



# Hillston Sun Farm

Request for Secretary's Environmental Assessment Requirements

Overland Sun Farming Company Pty Ltd

September 2016

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## Hillston Sun Farm

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## 1 Introduction

### 1.1 The project

OVERLAND Sun Farming Company Pty Ltd (OVERLAND) proposes to develop the Hillston Sun Farm, a large-scale solar photovoltaic (PV) generation facility and associated infrastructure near the township of Hillston, in the Riverina region of south-western 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 100 full-time equivalents during construction and five 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).

### 1.2 Site and surrounds

OVERLAND proposes to develop the project on a site within the Carrathool Shire local government area (LGA), approximately 3.5 kilometres (km) south of the township of Hillston (Figure 1.1). The project will be developed on land that is divided by Kidman Way and the Griffith to Hillston railway line, and is made up of an eastern (393 hectares (ha)) and western (296 ha) portion (the site). The parcels of land are legally described as, to the east, DP 664722 (Lot 63) and DP 1126458 (Lots 1, 2 and 3), and to the west, DP 755189 (part of Lots 22, 43, 61, 76, 77, 85, 100) (Figure 1.2). Elevation across the site is relatively uniform at approximately 117 - 120 m above sea level.

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

There are two corridors of remnant vegetation which traverse the western portion of the site, identified as Black Box – Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion). The area between these corridors is also identified as an overland flowpath in the Carrathool Shire Council Hillston Floodplain Risk Management Study (Cardno Willing NSW Pty Ltd (Cardno) 2005) during significant flood events. Avoidance of impacts to both the remnant vegetation corridors and the overland flowpath on the western portion of the site will be a priority during development of the project. The approximate extent of the overland flowpath on the western portion of the site, based on



Cardno (2005), is shown in Figure 1.2. Impacts to biodiversity and flooding are discussed in Section 5.2 and 5.5, respectively.

The site is ideally located close to the 132 kilovolt (kV) Essential Energy grid network which runs adjacent to the site, and at its northernmost extent is 250 m from the Hillston 132 kV Substation (Figure 1.2). It also has suitable access to the regional road network including Kidman Way and the Cobb and Mid-Western highways (Figure 1.1).

Climate data from the Bureau of Meteorology (BoM) indicates that the site's daily solar exposure ranges between 18-20 megajoules/m<sup>2</sup> (MJ/m<sup>2</sup>), which equates to approximately 5-5.6 kWh/m<sup>2</sup> with an average of 8-9 hours of sunshine per day (BoM 2016a; BoM 2016b). Annual cloud cover statistics over a 53 year period indicate that the site receives an average of 98.8 cloudy days per annum (BoM 2016c). The Carrathool Shire region experiences a consistently high availability of solar radiation, and is therefore ideal for large scale solar development.

### **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.

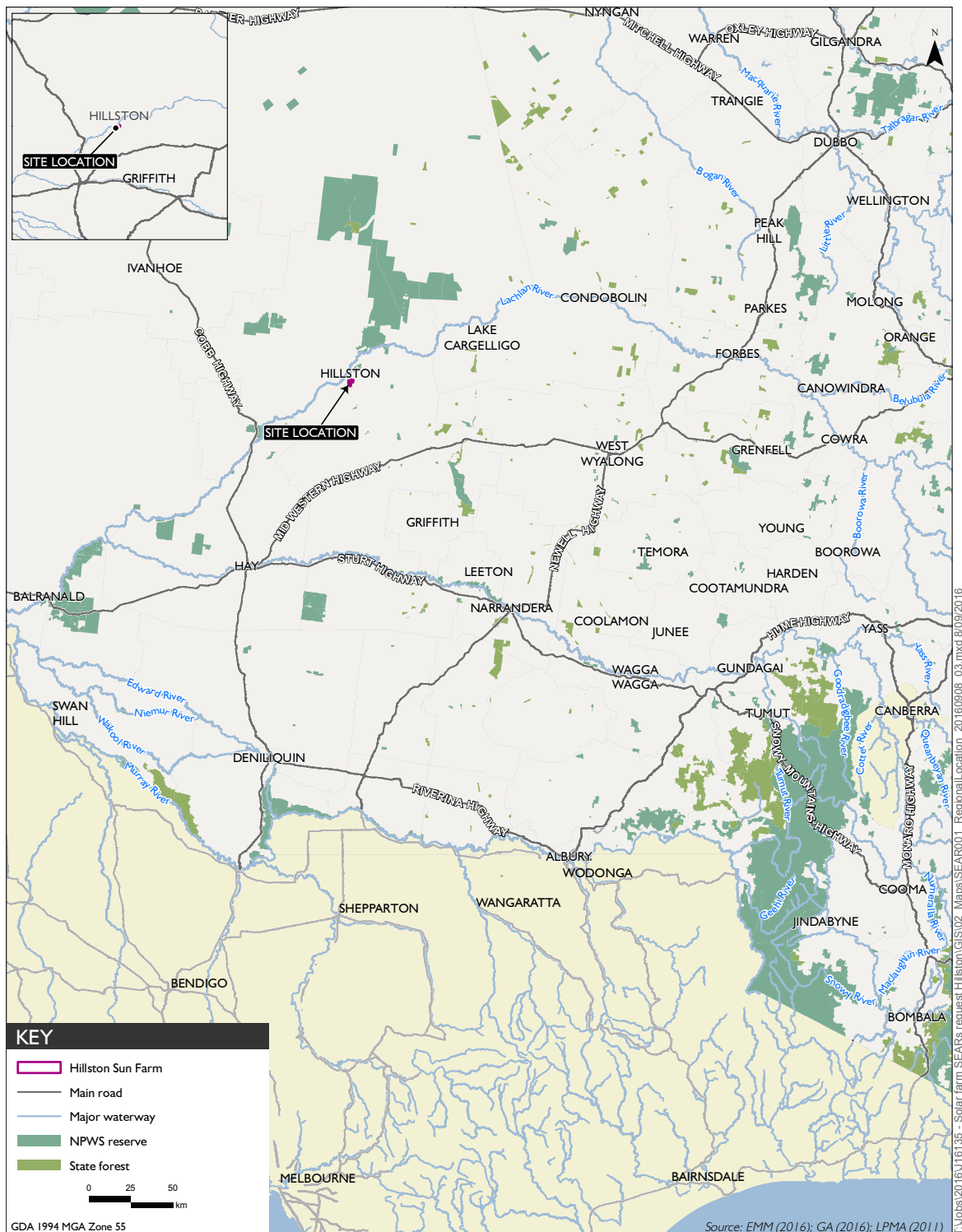
This experience includes responsibility for the development, financing, construction and operation of over 320 MW of renewable energy generation projects including the delivery of approximately 50 MW of renewable energy generation in NSW.

