

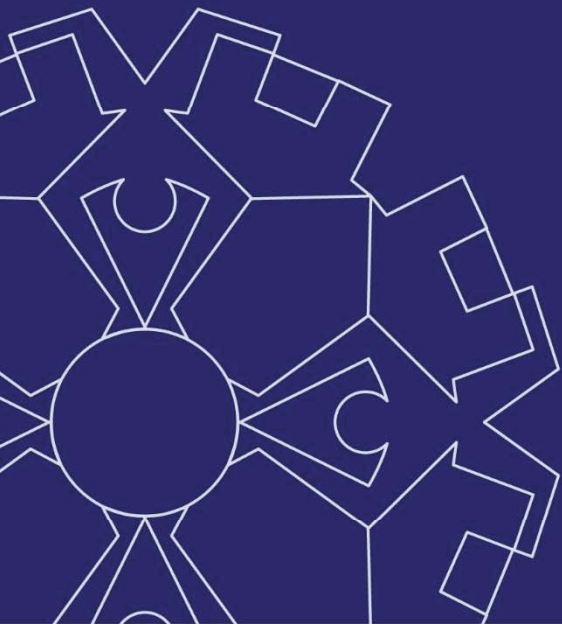


GEOLYSE

ENVIRONMENTAL IMPACT STATEMENT WALGETT SOLAR FARM

**PREPARED FOR
WALGETT SOLAR PTY LTD**

FEBRUARY 2017



• Civil, Environmental & Structural Engineering • Surveying • Environmental • Planning • Architecture

ENVIRONMENTAL IMPACT STATEMENT

WALGETT SOLAR FARM

PREPARED FOR:

WALGETT SOLAR PTY LTD

FEBRUARY 2017



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Certification

For submission of an environmental impact statement (EIS) under Part 4, Division 4.1 of the NSW *Environmental Planning and Assessment Act 1979*.

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APPLICANT:

Walgett Solar Pty Ltd
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PROPOSED DEVELOPMENT:

Walgett Solar Farm which includes the construction, operation, upgrading and decommissioning of a 30 MW_{AC} solar photovoltaic plant, and associated infrastructure including a grid connection.

LAND TO BE DEVELOPED:

The development site incorporates:

Solar Farm - Lot 1 DP 822477; Lot 49 DP 752271 and Lot A DP 418888

Grid Connection - Crown Land, Lot 92 DP 752271 and Lot 56 DP 752271

CERTIFICATION:

I declare that this statement has been prepared in accordance with Schedule 2 *Environmental Planning and Assessment Regulation 2000*, contains all available information that is relevant to the environmental assessment of the development to which the statement relates, and that the information contained in this statement is neither false nor misleading.



ANDREW BROWNLOW

28th February 2017



CHLOE BIGG

28th February 2017

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ABBREVIATIONS

Acronyms

AEMO	Australian Energy Market Operator
ABS	Australian Bureau Statistics
AC	Alternating Current
ACHAR	Aboriginal Cultural Heritage Assessment Report
AEP	Annual Exceedance Probability
AER	Australian Energy Regulator
AHIMS	Aboriginal Heritage Management System
AHIP	Aboriginal Heritage Impact Permit
ANL	Acceptable Noise Levels
ARENA	Australian Renewable Energy Agency
ARPNSA	Australian Radiation Protection and Nuclear Safety Agency
APZ	Asset Protection Zone
BAR	Biodiversity Assessment Report
BOM	Bureau of Meteorology
BSAL	Biophysical Strategic Agricultural Land
CASA	Civil Aviation Safety Authority
CC	Carbon Credit
CEMP	Construction Environmental Management Plan
CO ₂ e	Carbon Dioxide Equivalent
CRTN	Calculation of Road Traffic Noise
DA	Development Application
DC	Direct Current
DCP	Development Control Plan
DMP	Decommissioning Management Plan
DoE	Commonwealth Department of Environment
DPE	NSW Department of Planning and Environment
DPI	NSW Department of Primary Industries
EEC	Endangered Ecological Community
EIS	Environmental Impact Statement
EMF	Electric and Magnetic Field
EPA	Environment Protection Authority
EPC	Engineering Procurement Construction
ESD	Ecologically Sustainable Development
EIGP	Epuron Island GP
FBA	Framework for Biodiversity Assessment
FTE	Full Time Equivalent
GHG	Greenhouse Gas
HV	High Voltage
ICNG	Interim Construction Noise Guideline
INP	Industrial Noise Policy
IPA	Inner Protection Area
LEMC	Local Emergency Management Committee
LEP	Local Environmental Plan
LGA	Local Government Area
LGC	Large Generation Certificates
LV	Low Voltage

NEM	National Electricity Market
NERR	National Energy Retail Rules
NHMRC	National Health and Medical Research Council
NWLLS	North West Local Land Services
OEH	Office Environment and Heritage
OEMP	Operations Environmental Management Plan
PCT	Plant Community Type
PV	Photovoltaic
RAP	Registered Aboriginal Parties
REAP	Renewable Energy Action Plan
RET	Renewable Energy Target
RFS	Rural Fire Service
RMS	Roads and Maritime Service
RNP	Road Noise Policy
SAT	Single-Axis Tracking System
SEAR	Secretary's Environmental Assessment Requirements
SEPP	State Environmental Planning Policy
SSD	State Significant Development
TSR	Travelling Stock Reserve
WAL	Water Access Licence
WSC	Walgett Shire Council
WSF	Walgett Solar Farm
WSP	Water Sharing Plan
WSPL	Walgett Solar Pty Ltd

Units of measure

°C	degrees Celsius
dB(A)	A-weighted decibel
GW	Gigawatt
GWh	Gigawatt Hour
Ha	Hectare
kV	Kilovolt
kV/m	kilo Volts per metre
kW	Kilowatt
kWh	Kilowatt hour
m	Metres
mAHD	Metres Australian Height Datum
m/s	Metres per second
ML	Megalitre
MW	Megawatt
MWh	Megawatt Hour
MWp	Megawatt Peak
μT	micro Teslas

Executive Summary

The proposed Walgett Solar Farm (WSF) is a 30 MW_{AC} electricity generation works that will be comprised of solar photovoltaic modules, steel racking and piled supports, electrical transformers and inverters, electrical cabling, telecommunications equipment, an electrical control room, site substation and perimeter fencing with screen plantings. The generated electricity will be exported into the network by an underground 66 kV line into Essential Energy's substation located approximately 2.37 km to the south. The development is consistent with the Commonwealth's Renewable Energy Target, both the NSW Government's existing *Renewable Energy Action Plan* and *Climate Change Fund: Draft Strategic Plan* and Walgett Shire Council's *Community Strategic Plan*.

Once built the WSF will generate 68,000 MWh of clean electricity a year, enough to power 11,690 households and displace 57,120 tonnes of greenhouse gas emissions annually. During the nine month construction effort it will require a peak workforce of up to 85 and with a capital investment value of \$55.5 million, provide economic and employment opportunities in the Walgett district. The benefits of the WSF are clear and significant. The costs of the development in terms of potential bio-physical and social impacts have been avoided and minimised through accommodating site constraints and consulting with neighbours. The capacity and development footprint of the farm has been refined through the identification of constraints and opportunities mapped through the environmental impact assessment process. Excluding the underground transmission line that will provide grid connection to the electricity network, all farm infrastructure will be contained within a 58 hectare footprint located approximately 5 km north of town. The farm's footprint is not Biophysical Strategic Agricultural Land, it does not contain any watercourses, is not mapped as bush fire prone, and is free of Aboriginal heritage constraints. Stands of native vegetation that do exist in this predominantly cleared landscape will also be protected.

The road upgrade to provide all weather access and underground grid connection will provide tangible benefits to landowners and the environment. Upgrading the existing road crossing of the Two Mile Warramboul with culverts will provide for connectivity of flow and fish passage between the Namoi and Barwon Rivers, and has been identified a highly valuable movement pathway between these two major river basins. The intersection upgrade off the Castlereagh Highway will result in impacts to 0.63 ha of native vegetation. The safety of the public road network dictate the need for works at the location proposed, and were developed after site inspections and consideration of all access options in consultation with both Roads and Maritime Service and Walgett Shire Council. To offset this unavoidable impact, requiring two ecosystem credit points, the proponent has committed to a Biodiversity Offset Strategy consistent with NSW *Biodiversity Offsets Policy for Major Projects*.

Whilst the development footprint is subject to flooding, historically this flooding is temporary, relatively shallow and with slow flow velocity. Sensitive elements of the farm infrastructure can be elevated above the 1 in 100 year flood level without causing detrimental changes to flood inundation behaviour for any third party. Community consultation has been targeted to representatives of the Aboriginal community, potentially impacted neighbours and the broader Walgett community. To date, all feedback has been positive. The development site is visible from the curtilage of only one neighbour's home. Noise modelling under a range of operating scenarios and meteorological conditions concludes that both construction and operational impacts can comply with all applicable criteria designed to protect acoustic amenity values. The WSF is not an incompatible land use with a potential to create land use conflicts. It is not a threat to continued primary production activities for any neighbour. There would be no impact to any groundwater resource nor any fundamental change to surface hydrology in terms of modified flow patterns leaving the property.

Harvesting sunlight is a passive land use and effectively constitutes an extended fallow that would provide benefits to soil health. The WSF represents an ecologically sustainable development. There is no risk of serious or irreversible environmental damage, biological diversity and ecological integrity is being protected, the health, diversity and productivity of the environment is being maintained and enhanced for future generations, and producing carbon free electricity embodies the principle of improved valuation of a natural resource, solar energy.

Introduction

1.1 BACKGROUND

Epuron is an Australian-owned renewable energy development company established in 2003. Epuron has developed, owns and operates a portfolio of solar projects which is one of the largest in the country. Epuron is co-developing a number of large scale solar projects with Island Green Power. Island Green Power has extensive solar development experience in Europe.

Epuron and Island Green Power have formed a joint company called Epuron Island GP Management Pty Ltd (EIGP). Walgett Solar Pty Ltd (WSPL) is a subsidiary of EIGP and is the development proponent of the Walgett Solar Farm (WSF).

1.2 DEVELOPMENT OVERVIEW

The WSF will generate electrical energy by converting solar radiation into electricity through the use of solar PV panels. The farm will operate year-round to generate electricity during daylight hours when electricity demand in NSW is at its peak. The farm will be monitored remotely with a very limited on-site presence, apart from routine maintenance.

The farm will consist of solar panels, steel racking and piled supports, inverter stations, electrical cabling, telecommunications equipment, an electrical control room, site substation, perimeter security fencing, security lighting and screen plantings around the northern, eastern and southern boundary.

The farm will incorporate an estimated 90,909 solar panels, although the precise panel count will be dependent upon the specific PV technology selected. The ultimate decision for the panel type and racking system will be dependent upon availability and market conditions at the time of procurement.

The solar panels will be similar to those used for domestic purposes and will operate as either a fixed tilt or a single axis tracking system (SAT) which follows the sun during the course of the day to ensure optimal energy generation. The farm will consist of linear strings of mounted panels organised into blocks of between 2.2 and 4.9 megawatt (MW). Each block will connect to an inverter station that will convert the direct current (DC) energy into grid compatible alternating current (AC) energy.

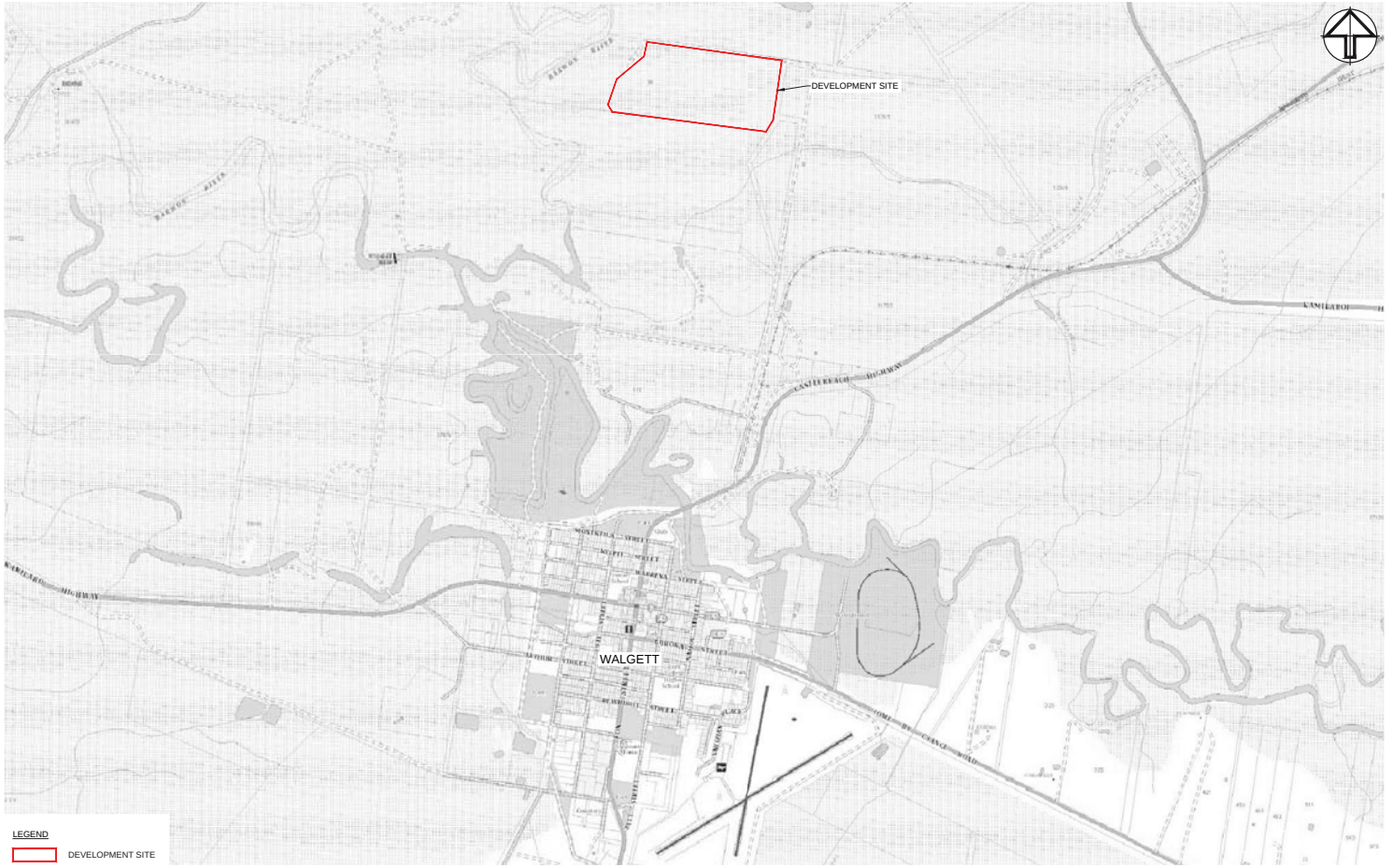
The farm will include a site sub-station, comprising a transformer, switch gear, protection equipment and control room. The generated electricity will be exported into the network by an underground 66 kV line into Essential Energy's substation which is located approximately 2.37 km south, south east of the solar farm.

1.3 DEVELOPMENT SETTING

The development site sits within the 91 ha property "Kulleen" approximately 5 km north of the town of Walgett (refer **Drawing EV01**). Surrounding land uses are agricultural, including farming and grazing.

The site fronts an unmade public road and the Barwon River effectively forms the northern and western boundary. Whilst the site is productive farming/grazing country it is not mapped as Biophysical Strategic Agricultural Land (BSAL). The development footprint does not contain any watercourses, is not mapped as bush fire prone and is cleared of native vegetation. Like most of the Walgett local government area the site is subject to flooding.

The site is relatively isolated in terms of potentially impacted neighbours, with just five dwellings located within 2 km of the site. The closest of these is 330 m to the north, while the other four are between 880 m – 1,870 m distant and located to the south of Two Mile Warrambool, where the riparian corridor associated with this watercourse blocks views of the development site from the curtilage of these homes.

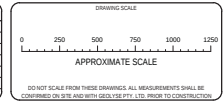


LEGEND
DEVELOPMENT SITE



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REV	DATE	DRG	APPC	DETAILS
A	11/02/2024	GT	AGS	FOR EXHIBITION
C	24/02/2023	GT	AGS	WORKING DRAFT
D	11/02/2023	GT	AGS	WORKING DRAFT
E	24/02/2023	WT	AGS	FOR DEVELOPMENT APPLICATION
F	06/02/2023	GT	AGS	FOR DEVELOPMENT APPLICATION
G	06/02/2023	GT	AGS	FOR EXHIBITION





CUSTOMER

WALGETT SOLAR PTY LTD

PROJECT

WALGETT SOLAR FARM

DRAWING

DEVELOPMENT LOCALITY

PROJECT NUMBER 217143	DRAWING FILE 217143_DPL_EV07.dwg	ORIGINAL
DATA SOURCE		A1
SCALE SOURCE		50%
STATUS FOR REVIEW	SHEET EV01 OF EV07	01

1.4 STATEMENT PURPOSE

The construction and operation of the WSF requires development approval under NSW planning legislation. This Environmental Impact Statement (EIS) has been prepared to support a Development Application (DA) lodged with the NSW Department of Planning and Environment (DPE).

1.5 STATEMENT REQUIREMENTS

This EIS identifies and assesses the environmental impacts associated with the construction, operation, upgrading and decommissioning of the proposed WSF. It has been prepared in accordance with the requirements of Schedule 2 of the *Environmental Planning and Assessment Regulation 2000*.

1.6 STATEMENT STRUCTURE AND SCOPE

The structure and content of this EIS addresses the Environmental Assessment Requirements (SEAR) issued by DPE on 13 December 2016. The SEAR were issued by DPE following consultation with relevant Government agencies. A copy of the SEAR is provided in **Appendix A**.

Appendix B provides a checklist identifying where these environmental assessment requirements have been addressed in this EIS.

The Development

2.1 DEVELOPMENT OBJECTIVE

The objective of the WSF is to use solar PV panels to convert sunlight into carbon free electricity which will be sold in the National Electricity Market (NEM), create Large Generation Certificates (LGC) which will be sold to liable entities under the *Renewable Energy Act 2000* and produce electricity that will contribute to the Federal Government's Renewable Energy Target (RET) of 33,000 gigawatt hours (GWh) by 2020.

2.2 FARM CAPACITY

The WSF will have a maximum capacity of 30 MW_{AC} and once operational will generate 68,000 megawatt hours (MWh) of carbon free electricity annually.

The Australian Energy Regulator (AER) provides electricity benchmarks and in December 2011, as part of the National Energy Retail Rules (NERR), energy retailers have been required to publish consumption benchmarks on a residential customer's bill. In March 2015 the AER reported that the average annual household electricity usage in Australia in 2014 was 5,817 kilowatt hours (kWh) (ACIL, 2015).

