MODIFICATION 4 - AMENDMENT REPORT

Gregadoo Solar Farm

Gregadoo Solar Farm Pty Ltd

Job No: 222222-R01

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25 September 2025

Premise

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ABBREVIATIONS

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

Abbreviation	Abbreviated term
TIA	Traffic Impact Assessment
TfNSW	Transport for New South Wales
VIA	Visual Impact Assessment
Units of Measurement	
°C	degrees Celsius
dB(A)	A-weighted decibel
MW	Megawatt
MWh	Megawatt hours
Acronyms	
AC	Alternating Current
Ha	Hectare
M	Metres
m/s	Metres per second
ML	Megalitre

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EXECUTIVE SUMMARY

Introduction

Premise has been commissioned by Gregadoo Solar Farm Pty Ltd to prepare an application to amend Modification 4 to the approved Gregadoo Solar Farm (SSD 8825) at 123 Redbank Road, 211 Redbank Road and 50 Ashfords Road, Gregadoo, being Lot 42 DP1303215, Lot 43 DP1303215 and Lot 1 DP524499.

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.

Modification 4 sought to optimise the approved Gregadoo Solar Farm by incorporating a Battery Energy Storage System (BESS) within the approved development footprint while maintaining a power output of 65 MW(AC). Modification 4 also sought to create an additional access point and internal access track from Boiling Down Road to the approved transmission line to enable construction and maintenance works while avoiding impacts on Boiling Down Creek and the adjoining riparian corridor.

Modification 4 was submitted to the Department of Planning, Housing and Infrastructure (DPHI) in late October 2024 and publicly exhibited from 19 November 2024 until 2 December 2024.

Since exhibition, the design has been further refined, including the relocation of the proposed BESS from the southwest corner of the approved development footprint to the southeast corner adjacent to the approved solar farm substation, and an update to the Schedule of Lands following subdivision of Lot 11 DP1043022.

The proposed BESS will continue to provide a generation capacity of up to 200 MWAC and 400 MWh. It will remain fully contained within the approved development footprint, and all associated infrastructure has been adjusted to reflect the new location.

Further, since exhibition, Lot 11 DP1043022 has been subdivided consistent with Development Consent SSD 8825, as shown in Appendix 5: Subdivision and described in Schedule 2, Condition 13, creating Lot 42 DP1303215 and Lot 43 DP1303215. Modification 4 as amended seeks to update the Schedule of Lands to reflect the subdivision of Lot 11 DP1043022,

The subdivision of Lot 11 DP1043022 amounts to the physical commencement of Development Consent SSD 8825 within the meaning of section 4.53(4) of the *Environmental Planning and Assessment Act 1979*.

This document constitutes the Amendment Report for Modification 4 as amended to the approved Gregadoo Solar Farm (SSD 8825). It has been prepared in accordance with the *State Significant Development Guidelines – Preparing an Amendment Report* (DPE, 2022). The Amendment Report provides an updated description and holistic assessment of Modification 4 as amended, including the potential impacts of the revised location of the proposed BESS.

The Amendment Report has been prepared concurrently with the Response to Submissions (RtS) Report for Modification 4. The RtS Report has been considered in preparing this Amendment Report.

Environmental Issues

In accordance with the requirements of the State *Significant Development Guidelines – Preparing an Amendment Report*, a review has been undertaken of the key environmental issues previously identified in the Environmental Impact Statement (EIS), Modification Reports 2 and 3, and assessment reports prepared by the Department of Planning and Environment (DPE).

The Amendment Report has updated the relevant technical studies to reflect the proposed changes. These updated assessments confirm that the results are consistent with earlier findings and that the amended project will not materially alter the nature or scale of environmental impacts.

The following matters were reviewed:

- Noise and Vibration – potential impacts from construction and operation of the BESS and construction of the internal access track on nearby receivers.
- Hazards and Risk – potential hazards associated with construction and operation of the BESS on the site and surrounding landscape.
- Biodiversity – potential impacts from the construction of the internal access track and access point.
- Visual Impact – potential effects associated with the construction and operation of the BESS on adjacent receivers.
- Aboriginal Cultural Heritage – potential impacts from the construction of the internal access track and access point.
- Traffic and Transport – potential impacts of additional construction traffic on the local road network.

Each matter is addressed in detail in the body of this report, with updated assessments provided in the appendices.

In summary, it is considered that the Modification 4 as amended 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 the need for fundamental change in the State's electricity system, noting that traditional generators are ageing, transmission is congested, and electricity prices continue to pressure households and businesses. These challenges have informed the preparation of Government policies, including the NSW Electricity Strategy, which seeks to deliver reliability, affordability, and sustainability in the electricity supply sector.

The amended Gregadoo Solar Farm will make a material contribution to the provision of renewable energy in NSW and will facilitate private investment in the State's electricity system over the coming decades. With an anticipated operational lifespan of approximately 30 years, the project will contribute directly to the NSW Government's three core electricity objectives: reliability, affordability, and sustainability.

The project also supports the transition from a centralised, fossil-fuel based generation system to a dispersed, renewable generation system, consistent with broader State planning objectives. In addition, it will generate local economic benefits through job creation during construction and operation and through the provision of affordable renewable electricity.

Conclusion

The assessments presented in this report indicate that the proposed Modification 4 as amended 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 assessments undertaken for this Amendment Report confirm that Modification 4 as amended warrants approval. The project will deliver clear benefits at the local, regional, and State levels, contributing meaningfully to renewable energy targets and supporting the transition to a more sustainable electricity system.

The supporting technical studies and memoranda demonstrate that the proposed amendments will not materially increase environmental impacts. Any residual impacts remain manageable through the application of established mitigation and management measures.

Modification 4 as amended is consistent with the objects of the EP&A Act, the relevant matters for consideration under the EP&A Act, and the principles of Ecologically Sustainable Development.

In summary, the amended project will not result in any material change to the scale or significance of environmental impacts at either the local or regional level. On this basis, it is concluded that the project remains environmentally acceptable and is in the public interest.

1. INTRODUCTION

1.1 Overview

Premise has been commissioned by Gregadoo Solar Farm Pty Ltd to prepare an application to amend Modification 4 to the approved Gregadoo Solar Farm at 123 Redbank Road, 211 Redbank Road and 50 Ashfords Road, Gregadoo, being Lot 42 DP1303215, Lot 43 DP1303215 and Lot 1 DP524499 (the 'development site').

This report has been prepared in accordance with *State Significant Development Guidelines – preparing an amendment report – Appendix D to the State Significant Development Guidelines* (DPIE, 2022).

The report is set out in the following format:

- **Executive summary**.
- **Section 1**: Introduction of this report provides a general introduction, including the applicant's details, a short summary of the approved project, a description of the proposed modifications and a summary of the environmental issues associated with the Amendment to Modification 4.
- **Section 2**: Strategic Context of this report provides a description of strategic context relevant to the Gregadoo Solar Farm and the Amendment to Modification 4.
- **Section 3**: Description of the Amendments describes the proposed amendments to Modification 4.
- **Section 4**: Statutory Context details the statutory planning framework applicable to the Gregadoo Solar Farm and the Amendment to Modification 4.
- **Section 5**: Community Engagement provides a summary of the community engagement process that has been undertaken for the Amendment including for the Response to Submission 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 changes proposed by the Amendment to Modification 4.
- **Section 7**: Justification provides the justification for the Amendment to 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 applicant ABN is 62 621 818 862 and their business address is Suite 101, Level 1, 15 Blue Street, North Sydney, NSW, 2060, Australia.

Hanwha Energy Australia 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 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 CO2-e pa (assuming grid Emissions Intensity of 0.6 tCO2-e/MWh).

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 and Modification 3 to the Development Consent were subsequently approved by the DPE under the delegation of the Minister on 5 March 2021 (**Table 1**) and 22 August 2023 (

Table 2), respectively.

A description of the approved project is provided at **Table 3** and illustrated at **Figure 1**.

Since submitting Modification 4, Lot 11 DP1043022 has been subdivided consistent with Development Consent SSD 8825, as shown in Appendix 5: Subdivision and described in Schedule 2, Condition 13, creating Lot 42 DP1303215 and Lot 43 DP1303215.

The subdivision of Lot 11 DP1043022 amounts to the physical commencement of Development Consent SSD 8825 within the meaning of section 4.53(4) of the *Environmental Planning and Assessment Act 1979* (the EP&A Act).

Consistent with the principles in *Hunter Development Brokerage Pty Ltd v Cessnock City Council*; *Tovedale Pty Ltd v Shoalhaven City Council [2005] NSWCA 169*, survey work that is substantive, genuine, and directly connected to the approved subdivision qualifies as "engineering work" capable of establishing commencement. As such, the registration of Lot 42 and Lot 43 demonstrates that SSD 8825 has been physically commenced and therefore the consent remains valid and will not lapse.

Table 1 – Gregadoo Solar Farm – Modification 2

Proposed change	Description
Change of capacity	Alter capacity from 47MW (undefined) to 43MW$_{AC}$
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 **Note:** 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).

Table 2 – Gregadoo Solar Farm – Modification 3

Proposed change	Description
Change of capacity	Increase the AC capacity from 43MW$_{AC}$ to 65MW$_{AC}$ and increase DC capacity from ~52MW$_{DC}$ to ~75MW$_{DC}$.
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.

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)
Invertor 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

Premise

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Gregadoo Solar Farm

Figure 1
Approved Development

Legend

- Project Area
- Development Footprint
- Landholder Subdivision
- Indicative Visual Screening
- Indicative Internal Road
- Indicative Construction Compound/Laydown Area
- Indicative Temporary Construction Facilities
- Indicative Array Layout
- Indicative Substation
- Indicative Overhead Connection Easement
- Indicative Underground Connection Easement
- 132kV — Indicative Solar Farm 132kV Overhead Transmission Line
- 132kV — Indicative Solar Farm 132kV Underground Transmission Line
- 132kV — Transgrid 132kV Transmission Lines
- 330kV — Transgrid 330kV Transmission Lines
- Transgrid 132kV Easement
- Cadastre
- Road

0 100 200m

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1.4 Description of Amendment

Modification 4, submitted in October 2024, sought to optimise the approved Gregadoo Solar Farm by incorporating a Battery Energy Storage System (BESS) within the approved development footprint, while maintaining a solar generation capacity of 65 MW_{AC}. The proposed BESS had a capacity of up to 200 MW_{AC} / 400 MWh.

Modification 4 also included 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, designed to enable construction and maintenance without impacting Boiling Down Creek or the adjoining riparian corridor.

Since that time, the design has been further refined to relocate the proposed BESS from the southwest corner to the southeast corner of the development footprint, adjacent to the approved solar farm substation. Minor adjustments to internal access tracks are also proposed to enable efficient construction and maintenance in the new location, while ensuring compliance with environmental protections for Boiling Down Creek and the riparian corridor.

Finally, Modification 4 as amended seeks to update the Schedule of Lands to reflect the subdivision of Lot 11 DP1043022, creating Lot 42 DP1303215 and Lot 43 DP1303215. This subdivision is consistent with Development Consent SSD 8825, as shown in Appendix 5: Subdivision and described in Schedule 2, Condition 13.

