultural land.
Livelihoods	<b>Positive impact</b> from increase in economic activity, during construction.	Low. Modification 4 would not materially influence livelihoods and economic activity. The BESS infrastructure proposed for modification 4 would require increased capital investment and would likely require additional tradespeople during construction. However, compared to the positive impacts described in the original SIA, these would only have a temporary and minor positive influence on livelihoods in the social locality.
Amenity and Way of Life	<p><b>Negative impact</b> on amenity for people living near the project site and/or along the proposed haulage route, derived from traffic during construction.</p> <p><b>Negative impacts</b> for road caused by increased traffic volumes during construction.</p>	<p>Low. The traffic impact assessment commissioned for modification 4 (refer Amber, 2024) identified that the introduction of a BESS to the development would result in increased heavy vehicle movements, including those requiring escorts to and from the development site. It is noteworthy that two individuals raised concerns about traffic impacts during the door knock conducted by bd infrastructure.</p> <p>However, it is also recognised that the heavy vehicle increases would occur for temporary period, and only for a period of approximately 6 months during peak construction activity. Furthermore, the range of mitigation and traffic management measures proposed in the original EIS would be preserved if modification 4 is approved. Noting these measures and the temporary nature of the heavy vehicle increase, it is predicted that the additional social impacts associated with modification 4 would be minor.</p>

Relevant social impacts	Project’s potential social impact described in the original SIA	Likelihood that Modification 4 would alter findings of original SIA
Surroundings	<b>Negative impact</b> to visual amenity caused by glare and reflectivity from some observation points during operation.	Low. The visual impact assessment review commissioned for modification 4 (refer Iris, 2024) states that modification 4 would not yield a noticeable change to visibility of the project compared to the visibility described in the original EIS. The mitigation measures proposed in the original assessment would manage the impacts of modification 4 with the application of measures to control the additional lighting at the BESS location. One individual consulted by bd infrastructure staff during the door knock raised visual impacts as a concern. However, based on the assessment made by Iris (2024), there is confidence that the resident’s concerns will be adequately addressed.

## 5.5 Conclusion

A review of the original SIA (NGH, 2022) against the features of Modification 4 concludes that there is a low likelihood the modification would create new or materially alter social impacts forecast in the social locality.

For the reasons described in **Table 10**, the social locality in the original SIA report is deemed to be adequate for Modification 4.

In terms of the community and other stakeholders, there is no obvious feature of the proposed Modification 4 that would suggest a wider range of people would be affected or interested, compared to those identified in the original SIA.

This evaluation is supported by the outcomes of the various EIS technical assessments commissioned for Modification 4 and evaluated as part of this SIA review, and also by the outcomes of the community and stakeholder engagement program conducted by bd infrastructure. There were few concerns raised by the individuals consulted during the engagement program and the majority of individuals consulted were supportive of the proposed development.

Social impacts predicted to arise from Modification 4 are consistent with those identified in the original SIA. Commentary in Table 11 indicates there is a low likelihood that the proposed modification would alter the findings of original SIA.

In summary, it is considered that Modification 4 would have an overall low likelihood of creating new or materially influencing the social impacts identified and evaluated in the original SIA, and as such, a revision of the SIA is not recommended.



## 6. ASSESSMENT OF IMPACTS

### 6.1 Introduction

The EIS for the original Gregadoo Solar Farm Development Application and reports for Modification 2 & 3 identified the key potential environmental impacts of the Gregadoo Solar Farm as:

- > Surface water
- > Biodiversity;
- > Visual impact;
- > Land use (including mineral resources);
- > Heritage;
- > Noise; and
- > Land and water.

Other potential impacts were identified as soils; water use and water quality (groundwater) and hydrology; traffic, transport and road safety; climate and air quality; electric and magnetic fields; socioeconomic and community; resource use and waste generation; fire; historic heritage and cumulative impacts.

The potential environmental impacts were considered manageable with the implementation of environmental safeguards.

Following an analysis of potential environmental impacts associated with the original DA, Modification 2 and 3, the following potential impacts were identified as requiring further assessment in relation to Modification 4:

- > The potential noise and vibration impacts associated with construction and operation of the BESS and construction of the internal access track on receivers adjacent to the project; and
- > The potential hazards association with the construction and operation of the BESS on the site and surrounding landscape.
- > The potential visual impact association with the construction and operation of the BESS on receiver adjacent to the project;
- > The potential impact of the construction of the internal access track and access point on biodiversity;
- > The potential impact of the construction of the internal access track and access point on Aboriginal cultural heritage;
- > The potential impact of additional construction traffic on the surrounding local road network;

These matters are addressed in detail in the following sections.

## 6.2 Flood Impact Assessment

### 6.2.1 EXISTING ENVIRONMENT

The project is located in the Riverina Local Land Services area within the Murrumbidgee River Catchment.

The Murrumbidgee River is located about 8 km to the north of the project site. The development site is located on flat, low-lying land. The nearest natural water course is Boiling Down Creek, which runs south-north through the development site. There are two drainage lines, and two dams located in the northern portion of the development site.

The site is not located in areas mapped as Flood Prone Land for riverine flooding

### 6.2.2 APPROVED PROJECT

The original EIS identified that the Wagga Wagga City Council had mapped the 1% AEP rainfall event, which identified that the maximum height of overland flow being about 0.8m.

In addition, the original EIS also identified that the flood height of overland flow would not exceed one metre in the 5% AEP, 1%AEP or 0.5% AEP, with overland flow during these being confined to the low regions around Boiling Down Creek, the dams and drainage lines.

The original EIS concluded that the development would be compatible with the identified flood hazards.

Water Modelling Solutions (WMS) were engaged to provide flood planning advice in relation to the existing flood risk of the development site, the description of available design flood behaviours and anticipated impact of Modification 3 on flood behaviour.

In order to assess the potential impact of Modification 3 on the original flood impact assessment, WMS formed an opinion of how the proposed changes would affect flood behaviours based on revised modelling assumptions.

Based on this process, WMS commented that Mod 3 was not considered to be materially different to the layout assessed by the original flood impact assessment and was not expected to yield significantly different flood impacts from the previous assessment.

### 6.2.3 PROPOSED MODIFICATION

Premise has reviewed the report prepared by Water Modelling Solutions (WMS) for Modification 3 and the *Wagga Wagga Major Overland Flow Floodplain Risk Management Study and Plan* (MOFFS) (WMA Water, 2021).

The MOFFS identifies that the proposed BESS would be located within a portion of the development site inundated by the 1% AEP event. In the 1% AEP event, the peak flood depth does not exceed a depth of 0.15m (15 centimetres) and is confined to an existing depression through the site.

No modelling of the revised site layout has been undertaken. However, Table 12 provides a comparison of the approved and proposed site layout, and WMS' opinion of how these changes are anticipated to affect the flood behaviour based on changes to the model schematisation

Based on this process WMS has commented that the proposed layout is not considered to be materially different to the layout assessed by the original flood impact assessment and that Modification 3 is not expected to yield significantly different flood impacts from the previous assessment.



Table 12 – Modelling Assumption Comparison

No.	Element	Original Assumption (WMA water, 2018)	Mod 3 Revised Modelling Assumption	Mod 4 Revised Modelling Assumption	Anticipated effect on Flood Impact
1	Filling of three stock dams	Existing embankments will be pushed into dams (See typical section shown in Chart 1, Section 3.2.1).	Unchanged	Unchanged	No change
2	Internal access tracks	To be raised 150 mm above natural surface with low level causeways at flow path crossings (150 mm above existing bed level)	The road layout has been updated but is similar in extent/scale to the approved design. Internal roads will still cross the internal flow paths, but at different locations within the site.	The road layout has been updated but is similar in extent/scale to the approved design. Internal roads will still cross the internal flow paths, but at different locations within the site.	No change
3	Security Fencing	Assumed to be cyclone fencing 2.3 m high with a blockage factor of 25%	Proposed security fence. 2.15m high with chain link and support cable along the bottom. 25% blockage would be retained as a conservative assumption to represent debris/leaves that may be washed up against the fence	Unchanged	No change.
4	Vegetation Screening	Security fences behind wooded areas are	Note extended vegetation screening	Unchanged	No change



No.	Element	Original Assumption (WMA water, 2018)	Mod 3 Revised Modelling Assumption	Mod 4 Revised Modelling Assumption	Anticipated effect on Flood Impact
		modelled as being 2.3 m high with 50% blockage applied.	on eastern side of project vs original flood assessment.		
5	Solar Panels	<p>A blockage factor of 7% has been applied to the developed site area to represent the solar panel piles. This factor is based on indicative spacing of solar panel piles provided by the developer:</p> <ul style="list-style-type: none"> <li>• Pile diameter: 0.18 m</li> <li>• 12 piles per row (~92 m)</li> <li>• 2-3 rows per model grid cell (5 m x 5 m)</li> </ul>	<ul style="list-style-type: none"> <li>• Pile: I-beam 150mm x 180mm</li> <li>• 16 piles per row (~93 m)</li> <li>• 2 rows per model grid cell (5 m x 5 m)</li> <li>• 4.95 m spacing between rows</li> </ul> <p>A similar blockage factor (~7%) would be considered appropriate given limited change in pile density</p>	Unchanged	No change
6	Power Stations – Conversion Units	Represented in model as an impermeable structure with a footprint of 10 m x 5 m (i.e., two grid cells).	Increased to 22 inverter stations. No change needed to footprint. Stations are significantly smaller than this (20ft container) but will be benched and raised around exterior so	Unchanged	No change



No.	Element	Original Assumption (WMA water, 2018)	Mod 3 Revised Modelling Assumption	Mod 4 Revised Modelling Assumption	Anticipated effect on Flood Impact
			assumption can be left the same.		
7	Internal Substation	Represented in model as an impermeable structure with a footprint of approximately 3,400 m <sup>2</sup> .	Unchanged.	Unchanged	No change
8	BESS and Substation	Not represented	Not represented	The BESS and substation will cross the internal flow paths. Similar to internal roads, overland flow will be managed within appropriately sized culverts.	Localised impacts where the BESS crosses flow path, likely to be contained within the site and managed with appropriately sized culverts.



## 6.3 Biodiversity

### 6.3.1 EXISTING ENVIRONMENT

The development site is located within the NSW South Western Slopes Bioregion in the Inland Slopes Subregion. The dominant vegetation type (pre-European) was dominated by White Box (*Eucalyptus albens*) in the east of the development site, and Grey Box (*Eucalyptus macrocarpa*) and White (*Cypraea Callitris glaucophylla*) in the west and north of the development site. The development site consists of two (2) plant community types (PCT) including:

1. Blakely's Red Gum-Yellow Box grassy woodland of the NSW South Western Slopes (PCT227).
2. Western Grey Box tall grassy woodland on alluvial loam and clay soil of the NSW South Western Slopes (PCT 76).

Land in the northeast extent of the development site (in the Wagga Wagga Transgrid Substation) is mostly devoid of native vegetation.

### 6.3.2 APPROVED PROJECT

A Biodiversity Development Assessment Report (BDAR) was prepared by NGH in 2018 to accompany the original EIS. The approved Gregadoo Solar Farm development involves the clearing of approximately 0.7ha of Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes Bioregion as well as the clearing of 1.4ha of Blakely's Red Gum – Yellow Box grassy tall woodland on the NSW South Western Slopes Bioregion.

During site surveys, the Superb Parrot (*Polytelis swainsonii*) was observed within the site. The approved development results in the removal of 12 hollow bearing trees, which were identified as potential habitats for this species. The Sloane's Froglet (*Crinia sloanei*), Glossy Black Cockatoo (*Calyptorhynchus lathamii*) and Masked Owl (*Tyto novaehollandiae*) species were also assumed to occur on site.

A second BDAR was prepared by NGH in 2021 for Modification 2 to assess the additional impact area created by the construction of the underground transmission line. This development footprint was designed to avoid all areas of biodiversity value. Overall, the BDAR identified that Modification 2 would result in almost no impacts to biodiversity.

### 6.3.3 PROPOSED MODIFICATION

A Biodiversity Development Assessment Report (BDAR, Ecology Consulting 2024) is provided at **Appendix I**.

The BDAR has been prepared in accordance with the requirements of the *Biodiversity Conservation Act 2016* (BC Act) and the Biodiversity Assessment Method (BAM).

#### 6.3.3.1 Measures to avoid and minimise

The access point and access track have been located to ensure that the approved overhead and underground transmission line for Gregadoo Solar Farm can be constructed and maintained without adverse impacts to Boiling Down Creek or the adjoining riparian corridor. The access point and access track has been designed to avoid tree removal and subsequently impacts to Vegetation Zone 1.

Remaining works are requirements for the road upgrade and were assessed to allow for consideration of the likely extent of impacts associated with Over Size Over Mass (OSOM) vehicle movements. Avoidance measures were considered, and impact areas sited to limit tree removal for these works.

The measures described above also apply to minimising the prescribed impacts to habitat connectivity and appropriate crossings will be constructed over the ephemeral drainage line to assist in avoiding and minimising impacts to water quality and hydrological processes

### 6.3.3.2 Native vegetation

The BDAR identifies that vegetation within the subject land contains native woodland including areas of both intact and cleared canopy with a varying composition of native and exotic understory. While exotic groundcover is abundant in most cleared areas, native grasses are scattered throughout, with 3.41 ha of the subject land being assessed as covered by native vegetation as defined under the *Local Land Services Act 2013* (LLS Act).

The subject land has been assessed as containing a mixed assemblage of native and exotic vegetation. The NSW SVTM (NSW DCCEEW, 2022) initially used to determine native vegetation extent indicated areas within the subject land to be PCT 0: non-native vegetation. Ground truthing via a series of vegetation surveys determined that these areas were in some cases inaccurately mapped through the NSW SVTM and have been determined as native vegetation (due to some cover of native grasses).

Vegetation within the subject land has been assessed as aligning with the BioNet Vegetation Classification PCT 76 and PCT 277:

- > PCT 76: Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW Southwestern Slopes and Riverina Bioregions.
- > PCT 277: Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW Southwestern Slopes Bioregion.

Based on the broad condition state of the PCTs, a total of five vegetation zones were identified in the subject land. Six vegetation integrity survey plots were collected, consistent with the BAM subsection 4.3.1. Patch size was determined based on field observation and plot data, and analysis of spatial data and aerial imagery.

The majority of the development footprint contains vegetation from Zone 2 (category 1-exempt land), with some impacts to Zones 3, 4 and 5. Vegetation Zone 1 was assessed further to account for any indirect impacts attributed to the proposed modification and inform proposed avoid, minimise, and mitigate options

### 6.3.3.3 Threatened ecological communities

*Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina* (PCT 76) is associated with the NSW BC Act listed, Endangered Ecological Community (EEC) commonly known as Inland Grey Box Woodland and is listed as *Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Penplain, Nandewar and Brigalow Belt South Bioregions*.

