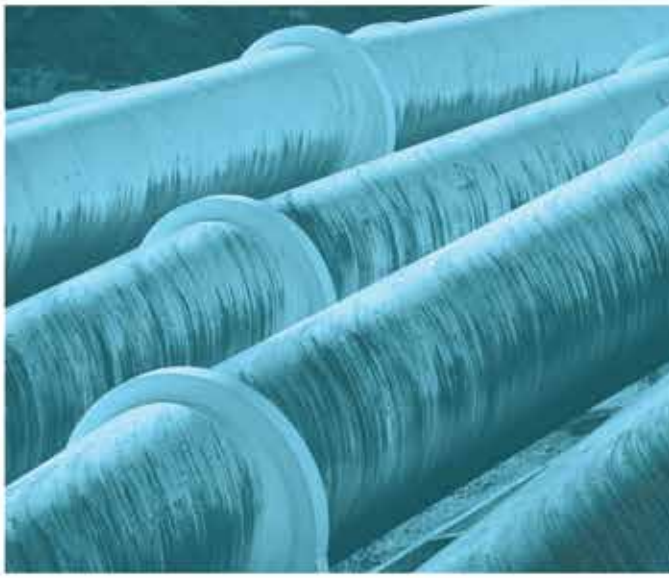



Cobbora Solar Farm

Scoping Report

Prepared for Marble Energy
October 2021

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Cobbora Solar Farm

Scoping Report

Report Number

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Client

Marble Energy

Date

18 October 2021

Version

Final

Approved by

Paul Freeman
Associate Director
18 October 2021

Executive summary

Marble Energy proposes to lodge a development application for the Cobbora Solar Farm. The Cobbora Solar Farm is a proposed large scale solar photovoltaic (PV) generation facility with associated infrastructure (the project), in the locality of Cobbora, approximately 20 kilometres (km) south-west of the township of Dunedoo and 55 km east of Dubbo in the New South Wales (NSW) Central West.

ES1 The project

The project generally involves:

- solar panel arrays with an indicative capacity of approximately 700 megawatts (MW);
- a centralised 200 megawatt/200 megawatt hour (MWh) battery energy storage system (BESS); and
- connection to the proposed Central-West Orana Renewable Energy Zone (CWO REZ) transmission line.

The development site is located in the Dubbo Regional and Warrumbungle local government areas. The site has an indicative footprint which covers around 2,700 hectares. The site has easy access via the Golden Highway and Spring Ridge Road.

Land surrounding the project site area is characterised by undulating cleared land used primarily for sheep and cattle grazing or dry land cropping with scattered rural residences. There are 4 project related residences within the site and 20 private residences within 3 km of the site.

ES2 Approval pathway

The project is classified as state significant development in accordance with the State Environmental Planning Policy (State and Regional Development) 2011 (SRD SEPP) as it is development for the purpose of electricity generating works. Therefore, the Minister for Planning and Public Spaces or the Independent Planning Commission will be the consent authority.

ES3 Consultation

Marble Energy is currently building a local presence. In terms of its engagement to date, Marble Energy has consulted with neighbouring property owners since early 2020 and has undertaken close consultation using a range of methods with all residents within a 3 km radius of the project.

Marble Energy has also conducted engagement with Dubbo Regional Council and Warrumbungle Shire Council. This engagement will continue as the project is further refined and studies to support the development application are underway.

Marble Energy will adopt the engagement principles detailed in Undertaking Engagement Guidelines for State Significant Project (DPIE 2021a). These principles will include consulting early and often, with a view to address any issues raised by the community as the project plans are developed.

ES4 Assessments

The following assessments would be undertaken for the project:

Table ES1 Proposed assessments

Detailed assessments	Standard assessments
Visual	Noise
Biodiversity	Land resources
Traffic	Water resources
Aboriginal cultural heritage	Social
Hazards and risk	Air quality
	Historic heritage

ES5 Justification

The project will have a number of benefits, including the provision of clean, cheap electricity for NSW energy consumers and it will support the anticipated generation shortfall from the closure of coal-generated power. The BESS will improve network reliability by storing excess energy during periods of low demand and dispatching energy during periods of peak demand.

The project will also provide significant direct employment opportunities during construction and operation of the project and direct financial benefits to local businesses and the local community.

The project aligns with the NSW and Commonwealth Government's objectives for energy security and reliability and emissions reductions and will contribute to the continued growth of renewable energy generation and storage capacity in the CWO REZ. In addition, it will result in a number of renewable energy development benefits including:

- support and contribution to Commonwealth and State climate change commitments such as the Paris Agreement, RET Scheme, 2020 ISP and NSW Net Zero Plan Stage 1: 2020–2030;
- development of the CWO REZ, supplying approximately 700 MW of electricity generating capacity to the national energy market (NEM), and significantly contributing to the targeted 3,000 MW for the CWO REZ as identified in the NSW Energy Strategy (NES);
- contribute to capacity gaps in the electricity market following the closure of major coal-fired power generators within NSW by 2035 (NES 2019), thereby enhancing reliability and security of electricity supply in NSW; and
- support the CWO Regional Plan's goal to diversify the local economy through direct and indirect economic benefits to local communities in the region, including employment opportunities, increased spending in local communities, community benefit programs and lease payments to landholders.

Table of Contents

Appendices

Tables

Figures

Plates

1 Introduction

1.1 Overview

Marble Energy proposes to lodge a development application for the Cobbora Solar Farm. The Cobbora Solar Farm is a proposed large-scale solar photovoltaic (PV) generation facility with associated infrastructure (the project), in the locality of Cobbora, approximately 20 kilometres (km) south-west of the township of Dunedoo and 55 km east of Dubbo in the New South Wales (NSW) Central West as shown (refer to Figure 1.1).

The project site area covers approximately 3,300 hectares (ha), with the project infrastructure to occupy an indicative development footprint of approximately 2,700 ha (refer to Figure 1.2). The project site area is located across two local government areas (LGAs) Warrumbungle Shire Council and Dubbo Regional Council and covers two rural landholdings over approximately 60 land parcels. An indicative schedule of lands is provided in Appendix A.

The project will have a capacity of up to 700 megawatts (MW) and include a centralised 200 megawatt/ 200 megawatt hour (MWh) battery energy storage system (BESS). The method of connection to the proposed Central West Orana (CWO) Renewable Energy Zone (REZ) transmission line will be confirmed as further details of the project are known. The project will improve the reliability of energy supply in the region by providing storage and firming capacity to the National Energy Market (NEM).

The area being considered for this project covers part of what was the Cobbora Coal Project (CCP) holdings, an open-cut coal mine proposed by Cobbora Holding Company Pty Limited (CHC), which was a state owned entity. The CPP was to secure long term fuel security for electricity generation, by supplying thermal coal via rail to power stations in the Upper Hunter Valley and Central Coast or for export markets. The assessments undertaken for the CCP and documented in the EIS will provide useful baseline information on the existing environment that will be used a guide for this project.

A description of the project is provided in Chapter 3.

1.2 The applicant

Marble Energy are progressing the development of solar and large-scale wind farms in NSW and bring a new perspective to how electricity generation is developed in Australia. Their 2025 mission is to develop, own and operate renewable energy asset pipeline with a capacity of more than 1 gigawatt. Marble Energy has been operating in Australia for over 4 years and is developing the Winton North solar farm near Glenrowan in Victoria.

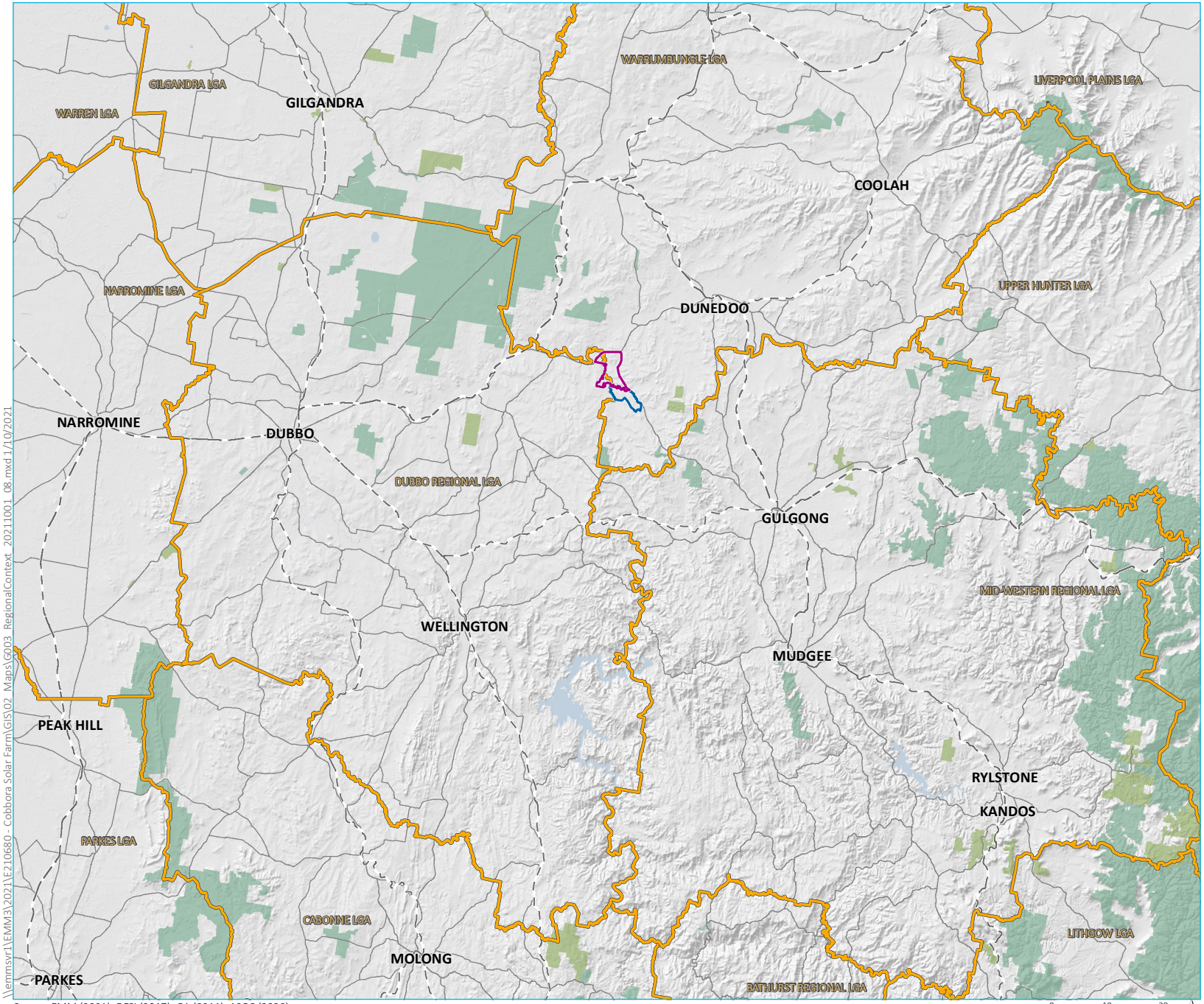
The Australian Business Number (ABN) of Marble Energy is 11 649 803 798 and Marble Energy's address is Level 12, 111 Elizabeth Street, Sydney NSW 2000.

1.3 Purpose of this report

The project is State significant development (SSD) pursuant to Schedule 1 of the State Environmental Planning Policy (State and Regional Development) 2011 (SRD SEPP), as discussed further in Section 4.1. Accordingly, approval for the project is required under Part 4, Division 4.7 of the NSW *Environmental Planning and Assessment Act* 1979 (EP&A Act).

This scoping report has been prepared to support a request for the Secretary's Environmental Assessment Requirements (SEARs) for the project in accordance with clause 3 of Schedule 2 of the *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation). The SEARs will identify the level of environmental assessment required to be carried out as part of the Environmental Impact Statement (EIS) for submission to the Department of Planning, Industry and Environment (DPIE) as part of a development application (DA) under Division 4.1 of Part 4 of the EP&A Act.

This scoping report has been prepared by EMM Consulting Pty Limited (EMM) on behalf of Marble Energy in accordance with the recently released DPIE guidelines: State significant development guidelines - preparing a scoping report: Appendix A to the state significant development guidelines (DPIE 2021a) (Scoping Report Guidelines).



KEY

- Local government area
- Project site area
- Cobbora Solar Farm north
- Cobbora Solar Farm south
- Existing environment
- Rail line
- Major road
- Named waterbody
- NPWS reserve
- State forest

Source: EMM (2021); DFSI (2017); GA (2011); ASGC (2006)

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Regional context

Cobbora Solar Farm
Scoping report
Figure 1.1

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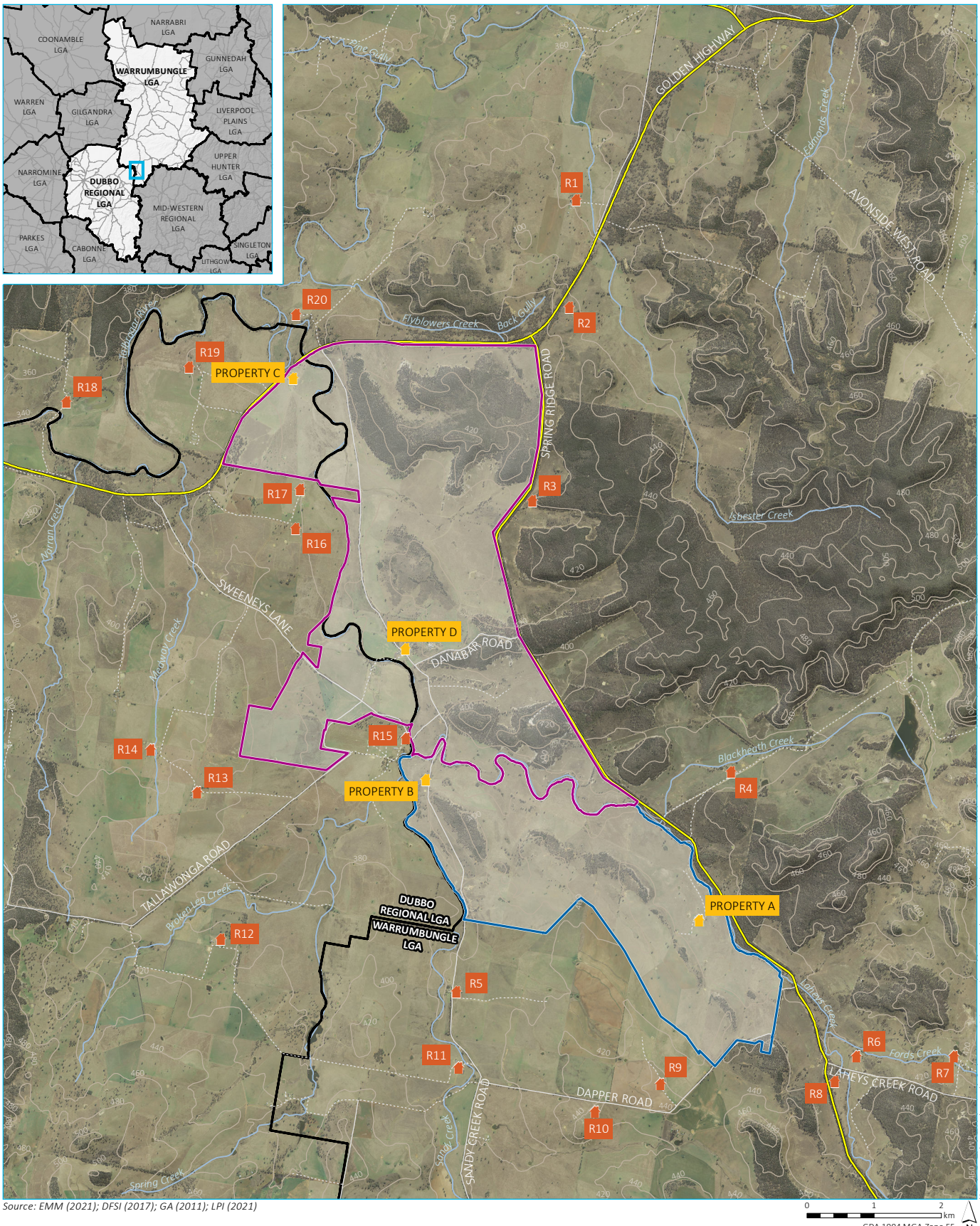

Source: EMM (2021); DFSI (2017); GA (2011); LPI (2021)

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GDA 1994 MGA Zone 55

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KEY

Project site area
- Cobbora Solar Farm north
- Cobbora Solar Farm south
- Non-project related residential receiver
- Project related receiver

Existing environment
- Major road
- Minor road
- Vehicular track
- Topographic contour (20 m)
- Named watercourse
- Local government area

Project context

Cobbora Solar Farm
Scoping report
Figure 1.2

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2 Strategic context

2.1 Site and surrounds

2.1.1 Regional context

The project is 6 km south-west of the small township of Cobbora within the Central West Local Land Services Region (Central West Region) of NSW.

The nearest population centre to the project is the township of Dunedoo, approximately 20 km north-east of the study area. Dunedoo is in the Warrumbungle Shire LGA and has a population of 1,221 (ABS 2016). Other nearby population centres in the vicinity of the project include:

- Gulgong (population 2,521), approximately 30 km south-east;
- Mudgee (population 10,923), approximately 50 km south-east;
- Wellington (population 4,077), approximately 50 km south-west; and
- Dubbo (population 38,943), approximately 55 km west (ABS 2016).

Key land uses in the local and broader region include agriculture, consisting primarily of sheep and cattle grazing and dry land cropping, with areas of mining, viticulture and production forestry located within the broader region (in the vicinity of Gulgong and Mudgee).

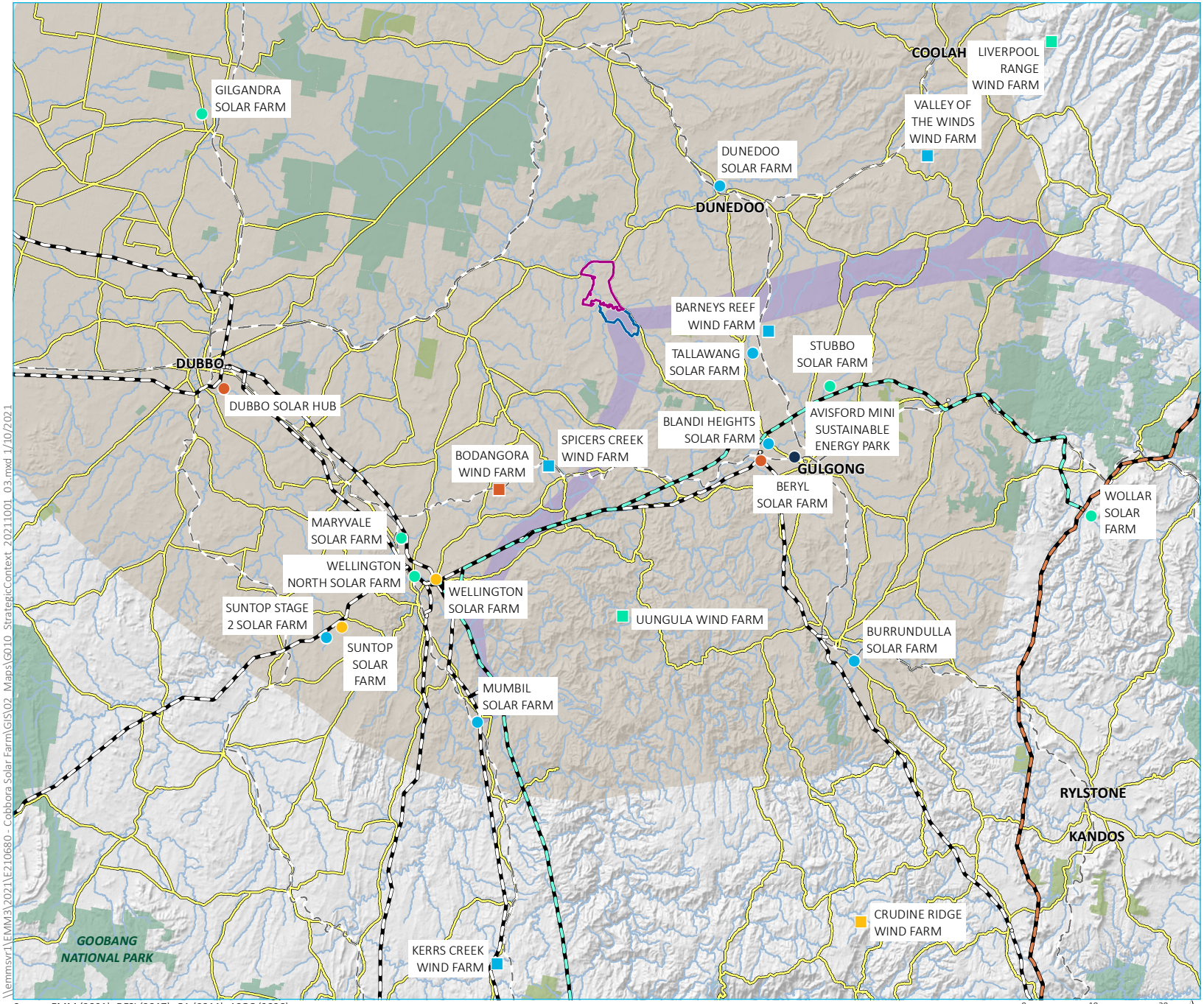
The nearest national parks to the project site area are the Goulburn River National Park, approximately 50 km to the east, and the Yarrobil National Park, approximately 15 km to the south-east. Other areas of environmental conservation in the vicinity of the project site area include Dapper Nature Reserve, Goodiman and Goonoo State Conservation areas (refer to Figure 1.1).

