



Wee Waa Sun Farm

Request for Secretary's Environmental Assessment Requirements




Prepared for OVERLAND Sun Farming Pty Ltd
on behalf of Wee Waa Sun Farm Pty Ltd.

November 2017



Wee Waa Sun Farm

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1 Introduction

1.1 The project

OVERLAND Sun Farming Pty Ltd (OVERLAND) on behalf of Wee Waa Sun Farm Pty Ltd proposes to develop the Wee Waa Sun Farm, a large-scale solar photovoltaic (PV) generation facility and associated infrastructure near the township of Wee Waa, in the Brigalow Belt South bioregion of northern NSW (Figure 1.1) (the project). The project will have a capital investment of greater than \$30 million.

The project is a State significant development (SSD) under the State Environmental Planning Policy (State and Regional Development) 2011 (SRD SEPP). Therefore, a development application (DA) for the project is required to be submitted under Part 4, Division 4.1 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). The NSW Minister for Planning, or the Minister's delegate, is the consent authority.

The project is intended to have benefits including:

- production of renewable energy, directly contributing to the State's renewable energy targets and the objectives of the NSW Government's Renewable Energy Action Plan (REAP);
- creation of employment opportunities, including approximately 80 full-time equivalents (FTEs) during construction, and three FTEs during operations;
- direct and indirect benefits to the local economy during the life of the project;
- diversification of local revenue streams; and
- increased energy security through valuable contributions to a more diverse energy mix.

The project is consistent with the objectives of the NSW Government's REAP and will contribute to achieving the Commonwealth Government's National Renewable Energy Target of 33,000 gigawatt hours (GWh) of energy generated by renewable sources by 2020 (DoI DRE 2016), which the Australian Energy Regulator (2017) reports as requiring an additional 7,000 GWh of renewable energy to meet.

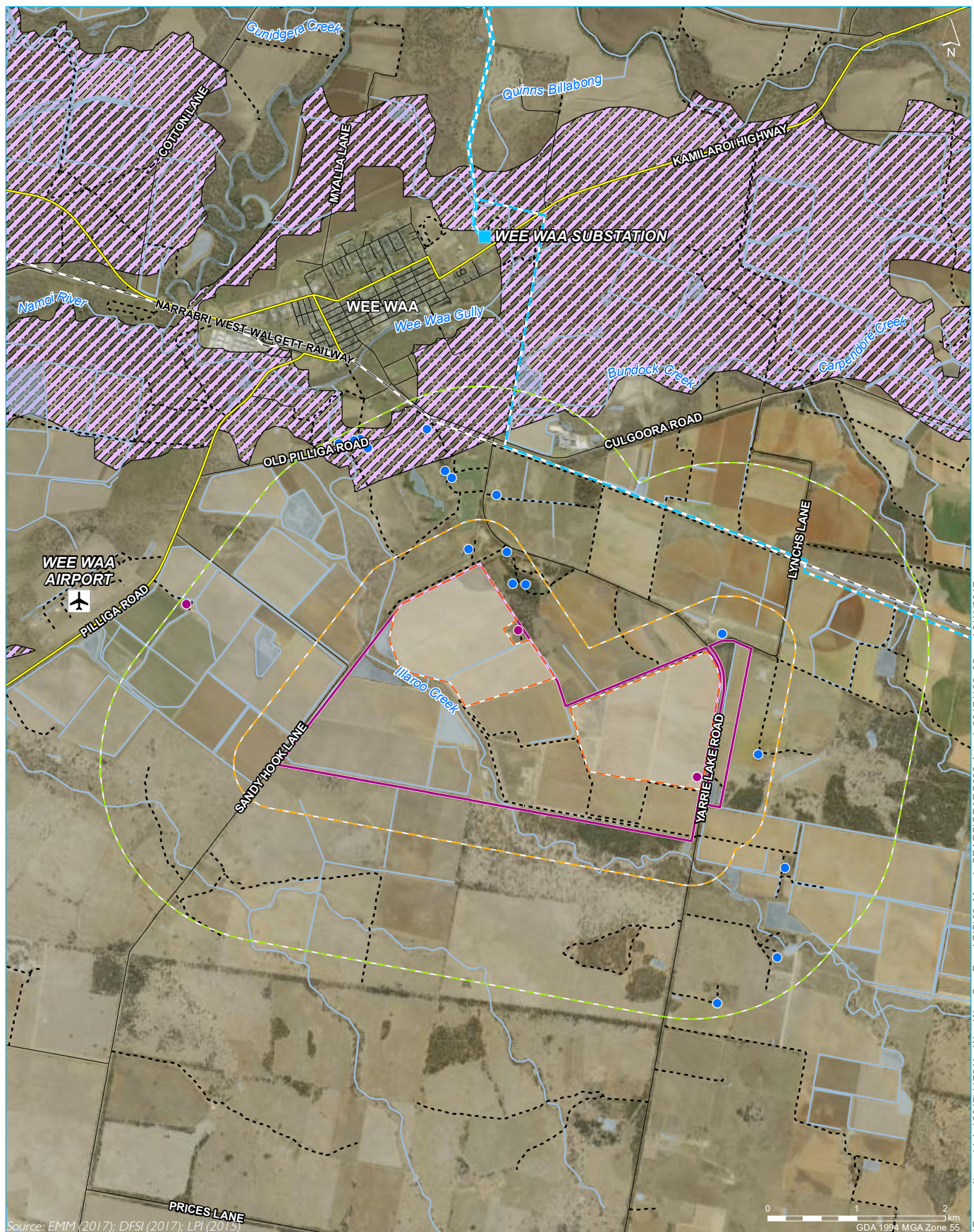
1.2 Site and surrounds

OVERLAND proposes to develop the project on a site within the Narrabri Shire local government area (LGA), approximately 3.5 kilometres (km) south-east of the township of Wee Waa (Figure 1.1). The site boundary is a broad footprint that extends across a portion of land of approximately 880 ha (the site) and incorporates a preliminary development footprint within which project infrastructure would be located (Figure 1.2).

The parcels of land within the site are legally described as DP 757125 (Lots 140 and 191), DP 590973 (Lots 1411 and 1412), and DP 757125 (Lots 187 and 188(1/2)) on the western side of Yarrie Lake Road; and DP 757120 (Lot 1), DP 244104 (Lot 2), and DP 757125 (Lot 188(2/2)) on the eastern side of the road (Figure 1.3). Land on the eastern side of Yarrie Lake Road would host only transmission line / grid connection infrastructure, with all other project related infrastructure to be located within the development footprint located to the west.

During the preparation of the EIS, the development footprint will be further refined on the basis of grid connection studies, environmental constraints identification and further engineering assessment and design of project infrastructure.