Based on the NSW DCCEEW description of the EEC, and comparison to the Ecology Consulting site survey observations and plot data, it is determined that Vegetation Zones 1, 2 and 3 within the subject

land meet the definition of the Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions TEC

Blakely's Red Gum – Yellow Box tall grassy woodland of the NSW Western Slopes (PCT 277) is associated with the NSW BC Act listed, Critically Endangered Ecological Community (CEEC) commonly known as Box Gum Woodland and listed as *White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions*.

Based on the NSW DCCEEW description of the CEEC, and comparison to the Ecology Consulting observations and plot data, it is determined that Vegetation Zones 4 and 5 within the subject land meet the definition of Box Gum Woodland TEC

#### 6.3.3.4 Vegetation integrity

The BDAR identifies that a total of six vegetation integrity survey plots were undertaken to meet the minimum number of plots required for each zone in accordance with subsection 4.3.4 - Table 3 of the BAM.

Composition, structure, function and resulting vegetation integrity scores for each zone are presented in Table 9 at section 4.5.2 of the BDAR.

#### 6.3.3.5 Habitat suitability for threatened species

Impact assessment relating to habitat suitability is not required on category 1-exempt land (NSW DPE, 2022d), and therefore Vegetation Zone 2 is excluded from the habitat suitability assessment.

Ecosystem credit species predicted to occur within the subject land are generated by the BAM-C following the input of vegetation integrity data and the PCT. Ecosystem credit species not generated by the BAM-C, but are predicted to occur on site, were manually added.

Ecology Consulting identified 15 threatened flora and fauna species that have the potential to occur on the site. The threatened flora and fauna species are identified in Table 15 at section 5.4 of the BDAR.

#### 6.3.3.6 Impact assessment

The BAM considers a project could result in either or both direct or indirect impacts. Impacts can also be either prescribed or uncertain, or serious and irreversible impacts. Each of these impacts is discussed in the following sections

##### 6.3.3.6.1 Direct Impacts

The BDAR identifies that primary and direct impacts of the proposal are the loss of native vegetation and associated habitats within the subject land.

Direct impacts include the clearing or otherwise direct disturbance to up to 0.54 ha of vegetation and associated habitats for native fauna, and threatened species outlined throughout this report, associated with the development of proposed internal roads and vehicle movements.

This is inclusive of:

- > 0.5 ha of PCT 76 modified grassland (Vegetation Zone 2),
- > 0.01 ha of PCT 76 derived native grassland which includes two saplings (less than 5 DBH) of Grey Box (Vegetation Zone 3),
- > 68 m<sup>2</sup> of PCT 277 planted vegetation composed (Vegetation Zone 4),
  - Up to four trees that are not Box Gum Woodland associated species (between the DBH of ~10-30) and not containing habitat features at the time of inspection such as nests or hollows.
- > 0.02 ha of PCT 277 modified grassland (Vegetation Zone 5).

#### 6.3.3.6.2 Indirect Impacts

The BDAR defines indirect impacts are development related activities not associated with clearing for the development footprint.

Indirect impacts often:

- > occur beyond the development footprint or even the development site,
- > have a lower or variable intensity of impact compared to direct impacts,
- > may be harder to predict spatially and temporally, and
- > may have unclear boundaries of responsibility.

Despite uncertainty, indirect impacts are to be considered in the site selection, design, and operational phases of the proposed development.

Indirect impacts are likely to occur across the entire subject land where areas of native vegetation and habitats remain following final construction footprint and management for bushfire protection requirements. Indirect impacts likely to occur for the proposed development include but may not be limited to:

- > Inadvertent impacts on adjacent habitat or vegetation
- > Transport of weeds and pathogens from the site to adjacent vegetation
- > Reduced viability of adjacent habitat due to edge effects
- > Rubbish dumping
- > Reduced viability of adjacent habitat due to noise, dust, or light spill
- > Increase in predatory and pest species populations
- > Increased risk of fire

#### 6.3.3.6.3 Prescribed an uncertain impact

Prescribed and uncertain impacts have been considered by Ecology Consulting in Section 8.3 of **Appendix I**. In respect of these impacts the following is noted:

- > The existing fence provides only low quality and minor perching habitat for bird species, particularly small woodland birds. The removal of existing fencing is not expected to have any significant consequences.
- > Only exotic grasses and forbs will be cleared for the proposal, which provide low quality habitat for native fauna species. As the subject land is already highly degraded and the extent of understorey

cleared is minor compared to that which is still available in the surrounding landscape, the removal of exotic understory vegetation is not expected to have any significant consequence.

- > As Vegetation Zone 2 within the subject land is already highly degraded and the extent of understory to be cleared is minor compared to that which is still available in the surrounding landscape, the removal of any native vegetation and associated habitat situated within defined category 1-exempt land is not expected to have any significant consequence.
- > Clearing of native vegetation and the construction of infrastructure is likely to have a localised disruption of connectivity for less mobile and disturbance-intolerant ground-dwelling, arboreal and aerial fauna. Furthermore, the proposal is likely to limit the use of the subject land for less mobile and disturbance-intolerant species. Consequently, the proposal would introduce a barrier for the localised movement of these species.
- > The proposal will have a minor impact on woody vegetation, with up to four non-PCT associated plantings from Vegetation Zone 4 and two regenerating saplings of Grey Box from Vegetation Zone 3 to be removed, thus largely retaining woody vegetation within the subject land.
- > The proposed primary access road has been cited only in degraded grassland (Vegetation Zone 2) and avoids impacts to trees in adjacent Vegetation Zone 1. Appropriate crossings will be constructed over the ephemeral drainage line as per NSW Fisheries guidelines (Fairfull and Witheridge, 2003).
- > Given the historical clearing within the subject land and immediate surrounds, the subject land is unlikely to serve as a key movement corridor. Habitat connectivity would remain relatively unchanged at the broader landscape scale, with the primary connectivity corridor in the area occurring directly adjacent to the subject land in the vicinity of Boiling Down Creek and the plantation (Vegetation Zone 4), which retains a greater condition of habitat and canopy cover.
- > The Groundwater Dependent Ecosystems Atlas (2023) does not identify the subject land or immediate surrounds as potential aquatic or terrestrial Groundwater Dependent Ecosystems.
- > The proposal has potential to impact water quality and hydrological processes in the absence of appropriate measures to control erosion, sedimentation, and pollution during the construction of the development including future residential development.
- > One threatened fauna species Rosenberg's Goanna, (*Varanus rosenbergi*) is assessed as a low to moderate risk of vehicle strike. The Rosenberg's Goanna is at moderate risk of vehicle strike though this is mitigated with reduced speed limits and it being a large species. Other recommended mitigation measures by NSW DCCEEW to change driver behaviour to reduce wildlife vehicle strike include reduced speed limits.

#### 6.3.3.6.4 Serious and Irreversible Impacts

Serious and irreversible impacts are addressed at Section 9 of the BDAR.

*Euphrasia arguta* is listed as a SAI entity due to the following principle:

- > Principle 3: species or ecological communities with currently observed, estimated, inferred or reasonably suspected to have a very limited geographic distribution.

Targeted surveys have been completed across Vegetation Zones 1 and 2 of the subject land, however, Vegetation Zones 3, 4 and 5 have yet to be surveyed for this species. While the presence of this species within these zones is considered unlikely given the extent of modification of these zones, its presence cannot be entirely discounted without the completion of targeted surveys.

The *White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions* (Box Gum Woodland CEEC) has been identified across 0.11 ha of the subject land. Box Gum Woodland CEEC has been listed as a possible SAII due to the following Principles:

- > Principle 1: species or ecological community currently in a rapid rate of decline.
- > Principle 2: species or ecological communities with a very small population size.

The proposal involves the removal of up to 0.027 ha of the Box Gum Woodland CEEC including up to four planted non-CEEC associated trees. Following development, the local CEEC patch is unlikely to be significantly fragmented given the small area of proposed impact.

It is considered unlikely to lead to a lack of habitat connectivity within the subject land and wider surroundings, given its small area of impact and the already highly fragmented characteristic of this CEEC within the surrounding landscape. Furthermore, it is unlikely to reduce the functionality of this CEEC or remove important habitat features that may be utilised by fauna species.

#### 6.3.3.6.5 Matters of National Environmental Significance

The BDAR identifies that an Environment Protection and Biodiversity Conservation (EPBC) Protected Matters Search Tool (PMST) report was generated on 20 August 2024 (with a 10 km buffer around the subject land) to identify MNES that have the potential to occur within the development).

Those relevant to biodiversity include:

- > Wetlands of International Importance.
- > Threatened Ecological Communities (TECs).
- > Threatened species.
- > Listed migratory species.

The proposal has the potential to be deemed a 'controlled action' under Part 7 of the EPBC Act if it is determined that it is likely to have a significant impact on MNES.

An EPBC Act referral was made for Gregadoo Solar Farm (EPBC Number: 2020/8643). A decision was made by Commonwealth DCCEEW in June 2020 which states that the proposed activity is not a controlled action.

Modification will involve impacts to a small area of additional vegetation and habitat for EPBC Act listed entities which was not considered in the original decision. The potential for MNES to occur on the subject land are discussed in the BDAR.

Targeted surveys have been undertaken for some threatened entities protected under Commonwealth legislation to determine their presence within the subject land. A Test of Significance has also been applied to determine the likelihood that the development may have a significant impact on MNES.

Significant impact assessment undertaken to date has identified that the proposal should be referred to the Commonwealth Department of Climate Change, Energy, the Environment and Water (Commonwealth DCCEEW) for a binding decision on whether approval is required. The referral will be made concurrent to submission of Modification 4.

### 6.3.4 MITIGATION MEASURES

#### 6.3.4.1 Impacts that Require an Offset

The BDAR has assessed the impacts of Modification 4 that require an off-set:

**Table 13 – Impacts that require an offset – ecosystem credits**

Vegetation Zone	PCT ID	TEC	Impact Area	Current VI Score	Future VI Score	Change VI Score	Biodiversity risk weighting	Number of ecosystem credits required
Zone 3	76	Inland Grey Woodland	0.01 ha	16.6	0	- 16.6	2	1
Zone 4	277	Box Gum Woodland	0.007 ha	43.1	0	- 43.1	2.5	1
Total Credits								2

**Table 14 – Impacts that require an offset – species**

Common name	Scientific name	BC Act Status	EPBC Act Status	Loss of habitat (ha)	Biodiversity risk weighting	No. of ecosystem credits
<b>Flora</b>						
A Spear-grass	<i>Austrostipa wakoolica</i>	E	E	0.02	2	3
Small Scurf-pea	<i>Cullen parvum</i>	E	-	0.02	2	3
N/A	<i>Euphrasia arguta</i>	CE	CE	0.02	3	3
<b>Fauna</b>						
Key's Matchstick Grasshopper	<i>Keyacris scurra</i>	E	E	0.02	2	3
Barking Owl	<i>Ninox connivens</i>	V	-	0.02	2	3
Squirrel Glider	<i>Petaurus norfolcensis</i>	V	-	0.01	2	1
Squirrel Glider in the Wagga Wagga Local Government Area	<i>Petaurus norfolcensis endangered population</i>	E	-	0.01	2	1

Common name	Scientific name	BC Act Status	EPBC Act Status	Loss of habitat (ha)	Biodiversity risk weighting	No. of ecosystem credits
Brush-railed Phascogale	<i>Phascogale tapoatafa</i>	V	-	0.01	2	1
Koala	<i>Phascolarctos cinereus</i>	E	E	0.01	2	1
Golden Sun Moth	<i>Synemon plana</i>	V	V	0.02	1.5	3
Masked Owl	<i>Tyto novaehollandiae</i>	V	-	0.02	2	3

Indirect and prescribed impacts that remain after measures to avoid, minimise, and mitigate have been applied, may be offset using additional biodiversity credits (above the credit requirement generated by the BAM-C for direct impacts) and/or other conservation measures. No additional biodiversity credits are proposed for indirect and prescribed impacts.

#### 6.3.4.2 Mitigation of Residual Impacts

The following mitigation measures are also recommended to manage residual impacts

- > A CEMP will be required for the construction phase and will be prepared prior to issue of the Construction Certificate. The CEMP would include, at a minimum, industry-standard measures for management of environmental factors (i.e., soil, surface water, weeds, pathogens, and pollutants) as well as site-specific measures, including the procedures outlined below.
- > To reduce the chance of inadvertent degradation of adjacent vegetation and habitat, the boundary of the development footprint will be clearly delineated with appropriate fencing. Clear exclusion zones should also be established for all areas to be protected including the ephemeral drainage line (Figure 1 of the BDAR) and patches of Inland Grey Box Woodland EEC (Figure 12 of the BDAR) identified in this BDAR. A suitably qualified ecologist should be present during the establishment of these zones, which are to utilise clear signage and physical markers such as temporary fencing or ropes (example in Photo 14). Ancillary works such as parking, stockpiling and site compounds are to be kept outside of these exclusion zones.
- > Before clearing works begin a pre-clearing survey will be undertaken by a qualified ecologist, with all key habitat features (e.g., nests, and burrows) and fauna utilising the proposed work area recorded and mapped. A subsequent pre-clearing inspection report will be prepared to include a list of findings, clearing recommendations and suitable areas identified for relocating displaced fauna, to reduce the potential impact on residing fauna. A qualified ecologist is then to supervise the clearing procedure, and where recommended, rescue and relocate residing fauna in accordance with the pre-clearing report. All fauna rescues and relocations are to be documented with the location of rescue and relocation.
- > The proposal may result in erosion and transport of sediments into the ephemeral drainage line and further offsite to Boiling Down Creek, as a result of, soil disturbance and spills during construction. To reduce sedimentation and pollution during construction, erosion and chemical contaminant control measures will be implemented in accordance with "The Blue Book" (Landcom 2004).

- > To avoid potential indirect impacts during construction, it is recommended that an ESCP should be in place following best practices (e.g., Landcom, 2004) and be included in the site-specific CEMP, prior to any construction works taking place
- > Clearing and construction works can result in the spread of weeds, pathogens and diseases throughout a site or lead to their introduction to an area. In order to minimise the spread of weeds, pathogens and diseases, monitoring, management, and control is to be aligned with relevant legislation and recommendations including the NSW Biosecurity Act 2015 and the Riverina East Regional Strategic Weed Management Plan 2023-2027. The subject land currently exhibits evidence of invasive weeds, with Vegetation Zones of higher disturbance and little to no canopy present generally displaying higher rates of invasive species. Importantly, invasive weeds categorised as Weeds of National Significance and High Threat Exotics were identified within the subject land and immediate surrounds.
- > Pathogen spread can cause disease and the weakening of an ecosystem's flora and fauna. Microorganisms causing such diseases can be spread by machinery, vehicles or footwear and preventative measures should be in place to prevent the introduction to the subject land.
- > Prevention and early intervention are the most effective strategies to manage weed, pathogen and disease spread. Strategies will be prompted early in the development of environmental management plans (e.g., CEMP and/or BMP) with robust communication between responsible parties to ensure controls are managed in a strategic and coordinated manner across the subject land.
- > A post-clearing assessment will be undertaken to confirm the final impact of this development. Following the completion of construction, a post-clearing inspection is to be undertaken by a qualified ecologist to verify the actual clearing footprint to ensure that clearing has not occurred beyond the marked development footprint. The results of the post-clearing inspection will seek to inform the accuracy of the project's credit obligation. The post-clearing inspection will ground-truth the areas that have been disturbed by the proposal, with a focus on areas identified as Vegetation Zone 1, as reflected in this BDAR. A post-clearing inspection report will be prepared by a qualified ecologist following the completion of the post-clearing inspection, including the result of the inspection including photos and GPS co-ordinates as evidence of clearing extent.
- > Staff training and site inductions are to communicate the impacts of vehicle strike on native fauna, and potential threatened species likely to occur within the subject land and the wider Gregadoo Solar Farm development.
- > Appropriate signage will be installed within the subject land across all time frames of the proposal to set speed limits that will be enforced.
- > Rehabilitation and restoration of native vegetation and habitat retained but disturbed during construction on or adjacent to the subject land will be undertaken. This will be informed by a Vegetation Management Plan (VMP) following industry best practice and standards. This VMP will inform specific weed management actions that should be undertaken to minimise the further establishment and or spread of present invasive species. Furthermore, a VMP will outline the plant densities and compositions recommended for revegetation and remediation of disturbed areas, aimed at re-establishing locally indigenous Grey Gum Woodland species and their maintenance.