Renewable energy development is a growing land use in the area. A number of other proposed, approved, under construction and operational renewable energy developments are within and in the vicinity of the CWO REZ, and are illustrated in Figure 2.1. Those nearest to the project site area include Dunedoo and Tallawang solar farms to the north-east and south-east respectively. Barney's Reef wind farm is to the east.

2.1.2 Local context

Land surrounding the project site area is characterised by undulating cleared land used primarily for sheep and cattle grazing or dry land cropping with scattered rural residences. Areas of vegetation is present within and surrounding the project site area in the form of paddock trees, pockets of vegetation on ridgelines, vegetation along local roads and drainage lines.

The nearest non-project related residence is R15, located approximately 60 m west of the northern project site area boundary off Sweeneys Lane. Additional residences are located along the Golden Highway, Spring Ridge Road, Dapper Road, Tallawonga Road and Sandy Creek Road. There are 20 non-project related receivers within 3 km of the project site area (refer Figure 1.2).



KEY

- Central West Orana Renewable Energy Zone
- Central West Orana REZ transmission corridor

Project site area

- Cobbora Solar Farm north
- Cobbora Solar Farm south

Operating system voltage

- 132 kV
- 330 kV
- 500 kV

Surrounding renewable development

Solar development

- Rejected
- In planning
- Approved
- Under construction
- Operational

Wind development

- In planning
- Approved
- Under construction
- Operational

Existing environment

- Rail line
- Major road
- Named watercourse
- NPWS reserve
- State forest

Source: EMM (2021); DFSI (2017); GA (2011); ASGC (2006)

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Strategic context

Cobbora Solar Farm
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Figure 2.1

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2.1.3 The site

The project site extends over approximately 60 land parcels and covers approximately 3,300 ha (refer Figure 1.2) The indicative development footprint within the project site covers approximately 2,700 ha.

An indicative schedule of lands for the project site area is contained in Appendix A. During the preparation of the EIS, the indicative development footprint within the project site area will be refined based on stakeholder engagement, environmental assessment, constraints identification and project design requirements.

The project site area is zoned RU1 Primary Production under both the Warrumbungle Local Environmental Plan 2013 (Warrumbungle LEP) and the Wellington Local Environmental Plan 2012 (Wellington LEP). It is on predominantly freehold land, with the exception of:

- Danabar Road, and sections of Sandy Creek Road, Tallawonga Road and Sweeneys Lane within the project site area; and
- small parcels of Crown land, for which an access agreement will be negotiated.

The land tenure of the study area and surrounding land is shown in Figure 2.2. There are four dwellings within the landholding, which will be either used as site offices or for accommodation during construction and operations, or demolished.

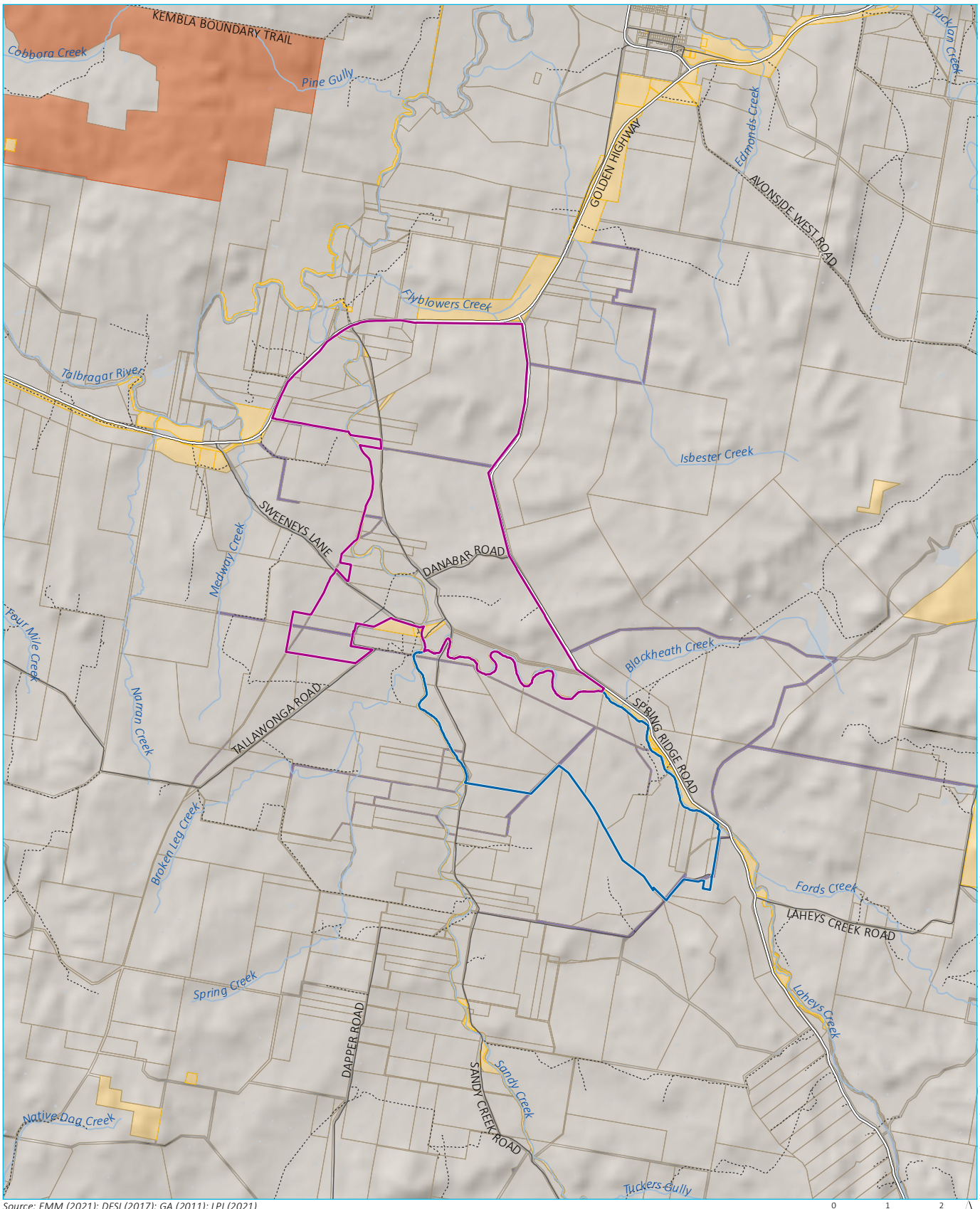
The project site area is accessible via the Golden Highway and Sandy Creek Road or Spring Ridge Road. All access to the site will be via Spring Ridge Road, which is a sealed local road.

Access to the various array areas within the site would be provided by the local roads noted above. These roads are graded roads which carry minimal traffic, as they are essentially access routes to rural properties. These roads would remain open and available for public use during the construction and operation of the project.

Remnant native vegetation is present across some portions of the project site area. Several ephemeral watercourses associated with the Talbragar River are within the project site area and follow a generally north or north-westerly direction, including the named Sandy Creek and Laheys Creek (refer Figure 1.2). There are also multiple farm dams within the site.

The Central Ranges gas pipeline aligns with a small section of the project's north-western boundary. The interaction of the project with this pipeline will be discussed with the pipeline operator (APA) and assessed during the EIS.

The project site area is illustrated in Plate 2.1 to Plate 2.4.



Source: EMM (2021); DFSI (2017); GA (2011); LPI (2021)

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GDA 1994 MGA Zone 55

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KEY

Project site area
- Cobbora Solar Farm north
- Cobbora Solar Farm south

Land tenure
- Crown
- Crown road
- Freehold
- NSW government

Existing environment
- Major road
- Minor road
- Vehicular track
- Named watercourse
- Named waterbody
- Waterbody

Land tenure

Cobbora Solar Farm
Scoping report
Figure 2.2

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Plate 2.1 Northern array area

Plate 2.2 Northern border of site looking south

Plate 2.3 North-east boundary looking south-west across the site

Plate 2.4 Southern border of site looking north-west across the southern array area

2.2 Strategic planning framework

An overview of relevant key policies, plans and strategics, and how the project aligns with these, is provided in Table 2.1.

Table 2.1 Alignment with key strategic planning frameworks

Plan, policy or strategy	Description	Alignment with strategic framework
Local context		
Warrumbungle Shire Local Strategic Planning Statement 2019	The Warrumbungle Shire Local Strategic Planning Statement (LSPS) is a draft for discussion that sets the framework for Warrumbungle Shire's economic, social and environmental land use needs over the next 20 years.	The project will bring economic investment into the Shire and drive the local economy. There will be more economic diversity.
Warrumbungle Shire Economic Development & Tourism Strategy 2019—2023	The purpose of the economic development strategy is to provide the direction and framework to encourage, support and facilitate economic development within Warrumbungle Shire. Eco efficiency and sustainability are identified as macro trends and drivers that have the potential to influence the following economic growth in the region.	The project would directly contribute to the aims of the plan, being economic growth and a shift to investment in renewable energy and alternative energy production.
Warrumbungle Shire Community Strategic Plan (Reviewed) 2017—2032	The strategic plan identifies the main priorities and aspirations for the LGA and establishes objectives and strategies to address social, environmental, economic and civic leadership issues as identified by the community. Local Economy LE5 – local mining and extractive industries and energy production enterprises provide economic returns and benefits to the communities of the shire. Public Infrastructure PI7 – communities across the shire are supported by the secure, long term supply of energy and clean water.	The project would directly contribute to the long term goal LE5, "energy production enterprises provide economic returns" and PI7, "communities across the shire are supported by the secure, long term supply of energy".
Warrumbungle Shire Council Land Use Strategy 2013	The Warrumbungle Shire Council Land Use Strategy (LUS) sets out the 25 year vision for land use planning in the Warrumbungle LGA and forms the foundation for the development of the LEP. The community wanted to preserve the natural environment and actively foster renewable energy principles such as solar. Economic growth will be facilitated through giving priority to investment that improves necessary energy infrastructure. Identified economic growth actions include permitting sustainable energy production forms in the new LEP such as wind, solar or geothermal.	The project will directly contribute to the strategy's focus on supporting economic growth and diversity while maintaining a considered approach to land use needs.

Table 2.1 Alignment with key strategic planning frameworks

Plan, policy or strategy	Description	Alignment with strategic framework
Dubbo Region Local Strategic Planning Statement 2020	The Dubbo Region LSPS plans for the economic, social and environmental land use needs of the community over the next 20 years. Key infrastructure and services need to be provided to further enhance the quality of life of our community, maintain and attract economic growth, including reliable energy supply. Renewable energy will play a key part in Dubbo's sustainable future, particularly as the QLD–NSW Interconnector transmission lines are constructed, facilitating energy transfer to the north and south of the LGA.	The project would directly contribute to economic growth through an investment in infrastructure and provision of reliable electricity.
Dubbo Region 2040 Community Strategic Plan	The 2040 Community Strategic Plan will guide and influence the actions and initiatives of Dubbo Regional Council, the community, all tiers of government and community stakeholders over a 22 year period through to 2040. The Dubbo Regional LGA has one of the highest take up rates for solar energy provision in Australia and the plan recognises the financial and environmental benefits of renewable energies and the role it plays in a sustainable future. Strategy 2.1.1: Investment in renewable energy opportunities are encouraged and supported.	The project directly aligns with Strategy 2.1.1 by investing in solar energy generation.
Regional context		
Central West and Orana Regional Plan 2036	Central West and Orana Regional Plan 2036 (the Regional Plan) was released by the DPIE (2017) to guide land use planning priorities and decision making in the CWO region for the next two decades.	The project directly contributes to Goal 1 of the Regional Plan (ie "to become the most diverse regional economy in NSW"). It also directly meets Direction 9 (ie "increase renewable energy generation").
State context		
NSW Climate Change Policy Framework – Net Zero Plan Stage 1: 2020—2030	NSW Climate Change Policy Framework (2016) sets an aspirational objective for NSW to achieve net zero emissions by 2050. The Net Zero Plan Stage 1 2020-2030 (DPIE 2020) builds on this and outlines the NSW Government's plan to grow the economy and create jobs while helping the state to deliver a 35% cut in emissions compared to 2005 levels.	The project contributes to Priority 1 of the Plan: "Drive uptake of proven emissions reduction technologies that grow the economy, create new jobs or reduce the cost of living." The CWO REZ is also identified in the Plan as critical in replacing retiring coal fired generators in NSW.
NSW Electricity Strategy 2019	The NSW Electricity Strategy is the NSW Government's plan for a reliable, affordable and sustainable electricity future that supports a growing economy. With four of NSW's five remaining coal-fired generators are scheduled to close by 2035, starting with Liddell Power Station in 2023 (DPIE 2019), the strategy outlines a reliable energy system which meets NSW's energy requirements and emission reduction targets.	As detailed above, the project will contribute to the development of the CWO REZ and assist in meeting NSW's energy generation and storage requirements, as well as the NSW Government's emissions reduction targets.

Table 2.1 Alignment with key strategic planning frameworks

Plan, policy or strategy	Description	Alignment with strategic framework
	The strategy supports the rolling out of REZs, commencing with the CWO REZ and the setting of a Renewable Energy Zone body, (Energy Corporation of NSW) that will bring together investors and carry out early planning so benefits to local communities are maximised.	
NSW Electricity Infrastructure Investment Roadmap	The Electricity Infrastructure Roadmap coordinates investment in transmission, generation, storage and firming infrastructure as ageing coal-fired generation plants retire. The roadmap includes actions that will deliver "whole-of system" benefits. The roadmap sets out a plan to deliver the state's first 5 Renewable Energy Zones (REZs) in the Central-West Orana, New England, South-West, Hunter-Central Coast and Illawarra regions.	The project site lies within the CWO REZ. The southern array area lies within the corridor earmarked for the REZ transmission corridor. The project is ideally placed to contribute to the success of the roadmap.
Large-Scale Solar Energy Guideline	Large-Scale Solar Energy Guideline (Solar Guideline) (DPIE 2018) provides the community, industry, applicants and regulators with guidance on the planning framework for the assessment of large-scale solar projects and identify the key planning considerations relevant to solar energy development in NSW.	Site selection and impact assessment considerations detailed in the guideline have been and will continue to be used to inform the project.
National context		
Large-scale Renewable Energy Target (LRET)	The Australian Government Clean Energy Regulator administers the LRET which incentivises investment in renewable energy power stations such as wind and solar farms. The LRET target of 33,000 gigawatt hours (GWh) of additional renewable electricity generation was met at the end of January 2021 (*Clean Energy Regulator* 2021). The annual target will remain at 33,000 GWh until the scheme ends in 2030, notwithstanding, the *Clean Energy Regulator* expects of large-scale renewable generation could reach up to 40,000 (GWh) in 2021.	The project will generate up to approximately 1,650 GWh of electricity annually, which will make significant contributions towards meeting the LRET target in future years.
Integrated System Plan 2020	The Integrated System Plan 2020 (ISP 2020) prepared by the Australia Energy Market Operator (AEMO) is an: "actionable roadmap for eastern Australia's power system to optimise consumer benefits through a transition period of great complexity and uncertainty". REZ's are identified in the ISP 2020 as areas where "clusters of large-scale renewable energy can be developed to promote economies of scale in high quality areas and capture geographical and technological diversity in renewable resources" (AEMO 2020).	The CWO REZ is identified within the ISP 2020 with the CWO REZ transmission link, to which the project will connect, identified as an "actionable ISP project", critical to address cost, security and reliability issues.

Table 2.1 Alignment with key strategic planning frameworks

Plan, policy or strategy	Description	Alignment with strategic framework
International context		
United Nations Framework Convention on Climate Change - The Paris Agreement	The Paris Agreement is a legally binding international treaty on climate change adopted by 196 parties in 2015. As a signatory to the agreement, the Australian Government has committed to reduce greenhouse gas (GHG) emissions to 26–28 percent on 2005 levels by 2030.	The project will contribute to meeting Australia's commitments under the Paris Agreement though estimated annual CO_2 emissions reductions in the order of 2.9 million tonnes per annum (Mtpa).

2.3 Project justification

2.3.1 Project benefits

Key benefits associated with the project include:

- clean, cheap electricity for NSW energy consumers;
- supporting the planned closure of over 3 gigawatts of NSW coal generators in the next decade by filling-in the anticipated generation shortfall;
- improvements to network reliability by storing excess energy during periods of low demand and dispatching energy during periods of peak demand, and provision of system services;
- improvements to network stability by providing back-up power during network disruptions;
- support for surrounding renewable energy generating facilities during periods where intermittent resources (eg wind and solar) are more plentiful allowing for storage and efficient delivery of electricity to meet demand; and
- direct employment opportunities during construction and operation of the project and direct financial benefits to local businesses and the local community.

The project aligns with the NSW and Commonwealth Government's objectives for energy security and reliability and emissions reductions and will contribute to the continued growth of renewable energy generation and storage capacity in the CWO REZ. In addition, it will result in a number of benefits including:

- support and contribution to Commonwealth and State climate change commitments such as the Paris Agreement, RET Scheme, 2020 ISP and NSW Net Zero Plan Stage 1: 2020–2030;
- development the CWO REZ, supplying approximately 700 MW of electricity generating capacity to the national energy market (NEM), and significantly contributing to the targeted 3,000 MW for the CWO REZ as identified in the NSW Energy Strategy (NES);
- contribute to capacity gaps in the electricity market following the closure of major coal-fired power generators within NSW by 2035 (NES 2019), thereby enhancing reliability and security of electricity supply in NSW; and

- support the CWO Regional Plan's goal to diversify the local economy through direct and indirect economic benefits to local communities in the region, including employment opportunities, increased spending in local communities, community benefit programs and lease payments to landholders.

2.3.2 Site suitability

The required land area for the project is driven primarily by the need for a project of sufficient electricity generating capacity to achieve economies of scale in output, justifying the substantial grid connection costs and thus being able to achieve a competitive price for the electricity supplied to households.

The site and size of the project have been developed in consideration of alternatives (refer to Section 3.9) to ensure the project will result in maximum benefits for the locality and region in the long term, whilst minimising impacts to the environment.

