



Hay Sun Farm

Request for Secretary's Environmental Assessment Requirements

Overland Sun Farming Company Pty Ltd

December 2016

Overland Sun Farming Company Pty Ltd

PO Box 589 Burwood Vic 3125

Level 1, 23 Milton Pde Malvern Vic 3144

www.overlandsunfarming.com.au

P +61 3 9889 2023

Hay Sun Farm

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Prepared by	Kate Cox	Approved by	Duncan Peake
Position	Associate Environmental Scientist	Position	Associate Director
Signature		Signature	
Date	6 December 2016	Date	6 December 2016

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Approved by Overland Sun Farming Company

Approved by	Brett Thomas
Position	CEO & Managing Director
Signature	
Date	6 December 2016



T +61 (0)2 9493 9500 | F +61 (0)2 9493 9599

Ground Floor | Suite 01 | 20 Chandos Street | St Leonards | New South Wales | 2065 | Australia

www.emmconsulting.com.au



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1 Introduction

1.1 The project

OVERLAND Sun Farming Company Pty Ltd (OVERLAND) proposes to develop the Hay Sun Farm, a large-scale solar photovoltaic (PV) generation facility and associated infrastructure near the township of Hay, in the Riverina region of south-western NSW (Figure 1.1) (the project). A project ownership entity, Plains SF No1 Pty Ltd, has been established for the development of 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 2016a).

1.2 Site and surrounds

OVERLAND proposes to develop the project on a site within the Hay Shire local government area (LGA), approximately 6 kilometres (km) north-east of the township of Hay (Figure 1.1). The site is split in to three separate portions and encompasses an area of approximately 741 hectares (ha) (Figure 1.2). The northern portion of the site is bounded by Sidonia Road to the west and north and a disused railway line to the south. The southern portion of the site is bounded by the railway line to the north and the Mid-Western Highway to the south. The western portion of the site is bounded by Sidonia Road to the west and a constructed irrigation channel to the north and east. Elevation across the three portions of the site is relatively uniform at approximately 89–95 m above sea level. The legal property description is given in Table 1.1.

Table 1.1 Property description

Site portion	Area (ha)	Lot description
Northern	397	DP 756748 (Lots 21, 22, 43, 44, 99 and 100) DP 239126 (Lots 122 and 124)



Site portion	Area (ha)	Lot description
Southern	262	DP 756748 (Lots 23, 35, 38, 39 and 40)
		DP 1039519 (Lot 1)
		DP 116037 (Lots 1 and 2)
		DP 1161822 (Lot 3)
Western	82	DP 1141794 (Lot 22)
		DP 208554 (Lot 14)
		DP 31449 (Lot 16)
		DP 857055 (Lot 8)

The northern and southern portions of the site are zoned RU1 Primary Production and the western portion of the site is zoned RU4 Primary Production Small Lots under the Hay Local Environmental Plan 2011 (Hay LEP). The site has most recently been used for agriculture including sheep farming and cropping. The closest residences (referred to as sensitive receptors) are located adjacent to the southern boundary of the western portion of the site (Figure 1.2). Receptors within approximately 2 km of the site boundary are shown on Figure 2.1.

The site is ideally located close to the 132 kilovolt (kV) Essential Energy grid network and is approximately 700 m (at the closest site boundary) from Essential Energy's Hay 132 kV Substation (Figure 1.2). It also has suitable access to the regional road network including the Cobb, Mid-Western and Sturt highways.

Climate data from the Bureau of Meteorology (BoM) indicates that the site's daily solar exposure ranges between 18-20 megajoules/m², which equates to approximately 5-5.6 kWh/m² 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 91.5 cloudy days per annum (BoM 2016c). The Hay plains region experiences a consistently high availability of solar radiation, and is therefore ideal for large scale solar development.

1.3 Applicant

The applicant for the project is Plains SF No1 Pty Ltd, ACN 611 727 792, a Special Purpose Vehicle established for the development of the project. OVERLAND is developing the project on behalf of Plains SF No1 Pty Ltd.

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.