### 6.3.4.3 Adaptive Management Strategy for Uncertain Impacts

The BDAR has assumed presence of threatened species on the basis that time constraints have been imposed and targeted surveys have not been undertaken for the following species:

Fauna:

- > Gang-gang Cockatoo (Breeding) (*Callocephalon fimbriatum*)
- > South-eastern Glossy Black Cockatoo (Breeding) (*Calyptorhynchus lathami lathamii*)
- > Key's Matchstick Grasshopper (*Keyacris scurra*)
- > Pink Cockatoo (Breeding) (*Lophochroa leadbeateri*)
- > Barking Owl (*Ninox connivens*)
- > Squirrel Glider (*Petaurus norfolcensis*)
- > Brush-tailed Phascogale (*Phascogale tapoatafa*)
- > Koala (*Phascolarctos cinereus*)
- > Superb Parrot (Breeding) (*Polytelis swainsonii*)
- > Golden Sun Moth (*Synemon plana*)
- > Masked Owl (*Tyto novaehollandiae*)

Flora:

- > A Spear-grass (*Austrostipa wakoolica*)
- > Small Scurf-pea (*Cullen parvum*)
- > Euphrasia arguta

The BDAR identifies that the actual presence and extent of these species are uncertain and consequently, the final impacts are difficult to measure. For threatened fauna species listed above the risk is relatively low due to limited impacts to any specialist habitat, and an unexpected threatened species finds procedure is suitable.

However, for threatened flora, following approval and prior to construction, targeted surveys are to be undertaken to determine presence and if present, determine the extent (e.g., abundance, location for plants) of threatened species within the subject land. Presence or absence will inform adaptive management strategies which are to consist of actions taken to reduce or eliminate the impact where practicable such as:

- > review of proposed minimisation and mitigation measures to appropriately accommodate and avoid serious impacts and harm to threatened species,
- > plans to translocate or relocate identified threatened species (under appropriate licences and approvals), and timing works to avoid critical life cycle events such as breeding or nursing.

In the event that a threatened species, or active breeding habitat of a threatened species is unexpectedly discovered during construction, implementation of the following unexpected finds procedure is to be followed:

- > cessation of work

- > notification made to person with environmental oversight of the project, potentially the Site Contractor or Environmental Officer,
- > consultation with appropriate members of NSW DCCEEW and Commonwealth DCCEEW as required,
- > determination of appropriate mitigation measures, relevant relocation measures,
- > consideration of potential for reassessment of the proposal and review location or design, recommencement of works only once advice and necessary approvals are obtained, and
- > inclusion of threatened species in future inductions and management plans.

## 6.4 Aboriginal Cultural Heritage

### 6.4.1 EXISTING ENVIRONMENT

The development site is agricultural land comprising several large paddocks which are generally flat and largely cleared and cultivated for cropping.

The development site holds several farm dams along unnamed drainage lines. Boiling Down Creek traverses the eastern part of the property flowing from the south to the north. A residence is located in the north-western corner of the property, which is accessed from Redbank Road.

The property holds remnant native vegetation in the form of paddock trees. Scattered trees occur along Boiling Down Creek. Planted vegetation is located between paddocks, along the southern boundary and Boiling Down Creek.

### 6.4.2 APPROVED PROJECT

An Aboriginal Cultural Heritage Assessment (ACHA) prepared by NGH was submitted with the original EIS. The ACHA identified seven (7) stone artefacts and a possible culturally modified tree are located within the proposal area.

While the majority of the sites, including the possible modified tree, will be avoided by the development, two (2) stone artefact sites (Gregadoo Solar IF 2 and Gregadoo SF 619) would be impacted by the proposed Gregadoo Solar Farm development.

The impact to the scientific values of the sites Gregadoo Solar IF 2 and Gregadoo SF 619 were considered low. The isolated artefacts have little research value apart from what has already been gained from the information obtained during the preparation of the ACHA. The information related to the presence of the artefacts and in the development of Aboriginal site modelling, which has largely now been realised by the recording.

The scarred tree site, Gregadoo SF 645, will not be impacted by the solar farm proposal as per the development designs submitted with the original EIS.

The Modification 2 Report included an addendum to the ACHA submitted with the original EIS. The addendum identified one (1) additional isolated artefact (Gregadoo SF IF 5). While located outside of the proposed development footprint, the addendum recommended demarcated fencing and a 5m buffer zone to prevent inadvertent impacts.

In 2022, NGH prepared a notification letter to all Registered Aboriginal Parties (RAPs) outlining the proposed Modification 3 works. This involved decreasing the spaces between solar panels and increasing the capacity of the solar farm, however, did not involve any changes to the development footprint. No further assessments were required.

### 6.4.3 PROPOSED MODIFICATION

An Aboriginal Heritage Due Diligence Assessment (AHDDA) was prepared by Premise to determine the potential impacts of Modification 4 on Aboriginal cultural heritage. This assessment focused on the proposed internal access track and access point as it is situated outside of the survey area previously assessed by NGH in the original EIS and during Modification 2 and Modification 3. The AHDDA is provided in **Appendix E**.

The AHDDA included a desktop assessment and site survey of the internal access track and access point. A search of the Aboriginal Heritage Information Management System (AHIMS) was undertaken for the development site and surrounding areas. The AHIMS data confirmed 17 previously recorded Aboriginal sites, 10 of which are located within the development site. Three (3) of these sites have been salvaged (Gregadoo SF 619, Gregadoo SF IF4 and Gregadoo Solar IF2) and reburied in the development site, however, outside of the development footprint to ensure they are not harmed. All previously recorded Aboriginal sites, included those salvaged and reburied, are shown in **Appendix E**.

A site inspection was undertaken on 1 March 2024 to assess the proposed internal access track and access point for any potential Aboriginal cultural heritage sites or areas of archaeological sensitivity. Following proposal refinements and the addition of the construction staging area, the semi-trailer turning head and the proposed widening of the main site access track, a second site inspection was undertaken on 22 August 2024.

The March 2024 site inspection identified one (1) of the previously recorded Aboriginal sites located along the eastern bank of Boiling Down Creek, however, this site will not be impacted by the proposed modification works. Similarly, other previously identified Aboriginal sites will not be adversely impacted by the proposed Modification 4 works. To further mitigate impacts to these sites, a minimum buffer of 10m will be implemented around these sites during the construction of the BESS, the internal access track and access point.

The site inspection undertaken in March also identified one (1) potential Aboriginal 'Ring Tree' located within close proximity to the proposed internal access track. This site was recorded on the AHIMS database (AHIMS ID: 56-1-0760) on 21 March 2024, and is referred to as the 'Gregadoo Ring Tree.' Upon completion of the site inspection, Premise Archaeologists made a recommendation to the project Engineers (Premise) that the proposed internal access track should be moved further to the west to mitigate impacts to the newly identified potential Ring Tree.

The internal access track was shifted 14.5m northwest which has allowed for an approximate 30m buffer between the potential Ring Tree and the proposed internal access track. This is considered appropriate in mitigating adverse impacts caused by construction works and the ongoing use of the access track.

The AHDDA was provided to RAPs for the project on 9 August 2024, with a 14-day review period. No feedback or comments were provided from the RAPs.

Following proposal refinements and changes to the project plans, a second site inspection was undertaken. This site inspection did not identify any additional Aboriginal sites or objects. The AHDDA was updated and provided to the RAPs again on 29 August 2024 with another 14-day review period. No comments were provided.

Overall, the proposed internal access track and access point will not result in adverse impacts to Aboriginal cultural heritage.

Similarly, the proposed addition of the BESS to the Gregadoo Solar Farm development will not result in any additional impacts to Aboriginal cultural heritage. The proposed location of the BESS is not situated within proximity to previously recorded Aboriginal sites. Similarly, this area has been extensively surveyed during past ACHAR assessments which identified this land as highly disturbed.

#### 6.4.4 MITIGATION MEASURES

The AHDDA prepared by Premise concluded that the proposed Modification 4 should proceed, conditional upon the recommendations outlined below:

- > The development must avoid the Gregadoo Ring Tree located within the study area (AHIMS ID 56-1-0760) as per the proposed development footprint in this report. Nearby Aboriginal sites including Gregadoo Solar IF 1, Gregadoo SF 393, Gregadoo SF 360 and Gregadoo SF Reburial, should also be avoided. A minimum 10m buffer around each site is appropriate.
- > Staff undertaking construction works should be subject to a heritage induction prior to commencing works. This induction should inform workers of Aboriginal objects on site (including the reburial site located to the west of the main access road) and the necessary measures which have been implemented to protect these sites.
- > If suspected Aboriginal objects are located during future works, works should cease, and a qualified heritage consultant advised to assess the find and recommend if further investigation or permits are required. Heritage NSW and the Wagga Wagga LALC must be identified.
- > No further archaeological investigations are proposed.
- > All impacts must remain within the assessed study area or further archaeological investigation may be required.

## 6.5 Traffic Impact

### 6.5.1 EXISTING ENVIRONMENT

Access to the Gregadoo Solar Farm would be provided via Sturt Highway, Inglewood Road, Mitchell Road, Ashfords Road and Boiling Down Road.

Sturt Highway, Elizabeth Avenue (along the section between Sturt Highway and Inglewood Road), Inglewood Road and Mitchell Road (between Kyeamba Avenue and Gregadoo Road) are all listed on the RMS Restricted Access Vehicles Map as being approved B-double routes.

The only sections of the proposed construction traffic route not identified as being approved routes for B-doubles are Mitchell Road between Gregadoo Road and Ashfords Road (which has a straight alignment until the large radius curve leading up to the Mitchell Road/Ashfords Road intersection), Ashfords Road and Boiling Down Road.

### 6.5.2 APPROVED PROJECT

The original EIS identified that the additional traffic associated with the construction and decommissioning of the Gregadoo Solar Farm would be a small component of the existing traffic loads on local and state roads.

Further, the original EIS identified that the proposed access route to the Gregadoo Solar Farm is suitable to accommodate the expected construction vehicle types and traffic volumes. No substantive increased collision risk, damage to road infrastructure, noise or dust impacts, disruption to existing services or reduced level of service was expected to during construction or decommissioning.

### 6.5.3 PROPOSED MODIFICATION

Amber Organisation Pty Ltd (Amber) were engaged to prepare a Traffic Impact Assessment (TIA) for the proposed development modification, relating to the addition of the BESS. The TIA is provided in 0.

The TIA has identified that the introduction of a BESS to the development will result in an increase in heavy vehicle movements and an increase in heavy vehicles requiring escorts to and from the development site.

The traffic generation during the peak construction period presented in the original EIS is shown in **Table 15** and an updated prediction of these figures in relation to the proposed Modification 4 is shown in **Table 16**.

**Table 15 – Assessed Traffic Generation as per original EIS**

Vehicle Type	Peak Vehicle Movements per Day
Light Vehicle (car / 4WD/ minibus)	60
Heavy Vehicles	20
Total	80

**Table 16 – Updated Predicted Traffic Generation During Construction (Solar Farm and BESS)**

Vehicle Type	Average Vehicle Movements per Day	Peak Vehicle Movements per Day
Light Vehicle	80	174
Heavy Vehicles	45	120
Total	125	294

In summary, the TIA concluded the following:

- > The overall project (including the Solar Farm and BESS development) is expected to generate a total of 294 vehicles per day, including 120 heavy vehicles during the construction peak, and outside of the construction peak, 125 vehicles per day including 45 heavy vehicles.
- > No increases in light and heavy vehicle traffic impacts are expected during operation, as a result of the addition of a BESS.

- > The surrounding road network can accommodate the additional traffic generation as a result of the modification during the construction, operation and decommissioning stages.
- > Heavy vehicles requiring escort necessary for the BESS will access the site from Port Botany or the Port of Melbourne. Some minor civil works and temporary traffic management measures will be required to facilitate this site access.
- > The site access arrangements are considered appropriate.

#### 6.5.4 MITIGATION MEASURES

Subject to approval, the modification would result in changes to the development consent conditions to reflect the increase in traffic volumes associated with the addition of the BESS. Schedule 3, Condition 2 (a) of the development consent is proposed to be amended to:

- > increase the number of heavy vehicle movements per day from 50 to 120 to during construction, upgrading and decommissioning; and
- > to increase the number of over-dimension vehicles movement per day from 2 to 4.

The TIA also recommends that references to 'over-dimensional vehicle/s' in the development consent be changed to 'Heavy vehicles/s requiring escort' to reflect current terminology and to better allow for the management of high-risk over-dimension vehicles.

Overall, the TIA confirms that the mitigation measures outlined in Schedule 3, Condition 5 of the development consent remain suitable in managing impacts for the solar farm and BESS development, during the construction, operation and decommissioning stages.

## 6.6 Visual Impact

### 6.6.1 EXISTING ENVIRONMENT

The development site has historically been cleared of native vegetation, with some patches of remnant native vegetation and planted trees remaining.

The dominant land use in the area is agriculture, with the visual character of the land surrounding the development site being defined by a mixture of agriculture, industry and mixed residential properties.

Key features of the surrounding landscape include the Gregadoo Waste Management Centre to the south, a pine plantation to the east and residential properties to the north and east.

### 6.6.2 APPROVED PROJECT

The original EIS and Modification 2&3 Report identified that no viewpoints were found to have a high impact.

Four viewpoints were assessed to have a medium impact, defined as visual impact where contrast is acceptable, and safeguards can be considered. All four of these viewpoints were rural roads, and two were assessed as being representative of residences in the vicinity. Additional vegetation screening was recommended for these two viewpoints.

During construction, additional traffic and dust generation are considered the greatest for cumulative visual impacts. During operation, cumulative visual traffic impacts are considered negligible.

Any adverse cumulative impacts are anticipated to be manageable due to the ability to effectively screen infrastructure.