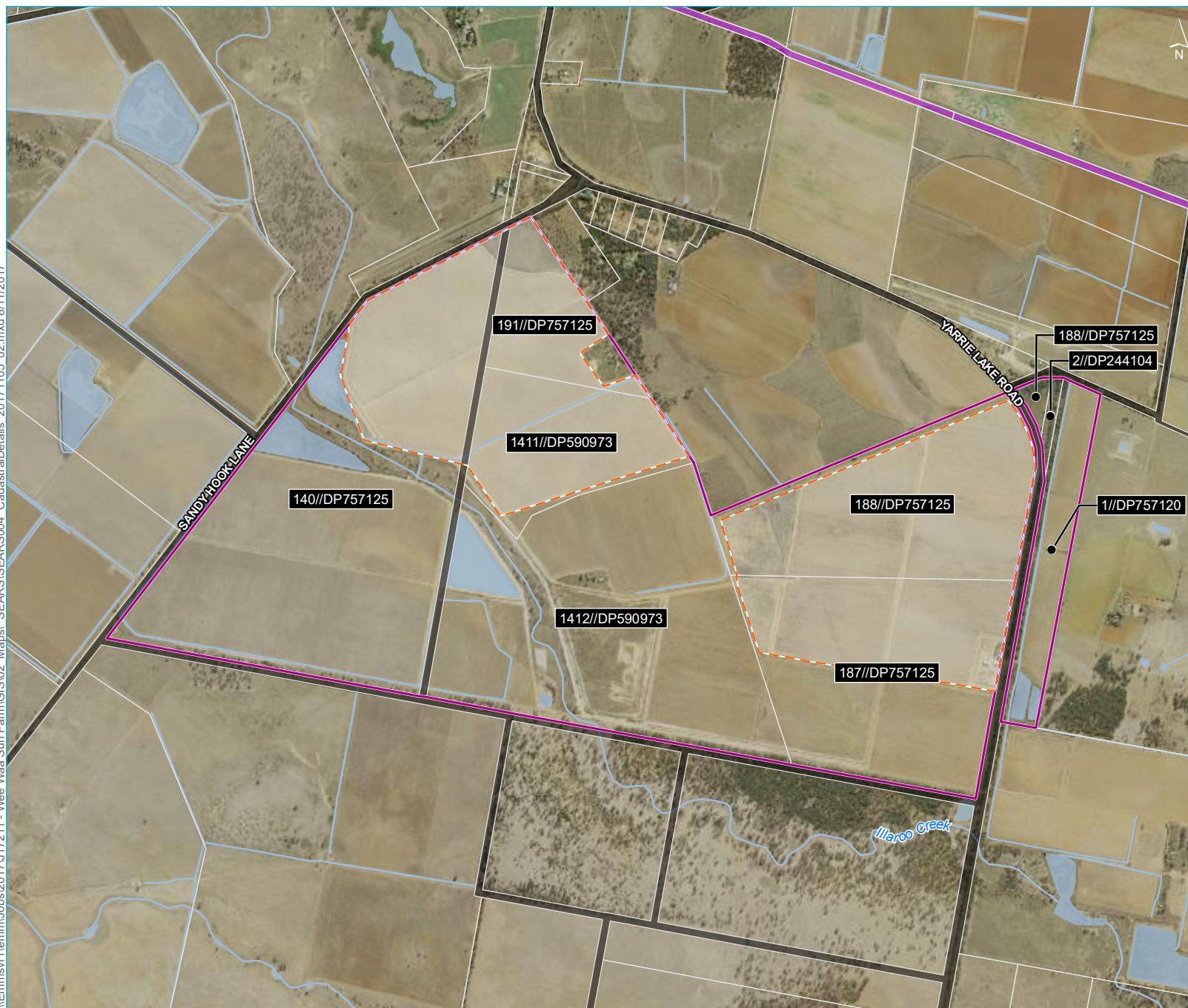
KEY

- | | | |
|--|--|---|
| Site boundary | Rail line | Biophysical Strategic Agricultural Land |
| Preliminary development footprint | Main road | |
| 500 m buffer | Local road | Receptors |
| 2 km buffer | Vehicular track | ● Sensitive receptor |
| Narrabri to Wee Waa 66 kV transmission line | Watercourse / drainage line | ● Project-related receptor |
| | Waterbody | |

Location of the Wee Waa Sun Farm

Wee Waa Sun Farm
Request for SEARs
Figure 1.2

\\Emmsvr1\emm\Jobs\2017\J17211 - Wee Waa Sun Farm\GIS\02 Maps\ SEARS\SEARS004 CadastralDetails 20171105 02.mxd 8/11/2017



- KEY
- Site boundary
 - Preliminary development footprint
 - Cadastral boundary
 - Road corridor (public road in use)
 - NSW Government (railway corridor)
 - Watercourse / drainage line
 - Waterbody

Cadastral details

Wee Waa Sun Farm
Request for SEARs
Figure 1.3



Source: EMM (2017); DFSI (2017); LPI (2015)

0 1 2 km
GDA 1994 MGA Zone 55



Elevation across the site is relatively uniform at approximately 191–199 m above sea level.

The site is zoned RU1 Primary Production under the Narrabri Local Environmental Plan 2012 (Narrabri LEP). The site has been highly modified by past disturbances associated with land clearing, cropping, livestock grazing and weed invasion. It is currently used for broad acre irrigated cropping.

A preliminary desktop assessment indicates that the site contains predominantly non-native, cropped vegetation and has been heavily disturbed by past land use. The preliminary ecological assessment indicates that there is minimal native vegetation within the site boundary. Native vegetation is limited to roadsides and windrows between properties.

The site is located outside of the biophysical strategic agricultural land (BSAL) as defined by the Strategic Agricultural Land Map – New England North West regional mapping presented in State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007 (the Mining SEPP) (Figure 1.2).

The site is located within the floodplain of the Namoi River, and the western land portion is adjacent to Illaroo Creek (see Figure 1.2). It lies outside of Narrabri Shire Council's (NSC) flood planning area. Preliminary consideration of published Department of Natural Resources (DNR) and Department of Primary Industries (DPI Water) regional flooding information indicates that regional flooding of the Namoi River is unlikely to extend into the site; however may impact areas in the vicinity. Due to the site's proximity to Illaroo Creek, it is considered that there exists some potential risk of localised flooding impacts in the vicinity of the western portion of the site.

At its closest point, the site is approximately 1.3 km south of the 66 kilovolt (kV) Essential Energy Narrabri to Wee Waa transmission line. At its closest point, the site is approximately 3.7 km south of Essential Energy's Wee Waa Substation (refer Figure 1.2).

The site has been heavily modified through cropping, which will enable development of the project and associated electricity grid connection with minimal impact to biodiversity and heritage values in the area.

The site has suitable access to the local and regional road network including the Kamilaroi Highway, Yarrie Lake Road and Culgoora Road (refer Figure 1.1).

Climate data from the Bureau of Meteorology (BoM) indicates that the site's daily solar exposure ranges between 10.8-26.9 megajoules/m² (MJ/m²), with an annual average of 19.5 MJ/m², which equates to approximately 5.4 kWh/m² with an average of 8-9 hours of sunshine per day (BoM 2017a; BoM 2017b). Annual cloud cover statistics over a 28 year period indicate that the site receives an average of 99.1 cloudy days per annum (BoM 2017c). The Narrabri Shire region experiences a consistently high availability of solar radiation, and is therefore ideal for large-scale solar development.

Photographs 1.1 and 1.2 illustrate the general condition of the site.



Photograph 1.1 **General condition of the eastern portion of the preliminary development footprint, looking north-east**



Photograph 1.2 **General condition of the western portion of the preliminary development footprint, looking east**



1.3 Applicant

OVERLAND is the applicant for the project. OVERLAND is an Australian-owned and operated business engaged in the development of a portfolio of solar energy sun farms on land across regional Australia. Guided by direct experience in the development and commercial delivery of large-scale renewable projects, OVERLAND works closely with landowners, electricity supply companies, councils and governments to develop solar energy sun farms that bring both environmental and economic benefits to regional Australia consistent with the goals and objectives of both the Commonwealth and NSW governments.

OVERLAND's personnel have successfully led benchmark renewable energy and infrastructure projects from start to finish and have a sound record that traverses early stage site identification, working with landowners and communities, obtaining consents and licences from government to build and operate, securing energy and grid connection contracts, arranging financing and managing construction and ongoing operations and power generation.

This experience includes responsibility for the development, financing, construction and operation of over 350 megawatts (MW) of large-scale, grid connected renewable energy generation projects in the National Electricity Market.

OVERLAND has completed the development and financing of 350 MW of large-scale solar and is continuing to develop a significant portfolio of solar energy sun farms throughout NSW and other National Electricity Market states. For example, the Limondale Sun Farm, a large-scale solar PV generation facility close to the township of Balranald in south-western NSW, which was approved by the Minister for Planning on 31 August 2017. In addition, OVERLAND proposes to develop the Hillston and Hay sun farms in south-western NSW, which are both currently under assessment by NSW Department of Planning and Environment (DPE).

1.4 Purpose of report

The purpose of this report is to request, and inform the content of, the Secretary's Environmental Assessment Requirements (SEARs) for the project. The SEARs will identify the requirements for the environmental impact statement (EIS) that will be prepared to accompany the DA for the project.

This report has been prepared by EMM Consulting Pty Limited (EMM) on behalf of Wee Waa Sun Farm Pty Ltd and OVERLAND Sun Farming Pty Limited.



2 Planning framework

2.1 NSW Environmental Planning and Assessment Act 1979

2.1.1 Approval process

The EP&A Act and the NSW Environmental Planning and Assessment Regulation 2000 (EP&A Regulation) provide the framework for environmental planning and assessment in NSW. Part 4 of the EP&A Act relates to development assessment; Part 4, Division 4.1 relates to the assessment of development deemed to be significant to the State (or SSD).

Section 89C(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 or 2.

The project meets both these requirements; it requires development consent, and is a development specified in Schedule 1 of the SRD SEPP. Permissibility of the project is described below.

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, distillate, waste, hydro, wave, solar or wind power) that:

- (a) has a capital investment value of more than \$30 million.

The project is a development for the purpose of electricity generation and will have a capital investment value of more than \$30 million. Consequently, the project is SSD.

2.1.2 Permissibility

The relevant local planning instrument is the Narrabri LEP. Under the Narrabri LEP, the site is zoned RU1 Primary Production. The objectives of this zone are:

- to encourage sustainable primary industry production by maintaining and enhancing the natural resource base;
- to encourage diversity in primary industry enterprises and systems appropriate for the area;
- to minimise the fragmentation and alienation of resource lands;
- to minimise conflict between land uses within this zone and land uses within adjoining zones; and



- to allow for non-agricultural land uses that will not restrict the use of other land for agricultural purposes.

The project will harness a natural resource, namely solar energy. Whilst the development of this project will impact the availability of the subject land for other primary production, it will allow for and encourage diversity in the area's land use.

Development for the purpose of electricity generation is prohibited in the RU1 Zone as it is not specified in item 2 or 3 of the Narrabri LEP. Notwithstanding, clause 34 (7) of State Environmental Planning Policy (Infrastructure) 2007 (Infrastructure SEPP) states that:

...development for the purpose of a solar energy system may be carried out by any person with consent on any land.