Based on the above, the energy generated from the WSF will be sufficient to service 11,690 homes annually during the life of the farm. Census data on the number of households by Local Government Area (LGA) from 2011 reported a total of 2,490 households in the Walgett Shire, with an average household size of 2.3 persons.

The WSF supply would significantly exceed (fourfold) the electricity demand for all households in the Walgett Shire.

2.3 FARM DESIGN

2.3.1 CONCEPT DESIGN PRINCIPLES

The WSF has been designed to a concept level by WSPL according to principles established through the deployment of similar projects, with both parties to the joint venture development (Epuron and Island Green Power) having experience building and operating solar PV farms.

The capacity and development footprint of the WSF have been refined through consideration of the results of site investigations, including consideration of potential constraints and opportunities identified during the environmental impact assessment process, as well as discussions with neighbours, Essential Energy (concerning electricity transmission network connection capacity) and the Roads and Maritime Service (RMS) and Walgett Shire Council (WSC) concerning preferred site access arrangements.

Through this process a 58 ha buildable development footprint has been identified. This development footprint would accommodate all electricity generating infrastructure and facilities associated with the development, including a temporary construction compound and laydown areas within the site.

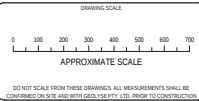
Drawings EV02, EV03 and EV04 identify this development footprint, environmental features in the locality, the location of neighbouring dwellings, the preferred site access route and the alignment of the grid connection.

As mapped the 58 ha footprint can accommodate a design and farm layout that avoids constraints and will minimise impacts. It avoids impacts on biodiversity values, keeps well off the banks of the Barwon River, provides for a buffer that can preserve acoustic amenity values and locates the farm within the landscape such that views of the development site from the curtilage of a home is restricted to a single neighbour who has been consulted with and indicated he has no issue with the proposed development.



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A	10/02/2024	GT	ACB	FOR EXHIBITION
C	24/02/2024	GT	ACB	WORKING DRAFT
D	25/02/2024	GT	ACB	WORKING DRAFT
E	26/02/2024	WT	ACB	FOR DEVELOPMENT APPLICATION
F	06/03/2024	GT	ACB	FOR DEVELOPMENT APPLICATION
G	06/03/2024	GT	ACB	FOR EXHIBITION



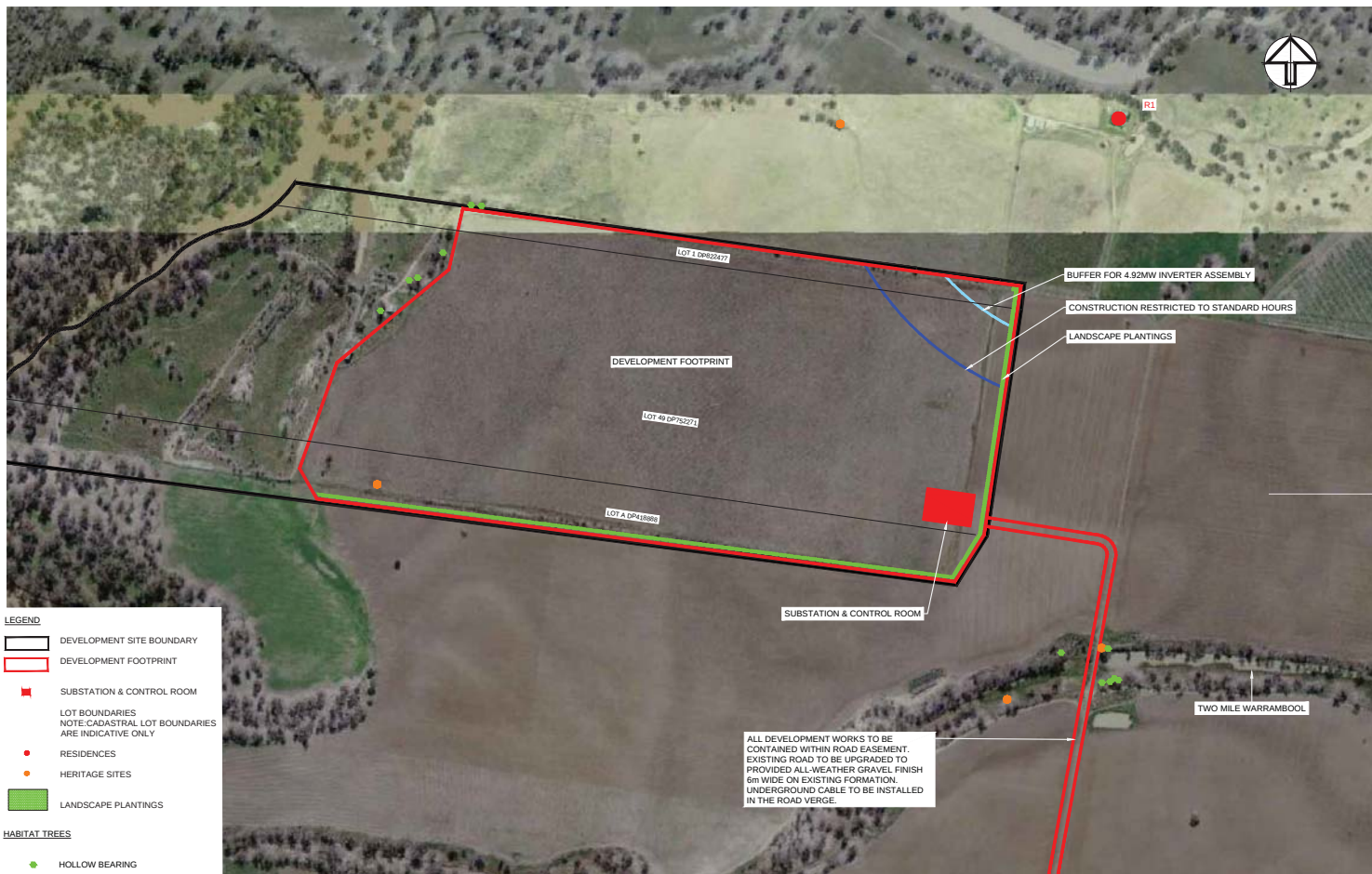
CUSTOMER

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PROJECT

WALGETT SOLAR FARM

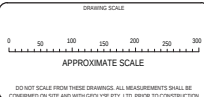
DRAWING			ORIGINAL
DEVELOPMENT FOOTPRINT OVERVIEW			
PROJECT NUMBER	217143	DRAWING FILE	217143_DFP_OVERVIEW.dwg
DATA SOURCE			A1
IMAGE SOURCE			01
STATUS	FOR REVIEW	SHEET	EV02 OF EV07



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A	22/12/2024	CT	AGB	FOR EXHIBITION
C	24/05/2023	CT	AGB	WORKING DRAFT
D	27/05/2023	CT	AGB	WORKING DRAFT
E	24/05/2023	WF	AGB	FOR DEVELOPMENT APPLICATION
F	06/03/2023	CT	AGB	FOR DEVELOPMENT APPLICATION
G	03/03/2023	CT	AGB	FOR EXHIBITION



APPROVAL AUTHORITY

CLIENT

WALGETT SOLAR PTY LTD

PROJECT

WALGETT SOLAR FARM

DRAWING

DEVELOPMENT FOOTPRINT
DETAIL 1

PROJECT NUMBER	217143	DRAWING FILE	217143_DPM_EV03_EV07.AWG	ORIGINAL
DATA SOURCE				A1
IMAGE SOURCE				SE
STATUS	FOR REVIEW	SHEET	EV03 OF EV07	01



LEGEND

- DEVELOPMENT FOOTPRINT
- RESIDENCES
- HERITAGE SITES
- COOLABAH OPEN WOODLAND-MEDIUM CONDITION
- COOLABAH OPEN WOODLAND-HIGH CONDITION
- HABITAT TREES
 - NON HOLLOW BEARING
 - HOLLOW BEARING

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E	26/02/2024	WT	ACB	FOR DEVELOPMENT APPLICATION
F	06/03/2024	GT	ACB	FOR DEVELOPMENT APPLICATION
G	06/03/2024	GT	ACB	FOR EXHIBITION

DRAWING SCALE
0 50 100 150 200 250 300
APPROXIMATE SCALE
DO NOT SCALE FROM THESE DRAWINGS. ALL MEASUREMENTS SHALL BE CONFIRMED ON SITE AND WITH GEOLYSE PTY. LTD. PRIOR TO CONSTRUCTION.

APPROVAL AUTHORITY
NSW Planning & Environment

CLIENT
WALGETT SOLAR PTY LTD

PROJECT
WALGETT SOLAR FARM

DRAWING		ORIGINAL
DEVELOPMENT FOOTPRINT DETAIL 2		A1
PROJECT NUMBER: 217143	DRAWING FILE: 217143_DFM_EV04_EV07.dwg	REV
DATA SOURCE:		
IMAGE SOURCE:		
STATUS: FOR REVIEW	SHEET EV04 OF EV07	01

2.3.2 DETAILED DESIGN PROCESS

Contingent on securing planning approval the next step in the WSF project would be to progress to detailed design. EIGP will undertake this through awarding an Engineering Procurement and Construction (EPC) contract. An EPC contract is the most common form of contract used to undertake construction works by the private sector on large-scale infrastructure projects.

Under an EPC contract a contractor is appointed to deliver a complete project for a fixed price by a fixed date. The EPC contractor carries out the detailed engineering design of the project, procures all the equipment and materials necessary, and then constructs to deliver a functioning facility to their client.

For the WSF, WSPL will have an EPC contractor design some elements of the farm and other elements will be designed by WSPL's Owner Engineer. An Owner's Engineer is an independent third party or subcontracted role; undertaken to ensure that the technical and build contractors are adhering sufficiently to the project specification and fill gaps in resources and expertise for a project.

As part of the detailed design of the WSF a suite of very specific and targeted additional site investigations and studies are completed. These investigations and studies are undertaken to 'lock-in' a precise farm layout and inform the need for any site specific construction methodologies that may be required to mitigate potential impacts. For example, as preliminary detailed design work is completed this will inform the scope of a targeted soil survey, the results of which will inform the construction methodologies to be adopted and the need to implement specific mitigation measures during construction.

Development consent is a standard and logical 'hold-point' on projects before progressing to detailed design. It not only defers some project expenditure until there is greater certainty, it also ensures all relevant consent conditions can be incorporated into the detailed design process.

The need to submit Final Layout Plans and a Construction Environmental Management Plan (CEMP) for approval, before works can commence, provides the regulatory check and mechanism for ensuring that what is built, and how, is consistent with the development consent and complies with all consent conditions.

2.4 FARM LAYOUT

2.4.1 ELECTRICAL GENERATION EQUIPMENT

The solar PV panel technology will be either crystalline silicone or thin film. The panel modules will be connected together via a DC collection system consisting of cables mounted on the module support structure. The racking system will either be fixed-tilt or a single axis tracking (SAT) or a combination of both.

Fixed tilt systems hold the modules in a fixed orientation (north facing and set at approximately 20 degrees) in relation to the sun and have no moving parts. A SAT system tracks the daily movement of the sun and motorised linkages rotate the modules from the east in the morning to the west in the afternoon; constantly aligning towards the sun to maximise energy output performance.

The modules are laid out in rows or strings, typically 5 to 7 m apart, depending on the technology used. The flatness of the WSF site will lead to optimal spacing without output being affected by shading of adjacent strings. The choice of fixed tilt or SAT will determine the orientation of the strings, whether east-west (fixed) or north-south (SAT). The racking system will be supported by steel piles. These are hollow sections which are driven into the ground or otherwise placed in bored holes and concreted in place.

Inverters will convert the DC current to AC current and medium voltage transformers will increase the voltage to the collection system rating. Contingent on procurement, the WSF will have either 6 (4.92 MW) or 14 (2.2 MW) inverter stations. These inverter stations will be positioned throughout the module arrays with each power block of the solar farm corresponding to the capacity of the inverter station.

The AC collection system will consist of cabling at 22 kilovolt (kV) or 33 kV which will connect to each inverter station and deliver the electricity to a site substation. This substation will transform the voltage from the collection system to 66 kV grid compliant energy suitable for connection to the existing electricity network owned and operated by Essential Energy.

The site substation will consist of a secure enclosure (approximately 90 m x 120 m) with several items of electrical equipment and supporting structures. This will include a transformer to increase the voltage to 66 kV as well as essential switch gear, protection equipment and a small control room. The equipment and structures will be installed on concrete foundations and the substation yard will be kept free of vegetation. The site substation will be monitored remotely via a security system.

2.4.2 GRID CONNECTION

Grid compliant energy will be delivered to the network by an underground 66 kV line connecting to Essential Energy's substation located approximately 2.37 km south, south east of the solar farm.

2.4.3 ANCILLARY INFRASTRUCTURE

Staff will utilise the control room during commissioning in order to advance the farm to its operational readiness. Once the farm is operational, staff will occasionally occupy the control room as needed to monitor the performance of the farm and to diagnose any faults. From the control room there will be communications connections to the electricity market operator, Essential Energy and the operation's team.

A security fence will surround the infrastructure. Inside this fence a 10 m wide asset protection zone (APZ) will be maintained to provide for bush fire control and tanker access.

Outside the security fence, on the southern and eastern boundaries a 5 m wide screen of landscape plantings will be established.

2.5 FARM CONSTRUCTION

2.5.1 DEVELOPMENT PROGRAM

Construction will include all pre-operation activities associated with the project other than survey, acquisitions, fencing, investigative drilling or excavation, or other preparatory activities that have minimal environmental impact such as site mobilisation, minor adjustments to services/utilities, establishing the temporary construction site compound and laydown areas, or minor clearing.

Construction is estimated to take up to nine months with an indicative scheduled program of activities provided below.

WALGETT SOLAR FARM INDICATIVE CONSTRUCTION SCHEDULE												
Month	1	2	3	4	5	6	7	8	9	10	11	12
Construction Environmental Management Plan												
Engineering												
Civil Design												
Structural and Mechanical Design												
Electrical Design												
Grid Connection Design												
Procurement												
Piling												
Modules												
Inverters												
Cabling												
Construction												
Mobilisation												
Site Preparations, survey and set-out												
Civil Works												
Trenching and Conduits												
Piling												
Module Installation												
Inverters and Cabling												
Grid connection Works												
SCADA, comms & weather station												
Commissioning												

Figure 1: Indicative Construction Program

2.5.2 SITE ACCESS

The first priority will be to upgrade the existing Castlereagh Highway intersection treatment and upgrade the existing Crown public road. A small portion of the Crown public road is currently unformed and will be upgraded to a standard suitable to provide for all weather heavy vehicle access. This upgrade will include topping and compacting the road to provide for a gravel finish.

These works will also include the installation of culverts at the existing Two Mile Warrambool crossing; providing a significant environmental improvement to the existing arrangement. At present there are no culverts that permit flow and the road forms a flow barrier.

The upgrade to the Castlereagh Highway will be constructed to a standard of the Roads and Maritime Service.

2.5.3 SITE PREPARATION

Whilst the development site is relatively flat there will be the requirement to undertake preparatory earthworks such that the finished ground surface level across the site is no lower than 1.5 m below the 1% Annual Exceedance Probability (AEP) flood level. This will be done through balanced cut and fill earthworks, with the retention of existing natural drainage patterns. A flood assessment has been undertaken to identify indicative cut and fill areas (refer **Section 8** for more detail).

Site facilities and construction laydown areas will be established within the development footprint and construction equipment will then be mobilised to the site. Internal site access tracks will be established through scraping, grading and compacting. Extensive track construction is not planned. A typical layout and extent of track formation is shown in **Plate 1**.



Plate 1: Typical Layout and internal track formation. Photo of Nyngan Power Plant (Courtesy AGL Energy Ltd)

A security fence will be installed around the site perimeter and the site cleared of internal fences.

It is likely that the Essential Energy 22 kV line crossing Lot 1 DP 822477 will be disconnected. This will not impact on any third party as this line only services the property "Kulleen".

2.5.4 SUBSTATION

The site substation will also be commenced at this phase. Civil works will be required to prepare the base including establishment of slab foundations and cable trenches. Concrete slab foundations will be poured and road base will be laid down to create an all-weather compound (90 m x 120 m). The pad level of the sub-station would be positioned above the 1% AEP level. The transformer, switch gear and protection equipment will be installed on the slab foundations.

The site preparation and substation construction will require the use of plant such as bulldozers, water trucks, graders, flatbed trucks, skid steers, front end loaders, roller compactors, trenchers, backhoes, gravel trucks, cranes and aerial lifts.

2.5.5 SOLAR PV MODULES

Following site preparation the supporting structures and the solar modules will be installed. The site will be surveyed and locations of all the equipment will be pegged. The hollow sections or flanged sectioned steel piles which support the racking system will be driven into the ground pneumatically or alternatively holes will be bored and the piles will be grouted in position.

Piles may be cut off to height and the steel racking assembly will be attached according to the manufacturer's proprietary system. The solar PV modules will then be installed on the racking and secured in position to withstand wind loading. Once the modules have been installed the DC collection cables will be laid on the structure and terminated to the modules. If a tracking system is being used the rotating mechanism and server motors will be installed on the support structure. Cable connection points and any tracking motors will be positioned on the modules at an elevation above the 1% AEP level.

This phase will require the use of equipment including pile drivers, augers, forklifts, welders, oxy acetylene, trenchers, excavators, pickup trucks, water trucks, flatbed trucks and cranes.



Plate 2: Module Assembly

2.5.6 INVERTER STATIONS AND ELECTRICAL COLLECTION SYSTEM

Once the PV modules have been installed cable trenches will be excavated and AC and DC cables will be laid. Trenches will be backfilled with excavated material (and any ameliorant to prevent tunnel erosion if soil investigations determine sodic soils are present) and cables will be terminated to the modules.

Trench details are determined by local regulations and voltage specifications, but typically are approximately 800 mm deep.



Plate 3: Typical cable trench for MV collection system

The inverter stations will sit on piles above the 1% AEP level and the medium voltage cables will be terminated to them. Testing and quality assurance will be carried out as connections are made.

2.5.7 GRID CONNECTION

Grid connection will involve trenching and placement of high voltage cables in the upgraded road verge from the development site to Essential Energy's zone substation.