### 6.6.3 PROPOSED MODIFICATION

Iris were engaged to prepare a Visual Impact Assessment (VIA) for the proposed modification to the Gregadoo Solar Farm. This assessment was prepared in the form of a memorandum (memo) and assessed the potential visual impacts of the proposed addition of the BESS and adjacent collector substation as well as new overhead grid connection between the proposed BESS and the Transgrid Wagga substation. The VIA memo is provided in **Appendix G**.

Iris identified additional large-scale projects being undertaken or proposed in the landscape character unit (LCU) which have emerged since the previous VIA. The most significant of these projects are the extension works occurring at the Transgrid Wagga Substation located immediately to the east of the site. Overall, the current scenic quality of the LCU remains moderate for this assessment.

The VIA identifies that the visibility of the proposed BESS and associated infrastructure would remain limited due to the existing vegetation, buildings and undulations in landform. The vegetation along Boiling Down Road and Redbank Road, Boiling Down Creek, an area of plantation pine forest to the north of the existing Transgrid Wagga substation, and along the fence lines and within the gardens of dwellings near the site all provide dense screenings of the development site from nearby receivers.

The proposed BESS and collector substation would be visible from an approximately 500m section of Boiling Down Road (near the Redbank Road intersection) as there is no intervening vegetation here.

Additional lighting may be required for the BESS which are recommended to be sensor lights to reduce visual impacts.

The construction works associated with the modification would be similar to that required for the installation of the solar farm. Therefore, the extent of visibility during construction will not change as a result of the modification.

In summary, the overall visibility of the project will not noticeably change from what has been described in the original EIS. The existing mitigation measured would manage the impacts of the modification with the addition of measures to control the additional lighting (at the BESS location) and the treatment of noise walls, if necessary.

## 6.7 Acoustic Impact

### 6.7.1 EXISTING ENVIRONMENT

The existing noise sources from land use adjacent to the development site generally consist of agricultural activities (including livestock grazing, cultivation management and harvesting of cereal crops), large lot residential activity and road traffic noise from Mitchell Road, Ashfords Road and Gregadoo Road. These land uses characterise the background noise within the area.

Noise generating equipment in the existing environment includes tractors, headers, quad bikes, light vehicles and heavy vehicles. Noise levels from farm activities (sowing, spraying, harvest) are likely to be concentrated at peak times during a given season.

Large lot residential properties are predominantly located to the north and east of the development site. Large lot residential properties to the north are approximately 650m from the approved solar farm development footprint.

Residential properties to the east are in excess of 500m from the approved solar farm development footprint.

The nearest non-associated residential dwelling (R1) is approximately 71m north of the site boundary and 540m from the development footprint.

### 6.7.2 APPROVED PROJECT

The original EIS identified that the construction works would occur in a rural environment with a low level of background noise.

The works were noted to be likely to generate some low impact exceedances over a short-term as a result of noise impacts from the use of machinery and plant during construction.

In addition, the EIS identified that during daylight saving period over summer some operational tracker noise emissions may occur between 6 am and 7 am. Notwithstanding, it was concluded that noise levels at the closest receivers would be well below the sleep disturbance criteria.

The Modification 2 & 3 Reports commented that overall, predicted construction noise impacts are less than those for the originally approved project. The impacts were assessed as being unlikely to significantly affect nearby sensitive receivers.

### 6.7.3 PROPOSED MODIFICATION

Assured Environmental (AE) have been engaged to prepare a noise and vibration impact assessment for Modification 4. The Noise and Vibration Impact Assessment is provided in **Appendix H**.

Impacts associated with the construction, operation and decommissioning of the solar farm and BESS have been considered. Noise and vibration impact assessments were calculated using worst case scenarios. In particular, when assessing construction noise, AE have assumed no ground absorption and minimal distances between sensitive receptors and plant equipment.

The closest sensitive receiver to the development site is R1. R1 is not associated with the development.

AE concluded that the proposed development site is acceptable for the proposed modification. An assessment of construction noise, operational noise, road traffic noise and vibration is provided below.

Given that the noise impact assessment submitted with the original EIS was prepared by a separate consultancy in 2018, Assured Environmental has provided commentary to clarify the difference in the results where necessary.

With regard to baseline noise levels, the NIA identifies that the evening and night time Rating Background Level (RBL) measured by Assured Environmental in January 2023 are lower than the RBL measured in 2018. Assured Environmental indicate that the likely reason for this difference is that a 1/3 octave review was not undertaken to remove the influence of frogs, insects and birds from the RBL measured in 2018.

### 6.7.3.1 Construction Noise

Calculations for noise impacts caused from construction activities has been undertaken using first principle calculations based on the distance separation of the development site to the receptor.

With respect to construction noise, the NIA makes the following conclusions:

- > The closest sensitive receptors exceed the noise affect criteria of 50dB(A) during the first stage of construction. Notwithstanding, none of the receptors meet or exceed the highly Noise Affected criteria during this stage of construction.
- > All receptors exceed the noise affected criteria of 50 dB(A) during the second stage of construction.
- > R1 exceeds the highly noise affected criteria of 75 dB(A) during the second stage of construction.

Assured Environmental acknowledged that the results presented in the Modification 3 NIA were higher than those reported in the 2018 noise impact assessment submitted with the original EIS.

Assured Environmental noted that a comparison of the results identified the following key differences:

- > The 2018 noise impact assessment distance is measured from the receptor to the development footprint rather than the solar farm site boundary. Assured Environmental has measured from the receptor to the development site boundary, as it is unknown how plant will move around the site at this stage of development. In this regard Assured Environmental NIA has made a more conservative assumption than the 2018 noise impact assessment.
- > The number of noise sources is not reported in the 2018 noise impact assessment. For this reason, Assured Environmental assume that the 2018 noise impact assessment modelled one noise source only. By comparison, the Assured Environmental NIA has modelled multiple noise sources, contributing to an overall higher noise level at receivers.
- > There are differences between the sound power levels assumed for equipment used in the Assured Environmental NIA and the 2018 noise impact assessment.

Overall, Assured Environmental states that its assessment of construction noise impacts is more conservative than the 2018 noise impact assessment.

The following mitigation measures are recommended to reduce the noise impact at all receptors:

- > Limiting the type and scale of concurrent activities undertaken close to sensitive receptors where possible;
- > Using broad band reversing alarms on all mobile plant and equipment;
- > Examine different types of machines that perform the same function and compare the noise level data to select the least noisy machine;
- > Operating plant in a quiet and efficient manner;
- > Reduce throttle setting and turn off equipment when not being used;
- > Regularly inspect and maintain equipment to ensure it is in good working order including checking the condition of mufflers;
- > Conduct community consultation and discuss the timing of works and potential respite periods; and

- > A temporary noise barrier is installed to minimise noise impacts to R1. Alternatively, the resident could be engaged through consultation to identify alternative means of reducing noise exposure (operating hours, respite periods, offering alternative accommodation etc.).

Consultation should occur regularly with sensitive receivers during any works which generate high noise levels with an impulsive, intermittent, low frequency or tonal characteristic.

#### 6.7.3.2 Operational Noise

The NIA includes an assessment of operational noise impacts based on sound power levels and source locations of operational equipment during the day, evening and night time periods.

Consistent with the results presented in the 2018 and 2023 NIA, the Modification 4 NIA confirms that the project will comply with the relevant project noise trigger level in accordance with the Noise Policy for Industry (NPI) under worst-case meteorological conditions.

It is therefore, not considered necessary to implement any mitigation measures, as full compliance is achieved at all receptors.

#### 6.7.3.3 Road Traffic Noise

The NIA includes an assessment of the road traffic impacts during the construction phase.

Predicted noise levels were modelled for road traffic noise at 30 sensitive receivers along Mitchell Road and Ashfords Road, with road setbacks ranging from 39 metres to 170 metres. The assessment identifies that modelling of existing traffic volumes demonstrated that the existing road traffic noise is already above the road traffic noise assessment criteria for the associated sensitive receivers.

Notwithstanding, the NIA identifies that the Road Noise Policy (RNP) makes an allowance "for existing residences and other sensitive land uses affected by additional traffic on existing roads generated by land use developments, any increase in total traffic noise levels should be limited to 2dB above that of the corresponding "no build option".

The NIA concludes that computational modelling of the future peak road traffic scenario (vehicle volumes as described in the TIA (Amber, 2024) demonstrated an increase of  $\leq 2$  dB(A) for all sensitive receptors along the access route on Mitchell Road. As such during peak construction traffic volumes all receptors will be compliant under the NSW Road Noise Policy.

#### 6.7.3.4 Vibration

The Assured Environmental NIA includes an assessment of the construction and operational vibration impacts of the project.

Construction vibration levels are not predicted to exceed the continuous maximum vibration nuisance and building damage criteria for the closest receiver (R1), which is located 72m from the nearest potential vibration source. Intermittent vibration associated with construction vehicles, while harder to predict, is predicted to be within the maximum intermittent criteria of 0.2mm/s.

Operational vibration impacts will be minimal due to the separation distance and design of the surface pad.

## 6.7.4 MITIGATION MEASURES

### 6.7.4.1 Construction

The following mitigation measures are recommended to reduce the noise impact at all receptors:

- > Limiting the type and scale of concurrent activities undertaken close to sensitive receptors where possible;
- > Using broad band reversing alarms on all mobile plant and equipment;
- > Examine different types of machines that perform the same function and compare the noise level data to select the least noisy machine;
- > Operating plant in a quiet and efficient manner;
- > Reduce throttle setting and turn off equipment when not being used; and
- > Regularly inspect and maintain equipment to ensure it is in good working order including checking the condition of mufflers.
- > Conduct community consultation and discuss the timing of works and potential respite periods.

With specific regard to the receiver R1, the following mitigation measures are recommended:

- > A temporary noise barrier is installed to minimise noise impacts experienced at receiver R1. This barrier should be installed as needed to mitigate noise as construction moves closer to this receiver.

## 6.8 Hazards and risk

### 6.8.1 EXISTING ENVIRONMENT

The development site is generally bound by farm land to the north, Mitchell Road / Ashford Road to the east, Boiling Down Road to the south and Redbank Road to the west. The Gregadoo Waste Disposal Facility is located to the immediate south of the development site, beyond Boiling Down Road.

The development site is located on bushfire prone land (Vegetation Categories 1 and 3) and is affected by an overland flow path. Additionally, there are no known contaminated land located within the development site. The land has previously been used for agricultural activities which are unlikely to result in any contamination of soils

### 6.8.2 APPROVED PROJECT

An assessment of potential hazards relevant to the Gregadoo Solar Farm were addressed within the original EIS. These potential risks include bushfire and flooding hazards as well as the potential impacts of electric and magnetic fields (EMFs) associated with the solar farm infrastructure.

The approved development is considered unlikely to pose a significant bushfire risk however, a Bushfire Management Plan will be prepared prior to construction commencing on site.

The original EIS also identified that the development would be compatible with the identified flood hazards. Flood planning advice was sought for Modification 3 of the Gregadoo Solar Farm. This assessment identified that Modification 3 would not result in any additional flood impacts from the original EIS.

It was determined that development would result in a low potential for EMF impacts during the construction, operation and decommissioning stages and is not anticipated to result in any adverse health impacts to nearby receivers or employees.

### 6.8.3 PROPOSED MODIFICATION

Riskcon Engineering have been engaged to prepare a Preliminary Hazard Analysis for Modification 4. The Preliminary Hazard Analysis is provided in **Appendix J**.

As required by the Guidelines, the PHA has been prepared in accordance with the Hazard Industry Planning Advisory Paper No. 4 - Risk Criteria for Land Use and Safety Planning, Hazard Industry Planning Advisory Paper No. 6 – Guidelines for Hazard Analysis (DOP, 2011) and Multi-Level Risk Assessment (DOP, 2011).

The Multi-Level Risk Approach (MLRA) has been adopted in preparing the PHA. The MLRA has been prepared in accordance with the Multi-Level Risk Approach Guidelines (DPIE, 2011). The MLRA Guidelines are intended to assist industry, consultants and the consent authorities to carry out and evaluate risk assessments at an appropriate level for the project being studied.

The approach to the MLRA was as follows:

- > Hazard analysis – to identify potential hazards in the context of the site, location and project details.
- > Consequence analysis – for those hazards identified via the hazard analysis as having a potential impact;
- > Frequency analysis – those hazards identified via the consequence analysis of having the potential to occur off-site were then considered in the context of an initiating event and the probability to occur for failure of safeguards;
- > Risk assessment and Reduction – the results of the consequence and frequency analysis for those incidents carried forward via the PHA were combined with the risk in the context of HIPAP No. 4 risk criteria. Where this risk was exceeded, a further assessment of the risk was completed in the context of the proposed mitigation measures; and
- > Reporting – a summary of the outcome of the assessment.

Via the MLRA number of risks were considered and discounted. Those that were carried forward as having a residual risk requiring further assessment are:

- > Li-ion battery fault, thermal runaway and fire;
- > Victorian Big Battery fire review;
- > Li-ion battery fire and toxic gas dispersion;
- > Electrical equipment failure and fire;
- > Transformer internal arcing, oil spill, ignition and bund fire;
- > Transformer electrical surge protection failure and explosion; and
- > Electromagnetic field impacts.

### 6.8.3.1 Li-ion battery fault, thermal runaway and fire

As noted in the Riskcon PHA, despite improvement in battery technology there are several degradation mechanisms which can result in thermal runaway that are primarily a result of high discharge, overcharging, or water ingress into the battery which results in a host of by-products being formed within the battery during charge and cycles.

As a result, Li-ion batteries are equipped with several safety features to prevent the batteries from overcharging or discharging at voltages which result in battery degradation, leading to shorting of the battery and thermal runaway.

The PHA includes a review of the batteries proposed to be used for the BESS which are based on a battery chemistry of Lithium Iron Phosphate (LiFePO<sub>4</sub>, or simply LFP). LFP is considered to be one of the safest battery chemistries within the industry, having a thermal rise of 1.5°C/min. Where other typical lithium ion battery chemistries have a thermal rise of 200-400°C/min, the gradual temperature rise of LFP does not result in a fire and incident propagation to other batteries.

In the event that LFP chemistries ignite by artificial means, the combustion by-products release carbon dioxide which reduces the oxygen concentration within a confined space reducing the combustion rate. Any fire would be further suppressed by a fire suppression system fitted within each container to prevent escalation to other battery units

In the few circumstances where battery modules may catch fire (i.e., due to leaking coolant or electrical fault), fire will be constrained within a confined space reducing the combustion rate. Finally, the containers are fitted with a fire suppression system which will activate to suppress and control a fire preventing escalation to other battery units

In addition, manufacturers and integrators can implement different means of preventing battery ignition or controlling if it occurs (such as physical construction arrangements, battery monitoring, heat detection, etc). These are implemented on a system-by-system basis and are specific to the system needs

The Riskcon PHA concludes that LFP technology does not cause fire during thermal runaway and that should fire develop within one container it would not transfer to nearby containers due to fire safety design features. The incident is not carried forward for further analysis.

### 6.8.3.2 Victorian Big Battery Fire Review

The Riskcon PHA includes a review of the Victorian Big Battery (VBB) Fire to determine whether similar incidents could occur at the BESS.