The study area is considered suitable due to:

- the location of the project being within the CWO REZ, with very good solar resource and physical conditions for large-scale solar energy generation (such as low topographic relief, and minimal tree cover);
- the proposed CWO REZ transmission line study corridor passes through the centre of the project study area. The location of the proposed transmission line will have the capacity to receive the energy proposed to be generated without requiring additional agreements with landholders to secure access;
- the large land area provides flexibility in design and response to constraints;
- the existing agricultural land use within and surrounding the project site area, which is compatible with large-scale solar energy generation;
- the land is not classed as Biophysical Strategic Agricultural Land (BSAL), thereby not sterilising valuable agricultural land. BSAL is land with high quality soil and water resources capable of sustaining high levels of productivity;
- proximity to transport links (eg Golden Highway);
- development of the site for the purposes of a solar farm is not anticipated to result in significant adverse biophysical, cultural, social or economic impacts;
- there are relatively few neighbours living within close proximity of the project study area and limited visibility from major roads; and
- the project site area has existing environmental reports as a result of the site being subject to the approved Cobbora Coal Project (CCP). The assessments undertaken for the CCP will provide useful baseline information on the existing environment that will be used a guide for this project.

3 Project

3.1 Overview

The project comprises a large-scale solar PV generation facility along with associated infrastructure with an indicative development footprint of up to 2,700 ha. The project will have an indicative capacity of approximately 700 MW and include a centralised 200 MW/200 MWh BESS. The method of connection to the proposed REZ transmission line will be confirmed as further details of the project are known.

The exact land area to be covered by the PV arrays and BESS will be refined as the project design process progresses. As is generally the case with solar projects, Marble Energy would seek approval for an indicative development footprint rather than a specific project layout.

Site access will be via the Golden Highway and Spring Ridge Road for both the north and south project site areas as shown in Figure 3.1. It is noted that Spring Ridge Road is a council road which may require minor upgrades.

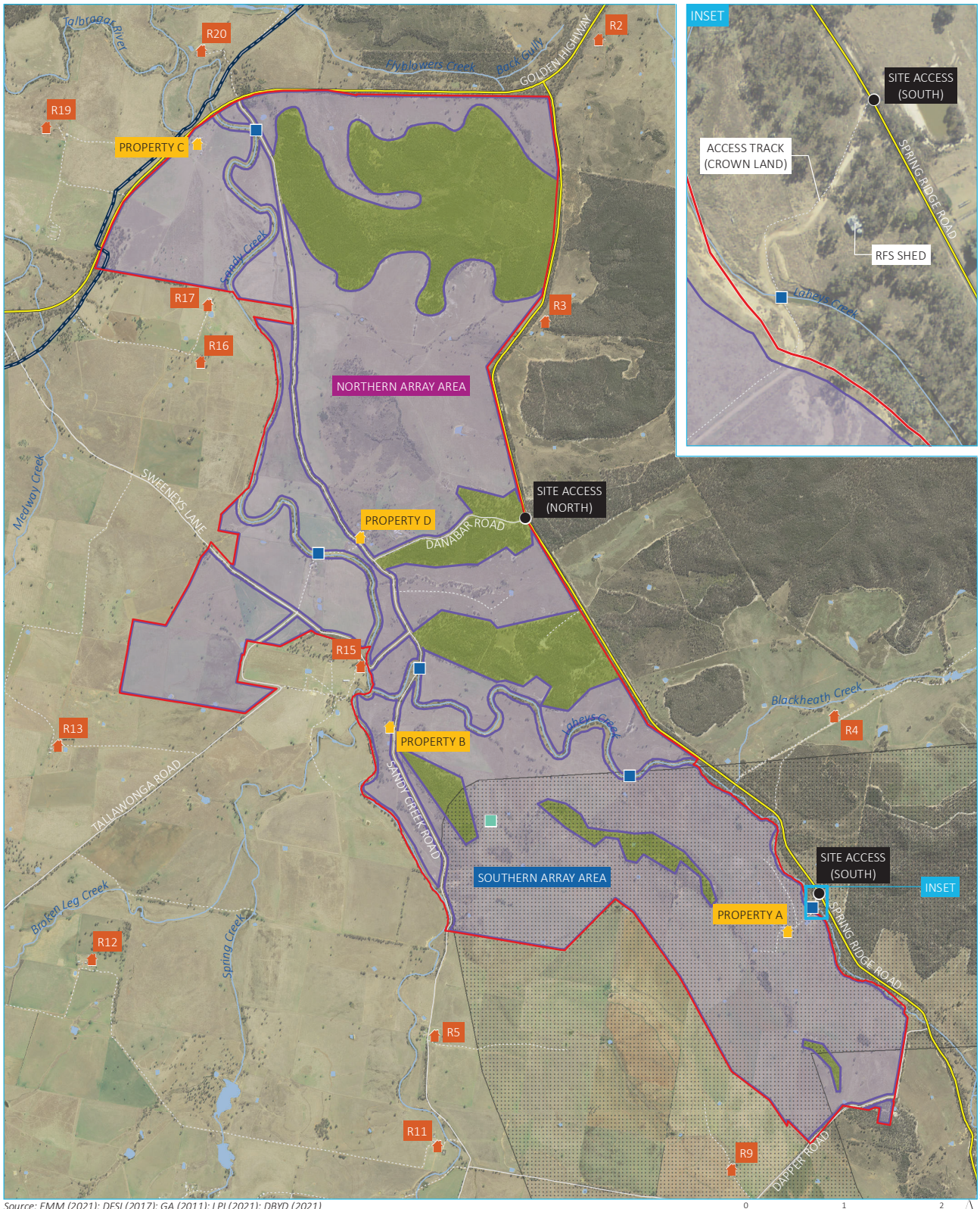
3.2 Project components

3.2.1 Solar arrays, PV modules, medium voltage cable network and inverters

The project will involve the development of separate arrays of PV modules (solar panels). The total land area required to achieve the target capacity for each array will be refined on the basis of further detailed grid connection studies; stakeholder engagement, environmental assessment and constraints identification. The location of the arrays within the study area will be confirmed in the EIS; with the number of PV modules and array configuration subject to detailed design and capacity in the transmission network at the time of finalising a connection agreement with TransGrid.

The project involves the use of single axis tracking. An example of the type of PV modules, mounted on a single axis tracking system, that may be used is provided in Plate 3.1. The PV modules will be installed on racking frames fixed onto a horizontal tracker tube, with this mounted on top of vertical piles driven or screwed into the ground; and installed in rows spaced between 5 m and 12 m apart. The rows of PV modules will be aligned in a north-south direction, allowing the panels to rotate from east to west during the day, tracking the sun's movement.

The maximum height of the panels to the higher edge from ground level at the maximum tilt angle is expected to be 4.5 m, with the leading (lower) edge of each PV module up to 1.2 m from the ground (when in a horizontal position) and no less than 0.3 m (maximum tilt).



Source: EMM (2021); DFSI (2017); GA (2011); LPI (2021); DBYD (2021)

0 1 2 km

GDA 1994 MGA Zone 55

N

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KEY

- Project boundary
- Exclusion area
- Indicative developable area *
- Central West Orana REZ transmission corridor
- Possible grid substation & battery energy storage system location
- Indicative creek crossing
- Proposed site access point
- Non-project related residential receiver
- Project related receiver

Existing environment

- Major road
- Minor road
- Vehicular track
- APA high pressure gas pipeline
- Named watercourse
- Waterbody

Note: * Buffers/ setback applied:
Roads = 5m either side
Site Boundary = 10m setback
Laheys Creek = 30m either side
Sandy Creek = 40m either side

Project overview

Cobbora Solar Farm
Scoping report
Figure 3.1

EMM
creating opportunities

Plate 3.1 Example of a PV module layout

3.2.2 Power conversion units

The power conversion units (PCUs) comprise three main components:

- inverters;
- transformers; and
- a ring main unit.

They are designed to convert the DC electricity generated by the modules into AC form that is compatible with the NEM. The PCUs will also increase the voltage of the electricity generated by the PV modules, to 33 kV for transmission to the nearest substation. The quantity and exact dimensions of the PCUs will be determined during detailed design.

3.2.3 Battery energy storage system

The project includes a centralised BESS of up to 200 MW/200 MWh. The specific technology, MW rated capacity and MWh of storage of the proposed BESS will be determined during the detailed design stage of the project and will be dependent on a number of commercial and financial considerations. The sizing of the BESS is also likely to be driven by government policy, given the current focus on mechanisms to ensure reliability and dispatchability of renewable energy power generation.

The major components of the BESS are:

- batteries – generally lithium-ion technology type;
- inverters – convert the DC electricity generated by the batteries into AC;
- transformers – increases the voltage of the electricity exported from the batteries to feed into the grid;
- heating ventilation air conditioning (HVAC) – the HVAC will maintain the batteries at a temperature to optimise their lifetime and performance; and
- fire protection – active gas-based fire protection systems will be installed within the BESS enclosure. Thermal sensors and smoke/gas detectors will be installed and connected to a fire control panel.

The EIS will assess a centralised BESS to be installed adjacent to the project's substation. While an indicative location has been identified in Figure 3.1, the location and type of BESS will be confirmed in the EIS.

3.2.4 Connection hub

Marble Energy are investigating different options to connect to TransGrid's proposed CWO REZ transmission link, however, given the REZ transmission line corridor under investigation passes entirely through the southern portion of the project, the preferred option would be co-location of the project's substation with a TransGrid substation within the indicative development footprint in a "connection hub". This connection hub would be included and assessed as part of the project and allow connection of the project to the TransGrid network. Ongoing consultation with TransGrid will be undertaken.

3.2.5 Supporting infrastructure

In addition to the infrastructure described above, the project will also require:

- staff office, operations and control room, meeting facilities, amenities and car parking;
- a temperature controlled spare parts storage facility;
- supervisory control and data acquisition (SCADA) facilities;
- a workshop and associated infrastructure;
- a number of new internal roads to facilitate access within the study area to allow for construction and ongoing maintenance; and
- fencing and landscaping.

Temporary infrastructure during the construction phase of the project, including laydown and storage areas and a site compound, may also be required.

Detailed layout configuration will be informed by technical assessments performed during the preparation of the EIS and the detailed design stage of the project. Project infrastructure will be positioned, where possible, to avoid identified constraints.

3.2.6 Road upgrades

The project will be accessed via the Golden Highway/Spring Ridge Road intersection, with two dedicated site access points currently under consideration:

- northern access via Spring Ridge Road, turning into the project site area approximately 5 km from the Golden Highway; and
- southern access via Spring Ridge Road, turning into the project site area approximately 10 km from the Golden Highway.

Spring Ridge Road has been selected as the most appropriate point of access to the project. Minor upgrades to the local road network may be required, potentially impacting on adjacent roadside vegetation. These upgrades may involve upgrades to the Golden Highway intersection with Spring Ridge Road, and possible widening of portions of Spring Ridge Road.

The outcomes of technical studies to be undertaken for the EIS (particularly traffic and biodiversity) will be used to determine the most appropriate site access for the project, as well as the outcomes of consultation which will be carried out with Warrumbungle Shire Council, Transport for NSW (TfNSW), the local community and nearby landholders. The site access options can be seen in Figure 3.1.

The EIS will assess other access options if neither of the above options are deemed feasible based on the outcomes of engagement with relevant stakeholders and further project design and assessment.

3.3 Subdivision

Based on the current design, no subdivision is proposed on the lots within the indicative development footprint, with the exception of land required for the grid substation.

The land on which the grid substation is constructed is likely to require subdivision as this is a typical requirement of TransGrid, the likely owner/operator of the cut-in section of the yard. At the end of the operational life of the grid substation, the infrastructure on the subdivided lot will be decommissioned and the lot will be reconsolidated back into the residual lot.

All land within the indicative development footprint is zoned RU1 Primary Production under the Wellington LEP and Warrumbungle LEP (refer Figure 2.2), with associated minimum lot sizes of 600 ha and 400 ha respectively. The subdivision of the lot(s) that is selected for the grid substation may result in a lot size that is less than the minimum lot size under these LEPs. Notwithstanding, in accordance with the provisions of Section 4.38 of the EP&A Act, the proposed subdivision will be permissible subject to the approval of the Minister for Planning and Public Spaces, or delegate.

Once the location of the grid substation is determined, the proposed subdivision will be the subject of ongoing discussion with Dubbo Regional Council or Warrumbungle Shire Council, DPIE and the relevant landholders.

3.4 Project staging

The project intends to connect into the electricity grid via the CWO REZ transmission infrastructure. The timing and capacity the project will be permitted to connect into this electricity network will be determined by the NSW Government in consultation with Marble Energy. The Cobbora Solar Farm will likely proceed in two or more construction stages to accommodate this process. Further details on staging will be provided at a later stage and likely during the preparation of the EIS.

3.5 Construction

The construction phase of the project is expected to take 36 months but will depend on staging of the project and scheduling of the construction works. Construction activities will be undertaken during standard day time construction hours.

Civil works will be required to prepare the site by installing fencing, internal access tracks, and minor earthworks. Some heavier earth moving activities will be required for certain project infrastructure (eg the BESS) in those instances where a level pad is necessary.

As part of site establishment works, management measures will be introduced to mitigate potential impacts on the environment and sensitive receptors that are close to the development footprint. Where required, additional or improved drainage, sediment control ponds and dust control measures will be implemented. Laydown areas and waste handling, fuel and chemical storage areas will be strategically placed to minimise potential environmental impacts during the construction phase of the project.

Construction will involve the following activities:

- clearing of vegetation and cut and fill to desired design levels;
- construction of concrete slabs to support battery modules, PCUs and substations;
- installation of battery modules, PCUs, transformers, and substations;
- installation of overhead/underground cabling from battery substation to TransGrid switchyard;
- minor works in TransGrid switchyard to facilitate connection;
- testing and commissioning; and
- removal of construction activities and equipment and site clean-up.

Construction activities would be undertaken during standard day time construction hours. Marble Energy will hire local contractors and suppliers for the construction of the facility wherever feasible.

Construction is expected to commence late 2023 subject to planning approval and other authorisations.

3.6 Construction workforce

During the construction phase of the project a peak workforce in the order of 700 full time employees (FTE) is anticipated to be required. Consultation will be carried out with Dubbo Regional Council, Warrumbungle Shire Council, business owners and key stakeholders throughout the development and assessment phases of the project regarding managing potential impacts and opportunities associated with the construction workforce.

The construction workforce will be sourced from the local area as far as practicable, with Marble Energy considering options to provide training for local hires. Where possible, the construction schedules of other renewable projects in the CWO REZ will be considered in the scheduling of the project's construction to minimise the impact on the local community.

Accommodation required for non-local hires is anticipated to be sourced through the use of available rental and short-stay accommodation in surrounding townships and in the regional centres of Dubbo, Dunedoo, Gulgong and Mudgee. The availability of accommodation will be assessed in the EIS as part of the social impact assessment. Should the assessment of suitable workers' accommodation determine that local accommodation is unsuitable or inadequate for the project, Marble Energy will consider alternatives which includes the use of temporary on-site workers' accommodation.

3.7 Operation

The solar farm is expected to be operational in early 2026. The solar farm will require regular maintenance throughout its operational life and will generally include maintaining fencing, vegetation management, upgrading drainage channels and maintaining internal roads. Additional activities, such as replacement of faulty PV modules and inverters may also be required. During the operational phase of the project a maximum workforce in the order of 15 FTE will be required.

Regular light vehicle access will be required throughout the operations phase. Heavy vehicles may be required occasionally for replacing larger components such as inverters, transformers or components of the BESS. Operational maintenance activities will typically be undertaken by specialist subcontractors and/or equipment manufacturers.

The operational lifespan of the project will be in the order 30 years, unless the solar farm is re-powered at the end of the PV modules' technical life. The decision to re-power the solar farm will depend on the economics of solar PV technology and energy market conditions at that time. If the PV modules are replaced during operations, the lifespan of the project may extend to up to 50 years.

3.8 Decommissioning

Once the project reaches the end of its investment and operational life, the project infrastructure will be decommissioned and the study area returned to its previous land use, namely grazing of sheep and cattle, or another land use as agreed by the project owner and the landholder at that time.

Project decommissioning will require disturbance of the study area during the removal of equipment. A significant number of FTEs, including both staff and contractors, and vehicle movements will be required during the decommissioning phase of the project.

Marble Energy will recycle all dismantled and decommissioned infrastructure and equipment, where practicable. Structures and equipment that cannot be recycled will be disposed of at an approved waste management facility.

3.9 Alternatives considered

Marble Energy has identified the study area as being suitable for solar farm development due to its location in the CWO REZ. The project site area was also selected due to its optimal renewable energy generation potential and overlap with the study corridor for the proposed CWO REZ transmission line. Given the magnitude of the project, suitable alternative locations are limited due to the requirements of surface area, topography, proximity to existing and/or proposed energy infrastructure and available network capacity.

The project site area is situated on part of the approved Cobbora Coal Project, which was subsequently deemed not viable. The land was subsequently sold to private buyers following the NSW Government's decision to abandon plans for the open cut coal mine. The possibility of transforming an area previously considered as a source of fossil fuel into a solar farm was appealing to Marble Energy.

Alternatives to the proposed location were considered by Marble Energy as part of the site identification process, including other potential sites in NSW and the Central West region. In addition to the reasons listed above, the project site area was selected due to the capacity available in the proposed electricity network for a utility-scale solar PV project, the relatively low level of environmental constraints presented by the study area, the relatively few neighbours living within close proximity of the study area and the willingness of landholders to be involved.

Alternative power generation options are economically limited from a private investment standpoint, with solar power generation, along with wind, becoming the cheapest forms of new build electricity in Australia. There are significant constraints for the private sector to invest in other technologies, such as pumped hydro, due to their relatively higher costs and higher risks. Replacing retiring coal-fired power plants with a combination of solar farms, wind farms, and battery storage systems is the most economically viable option for the foreseeable future.

4 Statutory context

The key relevant statutory requirements for the project having regard to the EP&A Act, other NSW and Commonwealth legislation, and environmental planning instruments are summarised in Table 4.1. This table has been set out in accordance with the scoping report guidelines and state significant development - preparing an environmental impact statement Appendix B to the State Significant Development Guidelines (DPIE 2021b) (EIS guidelines), to cover the following:

- power to grant approval (eg approval pathway);
- permissibility;
- consistent approvals;
- Commonwealth approvals;
- approvals not required (pursuant to Section 4.41 of the EP&A Act); and
- mandatory matters for consideration.

Detailed consideration of relevant statutory requirements will be provided in the EIS.

Table 4.1 Statutory context

Aspect	Requirement
Power to grant approval	
Environmental Planning and Assessment Act 1979 (EP&A Act) and *State Environmental Planning Policy* (State and Regional Development) 2011 (SRD SEPP)	Part 4 of the EP&A Act relates to development assessment and consent; Part 4, Division 4.7 relates to the assessment of development deemed to be significant to the State (or SSD). Section 4.36(2) of the EP&A Act states that a: *…State environmental planning policy may declare any development, or any class or description of development, to be State significant development.* The SRD SEPP identifies development that is SSD. Clause 8 of the SRD SEPP states: *(1) Development is declared to be State significant development for the purposes of the Act if:* *(a) the development on the land concerned is, by the operation of an environmental planning instrument, not permissible without development consent under Part 4 of the Act, and* *(b) the development is specified in Schedule 1 and 2.* The project meets both these requirements; it requires development consent, and is a development specified in Schedule 1 of the SRD SEPP. Schedule 1 of the SRD SEPP defines the following as SSD: *Electricity generating works and heat or co-generation* *Development for the purpose of electricity generating works or heat or their co-generation (using any energy source, including gas, coal, biofuel, waste, hydro, wave, solar or wind power) that:* (4) *has a capital investment value of more than $30 million.* The project meets the definition of "electricity generating works" under the Standard Instrument – Principal Local Environmental Plan (Standard Instrument) as it is a building or place used for the purpose of electricity storage. The project will also have a capital investment value of more than $30 million. Consequently, the project is SSD.
Permissibility	
State Environmental Planning Policy (Infrastructure) 2007 (ISEPP)	Clause 34 (1) of ISEPP states that: *Development for the purpose of electricity generating works may be carried out by any person with consent on…any land in a prescribed rural, industrial or special use zone.* As noted above, the project meets the definition of "electricity generating works" and is wholly located in land zoned RU1 Primary Production. Land zoned RU1 Primary Production comprise a prescribed rural, industrial or special use zone for the purposes of Clause 34. Accordingly, the project may be carried out within the project site area with development consent.
Consistent approvals	
Section 4.42, EP&A Act	Section 4.42 of the EP&A Act outlines that the approvals listed below cannot be refused if necessary for carrying out an approved SSD and are to be consistent with the terms of the development consent for the SSD.
An approval under section 138 of the NSW *Roads Act 1993* (Roads Act)	Under Section 138 or Part 9, Division 3 of the Roads Act, a person must not undertake any works that impact on a road, including connecting a road (whether public or private) to a classified road, without approval of the relevant authority, being either TfNSW or local council, depending upon the classification of the road. The project is located off Spring Ridge Road, which is a local road managed by Warrumbungle Shire Council. The project involves the development of a formal site access which may involve works within the designated road corridor. Should the project obtain development consent, approval under the Roads Act cannot be refused and will be consistent with conditions of approval.