OVERLAND is currently developing a significant portfolio of solar energy sun farms throughout NSW and other National Electricity Market states.

### **1.4 Purpose of report**

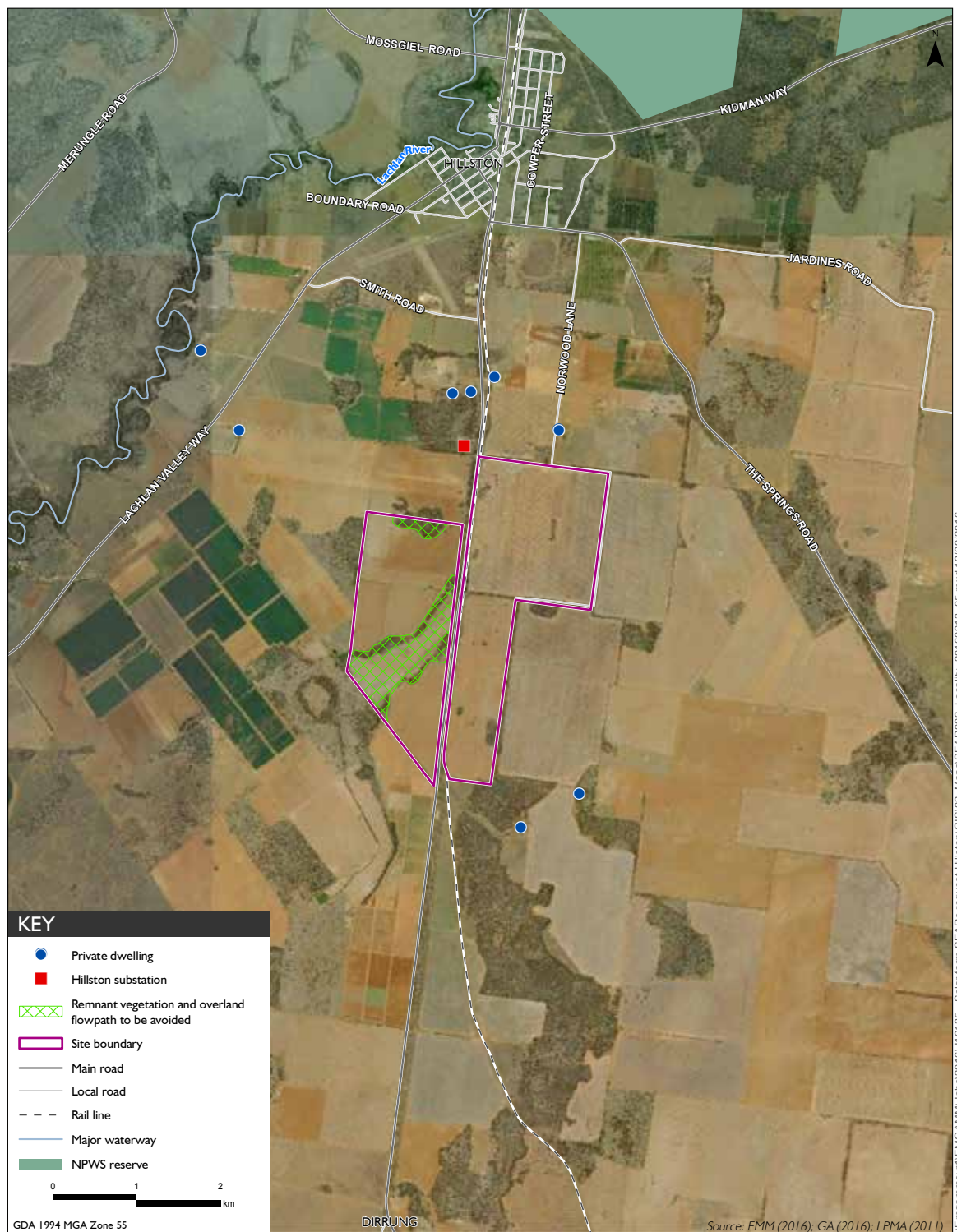
The purpose of this report is to request, and inform the content of, the Secretary's Environmental Assessment Requirements (SEARs) for the project. The SEARs will identify the requirements for the environmental impact statement (EIS) that will be prepared to accompany the DA for the project.