The Riskcon PHA reports that the main reason for fire propagation within the VBB was strong winds blowing flames from one Megapack to the unprotected vent atop an adjacent Megapack, resulting in the ignition of a plastic fan which impacted battery modules directly beneath. Riskcon confirms that the additional safety precautions have been incorporated within the battery technology to be used as part of the BESS, with vents made of metal instead of plastic and covered by a metallic mesh shield.

Further, the Riskcon PHA states that the placement of the fans shall be such that batteries or flammable materials shall not be located directly beneath ventilation openings.

To ensure the above are captured the following recommendations have been made

- > The vent covers of the BESS shall be constructed of non-combustible material.
- > The vents shall not be located above battery packs within the BESS container.

Based upon the designs incorporated with the container based upon the VBB fire, the available area assessment and the separation distance assessment, Riskcon identify that the propagation between two units is considered unlikely. This incident has not been carried forward for further analysis.

### 6.8.3.3 Li-ion battery fire and toxic gas dispersion

As noted in the Riskcon PHA, in the event of a BESS fire by-products of combustion toxic gasses may be formed as a by-product of combustion, including:

- > Carbon dioxide;
- > Carbon monoxide; and
- > Fluorine gases.

These gases are discussed in further detail below.

#### 6.8.3.3.1 Carbon dioxide

The Riskcon PHA identifies that while li-ion batteries are predominately composed of metal structures, ancillary equipment and materials include wiring, plastic and anodes etc that would liberate carbon dioxide during a fire.

Notwithstanding, The PHA states that based upon a review of sensitive areas and similar BESS fires (i.e., Victoria BESS fire), it is not considered that that the formation of carbon dioxide would not result in downwind impacts sufficient cause injury or fatality.

This incident has not been carried forward for further analysis.

#### 6.8.3.3.2 Carbon monoxide

The Riskcon PHA identifies that while there is potential for fire to occur within the BESS units which could form carbon monoxide if there is sufficient oxygen to sustain combustion, the combustible load within the BESS which could result in the formation of carbon monoxide is low.

The PHA states that the formation of carbon monoxide at levels which result in a substantial downwind impact are not considered credible and analysis of the incident has not been carried forward for further analysis.

#### 6.8.3.3.3 Fluoride gases

With regard to fluorine gases, the Riskcon PHA notes that hydrogen fluoride (HF) is the main fluorine gas of concern in a Li-ion battery fire.

For toxic gas dispersion of HF to occur, a battery container fire is necessary as the initiating event.

Given that the potential for a fire to occur is considered negligible due to the highly stable and safe battery chemistries used, the initiating event is considered unlikely.

This incident has not been carried forward for further analysis.

#### 6.8.3.4 Electrical equipment failure and fire

With respect to electrical equipment failure and fire, the Riskcon PHA notes that type of equipment used within the project is ubiquitous throughout the world and across industry segments and is not a unique fire scenario.

Although there is potential for equipment within the switch room to fail and result in arcing and overheating, any fire would be relatively slow in growth and would be unlikely to result in substantial impacts in terms of offsite impact or incident propagation.

This incident has not been carried forward for further assessment.

#### 6.8.3.5 Transformer internal arcing, oil spill, ignition and bund fire

As noted in the Riskcon PHA, transformers are fitted with low oil pressure switches and a pressure surge switch which are intended to identify potential oil and pressure events within the transformer, isolating power and alarming operators.

While the PHA reports that there is potential for the oil in a transformer to ignite if pressure rise in a transformer exceeds structural integrity of the reservoir, it is considered that the transformers are common units with a low potential for failure. Further, it is considered that the separation distance to the site boundary and other adjacent units would be unlikely to result in incident propagation and offsite impacts.

This incident has not been carried forward for further analysis.

#### 6.8.3.6 Transformer Electrical Surge Protection Failure and Explosion

The Riskcon PHA states that in order to protect against overheating and explosions, transformers have surge protection devices which shunt electrical surges safely to ground.

Notwithstanding, in the case of an electrical overload, such as a major lightning strike, or significant deterioration, leakage of water into the transformer or physical damage, such as a fallen tree, the surge protection may be too slow.

While there is potential for an explosion to occur under these circumstances, the transformers are common units with a low potential for failure.

This incident has not been carried forward for further analysis.

#### 6.8.3.7 Electromagnetic field impacts

The Riskcon PHA states that BESS create Electromagnetic Fields (EMFs) from operational equipment such as transmission lines, transformers and the electrical components found within BESS units, inverters etc. This equipment has the potential to produce ELF EMFs in the range of 30 to 300 Hz.

Riskcon reports that there are currently no standards in Australia to govern exposure limits to Extremely Low Frequency (ELF) EMF. However, the International Commission on Non-Ionizing Radiation Protection (ICNIRP) has provided some guideline which limits exposure to 2,000 milligauss (mG) for member of the public in a 24 hour period.

The PHA concludes that as the strengths of EMF attenuate rapidly with distance, the ICNIRP reference level for exposure to the general public will not be exceeded and impact the general public in surrounding areas would be negligible.

This incident has not been carried forward for further analysis.

#### 6.8.3.8 Assessment Conclusion

The Riskcon PHA concludes that the review of the aforementioned incidents indicates that there was no observed offsite impact and that any risk at the site boundary is not considered to exceed the acceptable risk criteria

#### 6.8.4 MITIGATION MEASURES

The following recommendations have been made by Riskcon:

- > End-to-end spacing (short side) of BESS containerised units shall be a minimum of 600 mm
- > Back-to-back spacing (long side) of BESS containerised units shall be a minimum of 150 mm
- > Spacing between BESS container accumulations (i.e. 4 containerised units) shall be a minimum of 2.5 m.
- > Prior to construction, the total area required for the BESS units shall be verified against the available space to demonstrate there is adequate area to achieve the required spacing.
- > The BESS containerised units shall be provided with the fire protection system specified by the BESS manufacturer.
- > Prior to commissioning, the UL test data for the selected battery units shall be made available to the DPE.
- > The vent covers of the BESS shall be constructed of non-combustible material.
- > The vents shall not be located above battery packs within the BESS container.

## 7. JUSTIFICATION AND CONCLUSION

### 7.1 Need for the Project

Modification 4 seeks to optimise the design of the approved Gregadoo Solar Farm. This will occur through the addition of a BESS with a generation capacity of 200MW<sub>AC</sub> and 400MWh. This optimisation assists to ensure the orderly and economic use of land, while assisting to achieve State and Federal renewable energy targets and objectives for renewable energy and grid firming.

Modification 4 also seeks the addition of an additional access point to the development site along Boiling Down Road and an internal access track. The access point and access track are required to ensure that the approved overhead and underground transmission line can be constructed and maintained without impacting on the Boiling Down Creek or the adjoining riparian corridor.

The Gregadoo Solar Farm has a capital investment of approximately \$95M, increased from approximately \$61M at the original capacity. It will create jobs, diversify income, and increase revenue to ancillary services such as food, lodging and tourism for the local area. The addition of the BESS will result in an overall capital investment value of approximately \$200M.

Estimated job numbers are approximately 150-200 full time equivalent (FTE) construction jobs at peak construction, approximately 2-3 FTE operational roles, and up to 4 contractors annually.

The Gregadoo Solar Farm will produce approximately 155,000 MWh in year 1, enough to power at around 27,000 homes (assuming average annual household consumption of 5,662 kWh) and offsets around 93,000 tonnes of CO<sub>2</sub>-e pa (assuming grid Emissions Intensity of 0.6 tCO<sub>2</sub>-e/MWh). The addition of the BESS will allow for increased generation capacity.

The additional of a BESS to the Gregadoo Solar Farm allows for a more efficient use of the available space and assists to offset carbon emissions.

### 7.2 Consistency of the Project with the Strategic Context

The NSW Government has recognised that the NSW electricity system needs to change, acknowledging that traditional generators are ageing, and the State's transmission system is congested. Further, electricity prices are putting pressure on households and businesses. This realisation has informed the preparation of Government policies and documents, the provisions of which have filtered to the local scale and informed local plan making.

The project will contribute to the provision of renewable energy in NSW and facilitate private investment in the state's electricity system over the next decade and beyond, a key consideration of the NSW Electricity Strategy.

The Gregadoo Solar Farm and Battery Energy Storage System has an anticipated lifespan in the order of 30 years and will contribute to the NSW Government's three objectives for the electricity system: reliability, affordability and sustainability.

Refer to the detailed discussion at **Section 2** of this Modification Report.

## 7.3 Compliance with Relevant Statutory Requirements

The development is characterised as an SSD as it is for the purpose of electricity generating works with a capital investment value of ('CIV') in excess of \$30 million, pursuant to Clause 20 of Schedule 1 of the Planning Systems SEPP.

Pursuant to the *Wagga Wagga Local Environmental Plan 2010*, the development site is zoned RU1 – Primary Production.

Electricity generating works are permitted with consent in the RU1 Primary Production zone pursuant to Section 2.36(9) of the Infrastructure SEPP.

Refer to **Section 4** of this report for a detailed assessment of the modification framework.

## 7.4 Economic, Social, Environmental and Cumulative Impacts of the Project

Modification 4 seeks to optimise the design of the approved Gregadoo Solar Farm.

The development footprint area has been optimised as part of Modification 4 through the addition of a BESS which will store additional energy generated by the solar farm, which can be utilised during peak energy consumption periods.

A review of the public record information for large scale projects with the potential to generate cumulative impacts within 5 kilometres of the sites identifies:

- > The approved Project Energy Connect (NSW – Eastern Section) SSI-9172452 is associated with the Wagga Wagga Transgrid substation situated to the east of the development site.
- > An existing SSD application for the Belhaven Battery Energy Storage System (BESS) has been identified (SSD-57575973). This BESS is proposed to be located at 233 Boiling Down Road, Rowan, 2650, situated southwest of the development site.

Project Energy Connect involves an electricity inter connector between South Australia and the existing substation situated to the east of the development site.

With regard to cumulative impact, it is noted that the DPIE Critical State Significant Infrastructure Assessment states:

- There is the potential for cumulative visual and landscape impacts associated with the project and several proposed wind farms and solar farms proposed along the route associated with the South-West REZ. Given the nature of the project infrastructure, the Department considers that the project's contribution to cumulative visual impacts would be minimal and any residual cumulative visual impacts could be appropriately mitigated with additional screening.*
- Subject to the implementation of the recommended conditions, the Department considers the overall visual impact of the project on surrounding residences, road users and the rural landscape would not be significant.*

Notably, the proposed development is strategically located and sufficiently separated from the nearest proposed large-scale projects to not result in any cumulative impact.

## 7.5 Compliance Monitoring and Communication

Throughout construction, management measures will be implemented through a range of management plans and strategies.

Operation and monitoring of the facility would be governed by an adopted operational Environmental Management Strategy which is required by the existing conditions of consent.

## 7.6 Key Uncertainties

Due to the extent of technical input provided to inform Modification 4, there are no uncertainties with the project. All impacts can be adequately mitigated through the location and design of the BESS, access point and internal access track, and on-going management practices and monitoring.

## 7.7 Public Interest

The public interest may be determined by consideration of relevant national, state and local government goals, as well as community priorities, which are expressed through a range of documentation. Relevant strategic documents are considered in **Section 2**.

It also requires the consideration of the principles of ecologically sustainable development, discussed in **Section 7.8**. It has been consistent held through a range of determinations in the NSW Land and Environment Court that the ESD precautionary intergenerational equity principles include considerations associated with climate change (impact of the development on climate change and impacts of climate change on development).

Mostly recently, the LEC held that the downstream impacts of mining projects, including the burning of fossil fuels for energy production, is a public interest consideration. Namely, in *Gloucester Resources Limited v Minister for Planning* [2019] NSWLEC 7, Preston J stated at 499:

*Many courts have held that indirect, downstream GHG (greenhouse gas) emissions are a relevant consideration to take into account in determining applications for activities involving fossil fuel extraction or combustion or electricity generated by fossil fuel combustion.*

In summing up, Preston noted that the impacts associated with climate change, among others, were sufficient to justify refusal of the project.

It follows that a renewable energy project is in the public interest as it reduces the reliance on forms of electricity generation that rely on the consumption and burning of fossil fuels and that negatively contribute to the impacts of climate change as a result. Adoption of forms of development that counter the need for these high impact uses is therefore positive in the context of the ESD principles and in the public interest.

The approved Gregadoo Solar Farm and proposed Modification 4 is considered to be in the public interest on the basis that it:

- > Offers an opportunity for productive and sustainable economic activity within the area;
- > Presents an excellent opportunity to the local region to provide local employment opportunities;
- > Has been designed with appropriate to the consideration to social, environmental and sustainability interests of the community;
- > Aims to minimise impacts to natural resources through minimising the land required to support energy supply;
- > Assists to reduce reliance on traditional, fossil fuel burning forms of electricity generation, thereby assisting in curbing the long term impacts of climate change.

## 7.8 Ecologically sustainable development

The *National Strategy for Ecological Sustainable Development* (NSES D) (Department of Environment and Heritage 1992) defines Ecologically Sustainable Development (ESD) as:

*using, conserving and enhancing the community's resources so that ecological processes, on which life depends, are maintained, and the total quality of life, now and in the future, can be increased (refer website)*

The concept of ESD gives formal recognition to environmental and social considerations in decision-making to ensure the current and future generations can enjoy an environment that functions as well as or better than the environment they inherit.

The core objectives of the NSES D are:

- > To enhance individual and community well-being and welfare by following a path of economic development that safeguards the welfare of future generations;
- > To provide for equity within and between generations; and
- > To protect biological diversity and maintain essential ecological processes and life-support systems.

As outlined in Clause 193 of the *Environmental Planning and Assessment Regulation 2021*, the four (4) principles of ESC are listed below. These are discussed in the following sections.

- > Precautionary principle;
- > Intergenerational equity;
- > Conservation of biological diversity and ecological integrity; and
- > Improved valuation and pricing of environmental resources.

### 7.8.1 PRECAUTIONARY PRINCIPLE

The precautionary principle states where there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a justification for not implementing mitigation measures or strategies to avoid potential impact. This has been held in various decisions in the NSW Land and Environment Court to include considerations associated with climate change (impact of the development on climate change and impacts of climate change on development).

The potential impact from the proposal along with a list of mitigation measures has been identified in the environmental assessment in **Section 6** of this report.

The approved Gregadoo Solar Farm and Modification 4 provide for the efficient delivery of renewable energy, which assists in reducing the long-term impacts of climate change and is therefore in the public interest. The potential outcome of climate change, being higher temperatures and greater periods of sunlight, also suggests that increasing reliance of renewable forms of energy generation is sustainable.

### 7.8.2 INTERGENERATIONAL EQUITY

The second principle of ESD is intergenerational equity, such that the present generation should ensure the health, diversity and productivity of the environment are equal to or better for future generations.