The proposed amendment is illustrated in **Figure 2**.

In summary, this amendment does not alter the overall objectives, generation capacity, or external connection arrangements of Modification 4. It solely involves the relocation of the BESS within the approved footprint, with minor associated track adjustments, to optimise site functionality and reduce potential environmental impacts.

1.5 Proposed Modification 4

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

The 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_{AC}.

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 infrastructure including switchgear, protection and control equipment, metering, reactive power equipment, filtering equipment, auxiliary/earthing transformers, and enclosures/buildings for housing equipment;
- Underground and overhead 132 kV 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, and lighting;
- Utilisation of approved site access arrangements.

The BESS has been designed to utilise the approved Gregadoo Solar Farm substation and 132 kV underground and overhead powerlines connecting to the existing Wagga Wagga TransGrid Substation.

In addition, Modification 4 as amended seeks to include an additional access point and internal access track. This infrastructure is required to facilitate the construction and maintenance of the approved overhead and underground transmission line without impacting Boiling Down Creek or the adjoining riparian corridor.

Finally, Modification 4 as amended seeks to update the Schedule of Lands to reflect the subdivision of Lot 11 DP1043022, creating Lot 42 DP1303215 and Lot 43 DP1303215. This subdivision is consistent with Development Consent SSD 8825, as shown in Appendix 5: Subdivision and described in Schedule 2, Condition 13.

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

- Addition of a BESS with a generation capacity of 200 MWAC and 400 MWh, located in the southeast corner of the approved development footprint;
- 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;
- 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.
- Minor changes to the wording of the consent to reflect the subdivision of Lot 11 DP1043022.

A revised project description is provided at **Appendix A**. A revised general layout plan is provided at **Appendix C**.

As a consequence of these changes, Modification 4 as amended seeks to change the Development Consent and associated conditions as follows:

- 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, defined as "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 during construction, upgrading, and decommissioning, and to increase the number of over-dimension vehicle movements per day from 2 to 4;
- Amend all references to over-dimensional vehicle/s in Schedule 3 Condition 2 of the Development Consent to Heavy vehicle/s requiring escort;
- Amend Appendix 1 to include an updated overall layout plan.
- Amend Appendix 2 to remove Lot 11 DP1043022 and include Lot 42 DP1303215 and Lot 43 DP1303215.

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

Bakers Lane Temporary Hardstand Area

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Gregadoo Solar Farm

Figure 2
Modification 4 As Amended

Legend

- Project Area
- Development Footprint
- Indicative Visual Screening
- Indicative Sealed Road
- Indicative Gravel/Dirt Road
- Indicative Construction Compound/Laydown Area
- Indicative Temporary Construction Facilities
- Indicative Asset Protection Zone
- Indicative Array Layout
- Indicative BESS
- Indicative Substation
- Indicative Overhead Connection Easement
- Indicative Underground Connection Easement
- Indicative Solar Farm 33kV Underground Connection Route
- Indicative BESS Connection Route
- Indicative Solar Farm 132kV Overhead Transmission Line
- Indicative Solar Farm 132kV Underground Transmission Line
- 132kV Transgrid 132kV Transmission Lines
- 330kV Transgrid 330kV Transmission Lines
- Transgrid 132kV Easement
- Cadastre
- Road

0 100 200m

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1.6 The Site and Locality

1.6.1 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 (km) southeast of the Wagga Wagga Central Business District (CBD).

Specifically, the development site includes 123 Redbank Road, 211 Redbank Road and 50 Ashfords Road, Gregadoo, being Lot 42 DP1303215, Lot 43 DP1303215 and Lot 1 DP524499.

The development site is generally bound by farmland 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 approved development site and its existing conditions are depicted in **Figure 1**.

1.6.2 THE LOCALITY

The development site is located approximately 500 m 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 3**.

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Gregadoo Solar Farm

Figure 3
Local Context

Legend

- Project Area
- Development Footprint
- Major Road
- Railway
- Runway
- Named Water Body
- Named Watercourse

0 1 2km

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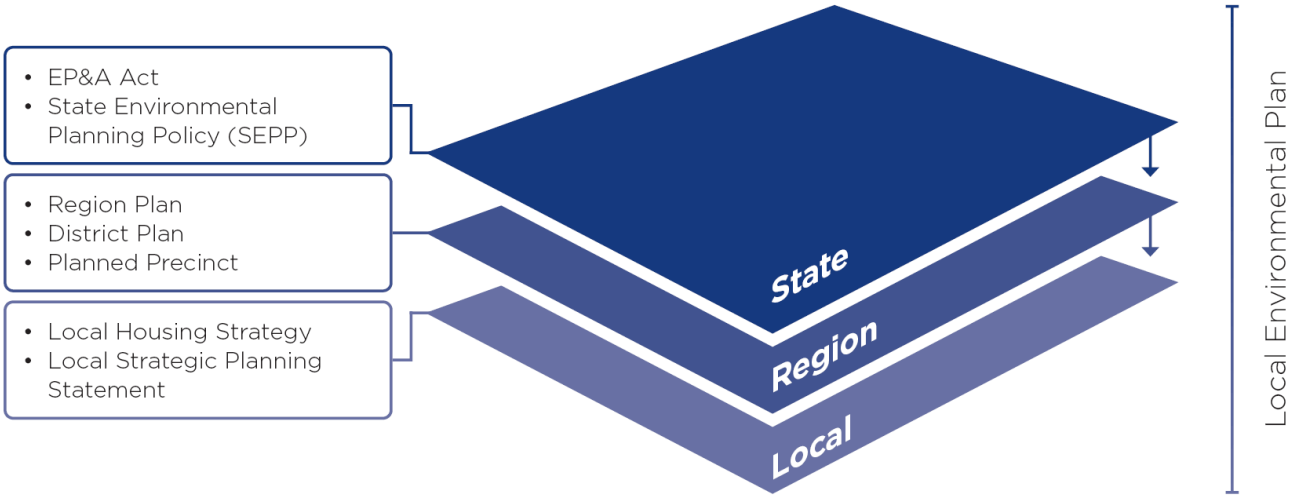
2. STRATEGIC CONTEXT

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 4.

Figure 4 – 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.

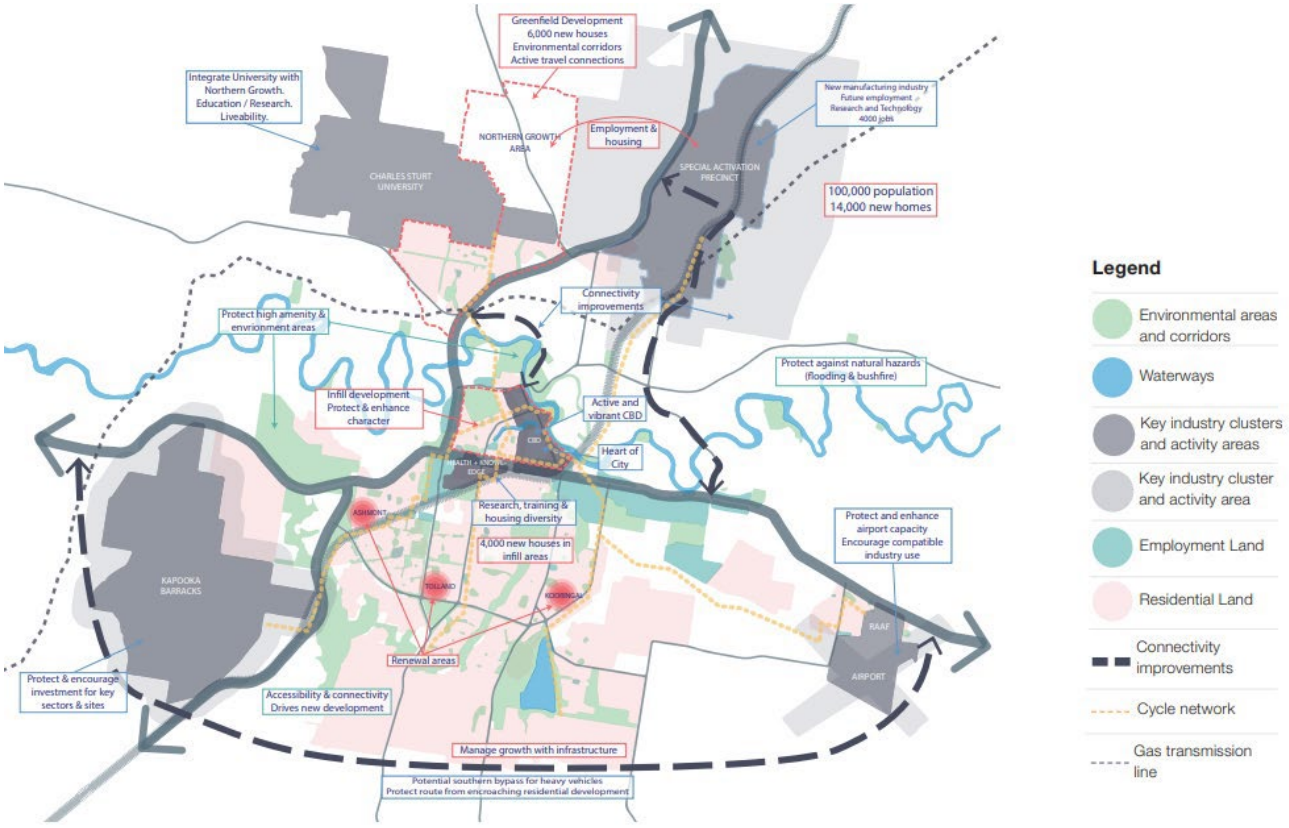
Within Theme 2: The growing economy, the LSPS outlines that the State Government has identified renewable energy as an industry with specific potential in or around Wagga Wagga and that renewable energy projects will be supported in the area with the traditional industrial base and other potential industries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

The Wagga Wagga structure plan (**Figure 5**) 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 5 – 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 1,200 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 Modification 4 as amended. 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 Modification 4 as amended.

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

3. DESCRIPTION OF THE AMENDMENT

3.1 Description of Amendment

Modification 4, submitted in October 2024, sought to optimise the approved Gregadoo Solar Farm by incorporating a Battery Energy Storage System (BESS) within the approved development footprint, while maintaining a solar generation capacity of 65 MW_{AC}. The proposed BESS had a capacity of up to 200 MW_{AC} / 400 MWh.

Modification 4 also included 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, designed to enable construction and maintenance without impacting Boiling Down Creek or the adjoining riparian corridor.

Since that time, the design has been further refined to relocate the proposed BESS from the southwest corner to the southeast corner of the development footprint, adjacent to the approved solar farm substation. Minor adjustments to internal access tracks are also proposed to enable efficient construction and maintenance in the new location, while ensuring compliance with environmental protections for Boiling Down Creek and the riparian corridor. The proposed amendment is illustrated **Figure 2**.