This report has been prepared by EMM Consulting Pty Limited (EMM) on behalf of OVERLAND.



Regional project location | Hillston Sun Farm | Request for SEARs | Figure 1.1





Location of the Hillston Sun Farm | Hillston Sun Farm | Request for SEARs | Figure 1.2





## 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 Carrathool LEP. Under the Carrathool 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;
- to facilitate farm adjustments;



- to enable agricultural support facilities to be carried out on land within the zone in a manner which does not significantly reduce the agricultural and horticultural production potential of land in the locality; and
- to encourage eco-tourist facilities and tourist and visitor accommodation that minimise any adverse effect on primary industry production and scenic amenity of the area.

The project will harness a natural resource, namely solar energy. Whilst the development of this project will impact the availability of 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 Carrathool LEP. Notwithstanding, clause 34 (7) of State Environmental Planning Policy (Infrastructure) 2007 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 a premise. Scheduled activities are defined in Schedule 1 of the POEO Act and include the following premise-based 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 a SSD authorised by a development consent (see Section 2.2.5).

### **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 NSW 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 *Roads Act 1993* cannot be refused if it is necessary for carrying out a SSD authorised by a development consent (see Section 2.2.5).

### 2.2.4 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 Bush Fire Prone Land online mapping tool indicates that the site is not bush fire prone.

### 2.2.5 Other State approvals required

Section 89J of the EP&A Act states that the following relevant authorisations 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*;
- an Aboriginal heritage impact permit under section 90 of the NSW *National Parks and Wildlife Act 1974*;
- an authorisation referred to in section 12 of the NSW *Native Vegetation Act 2003* (or under any Act to be repealed by that Act) to clear native vegetation on State protected land;
- a bush fire safety authority under section 100B of the NSW *Rural Fires Act 1997*; 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 NSW *Water Management Act 2000*.

In addition, Section 89J states that Division 8 of Part 6 of the NSW *Heritage Act 1977* 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 potential for listed threatened ecological communities (TECs), 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 or Proposed Action is submitted to the Commonwealth Department of the Environment and Energy (DoEE – formerly Department of the Environment).



## 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 (determined 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 could be in the order of up to 100 megawatts (MW), which would be generated by around 300,000 PV solar panels.

The project will connect to the Essential Energy 132 kV electricity distribution network that originates at the Hillston 132 kV Substation (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:

- a network of PV solar panel arrays;
- electrical collection systems, switchyard and control room;
- a management hub, including demountable offices and amenities and equipment sheds;
- parking and internal access roads; and
- connection infrastructure to the Hillston 132 kV Substation.

The site boundary presented in Figure 1.2 is a broad footprint which has been identified during initial design and planning stages. During the preparation of the EIS, the development footprint within the site boundary will be refined on the basis of grid connection studies, environmental constraints identification and further engineering assessment and design of project infrastructure. As described in Section 1.2, development within the site boundary would avoid both the remnant vegetation corridors and overland flowpath traversing the western portion of the site. Further analysis of these constraints would be completed as part of the EIS.

The project will also require the construction of connection infrastructure to deliver electricity produced at the site to the electricity grid. As identified above, the point of connection to the electricity distribution network will be the Hillston 132 kV Substation, located approximately 250 m from northern extent of the eastern portion of the site and approximately 900 m from the northern extent of the western portion of the site.

#### 3.2.1 PV solar panels

The project will install PV solar panels, arranged in a series of rows positioned to maximise the use of the solar resource available at the site. Panels are expected to be constructed in either fixed tilt or single axis tracking configuration. The later configuration will allow the PV 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 height of the solar panel rows will be approximately 2 m. Initial investigations indicate approximately 300,000 PV solar panels could be accommodated at the site, however as stated above, this will depend on factors including available



technologies, the size of the development footprint, the available grid capacity, economics of scale and grid connection, and energy demand.

### **3.2.2 Electrical collection system and switchyard**

The PV panels will be connected in series and the electricity generated by the project will be internally directed via underground electrical collection systems to a central electrical switchyard where it will be exported off-site to the electricity grid.

The on-site electrical collection systems will be placed underground in standard electrical conduit trenches of between 600 to 1,200 mm in depth. The electrical cabling necessary to connect the solar panels in series will be positioned in cable trays mounted underneath the panels.

### **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 demountable offices and operational control building, 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 12 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 100 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 five full-time equivalent employees. 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 25 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 Hillston 132 kV Substation 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, and environmental and landholder constraints. The Hillston 132 kV Substation is located approximately 250 m from northern extent of the eastern portion of the site and 900 m from the northern extent of the western portion of the site. Route identification and assessment will be completed as part of the EIS. Suitability of existing easements connecting to the Hillston 132 kV Substation would also be investigated to identify any opportunities for co-location of infrastructure.