Table 4.1 Statutory context

Aspect	Requirement
Commonwealth approvals	
Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)	The EPBC Act aims to protect matters of national environmental significance (MNES). If an action will, or is likely to, have a significant impact on any MNES, it is deemed to be a "controlled action" and requires approval from the Commonwealth Environment Minister or the Minister's delegate. A search of the Commonwealth Protected Matters Search Tool indicates that there are no world heritage properties or national heritage places within the vicinity of the site. Further, no Commonwealth land is expected to be affected by the project. Refer to Appendix C for results of the search. The preliminary biodiversity assessment indicates there is potential for listed threatened species and listed migratory species to occur within the project site area. Further field surveys will be undertaken to determine whether the alignment of vegetation within the indicative development footprint meets the EPBC Act determination for the White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland Critically Endangered Ecological Community. This would require vegetation plots to surmise vegetation thresholds to confirm whether a referral to the Commonwealth Department of Agriculture, Water and the Environment (DAWE) is required.
Approvals not required	
Section 4.41, EP&A Act	Section 4.41 of the EP&A Act outlines the following approvals, permits etc are not required for an approved SSD.
Fisheries Management Act 1994	A permit under the *Fisheries Management Act 1994* (FM Act) to block fish passage or dredge or carry out reclamation work on water land will not be required pursuant to Section 4.41 of the EP&A Act. Construction work, such as creek crossings to provide access, may be required. Any works will be undertaken in accordance with NSW DPI *Policies and Guidelines on Fish-Friendly Waterway Crossings* (undated), *Policy and Guidelines for Fish Habitat Conservation and Management* (DPI 2013), and NSW Guidelines for Controlled Activities.
Heritage Act 1977	An approval under Part 4, or an excavation permit under section 139, of the Heritage Act will not be required pursuant to Section 4.41 of the EP&A Act. Notwithstanding, there are no listed heritage items within the project site area.
National Parks and Wildlife Act 1979	An Aboriginal heritage impact permit under section 90 of the *National Parks and Wildlife Act 1974* (NPW Act) will not be required pursuant to Section 4.41 of the EP&A Act. There is potential for Aboriginal sites to occur within the project site area, primarily associated with watercourses and higher vegetated areas. Any Aboriginal heritage sites identified within the project site area will be avoided as far as practicable through the design process.
Rural Fires Act 1997	A bushfire safety authority under section 100B of the *Rural Fires Act 1997* will not be required pursuant to Section 4.41 of the EP&A Act. An assessment of hazards and risks will be undertaken to assess hazardous scenarios and risks associated with the project including from bushfires. The vegetated areas of the project site area are mapped as bushfire prone land (Category 1), however, these areas correspond with the exclusion areas. The indicative development footprint will be largely on land mapped as Category 2, with a lower bushfire risk.

Table 4.1 Statutory context

Aspect	Requirement
Water Management Act 2000	A water use approval under section 89, a water management work approval under section 90, or an activity approval (other than an aquifer interference approval) under section 91 of the *Water Management Act 2000* pursuant to Section 4.41 of the EP&A Act. Construction work near or within watercourses within the project site area may be required. These works will be carried out in accordance with DPIE's various guidelines for controlled activities.
Mandatory considerations - considerations under EP&A Act and EP&A Regulation	
Section 1.3 – Objects of Act	Relevant objects of the EP&A Act are: *(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,* *(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,* *(j) to provide increased opportunity for community participation in environmental planning and assessment.*
Section 4.15 – Evaluation	Pursuant to Section 4.15 of the EP&A Act the consent authority must consider the following relevant matters for consideration: • relevant environmental planning instruments for the project including: – State Environmental Planning Policy No 33-Hazardous and Offensive Development (SEPP 33); – State Environmental Planning Policy No 55-Remediation of land (SEPP 55); – State Environmental Planning Policy (Infrastructure) 2007 (ISEPP); – State Environmental Planning Policy (Koala Habitat Protection) 2020 (Koala SEPP); – Warrumbungle Local Environmental Plan 2013 (Warrumbungle LEP); and – Wellington Local Environmental Plan 2012 (Wellington LEP). • relevant development control plans (DCPs) for the project including: – Warrumbungle Development Control Plan 2015 (Warrumbungle DCP); and – Wellington Development Control Plan 2013 (Wellington DCP). • The Dark Sky Planning Guideline. • the likely impacts of that development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality; • the suitability of the site for the development; and • the public interest. The above will all be considered in detail in the EIS.

Table 4.1 Statutory context

Aspect	Requirement
Mandatory considerations - Considerations under other legislation	
Biodiversity Conservation Act 2016 (BC Act)	The likely impact of the project on biodiversity values as assessed in the biodiversity development assessment report. The Minister for Planning and Public Spaces may (but is not required to) further consider under the BC Act the likely impact of the project on biodiversity values.
Mandatory considerations - Environmental planning instruments	
State Environmental Planning Policy No 55 – Remediation of Land, Clause 7	As the development will involve a change of use on land on which development for a purpose referred to in Table 1 to the contaminated land planning guidelines (agriculture) is being, or is known to have been, carried out, a report specifying the findings of a preliminary investigation of the land concerned carried out in accordance with the Managing Land Contamination Planning Guidelines (DUAP 1998).
State Environmental Planning Policy No 33 – Hazardous and Offensive Development, Clause 8	The EIS will consider the following relevant departmental guidelines: • Applying SEPP 33 (DoP 2011a); • Hazardous Industry Planning Advisory Paper No. 3 – Risk Assessment (DoP 2011b); • Hazardous Industry Planning Advisory Paper No. 12 – Hazards (DoP 2011c).
Warrumbungle LEP 2013	The EIS will consider: • the relevant objectives for the RU1 zone; • Clause 5.14 Siding Spring Observatory - maintaining dark sky; • Clause 6.1 Earthworks; • Clause 6.3 Terrestrial biodiversity; • Clause 6.4 Groundwater vulnerability; and • Clause 6.5 Riparian land and watercourses.
Wellington LEP 2012	The EIS will consider: • the relevant objectives for the RU1 zone; • Clause 6.3 Terrestrial biodiversity; • Clause 6.4 Groundwater vulnerability; and • Clause 6.5 Riparian land and watercourses.
Mandatory considerations Development control plans	
Warrumbungle DCP	The EIS will consider the following: • Section 5 – Rural development controls; and • Section 9 – Other development controls.
Wellington DCP	The EIS will consider the following: • Section B – Environmental requirements; • Section C – Hazard minimisation requirements; • Section D – Development design requirements; • Section E – Heritage conservation requirements; and • Section G – Erosion and sediment control plans.

5 Engagement

5.1 Overview

Marble Energy is currently building a strong local presence. In terms of its engagement to date, Marble Energy has consulted with neighbouring property owners since early 2020. Marble Energy has recently been back in touch with all the residents within a 3 km radius of the project to provide an update on the project and seek the neighbours' feedback.

Marble Energy has also conducted engagement with Dubbo Regional Council and Warrumbungle Shire Council and has made offers to meet with these key stakeholders to further discuss the proposal. This engagement will continue as the project is further refined and studies to support the development application are underway.

Marble Energy will adopt the engagement principles detailed in Undertaking Engagement Guidelines for State Significant Project (DPIE 2021a). These principles will include consulting early and often, with a view to address any issues raised by the community as the project plans are developed.

It is noted that as with other renewable developments in the CWO REZ, that the project may attract a degree of local interest. However, it is unlikely that the project will generate significant opposition from the community if open and transparent communication with stakeholders and the community is maintained. In addition, there are relatively few neighbours living within close proximity of the project and there is limited visibility of the site from surrounding roads.

Consultation undertaken during the preparation of the EIS will aim to:

- consult proactively with stakeholders using clear and consistent key messages;
- continue to engage with key stakeholders to identify potential issues and opportunities;
- communicate the progress of the project;
- enable stakeholders to have input into the preparation of the EIS and project planning; and
- implement response and feedback strategies to address stakeholder concerns and use these to inform the evolution of the project.

5.2 Scoping study phase consultation

5.2.1 Stakeholder identification

Stakeholder identification has been undertaken as part of the scoping phase for the project. The following key stakeholders for the scoping phase have been identified:

- immediate neighbours;
- directly impacted neighbours;
- indirectly impacted neighbours;
- local members of parliament;
- community interest groups;

- government organisations such as Crown Lands and TfNSW; and
- Dubbo Regional Council and Warrumbungle Shire Council.

5.2.2 Summary of engagement

The stakeholder engagement process commenced in 2020, with more targeted engagement occurring recently with a summary of engagement activities undertaken during the scoping phase summarised in Table 5.1.

Table 5.1 Summary of stakeholder engagement activities

Stakeholder group	Method	Purpose of engagement
Dubbo Regional Council	Via telephone call	Dubbo Regional Council was contacted by telephone on 16 August 2021, where the project was introduced and feedback sought on the issues Council considers important to be included when developing the design and when undertaking environmental impact assessments.
	Via email	An email was sent to Council on 25 August 2021 with project details and a figure showing the indicative development footprint. A response was received 8 September 2021 detailing the following matters: • access to the project site area, particularly during the construction phase by heavy vehicles; • access to the project site area would likely be off the Golden Highway, which is a classified road. Suggest consultation with TfNSW to determine their requirements; • impacts on native fauna and flora, including native grasses and the BC Act; • impacts of bushfire protection (grassland risk) and matters of consideration under the Planning for Bush Fire Guidelines 2019; • Aboriginal cultural heritage impacts; • visual impacts, and the potential for screening of the development, such as landscaping around the perimeter; and • detail around built features such as workers offices and amenities buildings.
Warrumbungle Shire Council	Via email	An email was sent to Warrumbungle Shire Council on 19 August 2021 to introduce the project and seek feedback as to what issues council would require to be considered when developing the design and in undertaking environmental impact assessments. A follow up email was sent to council on 25 August 2021 with project details and a figure showing the indicative development footprint. Further emails were sent in September 2021 with offers made to meet with Council to discuss the project.
	Via telephone call	A telephone call was held with council's town planner on 23 August 2021 to follow up on the email and seek feedback as to what issues council would require to be considered when developing the design and in undertaking environmental impact assessments. This was followed up with further telephone calls in September and October 2021. Council officers confirmed that Council had received the project information, and is aware of the project.

Table 5.1 Summary of stakeholder engagement activities

Stakeholder group	Method	Purpose of engagement
NSW Crown Lands (Dubbo)	Via telephone call	A telephone call was held with Crown Lands on 23 September 2021 to introduce the project and indicate the project will involve developing on several crown roads, with details to follow during the preparation of the EIS. Crown Lands did not identify any issues of concern at this stage, and confirmed that it will provide input to DPIE during the scoping and EIS stages of the project.
	Via email	An email was sent to Crown Land on 23 September 2021 with project details and a figure showing the indicative development footprint.
TransGrid	Via online application form	Marble responded to TransGrid and the NSW Government's registration of interest to connect into the CWO REZ infrastructure in late 2020. Marble will continue to consult with TransGrid regarding the design of the CWO REZ infrastructure.
Local Member of Parliament (Dubbo) Dugald Saunders MP (Nationals)	Via telephone call	Marble contacted Mr Saunders' office on 27 September 2021 and confirmed the preferred form of communication to introduce the project is via email.
	Via email	An email was sent to Dugald Saunders on 27 September 2021 to introduce the project and seek a meeting to formally introduce the company.
Local Member of Parliament (Barwon) Royal (Roy) Butler MP (Shooters, Fishers and Farmers)	Via telephone call	Marble contacted Mr Butler's office on 27 September 2021 and confirmed the preferred form of communication to introduce the project is via email. Marble has since arranged for a project introduction meeting to be held with Mr Butler in November 2021.
	Via email	An email was sent to Mr Butler on 27 September 2021 to introduce the project and seek a meeting to formally introduce the company.
National Farmers' Federation	Via telephone call	Marble contacted the head office on 27 September and confirmed the preferred form of communication to introduce the project is via email.
	Via email	An email was sent on 27 September 2021 to introduce the project and share key details on the project site's land capability relating to its agriculture potential. A map of the site location and land capability was provided. A response was received on 28 September advising that NFF deals with national issues and legislation, and that the most appropriate pathway to communicate with the industry about the project is with NSW Farmers Association.

Table 5.1 Summary of stakeholder engagement activities

Stakeholder group	Method	Purpose of engagement
NSW Farmers Association	Via email	An email to NSW Farmers on 27 September 2021 introduced the project and shared key details on the project site's land capability relating to its agriculture potential. A map of the site location and land capability was also provided. Marble representatives also met with the NSW Farmers Association (Orana region) on 14 October 2021 to introduce the project and company. The association agreed that the site appears appropriate for a solar farm and the following issues were discussed: • insurance premiums increasing for neighbouring properties; • the potential loss of agricultural production; • the potential effect on land prices; • the ability for long term community benefit sharing arrangements to be implemented for the project; and • partnership/research opportunities with local farmers. The NSW Farmers Association indicated it will send its positions paper on renewable energy development for Marble's consideration. Marble also committed to keeping the association updated with any major project updates.
Direct neighbours	Via notification letter	The letter was distributed via letter box drop to immediate neighbours and residences within a 3 km radius of the project site on 1 September 2021. The purpose of the letter was to introduce the project and Marble Energy, to inform about the development application process, and to invite recipients to provide feedback regarding the project. No written responses were received as a result of this communication. Marble Energy will continue to consult with direct neighbours during the preparation of the EIS.
Direct neighbours and nearby landholders	Via telephone call and follow up emails (see also Section 5.2.3)	Nearby landholders were contacted via telephone between 23 August 2021 and 1 September 2021. The purpose of the call was to introduce the project and Marble Energy, to inform about the development application process, and to invite recipients to provide feedback regarding the project. All conversations were constructive, with a willingness to work together to address any amenity issues which may arise. There is a general understanding of the development of the REZ and TransGrid transmission lines. Marble Energy will continue to consult with landholders during the preparation of the EIS.
Local community	Dedicated project website: https://www.marbleenergy.com.au/featured-projects-2/cobbora-solar-farm	The project website was launched during September 2021. The website provides an overview of the project and Marble Energy and will be kept updated with relevant information regarding the development application process, and to provide an email address for visitors to leave a comment or question. No feedback or responses have yet to be received via the email address.

5.2.3 Neighbour engagement

Marble Energy has led consultation with project neighbours who either share a border or have a residence within 3 km of the project site. Despite the current pandemic situation Marble has remained proactive in its engagement activities, and has engaged with neighbours through face-to-face consultation where possible, letters, emails, and telephone calls. A list of the receivers and the form of engagement with Marble to date is outlined in Table 5.2.

Table 5.2 Neighbour engagement

Residence (see Figure 1.2)	Face to face meeting	Telephone call	Email/letter
R1		✓	✓
R2		✓	✓
R3		✓	✓
R4		✓	✓
R5	✓	✓	✓
R6		✓	✓
R7		✓	✓
R8		✓	✓
R9	✓	✓	✓
R10			✓
R11		✓	✓
R12		✓	✓
R13	✓	✓	✓
R14	✓	✓	✓
R15	✓	✓	✓
R16		✓	✓
R17		✓	✓
R18		✓	✓
R19		✓	✓
R20		✓	✓

Feedback received from consultation with neighbours has been positive, with a general acknowledgement that the region is currently undergoing a transformation due to the establishment of the renewable energy zone. Most were comfortable with the project and associated changes to the surroundings as the site was previously approved for a coal mine that would have seen extensive, irreversible changes to the landscape.

There were several issues raised by nearby neighbours and which Marble Energy will explore in greater detail during the development of the project, and which will be documented in the EIS. The key issues raised by community members were:

- visual impacts;
- traffic management;

- noise impacts;
- availability of housing for the construction workforce; and
- the extent of benefit sharing with the community.

5.3 EIS phase consultation

Consultation undertaken during the preparation of the EIS will aim to:

- consult proactively with stakeholders using clear and consistent key messages;
- continue to engage with key stakeholders to identify potential issues and opportunities;
- communicate the progress of the project;
- enable stakeholders to have input into the preparation of the EIS and the design of the project; and
- implement response and feedback strategies to address stakeholder concerns and use these to inform the evolution of the project.

A summary of consultation methods that will be used as the project develops, and their purpose, is provided in 3

Table 5.3 Proposed EIS consultation purpose and methods

Stakeholder	Purpose	Method
DPIE including: • Environment, Energy and Science (EES) Group; • Water Group.	• informing DPIE of project progress; • resolving of issues during EIS preparation; • applying DPIE guidelines to engagement activities.	• face to face/videoconference meetings; • email and telephone correspondence; • briefing letters (to EES and Water Group).
TfNSW	• informing TfNSW of project progress; • discuss access options for the project and confirm TfNSW requirements for potential upgrades of access route connection with the Golden Highway.	• face to face/videoconference meetings; • email and telephone correspondence; • briefing letters.
Warrumbungle Shire Council	• informing council of project progress; • discuss access options for the project and confirm council requirements for road upgrades; • consultation to inform the social impact assessment (SIA); • communicate outcomes of assessments.	• face to face/videoconference meetings; • email and telephone correspondence; • briefing letters.
Dubbo Regional Council	• informing council of project progress; • discuss access options for the project and confirm council requirements for road upgrades (should roads within this LGA be impacted by the project); • consultation to inform the social impact assessment (SIA).	• face to face/videoconference meetings; • email and telephone correspondence; • briefing letters.

Table 5.3 Proposed EIS consultation purpose and methods

Stakeholder	Purpose	Method
TransGrid	• informing TransGrid of project progress; • project design discussions.	• face to face/videoconference meetings; • email and telephone correspondence.
NSW Environment Protection Authority (EPA)	• informing EPA of project progress; • following EPA technical assessment guidelines.	• email and telephone correspondence; • briefing letters.
State MPs	• regular project updates.	• face to face/videoconference meetings; • briefing letters.
Associated landholders and non-project related nearby neighbours	• regular project updates; • identification of key environmental and social concerns; • communication regarding how environmental and social concerns will be mitigated; • communication regarding opportunities to lodge a submission on the project.	• face-to-face briefings, interviews and telephone calls; • newsletters and fact sheets; • community drop-in sessions (face-to-face or virtual); • website feedback forms and project information line.
Wider community	• regular project updates.	• newsletters and fact sheets; • community drop-in sessions (face-to-face or virtual); • website feedback forms and project information line.
Aboriginal community	• regular project updates; • identify Aboriginal cultural heritage values of the study area and connection to place.	• consultation in accordance with the *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW 2010); • newsletters and fact sheets; • community drop-in sessions (face-to-face or virtual); • website feedback forms and project information line.
Local service providers	• regular project updates; • identify key environmental, social and economic concerns; • gain an understanding of the local economy and resource availability (ie availability of accommodation for the construction phase).	• face-to-face briefings, interviews and phone calls; • newsletters and fact sheets; • community drop-in sessions (face-to-face or virtual); • website feedback forms and project information line.
Special interest groups	• regular project updates • identify key environmental, social and economic concerns	• face-to-face briefings, interviews and phone calls; • newsletters and fact sheets; • community drop-in sessions (face-to-face or virtual); • website feedback forms and project information line.