In summary, this amendment does not alter the overall objectives, generation capacity, or external connection arrangements of Modification 4. It solely involves the relocation of the BESS within the approved footprint, with minor associated track adjustments, to optimise site functionality and reduce potential environmental impacts.

The proposed amendment to Modification 4 does not alter the original description of Modification 4, which remains valid, it only refines the location of the BESS and therefore requires updating references to this Amendment Report. The original description of Modification 4 is reproduced in **Section 1.5**.

3.2 The Proposed Modification

Modification 4 as amended 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 200MWAC and 400MWh.

In addition, Modification 4 as amended 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 CO2-e pa (assuming grid Emissions Intensity of 0.6 tCO2-e/MWh).

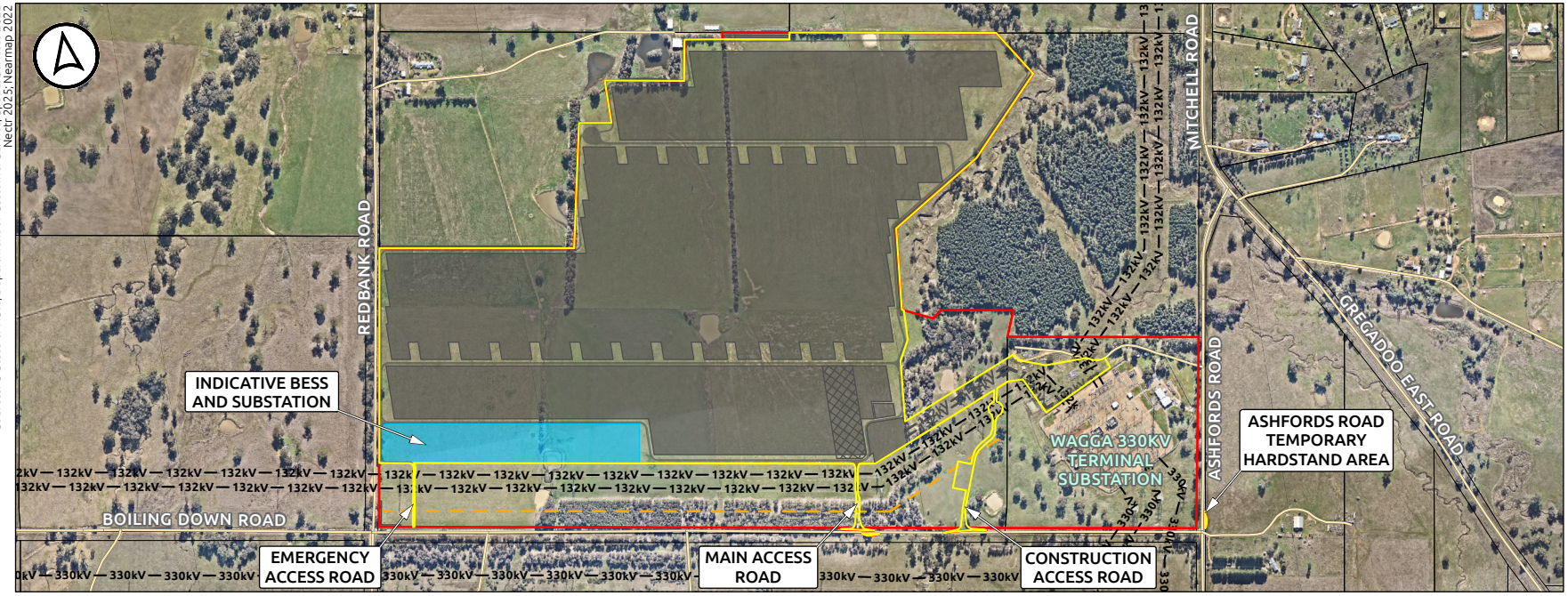
In summary, Modification 4 as amended involves the addition and relocation of a 200 MWAC / 400 MWh BESS within the approved development footprint, the provision of a new site access point and internal access track, and refinements to substation arrangements.

A consolidated project description is provided in **Appendix A**. A revised generally layout plan is provided at **Appendix C**.

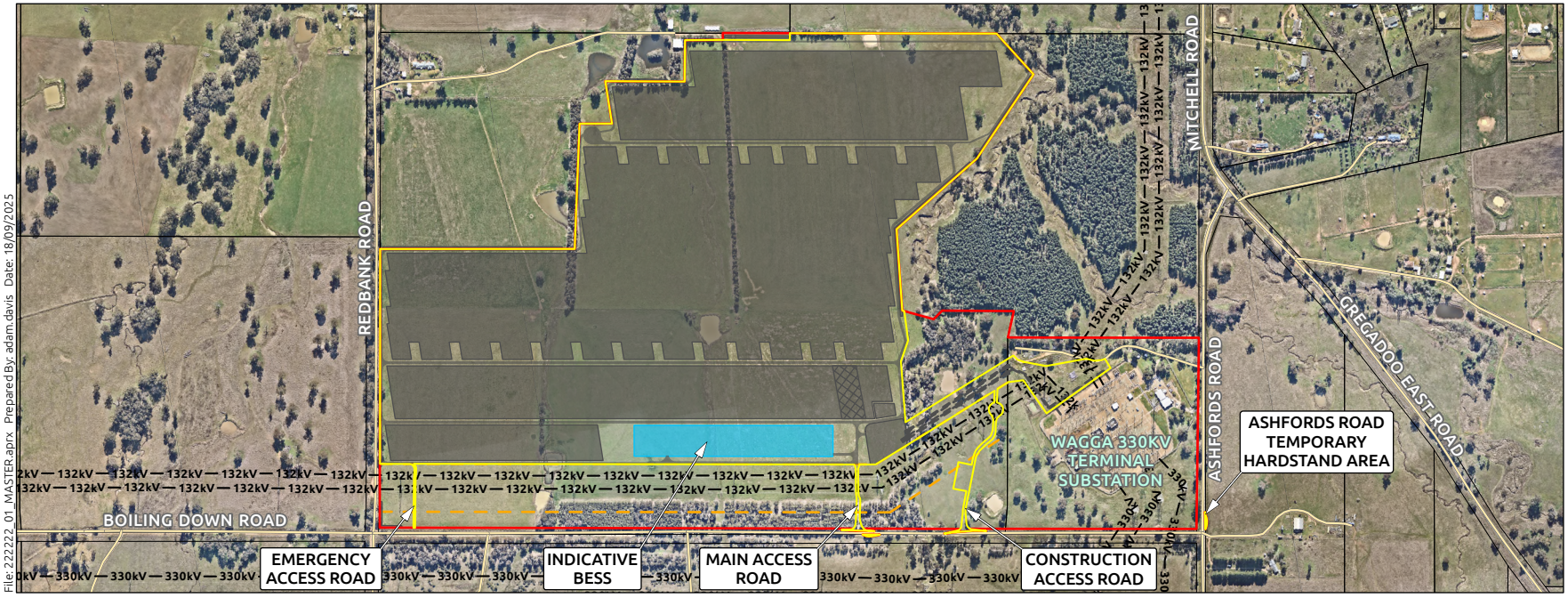
Updated technical assessments confirm that these amendments do not materially increase the environmental impacts of the project beyond those previously assessed.

Table 4 – Amendment to Modification 4 Summary

Item	Approved Project	Modification 4	Modification 4 amended
Project site	153.70 ha	No change	No change
Development footprint	97.48 ha	102.5 ha	No change
Solar Capacity (MW)	65MW(AC)	Solar Farm: 65MW(AC) BESS: 200MW(AC) and 400MWh	No change
Solar panels	134,618 solar panels (up to 2.8m high)	No change	No change
Solar panel spacing	4.95m (centre to centre of bearing columns)	No change	No change
Invertor units	22	No change	No change
BESS	N/A	200 MW/400 MWh	No change
Subdivision	Subdivide Lot 11 DP1043022 and Lot 1 DP524499 (substation)	No change	No change
Transmission line	Overhead and underground	No change	No change
Substation	On-site 132kV with connection to TransGrid's 132 kV substation for solar farm	Additional on-site 132 kV with connection to TransGrid's 132 kV substation (for BESS)	One hybrid 132kV substation (for solar farm and BESS) with connection to TransGrid's 132kV substation
Screening	Vegetation screening along the boundaries of the site	No change	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	No change
Schedule of lands	Lot 11 DP 1043022 and Lot 1 DP 524499	No change	No change



Modification 4



Modification 4 As Amended

Premise

GREGADOO SOLAR FARM PTY LTD

Gregadoo Solar Farm

Figure 6
Modification 4 Site Plan

Legend

- Project Area
- Development Footprint
- Indicative BESS
- 132kV Transgrid 132kV Transmission Lines
- 330kV Transgrid 330kV Transmission Lines
- Transgrid 132kV Easement
- Cadastre
- Road

0 250 500m

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4. STATUTORY CONTEXT

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 Modification 4 as amended remains consistent with the statutory framework that applied when the Gregadoo Solar Farm Modification 4 was submitted in October 2024.

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

4.1.1.1 The Objects of the Act

The objects of the EP&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 as amended 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 design of the Gregadoo Solar Farm which allows power to be stored on site while utilising the approved development footprint more efficiently.

In this regard, it should be acknowledged that relocation the proposed BESS 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 as amended 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 Modification 4 as amended 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 as amended 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 as amended 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 maters referred to a Section 4.15 as are of relevance to the development application, including:

1. 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,

2. The likely impacts of that development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality,
3. The suitability of the site for the development,
4. Any submissions made in accordance with this Act or the regulations,
5. 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 as amended 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.**

4.2 Environmental Planning and Assessment Regulation

Section 113 of the *Environmental Planning and Assessment Regulation 2021* (EP&A Regulation) describes that a modification application may be amended by the applicant at any time before the application is determined.

This report supports the amended modification application for the project and has been prepared having regard to the *State significant development guidelines – preparing an amendment report* (DPE 2022).

It accompanies the Response to Submission Report for the project and describes the amended modification for which approval is now sought, providing a summary of the impacts associated with the amended modification compared to those presented in the Modification 4 report, and presents an updated evaluation of the merits of the project.

This statutory context confirms that the proposed amendment can be validly assessed and determined, and that the accompanying Amendment Report has been prepared in accordance with the requirements of the EP&A Act, the EP&A Regulation, and the State Significant Development Guidelines."

The updated statutory compliance table for Modification 4 as amended is included in **Appendix B**.

5. COMMUNITY ENGAGEMENT

5.1 Overview

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.

The original Environmental Impact Statement (EIS) and subsequent Modification Reports 2, 3, and 4 involved comprehensive consultation with relevant government agencies, stakeholders, and the local community. Feedback from that engagement directly informed the project's design and mitigation measures.

For Modification 4 as amended, bd infrastructure reviewed the nature of the changes and determined that the amendment was minor in scope and would not materially alter the environmental impacts previously assessed. On this basis, no further community or stakeholder engagement was required.

The Department of Planning and Environment's guidelines allow for a proportionate approach to engagement, having regard to the scale and significance of the proposed changes. Given that the amendment solely involves the relocation of the BESS within the existing approved development footprint, together with minor associated access adjustments, the potential impacts are negligible and fall within the scope already considered during earlier consultation.