Therefore, development for the purpose of a solar energy system may be carried out on the site with development consent.

Section 78A (8A) of the EP&A Act requires a DA for SSD to be accompanied by an EIS. Schedule 2 of the EP&A Regulation requires an EIS to be prepared in accordance with the SEARs issued for the project.

2.2 Other State legislation

2.2.1 Protection of the Environment Operations Act 1997

The NSW *Protection of the Environment Operations Act 1997* (POEO Act) is the principal NSW environmental protection legislation and is administered by the NSW Environment Protection Authority (EPA). Section 48 of the POEO Act requires an environment protection licence (EPL) to undertake scheduled activities at any premises. Scheduled activities are defined in Schedule 1 of the POEO Act and include the following activities that apply to the project:

17 Electricity generation

(1) ...general electricity works, meaning the generation of electricity by means of electricity plant that, wherever situated, is based on, or uses, any energy source other than wind power or solar power.

(2) Each activity referred to in Column 1 of the Table to this clause is declared to be a scheduled activity if it meets the criteria set out in Column 2 of that Table.

The table referred to in Schedule 1, clause 17 specifies 'general electricity works' with 'capacity to generate more than 30 megawatts of electrical power'. The project will have a capacity that is greater than 30 MW and therefore requires an EPL. Under the provisions of the EP&A Act, an EPL cannot be refused if it is necessary for carrying out an SSD authorised by a development consent (see Section 2.2.6).

2.2.2 Water Management Act 2000

The NSW *Water Management Act 2000* (WM Act) regulates the use and interference with surface and groundwater in NSW where a water sharing plan has been implemented. A number of water sharing plans apply to the region in which the site is located. The relevant water sharing plans will be discussed in the EIS.



2.2.3 Biodiversity Conservation Act 2016

The NSW *Biodiversity Conservation Act 2016* (BC Act) commenced on 25 August 2017, which repealed the following:

- NSW Threatened Species Conservation Act 1995;
- sections of the NSW National Parks and Wildlife Act 1974 (NPW Act); and
- NSW Native Vegetation Act 2003.

The BC Act establishes a new regulatory framework for assessing and offsetting biodiversity impacts for proposed developments. Where development consent is granted, the consent authority may impose as a condition of consent, an obligation to retire a number and type of biodiversity credits determined under the new Biodiversity Assessment Method (BAM).

The BC Act is also supported by the Biodiversity Conservation Regulation 2017 and the Biodiversity Conservation (Savings and Transitional) Regulation 2017, which outline the methods to be used in applying the BAM, and specific considerations for transitional projects immediately following commencement of the new framework.

Biodiversity surveys and an assessment of the potential impacts of the project will be undertaken in accordance with the BC Act and incorporated in to the EIS. A key aim of the project design will be to avoid and minimise potential impacts to biodiversity values as far as practical and, subsequently, avoid or minimise offset obligations under the BAM.

2.2.4 Roads Act 1993

The NSW *Roads Act 1993* is administered by either Roads and Maritime Services (RMS), local government or New South Wales Land and Property Information (NSW LPI). The RMS has jurisdiction over major roads, local government over minor roads and NSW LPI over Crown roads. The *Roads Act 1993* sets out the rights of the public in regard to access to public roads.

Under Section 138 or Part 9, Division 3 of the NSW *Roads Act 1993*, 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 RMS or local council, depending upon classification of the road.

The interaction of the project with the local and regional road network will be addressed in the EIS. Under the provisions of the EP&A Act, an approval under Section 138 or Part 9, Division 3 of the NSW *Roads Act 1993* cannot be refused if it is necessary for carrying out a SSD authorised by a development consent (see Section 2.2.6).

2.2.5 Rural Fires Act 1997

The NSW *Rural Fires Act 1997* (RF Act) aims to prevent, mitigate, and suppress bush and other fires in local government areas of the State. Section 63(2) of the RF Act requires the owners of land to prevent the ignition and spread of bushfires on their land. Under Section 89J of the EP&A Act, a bush fire safety authority under Section 100B of the RF Act is not required for SSD that is authorised by a development consent.

The NSW Rural Fire Service (RFS) Bush Fire Prone Land online mapping tool indicates that the site is not bush fire prone.



2.2.6 Other State approvals required

Section 89J of the EP&A Act states that the following relevant authorisations that might otherwise apply to the project, are not required for SSD that is authorised by a development consent:

- an approval under Part 4, or an excavation permit under Section 139, of the NSW *Heritage Act 1977* (Heritage Act);
- an Aboriginal heritage impact permit (AHIP) under Section 90 of the NPW Act;
- a bush fire safety authority under Section 100B of the NSW RF Act; and
- 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 WM Act.

In addition, Section 89J states that Division 8 of Part 6 of the Heritage Act does not apply to, prevent or interfere with the carrying out of SSD authorised by a development consent.

Section 89K of the EP&A Act lists the authorisations that must be obtained but cannot be refused if they are necessary for carrying out SSD that is authorised by a development consent. These authorisations include (as relevant to the project):

- an EPL under the POEO Act; and
- a consent under Section 138 of the NSW *Roads Act 1993* from the relevant road authority.

2.3 Commonwealth legislation

The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) aims to protect matters of national environmental significance (MNES) including:

- world heritage properties;
- national heritage places;
- Ramsar wetlands of international importance;
- nationally threatened species and ecological communities;
- migratory species;
- Commonwealth marine areas;
- the Great Barrier Reef Marine Park;
- nuclear actions (including uranium mining); and
- a water resource, in relation to coal seam gas development and large coal mining development.

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. The Commonwealth Protected Matters Search Tool and preliminary ecological investigations indicate that there is limited potential for listed threatened species and listed migratory species to occur within the vicinity of the site.



If an action would, 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. To determine whether a proposed action will or is likely to be a controlled action, a referral is submitted to the Commonwealth Department of the Environment and Energy (DoEE).

Preliminary ecological investigations indicate a referral is unlikely to be required.



3 Project description

3.1 Overview

The project includes the development, construction and operation of a solar PV electricity generation facility, which comprises the installation of PV solar panels and associated infrastructure on the site.

Ultimately, the installed capacity will depend on the development footprint (to be refined during preparation of the EIS), the available grid capacity, the economics of scale and grid connection, and energy market demand. As an indication of scale, based on current technologies, the estimated total installed capacity will be in the order of up to 55 MW, which would be generated by approximately 165,000 PV solar panels.

The project will connect to either the Essential Energy 66 kV electricity distribution network via Essential Energy's Wee Waa Substation or the Narrabri to Wee Waa 66 kV transmission line that traverses the landscape between Narrabri and Wee Waa (see Figure 1.2).

The electricity and associated environmental products that are generated from the project will be sold to one or more of a registered energy retailing organisation, large energy user (governmental or private) or to the National Electricity Market that is managed by the Australian Energy Market Operator.

3.2 Project components

The project comprises a number of key components on the site, including:

- a network of PV solar panel arrays;
- electrical collection systems, switchyard and control room;
- energy storage and network support devices;
- a management hub, including demountable offices and amenities and equipment sheds;
- parking and internal access roads; and
- easement and connection infrastructure to deliver electricity generated by the project to the existing electricity network.

The project may include the installation of battery and energy storage devices within the development footprint. The rated capacity of the proposed battery and energy storage devices will be determined during the detailed design stage of the project and will be dependent on commercial considerations at the time of construction. The proposed battery and energy storage devices will be housed in a secure compound within the development footprint.

The purpose of the battery and energy storage devices will be to store energy on-site, which will allow energy to be released at specific times. The battery and energy storage devices will also provide a number of network services, including, frequency control integration and energy arbitrage, as well as improved reliability of electricity provision from the project. Energy arbitrage allows energy to be stored on-site during periods of low demand and then be discharged into the network during periods of greater demand.

No subdivision of land is proposed as part of the project.



The site boundary presented in Figure 1.2 is a broad footprint which has been identified during initial design and planning stages and incorporates a preliminary development footprint within which project infrastructure would be located. During the preparation of the EIS, the development footprint will be further refined on the basis of grid connection studies, environmental constraints identification and further engineering assessment and design of project infrastructure.

3.2.1 PV solar panels

The project involves the installation of PV solar panels, arranged in a series of rows positioned to maximise the use of the solar resource available at the site. PV solar panels will be constructed in a fixed array or in a single axis tracking configuration, which will allow the PV solar panels to rotate from east to west during the day tracking the sun's movement. Panels will be fixed to and supported by ground-mounted framing. The average height of the PV solar panel rows will be up to approximately 1.2 m. For a tracking configuration, the maximum height of the PV solar panel rows will be approximately 2 m during the early morning and late afternoon tracking periods.

The typical dimensions of the PV solar panels are 1.7 m by 1 m, which provides a surface area of approximately 1.65 square metres (m²) per PV solar panel. PV solar panels will be constructed of solar glass with an anti-reflective surface treatment.