It is noted that the ongoing COVID-19 pandemic and associated health orders may preclude the ability for face-to-face engagement on the project. Alternative forms of engagement, such as project fact sheets and online meetings on request or virtual community drop-in sessions, would be used to account for any inability for face-to-face engagement.

6 Proposed assessments

6.1 Introduction

A preliminary environmental assessment has been carried out to assist in the identification of matters that will require further assessment in the EIS and the level of assessment that should be carried out for each matter. In accordance with the Scoping Report Guidelines (DPIE 2021a), the following factors have been considered in the identification of matters needing further assessment for the project:

- the scale and nature of the likely impact of the project and the sensitivity of the receiving environment;
- whether the project is likely to generate cumulative impacts with other relevant future projects in the area; and
- the ability to avoid, minimise and/or offset the impacts of the project, to the extent known at the scoping phase.

The following sections of this chapter present the identified matters requiring further assessment and the proposed approach to the respective assessments. Matters have been categorised as per the categories identified in the Scoping Report Guidelines (DPIE 2021a). A scoping summary table in accordance with the Scoping Report Guideline is included in Appendix B. Also, in accordance with the Scoping Report Guideline, the level of assessment identified for each aspect is as follows:

Table 6.1 Proposed assessments

Detailed assessments	Standard assessments
visual	noise
biodiversity	land resources
traffic	water resources
Aboriginal cultural heritage	social
hazards and risk	air quality
	historic heritage

6.2 Amenity

6.2.1 Visual

i Existing environment

The prevailing undulating topography of the study area and surrounding areas, together with remnant roadside vegetation and planted windbreaks, serve to provide a degree of screening of the study area when viewed from surrounding residences, local roads, Golden Highway and adjacent agricultural land. Notwithstanding, there is potential for scattered rural residences to have views of proposed project infrastructure, particularly those residences and landholdings to the west and south which have elevated views over the project site area. Drivers on local roads will also have views of the project, particularly along Spring Ridge Road, Sandy Creek Road, Dapper Road, Danabar Road, Sweeneys Lane and Tallawonga Road.

The nearest non-project related residence is located approximately 50 m west of the northern project site area boundary off Sweeneys Lane.

The project falls within the Dark Sky Region which consists of the land within a 200-kilometre radius of Siding Spring Observatory Therefore the proposal will also consider the relevant matters required in terms of lighting of the site in accordance with the The Dark Sky Planning Guideline (2016a).

ii Assessment approach

The visual impact assessment will include an assessment of the likely visual impacts of the project (including any glare, reflectivity and night lighting) on surrounding residences, scenic or significant vistas, air traffic and road corridors in the public domain.

A comprehensive viewshed analysis utilising light detection and ranging (LiDAR) data and results from site inspections and stakeholder engagement will be performed to identify locations and receivers within the local setting that may experience views of project infrastructure. This will be complemented with photomontages to show the views of the project components and the potential visual impacts with and without treatment and mitigation implemented. Where relevant, the visual impact assessment and EIS will recommend appropriate mitigation measures to reduce the project's visual amenity impacts. Possible mitigation measures will be discussed with relevant stakeholders during the process.

6.2.2 Noise and vibration

i Existing environment

Land use in the study area and surrounds is predominantly agricultural. Given the project's rural setting, background noise at nearby sensitive receptors is likely to be low and characterised by animals, agricultural equipment and machinery associated with agricultural production activities and vehicle movements.

ii Assessment approach

The construction of the project has potential to create noise impacts for surrounding landholders within and adjacent to the study area. Noise generated by the project will include construction noise, and noise generated by increased traffic along the local road network.

During the operational phase of the project, noise generated is anticipated to be minimal, consisting of noise associated with vehicle movements within the study area and electrical infrastructure such as transformers, PCUs, the BESS and substation.

A road traffic noise assessment will also be included in the EIS to determine noise impacts associated with project related vehicle movements along the local road network during the construction phase of the project.

Noise will be assessed in the EIS in accordance with the:

- NSW Interim Construction Noise Guideline (ICNG) (DECC 2009);
- NSW Noise Policy for Industry (NPfI) (EPA 2017); and
- NSW Road Noise Policy (RNP) (DECCW 2011).

It is unlikely that the construction or operation of the project will result in vibration impacts.

6.3 Biodiversity

6.3.1 Existing environment

i Previous assessments

The site was extensively assessed for its biodiversity values during the EIS process for the Cobbora Coal Project in 2012. While this assessment was undertaken under previous legislation and policies, and as the land is used for the same purpose it was in 2012, the assessment still provides useful insight into the potential biodiversity values which are present at the site. The findings of the previous assessment were:

- the project site is within an agricultural region that is dominated by grazing land with large tracts of remnant vegetation on the less fertile slopes and ridges;
- much of the area within the center of the site now proposed for the solar arrays was considered to be improved pasture or disturbed land;
- the overall removal of vegetation and fauna habitat was considered to be minor within the regional context; and
- significant impacts to threatened species and communities would have been unlikely if the project had been developed, with the proposed mitigation measures in place.

ii Bioregion

The site is in the Brigalow Belt South Interim Biogeographic Regionalisation for Australia (IBRA) Bioregion (DoEE 2016a and 2016b) and the Talbragar Valley subregion. The Goonoo Slopes BioNet Landscape (formerly Mitchell Landscape, DPIE 2016b) dominates the site, with small areas of Talbragar - Upper Macquarie Terrace Sands and Gravels in the northern portion of the site.

iii Plant community types and threatened ecological communities

Review of the State Vegetation Type Mapping (SVTM), Central West/Lachlan Region (DPIE 2015) indicates that 629.53 ha (approximately 20% of the site) is listed as non-native and considered cleared. However most of the area where the solar array would be located is used for agricultural pasture or cropping. A preliminary site visit is required to accurately map the vegetation communities. The SVTM also indicates that there are small areas of native vegetation, with 16 Plant Community Types (PCTs) mapped (Table 6.1 and Figure 6.1).

Nine of the PCTs are aligned with three different threatened ecological communities (TECs) (Table 6.1):

- the Endangered Ecological Community (EEC) Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions (referred to as Inland Grey Box EEC);
- the Endangered Ecological Community Fuzzy Box Woodland on alluvial Soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions (referred to as Fuzzy Box EEC); and
- the Critically Endangered Ecological Community (CEEC) 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 (also referred to as Box-Gum CEEC).

All three TECs are listed under the BC Act, Inland Grey Box EEC and Box-Gum CEEC are also listed under the EPBC Act, albeit with different determinations. A key example of the difference is the specific condition requirements for woodland and derived native grassland (DNG) to meet the Box-Gum Woodland criteria under the EPBC listing. In contrast the BC Act list has few condition requirements to meet the listing. Derived grassland are grasslands where the canopy (trees) has been cleared however native groundcover species remain.

The Box-Gum CEEC is also a candidate for Serious and Irreversible Impacts (S&II). While the approval authority can approve a proposal which is likely to have serious and irreversible impacts, they must take those impacts into consideration and determine whether there are any additional and appropriate measures that will minimise those impacts if approval is to be granted.

In addition to these TECs the following were identified using the Commonwealth Protected Matters Search Tool (PMST) (see Appendix C) as having potential to occur:

- Coolibah – Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions;
- Grey Box (Eucalpytus macrocarpa) Grassy Woodlands and Derived Native Grasslands of south-eastern Australia;
- natural grasslands on basalt and fine-textured alluvial plains of norther New South Wales and Southern Queensland;
- Poplar Box Grassy Woodland on Alluvial Plains; and
- Weeping Myall Woodlands.

However, no PCTs aligned with these communities have been identified by the SVTM.

Table 6.1 Plant community types and threatened ecological communities mapped by the SVTM

Plant community type	Area (ha)	BC Act	EPBC Act
PCT 78: River Red Gum riparian tall woodland/open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion	41.94	-	-
PCT 81: Western Grey Box - cypress pine shrub grass shrub tall woodland in the Brigalow Belt South Bioregion	290.39	Inland Grey Box EEC[1]	Inland Grey Box EEC[1]
PCT 84: River Oak - Rough-barked Apple - red gum - box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion	0.38	-	-
PCT 202: Fuzzy Box woodland on colluvium and alluvial flats in the Brigalow Belt South Bioregion (including Pilliga) and Nandewar Bioregion	34.18	Fuzzy Box EEC[2]	-
PCT 277: Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	2.58	Box-Gum CEEC[3]	Box-Gum CEEC [3]
PCT 281: Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion	39.06	Box-Gum CEEC [3]	Box-Gum CEEC[3]
PCT 403: Dapper Mugga Ironbark - Western Grey Box - Blakely's Red Gum - Black Cypress Pine grass shrub hill woodland (southern Brigalow Belt South Bioregion)	16.01	Box-Gum CEEC[3]	Box-Gum CEEC[3]

Table 6.1 Plant community types and threatened ecological communities mapped by the SVTM

Plant community type	Area (ha)	BC Act	EPBC Act
PCT 412: White Box - Black Cypress Pine shrubby hill woodland in the east Pilliga - Mendooran - Gulgong regions, mainly Brigalow Belt South Bioregion	1.70	-	-
PCT 437: Yellow Box grassy woodland on lower hillslopes and valley flats in the southern NSW Brigalow Belt South Bioregion	13.511	Box-Gum CEEC[3]	Box-Gum CEEC[3]
PCT 461: Tumbledown Gum woodland on hills in the northern NSW South Western Slopes Bioregion and southern Brigalow Belt South Bioregion	1.65	-	-
PCT 467: Blue-leaved Ironbark - Black Cypress Pine shrubby sandstone open forest in the southern Brigalow Belt South Bioregion (including Goonoo)	258.42	-	-
PCT 468: Narrow-leaved Ironbark - Black Cypress Pine +/- Blakely's Red Gum shrubby open forest on sandstone low hills in the southern Brigalow Belt South Bioregion (including Goonoo)	107.31	-	-
PCT 479: Narrow-leaved Ironbark- Black Cypress Pine - stringybark +/- Grey Gum +/- Narrow-leaved Wattle shrubby open forest on sandstone hills in the southern Brigalow Belt South Bioregion and Sydney Basin Bioregion	28.22	-	-
PCT 511: Queensland Bluegrass - Redleg Grass - Rats Tail Grass - spear grass - panic grass derived grassland of the Nandewar Bioregion and Brigalow Belt South Bioregion	1,824.49[4]	Box-Gum CEEC[3]	Box-Gum CEEC[3]
PCT 599: Blakely's Red Gum - Yellow Box grassy tall woodland on flats and hills in the Brigalow Belt South Bioregion and Nandewar Bioregion	1.80	Box-Gum CEEC[3]	Box-Gum CEEC[3]
PCT 796: Derived grassland of the NSW South Western Slopes	20.33	Box-Gum CEEC[3]	Box-Gum CEEC[3]
Cleared/Non-native	629.53	--	
Total	**3,311.51**		

1. Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Regions.
2. Fuzzy Box Woodland on alluvial Soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions.
3. 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 CEEC).
4. Likely that a proportion of this area is agricultural land, a preliminary site visit is required to map vegetation communities accurately.

iv Threatened species

A desktop search was conducted for threatened species and included a review of the following:

- any species associated with the 16 PCTs identified in the SVTM (DPIE 2021);
- MNES report generated from the Commonwealth PMST (DAWE 2021);
- habitat distribution maps for aquatic species (DPI 2016-2020); and
- atlas records from Bionet using a 10 km buffer of the site (OEH 2021).

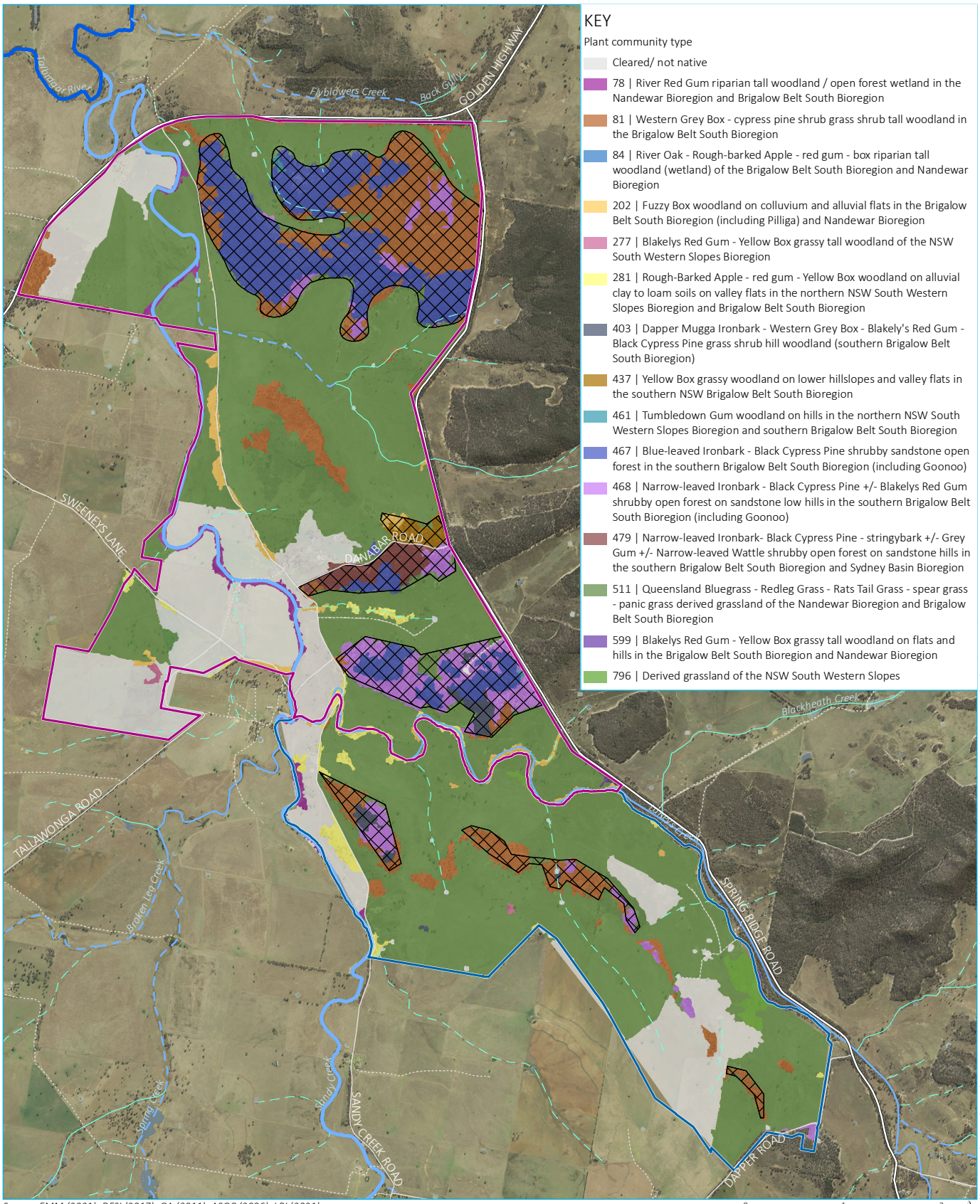
A threatened species list was compiled from the above sources. The list includes 84 terrestrial threatened species comprising one amphibian, 6 bats, 49 birds, 19 flora, 3 fish, 4 marsupials and 3 reptiles.

a Assessment of terrestrial threatened species

Interrogation of the Department of Primary Industries (DPI) Mapping (DPI 2016-2020) for Key Fish Habitat and threatened species distributions reveal that three creeks (Laheys Creek, Sandy Creek, and an unnamed watercourse off Sandy Creek) within the study area are mapped as Key Fish Habitat (DPI 2009), refer to Figure 6.1. Laheys Creek is Strahler order 4, Sandy Creek is order 5, and the unnamed watercourse is order 3.

Laheys Creek and Sandy Creek are also within the mapped distribution for the threatened Southern Purple Spotted Gudgeon (Mogurnda adspersa).

If the project will impact these watercourses a habitat assessment and targeted survey may be required. If waterway crossings are required, the project will also be required to consider an appropriate design in accordance with the Policy and Guidelines for Fish Friendly Waterway Crossings (DPI 2003).



Source: EMM (2021); DFSI (2017); GA (2011); ASGC (2006); LPI (2021)

0 1 2 km

GDA 1994 MGA Zone 55

N

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KEY

Project site area
- Cobbora Solar Farm north
- Cobbora Solar Farm south
- Area to avoid

Existing environment
- Major road
- Minor road
- Vehicular track
- Waterbody

Strahler stream order
- 1st order
- 2nd order
- 3rd order
- 4th order
- 5th order
- 7th order

Regional vegetation mapping

Cobbora Solar Farm
Scoping Report
Figure 6.1

EMM
creating opportunities

b Assessment of terrestrial threatened species

Under the Biodiversity Assessment Method (BAM) (DPIE 2020), “ecosystem credit” species are considered to be reliably predicted using vegetation types as surrogates and as such do not require target surveys to determine presence. In contrast, “species credits” species cannot be confidently predicted by vegetation surrogates and must be subject to targeted survey. Several species are dual credit species, whereby they are assessed as ecosystem credit species but are assessed as a species credit species for a specific habitat or stage of their lifecycle.

To understand the likely targeted survey requirements for threatened species, a preliminary candidate species list has been compiled from species identified during the desktop searches. This is limited to species credit and dual credit species (Table 6.2). This includes the seasonal survey timing requirements for each species. There are 39 preliminary candidate species identified using this approach. Six of these species credit species are also listed as candidates for S&II.

It is anticipated that the candidate species list will be able to be reduced after preliminary field surveys given the prediction a greater proportion of land is cleared for agricultural use than is currently indicated by SVTM. Given the predicted highly cleared nature of the site it is likely that many of the habitat requirements for the threatened species will be absent/degraded and will allow exclusion on this basis.

The field surveys may also identify different PCTs or find less PCTs than the SVTM, which will in turn affect the threatened species generated by vegetation associations. The result our initial desktop review has indicated that the biodiversity values within the study area are largely associated with riparian corridors, field margins and roadside verges.