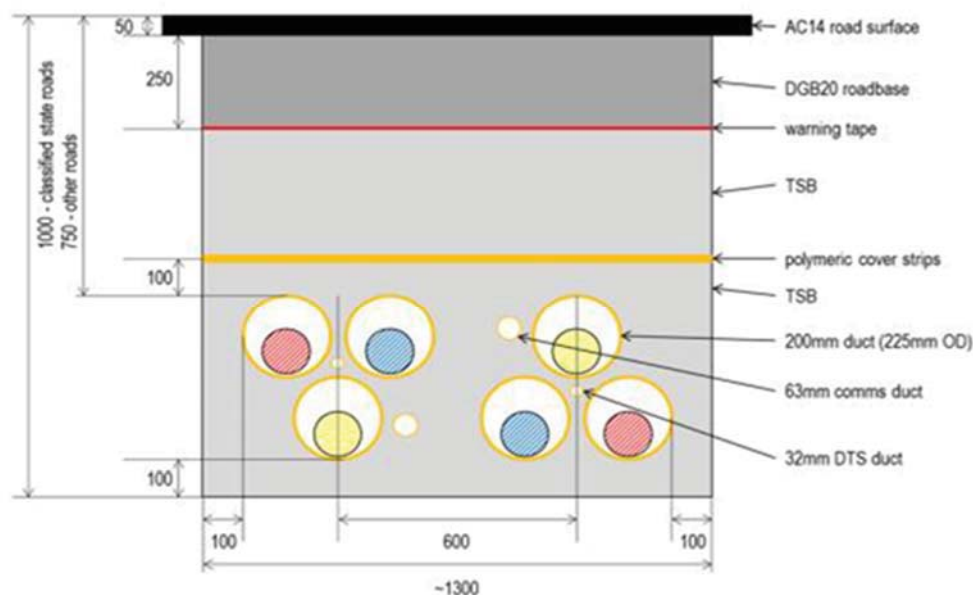


Figure 2: Typical Cable Trench for MV Collection System

2.5.8 COMMISSIONING

Once all the inverter stations and electrical collection system has been installed, commissioning of equipment will be undertaken. Commissioning will include terminations, testing, calibration and troubleshooting.

The inverters, transformers, collection system, solar PV array and substation will be tested prior to commencement of commercial operations to ensure any system issues are rectified. Commissioning will involve site crews and Essential Energy personnel. Upon completion of successful testing the solar farm can be connected to the Essential Energy network and it will be ready to export electricity.

2.5.9 SITE RESTORATION

To facilitate construction there will be areas disturbed to establish infrastructure required for construction activity alone. This will include a temporary construction compound for site offices and amenities, vehicle parking and equipment laydown areas.

Post commissioning these areas will not be required and will be made good through removal of all materials, deep ripping and establishing a groundcover.

2.5.10 TEMPORARY ON-SITE ACCOMMODATION

It is not envisaged that temporary on-site construction workers accommodation will be required.

Over the nine (9) month construction effort the demand for labour will vary depending on the site activities being undertaken. Installation and commissioning of modules is labour intensive and employment is expected to peak at approximately 85 on-site workers involved directly in project construction. This peak period is expected to extend over a five (5) month period. Outside this peak the workforce is expected to drop to 20.

These jobs will include construction managers, electricians, fitters, various plant operators, mechanics and other skilled and semi-skilled labour. WSPL's intent is to award a contract to an Engineering, Procurement and Construction (EPC) contractor that has a commitment to maximise local employment opportunities (refer **Section 9**). How many of the peak 85 construction jobs can be serviced locally has yet to be determined.

Notwithstanding, there are 84 rooms in Walgett available for accommodation, and up to 50% of these are twin share. Whilst limited, there are also at any one time several (typically 3 – 4) rental houses on the market.¹ While motel/hotel operators could not make available all accommodation for construction staff as they have regular customers that need to be looked after, it is considered that forward planning and effective consultation with accommodation operators and local real estate agents would negate the need for on-site accommodation.

It is also noted that although some distance from Walgett (~80 km), Lightning Ridge also provides additional accommodation options.

¹The Walgett Rural Residential Land Use Strategy (GHD, 2013) also reports that a relatively significant number of private dwellings in Walgett, as assessed from 2011 census data, are un-occupied. Specifically, of the 635 total private dwellings 114 of these dwellings (18%) were reported as unoccupied.

2.5.11 MATERIALS AND RESOURCES

2.5.11.1 Water

Water demand during construction will be limited to that required for dust mitigation and/or moisture conditioning of material, as well as a potable supply for construction staff. The former will be sourced from a yet to be identified legal supply point and trucked to the site in a bulk tanker.

The supply source will be determined by the EPC contractor and specified in the Construction Environmental Management Plan (CEMP) that will need to be approved before works can commence (refer **Section 19.4**).

Notwithstanding limitations and restrictions that do exist in this part of the State in terms of water availability, supply options do exist.

Pumping from the river (Barwon or Namoi) to source water for construction purposes may be possible contingent on sourcing an existing allocation and Water Access Licence (WAL). Consultation with WaterNSW has established that any WAL which water is extracted against would be required to nominate a Miscellaneous Work Approval which lists the work/s through which the water will be extracted (i.e. pump/s).

The WAL would be required to be in the same water source (and management zone if applicable) as the works extracting the water, and in accordance with the relevant Water Sharing Plan (WSP) rules which can and do include cease to pump rules when flows at a reference point is equal to or less than the flow rate specified in the WAL.

Given the development site location it is conceivable that water could be sourced from one of two surface Water Sharing Plans; subject to securing the required WAL from Water NSW.

Table 2.1 – Water Sharing Plans

	Possibility 1	Possibility 2
Water Sharing Plan	Namoi Unregulated and Alluvial Water Sources 2012	Barwon-Darling Unregulated and Alluvial Water Sources 2012
Water Source	Pian Creek Water Source	Barwon – Darling Unregulated River Water Source
Management Zone	Pian Creek Tributaries Management Zone	Walgett Weir Pool Management Zone

Alternatively, Walgett Shire Council has indicated raw or filtered water could be purchased and supplied from Council's existing water supply system.² Again, supply availability would be dictated by river flows at the time with Walgett's potable demand being Council's first priority. Certainty of supply cannot be guaranteed and like any land use or activity in the north west of the State, be subject to the vagaries of seasonal conditions and the circumstances at the time.

The quantity of water required for dust mitigation during construction can only be roughly estimated. Ultimately, it will be determined by the detailed design, the EPC contractor's approach to the construction program and the climatic conditions experienced at the time the works are undertaken. Assuming a maximum daily use, in excessively dry and windy conditions, would be 50 kL, and that these conditions are experienced 50% of the time during the five month construction peak, this equates to 3 ML.

The potable supply will be provided through bottled water.

Dry port-a-loos will be provided for amenities throughout construction negating the need for on-site domestic sewage treatment.

² Walgett's water supply has, until recently, relied totally on pumping from the Walgett weir pool. In December 2016 contingency works for dealing with a drought emergency situation for Walgett Town and Namoi Village were commissioned. These works include a new bore, which will be operated during emergency periods when the river flow is low and river water quality degraded significantly.

2.5.11.2 Sand and Gravel

The upgrade of the access road and establishing compacted hardstand areas around the construction compound and laydown areas will require gravel. Sand will be required for the bedding of cabling in the trenches before backfilling. These materials will be sourced from local suppliers.

2.5.12 HOURS OF WORK

The Environment Protection Authority has recommended standard hours for construction. That is, Monday to Friday 7.00 am – 6.00 pm; Saturday 8.00 am to 1.00 pm; and with no work on Sunday's or Public Holidays.

The noise impact assessment undertaken as part of the environmental investigations has determined that with the buffers distances available, and the relatively few potentially sensitive receptors that could be impacted, it will be possible to construct outside the EPA's 'standard' hours without compromising acoustic amenity values for any third party.

Evidence that neighbours' are amenable to works being undertaken outside the 'standard' hours will be obtained if the EPC contractor proposes to do this.

2.6 FARM OPERATION

2.6.1 MAINTENANCE ACTIVITIES

Following commissioning the WSF will begin operating with the production of electricity fed into the electricity grid. The solar modules will operate during daylight hours, seven days per week, 365 days a year.

The farm will operate independently and no employees will be permanently stationed on-site. The farm will be monitored remotely from an off-site location and apart from a routine maintenance program, operators will only visit the farm when responding to any performance issues (ie. where actual output measured by the monitoring system deviates from generation forecasts and other key performance metrics).

Activities at the farm that will be part of a routine maintenance program will generally be limited to:

- Equipment, cabling, substation and communications system inspection and maintenance.
- Fence, access road and control room management.
- Vegetation (fuel load), weed and pest management.
- Possible solar PV module washing on an as-needed basis.
- Security monitoring.
- Communicating with customers, transmission and distribution network operators, Australian Energy Market Operator (AEMO), Walgett Shire Council, neighbours and other stakeholders.

2.6.2 SOLAR PV MODULE WASHING

Water use for regular washing of modules is not expected to be required. In the event of an abnormal soiling event (e.g. due to a particularly severe dust storm) water would be trucked to the site and the modules cleaned with a portable pressure washer without the use of any detergent or cleaning agent.

2.6.3 FUEL MANAGEMENT

Fuel management will be a key ongoing activity targeting bushfire risk prevention (refer **Section 13**). Groundcover across the property will be proactively managed to avoid excessive fuel loads (which would also compromise the solar farm's performance) and prevent the proliferation of any noxious weeds.

2.6.4 OPERATIONS ENVIRONMENTAL MANAGEMENT PLAN

An Operations Environmental Management Plan (OEMP) will be prepared prior to the WSF commencing operation. The WSF will be operational after commissioning and equipment trials and electricity is being loaded into the transmission network.

The OEMP will include procedures, reporting, and the allocation of responsibilities designed to minimise environmental impacts. The OEMP will document the environmental procedures and controls that would be implemented to operate the solar farm as a responsible rural land owner.

The OEMP would comprise various sub-plans detailing the specific mitigation measures that would be implemented to avoid and manage potential environmental impacts and minimise risks. These would include plans covering land management (specifically relating to fuel loads and noxious weeds) and emergency preparedness. Further detail on the scope of the OEMP is provided in **Section 19.5**.

2.7 FARM UPGRADING

Upgrading of the farm would include the augmentation and/or replacement of solar panels and ancillary infrastructure within the development footprint. Prior to carrying out any such upgrades, the owner of the WSF will provide revised layout plans of the development to DPE incorporating the proposed upgrades.

2.8 FARM DECOMMISSIONING

It is proposed that no later than 12 months before the intent to decommission the WSF the owner of the solar farm will provide a Decommissioning Management Plan (DMP) to DPE for approval. The DMP would detail what decommissioning would entail and how it would be conducted. For example, the DMP would detail required procedures for ensuring:

- soil profiles through the replacement of topsoil and subsoil are consistent with the pre-decommissioning soil profiles;
- soil profile functionality is restored by appropriate placement of sub soil and top soil and eliminating compaction;
- appropriate soil handling procedures (e.g. stripping techniques, stockpiling, weed control) and erosion and sediment controls are prescribed;
- procedures for any soil amendment rate determination and application, and pasture seed species for groundcover establishment are detailed;
- the timing for undertaking a post-decommissioning soil survey that will provide objective and verifiable data to confirm the site is structurally stable and the land has been restored to its pre-disturbance capability. This post-decommissioning soil survey will involve the collection and analysis of representative soil samples from the same locations and for the same suite of agronomic indicators as collected in the baseline agronomic survey (refer below); and
- appropriate reporting is provided to DPE after decommissioning is completed that demonstrates the rehabilitation objective of the decommissioning works have been achieved: that is, the 58 ha is structurally stable, and conditions for revegetation and agricultural land use success has been achieved.

Significantly, the DMP would specify the requisite performance criteria to ensure that the primary decommissioning objective is realised. This primary objective of the DMP would be to restore the land capability to its pre-existing agricultural value and use.

The performance criteria would be linked directly to the agronomic baseline data collected in the soil survey that will be undertaken prior to the solar farm being built (refer **Section 11.5**). This survey will entail collection of representative soil samples from across the development site to establish baseline data on the pre-existing agronomic characteristics of the soil resource. This would include sampling for soil texture and structure, nutrients, acidity, organic matter, clay content, electrical conductivity and exchangeable cation capacity for both top and subsoils.

Statutory Planning

3.1 DEVELOPMENT SITE

Infrastructure associated with the solar farm, inclusive of the grid connection, includes lands as described in **Table 3.1**.

Table 3.1 – Development Land

Development Component	Lot/Deposited Plan
Solar Farm	Lot 1, DP 822477 Lot 49 DP 752271 Lot A DP 418888
Grid Connection	Crown Land Lot 56 DP 752271 Lot 92 DP 752271

The solar farm would occupy a footprint of approximately 58 ha.

3.2 PERMISSIBILITY

The development site is located on land zoned RU1 – Primary Production under the *Walgett Local Environmental Plan 2013* (LEP). As a solar farm is not expressly listed as permitted with consent or without consent, it would be considered a prohibited land use under a strict reading of the LEP.

However, based on a broader reading of the LEP, consideration of the objectives of the RU1 zone, and discussions with Walgett Shire Council, it is reasonable to conclude that there is no clear intention to prevent the development of a solar farm on land zoned for Primary Production in the Walgett LGA.

The basis for this position includes the following considerations.

Firstly, the Walgett LEP expressly notes the LEP is subject to the provisions of State Environmental Planning Policy and to this end *State Environmental Planning Policy (Infrastructure) 2007* acknowledges that electricity generating works and solar energy systems are regulated by the Infrastructure SEPP rather than the LEP. A solar farm is permitted with consent under the Infrastructure SEPP.

Secondly, a solar farm is not inconsistent with the objectives of the RU1 zoning. The proposed solar farm would not:

- compromise or diminish the natural resource base;
- discourage diversity in primary industry enterprises and systems appropriate for the area;
- lead to the fragmentation or alienation of resource lands;
- create conflict between land uses within this zone and land uses within adjoining zones; or
- inhibit small-scale rural tourism uses associated with primary production and environmental conservation.

The WSF will not fragment or alienate any resource lands during its operation as it will have no off-site impact that would compromise the use of neighboring lands for primary production purposes. Similarly, post-operation the site can be returned to agricultural land use in the future if the solar farm is decommissioned. Arguably, the land returned after what would effectively be a 35 year fallow would, subject to appropriate management during the farm's operational life in terms of weed control, and successful decommissioning, be in an improved condition.

A solar farm encourages a new element of agricultural enterprise and diversity through the generation of solar energy and a Council objective for the Walgett Shire's economic development is a strong and

diverse economic base that supports employment and industry, to be realised through an economic development strategy that identifies potential projects and/or industries that build on the Shire's attributes and/or natural resources.

Walgett's solar resource is both natural and significant.

3.3 STATE SIGNIFICANT DEVELOPMENT

The WSF is an electricity generating activity with a capital investment value of \$55.5 million. Accordingly the development is classified as a State Significant Development (SSD) and pursuant to *State Environmental Planning Policy (State and Regional Development) 2011* the Minister for Planning is the consent authority.

3.4 STATE LEGISLATION

3.4.1 NATIVE VEGETATION ACT 2003

An authorisation to clear native vegetation is not required for SSD pursuant to s.89(J) of the *Environmental Planning and Assessment Act 1979*. Clarification in relation to the extent of impact on native vegetation is provided in **Section 10**.

3.4.2 THREATENED SPECIES CONSERVATION ACT 1995

The *Threatened Species Conservation Act 1995* is the key piece of legislation providing for the protection and conservation of biodiversity in NSW through the listing of threatened species, populations and ecological communities and the declaration and mapping of their critical habitats, as well as the identification of key threatening processes. This Act also establishes a system for biodiversity certification and establishes the Biodiversity Banking and Offsets Scheme. For all major projects, such as the WSF, impacts to biodiversity are assessed in accordance with the Framework for Biodiversity Assessment (FBA).

Through adopting the principles of avoidance and identifying ecological constraints in the immediate locality that will be protected, the biodiversity assessment (refer **Appendix C**) has determined that a significant impact on threatened species, populations or ecological communities (and their habitats) is not likely.

3.4.3 FISHERIES MANAGEMENT ACT 1994

The upgrade of the access road where it crosses Two Mile Warrambool will entail the installation of culverts. This will be a significant improvement on the existing arrangement as the road crossing at this location is currently a dam wall that prevents flow.

The installation of culverts would, by definition, entail 'dredging'. Notwithstanding, no permit under section 201, 205 or 219 of the *Fisheries Management Act 1994* is required pursuant to s.89(J) of the *Environmental Planning and Assessment Act 1979*.

Based on the proposed impact area, and the lack of impact on waterways, no key threatening processes are relevant to the development. To the contrary, the proposal to provide culverts under the existing road crossing of the Two Mile Warrambool will reduce the operation of a key threatening process through removing 'instream structures and other mechanisms that alter natural flow'.

3.4.4 NATIONAL PARKS AND WILDLIFE ACT 1974

An Aboriginal Heritage Impact Permit (AHIP) under s.90 of the *National Parks and Wildlife Act 1974* is not required for SSD pursuant to s.89(J) of the *Environmental Planning and Assessment Act 1979*.

An assessment of impacts on Aboriginal heritage is provided in **Appendix D**.

3.4.5 WATER MANAGEMENT ACT 2000

A water use approval under section 89, a water management work approval under section 90 or an activity approval (other than an aquifer interference approval) under section 91 of the *Water Management Act 2000* is not required for SSD pursuant to s.89(J) of the *Environmental Planning and Assessment Act 1979*.

3.4.6 PROTECTION OF THE ENVIRONMENT OPERATIONS ACT 1997

The development is not a scheduled premise and does not require licensing under s.48 of the *Protection of the Environment Operations Act 1997*.

3.4.7 ROADS ACT 1993

Under the *Roads Act 1993* a person must not:

- erect a structure or carry out a work in, on or over a public road, or
- dig up or disturb the surface of a public road, or
- remove or interfere with a structure, work or tree on a public road, or
- pump water into a public road from any land adjoining the road, or
- connect a road (whether public or private) to a classified road,

without the consent of the appropriate roads authority.

Castlereagh Highway is a Public Road for which Roads and Maritime Services is the appropriate road authority. Works on the access off the Castlereagh Highway will require RMS consent noting that a consent under s.138 of the *Roads Act 1993* cannot be refused if it is necessary for carrying out State significant development that is authorised by a development consent and is to be substantially consistent with the consent. The appropriate roads authority for the balance of the local road upgrade works will be Walgett Shire Council and the Crown.

Land tenure arrangements for the transmission line are being progressed with the Crown and Council on the Crown road and Council controlled road.

3.4.8 CROWN LANDS ACT 1989

The access road to be upgraded, and the underground transmission line to connect to the Essential Energy zone substation will pass through Crown land, being Crown and Council public roads. Consultations with the Department of Industry – Lands has clarified the Department's preferred administrative means of dealing with this Crown land (refer **Section 4.5**).

It is noted that irrespective of any development consent or any approval given by other public authorities, any work or occupation of Crown land and/or Public Roads cannot commence without a lawful tenure from the Department authorizing such work or occupation, pursuant to the *Crown Lands Act 1989* and/or the *Roads Act 1993*.

It is also noted that either WSPL or a network operator such as Essential Energy may construct the transmission line. If a network operator performs the work it can do so under s.45 of the *Electricity Supply Act 1995*.

3.4.9 NOXIOUS WEEDS ACT 1993

The *Noxious Weeds Act 1993* was enacted to provide for the identification, classification and control of noxious weeds. Plants declared as noxious weeds are currently listed under Weed Control Order No. 28 Declaring Certain Plants to be Noxious Weeds published in the New South Wales Government Gazette No. 97 (Department of Premier and Cabinet 2011).