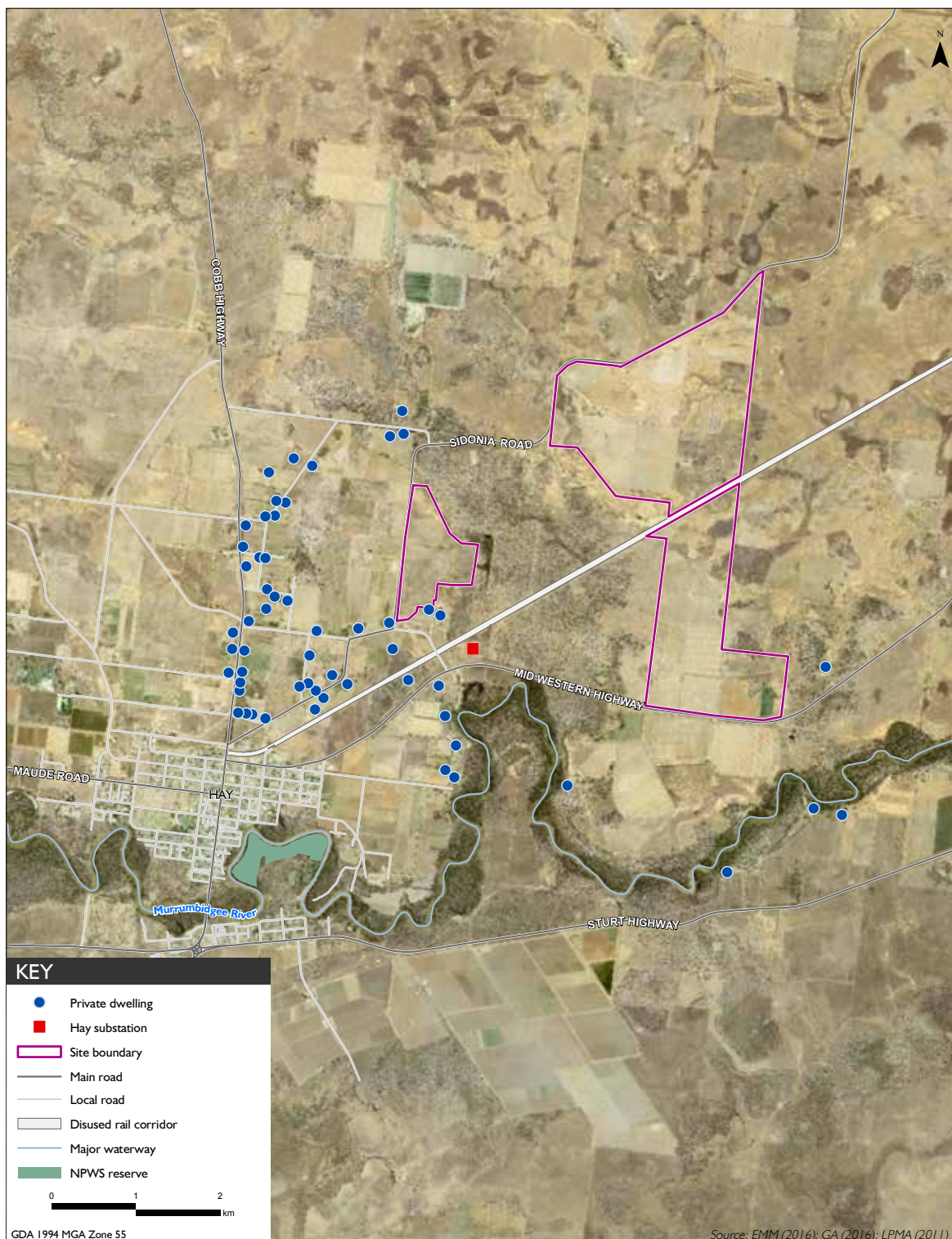
1.4 Purpose of report

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 | Hay Sun Farm | Request for SEARs | Figure 1.1



Location of the Hay Sun Farm | Hay 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 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 Hay LEP. Under the Hay LEP, the site is zoned RU1 Primary Production and RU4 Primary Production Small Lots. The objectives of the RU1 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; and
- to minimise conflict between land uses within this zone and land uses within adjoining zones.

The objectives of the RU4 zone are:

- to enable sustainable primary industry and other compatible land uses;



- to encourage and promote diversity and employment opportunities in relation to primary industry enterprises, particularly those that require smaller lots or that are more intensive in nature; and
- to minimise conflict between land uses within this zone and land uses within adjoining zones.

The project will harness a natural resource, namely solar energy. While 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 and RU4 zones as it is not specified in item 2 or 3 of the relevant land use table for each zone. 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 the 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 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 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 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 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 retail/energy market demand.