Table 6.2 Preliminary candidate species for target survey consideration

Scientific name	Common name	Credit class	BC Act	EPBC Act	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Amphibians																
Crinia sloanei	Sloane's Froglet	S	V	E	No	No	No	No	No	No	Yes	Yes	No	No	No	No
Bats																
*Chalinolobus dwyeri**	Large-eared Pied Bat	S	V	V	Yes	No	No	No	No	No	No	No	No	No	Yes	Yes
*Miniopterus orianae oceanensis**	Large Bent-winged Bat	SE/E	V		Yes	Yes	No	No	No	No	No	No	No	No	No	Yes
Pteropus poliocephalus	Grey-headed Flying-fox	SE/E	V	V	No	No	No	No	No	No	No	No	No	Yes	Yes	Yes
Birds																
*Anthochaera Phrygia**	Regent Honeyeater	S/E	CE	CE	No	No	No	No	No	No	No	No	No	No	No	No
Burhinus grallarius	Bush Stone-curlew	S	E		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Calyptorhynchus lathami	Glossy Black-Cockatoo	SE/E	V		No	No	No	Yes	Yes	Yes	Yes	Yes	No	No	No	No
Haliaeetus leucogaster	White-bellied Sea-Eagle	SE/E	V		No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Hamirostra melanosternon	Black-breasted Buzzard	SE/E	V		No	No	No	No	No	No	No	No	Yes	Yes	Yes	No
Hieraaetus morphnoides	Little Eagle	SE/E	V		No	No	No	No	No	No	No	Yes	Yes	Yes	No	No
Hirundapus caudacutus	White-throated Needletail	S		V	Yes	Yes	Yes	Yes	No	No	No	No	No	Yes	Yes	Yes
*Lathamus discolor**	Swift Parrot	S/E	E	CE	No	No	No	No	No	No	No	No	No	No	No	No
Lophochroa leadbeateri	Major Mitchell's Cockatoo	SE/E	V		No	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes
Lophoictinia isura	Square-tailed Kite	SE/E	V		Yes	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes
Ninox connivens	Barking Owl	SE/E	V		No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Ninox strenua	Powerful Owl	SE/E	V		No	No	No	No	Yes	Yes	Yes	Yes	No	No	No	No
Polytelis swainsonii	Superb Parrot	SE/E	V	V	No	No	No	No	No	No	No	No	Yes	Yes	Yes	No

Table 6.2 Preliminary candidate species for target survey consideration

Scientific name	Common name	Credit class	BC Act	EPBC Act	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Tyto novaehollandiae	Masked Owl	SE/E	V		No	No	No	No	Yes	Yes	Yes	Yes	No	No	No	No
Marsupials																
Cercartetus nanus	Eastern Pygmy-possum	S	V		Yes	Yes	Yes	No	No	No	No	No	No	Yes	Yes	Yes
Petaurus norfolcensis	Squirrel Glider	S	V		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Phascolarctos cinereus	Koala	SE/E	V	V	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Reptiles																
Aprasia parapulchella	Pink-tailed Legless Lizard	S	V	V	No	No	No	No	No	No	No	No	Yes	Yes	Yes	No
Hoplocephalus bitorquatus	Pale-headed Snake	S	V		Yes	Yes	Yes	No	No	No	No	No	No	No	Yes	Yes
Flora																
Acacia ausfeldii	Ausfeld's Wattle	S	V		No	No	No	No	No	No	No	Yes	Yes	Yes	No	No
Commersonia procumbens	Commersonia procumbens	S	V	V	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes
Dichanthium setosum	Bluegrass	S	V	V	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No	Yes	Yes
Diuris tricolor	Pine Donkey Orchid	S	V	V	No	No	No	No	No	No	No	No	Yes	Yes	No	No
*Euphrasia arguta**		S	CE	CE	Yes	Yes	Yes	No	No	No	No	No	No	No	Yes	Yes
Homoranthus darwinioides	Fairy Bells	S	V	V	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Indigofera efoliata	Leafless Indigo	S	E	E	No	No	No	No	No	No	No	Yes	Yes	Yes	No	No
*Prasophyllum sp. Wybong**		S		CE	No	No	No	No	No	No	No	No	Yes	Yes	No	No
Philotheca ericifolia	Philotheca ericifolia	S			No	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes
Pomaderris queenslandica	Scant Pomaderris	S	E		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Swainsona recta	Small Purple-pea	S	E	E	No	No	No	No	No	No	No	No	Yes	Yes	Yes	No
Swainsona sericea	Silky Swainson-pea	S	V		No	No	No	No	No	No	No	No	Yes	Yes	Yes	No

Table 6.2 Preliminary candidate species for target survey consideration

Scientific name	Common name	Credit class	BC Act	EPBC Act	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Tylophora linearis	Tylophora linearis	S	V	E	Yes	Yes	Yes	Yes	Yes	No	No	No	No	Yes	Yes	Yes
Zieria ingramii	Keith's Zieria	S	E	E	Yes	Yes	No	No	No	No	No	No	Yes	Yes	Yes	Yes

Credit class: S = species credit, S/E = dual species/ecosystem credit.
EPBC and BC Act Status: V = Vulnerable, E = Endangered and CE = Critically Endangered.
*indicates candidate for S&II.

6.3.2 Assessment approach

The potential biodiversity impacts of the project will be assessed in accordance with the BAM. This assessment will include but is not limited to the following:

- detailed vegetation mapping in the field to map PCTs and stratify these PCTs into broad condition states (vegetation zones);
- a review of biodiversity constraints present, to inform design process and avoidance of areas of high biodiversity constraint including native vegetation (including DNG) and threatened species habitats. Priority will be given to TECs and candidates for S&II;
- habitat mapping with focus on assessing habitat constraints for candidate species, this will allow several species to be excluded from requiring further assessment if features are absent or degraded;
- development of a refined list of candidate species requiring survey based on the outcomes of the habitat assessment;
- a survey plan for candidate species detailing methods and timing. While a portion of the project site area is cleared, threatened species will be assessed, in accordance with NSW and Commonwealth survey guidelines and the BAM. In the event of uncertainty regarding effort or approach DPIE/DAWE will be contacted;
- vegetation plots undertaken to measure vegetation integrity scores of different vegetation zones. Any vegetation above the vegetation integrity threshold that requires offsetting will be avoided through the design process or offset in accordance with the BOS;
- consideration of any impacts to key fish habitat and threatened aquatic species;
- consideration of impacts to any matters of MNES and whether referral to the Commonwealth is required; and
- preparation of a BDAR in accordance with the BAM. The BDAR will include assessment of biodiversity values, consideration of prescribed impacts (those not quantified by ecosystem or species credits), presentation of mitigation and avoidance measures, quantification of the offsetting requirements and presenting a strategy for offset delivery.

6.3.3 Summary of key findings

The SVTM indicates the study area is dominated by PCT 511 (1,824.494 ha) which is aligned with Box-Gum TEC listed under the BC Act and EPBC Act as a CEEC. However, it is more likely that the vegetation is associated with agricultural land use and therefore the proportion of cleared/non-native detailed in Table 6.1 will increase. The result our initial desktop review has indicated that the biodiversity values within the study area are largely associated with riparian corridors, field margins and roadside verges.

A preliminary field survey is required to accurately map and stratify the vegetation communities to inform project design and avoid areas of higher biodiversity value.

6.4 Heritage

6.4.1 Aboriginal cultural heritage

i Existing environment

An Aboriginal Heritage Information Management System (AHIMS) search over approximately 120 km^2 (12,000 ha) area centred on the study area was carried out.

The search returned 103 AHIMS registrations within the study area as shown in Figure 6.2. The number of registrations on AHIMS is considered a product of the level of prior assessment for the CCP. As illustrated in Figure 6.2, there is potential for Aboriginal sites to occur, primarily associated with Laheys Creek, Sandy Creek, the unnamed watercourse and elevated ridge lines. Given the high level of land clearance, unobtrusive site types are most likely to be identified such as isolated finds and artefact scatters; however, scarred trees are possible amongst mature vegetation, most commonly associated with roadside vegetation along potential access routes, as well as grinding groove sites which have been documented on-site. The high level of land clearance and modification due to agricultural land uses will have direct implications on archaeological preservation.

The assessment previously undertaken for the CCP and the number of sites identified has provided a good indication of the type and location of Aboriginal sites that occur in the area. This baseline information on the existing environment will be used a guide for this project.

ii Assessment approach

The project has the potential to impact on Aboriginal cultural heritage through the disturbance or destruction of Aboriginal heritage sites potentially present within the study area without appropriate Aboriginal cultural heritage assessment and implementation of avoidance measures.

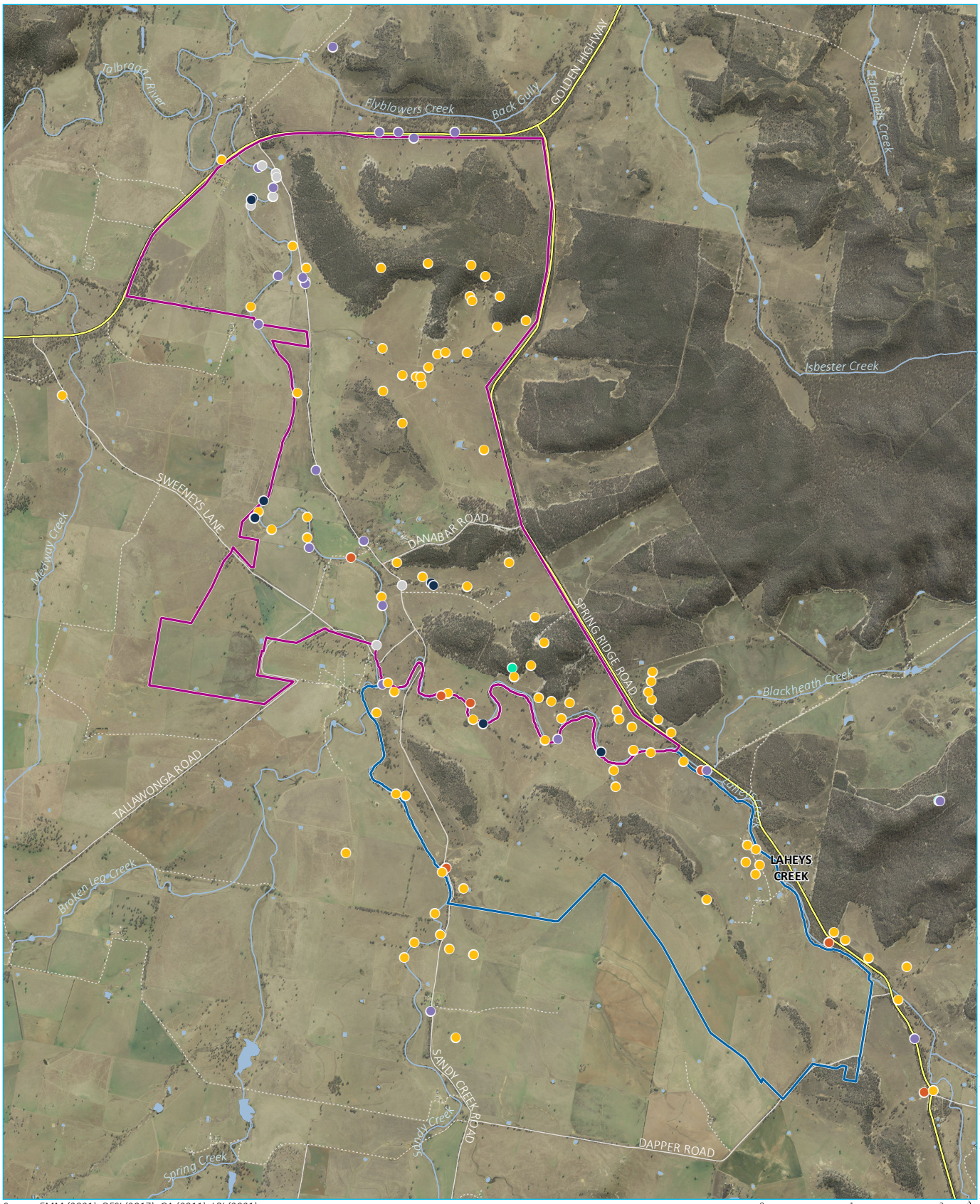
An Aboriginal cultural heritage assessment (ACHA) will be prepared for the project in accordance with relevant regulations and guidelines, including:

- Guide to investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW (OEH 2011);
- Aboriginal Cultural Heritage Consultation Requirements for Proponents (DECCW 2010a); and
- Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales (DECCW 2010b).

The approach to the ACHA is summarised below.

a Consultation

Consultation with the Aboriginal community is a requisite component of Aboriginal assessment in NSW in instances where Aboriginal objects or places are identified in an area and have the potential to be harmed. Aboriginal people that express an interest in being involved with the project then become registered and are referred to as registered Aboriginal parties (RAPs).



Source: EMM (2021); DFSI (2017); GA (2011); LPI (2021)

0 1 2 km

GDA 1994 MGA Zone 55

N

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KEY

Project site area
- Cobbora Solar Farm north
- Cobbora Solar Farm south

Existing environment
- Major road
- Minor road
- Vehicular track
- Named watercourse
- Waterbody

AHIMS site
- Artefact
- Grinding groove
- Habitation structure
- Hearth
- Modified tree (carved or scarred)
- Potential archaeological deposit (PAD)

AHIMS sites

Cobbora Solar Farm
Scoping report
Figure 6.2

EMM
creating opportunities

Consultation must be in accordance with the consultation guidelines with the following stages:

- stage 1: notification and registration of RAPs (approximately one month to complete). This stage also requires that a media notice be placed in a local newspaper to advertise for interested Aboriginal groups;
- stage 2: presentation of the project and assessment methods (mandatory minimum 28 day review period);
- stage 3: gathering information about Aboriginal cultural heritage (from RAPs). This stage initiated upfront with Stage 2 so that it may guide the archaeological survey. Cultural information will also be welcomed throughout the ACHA phase; and
- stage 4: Aboriginal community review of draft ACHA (mandatory minimum 28 day review period). Depending on the complexity of the results and proposed management measures, a consultation meeting may be necessary during this stage, however it has not been costed for at this stage. Stage 4 also includes the additional task of responding to RAP comments/submissions in the final report.

Aboriginal consultation includes keeping a consultation register that records all relevant communication with RAPs and the outcomes of that communication. The consultation log is an essential part of the ACHA.

b Desktop assessment and predictive model

A desktop assessment will be carried out comprising of:

- review of existing environment: the landscape context of the proposed area will be reviewed to identify the likelihood of Aboriginal objects to have been deposited and the likelihood of their preservation in light of historical and natural site disturbance processes; and
- literature review: relevant previous archaeological investigations and ethnographical records will be reviewed to determine if Aboriginal objects have been recorded on similar landscapes in the local area.

A predictive model of Aboriginal site locations will be prepared with the aid of GIS analysis and mapping. The results of the predictive model will form the basis of the archaeological survey. This information will be used to:

- target the survey towards areas of higher archaeological sensitivity;
- allow the inspection of specific cultural areas, if identified by the Aboriginal community; and
- gather a representative sample of areas of lower archaeological sensitivity to verify predictions and characterise the nature of archaeological record.

c Archaeological survey

An archaeological survey is required to meet the requirements of the Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales (DECCW 2010b). Survey will be undertaken once RAPs have been identified and provided with the opportunity to comment on the proposed assessment methods. The archaeological survey will aim to:

- identify previously unrecorded Aboriginal sites or identify Aboriginal places of cultural with the aid of local Aboriginal knowledge holders; and
- identify areas with subsurface archaeological potential.

Potential project constraints identified during the survey will inform refinement of the project development footprint (where possible) to minimise impacts to Aboriginal heritage values.

6.4.2 Historic heritage

i Existing environment

A search of the available historic heritage inventories was carried out including:

- Wellington LEP;
- Warrumbungle Shire LEP;
- Australian Heritage Database; and
- NSW State Heritage Branch.

There are no national, state or local listed heritage items identified within the study area.

The closest items of heritage significance include:

- Elong Elong General Cemetery (I21) approximately 9 km west from the project site locally listed in the Wellington LEP; and
- Cobbora cemetery (I3), courthouse, police station, goal (I4), former public school and residence (I2) which are locally listed items in the Warrumbungle LEP and are approximately 6 km north-east of the project site.

While there will be no direct impacts on listed items, there may be potential indirect impacts and accordingly an assessment of the potential for indirect impacts will be carried out. There is potential for previously unreported heritage items to be located within the study area associated with historical agricultural land use.

ii Assessment approach

The following key tasks will be undertaken as part of a Historic Heritage Impact Assessment to assess the potential impacts on historic heritage associated with the project:

- a review of the NSW State Heritage Inventory, the relevant LEPs and the Australian Heritage Database to determine if there is any additional information on place of heritage significance in or near to the project;
- a site assessment will be carried out with the aim of assessing the potential impact of the project upon any previously unidentified heritage values and assessing the significance of any potential historic heritage items identified; and
- mapping of identified registered historic heritage items and additional historic heritage items (if found during site assessment) identified from these reviews.

6.5 Social

6.5.1 Area of influence

The area of social influence for the project will include the following Australian Bureau of Statistics (ABS) areas and form the proposed social impact assessment (SIA) study area:

- state suburbs (SSC) of Dunedoo, Elong Elong, and Ballimore;
- LGAs of Warrumbungle and Dubbo Regional; and

- statistical area level 1 (SA2) Dubbo – East.

The landholders and residents closest to the site and along the access route are most likely to be negatively impacted. Stakeholders and residents of Warrumbungle and Dubbo Regional LGAs and Dubbo – East SA2 are likely to experience impacts and benefits as a consequence of the project.

6.5.2 Community profile

The population outside Dubbo East (10,378) is highest in Dunedoo (1,221) with Elong Elong (115) and Ballimore (197) having small populations. All these locations have far higher Indigenous populations than NSW, with Ballimore the highest at 10.1%. The study area has an older population with a median age of 49 in Dunedoo, 55 in Elong Elong and 44 in Ballimore compared to 38 in NSW. Unemployment and underemployment are highest in Dunedoo (8.6% and 59.4% respectively) and Warrumbungle (7.9% and 60.7% respectively).

The SIA study area has higher rates of beef cattle farming (specialised) and sheep farming (specialised). Other industries include hospitals (except psychiatric hospitals), combined primary and secondary education, and road freight transport. Those who are employed are most likely to have an occupation of manager, labourer, professional, manager, clerical and administrative workers, or technicians and trades workers.

A summary of the study area is provided in Table 6.3.

Table 6.3 Community profile SIA study area, 2016

Indicators	Dunedoo SSC	Elong Elong SSC	Ballimore SSC	Warrumbungle LGA	Dubbo East SA2	NSW
Population size	1,221	115	197	9,384	10,378	7,480,228
Male	49.7%	49.2%	51.7%	50%	48.2%	49.3%
Female	50.3%	50.8%	48.3%	50%	51.8%	50.7%
Indigenous Population	7.7%	6.0%	10.1%	9.8%	18.0%	2.9%
Median Age	49	55	44	49	37	38
Average people per household	2.2	2.0	2.5	2.3	2.6	2.6
Median personal weekly income*	$520	$472	$624	$479	$664	$664
Median weekly household $4791	$871	$771	$1,2814	$878	$1,336	$1,486
Median monthly mortgage repayment	$967	$368	$1,278	$923	$1,517	$1,986
Median weekly rent	$175	$205	$240	$160	$260	$380
Average motor vehicle per dwelling	2.0	1.8	2.4	1.9	1.9	1.7
Internet accessed from dwelling	65.5%	70.4%	72.6%	67.0%	77.6%	82.5%

Table 6.3 Community profile SIA study area, 2016

Indicators	Dunedoo SSC	Elong Elong SSC	Ballimore SSC	Warrumbungle LGA	Dubbo East SA2	NSW
Year 10 highest year of schooling	16%	19.5%	18.4%	18.4%	16.3%	11.5%
Year 12 highest year of schooling	12.9%	7.1%	9.9%	10.6%	12.2%	15.3%
Bachelor degree and above	7.6%	14.2%	7.2%	9.3%	14.1%	23.4%
Certificate (all levels)	14.4%	16.8%	15.8%	16.6%	21.1%	14.9%
Unemployed*	8.6%	5.4%	4.1%	7.9%	6.2%	6.3%
Employment - 35+ hours worked per week	59.4%	58.5%	62.5%	60.7%	65.3%	63.2%
Top 3 occupations*	manager 29.4% labourer 16.8% professional 11.1%	manager 44.4% labourer 17.8% clerical and administrative workers 13.3%	manager 34.1% technicians and trades workers 12.5% clerical and administrative workers 12.5%	manager 26.7% labourer 14.3% professional 14.1%	professionals 17.6% clerical and administrative workers 13.7% technicians and trades workers 13.6%	professionals 23.6% clerical and administrative workers 13.8% manager 13.5%
Top 3 industries of employment*	beef cattle farming (specialised) 8.1% sheep farming (specialised) 7.6% combined primary and secondary education 6.2%	beef cattle farming (specialised) 28.0% sheep farming (specialised) 20.0% hospitals (except psychiatric hospitals) 16.0%	beef cattle farming (specialised) 20.4% sheep farming (specialised) 13.0% road freight transport 13.0%	beef cattle farming (specialised) 10.7% local government administration 5.5% hospitals (except psychiatric hospitals) 3.8%	hospitals (except psychiatric hospitals) 5.4% primary education 3.1% other social assistance services 2.7%	hospitals (except psychiatric hospitals) 3.5% cafes and restaurants 2.4% supermarket and grocery stores 2.2%

Source: ABS Census Data 2016.
Note: Employed people aged 15 years and over.

6.5.3 Potential social impacts

A preliminary set of potential impacts (negative and positive) has been identified based on the scoping assessment of the local community and project site. The purpose of identifying potential impacts at this preliminary stage is to ensure that the appropriate range of stakeholders is engaged and that no affected group or individual is excluded from the engagement.