The only noxious weed identified at the time of the ecological field survey (refer **Appendix D**) was Noogoora Burr (*Xanthium occidentale*), which has a control Class 4 that requires the landowner to ensure that the growth of the plant be managed in a manner that continuously inhibits the ability of the plant to spread.

3.5 STATE PLANNING POLICIES

3.5.1 SEPP 55 - REMEDIATION OF LAND

A review of the EPA Contaminated Land Record under s.58 of the *Contaminated Land Management Act 1997* and the List of NSW contaminated sites notified to EPA under s.60 of the Act does not identify any registered contaminated sites at or near the development site. Nor is the development site located on land upon which development referred to in Table 1 of the *Managing Land Contamination Planning Guidelines SEPP 55 – Remediation of Land*, is being or is known to have been carried out. Pursuant to Clause 7 of *State Environmental Planning Policy No 55 – Remediation of Land* there is no apparent reason to consider that land on the development site would be contaminated.

3.5.2 SEPP – RURAL LANDS 2008

Pursuant to this Policy the WSF does not compromise the orderly and economic use and development of rural lands for rural and related purposes, compromise the proper management, development and protection of rural lands for the purpose of promoting the social, economic and environmental welfare of the State, increase land use conflicts, or impact on State significant agricultural land.

3.5.3 SEPP 44 – KOALA HABITAT PROTECTION

The aim of the *State Environmental Planning Policy 44 – Koala Habitat Protection* is to encourage the proper conservation and management of areas of natural vegetation that provide habitat for koalas to ensure a permanent free-living population over their present range and reverse the current trend of koala population decline. The SEPP applies to the Walgett LGA, however the vegetation within the study area is not potential Koala habitat as defined under the SEPP (refer **Appendix D**).

3.5.4 SEPP 33 – HAZARDOUS AND OFFENSIVE DEVELOPMENT

The proposed WSF does not pose a significant risk in relation to the locality to human health, life or property, or to the biophysical environment. It is not a potentially hazardous industry. Similarly, the WSF would not emit a polluting discharge which would have a significant adverse impact in the locality or on the existing or likely future development on other land. The proposed WSF is neither a hazardous nor offensive industry.

3.6 COMMONWEALTH LEGISLATION

3.6.1 ENVIRONMENT PROTECTION BIODIVERSITY CONSERVATION ACT 1999

An assessment of the impacts of the proposed solar farm on matters of National Environmental Significance (NES), against relevant heads of consideration was undertaken to determine whether referral of the project to the Commonwealth Minister for the Environment is required.

A summary is provided below and **Appendix D** provides further details.

Matters of NES relevant to the project are summarised in **Table 3.2**.

Table 3.2 – Assessment of the project against the EPBC Act

Matter of NES	Project Specifics	Potential for significant impact
Threatened species	One flora species and 11 fauna species have been recorded or are predicted to occur in the locality. The majority of these species are considered unlikely to occur within the study area. There is some potential for the Five-clawed Worm-skink to occur within the broader study area, but impacts from the proposed works are considered unlikely to result. Given this, the activity is considered low risk in line with Commonwealth of Australia (2011).	Significant impact unlikely to result from the proposed development.
Threatened ecological communities	<i>Coolibah – Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions</i> endangered ecological community was mapped within the study area.	The impacted moderate/good condition vegetation within the subject site does not meet the minimum condition threshold as the percentage cover of non-native perennial plant species exceeds the percentage cover of native plant species in the ground layer. Therefore, a significant impact unlikely to result from the proposed development.
Migratory species	Nine migratory species have been recorded or are predicted to occur in the locality. The study area does not provide important habitat for an ecologically significant proportion of any of these species.	Significant impact unlikely to result from the proposed development.
Wetlands of international importance (Ramsar sites)	The study area does not flow directly into a Ramsar site and the development is not likely to result in a significant impact.	Significant impact unlikely to result from the proposed development.

Referral to the Australian Government Minister for the Environment under the Commonwealth's *Environment Protection Biodiversity Conservation Act 1999* is not required.

3.6.2 NATIVE TITLE ACT 1993

The development site is located on freehold land and Crown land that is subject to a lodged native title claims (refer **Appendix C**).

3.6.3 RENEWABLE ENERGY ACT 2000

The *Renewable Energy Act 2000* establishes solar as an eligible energy source under the Commonwealth's RET. Creating LGC's from the WSF, which can then be sold to liable entities, is subject to the approval of the Clean Energy Regulator pursuant to the *Renewable Energy Act 2000*.

Consultation

4.1 INTRODUCTION

The approach to the consultation undertaken as part of this EIS has been to target stakeholders that have a potential to be impacted by the development as well as those with an interest in the land to be developed. This has included neighbours as well as the broader Walgett community, representatives of the Aboriginal community, various State Government agencies, the Civil Aviation Safety Authority, Walgett Shire Council and the electricity network operator Essential Energy.

Individuals likely to have an interest in the WSF have been provided the opportunity to express their views. Information regarding the nature of the proposal has been widely distributed across the Walgett district, and community and stakeholder feedback encouraged.

The consultation has involved engagement techniques that offer opportunities to participate across all relevant groups. This has included face-to-face meetings with neighbours, distribution of newsletters, and the establishment of a dedicated website and Facebook page and the planned conduct of an Open Day.

The reporting on this consultation process below includes:

- a summary of findings;
- the process involved, including the objectives of the consultation; when the consultation was undertaken; the number and type of stakeholders involved; and the engagement techniques (how feedback was collected and how discussions with community were undertaken); and
- an analysis of the issues raised and how each issue is addressed in this EIS.

4.2 NEIGHBOURS

Meetings were undertaken with the three closest landowners not associated with the development who have residences on their properties. Two of these are located to the south of the development site, with homes on the southern side of Two Mile Warrambool. Neither landowner has views of the development site from the curtilage of their homes or had concerns or issues about the development.

The third landowner's residence is located 330 m to the north of the development site. Again, consultations with this landowner indicates that he does not have any issues or concerns about the development.

The location of all these residences are shown on **Drawing EV02**.

WSPL has also been communicating with the owner of land adjoining the development site to the south and east. These parcels of land do not have residences on them at present although they do have building entitlements (refer **Section 11.2.2**). A right of access exists over Lot 50 that contains the existing formed road that provides access to the development site and residence R1. As part of the proposed development WSPL plan to construct the access road and grid connection within the actual Crown road reserve that adjoins the development site. This arrangement has been developed in consultation with the Department of Industry – Lands (refer **Section 4.5.4**). Some of this Crown public road is subject to an Enclosure Permit (EP) held with the Department of Industry – Lands and the adjoining land owner.

A small section of the Crown public road is currently unmade. The Department has advised WSPL that the holder of the EP will be notified of the intended Crown road use for the WSF as part of the land tenure agreement process. WSPL has consulted with this landowner with regard to its plans for access, and location of the transmission line within the unmade Crown public road. WSPL will continue to consult with adjoining landowner to coordinate works in a way that avoids disturbance.

An issue raised by this landowner was a request that buried cabling be at a depth that will not compromise continued farming practices; principally ground disturbance during paddock work (eg. ploughing or sowing). A minimum depth of 0.5 m was discussed and this is satisfactory to both this landowner and WSPL.

4.3 ABORIGINAL STAKEHOLDERS

A four step process of consultation with Aboriginal stakeholders was undertaken in accordance the OEH *Aboriginal Cultural Heritage Consultation Requirements for Proponents (ACHCRP 2010)*.

- Notification letters were sent to the relevant bodies/agencies listed in the *ACHCRP* requesting details of any parties with a known interest, or who hold knowledge related to the study area. Following receipt of a list of potential Aboriginal stakeholders from the OEH, notification letters were sent to these organisations and individuals on the 6th of December 2016

Notification of the Aboriginal heritage project was also undertaken via the placement of a newspaper notice in the *Walgett Spectator* on 16th November 2016.

The notification phase resulted in the following groups expressing interest in the project:

- o Walgett Local Aboriginal Land Council
 - o Dharriwaa Elders Group
- A *Project Proposal Information* document for the assessment was forwarded to respondents. The document provided details of the project and the proposed heritage assessment methodology and invited comments from the interested parties. The document also sought any information regarding known Aboriginal cultural significance values associated with the study area and/or any Aboriginal objects contained therein.
- An archaeological survey was then undertaken involving a representative of the Walgett Local Aboriginal Land Council. General discussion was had regarding local Aboriginal heritage and the potential cultural significance of the area. No particular or immediate concerns were raised regarding the study area from the perspective of non-tangible cultural heritage.
- The draft report ACHAR was then provided to the Registered Aboriginal Parties (RAP) on 23 rd December 2016. Both the Walgett Local Aboriginal Land Council and the Dharriwaa Elders Group endorsed the recommendations of the ACHAR

4.4 WALGETT COMMUNITY

4.4.1 NEWSLETTER

In the week starting 21 November 2016 Australia Post delivered a project information newsletter and invitation for community feedback to the broader Walgett community. This newsletter introduced the development proponent WSPL and provided web-site links so that the community could find out more information about the company and its renewable energy projects. The newsletter also identified the location of the development, the size of the solar farm in terms of generation capacity and the likely infrastructure footprint. The newsletter explained that the solar farm is a development that requires consent and approval under NSW planning legislation and indicated that a range of environmental impact assessment studies were about to commence.

WSPL advised that the Walgett community's input to this assessment and approvals process was important to help ensure that local issues were well understood and considered in progressing the project. The newsletter also confirmed that the Environmental Impact Statement (EIS), when complete, would be available to the public on the NSW Department of Planning and Environment website and that public submissions would be sought.

The newsletter encouraged any member of the community to contact the WSPL project team to discuss any aspect of the solar farm development and provided assurances that contact details would be kept anonymous and confidential.

A community feedback form was also attached to the newsletter that asked the individual:

- to raise any specific concerns they may have about a solar farm development at Walgett;
- identify what it is that they value most about the local area;
- whether there was anything they wanted WSPL to be aware of;
- whether they wanted to be contacted by the WSPL project team.

Postal, email and phone contacts details for WSPL were included.

As at 15th February 2017 nine responses were received. An analysis of these and the feedback received is outlined below.

- Two responses were received from residents living less than 2 km from the development site, three responses from residents living between 2-5 km of the development site, and four from residents living greater than 5 km from the development site.
- Six wanted to be contacted by the WSPL project team to discuss the project. WSPL's Project Manager rang and spoke with all six.

No response raised any issues of concern. To the contrary, all responses were positive:

- o *Think it is a great idea, and all helps to reduce our dependence on traditional electricity generation. Go for it. The bigger the better.*
- o *I believe this will be a huge opportunity for the local community with lots of employment opportunities for the town plus boost local businesses and the overall local economy.*
- o *Great idea.*
- o *We were very excited to learn of your company's solar farm proposal for Walgett.*
- o *No concerns – should have happened years ago. Why waste sunlight.*
- o *The solar farm should be good for Walgett and district. I live along side and have no concerns.*
- o *Work opportunities. It should help a small town like Walgett.*
- o *Continued discussions with adjacent neighbours and support due to impact of new development on lifestyle and aesthetic appearance of the area.*
- o *Upgrading of the road will be good for the area.*
- o *Creek crossing upgrade will allow flowing of Pagan Creek through crossing which has up till now been prevented.*

Questions raised included:

- o *Does this mean that Walgett will be powered by solar or is all the power generated going into the grid? If power into the grid what benefits do the local residents expect from this. Is there employment opportunities, infrastructure, etc.*
- o *The best for the townspeople if it helps keep the cost of power down, or is it not for the people?*

4.4.2 OPEN HOUSE

WSPL conducted an Open House in Walgett on 14 February 2017. The purpose of the Open House was to provide the Walgett community with the opportunity to drop in and speak with members of the WSPL project team about the proposed solar farm. It was an informal day designed to enable the local community to obtain information about the solar farm at their convenience.

The intent was to provide information on the determination and approvals process and explain the process and means of making a submission during the exhibition period to the Department of Planning and Environment.

An invitation to attend the Open House and a newsletter providing an update on the project was disseminated by Australia Post in the week 30th January 2017, as well as being posted on WSPL's Walgett Solar Farm website and Facebook.

The Open House was attended by 11 members of the public, all who expressed their support for the project. Two questionnaires were completed, with the following comments:

- o *A great idea and logical development for the sunny town of Walgett. Any project carried out can only benefit the town and district – well done!*
- o *Great idea. The presentation and explanation was friendly and well explained. I like the idea of community involvement.*

4.4.3 WEBSITE AND FACEBOOK

A project website walgettsolarfarm.com.au was made live on 14 December 2016. The website includes information about the proposed project, WSPL contact information and a community feedback form. An invitation to the WSF open house was published on the WSF website and posted to the Epuron Facebook page on 24 January 2017.

4.5 GOVERNMENT AGENCIES

Consultation was undertaken with the following agencies during the preparation of the EIS.

4.5.1 WALGETT SHIRE COUNCIL

Consultation with Walgett Shire Council commenced in March 2016 where the project concept, local flooding, topography and bushfire information was discussed.

A second meeting was held with Council on 1 November 2016. The key outcome of these discussions were that:

- Council was most keen to maximise local benefits resulting from the development in terms of jobs and expenditure in the Walgett community.
- Notwithstanding that the land was flood prone, Council was of the opinion that flood behaviour across the site was not expected to be problematic as floodwaters were infrequent, quickly receded and did not have significant flow velocity.
- Council wanted WSPL to note that any sub-division that results in a lot size of less than 400 ha means that lot would lose the dwelling entitlement: even if there is an existing dwelling on that lot. This is noted and no sub-division is proposed.

A third meeting was held with Council on 25 November 2016, with Roads and Maritime Service, to discuss traffic impacts and access arrangements during construction of the solar farm.

A presentation on the status of the project was also provided in a briefing to a full Council meeting on 14 February.

4.5.2 ROADS AND MARITIME SERVICES

A site meeting was held with the Roads and Maritime Service on 25 November 2016 to discuss access arrangements off the Castlereagh Highway. This resulted in selection of a preferred access at an existing intersection that can be readily upgraded and provides adequate line-of-sight distances for safe access/egress.

4.5.3 NORTH WEST LOCAL LAND SERVICE

Consultation with the North West Local Land Services has confirmed that it has no objections to the proposed solar farm, that it would have no impact on any Travelling Stock Reserve and as a land use, the solar farm would not compromise any of the priorities of the *North West Local Strategic Plan* (NWLLS, 2016). As a passive land use without any cropping or grazing pressure the solar farm will provide an enhanced capacity to maintain 50% groundcover: one of the Walgett Sub-Region's key natural resource management priorities.

4.5.4 CROWN LAND

Consultation has been undertaken with the Department of Industry – Lands with regards to the Crown lands impacted by the proposed development (refer **Appendix F**). The nature of this impact and the proposed land management arrangements for accommodating this are outlined below.

Access to the development site at present is via a number of formed roads that traverse Crown land as well as private land holdings. This includes sections of basic access tracks, formed roads and the partially sealed and sign posted George Sands Way.

WSPL intend to formalise a legal access through constructing new sections of road as well as upgrading the existing road formation within designated Crown land road reserves.

The intent is to also lay an electrical cable in what is now Crown land to facilitate grid connection to Essential Energy's zone substation. Consultation with DPI – Lands has established that the appropriate mechanism for doing this is to define the Crown and Council road parcels as lots in survey plans and then create easements over these lots within which the underground transmission line would be placed.

4.5.5 JOHN HOLLAND RAIL

WSPL has consulted with John Holland Rail and will, if a network operator (eg. Essential Energy) does not construct and own the transmission line, require a licence for the transmission cable to cross the disused rail line.

4.5.6 CIVIL AVIATION SAFETY AUTHORITY

Consultation with the Civil Aviation Safety Authority (CASA) has established that as the WSF is not runway aligned and is close to 5 km north of the airport it is not likely to impact on pilots' sight during the critical approach phases of a flight (Air Navigation, Airspace & Aerodromes Branch, 22 December 2016). CASA does not consider the WSF to be a hazard to aviation but has recommend that anti-glare coating be applied to the panels to minimise any potential glare. WSPL has committed to utilising this coating.

4.6 NETWORK OWNER

The WSF has been sized to take advantage of available capacity in the network. Studies are currently underway to design the connection and to identify the technical requirements for the operation of the farm. These studies may have some impact on the final capacity of the WSF however neither EIGP nor Essential Energy expect these will conclude that less than 30 MW_{AC} is capable of being connected.

Consultation has also confirmed that Essential Energy has no objection to the proposed underground grid connection through the Essential Energy owned Lot 56 DP 752271: noting that:

- the cable route distance away from the existing 66 kV poles will be confirmed at the Design Certification phase; and
- if the cable is not going to be a gifted asset, an easement will be required through Lot 56 DP 752271. If the cable is to be a gifted asset no easement is required. This will be confirmed upon agreement of the Connection Point and the ownership of each party's network.

Environmental Issues

5.1 IDENTIFYING POTENTIAL CONSTRAINTS

The process of identifying key potential environmental issues associated with the construction and operation of the WSF commenced with a preliminary desktop risk assessment that identified the likely planning and environmental issues associated with the development.

Site inspections and specialist surveys were then completed to ground truth the bio-physical data sourced from the desktop assessment and inspect the features in and around the development site.

Targeted consultation with Council, neighbours, Roads and Maritime Service, North West Local Land Services and the Department of Industry – Lands was then undertaken with respect to specific issues.

The objective has been to accurately identify and map features of the development site and its surrounds that could represent a design constraint and to inform the impact assessment methodologies.

5.2 ENVIRONMENTAL ISSUES

The following have been identified as the key potential environmental issues associated with the WSF:

- Aboriginal Heritage
- Access
- Flooding
- Maximising local economic benefits

Other environmental issues include:

- Biodiversity
- Land Use
- Visual
- Noise
- Water
- Bushfire
- Air quality
- Waste management
- Electromagnetic Interference

Heritage

6.1 ABORIGINAL HERITAGE

6.1.1 ABORIGINAL CULTURAL HERITAGE ASSESSMENT

Building the WSF would involve ground disturbance with the potential to disturb Aboriginal heritage objects which are protected under the NSW *National Parks and Wildlife Act 1974*. The proposed development has been determined to be SSD, and as such is exempt from the requirement to obtain an Aboriginal Heritage Impact Permit (AHIP) to harm Aboriginal objects.

Notwithstanding, it is a requirement that Aboriginal heritage be assessed in a manner consistent with:

- *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010*,
- *Code of Practice for Archaeological Investigations*, and
- *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW*

Access Archaeology and Heritage (AAH) was engaged to prepare an Aboriginal Cultural Heritage Assessment Report (ACHAR) for the proposed WSF.