Approximately 165,000 PV solar panels could be accommodated at the site, providing an estimated capacity in the order of 55 MW. The final number of PV solar panels within the development footprint will be dependent on detailed design, module type and availability, and commercial considerations at the time of construction.

3.2.2 Electrical collection system and switchyard

The PV solar panels will be connected in series and the electricity generated by the project will be directed via underground electrical collection systems to the inverters. The number of inverters required will be dependent on the final detailed design; however, it is anticipated that approximately 25 inverters will be required. The inverters will connect to a project electrical switchyard and onsite substation, which will use the connection infrastructure to export electricity to the grid network. All electricity generated by the PV solar panels will pass through a substation and then be transmitted into the grid network.

3.2.3 Management hub

The project includes the development of a management hub, from which operation of the infrastructure will be managed. Structures will include a demountable office control building, including staff amenities, and equipment storage sheds. This will be the receipt point for all equipment delivery during construction and all management activities during the project's operational period.

3.3 Construction

Construction of the project will take approximately nine months from the commencement of site works. Due to the site's flat terrain and predominantly cleared landscape, minimal site preparation and civil works are anticipated prior to construction. During the peak construction period, a workforce of approximately 80 people will be required on-site. Construction activities will be undertaken during standard daytime construction hours.



3.4 Operation and decommissioning

Once operational, the project will require around three FTEs. The primary operational activities conducted on-site will include day-to-day routine operations, maintenance of infrastructure, and general site maintenance and security.

The operational lifespan of the project will be in excess of 30 years, depending on the nature of solar PV technology and energy markets. Once the project reaches the end of its investment and operational life, the project infrastructure will be decommissioned and the site returned to its pre-existing land use, or other land use in consultation with the landowner, as far as practicable.

3.5 Network connection

The infrastructure required for connection to the local electricity distribution network between the site and the Wee Waa Substation or the Narrabri to Wee Waa 66 kV transmission line will be dependent on the requirements of the network service provider, outcomes of grid connection studies (which are currently in progress), transmission line route selection and engineering, environmental and landholder constraints.

As noted previously, at its closest point, the Wee Waa Substation is approximately 3.7 km north of the site. At its closest point, the Narrabri to Wee Waa 66 kV transmission line is approximately 1.3 km north of the site.

Route identification and assessment will be completed as part of the EIS. Suitability of existing easements to connect to the Wee Waa Substation or the Narrabri to Wee Waa 66 kV transmission line will also be investigated to identify any opportunities for co-location of infrastructure.



4 Justification

4.1 Strategic context

4.1.1 National context

The Commonwealth Government Renewable Energy Target (RET) scheme is designed to reduce emissions of greenhouse gases in the electricity sector and encourage the additional generation of electricity from sustainable and renewable sources. Since January 2011, the RET scheme has operated in two parts—the Small-scale Renewable Energy Scheme (SRES) and the Large-scale Renewable Energy Target (LRET). The LRET includes legislated annual targets, which requires significant investment in new renewable energy generation capacity in coming years, with a target of 33,000 gigawatt-hours of renewable electricity generation by 2020 (DoI DRE 2016).

Further, the Commonwealth Government has signed and announced its intention to ratify the United Nations Paris Agreement on climate change, which incorporates review and ratchet mechanisms that mean Australia's interim emissions reduction targets are likely to become more ambitious over time. The current interim targets are:

- 5% below 2000 levels by 2020; and
- 26-28% below 2005 levels by 2030.

The 2030 target is equivalent to a 50-52% reduction in per capita emissions and a 64-65% reduction in the emissions intensity of the economy.

4.1.2 State context

The NSW Government's REAP was introduced to guide NSW's renewable energy development and to support the former national target of 20% renewable energy by 2020.

This is supported by the recently released NSW Climate Change Policy Framework (Office of Environment and Heritage 2016), the aim of which is to maximise the economic, social and environmental wellbeing of NSW in the context of a changing climate and current and emerging international and national policy settings and actions to address climate change, and which adopts aspirational long-term objectives to achieve net-zero emissions by 2050 and to make NSW more resilient to a changing climate.

4.1.3 Local context

Narrabri Shire is diversifying its economy from a traditional agricultural sector base, to include an increased variety of industry. The Narrabri Shire Community Strategic Plan 2013 – 2023 outlines the community's strategic objectives focussed around four key themes: community; sustainable environment; diverse economy; and leadership and advocacy. Of relevance, the strategic objectives include a focus on facilitating industrial and commercial developments, and facilitating growth and diversification in the economy.

4.1.4 Project benefits

The project is consistent with the objectives of the NSW Government's REAP and will contribute to achieving the Commonwealth Government's National RET of 33,000 gigawatt hours (GWh) of energy generated by renewable sources by 2020 (DoI DRE 2016), which the Australian Energy Regulator (2017) reports as requiring an additional 7,000 GWh of renewable energy to meet.



The project is intended to have benefits including:

- production of renewable energy, directly contributing to the State's renewable energy targets and the objectives of the REAP;
- creation of employment opportunities, including approximately 80 full-time equivalents (FTEs) during construction, and three FTEs during operations;
- direct and indirect benefits to the local economy during the life of the project;
- diversification of local revenue streams; and
- increased energy security through valuable contributions to a more diverse energy mix.

The project is also consistent with NCS's aims for diversification of the region's economy, and NSC is supportive of the project (refer Appendix A) and its associated contribution to achieving council's strategic vision, provision of capital investment into the region, and creation of employment and training opportunities during construction and operation of the project.

4.2 Site Selection

The project site was selected in consideration of a range of commercial and environmental factors, with the aim to select a suitable site with attributes that maximise project design and efficient project delivery, whilst minimising commercial and environmental risks and potential environmental impacts. The following key factors contribute to the suitability of the site:

- it is located in close proximity to the existing electricity transmission network, which has sufficient capacity to accommodate the electricity generated by the project;
- it is ideally situated for large-scale solar development, having access to a solar resource that is consistently highly available;
- it is of suitable topography, being generally flat, but not subject to flooding, unlike much of the surrounding area to the north and west, which is subject to inundation from the Namoi River and associated tributaries;
- it is agricultural land of generally lesser quality than other areas in the locality, and is considered to consist of marginal farming paddocks, the ongoing commercial viability of such activities is reliant on ongoing access to the groundwater source at the site, for which water allocations/access rights have been reduced in recent years;
- it has been highly disturbed as a result of past land uses, is largely cleared of native vegetation, and has limited environmental value; and
- the site is well situated for access to the regional road network, and due to the nature of the site and surrounding environment and location of the nearest sensitive receptors, would result in limited and only localised impacts.



Whilst it is acknowledged that the development is prohibited in the RU1 Zone, it is permissible with consent under the provisions of the Infrastructure SEPP. Further, early consultation with NSC has identified that the project is consistent with NSC's aims and objectives for the community and regional economy and is in support of the project.

Alternative sites were considered in the locality, but were discounted predominantly due to proximity to connection infrastructure, or being either flood prone, or of high agricultural value.



5 Stakeholder engagement

OVERLAND will engage with stakeholders during preparation of the EIS. Stakeholder groups, with an interest in the project, include:

- DPE;
- RMS;
- NSW Office of Environment and Heritage (OEH);
- EPA;
- NSC;
- NSW DPE – Division of Resources and Energy (DRE);
- Civil Aviation Safety Authority (CASA);
- Essential Energy;
- local landowners, farm managers and nearby residents; and
- Aboriginal stakeholders.

OVERLAND has developed a positive working relationship with NSC as part of the process to identify and secure a suitable site for the project. A letter of support for the project from NSC is included as Appendix A.

Engagement activities with the stakeholders identified above will be developed as part of a stakeholder engagement program that will be prepared following receipt of the SEARs. A number of different resources will be used to inform the development of the stakeholder engagement program, including the NSW Government's *Community Attitudes to Renewable Energy* report (OEH 2015). The results of surveys conducted as part of that report indicate high levels of support among communities for the construction of solar farms throughout NSW (OEH 2015).

Outcomes of engagement activities will be addressed in the EIS and relevant technical studies.



6 Preliminary environmental impact assessment

6.1 Issues identification

An initial review of environmental constraints has been undertaken to identify the issues that require detailed consideration as part of the project design process and technical studies supporting the EIS for the project.

6.2 Biodiversity

6.2.1 Existing environment

Soil and vegetation within the Brigalow Belt South bioregion is very variable and is dependent on the local rock type or sediment source. The preliminary ecological assessment indicates soils within the site boundary consist of sandy loams derived from Pilliga outwash.

The preliminary ecological assessment indicates that the site is heavily disturbed from past land use for irrigation. Minimal native vegetation is present within the site boundary. A shallow depression in the north-eastern corner of the western portion of the site is mapped as plant community type (PCT) 53 Shallow freshwater wetland sedgeland in depressions on floodplains on inland alluvial plains and floodplains. However, the preliminary ecological assessment found that this area was dominated by exotic grasses, and is surrounded by a dense, regenerating shrub layer of Hakea Wattle (*Acacia hakeoides*).