As an indication of scale based on current technologies, the estimated total installed capacity could be in the order of 100 megawatts (MW), which would be generated by around 300,000 PV solar panels.

The project will connect to the local 132 kV electricity distribution network that originates at the Hay 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 on the site:

- 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 Hay 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.

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 Hay 132 kV Substation, shown in Figure 1.2.

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 3 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 of 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

As discussed previously, the site is ideally located approximately 700 m (from the nearest site boundary) from the Hay 132 kV Substation. The infrastructure required for connection of the project to the local electricity distribution network between the site and the Hay 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 suitability of existing easements connecting to the Hay 132 kV Substation will be investigated to identify any opportunities for co-location of infrastructure and utilisation of pre-disturbed areas dedicated to transmission of high voltage electricity and ongoing vegetation maintenance activities required for safe operation of the electricity 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);
- Hay Shire Council (HSC);
- Essential Energy;
- local land owners, farm managers and nearby residents; and
- Aboriginal stakeholders.

OVERLAND has developed a positive working relationship with HSC as part of the process to identify and secure a suitable site for the project. A letter of support for the project from HSC 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, irrigation development, cropping, livestock grazing and weed invasion. This disturbance history has resulted in a mosaic of modified areas and native vegetation communities.

OVERLAND has engaged the services of Biosis Pty Ltd 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;
- Murrumbidgee IBRA subregion; and
- Murrumbidgee Catchment Management Area.

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

- River Red Gum - Black Box woodland wetland of the semi-arid (warm) climatic zone (PCT10);
- Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (PCT 15);
- Black Box grassy open woodland of rarely flooded depressions, south western NSW (PCT16);
- Forb-rich Speargrass – Windmill Grass – White Top grassland of the Riverina Bioregion (PCT44);
- Shallow freshwater wetland sedgeland in depressions on floodplains on inland alluvial plains and floodplains (PCT53);
- Black Roly Poly low open shrubland of the Riverina and Murray-Darling Depression Bioregions (PCT216); and
- Other vegetation not classified as PCTs also occurs on the site and this includes scattered paddock trees, planted trees and non-native vegetation dominated by introduced crop, pasture and weed species.

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

No threatened flora species or endangered flora populations listed under the EPBC Act or TSC Act were recorded during preliminary field surveys. Given the modified nature of the site, the occurrence of significant populations of threatened flora is unlikely but isolated small populations may persist. These populations are likely to be