The objectives of the ACHAR were to:

- Undertake a search of the OEH Aboriginal Heritage Management System (AHIMS) database to determine if there had been any archaeological material recorded in the study area
- Consult the local Aboriginal community consistent with the intent of the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010*.
- To undertake an archaeological survey to determine if there are landforms with a high potential to contain Aboriginal objects and whether Aboriginal object occur within the study area.
- Assess the nature and level of disturbance of these landforms and the integrity of any Aboriginal objects.
- Complete a report on assessment and present recommendations for management of Aboriginal heritage in the study area.

A full copy of the ACHAR is provided in **Appendix C**.

6.1.2 CONSULTATION

A four step process of consultation with Aboriginal stakeholders was undertaken in accordance with clause 80C of the *National Parks and Wildlife Amendment (Aboriginal Objects and Aboriginal Places) Regulation 2010*.

The consultation steps listed below are outlined in the OEH *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010 (ACHCRP 2010)* guide.

Consultation Step 1 – Notification

Notification letters were sent to the relevant bodies/agencies listed in the ACHCRP requesting details of any parties with a known interest, or who hold knowledge related to the study area. Notification of the Aboriginal heritage project was undertaken via the placement of a newspaper notice in the *Walgett Spectator* on 16th November 2016.

Following receipt of a list of potential Aboriginal stakeholders from the OEH, notification letters were sent to these organisations and individuals on the 6th of December 2016.

The notification phase resulted in the following groups expressing interest in the project:

- Walgett Local Aboriginal Land Council
- Dharriwaa Elders Group

Consultation Step 2 Information to Respondents

A *Project Proposal Information* document for the assessment was forwarded to respondents. The document provided details of the project and the proposed heritage assessment methodology and invited comments from the interested parties. The document also sought any information regarding known Aboriginal cultural significance values associated with the study area and/or any Aboriginal objects contained therein.

Consultation Step 3 Information Gathering

An archaeological survey was then undertaken involving a representative of the Walgett Local Aboriginal Land Council. General discussion was had regarding local Aboriginal heritage and the potential cultural significance of the area. No particular or immediate concerns were raised regarding the study area from the perspective of non-tangible cultural heritage.

Consultation Step 4 Review

The draft report ACHAR was then provided to the Registered Aboriginal Parties (RAP) on 23rd December 2016. Both the Walgett Local Aboriginal Land Council and the Dharriwaa Elders Group endorsed the recommendations of the ACHAR.

6.1.3 REGISTER AND FIELD SURVEY

6.1.3.1 AHIMS Search

A search of the AHIMS register was undertaken over ~140 square kilometres, centred on the development area. This search showed that Aboriginal cultural material had been recorded at 91 locations. This material comprised:

- 84 Scarred Trees
- 1 Open Camp Site (Artefact Scatter)
- 3 Isolated Artefacts
- 4 Burials
- 1 Potential Archaeological Deposits (PADs)

None of these previously recorded sites are closer than 1 km from land to be impacted by the proposed solar farm.

6.1.3.2 Field Survey

Intangible Heritage

Discussion and correspondence with the Aboriginal Parties participating in the ACHAR did not reveal the existence of known intangible Aboriginal heritage. Mr Fields considered the landscape highly modified and the lack of water sources and variation in topography suggested no strong indication of the locality being particularly noteworthy.

Tangible Heritage

A total of five Aboriginal archaeological sites were recorded during the field survey, these being:

- 1 Isolated artefact, and
- 4 culturally modified trees

The culturally modified trees were observed on the periphery of the study area and none need be disturbed by the development. In addition, two trees exhibiting surveyors blazes and inscriptions were observed.

Table 6.1 – Heritage Sites

Site Name	Site Type	Description
WSF 1	Scarred Tree	South oriented scar on Coolabah tree
WSF 2	Isolated Artefact	Isolated grindstone fragment on plain.
WSF 3	Scarred Tree	Located on east side of access track, at north east corner of creek crossing. Scarred tree that has had top part of trunk removed, tree has since regrown from below scar.
WSF 4	Scarred Tree	Located on south bank of ephemeral creek.
WSF 5	Scarred Tree	South oriented scar on mature eucalypt.
WSF 6	Surveyor's Blaze	Surveyors blaze in eucalypt trunk. Surveyors scars very faint but arrow marks point to galvanised nail in trunk at top of scar.
WSF 7	Surveyor's Blaze	Surveyors blaze in eucalypt trunk. Blaze partly obscured by regrowth.

The locations of these sites are shown in **Figure 3**.

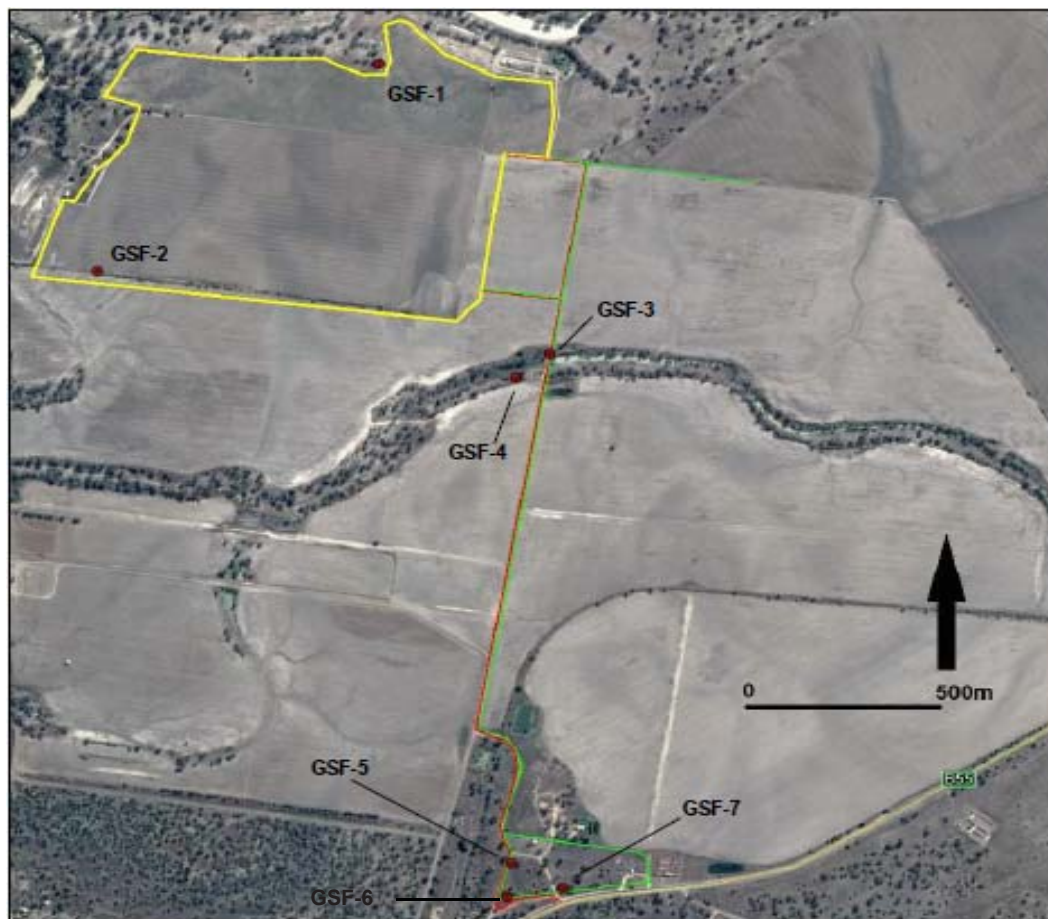


Figure 3: Recorded Heritage Sites

6.1.4 CULTURAL HERITAGE VALUES AND SIGNIFICANCE

6.1.4.1 Social or Cultural Value

Local Aboriginal people value evidence of their ancestors' occupation of the land extremely highly. Any evidence of occupation activity is afforded high cultural value. More complex or rare artefacts tend to be highly regarded. Discussion held during fieldwork illustrated a widely held deep and genuine regard for heritage sites and objects within the local Aboriginal community.

6.1.4.2 Scientific (Archaeological) Value

The scientific value of the occupation sites recorded during this study, while interesting, is limited due to overall low artefact numbers and sparse distribution. The archaeological value has largely been realised through the recording undertaken for this study.

6.1.4.3 Research Potential

Rarity

The sites recorded during this study are not rare. Scarred trees are the most commonly recorded site type in the region and isolated grindstone fragments are common.

Representativeness

The sites and objects recorded during this study are representative of their type and class in the region, being very widespread in the local and regional landscape.

Overall

Overall, the archaeological remains of occupation sites recorded during this project have low research potential beyond this current recording.

6.1.4.4 Aesthetic Value

The sites recorded during this study have low aesthetic value within the meaning attributed in a heritage assessment.

6.1.4.5 Historic Value

The study area in question is not directly associated with an important individual or identifiable historic event. Objects in the study area will not have 'historic value' within the meaning attributed by a heritage assessment.

6.1.4.6 Statement of Significance

As a group of objects the Aboriginal artefacts recorded during this project have overall low significance in that their ability to inform on Aboriginal life-ways and technology is limited, and largely realised during this recording. They are common and widespread elements that are to be found across the entire region.

6.1.5 ASSESSMENT OF HARM

The establishment of the proposed WSF will have a low impact on the archaeological resources of the study area. The installation of the framework to support the panels does not require substantial ground disturbing works and the vast majority of the land surface will remain undisturbed, and as a consequence there is low potential to cause significant harm to any recorded or unrecorded scatter of artefacts. It could be argued that establishment of the WSF could have a net beneficial effect on the conservation of the integrity of Aboriginal heritage objects by breaking the semi-annual cycle of cultivation. The proposed development will not affect Aboriginal scarred trees.

6.1.6 IMPACTS ON VALUES

6.1.6.1 Social and Cultural Values

The proposed development would not diminish social or cultural values of any site located wholly or partially on the study area. Local Aboriginal people will continue to hold any evidence in the study area in high value.

6.1.6.2 Scientific (Archaeological) Values

The proposed development would not significantly diminish the scientific value of the archaeology of the landscape. Indeed, overall it could be argued that the change of land use, accompanied by disturbance to a small proportion of the area, halts processes that incrementally degrade the integrity of the archaeological resource.

6.1.7 MITIGATION MEASURES

6.1.7.1 Management of Known Sites

- The isolated artefact WSF-2 should be found and relocated to the periphery of the development site directly south of its current location, and its new location marked with a steel star post to avoid further disturbance. The new location should be recorded on the AHIMS database through submission of an updated AHIMS recording.
- When undertaking re-development of the creek crossing the proponent must take note of the location of the scarred tree WSF-3 and avoid widening the crossing to the east.

6.1.7.2 Chance Finds Protocol

Section 89A of the *National Parks and Wildlife (NSW) 1974* requires that any person who is aware of the existence of an Aboriginal Object is required to notify the Chief Executive of the NSW Office of Environment and Heritage. To ensure compliance with Section 89A the proponent would undertake the following:

- Prepare an information poster for site staff that describes the most likely site occurrences that might be observed and how to recognise them.
- If an isolated artefact is discovered:
 - Record the location with a GPS using Eastings and Northings based on the GDA 94 Zone 55 Datum.
 - Take a photograph of the artefact with a scale (e.g. ruler) and a photograph of the general location noting the orientation (e.g., 'looking north' or 'looking east' etc.).
 - Move the artefact during work that may harm it and return it to the location immediately the work has concluded.
- If an isolated implement (e.g. hammer, hatchet, grindstone, etc.) is discovered:
 - Record the location with a GPS using Eastings and Northings based on the GDA 94 Zone 55 Datum.
 - Take a photograph of the artefact with a scale (e.g. ruler) and a photograph of the general location noting the orientation (e.g. 'looking north' or 'looking east' etc.).
 - Collect the artefact and store securely on site along with labelling that includes the Eastings and Northings.
- Where any other form or cluster of Aboriginal objects is discovered:
 - Record the location with a GPS using Eastings and Northings based on the GDA 94 Zone 55 Datum.
 - Take a photograph of the artefacts with a scale (e.g. ruler) and a photograph of the general location noting the orientation (e.g. 'looking north' or 'looking east' etc.).

- Isolate the area with a ~50m buffer and contact a qualified archaeologist for further information/advice on the most appropriate strategy.
- Within three months of making a discovery WSPL would inform OEH of its existence through a qualified archaeologist submitting an AHIMS recording form for each discovery. The person submitting the information will need to be supplied with the information recorded at the time of field recording and/or collection.
- Although very unlikely, if any object is found suspected to be human remains, work at the location must cease and the NSW Police (Walgett Police Station) and the OEH (Dubbo Office) must be contacted immediately. The location would be made secure to prevent unauthorised access and work continue no closer than 100 metres from the potential human remains.

6.1.8 CONCLUSION

The development should proceed with no further archaeological assessment. No areas of Potential Archaeological Deposit (PAD) were identified that would warrant test excavation and the significance of the Aboriginal heritage objects within the study area is low.

6.2 HISTORIC HERITAGE

6.2.1 HERITAGE ITEMS

A search of the NSW State Heritage Inventory (including the State Heritage Register, Interim Heritage Orders, State Agency Heritage Registers and Walgett LEP heritage items) did not identify any heritage items at or near the development site. Further, a search of the Australian Heritage Database (including items on the National Heritage List, World Heritage List, Commonwealth Heritage List and the Register of National Estate Non-Statutory archive) did not identify any recorded heritage items at or near the site.

Two potential heritage items were identified near the proposed access road at the southern end of the development footprint. These sites are surveyor's blazes marked on two trees. Works would not impact on these trees.

6.2.2 MITIGATION MEASURE

Should any object or item of historic heritage be uncovered during construction, work in that area should cease and the item cordoned off. A qualified heritage specialist would attend the site to determine the nature of the find and determine the required course of action; including consultation with the OEH if appropriate.

Access

7.1 INTRODUCTION

Once commissioned and operational the WSF will generate negligible traffic. The farm will operate independently and no permanent employees will be stationed on-site. The farm will be monitored remotely and visitation would be limited to periodic routine maintenance and infrequent plant and equipment replacements. It would be during the construction, upgrading and decommissioning of the farm that traffic movements would be significant.

7.2 TRAFFIC GENERATION

7.2.1 LIMITATIONS

While it is possible to estimate the likely quantum, type and routes of construction traffic, the way in which a large scale solar project like the WSF is delivered means that this can only be an estimate; albeit an informed one.

As noted earlier WSPL will, subject to securing development consent, appoint an Engineering Procurement and Construction (EPC) contractor to build and commission the WSF. The EPC contractor carries out the detailed engineering design of the project, procures all the equipment and materials necessary, and then constructs to deliver a functioning facility to their client.

What this means is that until the EPC contract is executed, and an EPC contractor subsequently determines sources of material and equipment and the most efficient haulage routes and means for delivery to Walgett, very detailed and precise information about construction traffic is not known. For example:

- the port (Brisbane, Sydney or Newcastle) at which components will be received is not locked in and accordingly, the national highway used to transport this equipment to Walgett is not certain;
- strategies to deliver equipment to a warehousing facility in the region and then deliver modules and frames to site on as needed basis to spread construction traffic through the construction period may be realised;
- the possibility of utilising rail to Dubbo or Moree cannot be ruled out;
- shuttle busses rather than the use of personal vehicles could be employed to reduce light vehicle movements for the construction crews.

These unknowns, at this stage of the project, are understood by Roads and Maritime Service (RMS).

This absence of detailed and definitive information is managed as follows. An informed estimate of likely traffic volumes and likely routes is presented to inform the determination of the Development Application then, subject to securing Development Consent, and before any construction works can commence, WSPL's EPC contractor submits a Traffic Management Plan to both Walgett Shire Council and the RMS for approval. This hold point ensures that the impact of generated traffic and the measures proposed to ensure the efficiency and safety of the public road network can be validated by these road authorities against a definitive traffic profile. At this point construction scheduling and staging detail, peak times and duration for project related traffic, transportation routes, etc. will be known.

It is in this context that the information presented below should be considered.

7.2.2 ESTIMATES

Construction is expected to be completed over a 9 month period with an expected peak period of 5 months during which a range of construction tasks will be undertaken concurrently. During this peak it is anticipated that up to 85 workers would be on-site daily, dropping to 20 workers for the 4 month shoulder periods.

It is expected that the EPC contractor would look to provide a shuttle bus service rather than provide provision for on-site parking for up to 85 light vehicles. Notwithstanding, for assessment purposes it is assumed that a shuttle service is not provided and only 30% of the 85 workers would participate in some form of carpooling; resulting in an estimated 60 private light vehicles travelling to and from the site daily for this 5 month peak period.

Estimates of total heavy vehicle movements associated with the delivery of farm infrastructure and associated materials and resources to build the WSF are provided in **Table 7.1**.

Table 7.1 – Heavy Vehicle Numbers

Plant/Equipment	Description	Heavy Vehicles
Modules	The ~90,909 modules, with a combined weight of 2,182 tonne, could be delivered in 44 x 50 tonne B-doubles	44
Mounting frames	The ~16 tonne of mounting frames could be delivered in two (2) semi-trailers	2
Piles	The 39,130 piles could be delivered in 82 x B-doubles	82
Inverter Stations	The 150 tonne of inverter stations (whether it be 14 of the 2.2 MW units or 6 of the 4.92 MW units), could be delivered in 3 x 50 tonne B-doubles.	3
Transformer	One (1) over mass vehicle would be required to deliver transformer for the step-up substation	1
Concrete	Estimate 360 m ³ required for sub-station compound, inverter assembly foundations and security fence, would generate 33 X 11m ³ concrete trucks.	33
Gravel	Estimated 1,800m ³ of gravel (2,700 tonne) for upgrade of access road would be delivered in 54 x 50 tonne truck & dog trailers	54
Sand	Estimated 500m ³ of sand (~800 tonne) would be delivered in 16 x 50 tonne truck & dog trailers	16
Water	Estimated 3 ML based on 50 kL/day in dry/windy conditions for dust suppression (assumed to be 50% of days during the 5 month construction peak period) delivered in 112 x 27 kL bulk tankers	112
Miscellaneous	Provision for miscellaneous deliveries based on three (3) incidental heavy vehicles a week for the 9 month construction period	108
TOTAL		455

The maximum number of heavy vehicles accessing the site during the peak of the construction period is not expected to exceed 20 (i.e. generating a total of 40 heavy vehicle movements in a day).

7.3 SITE ACCESS

The proposed access off the Castlereagh Highway to the development site is known and fixed, and has been selected in consultation with both Council and RMS as a result of an on-site inspection and consideration of options.

The intention is to upgrade an existing intersection to provide for a BAL/BAR treatment prior to the commencement of construction works (refer **Drawing EV05**).

This existing intersection is located where the posted speed limit on the Castlereagh Highway is 100 kilometre per hour. Line-of-sight distances are 280 metres to the south and 550 metres to the north. The requisite line-of-sight to provide a 2.5 second response time is 248 metres. As such line-of-sight conditions permit compliance with requisite design standards.