All work would be carried out in accordance with the environmental safeguards summarised in **Appendix C** to mitigate potential impact associated with noise and vibration, socio-economic considerations, traffic and transport, drainage and water quality, air quality, greenhouse gas emissions, climate change, Aboriginal and non-Aboriginal heritage, topography, soils, waste and hazardous materials.

The approved Gregadoo Solar Farm and Modification 4 provide for the efficient storage and delivery of renewable energy, and in doing so reduces reliance on traditional forms of electricity generation, including the burning of fossil fuels. This assists in reducing the impacts of climate change and therefore assists in ensuring the health of future generations is protected; the development is therefore in the public interest.

### 7.8.3 CONSERVATION OF BIOLOGICAL DIVERSITY AND ECOLOGICAL INTEGRITY

The third principle of ESD is conservation of biological diversity and ecological integrity such that ecosystems, species and genetic diversity within species are maintained.

Modification 4 will involve only minor impacts to biodiversity which can be mitigated through measures outlined in **Section 6.3.4** and provided in **Appendix C**.

### 7.8.4 IMPROVED VALUATION, PRICING AND INCENTIVE MECHANISMS

The final principle of ESD is improved valuation and pricing of environmental resources which establishes the need to determine economic values for services provided by the natural environment such as the atmosphere's ability to receive gaseous emissions, cultural values and visual amenity. The principle is designed to improve methods of carrying out valuation of environmental costs and benefits and use this information when making decisions.

The development of policy to guide pricing and incentive mechanisms in delivering ecologically sustainable development is the responsibility of governments and regulatory stakeholders.



## 7.9 Site Suitability

This Modification Report has been prepared pursuant to Part 5, Division 5.1, Subdivision 3 of the *Environmental Planning and Assessment Act 1979* (the EP&A Act), Part 8, Division 5 of the *Environmental Planning and Assessment Regulation 2000* (the EP&A Regulation), *State Significant Development Guidelines – Preparing an Environmental Impact Statement Appendix E* (DPIE 2021).

An assessment of potential environmental impacts has identified that proposed Modification 4 would not lead to any significant or detrimental impacts to the environment and that residual impacts are manageable through the implementation of standard measures. Measures are proposed during both construction and operation to ensure impacts are appropriately managed. These measures would ensure compliance with relevant legislation and any conditions of approval.

# APPENDIX A

## Revised Project Description



## 7.1 Proposed Gregadoo Solar Farm and Battery Energy Storage System

The proposal includes the following components:

- > Around 134,618 solar panels mounted on single axis tracking system, with highest point of panels around 2.8 m above ground surface.
- > Enclosed lithium-ion batteries.
- > Small operations and maintenance building with associated car parking.
- > Upgrade of existing farm access point from Boiling Down Road.
- > Internal access tracks.
- > 22 inverter units standing about 3.5 m above ground surface.
- > Electrical substations.
- > Underground electrical cable reticulation.
- > Security fencing and CCTV.
- > Native vegetation planting for visual screening.
- > Filling in three farm dams.

Within the development site, ground disturbance would be limited to.

- > The installation of the piles supporting the solar panels, which would be driven or screwed into the ground.
- > Construction of internal gravel access tracks.
- > Establishment of inverter storage, delivery station and substations.
- > Trenching and possible boring for the installation of cables.
- > Establishment of staff amenities and offices.
- > Construction of parking area.
- > Construction of perimeter security fencing.
- > Poles for mounting the overhead transmission line.

As illustrated on the Proposed Infrastructure map in Appendix B, the development footprint which includes the solar arrays covers the majority of the site. However, the ground disturbance from pile installation would disturb only about 0.2% of the total site area.

Panels within the solar array area would sit above the ground and ground cover vegetation would be maintained under the panels. The area of the site which would be affected by shading from the solar panels would be about 70%.

Additional ground disturbance outside the solar arrays would result from construction of the BESS, internal access tracks, trenches for cabling and footings for other equipment.

Construction ancillary facilities would be located within the ancillary facilities option areas.

It is noted that the exact location of solar farm and BESS infrastructure, including the ancillary facilities, would be determined at the detailed design phase. All work and infrastructure would be located within the proposed development footprint.

The annual output of the proposal would be about **83,000 MWh**. The construction phase of the project is expected to take between **12 to 18** months with a capital cost of about **\$61.5 million**. The proposal is expected to have an operating life of around 30 years, at which point the solar farm and BESS would either:

- > Be decommissioned, removing all above ground infrastructure and returning the site to its existing land capability, or
- > Continue operation, which could involve reconditioning, if the lease agreement is renewed. Reconditioning would involve replacing components that were originally installed with new components that reflect technology that is available at that time.

### **7.9.1 Solar Arrays**

The solar arrays would be comprised of about **134,618** solar panels, which would be either multicrystalline, monocrystalline or thin-film technology. The panels to be installed would be mounted on single-axis trackers (which would have about 2,400 tracker units).

About 22,000 piles would be driven or screwed into the ground in order to support the solar array's mounting system and solar panels, with racking systems to allow the installation of solar panels. This minimises ground disturbance.

The panel structures would be **up to 2.8 m** high. The mounting system to be installed on the poles would be dependent on the final project technology. The multicrystalline, monocrystalline or thin film solar PV panels installed on the mounting system would be interconnected. These module interconnections would be as short as possible and would shorten the cabling loops. Long cabling loops pose a higher risk for lightning strikes.

### **7.9.1 Battery Energy Storage System**

The proposed BESS contains enclosed lithium-ion type batteries which will be manufactured offsite and delivered to the site for installation. The number and exact layout of battery modules would be confirmed during detailed design. However, the location of this equipment would be limited to the areas shown on Figure 7.

For the purposes of the assessment of the BESS, a conservative approach was taken, whereby the maximum area and quantities of this infrastructure was considered, subject to this infrastructure being located wholly within the identified areas.

### **7.9.2 Inverter Units**

Inverters will be installed and evenly distributed across the site. The inverters will be containerised and would measure up to 13.0 m long, 3.5 m high and 2.5 m wide.

### **7.9.3 Substations / Connection Station**

The Gregadoo Solar Farm and BESS has been designed to incorporate two substations, with one substation located within the BESS area and one substation located to the immediate southeast of the solar array area.

Detailed design may demonstrate that the Gregadoo Solar Farm and BESS require one, single substation only. In this circumstance one, single substation would be constructed. The final location of the substation would be determined during detailed design.

#### **7.9.4 Underground Cabling**

Underground cabling on site would be designed in accordance with Australian and international standards, taking into account the temperature of the ambient environment in which the cables and ancillaries shall operate, and the allowable currents compatible with an acceptable warming-up as stated in the standards and as per manufacturers' recommendations. Underground cables and pipes will be buried at a depth of at least 500 mm to ensure agricultural land capabilities are not reduced if underground infrastructure is left in situ after decommissioning. Trenches would accommodate and protect the power cables along with other cabling for communications / monitoring and earthing.

The design and content of each trench will vary depending on its location and use across the solar farm and BESS.

#### **7.9.5 Transmission Line**

The electrical connection from the solar farm and BESS substations to the existing Gregadoo TransGrid substation would be via a 132 kV powerline (overhead/underground).

The overhead line will traverse from the solar substation to the TransGrid substation. It will take the most efficient route minimising distance and ecological impact.

The overhead line will cross the Boiling Down Creek.

#### **7.9.6 Internal Access Tracks**

The on-site tracks would be made of compacted gravel.

If required, geotextile would be laid between the soil and the gravel. Internal access tracks would be up to 4 m wide to allow for the safe delivery, unloading, installation and maintenance of key components. The total length of the access track would be determined during the detailed design phase and would be subject to the type of solar PV technology used. Internal access tracks are private roads designed and constructed only for the construction, operation and maintenance of the solar farm, and not necessarily suitable for any other purpose. Access roads would be maintained over the life of the solar farm.

#### **7.9.7 Perimeter Security Fencing**

The perimeter of the site would be fenced with 2.3 m high security fencing along the site boundaries. It would be constructed of cyclone fencing with a strand of barbed wire at the top.

#### **7.9.8 Site Access**

##### **Main access**

The site is proposed to be accessed from two access points, south of the development site along Boiling Down Road. The proposed access points will be designed and located in accordance with AustRoads Standards and in consultation with Wagga Wagga City Council. Boiling Down Road and its intersection

with Ashfords Road will be upgraded in accordance with [Traffic Design Group Australia suggestions and Wagga Wagga City Council requirements](#).

#### **Maintenance access**

Once commissioned, TransGrid would carry out maintenance on the proposed solar substation. Access will be from the existing road on Ashfords Road, east of the development site.

#### **Emergency access**

Emergency access will be from the second access road, off Boiling Down Road.

#### **7.9.8 Staff Amenities and Office Building**

A permanent staff amenities and office building would be constructed or installed on site. Its dimensions would be about 7 m long and 5 m wide. The amenity building will be incorporated into the Solar Farm substation area. The building will be small and used as an office and amenity building during maintenance works.

#### **7.9.8 Landscaping**

Landscaping would be undertaken on site to minimise visual impacts. Based on the result of a visual impact assessment undertaken for the proposal and avoiding areas of biodiversity significance as discussed in Section 6.1, landscaping is recommended along development site boundaries as shown in Appendix B. Proposed landscaping for visual screening purposes would involve the planting of 5 m wide vegetation strips using local native species along the development site boundaries where shown. Face-to-face consultation was also undertaken [with](#) affected landowners to develop the proposed landscaping plan. As a result, the involved residents took it upon themselves to plant vegetative screening on their property to block existing views from their closest neighbour, with Gregadoo Solar Farm and BESS to take over maintenance of plantings. Additional on-site screening was committed to by Gregadoo Solar Farm with direct consultation with the closest neighbour.



# APPENDIX B

## Statutory Compliance Table

Table 17 – Commonwealth Legislation

Statutory Reference	Pre-condition	Relevance	Section in EIS
<i>Environment Protection and Biodiversity Conservation Act 1999</i>	Direct or indirect impacts to a Matter of National Environmental Significance (MNES)	Modification 4 is unlikely to have a significant impact on a biodiversity MNES and therefore is unlikely to be deemed a controlled action based on impacts to biodiversity.	<b>Section 6.3</b>
<i>Native Title Act 1993</i>	Objective of the Act is to recognise and protect Native Title.	No sites listed on the Native Title register are impacted by the project	N/A

Table 18 – NSW Legislation

Statutory Reference	Section/Clause	Pre-condition	Relevance	Section in EIS
<i>Aboriginal Land Rights Act 1983</i>	Section 36	The NSW Aboriginal Land Council may make a claim for land on its own behalf or on behalf of one or more Local Aboriginal Land Council.	No impacts to land subject to an Aboriginal Land Claim will occur as a result of the development.	<b>N/A</b>
<i>Biodiversity Conservation Act 2016</i>	Section 7.9	Any SSD or SSI application is required to be accompanied by a BDAR unless the Planning and Environment Agency Heads determine that the proposed development is not likely to have any significant impact on biodiversity values.	A BDAR accompanied the original Development Application. A BDAR has been prepared for Modification 4.	<b>Section 6.3 and Appendix I</b>
<i>Contaminated Land Management Act 1997</i>	Section 11	The EPA may declare any land it believes to significantly contaminated as significantly contaminated land.	The site is not identified as significantly contaminated land.	<b>N/A</b>

Statutory Reference	Section/Clause	Pre-condition	Relevance	Section in EIS
<i>Electricity Infrastructure Investment Act 2020</i>	Section 19	The Minister may declare a renewable energy zone (REZ) by reference to a specified geographical area of the State and a specified generation, storage or network infrastructure (including planned or existing infrastructure).	The subject property is not within a REZ.	<b>N/A</b>
<i>Environmental Planning and Assessment Regulation 2021</i>	Section 1.3	Objects of the Act	The proposed development is consistent with each of the Objects of the Act, with the exception of Object (d) which relates to the delivery and maintenance of affordable housing which is not relevant to this proposal.	<b>N/A</b>
	Section 4.15(1)	Consideration of the relevant provisions of any environmental planning instruments	<ul style="list-style-type: none"> <li>• <i>State Environmental Planning Policy (Transport and Infrastructure) 2021;</i></li> <li>• <i>State Environmental Planning Policy (Planning Systems) 2021;</i></li> <li>• <i>Wagga Wagga Local Environmental Plan 2010.</i></li> </ul>	<b>Section 7.3</b>
		Consideration of the relevant provisions of any proposed environmental planning instruments	No draft environmental planning instruments apply.	<b>N/A</b>
		Consideration of the relevant provisions of any development control plans	Development control plans do not apply to SSD by way of clause 2.10 of the Planning Systems SEPP.	<b>N/A</b>

Statutory Reference	Section/Clause	Pre-condition	Relevance	Section in EIS
		Consideration of the relevant provisions of any planning agreements or draft planning agreements	No planning agreements or draft planning agreements apply.	<b>N/A</b>
		Consideration of the relevant provisions of the regulations	Refer next section of this table	<b>This table</b>
		Consideration of the likely impacts of the development		<b>Section 6</b>
		Consideration of the suitability of the site for the development		<b>Section 7.9</b>
		Consideration of any submissions made in accordance with this Act or the regulations	The proponent will be required to prepare a Submissions Report in accordance with Appendix C to the SSD Guidelines following the completion of the public exhibition period.	<b>N/A</b>
		Consideration of the public interest	Community engagement has been undertaken.	<b>Section 5 and 7.7</b>
<i>Environmental Planning and Assessment Regulation 2021</i>	Section 23	Requires the consent of all landowners to be obtained for the making of a Development Application.		<b>Attached to Modification 4 report submission.</b>
	Clause 192	(1) An environmental impact statement must contain the following—		



Statutory Reference	Section/Clause	Pre-condition	Relevance	Section in EIS
		(a) a summary of the environmental impact statement,		<b>N/A</b>
		(b) a statement of the objectives of the development, activity or infrastructure,		<b>N/A</b>
		(c) an analysis of feasible alternatives to the carrying out of the development, activity or infrastructure, considering its objectives, including the consequences of not carrying out the development, activity or infrastructure,		<b>N/A</b>
		(d) an analysis of the development, activity or infrastructure, including—		
		(i) a full description of the development, activity or infrastructure, and		<b>Section 1.4 and 3</b>
		(ii) a general description of the environment likely to be affected by the development, activity or infrastructure and a detailed description of the aspects of the environment that are likely to be significantly affected, and		<b>Section 1.5</b>



Statutory Reference	Section/Clause	Pre-condition	Relevance	Section in EIS
		(iii) the likely impact on the environment of the development, activity or infrastructure, and		<b>Section 6</b>
		(iv) a full description of the measures to mitigate adverse effects of the development, activity or infrastructure on the environment, and		<b>Appendix C</b>
		(v) a list of the approvals that must be obtained under another Act or law before the development, activity or infrastructure may lawfully be carried out,		<b>This table</b>
		(e) a compilation, in a single section of the environmental impact statement, of the measures referred to in paragraph (d)(iv),		<b>Appendix C</b>
		(f) the reasons justifying the carrying out of the development, activity or infrastructure, considering biophysical, economic and social factors, including the principles of ecologically sustainable development set out in section 193.		<b>Section 7</b>
<i>Heritage Act 1977</i>	Section 58	Approval in respect of the doing or carrying out of an act, matter or thing referred to in s 57(1)		<b>N/A</b>



Statutory Reference	Section/Clause	Pre-condition	Relevance	Section in EIS
<i>Local Land Services Act 2013</i>				<b>N/A</b>
<i>National Parks and Wildlife Act 1974</i>	Section 90	Grant of Aboriginal heritage impact permit	The results of the AHDDA confirm Modification 4 will not result in adverse impacts to Aboriginal heritage.	<b>Section 6.4</b>
<i>Protection of the Environment Operations Act 1997</i>	Sections 43(a), 43(b), 43(d), 47, 55 and 122	Various environmental protection licences	An EPL is not required under the POEO Act for the proposal.	<b>N/A</b>
<i>Roads Act 1993</i>	Section 138	Various activities within road reserves		<b>N/A</b>
Water Management Act 2000	Sections 89, 90 and 91	Water use approval, water management work approval or activity approval under Part 3 of Chapter 3	Controlled Activity Approval is not required pursuant to Section 91 of the <i>Water Management Act 2000</i> (WM Act) by reference to Section 4.41 of the EP&A Act (approvals that do not apply).	<b>N/A</b>



# APPENDIX C

## Updated Mitigation Measures and Conditions of Consent



**MITIGATION MEASURES**

Where measures are relevant to more than one environmental aspect, they are cited only once under the most relevant aspect to avoid duplication.