The preliminary ecological assessment indicates that roadside vegetation adjacent to Yarrie Lake Road, north of the site, forms a mosaic of semi-mature patches of PCT 397 Poplar Box - White Cypress Pine shrub grass tall woodland of the Pilliga - Wialda region, Brigalow Belt South Bioregion interspersed with stands of White Cypress Pine (*Callitris glaucophylla*) and grasslands dominated by exotic species where timber has been cleared. Vegetation adjacent to Yarrie Lake Road, south of the site, consists of stands of PCT 413 Silver-leaved Ironbark - White Cypress Pine - box dry shrub grass woodland of the Pilliga Scrub - Wialda region, Brigalow Belt South Bioregion.

No threatened ecological communities were recorded within or adjacent to the site during the preliminary ecological assessment.

Two threatened flora species and 27 threatened fauna species have been recorded within 20 km of the site. A list of these species is provided in Table 5.1.



Table 6.1 Threatened biota recorded within a 20 km radius of the site

Scientific name	Common name	EPBC Act status	BC Act status	Number of records within 20 km	Date of last sighting
Flora					
<i>Lepidium aschersonii</i>	Shrub Sida	VU	V	2	1996
<i>Sida rohlenae</i>	Spiny Peppercress		E1	22	2006
Fauna					
<i>Anomalopus mackayi</i>	Five-clawed Worm-skink	VU	E1	1	2015
<i>Anseranas semipalmata</i>	Magpie Goose		V	3	1976
<i>Artamus cyanopterus cyanopterus</i>	Dusky Woodswallow		V	1	2004
<i>Botaurus poiciloptilus</i>	Australasian Bittern	EN	E1	1	1992
<i>Calyptorhynchus lathami</i>	Glossy Black-Cockatoo		V	8	1978
<i>Chalinolobus picatus</i>	Little Pied Bat		V	4	2004
<i>Chthonicola sagittata</i>	Speckled Warbler		V	1	2013
<i>Climacteris picumnus victoriae</i>	Brown Treecreeper (eastern subspecies)		V	4	2010
<i>Ephippiorhynchus asiaticus</i>	Black-necked Stork		E1	1	2003
<i>Gallinago hardwickii</i>	Latham's Snipe	Mi		1	1973
<i>Gelochelidon nilotica</i>	Gull-billed Tern	Mi		1	1983
<i>Grantiella picta</i>	Painted Honeyeater	VU	V	3	1992
<i>Grus rubicunda</i>	Brolga		V	1	2004
<i>Hieraaetus morphnoides</i>	Little Eagle		V	1	2003
<i>Hirundapus caudacutus</i>	White-throated Needletail	Mi		2	2003
<i>Hoplocephalus bitorquatus</i>	Pale-headed Snake		V	7	2003
<i>Macropus dorsalis</i>	Black-striped Wallaby		E1	299	2013
<i>Merops ornatus</i>	Rainbow Bee-eater	Mi		4	2015
<i>Neophema pulchella</i>	Turquoise Parrot		V	1	2003
<i>Ninox connivens</i>	Barking Owl		V	7	1992
<i>Oxyura australis</i>	Blue-billed Duck		V	2	2013
<i>Phascolarctos cinereus</i>	Koala	VU	V	8	1981
<i>Polytelis swainsonii</i>	Superb Parrot	VU	V	15	2004
<i>Pomatostomus temporalis temporalis</i>	Grey-crowned Babbler		V	7	2004
<i>Sminthopsis macroura</i>	Stripe-faced Dunnart		V	1	2006
<i>Stictonetta naevosa</i>	Freckled Duck		V	1	1980
<i>Tyto longimembris</i>	Eastern Grass Owl		V	1	1985

Notes: 1. EPBC Act status: CE – critically endangered, E – endangered, VU – vulnerable, Mi – migratory.
2. BC Act status: E4A – critically endangered, E1 – endangered, V – vulnerable.

Many of the species listed in Table 5.1 are highly mobile woodland birds or raptors that would be restricted to larger stands of remnant vegetation, such as those found along riparian zones, or road and railway reserves. Others tend to prefer wetland or riparian areas, or relatively undisturbed stands of native vegetation. As outlined in Section 1.2, the site has been heavily modified through cropping. Subsequently, it is unlikely that many of the species listed in Table 5.1 would be resident within the site boundary. There is limited potential for some of these species to occur within roadside vegetation.

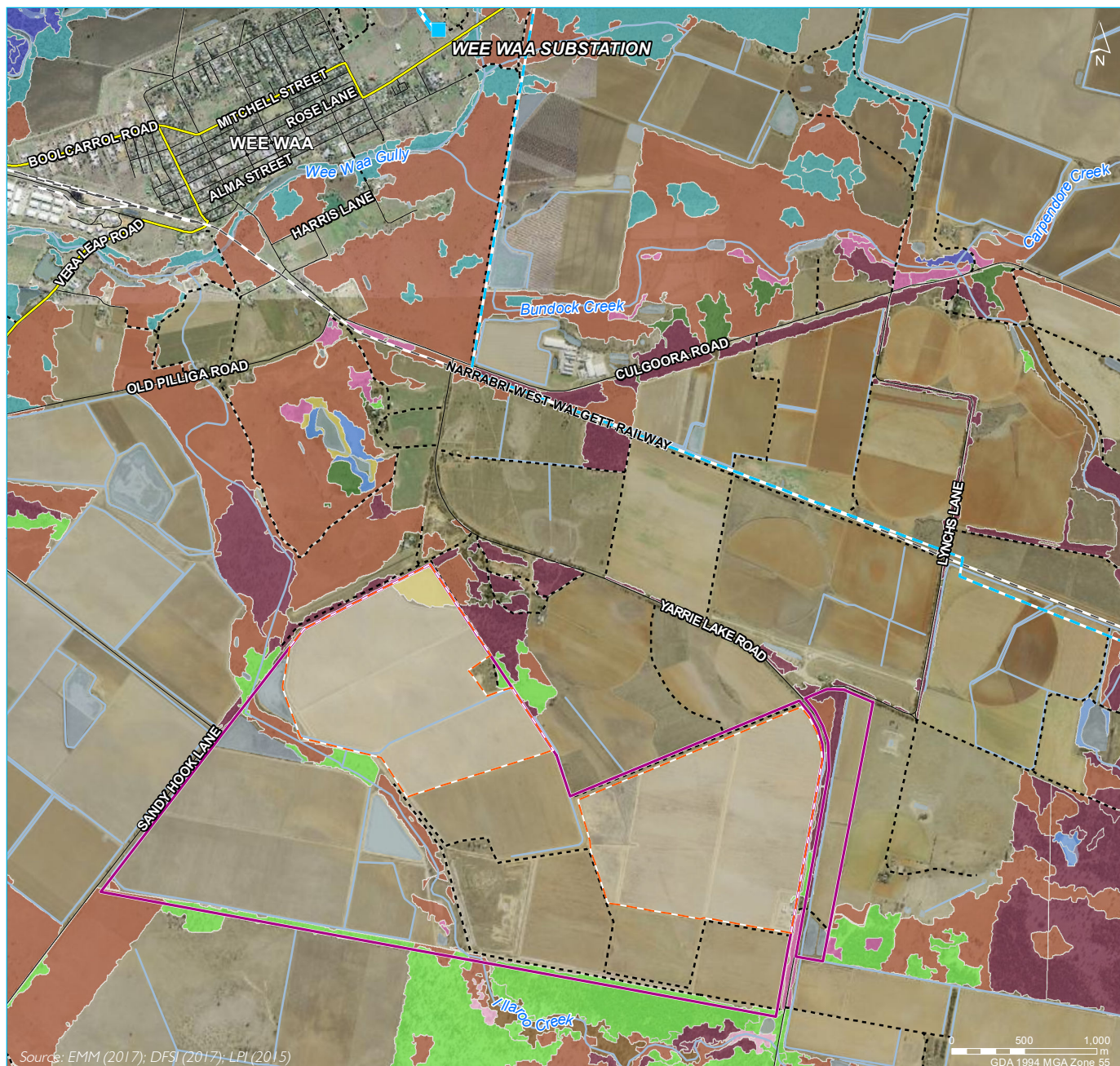


6.2.2 Assessment approach

The potential impacts to biodiversity from the project will be assessed in accordance with the BC Act, the Biodiversity Conservation Regulation 2017 and the new offsetting mechanism, namely the BAM. This will include:

- a review of the initial biodiversity constraints and field survey results to determine the threatened species and communities that require targeted field surveys. Searches will be undertaken for threatened species, populations and communities using the Atlas of NSW Wildlife, the EPBC Act Protected Matters Search Tool and local vegetation mapping datasets;
- native vegetation will be mapped and assessed in accordance with the BAM; and
- a biodiversity development assessment report (BDAR) will be prepared in accordance with the reporting requirements of the BAM.