## 4 Stakeholder engagement

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

- NSW Department of Planning and Environment (DP&E);
- NSW Department of Industry – Division of Resources and Energy (DRE);
- NSW Roads and Maritime Services (RMS);
- NSW Office of Environment and Heritage (OEH);
- NSW Environment Protection Authority (EPA);
- Transport for NSW (TfNSW);
- Carrathool Shire Council (CSC);
- local land owners, farm managers and nearby residents; and
- Aboriginal stakeholders.

OVERLAND has developed a positive working relationship with Carrathool Shire Council as part of the process to identify and secure a suitable site for the project. A letter of support for the project from CSC 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.





## 5 Preliminary environmental impact assessment

### 5.1 Issues identification

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

### 5.2 Biodiversity

#### 5.2.1 Existing environment

The site has been highly modified by previous and current land uses, including vegetation clearing, cropping, livestock grazing and weed invasion. This disturbance history has resulted in a mosaic of modified agricultural areas and native vegetation communities.

OVERLAND has engaged the services of Biosis Pty Ltd (Biosis) to complete an initial ecological constraints assessment for the site. The purpose of the assessment was to identify:

- the extent of native vegetation and key terrestrial fauna habitat present on the site; and
- the likelihood of threatened species, populations or ecological communities to occur on the site.

The site is within the:

- Riverina Interim Biogeographic Regionalisation for Australia (IBRA) Region;
- Lachlan IBRA subregion; and
- Lachlan Catchment Management Area.

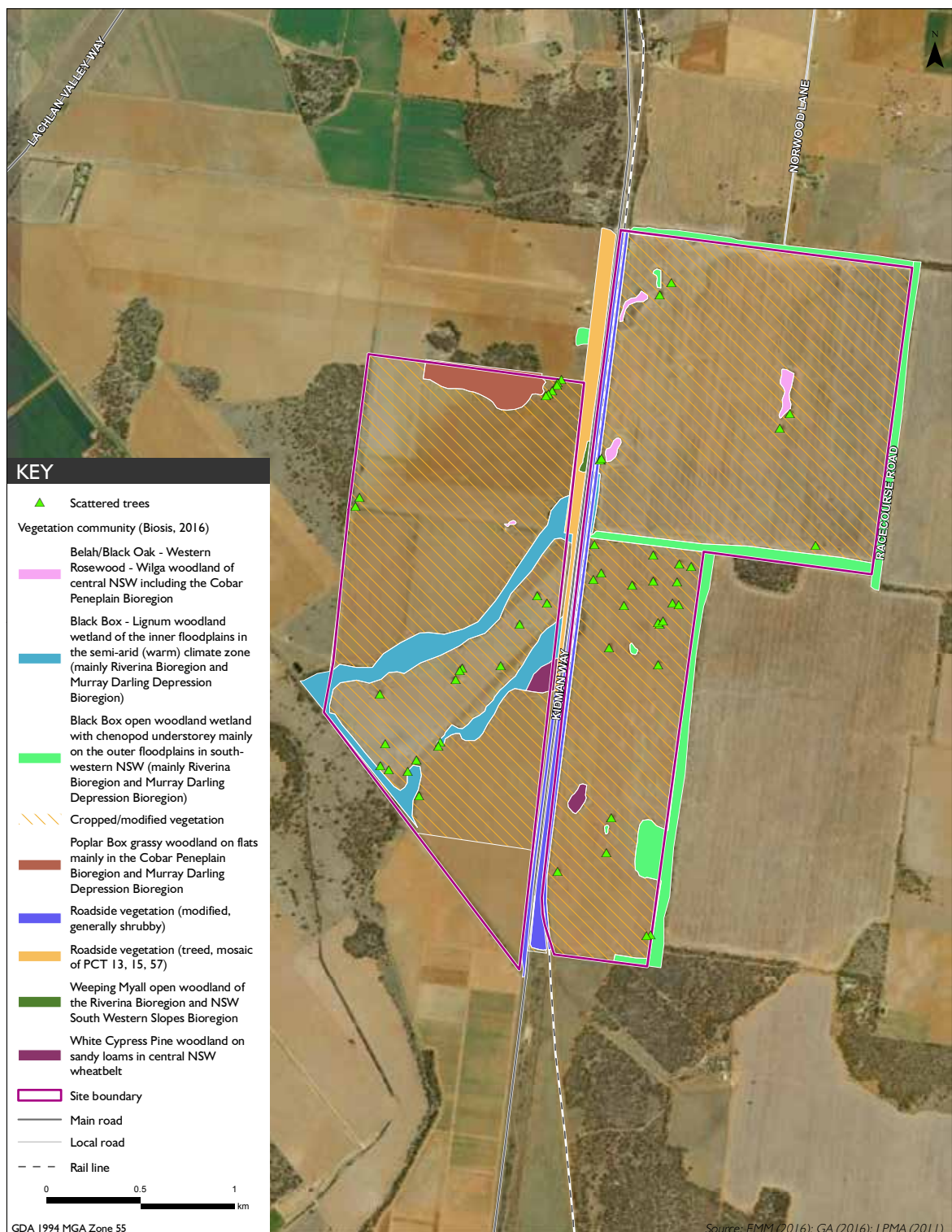
Preliminary field surveys carried out by Biosis on behalf of OVERLAND have confirmed the presence of several plant community types (PCTs) on the site (see Figure 5.1). These comprise:

- *Belah/Black Oak – Western Rosewood – Wilga woodland of central NSW including the Cobar Peneplain Bioregion* (PCT57);
- *Black Box – Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)* (PCT13);
- *Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)* (PCT15);
- *Poplar Box grassy woodland on flats mainly in the Cobar Peneplain Bioregion and Murray Darling Depression Bioregion* (PCT105); and
- *White Cypress Pine woodland on sandy loams in central NSW wheatbelt* (PCT 70).