Accordingly, the original community and stakeholder engagement is considered to remain adequate and appropriate to support the assessment of Modification 4 as amended.

Notwithstanding, it is acknowledged that in their submission, Wagga Wagga City Council raised concerns regarding the adequacy of the Social Impact Assessment (SIA) undertaken for Modification 4. Specifically, Council recommended that the SIA be updated to include a dedicated assessment of worker accommodation requirements, with particular regard to the cumulative impacts of other major infrastructure projects forecast to coincide in the 2026–2027 period.

For the original Modification 4 Report, bd infrastructure was engaged to review the previous SIA prepared by NGH (2022) against the refined project features and determine whether the modification would create new or materially altered social impacts within the locality. This review was documented in Section 5.4 of the Modification Report.

In response to Council's concerns, bd infrastructure prepared a targeted Accommodation Analysis (Appendix E of the RtS) to supplement the earlier SIA. This analysis drew on publicly available data sources, engagement with local real estate agencies, and consultation with accommodation providers across Wagga Wagga. The findings can be summarised as follows:

- Housing availability: Wagga Wagga is currently experiencing a significant housing shortage, with vacancy rates below 1%.
- Incremental demand: The addition of the BESS component is expected to generate a modest increase in workforce demand (approximately 50 additional workers at peak construction). This incremental demand is not forecast to materially exacerbate existing housing stress.
- Cumulative context: Several large-scale infrastructure projects are scheduled to conclude in early 2026. Their completion is expected to release capacity in the local housing and rental market, coinciding with peak construction for the Gregadoo Solar Farm BESS.

- Management strategies: Early procurement of accommodation is recommended, drawing on a diverse range of housing channels. Contingency arrangements in nearby towns may be required, and early engagement with providers will be critical to aligning project timelines with local capacity. Ongoing monitoring of accommodation supply will also ensure resilience during peak demand periods and concurrent community events.

On this basis, while housing pressures are recognised in Wagga Wagga, the incremental workforce associated with the BESS is not expected to create new or significant adverse impacts. With proactive management measures in place, the project can be delivered without compounding broader social housing challenges.

The Applicant is committed to implementing the recommendations of the Accommodation Analysis, including:

- Early and staged booking of accommodation,
- Contingency planning with providers in nearby towns, and
- Coordination with Council and other project proponents to monitor cumulative workforce accommodation needs.

6. ASSESSMENT OF IMPACTS

6.1 Introduction

The Environmental Impact Statement (EIS) for the original Gregadoo Solar Farm Development Application, together with the reports for Modification 2 and 3, identified a range of potential environmental impacts, including surface water, biodiversity, visual impact, land use (including mineral resources), heritage, noise, and land and water impacts. Other potential issues included soils, groundwater and hydrology, traffic and transport, climate and air quality, electromagnetic fields, socio-economic effects, resource use and waste, fire risk, historic heritage, and cumulative impacts. These impacts were found to be manageable with the implementation of appropriate environmental safeguards.

For Modification 4 as amended, a targeted reassessment was undertaken to address the specific potential impacts of the BESS and associated infrastructure. The following matters were identified as requiring further consideration:

- Noise and vibration impact from construction and operation of the BESS;
- Hazards associated with the construction and operation of the BESS;
- Visual impacts associated with the construction and operation of the BESS on nearby receivers;
- Biodiversity impacts from the construction of the internal access track and access point;
- Aboriginal cultural heritage impacts from the construction of the internal access track and access point;
- Traffic and transport impacts from additional construction traffic on the surrounding road network.

Each of these matters is addressed in the following sections, with updated technical assessments provided in the appendices.

The updated technical assessment confirm that Modification 4 as amended does not materially alter the scale or significance of impacts compared with those previously assessed.

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-to-north along the eastern boundary of the project area.

There are two drainage lines, and two dams located within the development footprint. The drainage lines run from south to north and converge with the Boiling Down Creek north of the project area. The westernmost drainage line consists of two first order lines that merge into a 2nd order drainage line within the development footprint. The central drainage line is of 1st order (**Figure 7**).

The site is not located in areas mapped as Flood Prone Land for riverine flooding and only impacted by overland flow from local rainfall events.

6.2.2 APPROVED PROJECT

The original EIS identified that maximum overland flow depths during a probable maximum flood would not exceed 0.8 m and would be confined to two drainage areas and Boiling Down Creek to the east and north of the site. The EIS concluded that the development would be compatible with identified flood hazards.

Water Modelling Solutions (WMS) subsequently provided advice on the flood behaviour of the approved project and Modification 3, drawing on the *Wagga Wagga Major Overland Flow Floodplain Risk Management Study and Plan (MOFFS)* (WMA Water, 2021). Using revised modelling assumptions (Table 5), WMS concluded that the changes proposed under Modification 3 were not materially different from the original layout and were unlikely to yield significantly different flood impacts.

6.2.3 PROPOSED MODIFICATION

Premise reviewed the MOFFS in relation to Modification 4 as amended.

The review identified that the BESS as proposed under Modification 4 was located within a natural drainage depression inundated during the 1% AEP flood event. By comparison, the proposed amended BESS location (Modification 4 as amended) has been shifted to the southeast corner of the site, outside the major drainage depression.

The amended BESS site is located on a minor depression associated with a first-order drainage line (**Figure 7** and **Figure 8**). During the 1% AEP event, modelled flood depths at this location do not exceed 0.15 m and are confined to the existing depression. The overland flow path at the amended BESS site has a modelled width of 36 m, compared to 140 m at the Modification 4 site, indicating substantially reduced exposure.

As with the approved project, localised impacts may occur where internal roads and the BESS platform cross minor flow paths. These effects are expected to remain contained within the site and can be managed using low-level causeways and appropriately sized culverts, consistent with the approved flood management approach for Modification 3.

Table 5 below details the original modelling assumptions from WMA as well as the revised assumptions from Modification 3, Modification 4 and Modification 4 as amended. Effects on flood impact have been anticipated for Modification 4 as amended based on the modelled effects by WMA.

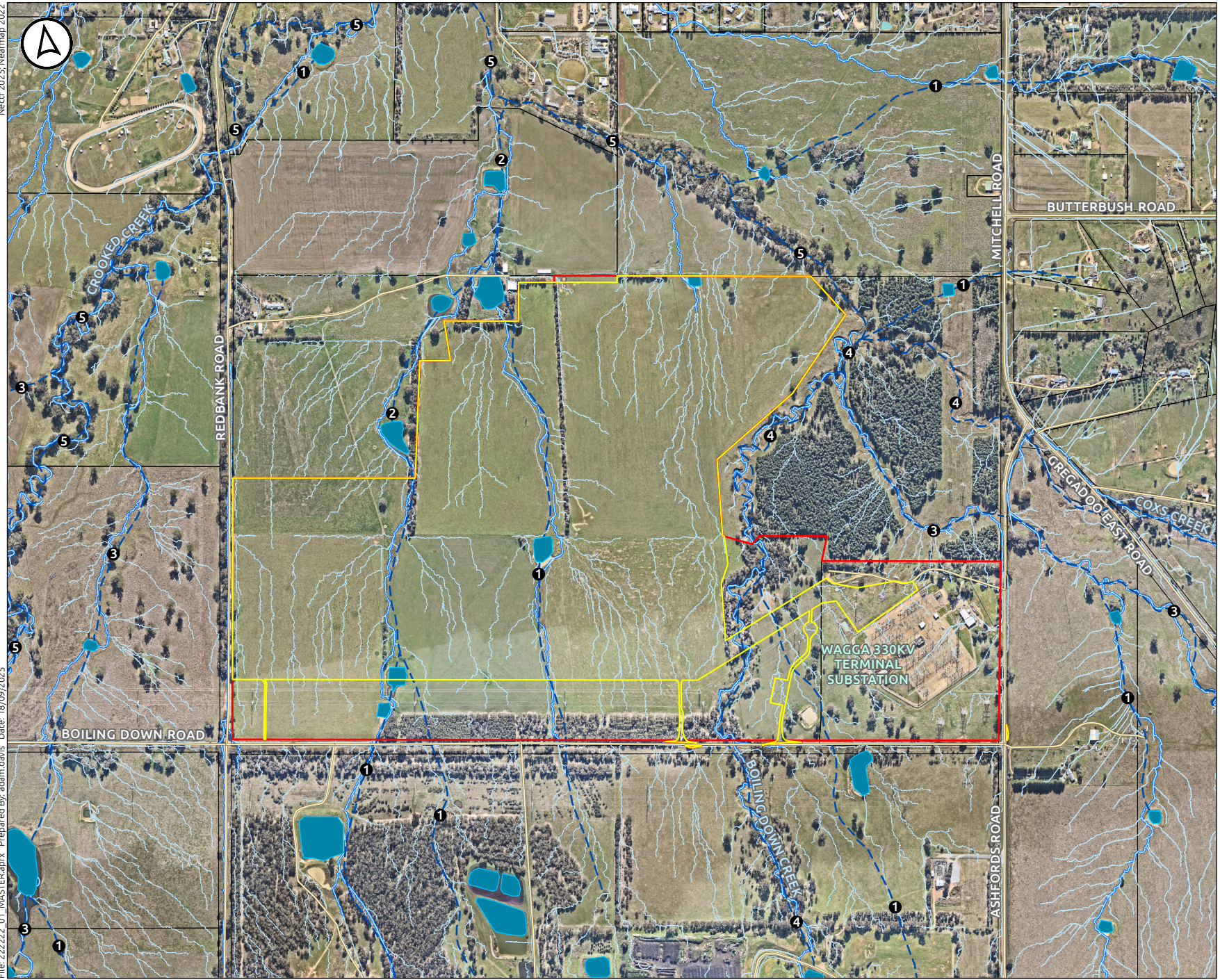
Table 5 – Modelling Assumption Comparison

No.	Element	Original Modelling Assumption (WMA Water, 2018)	Mod 3 Revised Modelling Assumptions	Approved effect on Flood Impact (Mod 3)	Mod 4 Revised Modelling Assumptions	Amendments to Modification 4	Anticipated effects on Flood Impact (Modification 4 Amendment)
1	Filling of three stock dams	Existing embankments will be pushed into dams (See typical section shown in Chart 1, Section 3.2.1).	No change	Unchanged	No change	No change	Unchanged
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 with the site.	Localised impacts where roads cross flow paths, likely to be contained within the site and managed with appropriately sized culverts.	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. The new BESS site has internal roads on both the southern and northern sides. The southern (upstream) internal road has not changed from the	Localised impacts where roads cross flow paths, likely to be contained within the site and managed with appropriately sized culverts. Despite changes to design no changes to effects on flood impact anticipated.