The EIS and BDAR will include constraints mapping to demonstrate the biodiversity values on the site and will demonstrate how impacts to biodiversity have been avoided, mitigated and if required, offset. Based on an initial desktop assessment, impacts to biodiversity may be avoided by restricting the development footprint for the project to previously disturbed (irrigated) land.



Plant community types

PCT 1 - Candidate Native Grasslands	PCT 55 - Belah woodland on alluvial plains and low rises in the central NSW wheatbelt to Pilliga and Liverpool Plains regions	PCT 400 - Riparian sedgeland rushland wetland of the Pilliga to Goonoo sandstone forests, Brigalow Belt South Bioregion
PCT 35 - Brigalow - Belah open forest / woodland on alluvial often gilgaied clay from Pilliga Scrub to Goondiwindi, Brigalow Belt South Bioregion	PCT 56 - Poplar Box - Belah woodland on clay-loam soils on alluvial plains of north-central NSW	78 - River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion
PCT 36 - River Red Gum tall to very tall open forest / woodland wetland on rivers on floodplains mainly in the Darling Riverine Plains Bioregion	PCT 247 - Lignum shrubland wetland on regularly flooded alluvial depressions in the Brigalow Belt South Bioregion and Darling Riverine Plains Bioregion	399 - Red gum - Rough-barked Apple +/- tea tree sandy creek woodland (wetland) in the Pilliga - Goonoo sandstone forests, Brigalow Belt South Bioregion
PCT 39 - Coolibah - River Coobah - Lignum woodland wetland of frequently flooded floodplains mainly in the Darling Riverine Plains Bioregion	PCT 241 - River Coobah swamp wetland on the floodplains of the Darling Riverine Plains Bioregion and Brigalow Belt South Bioregion	401 - Rough-barked Apple - red gum - cypress pine woodland on sandy flats, mainly in the Pilliga Scrub region
PCT 53 - Shallow freshwater wetland sedgeland in depressions on floodplains on inland alluvial plains and floodplains	PCT 397 - Poplar Box - White Cypress Pine shrub grass tall woodland of the Pilliga - Warialda region, Brigalow Belt South Bioregion	

KEY

Site boundary	Main road
Preliminary development footprint	Local road
Wee Waa Substation	Vehicular track
Narrabri to Wee Waa 66 kV transmission line	Watercourse / drainage line
Rail line	Waterbody

Vegetation communities at the site

Wee Waa Sun Farm
Request for SEARs
Figure 6.1



6.3 Aboriginal cultural heritage

6.3.1 Existing environment

i Ethno-historical context

According to Tindale (1974) the site falls within the Aboriginal language group boundary of the Kamilaroi people. The Kamilaroi language group boundary was recorded as covering one of the largest geographic areas in NSW, roughly spanning from Walgett in the west, north into Queensland, Tamworth in the east and south to the headwaters of the Hunter River. Oral histories of the region show that local Aboriginal communities express a common understanding that the broader landscape is interconnected through complex patterns of movement that are centred around Aboriginal kinship ties (RACAC 2002). Aboriginal people have placed particular cultural importance on elements in their landscape, such as flora and fauna, rivers, forests and community life (RACAC 2002). The site is within the boundary of the Wee Waa Local Aboriginal Land Council (LALC).

ii Landscape overview

The site is close to the border of the Darling Riverine Plains and Brigalow Belt South IBRA bioregions. Locally, the site is on a relatively flat alluvial plain landform pattern with deep alluvial and sometimes colluvial soils. The site is within the catchment of the Namoi River, which, at its closest point, is approximately 4 km north-west of the site.

The western portion of the site's western boundary is adjacent to Illaroo Creek, a second order tributary of Wee Waa Gully (Figure 1.2).

The site has been subject to historical vegetation clearance followed by intensive cultivation. Based on a preliminary desktop assessment, potential easement options to connect the project to either the Wee Waa Substation or the Narrabri to Wee Waa 66 kV transmission line primarily traverse existing road and electricity easements and cleared agricultural land.

iii Archaeological context

A search of the Aboriginal Heritage Information Management System (AHIMS) register identified 50 Aboriginal sites within a 20 km x 20 km area centred on the site. No Aboriginal sites have been registered within the site boundary. The frequency and distribution of Aboriginal sites indicates that they are concentrated within proximity to reliable water sources, such as the Namoi River, as well as lower order streams. Notably, there are concentrations of modified trees and artefact scatters approximately 6 km south-west of the western portion of the site, which are adjacent to a second order stream on an alluvial plains landscape. However, as noted above, the site has undergone complete vegetation clearance and consequently, it is unlikely concentrations of sites will be present on the site.

The Aboriginal cultural heritage assessment (ACHA) prepared for stages 1 and 2 of the Brigalow Belt South Bioregion (RACAC 2000; RACAC 2002) included: Aboriginal consultation; an oral history record; archival investigation; and archaeological survey. The archaeological survey covered multiple landforms and land tenures, including, State forests, travelling stock routes and recreational areas. The survey identified that Aboriginal sites frequently occur on landforms associated with low-lying alluvial plains, such as, the site for the project (RACAC 2002). Of the 1,100 sites recorded within the bioregion, 668 (60%) were identified on alluvial landforms (RACAC 2002). The ACHA also identified that most sites occur within 50 m of water sources, while overall approximately 90% of sites were recorded within 200–300 m of water sources.



iv Implications for archaeological material at the site

A desktop review of the site and surrounds indicates that the site is likely to have been used by Aboriginal people, particularly given the western portion of the site's proximity to Illaroo Creek. Aboriginal stone artefacts are likely to have been deposited particularly near Illaroo Creek, but also across the site more sporadically and in fewer numbers. Stone artefacts are likely to have been displaced from their original location through repeated ploughing events as part of the agricultural land use history of the site.

Modified trees have been identified in the local area; however, they are highly unlikely to occur within the site boundary because it has been cleared of native vegetation.

Aboriginal objects may occur along the potential easement options to connect the project to either the Wee Waa Substation or the Narrabri to Wee Waa 66 kV transmission line, particularly at creek intersections and in areas of remnant native vegetation, which have experienced less intensive historical ground disturbance.

6.3.2 Assessment approach

The ACHA to be prepared for the project will be guided by the following best practice documents, acknowledging that some of the requirements cannot be met because an Aboriginal Heritage Impact Permit (AHIP) does not apply for SSD:

- Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW (DECCW 2010); and
- Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW (OEH 2011).

The following will be undertaken as part of the ACHA:

- review of OEH databases and any relevant literature;
- field survey of the site to identify places or items of Aboriginal cultural heritage significance;
- an assessment of Aboriginal cultural heritage items or places identified during the field survey;
- a cultural assessment to investigate whether there are any living cultural knowledge holders who may have cultural knowledge relevant to the assessment;
- consultation with Aboriginal stakeholders with guidance from the *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW 2010); and
- development of measures to avoid and mitigate potential impacts to Aboriginal cultural heritage, if required.

6.4 Land use

6.4.1 Existing environment

The project is within the Narrabri Shire LGA, which covers an area of 13,031 km² in north-western NSW. The site is part of the Namoi River catchment. Land use within this catchment is dominated by extensive agricultural operations with grazing occupying 61.2% of the total catchment area (Office of Water 2011). Dryland cropping and horticulture (16.2%), forestry (10.3%), native landscapes (5.1%), conservation (3.2%) and irrigation (3.0%) are also prevalent across the catchment area (Office of Water 2011).



The site is part of the Pilliga Outwash soil landscape, which is characterised by deep texture contrast soils with harsh clay subsoils and grey clay with gilgai (NPWS 2003). Within the Land and Soil Capability (LSC) mapping for NSW, the western portion of the site is mapped as LSC Class 5. Land identified under this classification is recognised as having severe limitations and is incapable of sustaining high impact land uses except where resources allow for highly specialised land management practices to overcome limitations (OEH 2013). Lower impact land uses, such as grazing, can be managed by readily available practices (OEH 2013). The eastern portion of the site is mapped as LSC Class 3. Land identified under this classification is recognised as having moderate limitations and is capable of sustaining high impact land uses using more intensive, readily available and accepted management practices (OEH 2013).

As noted in Section 1.2, the site is located outside of the BSAL as defined by the Strategic Agricultural Land Map – New England North West regional mapping presented in the Mining SEPP (Figure 1.2).

The site has been highly modified by past disturbances associated with livestock grazing; weed invasion; land clearing; dryland cropping and, more recently, development for broad acre irrigation. Surrounding land uses include both dryland and irrigated broad acre crop production and livestock grazing.

Pilliga State Conservation Area is approximately 22 km south of the site and covers an area of 33,386 ha (Figure 1.1). Brigalow Nature Reserve is approximately 18 km south-east of the site and covers an area of 253 ha (Figure 1.1).