An assessment of negative impacts requiring further assessment and likelihood of potential positive social impacts is detailed in Table 6.4.

Table 6.4 Identified potential positive and negative impacts

Potential social impacts	Negative related to:	Positive related to:
Construction		
Livelihood	Land use tensions. Loss of grazing land could see a decrease in ability of local farmers to earn an income.	Opportunity for employment, apprenticeships, and traineeships for Dunedoo residents where there is high unemployment. Procurement opportunities for business in the Warrumbungle and Dubbo LGAs. Accommodation and service providers for DIDO[1] workers.
Access	Traffic causing delays accessing property. Pressure of local social infrastructure and services (housing and accommodation, emergency services).	
Community	Population increase due to construction workers could cause disruption to community cohesion and harmony especially with multiple projects.	
Operation		
Livelihood	Devaluation of properties adjacent to or nearby the project site.	Local employment and training for operational staff.
Culture	Changes to visual amenity impacting the character of the area.	

6.5.4 Assessment methods

EMM will undertake a SIA for the project. The initial tasks undertaken during the scoping phase to inform the SIA will include the confirmation of the project's area of social influence; and appropriately identifying potential material social impacts and the level of assessment that is required after the scoping phase.

The SIA scoping has been conducted in accordance with the DPIEs Social Impact assessment guideline: For state significant projects (DPIE 2021c). A suitably qualified person has determined the potential social impacts for further assessment during the EIS:

- potentially affected people and local community surrounding the project;
- supply chains and procurement processes;
- access route;
- transport of goods, materials and equipment;
- the movement of workers, including residential, and drive-in-drive-out arrangements (if any);
- the nature and scale of the project;
- social trends or changes experienced by the community;
- social infrastructure, built and natural, that have social value to the community; and

- the history of the proposed project and how it is experienced by the surrounding community.

The SIA will involve completion of the following stages of assessment.

Stage 1 social baseline study

A social baseline study will be prepared, including the following aspects of the local and extended area of social influence:

- the demography of the area of social influence;
- analysis of the community characteristics (community culture and values, community history, community well-being, land/property ownership and utilisation of natural resources);
- identification of vulnerable groups and the capacity of potentially affected community members to participate in the community and stakeholder engagement;
- an overview of land use and key industries in the region, and relevant local and state government plans;
- identification of the capacity and accessibility of infrastructure, facilities, and services, including education, health, and emergency services;
- analysis of the existing housing and accommodation market, including availability, capacity, and affordability;
- a profile of the local and regional labour market, including an assessment of available workforce with relevant skills to service the project; and
- a summary of other resource and infrastructure projects in the area of social influence, both planned and currently operating, based on publicly accessible information.

The social baseline will provide a comprehensive understanding of the communities that will be potentially directly and indirectly impacted by the project.

Stage 2 field survey

A field study will use social research methods to collect qualitative and quantitative data used to:

- validate the socioeconomic data; and
- consult with relevant stakeholders.

This may include a combination of online surveys and in-depth interviews with key stakeholders.

This data, along with information collected during community and stakeholder consultation and engagement activities conducted as part of the preparation of the EIS to assist in validation of data collected during the SIA and to assist in determining perceptions of social impacts from those supported by findings from technical studies.

Stage 3 social impact identification

The identification of potential social impacts and benefits from the project will be completed through triangulation of the findings from:

- social baseline study;
- SIA field study;
- EIS technical studies, eg noise, land and soil, heritage, biodiversity, traffic, and water;
- other similar projects and available literature to identify potential impacts; and
- community consultation conducted by the project engagement team.

This analysis will inform the socioeconomic risk assessment outlined in stage 4.

Stage 4 social risk assessment

EMM will assess each of the potential social impacts identified to predict the nature and scale of potential impacts for the life of the project and post closure. A social risk and benefit approach will be adopted to assess the consequence and likelihood of potential negative social impacts without mitigation. If impacts are assessed as significant, a significance assessment will be undertaken to determine the residual risk (ie once mitigation measures are applied).

The results from the social risk assessment will be used to inform priorities and resource allocation for the implementation of impact mitigation and benefit enhancement measures (stage 5).

Stage 5 social impact management and monitoring

The social impact management and monitoring for the identified social impacts will consider:

- required impact mitigation measures for construction and operations; and
- potential benefit enhancement strategies from project construction and operations.

The EIS will use the findings from stages 1 – stage 4 to inform the development of the social impact management plan to form part of the SIA Report.

6.6 Traffic

6.6.1 Existing environment

The study area is accessible via the Golden Highway (via Spring Ridge Road and Sandy Creek Road). The Golden Highway is an approved B-double transport route. The proposed site access (north and south) are along Spring Ridge Road, which is a sealed Council owned local road.

Other local roads are unsealed Council-owned roads with minimal through traffic and are used primarily to access the agricultural landholdings and scattered rural residences.

A Traffic Impact Assessment was performed for CCP. As part of this assessment, Spring Ridge Road and the Golden Highway were surveyed in detail. The assessment found that the classified and local road network was adequate to handle the construction and operational traffic for the coal project, with only minor works required to the Golden Highway/Spring Ridge Road intersection and on small sections of Spring Ridge Road.

Given the anticipated traffic movements that would be generated by the solar farm would be far less than that previously assessed for the coal project, the existing road network is again considered to be adequate to handle project related traffic.

6.6.2 Assessment approach

i Site access

It is anticipated that construction materials and infrastructure will largely be transported to the study area via road from the Port of Newcastle or the Port of Sydney. Construction deliveries from Newcastle would use the New England Highway, John Renshaw Drive, Hunter Expressway and Golden Highway while Sydney deliveries would use the M1 Motorway to the Hunter Expressway, and then use the same route as deliveries from Newcastle.

As describe in Chapter 3, the project will be accessed via the Golden Highway/Spring Ridge Road intersection, with two dedicated site access points currently under consideration:

- northern access via Spring Ridge Road, turning into the project site area approximately 5 km from the Golden Highway; and
- southern access via Spring Ridge Road, turning into the project site area approximately 10 km from the Golden Highway.

Upgrades to the local road network may be required, potentially impacting on adjacent roadside vegetation.

A project access options assessment will be carried out to confirm the preferred options for site access are acceptable. This assessment will be carried out in consultation with Dubbo Regional Council, Warrumbungle Shire Council, TfNSW, the local community and nearby landholders. It will also be informed by the outcomes of relevant technical studies such as the biodiversity assessment.

ii Traffic impact assessment

A traffic impact assessment (TIA) will be carried out to investigate potential impacts associated with the project. The TIA will include the following key elements:

- projections of traffic volumes (both light and heavy vehicles) and transport routes during construction and operation;
- assessment of the potential traffic impacts of the project on road network function, including intersection performance, site access arrangements and road safety, including school bus routes and cyclist safety;
- assessment of the capacity and condition of the existing road network to accommodate the type and volume of traffic generated by the project (including over size vehicles, over mass vehicles and escorted deliveries) during construction and operation; and
- provide details of measures to manage potential impacts, including a schedule of required road upgrades, road maintenance contributions, and other traffic control measures, developed in consultation with the relevant road authority.

6.7 Hazards and risks

Potential hazardous scenarios and risks associated with the project include bushfires, dangerous goods and hazardous substances and exposure to electromagnetic fields (EMF).

Accordingly, the EIS will include the following:

- an assessment of potential hazards and risks including but not limited to bushfires, and EMF for the proposed grid connection infrastructure against the International Commission on Non-Ionizing Radiation Protection (ICNIRP) Guidelines for limiting exposure to Time-varying Electric, Magnetic and Electromagnetic Fields (up to 300 GHz) (ICNIRP 1998) and Guidelines for limiting exposure Electromagnetic Fields (100 kHZ to 300 GHz) (ICNIRP 2020); and

- a preliminary hazard analysis prepared in accordance with Hazardous Industry Planning Advisory Paper No. 6 – Guideline for Hazard Analysis (DoP 2011c) and Multi-Level Risk Assessment (DoP 2011d).

There is no established evidence that the exposure to EMFs generated by powerlines, substations and other electrical sources can cause adverse health effects (ARPANSA 2018). Generally, distances beyond 50 m from a high voltage powerline are not expected to have higher than typical magnetic fields and for substations, magnetic field levels at distances of 5–10 m away are no higher than background levels in a typical home.

EMF that is anticipated to be generated by the project is not expected to exceed guidelines for public exposure and will not cause adverse impacts for human health. The EMF levels of the project including substation, BESS, PCUs and transmission line (if included in the project) will be assessed as part of the EIS but are not anticipated to increase EMF levels in a material way above existing background environmental levels.

6.7.1 Bushfire prone land

The project site area is identified primarily as Category 2 bushfire prone land by the Warrumbungle and Dubbo Regional Council's Bushfire Prone Land Mapping (refer to Figure 6.3). Although the project site area has been subject to extensive clearing associated with agricultural land use there are areas of remnant vegetation mostly associated with elevated ridges, which form a potentially significant fuel load capable of sustaining and spreading bushfire.

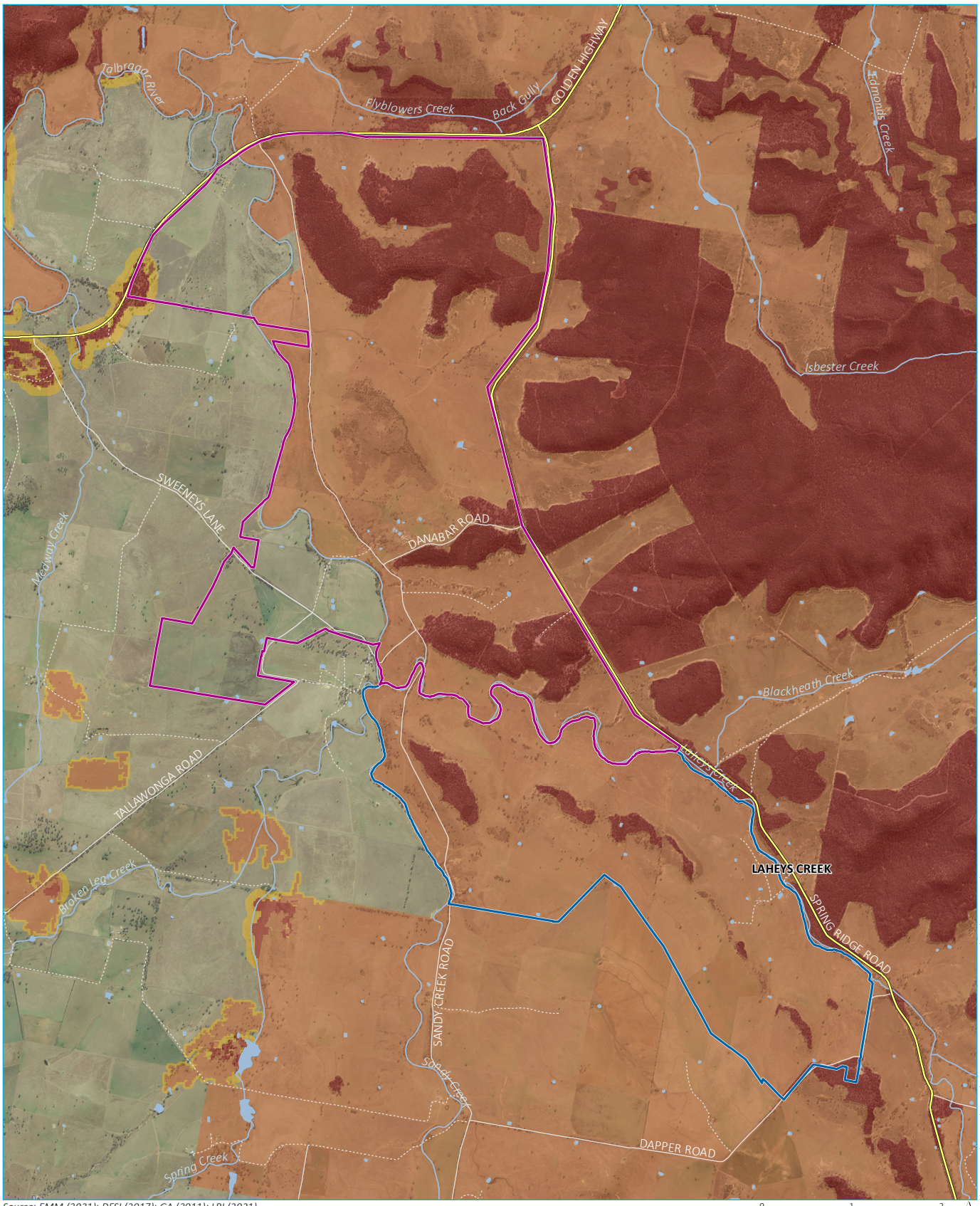
It also adjoins land that is mapped and identified as being Category 1, particularly to the east of Spring Ridge Road. Areas of vegetation within the project site area represent a potential linkage between vegetated areas within and adjoining the project site area, with the potential to support the spread of bushfire.

A bushfire threat assessment will be undertaken in accordance with the requirements of Planning for Bushfire Protection (PBP) 2019. Consultation with the Rural Fire Service (RFS) will also be undertaken during the preparation of the EIS.

6.7.2 Preliminary hazard analysis

The location of the proposed BESS infrastructure will be subject to further assessment, including a preliminary hazard analysis (PHA) in accordance with State Environmental Planning Policy No 33 – Hazardous and Offensive Development. The PHA will involve the following components of work:

- screening of preliminary risks for all hazardous materials and dangerous goods to be stored and transported to/from the project site area;
- classifying and prioritising risks, and estimating societal risk, in accordance with the NSW Multi-level Risk Assessment Guideline (DoP, 2011d); and
- analysing consequence and frequency for hazard scenarios identified as requiring further assessment in the qualitative risk assessment, undertaken in accordance with the NSW Risk Criteria for Land Use Safety Planning (DoP, 2011e).



Source: EMM (2021); DFSI (2017); GA (2011); LPI (2021)

0 1 2 km

GDA 1994 MGA Zone 55

N

KEY

Project site area
- Cobbora Solar Farm north
- Cobbora Solar Farm south

Existing environment
- Major road
- Minor road
- Vehicular track
- Named watercourse
- Waterbody

Bush fire prone land
- Vegetation Buffer
- Vegetation Category 1
- Vegetation Category 2

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Bushfire prone land

Cobbora Solar Farm
Scoping report
Figure 6.3

EMM
creating opportunities

6.8 Land resources

6.8.1 Existing environment

A review of the eSpade database indicates that the Dapper Hill soil landscape is common on ridgelines and commonly comprises yellow and red soloths and solodic soils with some podzolic soils and siliceous sands. Small rock outcrops also occur, associated with shallow soils. The Mitchell Creek soil landscape is associated with the area around Sandy Creek. These comprise alluvial deposits of sands, loams and Prairie Soils, with Red-brown Earths, Yellow Podzolic-Solodic Soils and Red Earths on older terraces. The Ballimore soil landscape unit primarily comprises red-brown earths, non-calcic brown soils and red and yellow solodic soils on lower slopes and in depressions.

The land around Lahey's Creek is mapped as the Lahey's Creek soil landscape and comprise yellow solodic and soloths on lower slopes and valley floors (Murphy & Lawrie 1998). This soil landscape unit makes up the majority of the indicative development footprint.

These soils often have moderate sheet erosion and minor to moderate gully erosion is common with some areas of severe gully erosion. Active streambank and gully erosion can occur along segments of creeks (Murphy & Lawrie 1998).

The Warrumbungle and Dubbo Regional LEPs confirm there is no mapped Biophysical Strategic Agricultural Land (BSAL) in the study area.

As noted in Section 2.1, the study area is currently used for the purposes of grazing as well as low intensity dry land cropping. The project site area is primarily mapped as Class 5 under the land and soil capability (LSC) assessment scheme, as shown in Figure 6.4. Class 5 is characterised as moderate to low capability land. Class 5 land has severe limitations for high-impact land uses. These limitations will largely restrict land use to grazing, some horticulture, forestry and nature conservation (OEH 2012).

6.8.2 Assessment approach

Marble Energy will design the project to minimise impacts on agricultural land, wherever possible. As part of the EIS, a land use conflict risk assessment (LUCRA) will be undertaken in accordance with DPI's (2011) Land Use Conflict Risk Assessment Guideline and in consultation with neighbouring landholders. The LUCRA will assess the project's potential impacts on neighbouring agricultural operations. Should they be required, land management practices will be implemented to avoid or minimise potential impacts on neighbouring agricultural operations.

Consideration of impacts to soils and the potential for erosion and sedimentation issues will be included in the EIS. More detailed assessment of soils will be required once the final position of project components has been determined. The soil assessment will focus on soil disturbance during construction, including erosion from construction work given the potentially erosion prone nature of the study area and rehabilitation where required.

6.9 Water resources

6.9.1 Existing environment

The study area is located within the Macquarie-Bogan River Catchment. The catchment covers an area of more than 74,000 km^2 within the Murray-Darling Basin. Several non-perennial tributaries of the Talbragar River, including the named watercourses Sandy Creek and Lahey's Creek and unnamed watercourse of Sandy Creek, flow through the project study area in a generally north-westerly direction before joining the Talbragar River, approximately 1 km to the north of the project site area (refer to Figure 1.2). Laheys Creek is Strahler order 4, Sandy Creek is order 5, and the unnamed watercourse is order 3 (refer to Figure 6.1).

A review of LEP flood planning maps did not identify any flood planning areas in or in the vicinity of the study area. There are also multiple farm dams within the study area.

Areas of the study area are identified as “groundwater vulnerable” on the Warrumbungle and Wellington LEPs Groundwater vulnerability map. Clause 6.4 of the LEPs requires the consent authority to consider the likelihood of groundwater contamination from a development and potential impacts on groundwater dependent ecosystems prior to determining a development application.

6.9.2 Assessment approach

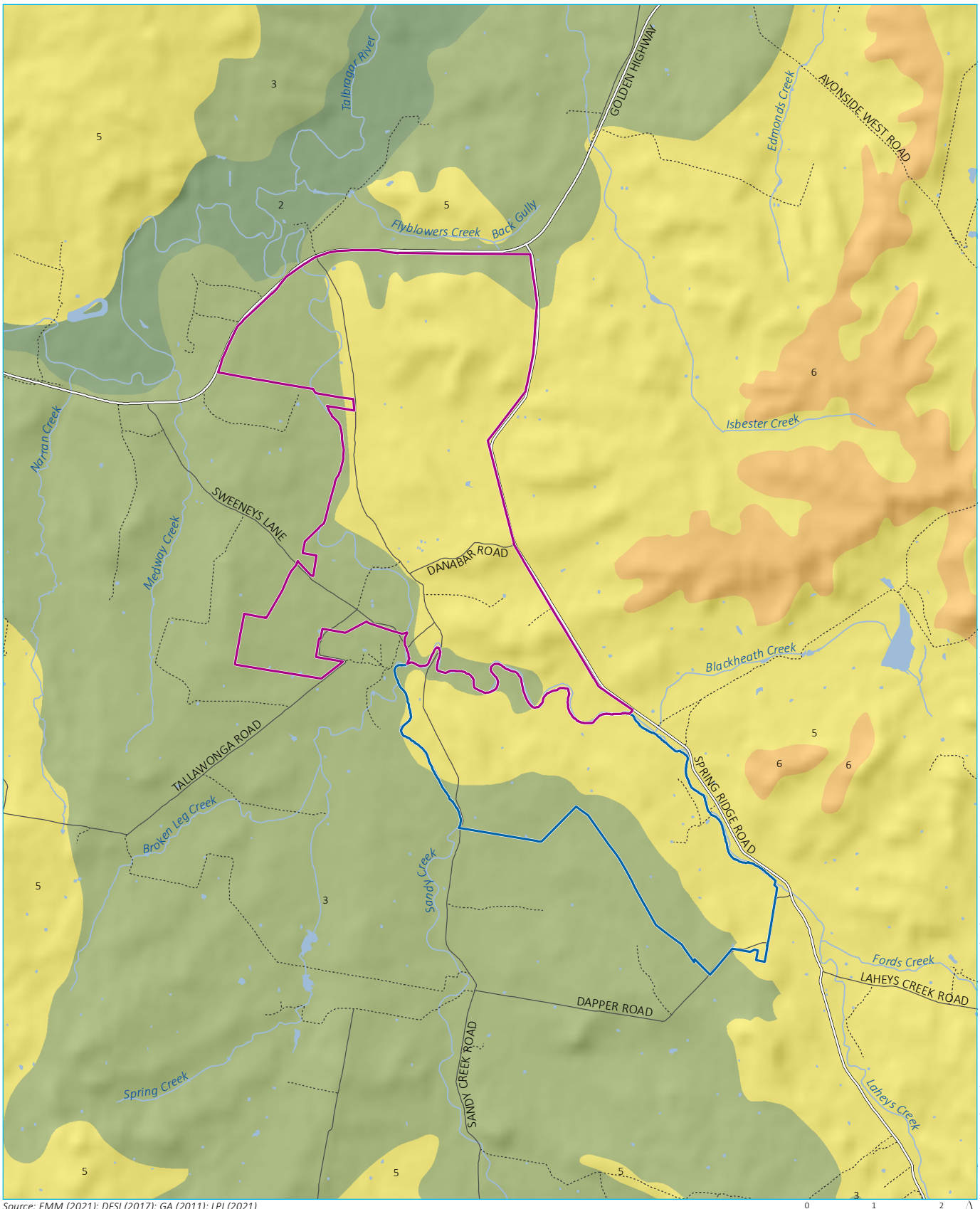
The project will avoid watercourses and riparian corridors within the study area as far as practicable. In areas where avoidance is unavoidable, actions will be carried out to minimise potential impacts. In addition, roads and services that require watercourse crossings will be designed and constructed in accordance with best practice design and construction methods.