Construction (C), Operation, (O), Decommissioning (D)

**Table 19 – Updated Mitigation Measures**

No.	Safeguards and mitigation measures	C	O	D
BD1	<p>Time works to avoid critical life cycle events:</p> <ul style="list-style-type: none"> <li>Hollow-bearing trees would not be removed during breeding season (spring to early summer) to mitigate impacts on superb parrots.</li> <li>If clearing outside of this period cannot be achieved, pre-clearing surveys would be undertaken to ensure no impacts to fauna would occur.</li> </ul>	<b>C</b>		
BD2	<p><del>Implement clearing protocols during tree clearing works, including pre-clearing surveys, daily surveys and staged clearing, the presence of a trained ecological or wildlife handler:</del></p> <ul style="list-style-type: none"> <li><del>Pre-clearing checklist.</del></li> <li><del>Tree clearing procedure.</del></li> </ul> <p>Before clearing works begin a pre-clearing survey will be undertaken by a qualified ecologist, with all key habitat features (e.g., nests, and burrows) and fauna utilising the proposed work area recorded and mapped.</p> <p>A subsequent pre-clearing inspection report will be prepared to include a list of findings, clearing recommendations and suitable areas identified for relocating displaced fauna, to reduce the potential impact on residing fauna.</p> <p>A qualified ecologist is then to supervise the clearing procedure, and where recommended, rescue and relocate residing fauna in accordance with the pre-clearing report. All fauna rescues and relocations are to be documented with the location of rescue and relocation.</p>	<b>C</b>		
BD3	<p>Relocate habitat features (fallen timber, hollow logs) from within the development site. Tree-clearing procedure including relocation of habitat features to adjacent area for habitat enhancement.</p>	<b>C</b>		

No.	Safeguards and mitigation measures	C	O	D
BD4	<p>Clearing protocols that identify vegetation to be retained, prevent inadvertent damage and reduce soil disturbance; for example, removal of native vegetation by chainsaw, rather than heavy machinery, is preferable in situations where partial clearing is proposed:</p> <ul style="list-style-type: none"> <li>• Approved clearing limits to be clearly delineated with temporary fencing or similar prior to construction commencing.</li> <li>• No stockpiling or storage within dripline of any native vegetation.</li> <li>• In areas to clear adjacent to areas to be retained, chainsaws would be used rather than heavy machinery to minimise risk of unauthorised disturbance.</li> </ul>	C		
BD5	<p>Noise barriers or daily/seasonal timing of construction and operational activities to reduce impacts of noise.</p> <p>CEMP will include measures to avoid noise encroachment on adjacent habitats such as avoiding night works as much as possible.</p>	C		
BD6	<p>Light shields or daily/seasonal timing of construction and operational activities to reduce impacts of light spill:</p> <ul style="list-style-type: none"> <li>• Avoid Night Works.</li> <li>• Direct lights away from vegetation.</li> </ul>	C	O	
BD7	<p>Adaptive dust monitoring programs to control air quality:</p> <ul style="list-style-type: none"> <li>• Daily monitoring of dust generated by construction activities.</li> <li>• Construction would cease if dust observed being blown from site until control measures were implemented.</li> <li>• All activities relating to the proposal would be undertaken with the objective of preventing visible dust emissions from the development site.</li> </ul>	C		
BD8	<p><del>Temporary fencing to protect significant environmental features such as riparian zones. Prior to construction commencing, exclusion fencing and signage would be installed around habitat to be retained.</del></p> <p>The development footprint will be clearly delineated with appropriate fencing.</p> <p>Clear exclusion zones should also be established for all areas to be protected including the ephemeral drainage line and patches of Inland Grey Box Woodland EEC identified in this BDAR.</p>	C		

No.	Safeguards and mitigation measures	C	O	D
	<p>A suitably qualified ecologist should be present during the establishment of these zones, which are to utilise clear signage and physical markers such as temporary fencing or ropes.</p> <p>Ancillary works such as parking, stockpiling and site compounds are to be kept outside of these exclusion zones</p>			
BD9	<p>Hygiene protocols to prevent the spread of weeds or pathogens between infected areas and uninfected areas:</p> <ul style="list-style-type: none"> <li>• A Weed Management Procedure would be developed for the proposal to prevent and minimise the spread of weeds. This would include:</li> <li>• Management protocol for declared priority weeds under the Biosecurity Act 2015 during and after construction.</li> <li>• Weed hygiene protocol in relation to plant, machinery, and fill.</li> <li>• Any occurrences of pathogens such as Myrtle Rust, Phytophthora and <b>Chytrid Fungus</b> would be monitored, treated, and reported.</li> <li>• The weed management procedure would be incorporated into the Biodiversity Management Plan.</li> </ul>	<b>C</b>	<b>O</b>	
BD10	<p>Staff training and site briefing to communicate environmental features to be protected and measures to be implemented:</p> <ul style="list-style-type: none"> <li>• Site induction.</li> <li>• Toolbox talks.</li> </ul>	<b>C</b>		
BD11	<p>Preparation of a vegetation management plan to regulate activity in vegetation and habitat adjacent to the proposed development:</p> <ul style="list-style-type: none"> <li>• Preparation of a Biodiversity Management Plan that would include protocols for: <ul style="list-style-type: none"> <li>– Protection of native vegetation to be retained.</li> <li>– Best practice removal and disposal of vegetation.</li> <li>– Staged removal of hollow-bearing trees and other habitat features such as fallen logs with attendance by an ecologist.</li> <li>– Weed management.</li> <li>– Unexpected threatened species finds.</li> </ul> </li> </ul>	<b>C</b>		

No.	Safeguards and mitigation measures	C	O	D
	<ul style="list-style-type: none"> <li>– Rehabilitation of disturbed areas.</li> <li>– <b>Adaptive management.</b></li> <li>– <b>Post clearing assessment.</b></li> </ul>			
BD12	An erosion and sediment control plan would be prepared in conjunction with the final design and implemented. <b>The erosion and sediment control plan is to be prepared in accordance with "The Blue Book" (Landcom 2004).</b>	<b>C</b>		
BD13	Making provision for the ecological restoration, rehabilitation and/or ongoing maintenance of retained native vegetation habitat on or adjacent to the development site. Retained native vegetation would be considered as an offset site.		<b>O</b>	
BD14	Sediment barriers or sedimentation ponds to control the quality of water released from the site into the receiving environment. An erosion and sediment control plan would be prepared in conjunction with the final design and implemented.	<b>C</b>		
BD15	Staff training and site briefing to communicate impacts of traffic strikes on native fauna: <ul style="list-style-type: none"> <li>• Awareness training during site inductions regarding enforcing site speed limits.</li> <li>• Site speed limits to be enforced.</li> </ul>	<b>C</b>	<b>O</b>	
BD16	<b>An appropriate crossing over the ephemeral drainage line is to be constructed to minimize impacts to water quality and hydrological processes.</b>	<b>C</b>		
AH1	An Unexpected Finds Protocol (UFP) would be prepared and followed should there be an inadvertent discovery of Aboriginal objects occur.	<b>C</b>		
AH2	The development must avoid the possible Scarred Tree (Gregadoo SF 645/AHIMS #56-0-0531). A minimum 10 m buffer around the tree should be in place to protect the tree canopy and root system.	<b>C</b>	<b>O</b>	

No.	Safeguards and mitigation measures	C	O	D
AH3	If complete avoidance of the seven isolated find sites recorded within the development site is not possible, the artefacts within the development footprint must be salvaged prior to the proposed work commencing and moved to a safe area within the property that will not be subject to any ground disturbance.	C		
AH4	The collection and relocation of the artefacts should be undertaken by an archaeologist with representatives of the registered Aboriginal parties and be consistent with Requirement 26 of the Code of practice for Archaeological Investigation of Aboriginal Objects in New South Wales. A new site card/s will need to be completed once the artefacts are moved to record their new location on the AHIMS database. The Aboriginal community requests that a Cultural Smoking Ceremony take place to cleanse any artefacts salvaged and the reburial location.	C		
AH5	A minimum 5 m buffer should be observed around all sites including those outside the development footprint.	C		
AH6	A Cultural Heritage Management Plan (CHMP) should be prepared to address the potential for finding additional Aboriginal artefacts during the construction of the Solar Farm and management of known sites and artefacts. The Plan should include the unexpected finds procedure to deal with construction activity.	C	O	
AH7	In the unlikely event that human remains are discovered during the construction, all work must cease in the immediate vicinity. OEH, the local police and the registered Aboriginal parties should be notified. Further assessment would be undertaken to determine if the remains were Aboriginal or non-Aboriginal.	C	O	
AH8	Items at site Gregadoo SF 360 (AHIMS # 56-1-0530) and Gregadoo Solar IF2 (AHIMS # 56-1-0541) will be salvaged prior to any disturbance occurring to the site.	C		
AH9	A minimum 10 m buffer should be observed around the Gregadoo Ring Tree (AHIMS # 56-1-0769).	C		
AH10	All personnel should be subject to a heritage induction prior to commencing works. This induction should inform workers of Aboriginal objects on site (including the reburial site) and the necessary measures which have been implemented to protect these sites.	C	O	D
VA1	On-site screening will be planted on the outside of the perimeter fence. Plantings will be native, derived from naturally occurring vegetation in the area.	C		

No.	Safeguards and mitigation measures	C	O	D
VA2	Vegetative screening will be maintained for the life of the solar farm.	Design stage	O	
VA3	The materials and colour of onsite infrastructure will, where practical, be non- reflective and in keeping with the materials and colouring of existing infrastructure or of a colour that will blend with the landscape.			
VA4	Night lighting would be minimised to the maximum extent possible (i.e. manually operated safety lighting at main component locations). It would be directed away from the Kidman Way, so as not to cause light spill that may be hazardous to drivers.	C	O	D
VA5	Dust will be controlled in response to visual cues, and any area of disturbance progressively rehabilitated.	C		D
VA6	Implementation of measures to control the additional lighting associated with the BESS and the treatment of noise walls, if necessary.  Suitable measures may include sensors to minimise visible lighting.	C		
LU1	Consultation with adjacent landholders would be ongoing to manage interactions between the solar farm and other properties.	C	O	D
LU2	Consultation would be undertaken with TransGrid regarding connection to the substation and design of electricity transmission infrastructure.	C		
LU3	A Rehabilitation and Decommissioning Management Plan is to be prepared in consultation with NSW Department of Primary Industries and the landowner prior to decommissioning. The Rehabilitation and Decommissioning Management Plan is to include: <ul style="list-style-type: none"> <li>Removal of all above ground infrastructure.</li> <li>Removal of gravel from internal access tracks where required, in consultation with landowner.</li> <li>Reverse any compaction by mechanical ripping.</li> </ul>			D
LU4	A pest and weed management plan would be prepared to manage the occurrence of noxious weeds and pest species across the site during construction and operation. The plans must be prepared in accordance with Wagga Wagga City Council and NSW DPI requirements. Where possible integrate weed and pest management with adjoining landowners.	C	O	

No.	Safeguards and mitigation measures	C	O	D
NS1	<p>Works should be undertaken during standard working hours only. (Except for the connection to substation)</p> <ul style="list-style-type: none"> <li>• Monday – Friday 7am to 6pm.</li> <li>• Saturday 8am to 1pm.</li> <li>• No work on Sundays or public holidays.</li> </ul>	C		
NS2	<p>All staff on-site should be informed of procedures to operate plant and equipment in a quiet and efficient manner.</p>	C	O	D
NS3	<p>A letter box drop would be prepared and provided to residences in close proximity to the works. The letter would contain details of the proposed works including timing and duration and a contact person for any enquiries or complaints.</p>	C	O	D
NS4	<p>Regular inspection and maintenance of equipment to ensure that plant is in good condition.</p> <p>CEMP will include measures to minimise potential impact of construction works, including:</p> <ul style="list-style-type: none"> <li>• Limit the type and scale of concurrent activities undertaken close to sensitive receptors where possible.</li> <li>• Use broadband reversing alarms on all mobile plant and equipment.</li> <li>• Examine different types of machines that perform the same function and compare the noise level data to select the least noisy machine.</li> <li>• Operating plant in a quiet and efficient manner.</li> <li>• Reduce throttle setting and turn off equipment when not being used.</li> <li>• Regularly inspect and maintain equipment to ensure it is in good working order including checking the condition of mufflers.</li> <li>• During any work generating high noise levels that have impulsive intermittent, low frequency, or tonal characteristics, consult with sensitive receptors regularly consult with sensitive receptors.</li> <li>• A temporary noise barrier is installed to minimise noise impacts experienced at receptor R1. This barrier should be installed as needed to mitigate noise as construction moves closer to the nearest sensitive receiver.</li> </ul>	C	O	D

No.	Safeguards and mitigation measures	C	O	D
	<ul style="list-style-type: none"> <li>• Works should be undertaken during standard working hours only. (Except for the connection to substation)</li> <li>– Monday – Friday 7am to 6pm.</li> <li>– Saturday 8am to 1pm.</li> <li>– No work on Sundays or public holidays.</li> <li>• All staff on-site should be informed of procedures to operate plant and equipment in a quiet and efficient manner.</li> <li>• A letter box drop would be prepared and provided to residences in close proximity to the works. The letter would contain details of the proposed works including timing and duration and a contact person for any enquiries or complaints.</li> </ul>			
SO1	<p>A Soil and Water Management Plan and Erosion and Sediment Control Plan would be prepared, implemented and monitored during the construction and decommissioning of the proposal, in accordance with Landcom (2004), to minimise soil (and water) impacts. These plans would include provisions such as:</p> <ul style="list-style-type: none"> <li>• At the commencement of the works, and progressively during construction, install the required erosion control and sediment capture measures.</li> <li>• Regularly inspect erosion and sediment controls, particularly following rainfall.</li> </ul>	<b>C</b>		<b>D</b>