No.	Element	Original Modelling Assumption (WMA Water, 2018)	Mod 3 Revised Modelling Assumptions	Approved effect on Flood Impact (Mod 3)	Mod 4 Revised Modelling Assumptions	Amendments to Modification 4	Anticipated effects on Flood Impact (Modification 4 Amendment)
						approved Modification 3 design.	
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	No change	Unchanged
4	Vegetation Screening	Security fences behind wooded areas are modelled as being 2.3 m high with 50% blockage applied.	Note extended vegetation screening on eastern side of project vs original flood assessment.	Unchanged	No change	No change	Unchanged
5	Solar Panels	A blockage factor of 7% has been applied to the developed site area	• Pile: I-beam 150mm x 180mm • 16 piles per row (~93 m)	Unchanged	No change	No change	Unchanged

No.	Element	Original Modelling Assumption (WMA Water, 2018)	Mod 3 Revised Modelling Assumptions	Approved effect on Flood Impact (Mod 3)	Mod 4 Revised Modelling Assumptions	Amendments to Modification 4	Anticipated effects on Flood Impact (Modification 4 Amendment)
		to represent the solar panel piles. This factor is based on indicative spacing of solar panel piles provided by the developer: • Pile diameter: 0.18 m • 12 piles per row (~92 m) • 2-3 rows per model grid cell (5 m x 5 m)	• 2 rows per model grid cell (5 m x 5 m) • 4.95 m spacing between rows A similar blockage factor (~7%) would be considered appropriate given limited change in pile density				
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 (20 ft container) but will be benched and raised around exterior so	Unchanged	No change	No change	Unchanged

No.	Element	Original Modelling Assumption (WMA Water, 2018)	Mod 3 Revised Modelling Assumptions	Approved effect on Flood Impact (Mod 3)	Mod 4 Revised Modelling Assumptions	Amendments to Modification 4	Anticipated effects on Flood Impact (Modification 4 Amendment)
			assumptions can be left the same.				
7	Internal Substation	Represented in model as an impermeable structure with a footprint of approximately 3,400 m^2.	No change	Unchanged	No change	No change	Unchanged
8	BESS and Substation	Not represented	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.	The BESS location has been updated but is smaller in extent/scale to the Mod 4 design due it not containing a separate substation. Internal roads (150 mm height) are located upstream (south) of the BESS and will impact overland flow more than the BESS.	Localised impacts where the internal roads around the BESS cross flow paths, likely to be contained within the site and managed with appropriately sized culverts. The impact is not anticipated to be greater than what was assessed with the internal roads in the Modification 3 revised modelling assumptions.



Premise

GREGADOO SOLAR FARM PTY LTD

Gregadoo Solar Farm

Figure 7
Existing Hydrological Conditions

Legend

- Project Area
- Development Footprint
- Cadastre
- Road
- Water Body
- Watercourse (Strahler Order)

Modelled Drainage Lines

- Drainage Lines
- Watercourse (Strahler Order =>1)

0 250 500m

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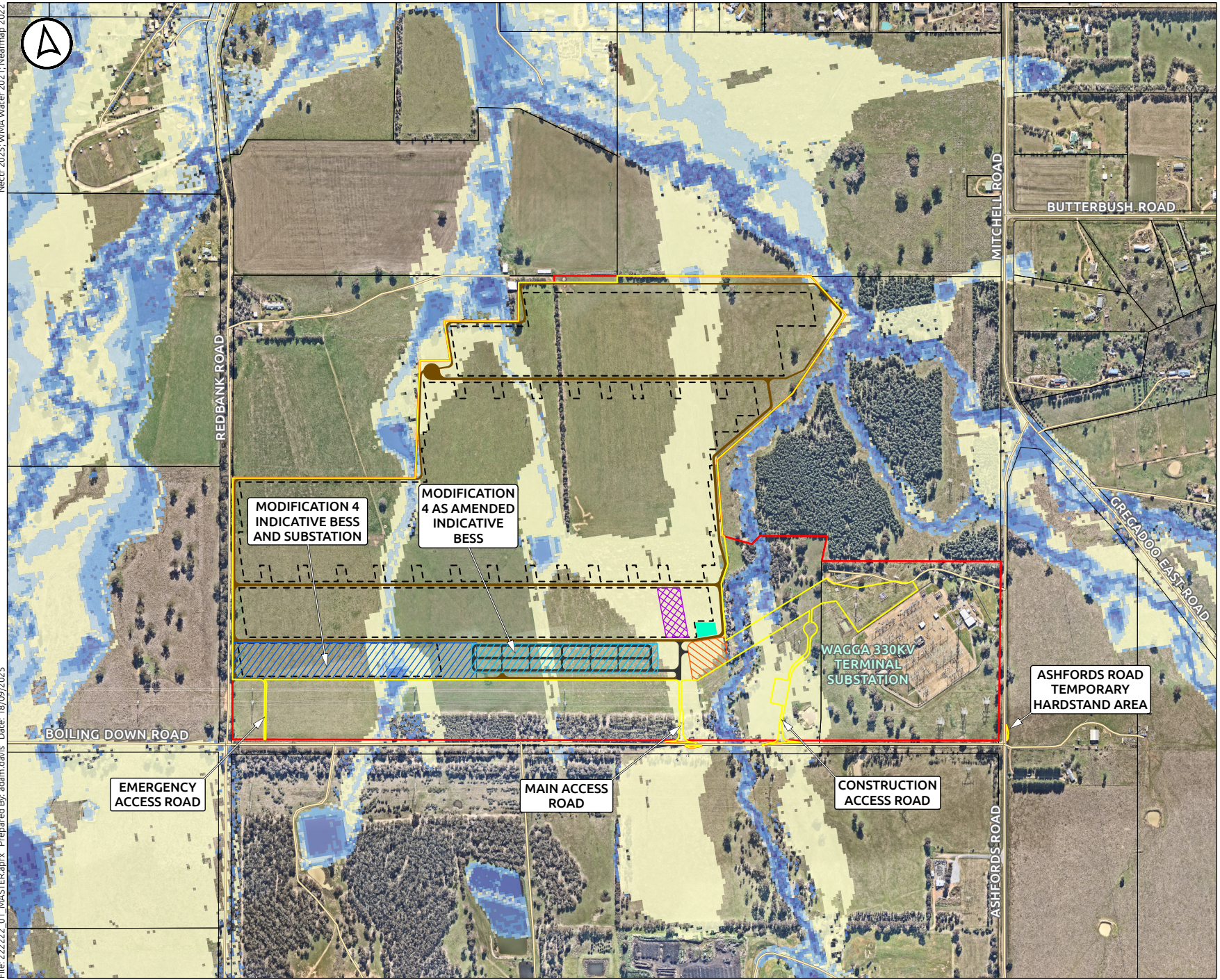

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Premise

GREGADOO SOLAR FARM PTY LTD

Gregadoo Solar Farm

Figure 8
1% AEP Overland Flow

Legend

- Project Area
- Development Footprint
- Indicative Sealed Road
- Indicative Gravel/Dirt Road
- Indicative Construction Compound/Laydown Area
- Indicative Temporary Construction Facilities
- Indicative Array Layout
- Indicative BESS
- Indicative Substation
- Cadastre
- Road

1% AEP Peak Flood Depth (m)

- <0.15
- 0.15 - 0.3
- 0.3 - 0.5
- 0.5 - 1
- 1 - 2
- >2

0 250 500m

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 (*Cypress Callitris glaucophylla*) in the west and north of the development site. The development site consists of two (2) plant community types (PCT) including:

- Blakely's Red Gum-Yellow Box grassy woodland of the NSW South Western Slopes (PCT227).
- 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 lathami*) 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) was submitted with the Modification 4 report.

In response to submissions from the Biodiversity, Conservation and Science (BCS) Group of the NSW Department of Climate Change, Energy, the Environment and Water (DCCEEW), and to address Modification 4 as amended, the BDAR has been updated (**Appendix H**).

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 3.48 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 Peneplain, 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 10 threatened 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 0.51 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:

- 0.50 ha of PCT 76 modified grassland (Vegetation Zone 2) (category 1-exempt land)
- 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^2 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 H. 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 understory 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

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 functionally 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 as amended.

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 offset:

Table 6 – 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 7 – 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
Eastern Pygmy-possum	*Cercartetus nanus*	V	-	0.007	2	1
Little Eagle (Breeding)	*Hieraaetus morphnoides*	V	-	0.04	1.5	3
Key's Matchstick Grasshopper	*Keyacris scurra*	E	E	0.04	2	3
Barking Owl	*Ninox connivens*	V	-	0.02	2	3
Squirrel Glider	*Petaurus norfolcensis*	V	-	0.01	2	1
Squirrel Glider in the Wagga Wagga Local Government Area	*Petaurus norfolcensis endangered population*	E	-	0.007	2	1
Brush-railed Phascogale	*Phascogale tapoatafa*	V	-	0.007	2	1
Koala	*Phascolarctos cinereus*	E	E	0.007	2	1
Golden Sun Moth	*Synemon plana*	V	V	0.04	1.5	3
Masked Owl	*Tyto novaehollandiae*	V	-	0.04	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

This BDAR has assumed presence of threatened species on the basis that time constraints have been imposed and targeted surveys have not been undertaken for threatened fauna species credit species.

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

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 northwestern 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) (Premise, 2024) was submitted with the Modification 4 report. 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.

In response to submissions from Heritage NSW within the NSW Department of Climate Change, Energy, the Environment and Water (DCCEEW), and to address the proposed project amendments, the AHDDA has been updated (**Appendix D**).

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 D.

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 and again on 29 August 2024. No comments were provided.

A draft copy of the revised AHDDA was subsequently provided to RAPS in September 2025, with one response received. The response included the following statements:

- The area is culturally important to Wiradjuri people.
- All persons are to be mindful of disturbance to Wiradjuri cultural heritage including all sites that are recorded on AHIMS and any newly identified sites within this location.
- No movement of Aboriginal objects/artefacts are to occur as part of the development.
- I would also ask that your company staff, contractors and anyone who has something to do with this site attends a Wiradjuri Cultural Awareness Program. Please have my comments added to your report.

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, as amended, 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 as amended 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

he 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

A Traffic Impact Assessment (TIA) (Amber, 2024) was submitted with the Modification 4 report. The TIA assessed

In response to the proposed relocation of the BESS under Modification 4 as amended the TIA has been updated (**Appendix E**).

6.5.3.1 Traffic Generation – Construction

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.

A review of the table shows that the increase as a result of the BESS is 134 additional vehicles per day during the construction peak, and 55 additional vehicles per day during the average construction period.

The proposed modification and inclusion of a BESS is expected to increase peak hour traffic volumes by approximately 45 vehicles per hour, comprising 32 light vehicles and 13 heavy vehicles.

During the construction peak, the combined Solar Farm and BESS development is anticipated to generate around 109 vehicle movements per hour, with traffic volumes decreasing outside the peak construction period. While the majority of these movements will involve light and heavy construction vehicles, the project will also require Restricted Access Vehicles (RAVs) and oversize/overmass (OSOM) vehicles to deliver specialist equipment such as cranes and excavators.

These vehicles will represent only a small proportion of overall traffic but will be managed under separate permit applications and regulatory requirements.