Potential impacts to water resources from the project are expected to include demand for water during the construction of the project, as well as for land management during operations. The project is not likely to impact groundwater during construction, operation and decommissioning due to the limited amount of subsurface disturbance activities required during the installation and decommissioning of project infrastructure.

Water demands will be relatively small, as the construction and operation of a solar PV electricity generation facility are non-water intensive and tanked water is typically brought in where needed. If surface water or groundwater extraction is required to meet the project’s demand for water, an assessment of impacts for these water sources will be included in the EIS.

The surface water assessment will include a review of the existing surface water environment, an assessment of the surface water impacts and a description of any proposed mitigation and management measures. Key surface water issues to be explored will include:

- flood risk assessment to identify flood extents and potential flooding characteristics;
- water management during construction and operation; and
- impacts to receiving waters.



Source: EMM (2021); DFSI (2017); GA (2011); LPI (2021)

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GDA 1994 MGA Zone 55

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KEY

Project site area

- Cobbora Solar Farm north
- Cobbora Solar Farm south

Land and soil capability class

- 2 | Slight but significant limitation
- 3 | Moderate limitation
- 5 | Severe limitation
- 6 | Very severe limitation

Existing environment

- Major road
- Minor road
- Vehicular track
- Named watercourse
- Waterbody

Land and soil capability class

Cobbora Solar Farm
Scoping report
Figure 6.4

EMM
creating opportunities

6.10 Air quality

i Existing environment

Land use within the study area and surrounds is primarily agricultural, which is likely to influence local and regional air quality. Existing sources of air pollution within a local setting are limited and consist primarily of dust and vehicle and machinery exhaust emissions associated with agricultural production and freight transport along the Golden Highway.

There are four non-project related residences within 200 m of the study area boundary, with the nearest residence (R7) located approximately 50 m from the project study area boundary.

ii Assessment approach

The project is not anticipated to generate significant air quality impacts during construction or operations. Project-related traffic on unsealed roads within the project study area may contribute to localised dust generation primarily during the construction phase of the project. Mitigation measures will be implemented to address these impacts. These measures will be discussed with Council and surrounding landholders as part of ongoing stakeholder engagement. The implementation of these mitigation measures will ensure that the project will not generate significant air quality impacts during construction, operation or decommissioning.

A detailed air quality assessment is not considered to be required as part of the EIS as potential impacts will be temporary in nature and will not extend beyond the construction phase of the project.

6.11 Cumulative impacts

The project will contribute to the overall development of the CWO REZ. Other proposed, approved, under construction and operational renewable energy developments within and in the vicinity of the CWO REZ are shown in Figure 2.1. As shown, there are multiple renewable energy generation projects (proposed and approved) in the general vicinity of the study area, with the nearest being Dunedoo solar farm, 20 km to the north-east, Tallawang solar farm 20 km to the south-east and Barneys Reef wind farm 17 km to the east. It is not considered likely that there will be cumulative visual impacts resulting from these projects.

The project may generate cumulative impacts in conjunction with surrounding projects during both construction and operation. These impacts would generally be limited to cumulative traffic and social impacts (such as the need for accommodation during construction).

However, there may also be a cumulative benefit to local communities from the project and other developments in the region through the generation of jobs during construction and ongoing operation, particularly under the CWO REZ, and contribution to local economies associated with the purchase of local goods and services.

The EIS will carry out a cumulative assessment in accordance with the Cumulative Impact Assessment Guidelines for State Significant Projects (DPIE 2021d).

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Appendix A

Schedule of lands

Table A.1 Schedule of lands

Lot	DP	Lot	DP
7306	DP1140964	5	DP754305
7301	DP1152415	21	DP754305
7302	DP1152415	22	DP754305
2	DP1160398	37	DP754305
1	DP1190968	39	DP754305
1	DP240245	66	DP754305
45	DP257066	96	DP754305
46	DP257066	97	DP754305
A	DP394127	100	DP754305
76	DP46155	105	DP754305
1	DP532844	106	DP754305
2	DP532844	107	DP754305
3	DP586865	112	DP754305
4	DP586865	119	DP754305
2	DP605613	120	DP754305
1	DP652054	5	DP754317
1	DP722859	6	DP754317
9	DP754289	17	DP754317
11	DP754289	18	DP754317
19	DP754289	31	DP754317
21	DP754289	40	DP754317
24	DP754289	56	DP754317
25	DP754289	57	DP754317
26	DP754289	60	DP754317
28	DP754289	69	DP754317
31	DP754289	70	DP754317
35	DP754289	75	DP754317
38	DP754289	32	DP771038
39	DP754289	2	DP842496
1	DP754305	7004	DP93109

Appendix B

Scoping summary table

B.1 Scoping summary table

Table B.1 Scoping summary table

Level of assessment	Matter	Cumulative Impact Assessment (CIA)	Engagement	Relevant policies and guidelines	Scoping report reference
Detailed	Amenity - Visual	Yes	Specific	• Guidelines for Landscape and Visual Impact Assessment (United Kingdom Landscape Institute of Environmental Management and Assessment 2013); • Wind Energy: Visual Assessment (VA) Bulletin AB 01 For State Significant Wind Energy Development (DPE 2016); and • Guidance Note for Landscape and Visual Assessment (Australian Institute of Landscape Architects 2018).	Section 6.2.1
	Biodiversity	Yes	General	• Biodiversity Assessment Method (BAM) (DPIE 2020); • Commonwealth EPBC 1.1 Significant Impact Guidelines – Matters of National Environmental Significance (Commonwealth of Australia, 2013); • Commonwealth EPBC 1.2 Significant Impact Guidelines – Actions on, or Impacting upon Commonwealth Land and Actions by Commonwealth Agencies (Commonwealth of Australia, 2013); • Commonwealth Department of the Environment – Survey Guidelines for Nationally Threatened Species (various).	Section 6.3
	Traffic and transport	Yes	Specific	• Guide to Traffic Management – Part 3 Traffic Studies and Analysis (Austroads, 2013).	Section 6.6
	Heritage – Aboriginal	Yes	Specific	• Guide to investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW (OEH 2011); • Aboriginal Cultural Heritage Consultation Requirements for Proponents (DECCW 2010); • Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales (DECCW 2010);	Section 6.4.1

Table B.1 Scoping summary table

Level of assessment	Matter	Cumulative Impact Assessment (CIA)	Engagement	Relevant policies and guidelines	Scoping report reference
	Hazards and risks	No	Specific	• Hazardous Industry Planning Advisory Paper No. 6 – Guideline for Hazard Analysis (DoP, 2011a); • Multi-Level Risk Assessment (DoP, 2011b); • Hazardous and Offensive Development Application Guidelines: Applying SEPP 33 (DoP 2011); • Waste classification guidelines (DECCW 2009).	Section 6.7
Standard	Amenity – noise and vibration	Yes	General	• NSW Interim Construction Noise Guideline (ICNG) (DECC 2009); • NSW Noise Policy for Industry (NPfI) (EPA 2017); • NSW Road Noise Policy (RNP) (DECCW 2011); • Assessing Vibration: A Technical Guideline (DECC 2006).	Section 6.2.2
	Social	Yes	Specific	• Social Impact Assessment Guideline for State Significant Projects 2021 (DPIE 2021).	Section 6.5
	Heritage - historic	Yes	General	• Historical Archaeology Code of Practice (Heritage Council 2006).	Section 6.4.2
	Land resources	No	General	• Land Use Conflict Risk Assessment Guideline (DPI 2011); • Managing Land Contamination: Planning Guidelines SEPP 55 – Remediation of Land (Department of Urban Affairs and Planning and Environment Protection Authority, 1998).	Section 6.8
	Water resources	No	General	• Managing Urban Stormwater: Soils and Construction Volume 1 (Landcom, 2004) • Managing Urban Stormwater: Soils and Construction Volume 2 (Department of Environment and Climate Change, 2008); • Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC / ARMCANZ, 2000); • Guidelines for instream works on waterfront land (NOW 2012) • Guidelines for riparian corridors on waterfront land (NOW 2012) • Guidelines for watercourse crossings on waterfront land (NOW 2012)	Section 6.9
	Air quality	No	General	• N/A	Section 6.10

Appendix C

Protected Matters Search Tool result

Australian Government

Department of Agriculture, Water and the Environment

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about Environment Assessments and the EPBC Act including significance guidelines, forms and application process details.

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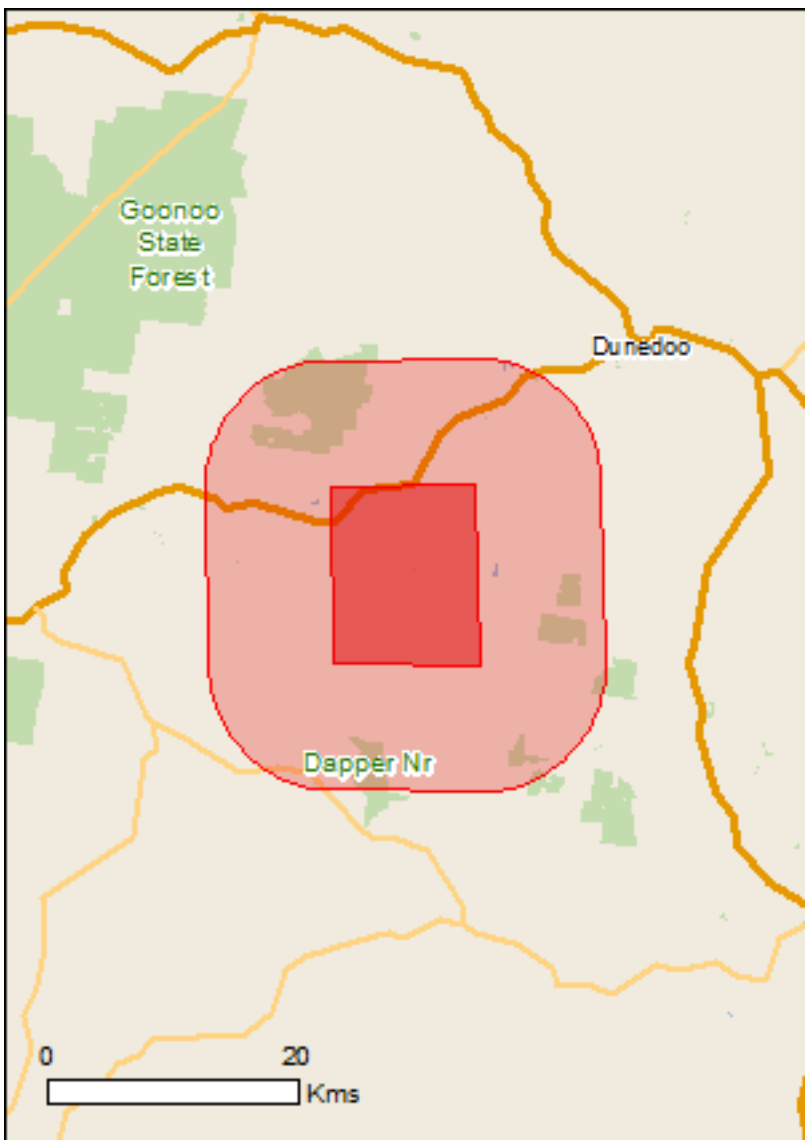

Coordinates

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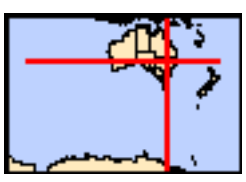

Summary

Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	4
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	6
Listed Threatened Species:	32
Listed Migratory Species:	11

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at http://www.environment.gov.au/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Land:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	17
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

State and Territory Reserves:	4
Regional Forest Agreements:	None
Invasive Species:	23
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar) [Resource Information]

Name	Proximity
Banrock station wetland complex	800 - 900km upstream
Riverland	700 - 800km upstream
The coorong, and lakes alexandrina and albert wetland	900 - 1000km upstream
The macquarie marshes	150 - 200km upstream

Listed Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Name	Status	Type of Presence
Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions	Endangered	Community may occur within area
Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia	Endangered	Community likely to occur within area
Natural grasslands on basalt and fine-textured alluvial plains of northern New South Wales and southern Queensland	Critically Endangered	Community may occur within area
Poplar Box Grassy Woodland on Alluvial Plains	Endangered	Community may occur within area
Weeping Myall Woodlands	Endangered	Community may occur within area
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community likely to occur within area

Listed Threatened Species [Resource Information]

Name	Status	Type of Presence
Birds		
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Species or species habitat known to occur within area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat likely to occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area

Name	Status	Type of Presence
[Lathamus discolor](#) Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area
[Leipoa ocellata](#) Malleefowl [934]	Vulnerable	Species or species habitat known to occur within area
[Numenius madagascariensis](#) Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
[Polytelis swainsonii](#) Superb Parrot [738]	Vulnerable	Species or species habitat likely to occur within area
[Rostratula australis](#) Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area
Fish		
[Galaxias rostratus](#) Flathead Galaxias, Beaked Minnow, Flat-headed Galaxias, Flat-headed Jollytail, Flat-headed Minnow [84745]	Critically Endangered	Species or species habitat may occur within area
[Maccullochella macquariensis](#) Trout Cod [26171]	Endangered	Species or species habitat may occur within area
[Maccullochella peelii](#) Murray Cod [66633]	Vulnerable	Species or species habitat may occur within area
[Macquaria australasica](#) Macquarie Perch [66632]	Endangered	Species or species habitat may occur within area
Mammals		
[Chalinolobus dwyeri](#) Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat known to occur within area
[Dasyurus maculatus maculatus (SE mainland population)](#) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat likely to occur within area
[Nyctophilus corbeni](#) Corben's Long-eared Bat, South-eastern Long-eared Bat [83395]	Vulnerable	Species or species habitat likely to occur within area
[Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)](#) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Vulnerable	Species or species habitat likely to occur within area
[Pteropus poliocephalus](#) Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Plants		
[Androcalva procumbens](#) [87153]	Vulnerable	Species or species habitat known to occur within area
[Dichanthium setosum](#) bluegrass [14159]	Vulnerable	Species or species habitat likely to occur within area
[Euphrasia arguta](#) [4325]	Critically Endangered	Species or species habitat may occur within area
[Homoranthus darwinioides](#) [12974]	Vulnerable	Species or species

Name	Status	Type of Presence
		habitat known to occur within area
Lepidium monoplocoides Winged Pepper-cress [9190]	Endangered	Species or species habitat may occur within area
Prasophyllum petilum Tarengo Leek Orchid [55144]	Endangered	Species or species habitat may occur within area
Prasophyllum sp. Wybong (C.Phelps ORG 5269) a leek-orchid [81964]	Critically Endangered	Species or species habitat may occur within area
Swainsona recta Small Purple-pea, Mountain Swainson-pea, Small Purple Pea [7580]	Endangered	Species or species habitat may occur within area
Tylophora linearis [55231]	Endangered	Species or species habitat likely to occur within area
Zieria ingramii Ingram's Zieria [56734]	Endangered	Species or species habitat known to occur within area
Reptiles		
Aprasia parapulchella Pink-tailed Worm-lizard, Pink-tailed Legless Lizard [1665]	Vulnerable	Species or species habitat likely to occur within area
Delma impar Striped Legless Lizard, Striped Snake-lizard [1649]	Vulnerable	Species or species habitat may occur within area

Listed Migratory Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat likely to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat may occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species

Name	Threatened	Type of Presence
		habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species		[Resource Information]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Chrysococcyx osculans Black-eared Cuckoo [705]		Species or species habitat likely to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area

Name	Threatened	Type of Presence
Lathamus discolor		
Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area
Merops ornatus		
Rainbow Bee-eater [670]		Species or species habitat may occur within area
Motacilla flava		
Yellow Wagtail [644]		Species or species habitat may occur within area
Myiagra cyanoleuca		
Satin Flycatcher [612]		Species or species habitat likely to occur within area
Numenius madagascariensis		
Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Rhipidura rufifrons		
Rufous Fantail [592]		Species or species habitat may occur within area
Rostratula benghalensis (sensu lato)		
Painted Snipe [889]	Endangered*	Species or species habitat likely to occur within area

Extra Information

State and Territory Reserves	[Resource Information]
Name	State
Cobbora	NSW
Dapper	NSW
Goodiman	NSW
Yarrobil	NSW

Invasive Species	[Resource Information]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit, 2001.

Name	Status	Type of Presence
Birds		
Acridotheres tristis		
Common Myna, Indian Myna [387]		Species or species habitat likely to occur within area
Carduelis carduelis		
European Goldfinch [403]		Species or species habitat likely to occur within area
Columba livia		
Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Passer domesticus		
House Sparrow [405]		Species or species habitat likely to occur

Name	Status	Type of Presence
		within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Mammals		
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Capra hircus Goat [2]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Feral deer Feral deer species in Australia [85733]		Species or species habitat likely to occur within area
Lepus capensis Brown Hare [127]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Sus scrofa Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Asparagus asparagoides Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]		Species or species habitat likely to occur within area
Lycium ferocissimum African Boxthorn, Boxthorn [19235]		Species or species habitat likely to occur within area
Nassella trichotoma Serrated Tussock, Yass River Tussock, Yass Tussock, Nassella Tussock (NZ) [18884]		Species or species habitat likely to occur within area
Opuntia spp. Prickly Pears [82753]		Species or species habitat likely to occur within area
Pinus radiata Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780]		Species or species habitat may occur within area
Rubus fruticosus aggregate Blackberry, European Blackberry [68406]		Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii Willows except Weeping Willow, Pussy Willow and		Species or species

Name	Status	Type of Presence
Sterile Pussy Willow [68497] Tamarix aphylla Athel Pine, Athel Tree, Tamarisk, Athel Tamarisk, Athel Tamarix, Desert Tamarisk, Flowering Cypress, Salt Cedar [16018]		habitat likely to occur within area Species or species habitat likely to occur within area

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species distributions have been derived through a variety of methods. Where distributions are well known and if time permits, maps are derived using either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc) together with point locations and described habitat; or environmental modelling (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Coordinates

-32.104622 149.170619,-32.103459 149.274646,-32.214196 149.277736,-32.213034 149.179545,-32.213034 149.174739,-32.213034 149.173022,-32.213034 149.173022,-32.104622 149.170619

Acknowledgements

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-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact Us page.

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