No.	Safeguards and mitigation measures	C	O	D
	<ul style="list-style-type: none"> <li>• Maintain a register of inspection and maintenance of erosion control and sediment capture measures.</li> <li>• Ensure there are appropriate erosion and sediment control measures are in place to prevent erosion and sedimentation occurring within the stormwater channel during concentrated flows.</li> <li>• Ensure that machinery arrives on site in a clean, washed condition, free of fluid leaks.</li> <li>• Ensure that machinery leaves the site in a clean condition to avoid tracking of sediment onto public roads.</li> <li>• In all excavation activities, separate subsoils and topsoils and ensure that they are replaced in their natural configuration to assist revegetation.</li> <li>• During excavation activities, monitor for increases in salinity, reduce water inputs and remediate the site with salt tolerant vegetation.</li> <li>• Stockpile topsoil appropriately, so as to minimise weed infestation, maintain soil organic matter, maintain soil structure and microbial activity.</li> <li>• Manage works in consideration of heavy rainfall events.</li> <li>• Areas of disturbed soil would be rehabilitated promptly and progressively during construction.</li> </ul>			
SO2	<p>A Spill Response Plan would be developed and implemented during construction, operation and decommissioning to prevent contaminants affecting adjacent surrounding environments. It would include measures to:</p> <ul style="list-style-type: none"> <li>• Manage the storage of any potential contaminants onsite.</li> <li>• Mitigate the effects of soil contamination by fuels or other chemicals (including emergency response and EPA notification procedures and remediation).</li> <li>• A protocol would be developed in relation to discovering buried contaminants within the development site (e.g. pesticide containers if any). It would include stop work, remediation and disposal requirements.</li> </ul>	<b>C</b>	<b>O</b>	<b>D</b>
SO3	<p>Any area that was temporarily used during construction (laydown and trailer complex areas) would be restored back to original condition or re-vegetated with native plants.</p>		<b>O</b>	



No.	Safeguards and mitigation measures	C	O	D
SO4	Gypsum should be used to treat sodic soils as required.	C		
SO5	Best Management Practices (BMPs) should be employed where applicable to reduce the risk of erosion and sedimentation control: <ul style="list-style-type: none"> <li>• Integrate project design with any site constraints.</li> <li>• Preserve and stabilise drainageways.</li> <li>• Minimise the extent and duration of disturbance.</li> <li>• Control stormwater flows onto, through and from the site in stable drainage structures.</li> <li>• Install perimeter controls.</li> <li>• Stabilise disturbed areas promptly.</li> <li>• Protect steep slopes.</li> <li>• Employ the use of sediment control measures to prevent off and on-site damage.</li> <li>• Protect inlets, storm drain outlets and culverts.</li> <li>• Provide access and general construction controls.</li> </ul>	C	O	D
SO6	Inspect and maintain sediment and erosion control measures regularly.	C	O	D
WA1	All staff would be appropriately trained through toolbox talks for the minimisation and management of accidental spills.	C	O	D
WA2	All fuels, chemicals, and liquids would be stored at least 50 m away from any waterways or drainage lines and would be stored in an impervious bunded area.	C	O	D
WA3	Adequate incident management procedures will be incorporated into the Construction and Operation Environmental Management Plans, including requirement to notify EPA for incidents that cause material harm to the environment (refer s147-153 Protection of the Environment Operations Act).	C	O	D
WA4	The refuelling of plant and maintenance of machinery would be undertaken in impervious bunded areas.	C	O	D
WA5	Machinery would be checked daily to ensure there is no oil, fuel or other liquids leaking from the machinery. All staff would be appropriately trained through toolbox talks for the minimisation and management of accidental spills.	C		D

No.	Safeguards and mitigation measures	C	O	D
WA6	Emergency management procedures will be prepared in consultation with Council and SES.	C	O	
TT1	<p>A Haulage Plan would be developed and implemented during construction and decommissioning, including but not limited to:</p> <ul style="list-style-type: none"> <li>• Assessment of road routes to minimise impacts on transport infrastructure.</li> <li>• Scheduling of deliveries of major components to minimise safety risks (on other local traffic).</li> <li>• Traffic controls (signage and speed restrictions etc.).</li> <li>• All vehicles associated with construction and operation of the solar farm development will be provided with instructions not to use Redbank Road. In addition, temporary signs will be installed at the northern end of Redbank Road, at the site exit, to further reinforce this message.</li> </ul>	C	O	D
TT2	<p>A Traffic Management Plan would be developed and implemented during construction and decommissioning. The plan would include, but not be limited to:</p> <ul style="list-style-type: none"> <li>• Prior to construction, a pre-conditioning survey of the relevant sections of the existing road network, to be undertaken with Council.</li> <li>• Assessment of road condition prior to construction on all local roads that would be utilised.</li> <li>• A program for monitoring road condition, to repair damage exacerbated by the construction and decommissioning traffic.</li> <li>• The designated routes of construction traffic to the site.</li> <li>• Carpooling/shuttle bus arrangements to minimise vehicle numbers during construction.</li> <li>• Scheduling of deliveries.</li> <li>• Community consultation regarding traffic impacts for nearby residents.</li> <li>• Consideration of cumulative impacts.</li> <li>• Traffic controls (speed limits, signage, etc.).</li> <li>• Procedure to monitor traffic impacts and adapt controls (where required) to reduce the impacts.</li> </ul>	C		D



No.	Safeguards and mitigation measures	C	O	D
	<p>Providing a contact phone number to enable any issues or concerns to be rapidly identified and addressed through appropriate procedures.</p> <p>Water to be used on unsealed roads to minimise dust generation through increased traffic use.</p>			
TT3	<p>The proponent would consult with Wagga Wagga City Council regarding the proposed upgrade to the intersection of Mitchell Road and Ashfords Road to allow for a Basic Right Turn (BRT) turning treatment.</p> <p>The upgrade would be subject to detailed design and would be designed and constructed to the relevant Australian road design standards.</p> <p>See Appendix J for proposed intersection design.</p>	<b>C</b>		
TT4	<p>The proponent would consult with Wagga Wagga City Council regarding the proposed upgrade to the intersection of Ashfords Road and Boiling Down Road to be widened slightly on the eastern side of Ashfords Road to accommodate the movement of heavy vehicles.</p> <p>The upgrade would be subject to detailed design and would be designed and constructed to the relevant Australian road design standards.</p> <p>See Appendix J for proposed intersection design.</p>	<b>C</b>		
TT5	<p>The proponent would repair any damage resulting from project traffic (except that resulting from normal wear and tear) as required at the proponent's cost.</p>	<b>C</b>		<b>D</b>
TT6	<p>Construction, operational and decommissioning traffic is not to deter from the approved heavy vehicle access route (Sturt Hwy, Elizabeth Avenue, Inglewood Road, Mitchell Road and Ashfords Road) Access via Gregadoo Road and Redbank Road is not permitted at any time.</p>	<b>C</b>	<b>O</b>	<b>D</b>
AQ1	<p>Development of a complaints procedure to promptly identify and respond to issues generating complaints.</p>	<b>C</b>	<b>O</b>	<b>D</b>
AQ2	<p>Protocols to guide vehicle and construction equipment use, to minimise emissions would be included in construction and operational environmental management plans. This would include but not be limited to Australian standards and POEO Act requirements.</p>	<b>C</b>	<b>O</b>	<b>D</b>
AQ3	<p>During construction, operation and decommissioning, dust would be managed to prevent dust leaving the development site. This includes dust from stockpiled materials.</p>	<b>C</b>	<b>O</b>	<b>D</b>
EM1	<p>All design and engineering would be undertaken by qualified competent persons with the support of specialists as required.</p>	<b>C</b>		

No.	Safeguards and mitigation measures	C	O	D
EM2	All electrical equipment would be designed in accordance with relevant codes and industry best practice standards in Australia.	C		
EM3	Transmission lines would be located as far as practical from residences, farm sheds, and yards in order to reduce the potential for both chronic and acute exposure to EMFs.	C		
EM4	Design of electrical infrastructure would minimise EMFs (underground).	C		
EM5	<p>BESS design is to conform with the following:</p> <ul style="list-style-type: none"> <li>• End-to-end spacing (short side) of BESS containerised units shall be a minimum of 600 mm</li> <li>• Back-to-back spacing (long side) of BESS containerised units shall be a minimum of 150 mm</li> <li>• Spacing between BESS container accumulations (i.e. 4 containerised units) shall be a minimum of 2.5 m.</li> <li>• Prior to construction, the total area required for the BESS units shall be verified against the available space to demonstrate there is adequate area to achieve the required spacing.</li> <li>• The BESS containerised units shall be provided with the fire protection system specified by the BESS manufacturer.</li> <li>• The vent covers of the BESS shall be constructed of non-combustible material.</li> <li>• The vents shall not be located above battery packs within the BESS container.</li> </ul>	C		
EM6	Prior to commissioning, the UL test data for the selected battery units shall be made available to the DPHI.			D
SE1	<p>A Community Consultation Plan would be implemented during prior to construction commencing to manage impacts to community stakeholders for the life of the project, including but not limited to:</p> <p>Protocols to keep the community updated about the progress of the project and project benefits.</p> <p>Protocols to inform relevant stakeholders of potential impacts (haulage, noise etc.).</p> <p>Protocols to respond to any complaints received.</p> <p>The objectives of the Community Consultation Plan are to:</p>	C	O	

No.	Safeguards and mitigation measures	C	O	D
	<ul style="list-style-type: none"> <li>• Ensure ongoing and transparent engagement with those who are directly impacted, as well as the broader community and other key stakeholders.</li> <li>• Build trust and relationships with those who are directly impacted, and well as other key stakeholders</li> <li>• Develop a sense of local ownership of the Project</li> <li>• Deliver an agreed and clear Community Benefits Scheme through a participatory approach with Council and the broader community</li> <li>• Ensure provision of an effective complaints process</li> <li>• Adaptively respond to emerging community concerns and changes in the social environment.</li> </ul>			
SE2	Liaison with local industry representatives to maximise the use of local contractors, manufacturing facilities, materials.	<b>C</b>	<b>O</b>	
SE3	<p>Liaison with local representatives regarding accommodation options for staff, to minimise adverse impacts on local services.</p> <p>An accommodation and Employment Strategy would be implemented prior to construction to address local participation and accommodation of the construction workforce.</p> <p>The strategy will be developed in partnership with key local stakeholders including:</p> <ul style="list-style-type: none"> <li>• Wagga Wagga Regional Council</li> <li>• Wagga Local Aboriginal Land Council</li> <li>• Economic development and industry support agencies (e.g., Regional Development Australia, Wagga Wagga Business Chamber, Industry Capability Network, Charles Sturt University)</li> </ul> <p>The strategy is to be generally in accordance with the recommendations outlined in <i>Social Impact Analysis Gregadoo Solar Farm Increase Modification</i> (NGH 2022), Chapter 5.2.1.</p>	<b>C</b>		<b>D</b>
SE4	Liaison with local tourism industry representatives to manage potential timing conflicts or cooperation opportunities with local events.	<b>C</b>		<b>D</b>

No.	Safeguards and mitigation measures	C	O	D
WM1	<p>A Waste Management Plan (WMP) would be developed and implemented during construction, operation and decommissioning to minimise waste. It would include but not be limited to:</p> <ul style="list-style-type: none"> <li>• Identification of opportunities to avoid, reuse and recycle, in accordance with the waste hierarchy.</li> <li>• Quantification and classification of all waste streams.</li> <li>• Provision for recycling management onsite.</li> <li>• Provision of toilet facilities for onsite workers and how sullage would be disposed of (i.e., pump out to local sewage treatment plant).</li> <li>• Tracking of all waste leaving the site.</li> <li>• Disposal of waste at facilities permitted to accept the waste.</li> <li>• Requirements for hauling waste (such as covered loads).</li> </ul>	<b>C</b>	<b>O</b>	<b>D</b>
BF1	<p>A Bush Fire Management Plan would be developed and implemented during construction, operation and decommissioning, with input from the RFS, and include but not be limited to:</p> <ul style="list-style-type: none"> <li>• Management of activities with a risk of fire ignition.</li> <li>• Management of fuel loads onsite.</li> <li>• Storage and maintenance of firefighting equipment, including siting and provision of adequate water supplies for bush fire suppression.</li> <li>• The below requirements of Planning for Bush Fire Protection 2006:</li> <li>• Identifying asset protection zones.</li> <li>• Providing adequate egress/access to the site.</li> <li>• Emergency evacuation measures.</li> <li>• Operational procedures relating to mitigation and suppression of bush fire relevant to the solar farm.</li> </ul>	<b>C</b>	<b>O</b>	<b>D</b>
HH1	<p>Should an item of historic heritage be identified, the Heritage Division (OEH) would be contacted prior to further work being carried out in the vicinity.</p>	<b>C</b>	<b>O</b>	<b>D</b>

**DEVELOPMENT CONSENT****Definitions**

EIS The environmental impact statement for Gregadoo Solar dated 13 April 2018, the associated response to submissions dated 25 July 2018 and additional information provided by the Applicant dated 8 August, 28 August and 7 September 2018, as modified by:

- Gregadoo Solar Farm Modification Application Mod 2 Report dated 8 February 2021;
- Gregadoo Solar Farm Modification 3 Application dated 6 July 2023; and
- Gregadoo Solar Farm Modification 4 dated 27 September 2004.

**SCHEDULE 3****ENVIRONMENTAL CONDITIONS – GENERAL****BATTERIES****Battery Storage Restriction**

1. ~~Battery storage is not permitted on the project site.~~

~~Note: Nothing in this condition prevents the Applicant from seeking to modify the consent to permit battery storage in the future.~~

**TRANSPORT****~~Over-Dimensional and~~ Heavy Vehicle Restrictions**

2. The Applicant must ensure that the:

(a) development does not generate more than:

- > ~~50-120~~ heavy vehicle movements a day during construction, upgrading or decommissioning;
- > ~~2-4 over-dimensional vehicle~~ heavy vehicle requiring escort movements during construction, upgrading and decommissioning; and
- > 6 heavy vehicle movements a day during operations; on the public road network;

(b) length of any vehicles (excluding over-dimensional vehicles) used for the development does not exceed 19 metres, unless the Secretary agrees otherwise.

3. The Applicant must keep accurate records of the number of over-dimensional and heavy vehicles entering or leaving the site each day.



**APPENDIX 1:**  
**GENERAL LAYOUT OF DEVELOPMENT**

(See attached plan)



# APPENDIX D

## Community Engagement



# APPENDIX E

## Aboriginal Heritage Due Diligence Assessment



# APPENDIX F

## Traffic Impact Assessment



# APPENDIX G

## Visual Impact Assessment



# APPENDIX H

## Noise Impact Assessment



# APPENDIX I

## Biodiversity Development Assessment Report



# APPENDIX J

## Preliminary Hazard Analysis