In addition to the aforementioned PCTs, roadside vegetation adjacent to Kidman Way and the Griffith to Hillston railway line includes a mosaic of PCT13, PCT15 and PCT57.

A small isolated community of Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion (PCT26) is located outside the site boundary in the Kidman Way road reserve south of the Hillston 132 kV Substation. This community is listed as critically endangered under the Commonwealth EPBC Act.

None of the vegetation communities mapped on the site are representative of threatened ecological communities listed under the Commonwealth EPBC Act or the NSW Threatened Species Conservation Act 1995 (TSC Act).



Vegetation communities at the site | Hillston Sun Farm | Request for SEARs | Figure 5.1



No threatened flora species or endangered flora populations listed under the EPBC Act or TSC Act were recorded during the preliminary field survey. Given the highly modified nature of the site, the occurrence of significant populations of threatened flora is unlikely. If present, these species would likely be restricted to larger remnant patches and the adjacent road reserve on Kidman Way.

Major Mitchell's Cockatoo and Grey-crowned Babbler (both listed as vulnerable under the TSC Act) were recorded during the preliminary field survey and are likely to nest on the site. A number of threatened fauna species may utilise the site on occasion for foraging and nesting purposes. A range of threatened woodland birds may also utilise the site. These species are generally mobile and are likely to utilise larger patches of remnant vegetation on the site or in the adjacent road and railway reserves. The two corridors of PCT 13 (Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)) which traverse the western portion of the site make up a substantial proportion of the remnant vegetation on site. Impacts to these two corridors would be avoided, as well as the area of land between them which contains a number of scattered trees and forms a flood flowpath during significant flood events (see Figure 1.2).

Threatened biota listed under the EPBC Act and/or the TSC Act that are considered to have at least a medium likelihood of occurring within the site are listed in Table 5.1. Most of these species are highly mobile woodland birds or raptors that would be restricted to larger stands of remnant vegetation on the site or the adjacent road and railway reserves. As stated above, large areas of remnant vegetation within the site would be avoided, namely the majority of PCT 13 traversing the western portion of the site. Other areas of remnant vegetation are also likely to be avoided, and would be considered further in the EIS.

**Table 5.1 Threatened biota considered to have a medium or high likelihood of occurring within the site**

Scientific name	Common name	Status TSC Act	Status EPBC Act
<i>Swainsona murrayana</i>	Slender Darling Pea	Vulnerable	Vulnerable
<i>Ardeotis australis</i>	Australian Bustard	Endangered species (Part 1, Schedule 1)	-
<i>Circus assimilis</i>	Spotted Harrier	Vulnerable	-
<i>Climacteris picumnus subsp. victoriae</i>	Brown Treecreeper (eastern subspecies)	Vulnerable	-
<i>Falco subniger</i>	Black Falcon	Vulnerable	-
<i>Hieraaetus morphnoides</i>	Little Eagle	Vulnerable	-
<i>Pomatostomus temporalis subsp. temporalis</i>	Grey-crowned Babbler (eastern subspecies)	Vulnerable	-
<i>Stagonopleura guttata</i>	Diamond Firetail	Vulnerable	-
<i>Leptorhynchus orientalis</i>	Lanky Buttons	Endangered species (Part 1, Schedule 1)	-
<i>Climacteris affinis</i>	White-browed Treecreeper	Endangered species (Part 2, Schedule 1)	-
<i>Daphoenositta chrysoptera</i>	Varied Sittella	Vulnerable	-
<i>Lophochroa leadbeateri</i>	Major Mitchell's Cockatoo	Vulnerable	-



Scientific name	Common name	Status TSC Act	Status EPBC Act
<i>Melanodryas cucullata subsp. cucullata</i>	Hooded Robin (south-eastern form)	Vulnerable	-
<i>Neophema pulchella</i>	Turquoise Parrot	Vulnerable	-
<i>Ninox connivens</i>	Barking Owl	Vulnerable	-

### 5.2.2 Assessment approach

The potential impacts to biodiversity from the project will be assessed in accordance with the *Framework for Biodiversity Assessment: NSW Biodiversity Offsets Policy for Major Projects* (the FBA) (OEH 2014), which provides the framework for assessment of biodiversity impacts for SSD projects. 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 method described in Section 5.3.2 of the FBA. Surveys will target areas of native vegetation in the proposed development footprint to identify the likely PCTs that may need to be cleared and offset. Surveys will also identify cleared lands (ie exotic pastures) that do not need to be offset.
- Biobanking calculations will be completed based on the results of the field survey. The calculations will be based on the disturbance footprint to determine the number of credits the project is likely to generate.
- A Biodiversity Assessment Report (BAR) will be prepared in accordance with the reporting requirements of the FBA.

The EIS and BAR 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.