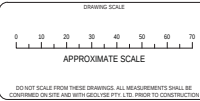
LEGEND

LOT BOUNDARIES
NOTE: CADASTRAL LOT BOUNDARIES
ARE INDICATIVE ONLY

GEOLYSE
ORANGE

204 PEARCE STREET
P.O. BOX 1385
ORANGE, NSW 2825
Ph: (02) 6951 5100
Fax: (02) 6951 5101
orange@geolyse.com
www.geolyse.com

REV	DATE	BY	APPD	DETAILS
A	22/03/2024	ST	AGB	FOR EXHIBITION
C	24/03/2024	ST	AGB	WORKING DRAFT
D	27/03/2024	ST	AGB	WORKING DRAFT
E	28/03/2024	ST	AGB	FOR DEVELOPMENT APPLICATION
F	08/04/2024	ST	AGB	FOR DEVELOPMENT APPLICATION
G	08/04/2024	ST	AGB	FOR EXHIBITION



APPROVAL AUTHORITY

NSW Planning & Environment

CLIENT

WALGETT SOLAR PTY LTD

PROJECT

WALGETT SOLAR FARM

DRAWING SITE ACCESS TREATMENT

PROJECT NUMBER 217143	DRAWING FILE 217143_001_EV05-EV07.dwg	ORIGINAL
DATA SOURCE -		A1
DRAWING SOURCE -		ST
STATUS FOR REVIEW	SHEET EV05 OF EV07	01

7.4 HAULAGE ROUTES

7.4.1 TO THE HIGHWAY ACCESS

As noted above, until the EPC contractor completes their investigations, equipment and material supply contracts executed and transport logistics finalised it is not possible to specify haulage routes. Notwithstanding, vehicles will use either the Castlereagh or Kamilaroi Highways. This would mean heavy vehicles could approach the access from either the north (via the Kamilaroi Highway with a right turn into the upgraded access intersection) or from the south (with a left turn in).

7.4.2 FROM THE HIGHWAY ACCESS

From the highway access the existing partially formed track/road will be upgraded to accommodate vehicles associated with the construction effort. Consultation with Council and the Department of Industry – Lands has determined which of the existing tracks/roads should be utilised to ensure the upgraded road is located within the actual road reserve.³

To this end, the sign posted (and partially sealed) Georges Sands Drive located further to the south would not be used as the road traverses private and third party lands, has its intersection with the Castlereagh Highway on a bend where line-of-sight distances are less than ideal, and because its use would put construction traffic onto a road that is used by people living in the Namoi Village.

7.5 EXISTING TRAFFIC

Traffic data supplied by RMS Services Journey Information provides a summary of known traffic volumes, type and direction for the Castlereagh Highway north of Walgett. This data is limited to counts collected in 2009 immediately north of Saleyards Road (i.e. within 1 km of the proposed WSF access). It is not anticipated that traffic volumes on the Castlereagh Highway would have changed significantly in the intervening period. The traffic logger data available is summarised in **Table 7.2**.

Table 7.2 – Daily Traffic Count Data Castlereagh Highway

Vehicle Type	Northbound	Southbound	Total
Light vehicles	320	311	631
Heavy vehicles	98	103	201
All vehicles	418	414	832
AM Peak			
Peak Hour	1100 – 1200	0800 – 0900	
Total Vehicles	28	36	
Heavy	8	6	
Light	20	30	
PM Peak			
Peak Hour	1700 – 1800	1500 – 1600	
Total Vehicles	35	36	
Heavy	7	6	
Light	28	30	

Source: Roads and Maritime Services Journey Information (Station 96324)

³ Consultation with Council has established that George Sands Drive is a gazetted Crown Road that only starts north of Lot 7005 DP 1057529. South of this point back to the highway, where the road traverses a number of third party landholdings, the official status of the road is un-determined: notwithstanding that it is paved and maintained by Council.

7.6 MITIGATION MEASURES

7.6.1 ROAD UPGRADES

7.6.1.1 Highway Intersection

Prior to the commencement of construction the existing intersection off the Castlereagh Highway would be upgraded to provide a BAL/BAR treatment to the satisfaction of Council and the RMS and in accordance with *Austroads Guide to Road Design* and *RMS Supplements*.

7.6.1.2 Crown/Public Road Upgrade

The existing track/road to the development site would be upgraded in consultation with Council and Department of Industry - Lands. The upgrade would be limited to providing a hardstand gravel surface to provide all weather access and a minor realignment at the south to ensure the upgraded road is located within the road reserve (and not private land), as well as provide adequate road geometry to accommodate the swept path of a 36.5 m road train.

This is a requirement because although the vast bulk of heavy vehicles associated with the WSF would be standard 25 m B-doubles or 19 m semi-trailers, there could be some over length vehicles required for the delivery of select farm infrastructure.

A further consideration is that an existing livestock transport business (PKH Transport) uses this access and wants to retain the ability to 'square up' when entering onto the Castlereagh Highway. To this end, it is noted that the existing track/road at this location traverses private land and is not located in the road reserve; hence the proposed minor realignment at this location.

This access route crosses the disused Walgett-Narrabri rail line and does not create any rail safety issues. The road also crosses the Top Mile Warrnambool and will require installation of culverts at this crossing. Compared to the existing arrangement culverts will permit flow and environmental improvement.

7.6.2 TRAFFIC MANAGEMENT PLAN

A traffic management sub-plan would form part of the Construction Environmental Management Plan (CEMP) to be prepared and approved prior to construction of the WSF commencing.

This sub-plan would include details of the measures to be implemented to protect traffic safety and minimize any disruption to local users of the road network, including

- Temporary traffic controls, including signage.
- Notifying the local community about project-related traffic.
- Scheduling of haulage vehicle movements to minimize convoy lengths or platoons.
- Ensuring all vehicles are loaded and unloaded on site and enter and leave the site in a forward direction.
- A driver's code of conduct that addresses travelling speeds; procedures to ensure that drivers adhere to the designated transport routes; and procedures to ensure that drivers implement safe driving practices.
- Ensuring there is sufficient parking on site for all vehicles and no parking occurs on the public road network in the vicinity of the site.
- Procedures for maintaining accurate records of the number of heavy vehicles entering or leaving the site each day.

7.7 IMPACTS

Traffic impacts associated with the WSF will be temporary, readily manageable and post construction, leave in place road infrastructure assets that are an improvement on the existing situation.

The capacity, due to its location, and intent to upgrade the existing intersection off the Castlereagh Highway will ensure the efficiency and safety of the public road network for motorists.

The requirement to submit and have approved a Traffic Management Plan before construction commences will also provide certainty that the measures to be employed for managing known traffic impacts are fit-for-purpose.

Upgrading the existing access road to the development site to provide an all-weather gravel surface, within the road reserve and built to Council standards, will provide benefits to current users of this road in terms of improved accessibility.

Flooding

8.1 FLOOD PRONE LAND

8.1.1 CONTEXT

Walgett is located on the southern bank of the Namoi River approximately 5 km upstream of its confluence with the Barwon River. The development site, as is most of the Walgett Local Government Area, located on land that is subject to flooding.

The *Walgett Shire Development Control Plan 2016* (DCP) notes that a significant amount of land within the Shire (about 85%) consists of a floodplain land form and is potentially flood prone.

The mapped flood prone land status within a 5 km radius of Walgett is shown in **Figure 4**. This shows the development footprint sits outside those lands mapped as subject to high velocity flood waters: a situation which is supported through the observations of long term residents and Walgett Shire Council.

8.1.2 EXISTING LEP PROVISIONS

The *Walgett Local Environmental Plan 2013* (LEP) states that development on land at or below the flood planning level must not be granted consent unless the consent authority is satisfied that the provisions of Clause 6.2 of the LEP have been met. The objectives of this clause are to:

- minimise the flood risk to life and property associated with the use of land;
- allow development on land that is compatible with the land's flood hazard, taking into account projected changes as a result of climate change; and
- avoid significant adverse impacts on flood behavior and the environment.

8.1.3 PLANNING PROPOSAL

Walgett Shire Council is currently publicly exhibiting (23 January to Friday 10 March 2017) a Planning Proposal to amend the *Walgett Local Environmental Plan 2013*. One of the objectives of this proposal is to amend Clause 6.2 to reflect a lack of flood planning level data to provide a 1:100 average recurrent interval flood event.

Council is doing this in order to:

provide a flood planning clause which reflects development standards applied to flood liable areas in the absence of a flood study.

The intended outcome of the planning proposal will be achieved by an:

Amendment of Clause 6.2 Flood Planning of the Walgett LEP 2013 to remove references to a flood planning level and average recurrent interval flood events.

The justification for this is that Council considers:

It is appropriate to remove references to a flood planning level and average recurrent interval flood events as no flood study for Walgett Shire has been done

and because

Amendment of the flood clause will provide greater clarity to homeowners, developers and insurers regarding how flood risk is assessed in the Walgett Shire.

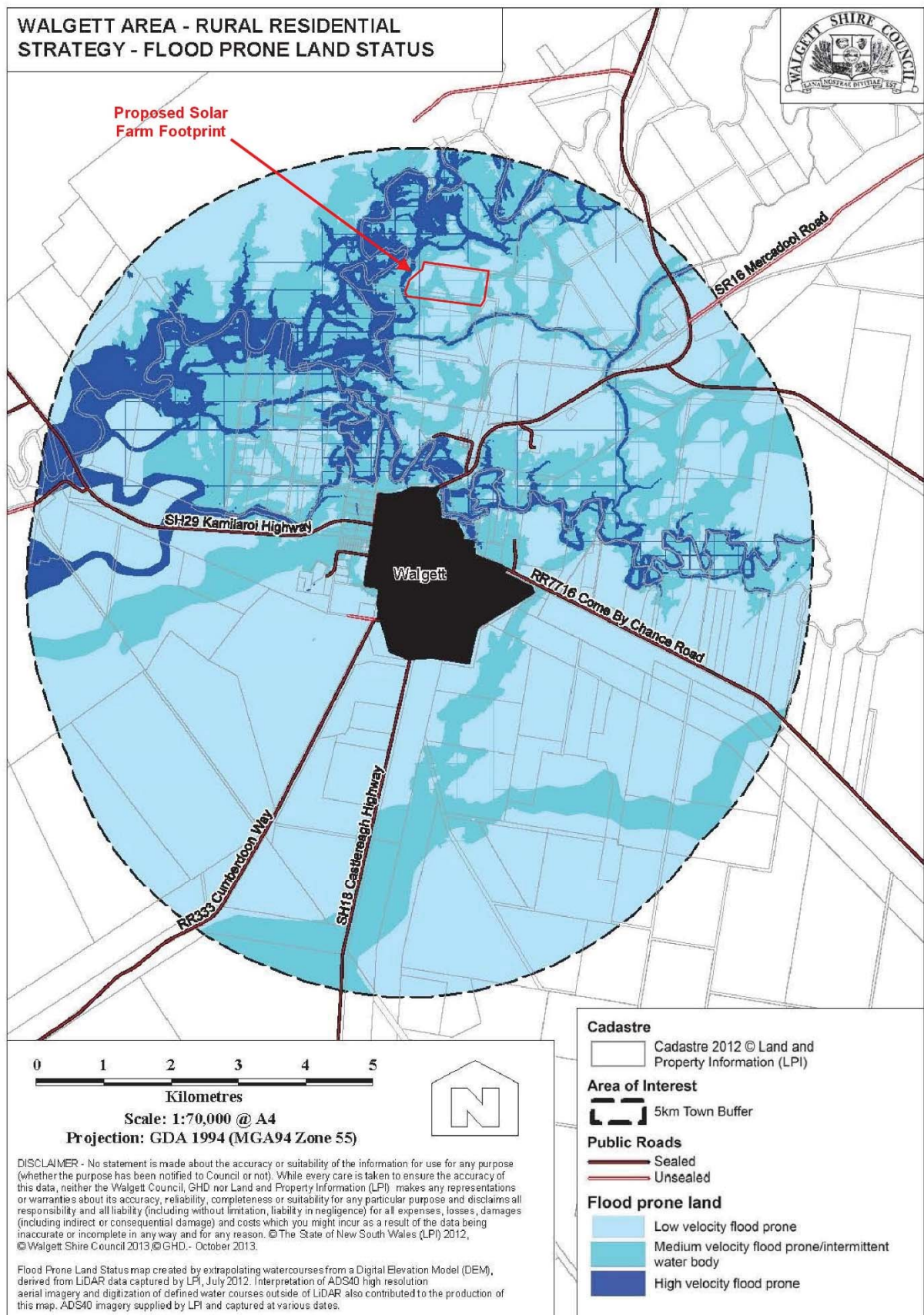


Figure 4: Flood Prone Land (Source: GHD)

8.2 FLOOD LEVELS

The extent of flooding over the development site and the associated impacts of the solar farm has been determined and mapped through analysis of work completed by the NSW Department of Commerce - Dams and Civil Unit in November 2005, hydraulic modelling and local flood data.

8.2.1 WALGETT LEVEE INVESTIGATION

The NSW Department of Commerce work was undertaken to inform the design height of the flood mitigation levee at Walgett (NSW Department of Commerce, 2005). The primary objective of this study was to investigate and verify the height of the levee to withstand, as a minimum, the 1% Annual Exceedance Probability (AEP) flood by carrying out investigations to update the previous flood studies and by using available gauge data collected since 1990.

Estimated design flood levels at Walgett Township were determined to be 132.95 mAHD for the 1% AEP flood event and 133.95 for the Probable Maximum Flood (PMF).

The study also concluded that the floodplain at Walgett is very wide and open with very flat slopes and the chance of occurrence of a PMF is very low. The estimated Average Recurrence Interval of the PMF was found to be about 10^4 years (0.01% AEP probability only).

Peak discharge for the top 10 historical floods taken from the Walgett levee investigation (NSW Department of Commerce, 2005) is provided in **Table 8.1**.

Table 8.1 – Top 10 Peak Annual Flood Data, Barwon River at Dangar Bridge

Flood rank	Year	Peak Discharge, m ³ /s
1	1890	5451.4
2	1976	5164.8
3	1974	4195.4
4	1950	3703.7
5	1921	2905.1
6	1998	2814.8
7	1956	2708.3
8	1910	2604.2
8	1971	2604.2
10	1988	1859.9

Source: NSW Department of Commerce (2005) Table A1

8.2.2 HYDRAULIC MODELLING

For the assessment undertaken in this EIS a HEC-RAS hydraulic model was developed for the site using available contour data (0.1 m interval data). Seven cross sections were extracted covering a section of the flood plain starting about 1,200 m downstream of the site and extending about 1,200 m upstream of the site. The downstream cross section was at the junction of the Namoi and Barwon Rivers. The hydraulic model cross sections are shown on **Figure 5**.

Data from the Walgett levee investigation (NSW Department of Commerce, 2005) including 1 % AEP flow (5,900 m³/s) and flood gradient (0.0001 m/m) were used to define flow conditions and downstream starting conditions. Model hydraulic parameters were adjusted to achieve a 1% AEP flood level of around 132.95 mAHD at model section 2.5 to be consistent with the NSW Department of Commerce study.

The 1% AEP design peak discharge of 5,900 m³/s is higher than the flood peak on record for the 1890 flood which is 5,451.4 m³/s (refer to **Table 8.1**).

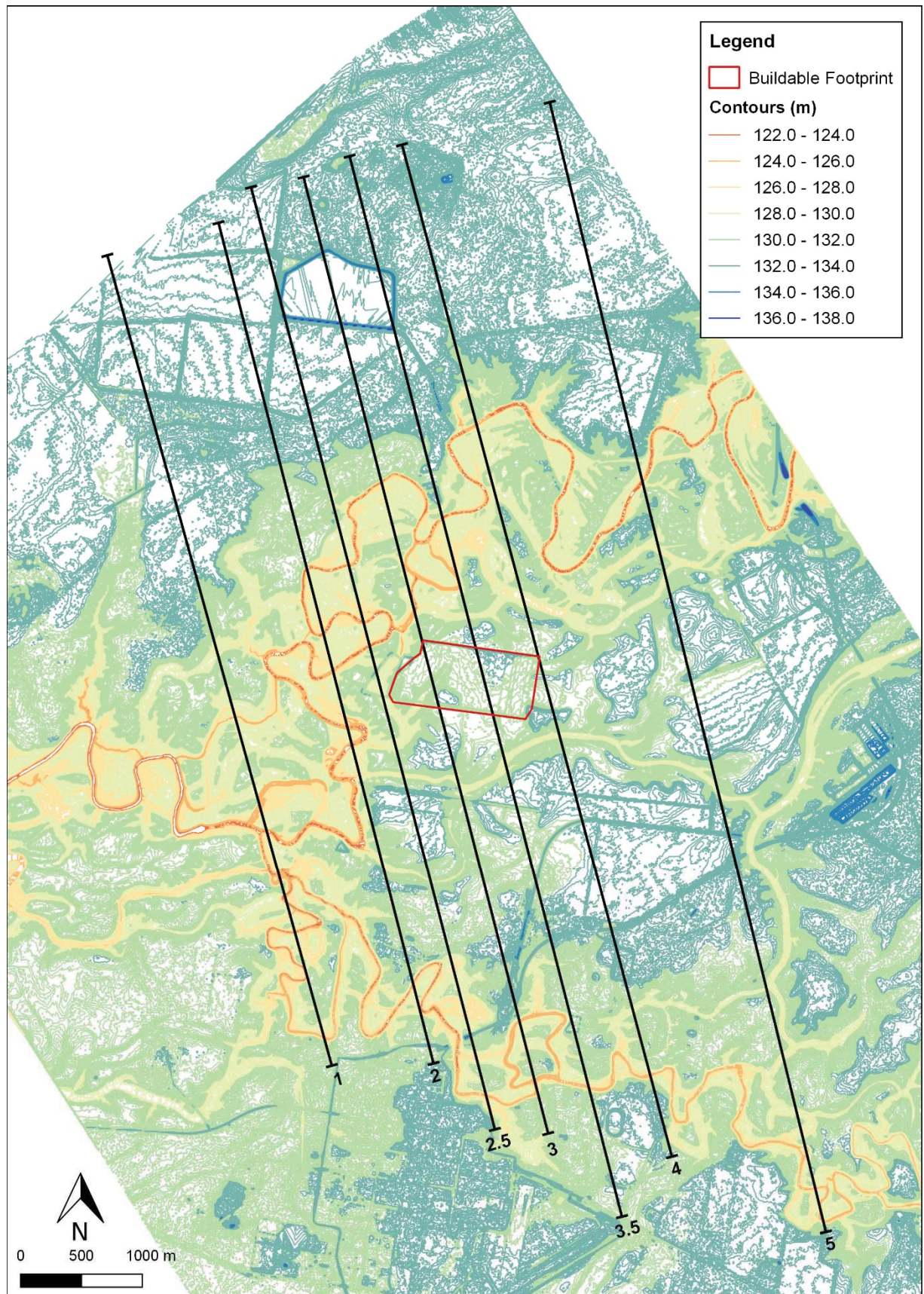


Figure 5: HEC-RAS Hydraulic Model Cross Sections

The hydraulic model was then used to identify flood depths and velocity across the development site and to assess potential flooding impacts.