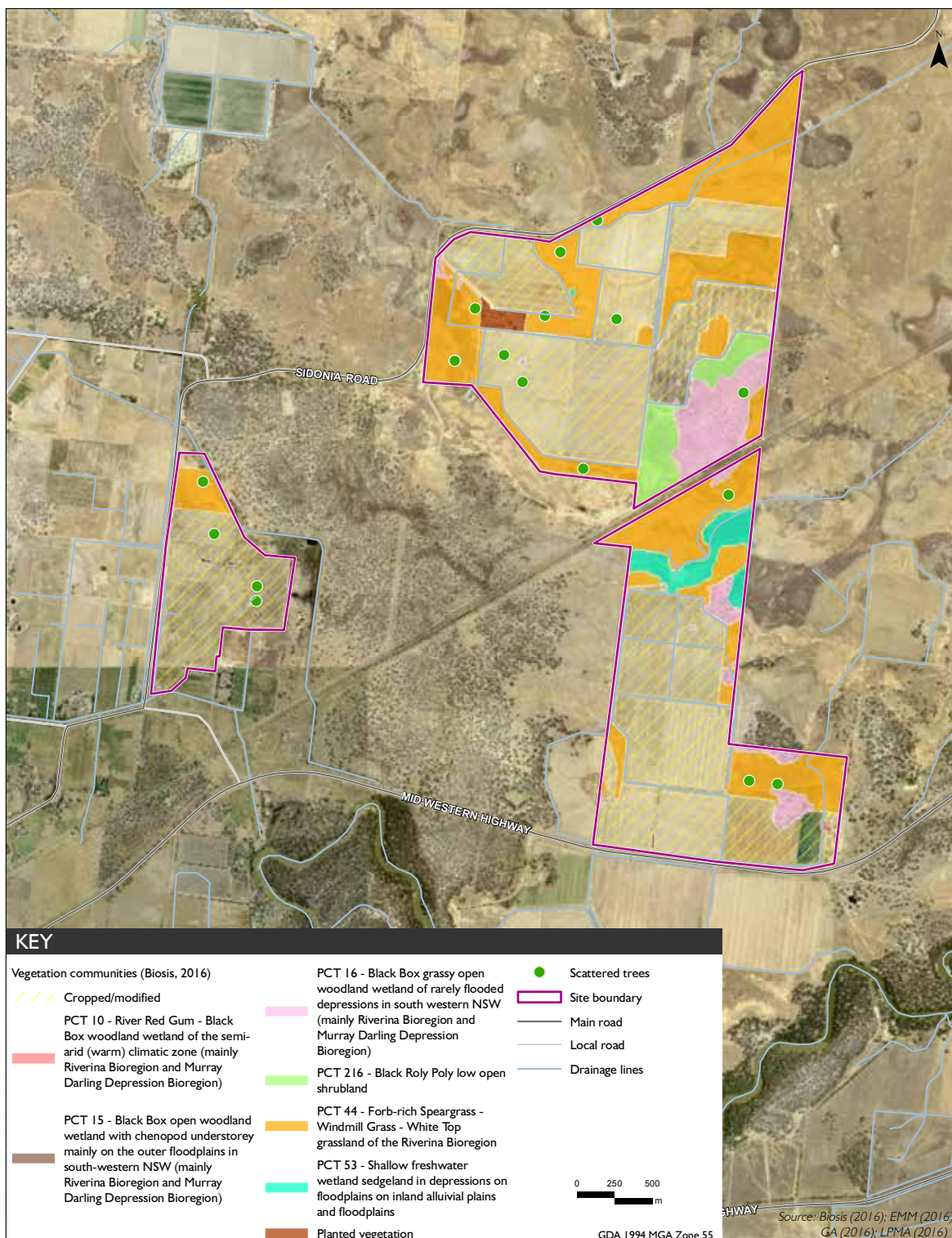
restricted to uncultivated areas that support remnant grassland and seasonal wetlands, or in adjacent road and rail reserves.

A number of threatened fauna species may utilise the site on occasion for foraging and nesting purposes. The EPBC Act listed fauna species, Superb Parrot and Plains Wanderer, may utilise vegetation within the site. 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 surrounding landscape. More generally, the site also supports seasonal wetlands, farm dams, irrigation channels and seasonally inundated pasture that may provide foraging opportunities for a range of waterbird species.

Threatened biota includes all flora and fauna species, populations and ecological communities listed under the EPBC Act and TSC Act. Threatened biota that are considered to have a medium or high likelihood of occurring within the site are listed in Table 5.1 below. 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 reserves.

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>Maireana cheelii</i>	Chariot Wheels	Vulnerable	Vulnerable
<i>Swainsona murrayana</i>	Slender Darling Pea	Vulnerable	Vulnerable
<i>Brachyscome papillosa</i>	Mossgiel Daisy	Vulnerable	Vulnerable
<i>Polytelis swainsonii</i>	Superb Parrot	Vulnerable	Vulnerable
<i>Pedionomus torquatus</i>	Plains-wanderer	Endangered species (Part 1, Schedule 1)	Critically Endangered
<i>Ardeotis australis</i>	Australian Bustard	Endangered species (Part 1, Schedule 1)	-
<i>Burhinus grallarius</i>	Bush Stone-curlew	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>Epthianura albifrons</i>	White-fronted Chat	Vulnerable	-
<i>Falco subniger</i>	Black Falcon	Vulnerable	-
<i>Hieraaetus morphnoides</i>	Little Eagle	Vulnerable	-
<i>Petroica phoenicea</i>	Flame Robin	Vulnerable	-
<i>Pomatostomus temporalis subsp. temporalis</i>	Grey-crowned Babbler (eastern subspecies)	Vulnerable	-
<i>Stagonopleura guttata</i>	Diamond Firetail	Vulnerable	-



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



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) (OEI 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 region.

The site falls within an area identified by Tindale (1974) as being within the boundaries of the Nari Nari linguistic group. Although the boundary of this group is difficult to define, the area occupied by the Nari Nari is thought to lie between Hay and Balranald. The first encounter many of these people would have had with Europeans was when Thomas Mitchell (1835) explored the inner regions of NSW. Mitchell (1835) kept journals of his explorations which detail many observations of Aboriginal people in the region before European settlement of the area.