6.4.2 Assessment approach

The project will alter the current land use of the site, being agriculture, to electricity generation. At the end of the project's operational life, project infrastructure will be decommissioned and the site may be returned to its pre-existing agricultural land use. As the site will not require significant civil works (such as bulk earthworks and re-shaping), the integrity of the land and soil capability is expected to be retained through appropriate land management practises. In order to establish the relevant land and soil capability, a desktop baseline assessment of land and soil capability will be undertaken in the EIS.

6.5 Water resources

6.5.1 Existing environment

The site is within the Brigalow Belt South bioregion, which extends from south of Dubbo in central-western NSW to the mid-Queensland coast. Several major rivers flow through this bioregion with their catchments forming an integral part of the Murray-Darling river system.

The site is part of the Namoi catchment and is approximately 4 km south-east of the Namoi River at its closest point (see Figure 1.2). The Namoi catchment covers an area of 42,000 km² and supports a population of approximately 100,000 people, which includes a number of rural townships, such as Tamworth, Gunnedah and Narrabri, as well as smaller towns including Wee Waa (Office of Water 2011). Within the catchment, the Namoi River stretches over 700 km, beginning in the Great Dividing Range and flowing across much of north-western NSW through to its junction with the Barwon River near Walgett. The highest daily mean flow of the Namoi River is experienced at Gunnedah, approximately 110 km upstream of Wee Waa, with a flow of 1,922 ML (Office of Water 2011). Streamflow declines downstream due to significant irrigation extractions and diversions into effluent channels (Office of Water 2011). Close to the site, the river is characterised by a mean daily flow of 1,364 ML (Office of Water 2011).

The Namoi catchment does not contain any extensive wetland complexes.



The site is within the floodplain of the Namoi River. The *Namoi River Narrabri to Wee Waa Floodplain Management Plan* (the FMP) (Department of Natural Resources (DNR) 2005) covers an area of approximately 800 km² within the Narrabri Shire LGA, including the town of Wee Waa and the site. This floodplain supports successful irrigation and dryland agricultural industries.

The site is also identified as part of the proposed Lower Namoi Valley Floodplain within the *Draft Floodplain Management Plan for the Lower Namoi Valley Floodplain* (DPI Water 2018). Within the Lower Namoi Valley Floodplain, Pian Creek and Gunidgera Creek are two major rivers that branch off from the Namoi River close to the town of Wee Waa. Both the Pian and Gunidgera creek systems have extensive floodplains independent of the Namoi River (DPI Water 2018).

The western portion of the site's western boundary is adjacent to Illaroo Creek (see Figure 1.2).

The site is within the Lower Namoi Alluvium groundwater management area which is characterised by an inland alluvial aquifer. Groundwater at the site is of fresh to moderate quality (0-1,500 TDS mg/L) and is suitable for domestic, stock and some irrigation purposes (Office of Water 2011). There is a groundwater monitoring bore approximately 1 km south-west of the western portion of the site that is listed on the DPI Water database (GW021482). The latest values indicate that the depth to groundwater at this location is approximately 24.9 m. In addition, there are a number of licensed groundwater bores on-site, which are authorised for a range of different purposes, including: stock; irrigation; and domestic use.

6.5.2 Assessment approach

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

Modelling of overland flowpaths and flood behaviour will be completed as part of project design and included the EIS. A surface water assessment will be prepared for inclusion in the EIS and will include an assessment of the existing surface water environment and a desktop assessment of flood risk of the project. The project will be designed to avoid significant adverse impacts on flood behaviour.

6.6 Traffic

6.6.1 Existing environment

The primary road transport routes in the vicinity of the site are Yarrie Lake Road and Culgoora Road (see Figure 1.2). Both Yarrie Lake Road and Culgoora Road are NSC rural roads connecting the towns of Wee Waa and Narrabri. Both roads service local traffic and agricultural operations. At the site, Yarrie Lake Road is a single carriageway with a sealed surface. Yarrie Lake Road is a recognised route exception within the RMS Road Train Network. As part of this exception, A-doubles are permitted to travel along this road corridor. Close to the site, Culgoora Road is also a single carriageway with a sealed surface; however, further east, the majority of this road is unsealed. It is understood that NSC recently received funding to seal Culgoora Road in its entirety.



The Kamilaroi Highway, approximately 3.5 km north of the site, is 605 km in length and is a NSW State highway extending from Bourke to Willow Tree. The highway connects a number of north-western NSW's major settlements including Brewarrina, Walgett, Narrabri and Gunnedah. The majority of the Kamilaroi Highway is a sealed single carriageway. The Kamilaroi Highway also connects the Mitchell and New England highways. It is a designated B-Double route.

At its closest point, the Narrabri West to Walgett rail line, which is an operational part of the NSW Country Regional Rail Network, is approximately 1.3 km north of the site.

Previously, there was a paper road that divided the land parcels which make up the western portion of the site. This road traversed the landscape in a north-south orientation and connected to Yarrie Lake Road in the north. Consultation with the project landholder has confirmed that this road has since been gazetted.

6.6.2 Assessment approach

Traffic generation is predominantly restricted to the construction stage of the project, with the site establishment and delivery of infrastructure likely to generate the greatest number of traffic movements during the life of the project. During operation, traffic is predicted to be limited to employee vehicle movements for in the order of three employees, plus a small number of daily vehicle movements associated with ongoing maintenance and associated activities.

A traffic assessment will be undertaken to assess potential impacts associated with traffic generation from the construction of the project in accordance with the relevant guideline *Guide to Traffic Generating Developments* (RTA 2002). It will include:

- existing traffic levels on transport routes and intersections likely to be used by the project;
- predicted traffic generation during construction;
- potential impacts to road and intersection capacity during construction;
- management of any level crossings of the Narrabri West to Walgett rail line during construction; and
- potential road and rail safety issues.

As traffic generation during operation will be minimal, a detailed assessment of operational traffic impacts is not considered to be required.

6.7 Air quality

6.7.1 Existing environment

The site is in a rural setting approximately 3.5 km south-east of the township of Wee Waa. The Narrabri Shire LGA is an area heavily dependent on agricultural activities, which is likely to influence local and regional air quality. The area surrounding the site is sparsely populated. In 2016, the population density within the Narrabri Shire LGA was approximately 1 person/km², which was significantly lower than the NSW average (9.6 people/km²) (ABS 2017a). Consequently, existing sources of air pollution within the area are limited and are primarily comprised of dust and vehicle and machinery exhaust emissions associated with transportation and agricultural activities. Bushfires are also a source of seasonal dust generation.



Emissions to the atmosphere from the project will largely be associated with dust and vehicle and machinery exhaust emissions during construction, and the maintenance of plant and equipment on-site. The project will be approximately 3.5 km south of the township of Wee Waa, which is the nearest considerable concentration of sensitive receptors. There are a total of five sensitive receptors within 500 m of the site at the closest boundaries (see Figure 1.2). In addition, a further 10 dwellings are between approximately 500 m and 2 km from the site boundary. The majority of these dwellings are north of the site (see Figure 1.2).

6.7.2 Assessment approach

The project is not anticipated to generate significant air quality impacts during construction or operation. Mitigation measures to manage dust generation on-site would be required during construction activities and as part of regular land management activities during operation. The EIS will detail measures to be implemented during the life of the project to minimise dust emissions. As impacts during construction would not be significant, and would be temporary in nature, a detailed air quality assessment is not considered to be required as part of the EIS.

6.8 Noise and vibration

6.8.1 Existing environment

Land use in the site's surrounding area is predominantly agricultural. Given the project's rural setting, background noise is likely to be low and characterised by agricultural activities and associated machinery, with minimal background wildlife noise also expected. Residential dwellings close to Yarrie Lake Road would likely be subject to some road noise.

Noise generated from the project will include construction noise, and noise generated by increased traffic along Yarrie Lake Road during the construction period, which will be the main transport route to and from the site. As stated previously, there are five sensitive receptors within 500 m of the site (see Figure 1.2).

6.8.2 Assessment approach

Noise impacts on-site during construction and operation are not expected to be significant; however, given the distance to the nearest sensitive receptors, consideration of noise management and mitigation measures may be required to ensure there are minimal exceedances of the relevant criteria at these receptors. Noise during construction will be limited to a period of approximately nine months, while operational noise sources over the life of the project will be limited. Accordingly, a detailed noise assessment is not considered to be required. The EIS will detail measures to be implemented during construction to minimise noise impacts.

The project would generate traffic movements during the construction stage, which would require vehicles to access the site from Yarrie Lake Road. A traffic noise assessment would be included in the EIS to assess noise impacts associated with traffic along Yarrie Lake Road during construction. Traffic movements during operation are expected to be minimal.



6.9 Visual

6.9.1 Existing environment

As previously discussed, the site is within the Namoi catchment, south of the Namoi River. Elevation across both the western and eastern portions of the site is relatively uniform at approximately 191–196 m above sea level and 195–199 m above sea level, respectively.