8.2.3 LOCAL FLOOD DATA

Local flood data was discussed with the owner of Residence R1 which is approximately 330 m to the north of the proposed farm. The owner has observed flooding in the area since 1970 and constructed a levee around his residence in 1982/83. The height of the levee was based on observed flood levels.

Flooding observations at Residence R1 are:

- the 1976 flood is the largest flood in more recent times;
- the 1890 flood was larger than the 1976 flood;
- the levee bank around his house was constructed with a crest height that is approximately 300 mm above the 1976 flood level at this location;
- floods in 1998 and 2012 came around the base of the levee; and
- the 2012 flood was between the 1971 and 1974 floods.

The available contour data shows that the levee at Residence R1 has a crest height of approximately 133 mAHD and the area around the base of the levee is at approximately 132 mAHD.

8.2.4 ADOPTED FLOOD LEVELS

The above data were combined to generate 1% AEP flood levels across the site.

Adopting an approximate 1% AEP flood level in the hydraulic model of 132.95 mAHD at the western end of the site (corresponding with the Walgett levee investigation) indicates that the 1% AEP flood level would be approximately 133.07 mAHD at the eastern end of the site due to the flood gradient.

Flood depths across the site derived from the hydraulic model are shown on **Figure 6**. Flood depths are less than 1.5 m across the majority of the site with shallower flood depths along the northern part of the site. There are areas where the flood depth is greater than 1.5 m and these are generally associated with shallow drainage depressions draining from the site on the southern side.

Modelled 1% AEP flood velocity across the site is low at 0.4 to 0.5 m/s.

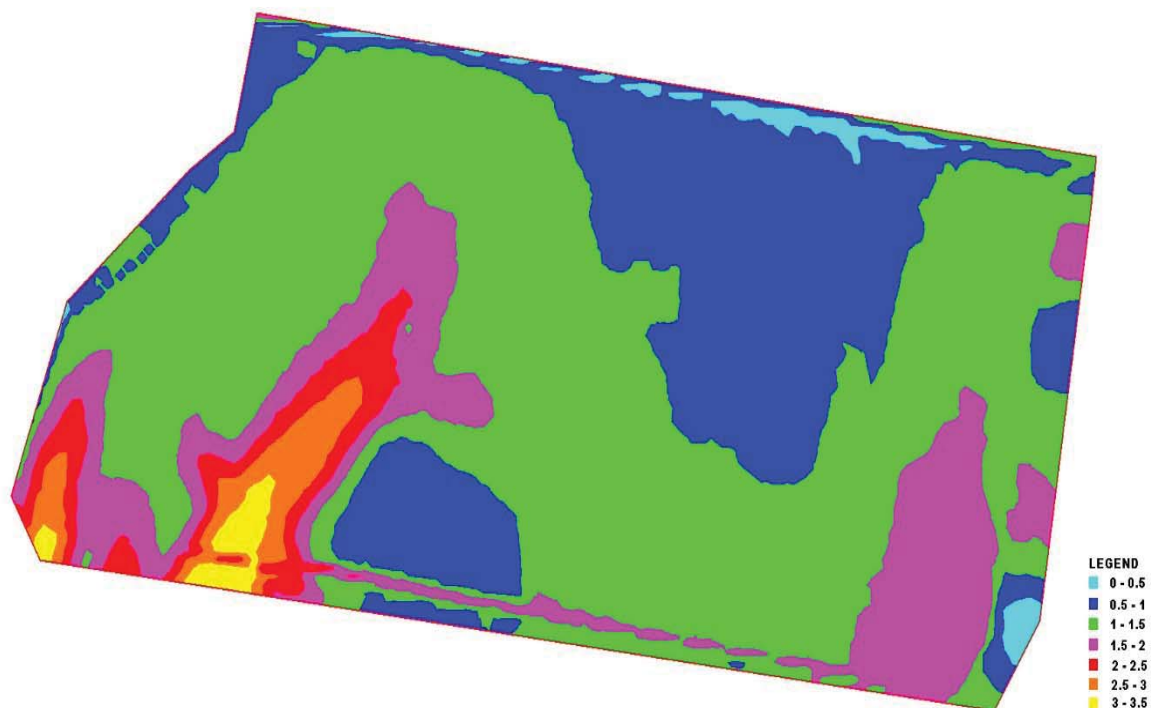


Figure 6: 1% AEP Flood Depths

8.2.5 COMPARISON TO OBSERVED DATA

The hydraulic model was used to estimate flood levels at Residence R1 using the design 1% AEP flood flow and relevant historic flood flows from the Walgett levee investigation (NSW Department of Commerce, 2005). Results are summarised in **Table 8.2**.

The available contour data shows that the levee at Residence R1 has a crest height of approximately 133 mAHD. The model results indicate that the levee would be overtopped in the 1% AEP design flood and for a repeat of the 1890 event; and almost for a repeat of the 1976 event.

The height of the levee crest was based on observed flood data and at the time of its construction the crest was estimated to be 300 mm above the 1976 flood level. This suggests that the hydraulic model may be over estimating flood levels across the site and would therefore be providing a conservative assessment of the flooding impacts on and of the proposed solar farm.

Table 8.2 – Top 10 Peak Annual Flood Data, Barwon River at Dangar Bridge

Flood	Peak Discharge, m ³ /s	Modelled Flood Level, mAHD
1% AEP	5900	133.19
1890	5451.4	133.05
1976	5164.8	132.96
1974	4195.4	132.57
1998	2814.8	132.04
1971	2604.2	131.95

8.3 IMPLICATIONS

The fact that the development site is located on flood prone land has two implications:

- there is the potential for flood events to impact on solar farm infrastructure; and
- There is potential for impact of the proposed solar farm for a third party in terms of the development causing changes to areas of inundation and afflux levels.

These potential impacts are discussed below.

8.3.1 IMPACT ON SOLAR FARM

A solar farm can be built and operated on flood prone land. There are however key elements of infrastructure that need to be positioned above a defined flood event. For the WSF WSPL has determined that this flood event is the 1 in 100 year event (1% AEP flood).

What this means is that particular sensitive infrastructure needs to be constructed at sufficient height to sit above the 1% AEP. This infrastructure includes the substation, the inverter stations and (if single axis tracking technology is proposed) the motor units that track the modules to follow the sun; noting that these modules provide the ability to set the panels to horizontal and above flood waters.

Minor earthworks will be undertaken in a balanced cut and fill operation such that no part of the development site would sit greater than 1.5 m below the 1% AEP flood level (refer to **Section 8.4**).

8.3.2 IMPACT OF SOLAR FARM

Infrastructure associated with the solar farm below the 1% AEP will effectively represent potential 'blockages' in the floodplain. The extent of these blockages is summarised below.

- Minor earthworks such that natural drainage patterns onto and off the development site are not significantly changed, but that the ground level is formed such that no part of the development site would sit greater than 1.5 m below the 1% AEP flood level.
- Sub-station: the substation would occupy an area of up to 90 m x 120 m. The substation is located in the proposed south eastern corner of the development site.
- Inverter stations: in the context of impacts to flooding behaviour, the worst case scenario for the inverter stations is that there are 14 x 2.2 MW units, each housed within a 20 foot shipping container, supported on 8 legs, with each leg 300 mm x 300 mm. In this scenario there would be a total of 84 legs supporting the inverters. The exact location of the inverters is not known but would be dispersed evenly across the development footprint.
- Piles: the farm would include approximately 39,310 piles supporting the modules; with each pile 100 mm x 100 mm.
- Security fence: a standard chain mesh security fence would surrounds the 58 ha development site.

The potential impact of the solar farm was assessed using the hydraulic model by assuming that the existing floodplain is fully blocked for the extent of the solar farm footprint. This assessment indicated very slight flood level increases of 10 to 20 mm upstream of the solar farm site with insignificant changes in flood velocity. The insignificant change in flooding patterns results from the very wide floodplain section.

The fully blocked hydraulic model assumption provides a conservative assessment of the potential flooding impact as it assumes the developable area cannot convey flood water and all flood water would need to pass around the site and be re-distributed across the floodplain. This would not be the case as apart from the earthworks shaping and raised substation mound, the remainder of the development would be on piles and/or legs to raise equipment above the 1% AEP flood level. The area in between the piles/legs will provide flood water conveyance.

The site generally falls in a south-west direction. It is higher along the northern site boundary and has several shallow drainage depressions along the southern side which leave the site. With rising flood waters, these drainage depressions would fill with water backing up from the main river channel or Two Mile Warrambool. Once high enough, flood water would overtop the northern side of the site and flow across the site in a south-westerly direction. Receding flood water would reflect the opposite pattern; overland flooding ceasing then waters receding in the drainage depressions as river levels drop.

The shallow drainage depressions along the southern side of the site will be filled to ensure they are no lower than 1.5 m below 1% AEP flood level. This will remove some flood storage volume on the rising limb of a flood; however the magnitude of the flood storage lost is insignificant in the overall floodplain. Filling these drainage depression would cause negligible changes in flooding patterns.

It is concluded from this assessment that the proposed solar farm would have an insignificant impact on flood behavior or the environment.

8.4 EARTHWORKS/LANDFILLING

Balanced cut and fill earthworks will be undertaken to establish a finished ground level across the site that will be no lower than 1.5 m below 1% AEP, and build up the on-site substation pad (90 m x 120 m).

The flood assessment has been used to identify those areas on the site that are more than 1.5 m below the 1% AEP flood level. These principally are located along the southern side of the site, in shallow drainage depressions in the south-west and south-east of the site. Balanced cut and fill earthworks will be used to raise the low areas of the site. The existing fall of the site to the south-west and the shallow drainage depressions in the west and east will be retained. Indicative cut and fill areas are shown on **Figure 7**.

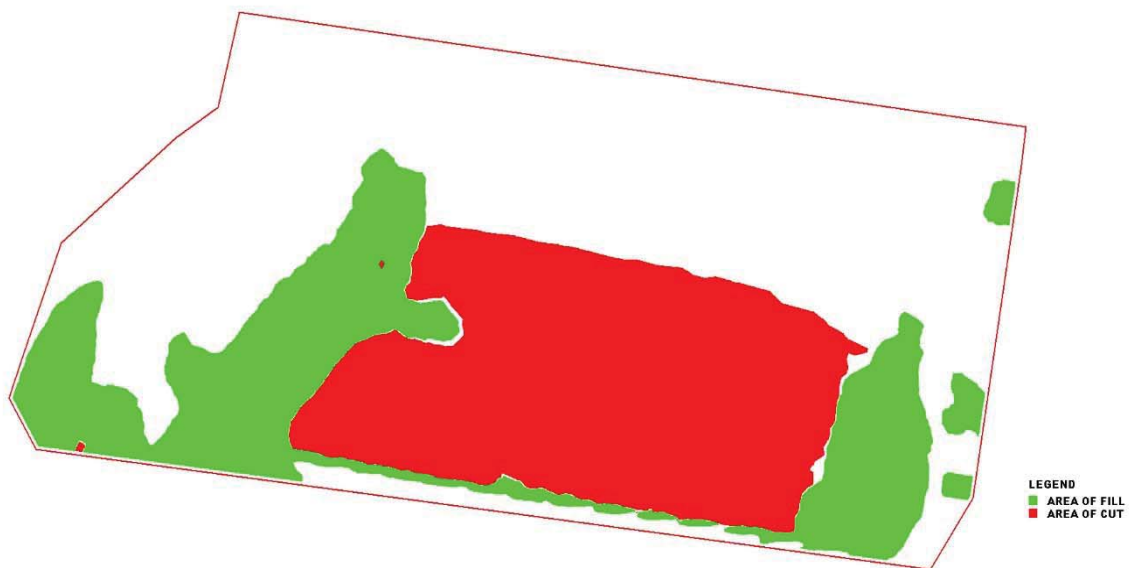


Figure 7: Indicative Cut and Fill Earthworks Extents

The proposed cut/fill earthworks will be undertaken to retain the general site fall to the south-west and existing drainage patterns. The hydraulic assessment of the development, assuming the area was fully blocked, indicated no detrimental flooding impacts.

The solar farm, consistent with the requirements of the *Walgett Development Control Plan* (DCP), will not obstruct the movement of floodwater or cause concentration or diversion of floodwaters.

8.5 CONCLUSION

Earthworks will be undertaken to establish a finished ground level across the site that will be no lower than 1.5 m below 1% AEP. This will be achieved through balanced cut and fill (i.e. the material used as fill will be sourced from the site) which will retain floodplain storage and will not adversely impact on flooding patterns.

Land shaping will be designed to ensure that natural drainage patterns onto and off the development site are not significantly changed. The existing fall of the site to the south-west and the shallow drainage depressions in the west and east will be retained, albeit raised to meet the design requirements.

The majority of the development will be on piles and/or legs to raise equipment above the 1% AEP flood level. The area in between the piles/legs will provide flood water conveyance.

As a development and land use the WSF is not incompatible with the flood hazard of the land. Hydraulic modelling, assuming a total blockage across the full extent of the development site (which will not actually be a consequence of the solar farm development and therefore represents a very conservative basis for assessment) shows that the WSF will not significantly adversely affect flood behavior or cause detrimental increases in the potential flood affectation of other development or properties. The WSF will

not result in unsustainable social and economic costs to the community as a consequence of an associated flooding impact.

Detailed design, informed by soils and geotechnical investigations, will specify appropriate measures to manage flood related risk and construction methodologies to avoid erosion. The requirement for these to be specified in a Construction Environmental Management Plan (CEMP), to be developed in consultation with Walgett Shire Council; and DPI – Water, and approved by the Department of Planning and Environment before works commence on site, provides the safeguard mechanism for ensuring adverse impacts are avoided.

8.6 MITIGATION MEASURES

8.6.1 DESIGN

Subject to securing development approval detailed design of the solar farm will be undertaken. As part of this detailed design a range of specific and targeted studies will be completed to inform the detailed design. These will include soils and geotechnical investigations to refine a farm layout, requisite earthworks and the need (or not) to adopt particular safeguards during construction (e.g. the treatment of sodic soils to minimise the potential for tunnel erosion).

Whilst there is adequate understanding of flood behaviour to conclude flooding impacts will be negligible, consistent with the requirements of the Walgett Development Control Plan, civil earthworks drawings will be prepared that specify the design contour levels for the finished works and a report certified by a consulting engineer confirming that the earthworks will have no impact on adjoining properties. This report will validate:

- that there will be no detrimental effect on drainage patterns and soil stability in the locality of the development;
- the effect of the development on the likely future use or redevelopment of the land,
- the quality of the soil to be cut, and
- any appropriate measures proposed to avoid, minimise or mitigate the impacts of the development.

Design criterion in relation to earthworks will be to ensure that works do not have a detrimental impact on environmental functions and processes, neighboring uses, cultural or heritage items or features of the surrounding land.

8.6.2 CONSTRUCTION

The CEMP to be approved before works can commence will provide detail on:

- the extent of earthworks;
- method of compaction of fill and associated impacts (control of dust, and requisite erosion and sedimentation controls, stabilisation);
- particular safeguards (e.g. the treatment of sodic soils – if required - to minimise the potential for tunnel erosion); and
- contingency arrangements for the containment of fill in the event of a flood during placement.

Economic Opportunity

9.1 COMMUNITY VISION

The Walgett Shire's *Community Strategic Plan 2012 – 2022* contains the following Vision Statement:

That the community be able to utilise the opportunities that arise within our environment, to improve their quality of life, while embracing their own culture and social diversity to the benefit of all.

A core Council objective for the Shire's economic development is:

... a strong and diverse economic base that supports employment and industry, to be realised through an economic development strategy that identifies potential projects and industries that build on the Shire's attributes and natural resources.

Walgett's solar resource is both natural and significant, and the WSF is a project that provides economic opportunities.

9.2 OPPORTUNITIES

The WSF has a capital investment value of \$55.5 million. Construction will generate local employment opportunities and a demand for services and resources that can be locally sourced. The project is expected to take nine months to build; inclusive of a five month peak period when there will be a requirement for up to 85 workers to be on site. For the other four months there is expected to be 20 workers on site.⁴

The roles required will vary from highly skilled electricians able to work with solar PV system (both low and high voltage) to general labourers. There will be contracts let for the provision of raw materials (eg. gravel, sand, concrete) and civil works plant and operators (e.g. graders, piling rigs, mobile cranes, trenchers, loaders, rollers, water carts). Money will be spent in town on accommodation, meals and support services. Construction will bring economic benefits to Walgett through business opportunities for local suppliers and skills development for local workers.

Post construction the WSF would employ one full time equivalent position. There will, however, also be a demand for contracted support services as regular maintenance on infrastructure and land management (e.g. weed spraying) will be required on an ongoing basis.

9.3 COMMUNITY EXPECTATIONS

A key finding of the Australian Renewable Energy Agency (ARENA) report *Establishing the social licence to operate large scale solar facilities in Australia: insights from social research for industry* is that developers need to engage effectively with communities around their expectations, concerns and needs in regard to large scale solar energy.

The consultation effort undertaken for the WSF (as detailed in **Section 4**) has been shaped by this objective. The Walgett community to date has not raised concerns and responses have been positive.

However, a recurring message is that the local community expects and wants to benefit from the project. It wants project related expenditure money to be spent in the district, and it wants the opportunity to secure as many jobs, contracts and supplies as possible. Council has also emphasised that economic benefits associated with the WSF need to be maximised at a local level.

These expectations are entirely reasonable and totally consistent with ARENA's research findings. Employment and contracting opportunities for local residents are seen as the key benefit to local

⁴ Consistent with DPE's requirement to specify full time equivalent positions (FTE), and its methodology for calculating this, the WSF is expected to generate 42 FTE jobs (ie. 85 x [5/12] + 20 x [4/12]).

economies, as well as the benefits to local businesses from the influx of workers from outside the local area.

Job creation and the corresponding opportunities for local businesses and residents are seen as the key economic benefits of a large scale solar project, noting that in small and relatively remote communities even a small number of additional jobs is seen as having a large impact on the economy.

ARENA's research concluded that job creation is likely the single most important factor in building a social licence to operate in communities and residents expect that the company developing a solar facility in their town would make efforts to engage with the local economy.

Opportunities for local businesses to win contracts were seen as benefiting the community in general, with the profits being spent in and around the community. The knock-on benefits for other local businesses of having large numbers of temporary construction workers in town was also identified as a benefit to the town as a whole.

ARENA's research showed that these expectations of developer engagement with the local economy included measures such as contacting local employment services and advertising tenders for contracting work in the local print media. In cases where these measures were perceived not to have been taken, or to have been taken half-heartedly, frustrations were expressed about lost opportunities. There was general acceptance, however, that in relatively small communities where labour resources and skills were not always available or appropriate for the job, that workers would inevitably be brought in from outside.