6.5.3.2 Traffic Generation – Operation, Upgrading and Decommissioning

The TIA identifies that the inclusion of the BESS is expected to result in only a minor operational increase of one to two staff, equating to approximately four additional vehicle movements per day, which can be easily absorbed by the existing road network without adverse safety or efficiency impacts.

Similarly, traffic generated during future upgrading and decommissioning of the Solar Farm and BESS will be lower than during the construction phase, and therefore not expected to cause significant effects on the transport network.

6.5.3.3 Traffic Distribution

The TIA identifies that the majority of the construction workforce for the BESS is expected to be based in Wagga Wagga, with materials and equipment sourced locally where practicable. Larger plant and equipment will be transported from Port Botany or the Port of Melbourne.

Light vehicles will primarily access the site via Mitchell Road, Ashford Road and Boiling Downs Road, while heavy and oversize/overmass (OSOM) vehicles will utilise the designated route via the Sturt Highway, Bakers Lane, Inglewood Road, Mitchell Road, Ashfords Road, Boiling Downs Road and the approved site access points, consistent with Schedule 3, Condition 4 of the development consent.

Traffic movements are expected to peak at the start and end of the working day, with most light vehicle trips inbound between 6:00am and 7:00am and outbound between 5:00pm and 6:00pm. Evening traffic volumes will be lower due to staggered staff departures.

Heavy vehicle trips will be more evenly distributed throughout the day, with inbound and outbound trips balanced. For assessment purposes, the TIA has conservatively assumed that 20% of light vehicle trips and all heavy vehicle trips will pass through the Sturt Highway/Bakers Lane intersection. Peak construction traffic volumes for this intersection, varying by delivery port, are detailed in the TIA (Figures 7, 8 and 9).

6.5.3.4 Traffic Assessment – State Road Network

The TIA identifies that a traffic modelling assessment was undertaken using SIDRA intersection software to evaluate the capacity of the Sturt Highway/Bakers Lane intersection to accommodate peak construction traffic.

The analysis applied a 1% annual traffic growth factor to 2026, combined with project peak hour volumes, and conservatively assumed construction and network peak hours coincided, although in practice workforce arrivals and departures are expected to occur outside network peaks.

Results indicate the intersection will generally operate at a good level of service with minimal queues and delays, except for the right-turn movement from Bakers Lane during the evening peak hour, where delays of 48–60 seconds were predicted (LOS D–E). The TIA identifies that these delays are considered acceptable because they:

- The delays are still relatively minor and based on a review of the current operation of the intersection there are already instances where vehicles are required to wait this long to exit and no road safety issues have been identified within the crash search • T
- The delays are limited to the evening peak hour only.
- The queue lengths recorded for this movement are in the order of two light vehicles or one heavy vehicle which is minimal.
- The increase in traffic is temporary and is only expected to occur during the peak construction period.
- The assessment has assumed that the peak hour of construction and the road network are concurrent but in reality they do not coincide meaning the intersection is expected to operate with improved conditions to what has been presented within the above assessment.
- It is expected that some heavy vehicles will originate within Wagga Wagga and would not travel through the intersection to access the site and as such, the assessment represents a conservative approach.
- In the event long delays are experienced by right turn vehicles they have the option to turn left and utilise the roundabout intersection of Sturt Highway and Tasman Road to perform a u-turn and travel east

- Represent only minor increases over existing conditions, with queues limited to 1–2 vehicles.
- Do not present identified safety issues.
- Reflect a conservative worst-case assumption, with actual conditions expected to be better.
- Can be mitigated by alternative manoeuvres (e.g., left turn and u-turn at Tasman Road roundabout).

Overall, the assessment concludes that the Sturt Highway/Bakers Lane intersection can adequately accommodate project-related traffic, with only minor and manageable impacts during peak construction.

Notwithstanding, the TIA identifies that an assessment has been undertaken at the intersection of Sturt Highway and Bakers Lane for the morning and evening peak hour assuming that the peak hour for the road network coincides with the peak hour for the Project. The assessment identifies that the intersection requires a Channelised Right Turn (CHR) and short Auxiliary Left Turn (AUL(s)) treatment to comply with *Austroads Guide to Traffic Management Part 6: Intersections, Interchanges, and Crossings.*

The TIA notes that the Gumly Business Park development, located on the north side of Sturt Highway opposite Bakers Lane, was approved in late 2024 and is currently under construction. The subdivision involves 10 industrial/commercial lots with access provided via a new connection to Sturt Highway at Bakers Lane and the provision of a roundabout. Swept path assessments show that the roundabout has been designed to accommodate B-Triples along Sturt Highway and the northern leg of Bakers Lane, and B-Doubles to the southern (project) leg of Bakers Lane.

The TIA notes that while the roundabout would be expected to accommodate existing, project, and Gumly Business Park traffic in a safe and suitable manner, the timeframe for its delivery is currently unknown.

6.5.3.5 Traffic Assessment – Local Road Network

The TIA identifies that traffic volumes at the Mitchell Road/Ashford Road intersection were assessed using existing count data (adjusted by a 1.5% annual growth factor to 2025) and project-related traffic volumes. The analysis considered the AM peak (6:00am) and PM peak (5:00pm) periods, when most construction traffic will occur.

The assessment found that during peak construction, Mitchell Road is expected to carry up to 158 vehicles per hour in the morning and 200 vehicles per hour in the evening, while Ashfords Road is expected to carry 115 vehicles per hour in the morning and 103 vehicles per hour in the evening. In all cases, the intersection is predicted to operate at Level of Service (LOS) A, indicating free-flowing traffic conditions with minimal queuing or delays.

The TIA notes that an assessment has been undertaken at the intersection of Mitchell Road and Ashford Road to confirm the suitability of the mitigation measures required under Schedule 3, Condition 5 of the development consent.

Based on the modest increase in traffic volumes and mix of heavy vehicle types of the modification (which are consistent with the approved Solar Farm) the TIA confirms that the intersection upgrade is considered suitable.

6.5.4 MITIGATION MEASURES

In summary, the TIA concludes that the surrounding road network and site access arrangements are suitable to accommodate additional traffic volumes of the modification during the construction, operational, upgrading and decommissioning phase, including the following key points:

- The overall project comprising the Solar Farm and BESS is expected to generate a total of 234 vehicles per day, including 120 heavy vehicles during the construction peak. Outside the construction peak the project is anticipated to 125 vehicles per day, including 45 heavy vehicles.
- Overall, the road network is able to accommodate the traffic generated by the project inclusive of the modification during the construction, operation and decommissioning stages.
- It is noted that a roundabout is proposed at the intersection of Sturt Highway and Bakers Lane that is to be delivered as part of the Gumly Business Park which would be expected to accommodate the project traffic in a safe and suitable manner. However, timeframes for the construction of the roundabout are currently unknown, so it may not be complete in time for the planned commencement of the project.
- It is recommended that references to "Over-dimensional vehicle/s" in the development consent be changed to "Heavy vehicle/s requiring escort" with an updated definition to better align with the intent of the condition.

With regard to mitigation measures, the TIA states the following:

- Mitigation measures under Schedule 3, Condition 5 of the development consent are suitable to manage impacts of the construction of the Solar Farm and BESS including the additional heavy vehicle volumes.
- The site access arrangements are appropriate noting the requirements under Schedule 3, Condition 6 of the development consent.
- A traffic management plan implemented in accordance with Schedule 3, Condition 8 of the development consent would appropriately manage the traffic impacts of the Solar Farm and BESS.

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

A Visual Impact Assessment (VIA) (Iris, 2024) was submitted with the Modification 4 report. 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.

In response to the proposed relocation of the BESS under Modification 4 as amended, the VIA has been updated (Appendix G). The updated VIA memo is provided in **Appendix F**.

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 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 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 4 as amended 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 650 m from the approved solar farm development footprint.

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

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

A Noise and Vibration Impact Assessment (NIA) (Assured Environmental, 2024) was submitted with the Modification 4 report. To address the proposed project amendments, Assured Environmental has prepared an updated NIA, which is provided in **Appendix G**.

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 cold 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 as amended NIA confirms that the project will comply with the relevant project noise trigger level in accordance with the Noise Policy for Industry (NPfI) 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 <= 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 Hazard and Risk

6.8.1 EXISTING ENVIRONMENT

The development site is generally bound by farmland 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

A Preliminary Hazard Analysis (PHA) (Riskcon Engineering, 2024) was submitted with the Modification 4 report. To address the proposed project amendments, Riskcon Engineering has prepared an updated PHA, which is provided in **Appendix I**.

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 studies.

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 (LiFePO4, or simply LFP). LFP is considered to be one of the safest battery chemistries within the industry, having a thermal rise of 1.5^0C/min. Where other typical lithium-ion battery chemistries have a thermal rise of 200-400^0C/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 supressed 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 OF THE AMENDED PROJECT

7.1 Need for the Project

Modification 4 as amended 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 200MWAC 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 as amended 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 CO2-e pa (assuming grid Emissions Intensity of 0.6 tCO2-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 have 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 Amendment 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 as amended seeks to optimise the design of the approved Gregadoo Solar Farm.

The development footprint area has been 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 km of the sites identifies:

- The approved Project Energy Connect (NSW – Eastern Section) SSI-9172452 and HumeLink SSI 36656827 are 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 for Project Energy Connect (NSW – Eastern Section) SSI-9172452) 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.

With regard to cumulative impact, it is noted that the DPHI State Significant Infrastructure Assessment for HumeLink (SSI 36656827) states:

> The Department acknowledges that the project has the potential to contribute to cumulative impact associated with the development of multiple projects. The Department also considers that the majority of these impacts would occur as part of the construction phase and be temporary in nature. These impacts can suitably be addressed though the implementation of committed mitigation measures and recommended conditions.

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 the Amendment to Modification 4 as amended, 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 Amendment to 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 minimises 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* (NSESD) (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 NSESD 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 section 193 of the *EP&A Regulation*, 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 the Amendment to 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 the Amendment to 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 as amended will involve only minor impacts to biodiversity which can be mitigated through measures 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

An assessment of potential environmental impacts has identified that Modification 4 as amended 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

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 substation.
- 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 estimated total annual output of the solar farm would be about 155,000 MWh. The construction phase of the project is expected to take between 12 to 18 months with an estimated capital cost of about $95 million for the solar farm and $200 million for the BESS. 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.

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.

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.

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.

Substations / Connection Station

The Gregadoo Solar Farm and BESS require one, single substation only, located to the immediate southeast of the solar array area, and to the immediate east of the BESS.

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.

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.

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.

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.

Site Access

Main access

The site is proposed to be accessed from three 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 Boiling Down Road.

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.