A number of Aboriginal cultural heritage investigations have been conducted for the Hay plain and surrounding areas of the Riverina region. The soil landscape within the area has high potential to contain Aboriginal objects or sites and past archaeological records indicate that the Murrumbidgee scalds soil landscape contains artefact scatters, hearths, earth mounds, middens and burials. There is also potential for culturally modified trees to occur in this soil landscape. 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 43 Aboriginal sites within an approximate 5 km search area from the site. None of the identified Aboriginal archaeological sites are located within the site boundary. An analysis of the Aboriginal cultural heritage sites registered within 5 km of the site indicates that the dominant site types in the surrounding landscape are culturally modified trees (58%), and earth mounds (26%).

Based on an initial desktop review, there is potential for Aboriginal cultural heritage sites to occur in the vicinity of the site.

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 Hay Shire LGA, which covers an area of 11,348 km² in the Riverina region of south-western NSW. The site is part of the Murrumbidgee catchment. Land use within this catchment is dominated by extensive agricultural operations with grazing occupying 64% of the total catchment area. Dryland cropping and horticulture, irrigated crops, forests and conservation areas are also prevalent across the catchment.

The site is within the Hay plain, an area formed by alluvial deposition, which began during the Tertiary period approximately 60 million years ago (Porteners 1993). Soils within the site reflect this alluvial origin, and are mapped as the Murrumbidgee scalded plains soil landscape (Mitchell 2002). This soil type consists predominantly of deep, cracking clays ranging from grey to brown to orange. Red brown texture contrast soils are also present (Mitchell 2002).

The site has a history of cultivation and grazing including extensive periods of sheep farming and cropping. This has resulted in the mosaic of modified areas and native vegetation communities now observable on the site. Although areas of natural vegetation can be found on the site, most plant communities have been disturbed due to the altered water regimes and physical disturbances associated with the site's predominantly agricultural land use history. A number of irrigation channels are also present across the site, further reflecting its agricultural history.

Murrumbidgee Valley Regional Park is approximately 3 km south of the site's western portion and covers an area of 1,197 ha. There is also a parcel of land zoned E2 Environmental Conservation under the Hay LEP



approximately 1.5 km west of the southern portion of the site and 1.5 km south-east of the western portion of the site.

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 Murrumbidgee catchment and is approximately 700 m from the Murrumbidgee River at its closet point and 6.5 km at its furthest point (see Figure 5.1). The Murrumbidgee catchment covers an area of 84,000 km² and is bordered by the Great Dividing Range to the east, the Lachlan catchment to the north and the Murray catchment to the south (Office of Water 2011). The catchment supports a population of more than 500,000 people, which includes the Australian Capital Territory, NSW's largest inland city and a number of regional cities and towns including Hay. Within the catchment, the Murrumbidgee River stretches over 1,600 km, flowing westward toward its junction with the Murray River. Close to the site, the river is characterised by a diminishing channel capacity due to the deposition of alluvium (Office of Water 2011). Notably, the channel capacity drops from 30,000 ML/day at Hay to 7,000 ML/day at Balranald to the west (Office of Water 2011).

The Murrumbidgee catchment supports Fivebough and Tuckerbil Swamps, which are both listed as internationally significant under the Ramsar Convention. The Fivebough and Tuckerbil Swamps Ramsar site is approximately 140 km upstream of the site. In addition, the catchment also supports 16 wetlands listed as nationally significant in the Directory of Important Wetlands in Australia (DoEE 2016). Of these wetlands, the Lowbidgee Floodplain and Mid-Murrumbidgee Wetlands are closest to the site, located approximately 43 km west (downstream) and 55 km east (upstream) of the site, respectively.

The plains surrounding Hay are a complex system of shallow creek beds and dry lakes, interspersed by wind-created sand dunes. As previously mentioned, the site is within the Hay plain, north of the Murrumbidgee River, which is a flat and mostly treeless plain of extensive saltbush scrubland.

The Murrumbidgee River Hay to Maude Floodplain Management Plan (the FMP) (OEH and Office of Water 2014) includes the reach and floodplain of the Murrumbidgee River between Hay and Maude, which spans an area of approximately 1,700 km² within the Hay Shire LGA. This floodplain is a successful grazing and irrigation area and also provides support for a diverse network of floodplain ecosystems. Significant waterways that provide connectivity between the Murrumbidgee River and the floodplain in this area include: Coonoon Creek; Eleven Mile Creek; Darcoola Creek; Sand Creek; Fiddlers Creek; Uara Creek; Black Creek; and Budgee Creek, as well as, a number of unnamed flood runners.