## 5.3 Aboriginal cultural heritage

### 5.3.1 Existing environment

OVERLAND has engaged the services of Biosis Pty Ltd to complete an initial assessment of Aboriginal cultural heritage constraints for the site.

The site is in the Riverina bioregion of south-west NSW, an area characterised by its ancient landscape and ancient lakes and waterways. Aboriginal occupation of the region dates back to around 50,000 years ago (Hiscock 2008, p.44). Previous reports indicate that Aboriginal occupation of the area occurred from pre-historic to post contact times and material remains (such as stone tools, hearths and middens) are considered to be dense in this bioregion.

A number of Aboriginal cultural heritage investigations have been conducted for the Lachlan River region and surrounding areas of the Riverina region. The Lachlan Channel and Floodplains and Lachlan Depression Plains contain resources commonly used by Aboriginal people in the past and evidence of this use may be found in the eroding landscape. The soil landscape within the region, which features clay pans and scalds, has high potential to contain evidence of Aboriginal occupation of the region including stone tools and hearths. There is also potential for culturally modified trees to occur in the region. However, as noted by Witter (2004), in the past



200 years, a large part of the region has been cultivated, which has led to the destruction of archaeological traces through the flattening of mounds and ploughing of the ground surface.

A search of the AHIMS database identified 120 Aboriginal sites within a 10 km search area, centred on the township of Hillston and encompassing the site. None of the identified Aboriginal archaeological sites are located within the site boundary. A simple analysis of the Aboriginal cultural heritage sites registered within 10 km of the site indicates that the dominant site types in the surrounding landscape are culturally modified trees (63%), and restricted sites (35%).

Based on an initial desktop review, there is potential for Aboriginal cultural heritage sites to occur in the vicinity of the site. During the investigation of constraints for the project, two modified trees were observed on the site. Further assessment, including a site inspection, is required to determine whether these trees are culturally modified trees.

### **5.3.2 Assessment approach**

The Aboriginal cultural heritage assessment (ACHA) will be completed in accordance with the Draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation (the Draft Guideline) (DEC 2005). 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.

## **5.4 Land use**

### **5.4.1 Existing environment**

The project is within the Carrathool Shire LGA, which covers an area of 18,933 km<sup>2</sup> in the Riverina region of south-western NSW. The site is part of the Lachlan catchment. Land use within this catchment is dominated by extensive agricultural operations with grazing occupying 75.5% of the total catchment area (Office of Water 2011). Dryland cropping and horticulture (15.1%), conservation (4.1%), forestry (1.6%) and irrigation (1.4%) are also prevalent across the catchment area (Office of Water 2011).

The site is located in a landscape of Quaternary alluvial plains. Two soil landscapes defined and described by Mitchell (2002) are present on the site. The Lachlan Channel and Floodplains soil landscape is characterised by an alluvial landscape consisting of sediments of grey, red and brown cracking clays and red brown texture contrast soils. The Lachlan Depression Plains soil landscape is characterised by alluvial plains consisting of grey and brown cracking and non-cracking clays contrasting with red and brown texture contrast sands.

The site has been highly modified by past disturbances associated with land clearing, cropping, livestock grazing and weed invasion. Surrounding land uses include dryland cropping (principally wheat), as well as irrigated horticulture (principally cotton).





Lachlan Valley Regional Park is approximately 4.3 km north of the site and covers an area of 1,564 ha. This area is zoned E1 National Parks and Nature Reserves under the Carrathool LEP.

#### 5.4.2 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.

### 5.5 Water resources

#### 5.5.1 Existing environment

As discussed in Sections 5.2 and 5.3, the site is within the Riverina bioregion, which is dominated by river channels, floodplains, backplains, swamps, lakes and lunettes that date back to the Quaternary period. It covers the alluvial fans of the Lachlan River, Murrumbidgee River and the Murray River, west of the Great Dividing Range. The topography of the Riverina bioregion is comprised of a series of overlapping, low gradient alluvial fans on the eastern half of the Murray Basin.

The site is part of the Lachlan catchment and is approximately 3 km east of the Lachlan River at its closest point (see Figure 1.2). The Lachlan catchment covers an area of 90,000 km<sup>2</sup> and supports a population of approximately 104,000 people, which includes a number of major rural centres, such as Cowra, Parkes, Forbes and Young, as well as smaller towns including Hillston (Office of Water 2011). Within the catchment, the Lachlan River stretches over 1,400 km, beginning in the Great Dividing Range and flowing across western NSW through to its junction with the Murrumbidgee River near Oxley. The highest daily mean flow of the Lachlan River is experienced at Forbes, approximately 230 km upstream of Hillston, with a flow of 3,197 ML (Office of Water 2011). As the river runs west, stream flow declines significantly with water diverted to a number of different effluent channels. Close to the site, the river is characterised by a mean daily flow of 1,234 ML (Office of Water 2011).

The Lachlan catchment supports a total of 471,000 ha of wetlands including nine wetlands listed as nationally significant in the Directory of Important Wetlands in Australia (DoEE 2016). Of these wetlands, Merrowie Creek and Lake Brewster are the closest to the site, approximately 18 km north (upstream) and 40 km east (upstream) of the site, respectively.