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 8 – Commonwealth Legislation

Statutory Reference	Pre-condition	Relevance	Section in EIS
Environment Protection and Biodiversity Conservation Act 1999	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.	**Section 6.3**
Native Title Act 1993	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 9 – NSW Legislation

Statutory Reference	Section/Clause	Pre-condition	Relevance	Section in EIS
Aboriginal Land Rights Act 1983	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.	N/A
Biodiversity Conservation Act 2016	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.	**Section 6.3** and **Appendix I**
Contaminated Land Management Act 1997	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.	N/A
Electricity Infrastructure Investment Act 2020	Section 19	The Minister may declare a renewable energy zone (REZ) by reference to a specified geographical area of the State and a specified	The subject property is not within a REZ.	N/A

Statutory Reference	Section/Clause	Pre-condition	Relevance	Section in EIS
		generation, storage or network infrastructure (including planned or existing infrastructure).		
Environmental Planning and Assessment Regulation 2021	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.	N/A
	Section 4.15(1)	Consideration of the relevant provisions of any environmental planning instruments	*State Environmental Planning Policy (Transport and Infrastructure) 2021;* *State Environmental Planning Policy (Planning Systems) 2021;* *Wagga Wagga Local Environmental Plan 2010.*	**Section 7.3**
		Consideration of the relevant provisions of any proposed environmental planning instruments	No draft environmental planning instruments apply.	N/A
		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.	N/A
		Consideration of the relevant provisions of any planning agreements or draft planning agreements	No planning agreements or draft planning agreements apply.	N/A
		Consideration of the relevant provisions of the regulations	Refer next section of this table	This table

Statutory Reference	Section/Clause	Pre-condition	Relevance	Section in EIS
		Consideration of the likely impacts of the development		**Section 6**
		Consideration of the suitability of the site for the development		**Section 7.9**
		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.	N/A
		Consideration of the public interest	Community engagement has been undertaken.	**Section 5** and **7.7**
Environmental Planning and Assessment Regulation 2021	Section 23	Requires the consent of all landowners to be obtained for the making of a Development Application.		Attached to Modification 4 report submission.
	Clause 192	(1) An environmental impact statement must contain the following—		
		(a) a summary of the environmental impact statement,		N/A
		(b) a statement of the objectives of the development, activity or infrastructure,		N/A
		(c) an analysis of feasible alternatives to the carrying out of the development, activity or infrastructure, considering its objectives,		N/A

Statutory Reference	Section/Clause	Pre-condition	Relevance	Section in EIS
		including the consequences of not carrying out the development, activity or infrastructure,		
		(d) an analysis of the development, activity or infrastructure, including—		
		(i) a full description of the development, activity or infrastructure, and		**Section 1.4** and **3**
		(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		**Section 1.5**
		(iii) the likely impact on the environment of the development, activity or infrastructure, and		**Section 6**
		(iv) a full description of the measures to mitigate adverse effects of the development, activity or infrastructure on the environment, and		**Appendix C**
		(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,		This table
		(e) a compilation, in a single section of the environmental impact statement, of the measures referred to in paragraph (d)(iv),		**Appendix C**
		(f) the reasons justifying the carrying out of the development, activity or infrastructure,		**Section 7**

Statutory Reference	Section/Clause	Pre-condition	Relevance	Section in EIS
		considering biophysical, economic and social factors, including the principles of ecologically sustainable development set out in section 193.		
Heritage Act 1977	Section 58	Approval in respect of the doing or carrying out of an act, matter or thing referred to in s 57(1)		N/A
Local Land Services Act 2013				N/A
National Parks and Wildlife Act 1974	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.	**Section 6.4**
Protection of the Environment Operations Act 1997	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.	N/A
Roads Act 1993	Section 138	Various activities within road reserves		N/A
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 *Water Management Act 2000* (WM Act) by reference to Section 4.41 of the EP&A Act (approvals that do not apply).	N/A

APPENDIX C

REVISED MITIGATION MEASURES, CONDITIONS OF CONSENT AND APPENDICES

No	Safeguards and Mitigation Measures	Phase		
		C	O	D
Biodiversity				
BD1	Time works to avoid critical life cycle events: • Hollow-bearing trees would not be removed during breeding season (spring to early summer) to mitigate impacts on superb parrots. • If clearing outside of this period cannot be achieved, pre-clearing surveys would be undertaken to ensure no impacts to fauna would occur.	C		
BD2	~~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:~~ ~~• Pre-clearing checklist.~~ ~~• Tree clearing procedure.~~ 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.	C		
BD3	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.	C		
BD4	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: • Approved clearing limits to be clearly delineated with temporary fencing or similar prior to construction commencing. • No stockpiling or storage within dripline of any native vegetation. • In areas to clear adjacent to areas to be retained, chainsaws would be used rather than heavy machinery to minimise risk of unauthorised disturbance.	C		
BD5	Noise barriers or daily/seasonal timing of construction and operational activities to reduce impacts of noise. CEMP will include measures to avoid noise encroachment on adjacent habitats such as avoiding night works as much as possible.	C		

No	Safeguards and Mitigation Measures	Phase		
		C	O	D
BD6	Light shields or daily/seasonal timing of construction and operational activities to reduce impacts of light spill: • Avoid Night Works. • Direct lights away from vegetation	C	O	
BD7	Adaptive dust monitoring programs to control air quality: • Daily monitoring of dust generated by construction activities. • Construction would cease if dust observed being blown from site until control measures were implemented. • All activities relating to the proposal would be undertaken with the objective of preventing visible dust emissions from the development site.	C		
BD8	~~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.~~ 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 and patches of Inland Grey Box Woodland EEC 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. Ancillary works such as parking, stockpiling and site compounds are to be kept outside of these exclusion zones.	C		
BD9	Hygiene protocols to prevent the spread of weeds or pathogens between infected areas and uninfected areas: • A Weed Management Procedure would be developed for the proposal to prevent and minimise the spread of weeds. This would include: • Management protocol for declared priority weeds under the Biosecurity Act 2015 during and after construction. • Weed hygiene protocol in relation to plant, machinery, and fill. • Any occurrences of pathogens such as Myrtle Rust, Phytophthora and Chytrid Fungus would be monitored, treated, and reported. • The weed management procedure would be incorporated into the Biodiversity Management Plan	C	O	
BD10	Staff training and site briefing to communicate environmental features to be protected and measures to be implemented: • Site induction. • Toolbox talks.	C		

No	Safeguards and Mitigation Measures	Phase		
		C	O	D
BD11	Preparation of a vegetation management plan to regulate activity in vegetation and habitat adjacent to the proposed development: • Preparation of a Biodiversity Management Plan that would include protocols for: – Protection of native vegetation to be retained. – Best practice removal and disposal of vegetation. – Staged removal of hollow-bearing trees and other habitat features such as fallen logs with attendance by an ecologist. – Weed management. – Unexpected threatened species finds. – Rehabilitation of disturbed areas; – Adaptive management. – Post clearing assessment.	C		
BD12	An erosion and sediment control plan would be prepared in conjunction with the final design and implemented. The erosion and sediment control plan is to be prepared in accordance with "The Blue Book" (Landcom 2004).	C		
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.		O	
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.	C		
BD15	Staff training and site briefing to communicate impacts of traffic strikes on native fauna: • Awareness training during site inductions regarding enforcing site speed limits. • Site speed limits to be enforced.	C	O	
BD16	An appropriate crossing over the ephemeral drainage line is to be constructed to minimize impacts to water quality and hydrological processes.	C		
Aboriginal Heritage				
AH1	An Unexpected Finds Protocol (UFP) would be prepared and followed should there be an inadvertent discovery of Aboriginal objects occur.	C		
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.	C	O	
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	C		

No	Safeguards and Mitigation Measures	Phase		
		C	O	D
	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.			
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
Visual				
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		
VA2	Vegetative screening will be maintained for the life of the solar farm.		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.	Design		
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		
Land Use				
LU1	Consultation with adjacent landholders would be ongoing to manage interactions between the solar farm and other properties.	C	O	D

No	Safeguards and Mitigation Measures	Phase		
		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: • Removal of all above ground infrastructure. • Removal of gravel from internal access tracks where required, in consultation with landowner. • Reverse any compaction by mechanical ripping.			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	
Noise				
NS1	Works should be undertaken during standard working hours only. (Except for the connection to substation) • Monday – Friday 7am to 6pm. • Saturday 8am to 1pm. • No work on Sundays or public holidays	C		
NS2	All staff on-site should be informed of procedures to operate plant and equipment in a quiet and efficient manner.	C	O	D
NS3	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.	C	O	D
NS4	Regular inspection and maintenance of equipment to ensure that plant is in good condition. CEMP will include measures to minimise potential impact of construction works, including: • Limit the type and scale of concurrent activities undertaken close to sensitive receptors where possible. • Use broadband 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.	C	O	D

No	Safeguards and Mitigation Measures	Phase		
		C	O	D
	• 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. • 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. • Works should be undertaken during standard working hours only. (Except for the connection to substation) – Monday – Friday 7am to 6pm. – Saturday 8am to 1pm. – No work on Sundays or public holidays. • All staff on-site should be informed of procedures to operate plant and equipment in a quiet and efficient manner. • 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.			
Soil				
SO1	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: • At the commencement of the works, and progressively during construction, install the required erosion control and sediment capture measures. • Regularly inspect erosion and sediment controls, particularly following rainfall. • Maintain a register of inspection and maintenance of erosion control and sediment capture measures. • 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. • Ensure that machinery arrives on site in a clean, washed condition, free of fluid leaks. • Ensure that machinery leaves the site in a clean condition to avoid tracking of sediment onto public roads. • In all excavation activities, separate subsoils and topsoils and ensure that they are replaced in their natural configuration to assist revegetation. • During excavation activities, monitor for increases in salinity, reduce water inputs and remediate the site with salt tolerant vegetation. • Stockpile topsoil appropriately, so as to minimise weed infestation, maintain soil organic matter, maintain soil structure and microbial activity. • Manage works in consideration of heavy rainfall events.	C		D

No	Safeguards and Mitigation Measures	Phase		
		C	O	D
	• Areas of disturbed soil would be rehabilitated promptly and progressively during construction			
SO2	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: • Manage the storage of any potential contaminants onsite. • Mitigate the effects of soil contamination by fuels or other chemicals (including emergency response and EPA notification procedures and remediation). • 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.	C	O	D
SO3	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.		O	
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: • Integrate project design with any site constraints. • Preserve and stabilise drainageways. • Minimise the extent and duration of disturbance. • Control stormwater flows onto, through and from the site in stable drainage structures. • Install perimeter controls. • Stabilise disturbed areas promptly. • Protect steep slopes. • Employ the use of sediment control measures to prevent off and on- site damage. • Protect inlets, storm drain outlets and culverts. • Provide access and general construction controls.	C	O	D
SO6	Inspect and maintain sediment and erosion control measures regularly.	C	O	D
Water				
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