The site is within the floodplain of the Murrumbidgee River and the southern and western portions of the site are within the extent of the 1974 flood inundation limit, regarded as having an average recurrence interval (ARI) of 40 years.

Within the Murrumbidgee catchment, the groundwater and surface water systems experience a wide range of connectivity. The site is within the Lower Murrumbidgee Alluvium groundwater management area which is characterised by an inland alluvial aquifer. Groundwater at the site is of moderate quality (500-1,500 TDS mg/L) and is suitable for domestic stock and some irrigation purposes (Office of Water 2011). There is one private groundwater bore recorded on the DPI-Office of Water database immediately adjacent to the eastern boundary of the site's northern portion (GW034962). It is authorised for stock watering and is recorded as having a water bearing zone at depths of 22-32 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.

Potential impacts to flooding on surrounding land, including impediments to the flow of floodwaters will be considered in the EIS.

5.6 Traffic

5.6.1 Existing environment

The primary transport routes in the vicinity of the site are the Cobb, Mid-Western and Sturt highways (see Figure 1.2).

The Cobb Highway, situated to the 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, bordering the southern portion of the site, is a state highway servicing rural communities and providing links to the Great Western, Mitchell, Olympic, Newell, Cobb and Sturt highways. It provides part of the most direct road link between Sydney and Adelaide, extending over 520 km from Bathurst in the east, to Hay in the west.

The Sturt Highway, also situated to the south of the site, is an Australian national highway that covers significant areas of NSW, Victoria and South Australia. The majority of the Sturt Highway's 947 km extent is a single carriageway. The Sturt Highway is roughly aligned to the Murrumbidgee River in NSW and provides the shortest route between Sydney and Adelaide.

Access to the site's western and northern portions is currently from Sidonia Road. Sidonia Road is a sub-arterial road that provides access to the township of Hay and the primary transport routes described above. Close to the Hay township and in the vicinity of the western portion of the site, Sidonia Road is a sealed, two lane undivided roadway. Sidonia Road becomes unsealed to the east of its intersection with Kangaroo Lane, and is unsealed in the vicinity of the northern portion of the site.

Access to the site's southern portion will be determined during the design phase and preparation of the EIS.



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 the 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; and
- potential road 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 2.5 km north-east of the township of Hay. The Hay 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 Hay Shire LGA was 0.2 people/km², which was significantly lower than the NSW average (9.1 people/km²) (ABS 2016b). 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 generated by the increased usage of the unsealed Sidonia Road, as well as, vehicle and machinery exhaust emissions during construction, and the maintenance of plant and equipment on site. The project is approximately 2.5 km north-east of the township of Hay, which is the nearest considerable concentration of sensitive receptors (ie residences). Sensitive receptors within approximately 2 km of the site boundary are shown in Figure 1.2.

As a clean, non-fossil fuel dependent source, the electricity generated from the project would result in positive air quality impacts, namely the reduction of greenhouse gas emissions associated with the generation of a renewable form of electricity over the life of the project. As discussed previously, the project will contribute to both NSW and Commonwealth targets for energy generation from renewable sources.

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. The nearest sensitive receptors to the site are located adjacent to the southern boundary of the western portion of the site (see Figure 1.2).

Noise generated from the project will include construction noise, and noise generated by increased traffic along Sidonia Road during the construction period, which will be the main transport route to and from the site.

5.8.2 Assessment approach

Noise impacts from activities on site during construction and operation are not expected to be significant. 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's northern and western portions from the Cobb Highway and Sidonia Road. As noted above, access to the site's southern portion will be determined during the design phase and preparation of the EIS. A traffic noise assessment would be included in the EIS to assess noise impacts associated with traffic along Sidonia Road 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 Hay plain, north of the Murrumbidgee River, which is a flat plain of extensive saltbush scrubland and agricultural land uses. Elevation across the site is relatively uniform ranging between 89–95 m above sea level.

The site is visible from Sidonia Road and the Mid-Western Highway, and will be visible from some dwellings along and surrounding Sidonia Road just outside the Hay township. The nearest sensitive receptors are located adjacent to the western portion of the site (see Figure 1.2). Receptors are sparser surrounding the northern and southern portions of the site. Visibility of project infrastructure will be dependent on distance, topography and the presence of vegetation which would screen views from a majority of these locations.