The site is within the floodplain of the Lachlan River. The Lachlan River Hillston Floodplain Management Plan Lake Brewster to Whealbah (the FMP) (Department of Natural Resources (DNR) 2005) includes the floodplains of the Lachlan River and Willandra Creek surrounding the town of Hillston. This floodplain supports successful irrigation and dryland farming industries and also has significant ecological values including a diverse and extensive network of wetlands. Significant waterways that provide connectivity between the Lachlan River and the floodplain include: Cabbage Garden Creek; Cogie Creek; Conoble Creek; Willandra Creek; Yangellawah Creek; Moolbong Creek; Middle Creek; Once-a-while Creek; Umbrella Creek; and Merrowie Creek (DNR 2005).

The *Carrathool Shire Council Hillston Floodplain Risk Management Study* (Cardno 2005) identifies areas within the site boundary as being within the extent of the 1990 flood inundation limit. Modelling included in Cardno (2005) identifies several overland flowpaths which cross the site.



The site is within the Lower Lachlan Alluvium groundwater management area which is characterised by an inland alluvial aquifer. Groundwater at the site is of moderate to high quality (0-1,500 TDS mg/L) and is suitable for domestic, stock and some irrigation purposes (Office of Water 2011). There are two private groundwater bores recorded on the DPI Water database that are located on the site (GW027954 and GW022162). Both of these bores are authorised for stock watering. GWO27954 is recorded as having a water bearing zone at depths of 32.6-34.7 m below ground level.

### 5.5.2 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 the 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. The project will be designed to avoid significant adverse impacts on flood behaviour. In particular, the flowpath on the western portion of the site (see Figure 1.2) will be avoided. Potential impacts to flooding, including impediments to the flow of floodwaters will be considered in the EIS.

## 5.6 Traffic and transport

### 5.6.1 Existing environment

The primary road transport routes in the vicinity of the site are Kidman Way and Lachlan Valley Way (see Figures 1.1 and 1.2). Also in the immediate vicinity of the site is the Griffith to Hillston railway line, which runs parallel to Kidman Way (see Figure 1.2).

The eastern and western portions of the site are divided by Kidman Way. Kidman Way is a state rural road extending over 644 km of western NSW. The road services the Murrumbidgee Irrigation Area and provides important transport connections for remote communities within the western Riverina region. Kidman Way also links the Newell Highway with the Sturt, Mid-Western, Barrier, Mitchell and Kamilaroi highways. At the site, Kidman Way is a single carriageway with a sealed surface. It is a designated B-Double route.

Lachlan Valley Way, situated 3.5 km west of the site, is 988 km in length and is a NSW state highway extending from Booligal to Yass. The highway connects a number of western NSW's major settlements including Hillston, Lake Cargelligo, Condobolin, Forbes, Gooloogong, Cowra and Boorowa.

The Griffith to Hillston railway line (see Figure 1.2) is owned by TfNSW and is part of NSW's freight transport network. At present, the line is used solely for grain-related train operations, servicing one of GrainCorp's primary sites in southern NSW. Recently, a \$3 million upgrade to the rail siding extension at Hillston was announced to help service the region's major grain receival site (TfNSW 2016). Train operations along this line are likely to be seasonal and are more frequent during the grain harvesting period between November and January.

The Cobb and Mid-Western highways are located in the wider region. The Cobb Highway, situated 70 km west of the site, begins at its junction with the Barrier Highway near Wilcannia and stretches over 571 km south through the townships of Ivanhoe, Booligal, Hay and Deniliquin. The majority of the Cobb Highway is a sealed single carriageway. The Cobb Highway also connects the Barrier, Mid-Western, Sturt and Riverina highways.





The Mid-Western Highway, situated 50 km south of the site, is a state highway servicing rural communities and providing links to the Great Western, Mitchell, Olympic, Newell, Cobb and Sturt highways. The Mid Western Highway extends around 520 km, from Bathurst in the east to Hay in the west.

### 5.6.2 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 five 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 Hillston to Griffith 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.

## 5.7 Air quality

### 5.7.1 Existing environment

The site is in a rural setting approximately 3.5 km south of the township of Hillston. The Carrathool 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 2011, the population density within the Carrathool Shire LGA was 0.1 people/km<sup>2</sup>, which was significantly lower than the NSW average (9.1 people/km<sup>2</sup>) (ABS 2016). 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 (OEH 2016).

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 Hillston, which is the nearest considerable concentration of sensitive receptors. There are a total of six receptors within 1 km of the site at the closest boundaries (see Figure 1.2); four dwellings are between 500–1,000 m to the north and two dwellings are between 660–1,000 m to the south-east.

### 5.7.2 Assessment approach

The project is not anticipated to generate significant air quality impacts during construction or operation. Mitigation measures to manage dust generation on the 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.

## **5.8 Noise**

### **5.8.1 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 Kidman Way would likely be subject to some road noise. In addition, residential dwellings close to the Griffith to Hillston rail line would likely be subject to noise generated by train movements.

Noise generated from the project will include construction noise, and noise generated by increased traffic along Kidman Way during the construction period, which will be the main transport route to and from the site. As stated in Section 5.7.1, there are a total of six sensitive receptors within 1 km of the site (see Figure 1.2).

### **5.8.2 Assessment approach**

Noise impacts on site during construction and operation are not expected to be significant, given the distance of 500 m to the nearest sensitive receptor. Noise during construction will be limited to a period of approximately 12 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 Kidman Way. A traffic noise assessment would be included in the EIS to assess noise impacts associated with traffic along Kidman Way during construction. Traffic movements during operation are expected to be minimal.