The site is partially visible from Yarrie Lake Road, and may also be partially visible from sections of Pilligra-Narrabri Road to the west, although views would be partially obscured by existing stands of remnant vegetation in many areas. As stated previously, there are five sensitive receptors within 500 m of the site (see Figure 1.2). Visibility of project infrastructure will be dependent on distance and the presence of vegetation which would screen views from the majority of these locations.

Wee Waa Airport is approximately 3.5 km west of the western portion of the site.

6.9.2 Assessment approach

Solar panels absorb sunlight and are designed to reflect only a small percentage of the sunlight that they receive. Consequently, glare is not anticipated to be a significant visual impact associated with the project. The EIS will consider likely visual impacts of the project infrastructure from sensitive receptors and nearby road corridors, as well as visibility of lighting during the night time.

6.10 Hazards and risks

6.10.1 Existing environment

As noted in Section 1.2, at its closest point, the site is approximately 1.3 km south of the 66 kV Essential Energy Narrabri to Wee Waa transmission line. Further, at its closest point, the site is approximately 3.7 km south of Essential Energy's Wee Waa Substation (refer Figure 1.2).

The infrastructure required for connection to the local electricity distribution network between the site and the Wee Waa Substation or the Narrabri to Wee Waa 66 kV transmission line will be dependent on the requirements of the network service provider, outcomes of grid connection studies (which are currently in progress), transmission line route selection and engineering, environmental and landholder constraints.

As noted in Section 2.2.5, the site is not identified as bushfire prone land in the NSW RFS online tool and the project is unlikely to pose a significant bushfire risk.

6.10.2 Assessment approach

The EIS will include a preliminary risk screening in accordance with State Environmental Planning Policy No 33 – Hazardous and Offensive Development and *Applying SEPP 33* (DoP 2011a). Should the preliminary risk screening indicate that the project is 'potentially hazardous', a preliminary hazard analysis will be prepared in accordance with *Hazard Industry Planning Advisory Paper No. 6 – Guidelines for Hazard Analysis* (DoP 2011b) and *Multi-Level Risk Assessment* (DoP 2011c).



The EIS will also include consideration of potential hazards and risks associated with electromagnetic fields generated by project infrastructure, and battery and energy storage devices within the development footprint. An assessment of the proposed grid connection infrastructure against the *Guidelines for Limiting Exposure to Time-varying Electric, Magnetic and Electromagnetic Fields* (International Commission on Non-Ionizing Radiation Protection (ICNIRP) 1998) would also be provided.

6.11 Socio-economics

6.11.1 Existing environment

The population of the Narrabri Shire LGA in 2016 was 13,084 compared to 12,925 in 2011, which reflects an increase of 159 people (or 1.2%) residing in the area (ABS 2013a; ABS 2017a). The township of Wee Waa experienced a slight decline in population over this period from 2,089 in 2011 to 2,080 in 2016 (ABS 2013b; ABS 2017b). The percentage of the population who identify themselves as Aboriginal and Torres Strait Islander people within the Narrabri Shire LGA (12.2% in 2016) is significantly higher than the State and national average (ABS 2017a).

The local economy within the Narrabri Shire LGA has traditionally been dependent on agriculture with the geography, climate, and environment within the Narrabri Shire LGA favourable for a variety of agricultural and horticultural activities. Cotton and wheat production and sheep and cattle grazing dominate the agricultural production activities undertaken within the area. Agriculture is the predominant employing industry within the Narrabri Shire LGA, with sheep, beef cattle and grain farming (11.7%), other crop growing (4.6%) and agriculture and fishing support services (3.3%) among the region's primary employers (ABS 2013a). Similarly, within the township of Wee Waa, these industries collectively account for more than 26% of the town's employment (ABS 2013b). More recently, coal mining and gas exploration developments have led to economic diversification within the Narrabri Shire LGA (NSC 2011). Within the Narrabri Shire LGA, the unemployment rate is 6.4%, which is higher than both the NSW (5.1%) and Australian (5.7%) unemployment rates (DoE 2017).

Wee Waa is one of the largest towns in the Narrabri Shire LGA with a population of 2,080. As noted above, agriculture is the dominant industry of employment for Wee Waa's population, with the town widely regarded as the birthplace of Australia's modern cotton industry.

6.11.2 Assessment approach

The EIS will include consideration of the socio-economic impacts and benefits of the project, including direct and indirect benefits to the economy during construction and operation.



7 Conclusion

OVERLAND proposes to develop a large scale, grid connected PV solar generation facility near the town of Wee Waa in the Narrabri Shire LGA, with an estimated generation capacity in the order of up to 55 MW. A detailed analysis of environmental, infrastructure and socio-economic constraints and opportunities will be undertaken during the design phase and preparation of the EIS. OVERLAND is committed to engaging with NSC, NSW regulators, landowners, Aboriginal stakeholders and the community and will develop and implement a program for stakeholder consultation during the preparation of the EIS.



Abbreviations

ACHA	Aboriginal cultural heritage assessment
BAM	biodiversity assessment method
BDAR	biodiversity development assessment report
BC Act	<i>NSW Biodiversity Conservation Act 2016</i>
BoM	Bureau of Meteorology
BSAL	biophysical strategic agricultural land
CL Act	<i>NSW Crown Land Act 1989</i>
DA	development application
DoEE	Commonwealth Department of Environment and Energy
DPE	NSW Department of Planning and Environment
DRE	NSW Department Planning and Environment – Division of Resources and Energy
EIS	Environmental impact statement
EMM	EMM Consulting Pty Limited
EP&A Act	<i>NSW Environmental Planning and Assessment Act 1979</i>
EP&A Regulation	NSW Environmental Planning and Assessment Regulation 2000
EPA	NSW Environment Protection Authority
EPBC Act	<i>Commonwealth Environment Protection and Biodiversity Conservation Act 1999</i>
EPL	environment protection licence
GWh	gigawatt hours
ha	hectares
IBRA	Interim Biogeographic Regionalisation for Australia
ICNIRP	International Commission on Non-Ionizing Radiation Protection
kW	kilowatt
LALC	Local Aboriginal Land Council
LGA	local government area
LPI	NSW Land and Property Information
LSC	land and soil capability



Mining SEPP 2007	State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries)
MNES	matters of national environmental significance
MW	megawatt
MWh	megawatt hours
Narrabri LEP	Narrabri Local Environmental Plan 2012
NPW Act	NSW <i>National Parks and Wildlife Act 1974</i>
NSC	Narrabri Shire Council
OEH	NSW Office of Environment and Heritage
OVERLAND	OVERLAND Sun Farming Pty Ltd
PCT	plant community type
POEO Act	NSW <i>Protection of the Environment Operations Act 1997</i>
PV	photovoltaic
REAP	Renewable Energy Action Plan
RF Act	NSW <i>Rural Fires Act 1997</i>
RFS	NSW Rural Fire Service
RMS	NSW Roads and Maritime Services
SEARs	Secretary's environmental assessment requirements
SRD SEPP	State Environmental Planning Policy (State and Regional Development) 2011
SSD	State significant development
TDS	Total dissolved solids
WM Act	NSW <i>Water Management Act 2000</i>



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Appendix A

Letter of support from Narrabri Shire Council



Our Reference: 394431. WRB:WRB
Your Reference:
Contact Name: Bill Birch
Telephone: (02) 6799 6850

Mr Sten Fraser
Land & Development Manager
Overland Sun Farming
PO Box 318
WELLERS HILL QLD 4121

25 September 2017

Dear Sten,

As discussed previously, the economic backbone of Narrabri Shire is the agricultural sector. The area has diversified from its traditional base of grain, cotton, wool, beef and prime lamb to that of manufacturing and resources. An increase in the variety of industry is something that Narrabri Shire Council wants to achieve, for and with the community, to provide additional economic diversification within the Shire. The arrival of the proposed Overland Wee Waa Sun Farm Pty Ltd project would assist in diversifying the economy further. It would also attract substantial initial capital to develop and create ongoing employment and training throughout the operations of this facility.

Narrabri Shire Council's Community Strategic Plan is based on four key Strategic Directions. Together, they provide a strong foundation for planning the social, environmental, economic and civic leadership outcomes for our Shire with the purpose of achieving our shared vision and strategic directions. The proposed Overland Wee Waa Sun Farm project could be associated across Council's four key strategic directions mentioned, but mainly across Theme 2, Our Environment and Theme 3, Our Economy where the directions are to be environmentally sustainable and productive and be a progressive and diverse economy.

Another of the four Strategic Directions is that of Civic Leadership and it is within this area that Council advocates for the realisation of the vision of the future of the Shire. The proposed Overland Wee Waa Sun Farm project is an essential ingredient in assisting with the delivery of Council's vision and thereby broadening and strengthening the economic base of the Shire.

If you require any further information in relation to this letter, then please do not hesitate to contact me on the above mentioned number.

Yours sincerely,

Bill Birch
ECONOMIC DEVELOPMENT MANAGER



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