No	Safeguards and Mitigation Measures	Phase		
		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
WA6	Emergency management procedures will be prepared in consultation with Council and SES.	C	O	
Traffic				
TT1	A Haulage Plan would be developed and implemented during construction and decommissioning, including but not limited to: • Assessment of road routes to minimise impacts on transport infrastructure. • Scheduling of deliveries of major components to minimise safety risks (on other local traffic). • Traffic controls (signage and speed restrictions etc.). • 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.	C	O	D
TT2	A Traffic Management Plan would be developed and implemented during construction and decommissioning. The plan would include, but not be limited to: • Prior to construction, a pre-conditioning survey of the relevant sections of the existing road network, to be undertaken with Council. • Assessment of road condition prior to construction on all local roads that would be utilised. • A program for monitoring road condition, to repair damage exacerbated by the construction and decommissioning traffic. • The designated routes of construction traffic to the site. • Carpooling/shuttle bus arrangements to minimise vehicle numbers during construction. • Scheduling of deliveries. • Community consultation regarding traffic impacts for nearby residents. • Consideration of cumulative impacts. • Traffic controls (speed limits, signage, etc.). • Procedure to monitor traffic impacts and adapt controls (where required) to reduce the impacts. • Providing a contact phone number to enable any issues or concerns to be rapidly identified and addressed through appropriate procedures. Water to be used on unsealed roads to minimise dust generation through increased traffic use.	C		D
TT3	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.	C		

No	Safeguards and Mitigation Measures	Phase		
		C	O	D
	The upgrade would be subject to detailed design and would be designed and constructed to the relevant Australian road design standards. See Appendix ~~J~~ E for proposed intersection design.			
TT4	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. The upgrade would be subject to detailed design and would be designed and constructed to the relevant Australian road design standards. See Appendix ~~J~~ E for proposed intersection design.	C		
TT5	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.	C		D
TT6	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.	C	O	D
Air quality				
AQ1	Development of a complaints procedure to promptly identify and respond to issues generating complaints.	C	O	D
AQ2	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.	C	O	D
AQ3	During construction, operation and decommissioning, dust would be managed to prevent dust leaving the development site. This includes dust from stockpiled materials.	C	O	D
EM1	All design and engineering would be undertaken by qualified competent persons with the support of specialists as required.	C		
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	BESS design is to conform with the following: • 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.	C		

No	Safeguards and Mitigation Measures	Phase		
		C	O	D
	• 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. • 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.			
EM6	Prior to commissioning, the UL test data for the selected battery units shall be made available to the DPHI.			D
Social				
SE1	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: Protocols to keep the community updated about the progress of the project and project benefits. Protocols to inform relevant stakeholders of potential impacts (haulage, noise etc.). Protocols to respond to any complaints received. 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.	C	O	
SE2	Liaison with local industry representatives to maximise the use of local contractors, manufacturing facilities, materials.	C	O	
SE3	Liaison with local representatives regarding accommodation options for staff, to minimise adverse impacts on local services. An accommodation and Employment Strategy would be implemented prior to construction to address local participation and accommodation of the construction workforce. The strategy will be developed in partnership with key local stakeholders including:	C		D

No	Safeguards and Mitigation Measures	Phase		
		C	O	D
	Wagga Wagga City Council Wagga Local Aboriginal Land Council Economic development and industry support agencies (e.g., Regional Development Australia, Wagga Wagga Business Chamber, Industry Capability Network, Charles Sturt University) The strategy is to be generally in accordance with the recommendations outlined in *Social Impact Analysis Gregadoo Solar Farm Increase Modification* (NGH 2022), Chapter 5.2.1; and the Accommodation Analysis – Gregadoo BESS (bd infrastructure 2025).			
Waste				
WM1	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: • Identification of opportunities to avoid, reuse and recycle, in accordance with the waste hierarchy. • Quantification and classification of all waste streams. • Provision for recycling management onsite. • Provision of toilet facilities for onsite workers and how sullage would be disposed of (i.e., pump out to local sewage treatment plant). • Tracking of all waste leaving the site. • Disposal of waste at facilities permitted to accept the waste. • Requirements for hauling waste (such as covered loads).	C	O	D
Bushfire				
BF1	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: • Management of activities with a risk of fire ignition. • Management of fuel loads onsite. • Storage and maintenance of firefighting equipment, including siting and provision of adequate water supplies for bush fire suppression. • The below requirements of Planning for Bush Fire Protection 2006: • Identifying asset protection zones. • Providing adequate egress/access to the site. • Emergency evacuation measures. • Operational procedures relating to mitigation and suppression of bush fire relevant to the solar farm. • The entire development footprint shall be managed as an Asset Protection Zone (APZ). • A minimum 20,000 L tank water supply fitted with a 65mm storz fitting shall be located adjoining the internal property access road within the required APZ.	C	O	D

No	Safeguards and Mitigation Measures	Phase		
		C	O	D
	• A 10 m defendable space (APZ) that permits a minimum 4 m wide, unobstructed vehicle access is to be provided around the perimeter of the solar array and associated structure.			
BF2	• An Emergency Plan (EP) is to be developed prior to occupation or commissioning. • An Emergency Services Information Package (ESIP) is to be developed prior to occupation or commissioning. • An emergency responder's induction package is to be developed prior to occupation or commissioning.	C	O	
Historic Heritage				
HH1	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.	C	O	D

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 Application 4 dated 23 September 2024.

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)

Bakers Lane Temporary Hardstand Area

Premise

GREGADOO SOLAR FARM PTY LTD

Gregadoo Solar Farm

General Layout of the Development

Legend

- Project Area
- Development Footprint
- Indicative Visual Screening
- Indicative Sealed Road
- Indicative Gravel/Dirt Road
- Indicative Construction Compound/Laydown Area
- Indicative Temporary Construction Facilities
- Indicative Asset Protection Zone
- Indicative Array Layout
- Indicative BESS
- Indicative Substation
- Indicative Overhead Connection Easement
- Indicative Underground Connection Easement
- Indicative Solar Farm 33kV Underground Connection Route
- Indicative BESS Connection Route
- Indicative Solar Farm 132kV Overhead Transmission Line
- Indicative Solar Farm 132kV Underground Transmission Line
- 132kV Transgrid 132kV Transmission Lines
- 330kV Transgrid 330kV Transmission Lines
- Transgrid 132kV Easement
- Cadastre
- Road

0 100 200m

File: 222222_01_MASTER.aprx Prepared By: adam.davis Date: 23/09/2025

APPENDIX 2:

SCHEDULE OF LANDS

Lot Number	Deposited Plan (DP)
42	1303215
43	1303215
1	524499

Note: The project site will also be taken to include any crown land and road reserves contained within the project site.

APPENDIX 4

ABORIGINAL HERITAGE ITEMS

Table 1: Aboriginal heritage items – avoid impacts

Item
Gregadoo SF 645
Gregadoo SF IF 5
Gregadoo SF Cultural Tree 1
Gregadoo SF Cultural Tree 2
Gregadoo SF
Gregadoo Ring Tree

Table 2: Aboriginal heritage items – surface collection salvage

Item
Gregadoo SF 463
Gregadoo SF 619
Gregadoo SF 393
Gregadoo SF 360
Gregadoo Solar IF1
Gregadoo Solar IF2
Gregadoo Solar IF3
Gregadoo Solar IF1

APPENDIX D

UPDATED ABORIGINAL HERITAGE DUE DILIGENCE ASSESSMENT

APPENDIX E

UPDATED TRAFFIC IMPACT ASSESSMENT

APPENDIX F

UPDATED VISUAL IMPACT ASSESSMENT

APPENDIX G

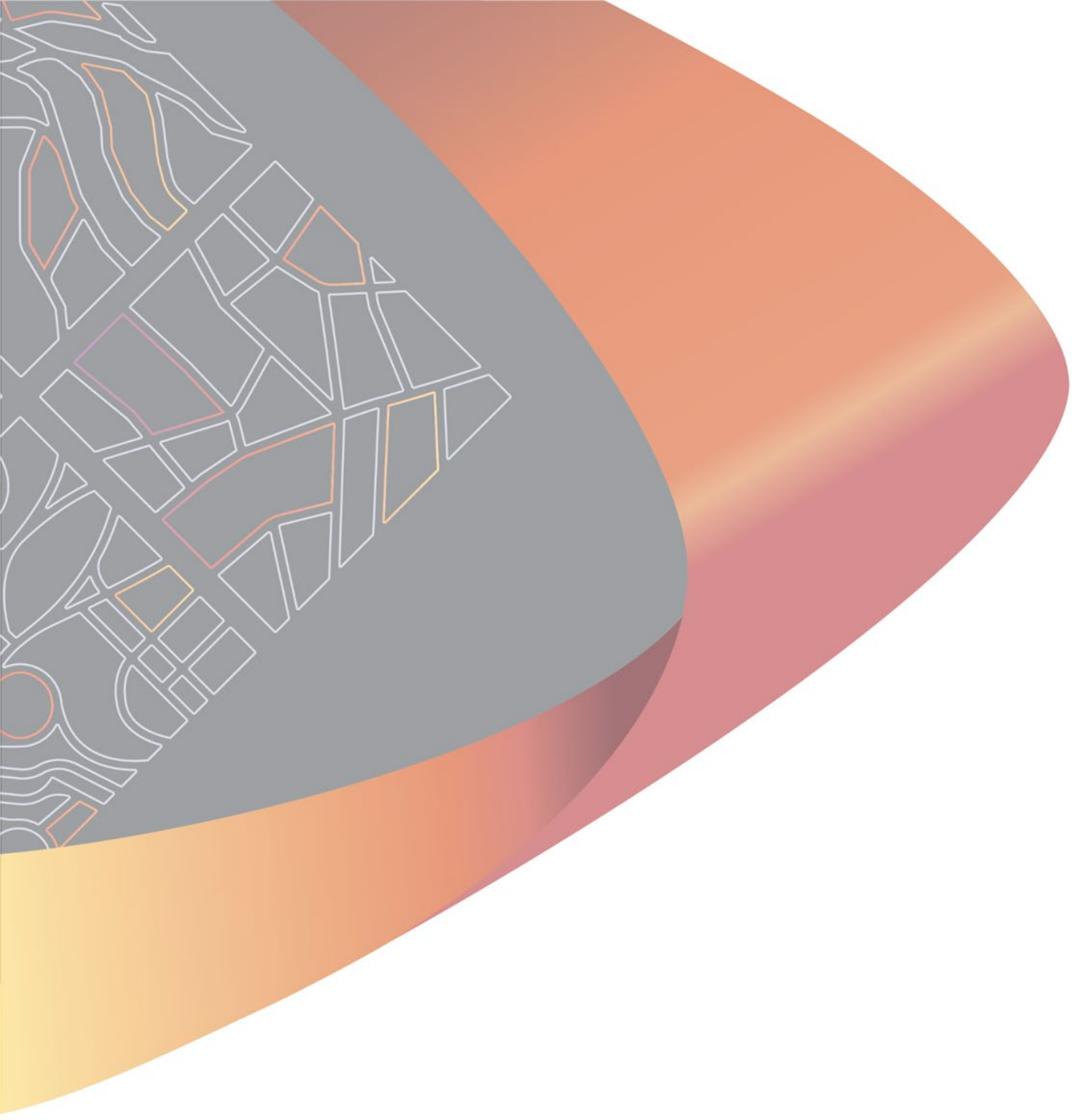
UPDATED NOISE IMPACT ASSESSMENT

APPENDIX H

UPDATED BIODIVERSITY DEVELOPMENT ASSESSMENT REPORT

APPENDIX I

UPDATED PRELIMINARY HAZARD ANALYSIS



Premise