## **5.9 Visual**

### **5.9.1 Existing environment**

As previously discussed, the site is within the Lachlan catchment's flat western plains, south of the Lachlan River. Elevation across the site is relatively uniform ranging between 117–120 m above sea level. The site is divided into its eastern and western components by both Kidman Way and the Griffith to Hillston railway line. The Hillston 132 kV Substation is also located approximately 250 m from the site's northern boundary.

The site is visible from Kidman Way, and may also be partially visible from sections of Rankins Springs Road to the east and Lachlan Valley Way to the west, although views would be partially or fully obscured by existing stands of remnant vegetation in many areas. As stated previously, there are six sensitive receptors within 1 km 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 a majority of these locations.

### **5.9.2 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.

## **5.10 Socio-economic**

### **5.10.1 Existing environment**

The population of the Carrathool Shire LGA in 2011 was 2,587 compared to 2,819 in 2006, which reflects a decline of 232 people (or 8%) residing in the area (ABS 2007; ABS 2013). Similarly, the township of Hillston has also experienced a decline in population. The percentage of the population who identify themselves as Aboriginal and Torres Strait Islander people within the Carrathool Shire LGA (6.8% in 2011) is more than double the state and national average (ABS 2013).

The local economy is dependent on agriculture with the geography, climate, and environment within the Carrathool Shire LGA favourable for a variety of agricultural and horticultural activities (CSC 2016). Sheep and cattle grazing and cotton and rice production dominate the agricultural production activities undertaken within the area. In addition, fruit, nut, olive and vegetable production also make important contributions to the area's local economy. Agriculture, forestry and fishing are the predominant employing industries in the Carrathool Shire LGA, accounting for more than 46% of the area's employment in 2011 (ABS 2016). More specifically, of the people employed in the Carrathool Shire LGA, 30.9% work in sheep, beef cattle and grain farming (ABS 2013). Within the Carrathool Shire LGA, the unemployment rate is 4.1%, which is lower than both the NSW and Australian unemployment rates (ABS 2013).

Hillston is the largest town in the Carrathool Shire LGA with a population of 1,430 and is the area's geographic and agricultural centre. Agriculture is the dominant industry of employment for Hillston's population, with school education and local government administration among the town's other major employers (ABS 2013). The town also hosts the majority of the area's largest social, cultural and recreational events, which make important contributions to its agriculturally dependent economy.

### **5.10.2 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.



## 6 Conclusion

OVERLAND proposes to develop a large scale PV solar generation facility near the town of Hillston in the Carrathool Shire LGA, with an estimated generation capacity in the order of up to 100 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 CSC, 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
ARI	Average recurrence interval
BAR	Biodiversity Assessment Report
BoM	Bureau of Meteorology
Carrathool LEP	Carrathool Local Environmental Plan 2012
CSC	Carrathool Shire Council
DA	Development application
DoEE	Commonwealth Department of the Environment and Energy
DP&E	NSW Department of Planning and Environment
DRE	NSW Department Primary Industries – Resources and Energy
EIS	Environmental impact statement
EMM	EMM Consulting Pty Limited
EP&A Act	NSW Environmental Planning and Assessment Act 1979
EP&A Regulation	NSW Environmental Planning and Assessment Regulation 2000
EPA	NSW Environment Protection Authority
EPBC Act	Commonwealth Environment Protection and Biodiversity Conservation Act 1999
EPL	Environment protection licence
FBA	Framework for Biodiversity Assessment
FDE	Flood dependent ecosystem
FMP	Floodplain management plan
GWh	Gigawatt hours
ha	Hectares
IBRA	Interim Biogeographic Regionalisation for Australia
kW	Kilowatt
LGA	Local government area
LPI	NSW Land and Property Information
MNES	Matters of national environmental significance
MWh	Megawatt hour
OVERLAND	Overland Sun Farming Company Pty Limited
OEH	NSW Office of Environment and Heritage
PCT	Plant community type



POEO Act	NSW Protection of the Environment Operations Act 1997
PV	Photovoltaic
REAP	Renewable Energy Action Plan
RF Act	NSW Rural Fires Act 1997
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
TfNSW	Transport for NSW
TSC Act	NSW Threatened Species Conservation Act 1995
WM Act	NSW Water Management Act 2000



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## **Appendix A**

### **Letter of support from Carrathool Shire Council**

# Carrathool Shire Council

Please address all correspondence to the  
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24 August 2016

NSW Planning & Environment  
Major Projects

Dear Sir/Madam

## ***OVERLAND SUN FARMING COMPANY – PROPOSED SOLAR FARM HILLSTON***

Overland has been working with the Carrathool Shire Council for nearly three years since 2013 to identify, review and secure suitable land for the proposed development.

John Zammit (Development Manager, Overland) met with myself and Shane Wilson – Director Development Services on the 21st of July 2016 to discuss the project in detail with Council.

Council is fully supportive of the proposed development and consider the proposed site to be suitable for the development and we look forward to working with Overland up to and during the development.

If you have further concerns in regard to this matter please contact Council's Director Development Services, Mr Shane Wilson during office hours.

Yours faithfully



PHIL MARSHALL  
GENERAL MANAGER



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