The Hay township is located over 2.5 km from the site; views are unlikely from this distance given the presence of vegetation and other infrastructure which would affect visibility.

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 Hay Shire in 2011 was 2,956 compared to 3,370 in 2009, which reflects a decline of 414 people (or 12%) residing in the area (ABS 2011; ABS 2016a). Similarly, the township of Hay has also experienced a decline in population. The percentage of the population who identify themselves as Aboriginal and Torres Strait Islander people within the Hay Shire LGA (5.6% in 2011) is more than double the state and national average (ABS 2016a).

The local economy is dependent on agriculture with the geography, climate, and environment within the Hay Shire LGA favourable for a variety of agricultural and pastoral activities (HSC 2016). The area is highly regarded for its Merino sheep and wool industry and produces a range of commercial crops. The area's central location means that produce can be easily transported to markets in Sydney, Melbourne, Adelaide and Canberra. Agriculture, forestry and fishing are the predominant employing industries in the Hay Shire LGA (ABS 2016b). More specifically, of the people employed in the Hay Shire LGA, 15.1% work in sheep, beef cattle and grain farming (ABS 2016a).

The community has recently embraced tourism as an alternative to agriculture, allowing for the diversification of the area's economy as new businesses are established in the hospitality, retail and service sector (HSC 2016). Within the Hay Shire LGA, the unemployment rate is 3.6%, which is lower than both the NSW and Australian unemployment rates (ABS 2016a).

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 in the Hay Shire LGA, with an estimated generation capacity in the order of 100 MW. A detailed analysis of environmental and socio-economic constraints and opportunities will be undertaken during the design phase and preparation of the EIS. OVERLAND is committed to engaging with HSC, 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
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
FMP	Floodplain management plan
GWh	Gigawatt hours
ha	Hectares
Hay LEP	Hay Local Environmental Plan 2011
HSC	Hay Shire Council
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
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
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 Hay Shire Council



Hay Shire Council

ABN: 84 075 604 155

134 Lachlan Street PO Box 141 HAY NSW 2711

Telephone: 02 6990 1100 Facsimile: 02 6993 1288

Email: mail@hay.nsw.gov.au Website: www.hay.nsw.gov.au

Ref: G:16/

Hay Shire
COUNCIL

25 August 2016

NSW Department of Planning & Environment
GPO Box 39
Sydney NSW 2001

Dear Sir/Madam,

Re: Support of Overland Sun Farming Project in Hay LGA

Hay Shire Council launched its "Green Hay" initiative in 2012, with the express aim of improving the economic and environmental sustainability of the Hay Shire, which at that stage were at a low point – surviving drought as well as a dramatic population decline. The Green Hay workshops highlighted the need for renewable energy, to be encouraged on all levels – from household scale to major development scale.

Hay Shire Council actively sought interest from the private sector to develop a solar farm in the process (see attached brochure), and Mr Ben Barnett from Overland Sun Farming was interested in assisting Hay Shire to become a leader in renewable energy in the region.

Hay Shire Council has been working actively with Overland Sun Farming since 2012 to establish a solar farm in the region.

The benefits to the region will be substantial, including:

- Ongoing employment
- Employment during the construction phase
- Showcasing sustainable energy as a viable alternative
- Encouraging landowners in our region to investigate renewable energy for their operations.

If there are any inquiries regarding the project and Council's support of the Overland Sun Farming proposal, please contact Council's Director for Community Development, Jack Terblanche on jterblanche@hay.nsw.gov.au, as he has been working closely with Overland Sun Farming for the past four years.

Kind regards

per Allen Dwyer
General Manager





Overland Sun Farming Company Pty Ltd

PO Box 589 Burwood Vic 3125

Level 1, 23 Milton Pde Malvern Vic 3144

www.overlandsunfarming.com.au

P +61 3 9889 2023



SYDNEY

Ground Floor, Suite 1,
20 Chandos Street
St Leonards NSW 2065
T 02 9493 9500
F 02 9493 9599

NEWCASTLE

Level 5,
21 Bolton Street
Newcastle NSW 2300
T 02 4927 0506
F 02 4926 1312

BRISBANE

Level 4, Suite 1,
87 Wickham Terrace
Spring Hill Queensland 4000
T 07 3839 1800
F 07 3839 1866