The research also showed that the definition of 'local' businesses in regional communities tends to be limited to the local town. Larger regional centres are not always viewed as being 'local' and as such, contracts won by businesses in these areas may not be recognised as such by residents.

In short, it is reasonable to assume that the Walgett community's support for the WSF to date is predicated, in part, on the expectation that it will provide opportunities for local business and workers to benefit from the project spend.

9.4 DEVELOPER COMMITMENT

To help ensure that the local economic opportunity is realised WSPL is committed to do the following.

9.4.1 LOCAL ENGAGEMENT

WSPL will deliver the WSF through awarding an EPC contract. Typically a myriad of factors and criteria influence the decision on how and to who a contract is awarded. These include considerations relating to technical capabilities, demonstrated experience, scheduling availability and price.

In awarding the EPC contract for the WSF WSPL will add 'local engagement' as a selection criterion. That is, the EPC Contractor's commitment and means for maximising the local 'spend' will be considered in awarding the EPC contract.

9.4.2 WORKING GROUP

ARENA's research determined that there are a number of approaches required in order to realise substantive economic benefits that a large scale solar project can provide for a local community. These include providing:

- accurate information about the project and associated timelines; and
- timely information about the job and contracting opportunities at each stage of construction.

WSPL will ensure that opportunities are actively 'pushed' into the community through working collaboratively with Council to establish a forum and means for maximising opportunities for Walgett businesses.

Biodiversity

10.1 INTRODUCTION

The project will be assessed under Section 89C of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) as State Significant Development (SSD 8095). Secretary's Environmental Assessment Requirements (SEARs) were issued by the NSW Department of Planning and Environment (DPE) on 13 December 2016, including Agency Comments from the NSW Office of Environment and Heritage (OEH) that are relevant to this assessment. The SEARs require that biodiversity impacts related to the proposed development are to be assessed and documented in accordance with the *NSW Biodiversity Offsets Policy for Major Projects* (OEH 2014a) and *Framework for Biodiversity Assessment* (FBA) (OEH 2014b) by an appropriately accredited person.

Biosis Pty Ltd was commissioned by Geolyse, on behalf of WSPL), to undertake a biodiversity assessment of the subject site and broader study area for the proposed WSF. All biodiversity assessment has been undertaken in accordance with the FBA (OEH 2014b). This report has therefore been prepared by Accredited BioBanking Assessor, Nathan Garvey and a copy of the Biodiversity Assessment Report (BAR) is provided in **Appendix D**.

10.2 SUBJECT SITE

The final footprint of the solar farm infrastructure was refined through consideration of findings as a result of previous site investigations and identification of constraints and opportunities mapped through the environmental impact assessment process, including biodiversity. The intent has been to maximise the built footprint over the development site while avoiding, wherever possible, impact on the ecological values present.

The subject site is defined as the maximum area to be directly impacted by the proposal. The study area is defined as the subject site plus the immediately surrounding land investigated during the field surveys and potentially impacted by indirect impacts.

The study area is located in the Darling Riverine Plains of NSW and consists of predominantly flat, cleared land used for agricultural purposes (refer **Plate 4**).



Plate 4: Agricultural land in the subject site

Currently, native vegetation exists as a mix of small remnants in a matrix of agricultural land as well as cleared land forming exotic grasslands and regenerating chenopod shrubland. Vegetation is significantly modified through past and current land practices and weed infestations. Where present, plant communities reflect the underlying geology, soils and floodplain hydrology with areas of *Coolabah - River Coobah - Lignum woodland wetland of frequently flooded floodplains mainly in the Darling Riverine Plains Bioregion* and *Coolabah open woodland wetland with chenopod/grassy ground cover on grey and brown clay floodplains*.

There are two mapped watercourses, or drainage lines located, within or adjacent to the study area. The Barwon River delineates the western boundary of the study area and the Two Mile Warrambool is an effluent channel which links the Namoi and Barwon Rivers (refer **Plate 5**). The study area also contains a number of farm dams.



Plate 5: Native vegetation associated with Two Mile Warrambool

10.3 LANDSCAPE

10.3.1 BIOREGIONS AND LANDSCAPES REGIONS

The study area occurs within the Darling Riverine Plains IBRA bioregion and the Castlereagh-Barwon-Namoi IBRA subregion. The Castlereagh-Barwon-Namoi IBRA subregion covers the entire study area and is the subregion used in this assessment.

Most of the study area occurs within the Barwon Channels and Floodplains Mitchell Landscape with a small section in the southern end located within the Gwydir Alluvial Plains Mitchell Landscape.

10.3.2 WATERWAYS AND WETLANDS

The study area is located within the Namoi Catchment, which borders Gwydir and Castlereagh catchments and is bound by the Great Dividing Range in the east, the Liverpool Ranges and Warrumbungle Ranges in the south, and the Nandewar Ranges and Mount Kaputar to the north.

There are two mapped watercourses within and adjacent to the study area. The Barwon River is a perennial river which runs along the western boundary of the study area. Two Mile Warrambool is a non-perennial effluent stream which connects the Namoi and Barwon Rivers. Barwon River and Two Mile Warrambool are mapped as habitat for the Sliver Perch and Olive Perchlet.

The study area also contains several farm dams.

10.3.3 NATIVE VEGETATION EXTENT

Mapping of vegetation undertaken using the *Refinement of vegetation mapping in the Namoi Catchment: Extant and pre-European* VIS ID 4028 (Ecological 2013), which is considered the most reliable and comprehensive local vegetation mapping study. This mapping was modified using vegetation extent as assessed by Biosis. Four native vegetation communities are mapped for the study area, including:

- Black Box woodland on floodplains, mainly Darling Riverine Plains.
- Coolibah - River Coobah - Lignum woodland of frequently flooded channels, mainly Darling Riverine Plains.
- River Red Gum riverine woodlands and forests, Darling Riverine Plains, Brigalow Belt South and Nandewar.
- Derived grasslands, Darling Riverine Plains and western Brigalow Belt South.

10.4 NATIVE VEGETATION

10.4.1 VEGETATION DESCRIPTION

The study area supports 92.76 hectares of native vegetation with varying levels of disturbance. Across the study area, ongoing cropping activities were noted with 88.43 hectares of disturbed and cropped land and 0.64 hectares of weeds and exotics mapped.

Native vegetation within the subject site is composed of patches of vegetation in an agricultural matrix. These isolated patches have heavy weed infestations, with some patches showing evidence of previous cropping and soil disturbance. This has prevented recruitment of native shrubs and eucalypts. The vegetation is therefore characterised by a canopy of mature and semi mature native trees over an understorey of mostly chenopod shrubs, exotic herbs and grasses. Resilience in the understory was low in areas away from watercourses, with a low diversity of native grasses.

Areas of native vegetation outside the subject site, but within the study area, are in better condition, with a relatively high diversity of native species and much lower levels of disturbance evident, particularly close to watercourses. This includes areas of native vegetation along the Barwon River along the western boundary and along the Castlereagh Highway in the southern section of the study area.

10.4.2 PLANT COMMUNITY TYPE

Site investigations identified the presence of two Plant Community Types (PCT) within the study area.

- Coolabah - River Coobah - Lignum woodland wetland of frequently flooded floodplains mainly in the Darling Riverine Plains Bioregion (PCT 39); and
- Coolabah open woodland wetland with chenopod/grassy ground cover on grey and brown clay floodplains (PCT 40)

The development will result in removal of 0.63 hectares of PCT40, 0.09 ha of which has been identified as being in 'moderate/good-high condition' and the residual 0.54 ha as 'moderate/good-medium' condition.

10.5 GROUNDWATER DEPENDENT ECOSYSTEMS

An assessment of the potential for the study area to support groundwater dependent ecosystems (GDEs) was undertaken using the Australian Government's Bureau of Meteorology, Groundwater Dependent Ecosystems Atlas (BoM 2016).

Large areas reliant on the surface expression of groundwater are mapped within and adjacent to the study area. These areas are largely associated with the Barwon River and are mapped as floodplain water bodies.

Vegetation reliant on the subsurface expression of groundwater is mapped within and adjacent to the study area. Again, these areas are largely associated with the Barwon River, and are listed as vegetation associated with Black Box *Eucalypts largiflorens*.

All the native vegetation mapped within the study area are floodplain wetlands, and all vegetation is likely to be associated with and reliant on the surface and subsurface expression of groundwater to some degree. However, the solar farm will not result in any significant changes to surface or subsurface hydrology, and no impacts to GDEs are predicted to result from the project.

10.6 FAUNA HABITAT

The study area has an extensive history of use for agricultural purposes; as a result the study area provides limited refuge or habitat for fauna.

Fauna habitat features are limited to areas of remnant vegetation and scattered trees. No hollow-bearing trees will be removed as a result of the project.

Areas of remnant of native vegetation along the Two Mile Warrambool and in the southern section of the study area contain a moderate level of fallen timber and leaf litter, providing habitat for ground-dwelling reptiles.

No impacts to threatened species will result from the solar farm.

10.7 AQUATIC ENVIRONMENTS

Aquatic environments within and adjacent to the study area are typical of lowland rivers within the Murray-Darling Basin, characterised by broad channels, complex floodplain features and highly variable seasonal flows.

Two-Mile Warrambool is a connecting channel between the Namoi and Barwon River Basins. This waterway is semi-permanent and holds ponding water for extended periods as a result of the existing crossing structure. As a result, a wetland environment exists and contains a tight clay matrix substrate, high quantities of coarse particulate organic matter, patchy emergent macrophytes and sparse large woody debris.

Connectivity between the Namoi and Barwon Rivers occurs during periods of high rainfall when the existing structure has blow outs or overtops. Two-Mile Warrambool is considered a highly valuable movement pathway between these two major river basins.

10.8 POTENTIAL IMPACTS

Potential direct and indirect impacts arising from the development are outlined below.

Potential direct impacts arising from the project include:

- Removal of 0.63 hectares of native vegetation within the subject site.
- Through iterative design, impacts to 92.13 hectares of vegetation within the broader study area will be avoided.
- Direct mortalities and injuries to native fauna during vegetation clearing procedure.

Potential indirect impacts arising from the project include:

- Decreased viability of retained vegetation due to edge effects and use of retained areas of native vegetation due to disturbance and degradation of habitat, including erosion and/or compaction of soils, as well as damage to seedlings and new growth.
- Encroachment of invasive exotic weeds species, leading to loss of habitat and suppression of native seedling establishment resulting in changes to vegetation communities over time.
- Temporary increased noise levels from construction equipment, leading to disturbance of fauna, especially during breeding seasons.

10.9 MITIGATION MEASURES

The principal means to reduce impacts on biodiversity values within the study area will be to avoid and minimise removal of native vegetation and fauna habitat and identify measures to mitigate residual impacts after all measures to avoid and minimise impacts have been considered.

Recommendations are broken down into site selection and planning, construction and operation.

10.9.1 AVOIDANCE

The site has been selected due to its suitability, previous disturbance and proximity to Essential Energy's zone substation.

In identifying and refining the development footprint WSPL has considered all biodiversity values to avoid, wherever possible, direct impacts to the identified values. As a result, impacts are restricted to those associated with an upgrade to the existing intersection off the Castlereagh Highway and associated minor road realignment works. Safe access and egress for motorists dictate the need for these works and were developed after site inspections and considerations of all access options in consultation with both Roads and Maritime Service and Walgett Shire Council. The extent of these works is modest and shown in **Drawing EV05**.

In all other areas the development will be restricted to existing access tracks or other disturbed areas, with the development footprint for photovoltaic panels restricted to cropped areas.

10.9.2 CONSTRUCTION

During construction, upgrades to the crossing of Two Mile Warrambool will be undertaken. Currently, this crossing consists of debris piled into the creek, restricting the ability of water to flow through this crossing. During floods the crossing is washed away and into the Barwon River. The upgrade will include the installation of a culvert, allowing flow under the roadway. Installation of these culverts will be based on the following design considerations.

- Multi-celled box culverts should be used.
- The base of the culverts should be recessed to just below the existing bed of the waterway.
- Adequate light penetration should be provided during nominal conditions.
- Align culverts in the direction of stream flow.

- Augment the roughness of the bed surface, within the culvert, by incorporating rock/cobble etc.
- Consider the use of wing-walls to deflect debris during high flow scenarios.

This will result in minimal impacts and an overall improvement to Two Mile Warrambool, including increased flow passage and fish passage.

No additional direct impacts are expected to occur as a result of the construction phase.

However, indirect impacts may result to retained biodiversity values. Additional mitigation measures recommended to avoid and minimise these potential impacts include:

- Installation of appropriate exclusion fencing around trees and vegetation to be retained in the study area.
 - o The radius of the tree protection zone (TPZ) is calculated for each tree by multiplying its diameter at breast height (DBH) by 12. ($TPZ = DBH \times 12$) in accordance with the Standards Australia Committee (2009).
 - o A TPZ should not be less than 2 metres nor greater than 15 metres, except where crown protection is required (Standards Australia Committee 2009).
 - o This would include appropriate signage such as 'No Go Zone' or 'Environmental Protection Area'.
 - o Identify the location of any 'No Go Zones' in site inductions and a Construction Environmental Management Plan.
- All material stockpiles, vehicle parking and machinery storage will be located within cleared areas proposed for clearing, and not in areas of native vegetation that are to be retained.
- Where appropriate native vegetation cleared from the study area should be mulched for re-use on the site, to stabilise bare ground.
- Wet down areas to reduce dust generation during construction.
- Implementation of temporary stormwater controls during construction to ensure that discharges to the drainage channels are consistent with existing conditions.
- Sediment and erosion control measures should be implemented prior to construction works commencing (e.g. silt fences, sediment traps), to protect the drainage channels to the Barwon River and Two Mile Warrambool. These should conform to relevant guidelines, should be maintained throughout the construction period and should be carefully removed following the completion of works.
- If landscape plantings are undertaken, these should use species indigenous to the local area and consistent with the native vegetation communities identified. A list of species recorded in the study area is provided in the species list (refer **Appendix D**).

Prescriptions for mitigation of potential impacts of construction activities on retained native vegetation and habitat should be addressed in a site-specific Construction Environmental Management Plan (CEMP).

10.9.3 OPERATION

The impacts arising from the operation of the solar Farm are expected to be negligible. As a result no additional mitigation measures are recommended.

10.9.4 RESIDUAL IMPACTS

As a result of the avoidance, minimisation and mitigation measures outlined above, residual impacts arising from the solar farm are restricted to removal of 0.63 hectares of native vegetation. No trees will be removed from these areas.

10.10 THRESHOLDS FOR OFFSETTING

This section outlines the thresholds for assessment and offsetting in accordance with the FBA (OEH 2014b).

10.10.1 IMPACTS REQUIRING FURTHER CONSIDERATION

10.10.1.1 Landscape Features

Two Mile Warrambool is a 6th order stream in the subject site. The crossing over this waterway will not result in a reduction in the width of vegetation in the buffer zone of this waterway. The study area does not support any other 4th order or greater streams, estuarine areas, important wetlands, or state or regional biodiversity links. The study area does not support any important wetlands. There are no impacts to landscape features requiring further consideration.

10.10.1.2 Native Vegetation

No critically endangered ecological communities have been mapped in the study area. No endangered ecological communities' were nominated in the SEARs. There are no impacts to native vegetation requiring further consideration.

10.10.1.3 Species and Populations

The study area does not include any areas of critical habitat. No impacts to critically endangered or endangered species will result from the proposed solar farm. There are no impacts to species or populations requiring further consideration.

10.10.2 IMPACTS REQUIRING OFFSETS

10.10.2.1 Impacts Native Vegetation

The proposed access off the Castlereagh Highway will result in removal of 0.09 hectares of NA130 Coolabah open woodland wetland (PCT40) in Moderate/good – High condition and 0.54 hectares in Moderate/good – Medium condition.

10.10.2.2 Impacts to Species and Populations

The solar farm will not result in removal of habitat for threatened species and populations. No offsets for species or populations are required.

10.10.3 IMPACTS NOT REQUIRING OFFSETS OR FURTHER ASSESSMENT

Since areas of NA130 in Moderate/good – Medium condition have a site value score of less than 17, no offsets will be required. However, 0.09 hectares of Coolabah open woodland wetland (NA130) in Moderate/good – High condition scored more than 17, and will require offsets.

The remainder of the subject site supports non-native vegetation and disturbed land. No further consideration of these areas is required.

10.11 BIODIVERSITY OFFSET STRATEGY

10.11.1 REQUIREMENTS

Two (2) ecosystem credits for *Coolabah open woodland wetland with chenopod/grassy ground cover on grey and brown clay floodplains* (PCT40) are required to offset the impacts on this vegetation type due to the proposed development.

10.11.2 STRATEGY

The proposed Biodiversity Offset Strategy will follow the NSW *Biodiversity Offsets Policy for Major Projects* (OEH 2014a). This will include the following steps:

- WSPL will try and identify like-for-like offsets. Like-for-like offsets are identified in the Policy as the same PCT, or a PCT in the same vegetation class that has been cleared to an equal or greater extent. Offset must be provided in the same or an adjacent IBRA subregion.
- If, after undertaking "reasonable steps", WSPL is unable to identify like-for-like credits, then WSPL will apply for application of the variation rules. The variation rules allow impacts on a PCT to be offset with a PCT from the same vegetation formation that has been cleared to an equal or greater extent anywhere in NSW.
- Contingent on the outcomes of the above, WSPL will apply for supplementary measures where offsets are not feasible and other options are needed.

Given the small number of credits required (ie. two), WSPL, on the advice of Biosis, has elected to seek retirement of the credits by purchasing them on the open market, subject to availability. Given the small number of credits required to offset impacts the identification of a suitable offset site from which to obtain the credits, including potential purchase and/or assessment, is not considered feasible.

In the first instance, every effort to obtain like-for-like offsets has been or will be pursued. In the preparation of this Biodiversity Offset Strategy the BioBanking public register has been checked for the availability of credits of the same PCT as that being impacted or those listed in the credit profile report. There are no matching credits currently available on the public register.

In line with the recommendations outlined in Appendix A of OEH (2014a), an expression of interest for the required credits was placed on the OEH 'Credits Wanted Register' on 21 December 2016.

Biosis, on behalf of Epuron Island GP, will consult with OEH and Walgett Shire Council to ascertain whether any suitable credits or land held by Council are available. As outlined above, given the small number of credits required acquisition of land or development of a BioBanking agreement is considered unfeasible.

Should a period of six months elapse since the expression of interest was placed on the public register with no positive outcome, and all other reasonable steps have been exhausted, then a variation of the offset rules will be applied in which credits can be sought from a PCT in the same vegetation formation as the PCT to which the required ecosystem credits relate. NA130 is from the Semi-arid Woodlands (Grassy sub-formation) vegetation formation. A review of the credit register shows that, at this stage, there are no credits listed under this vegetation formation.

10.11.3 TIMING COMMITMENT

WSPL commit to having implemented the Biodiversity Offset Strategy prior to commencement of operation of the solar farm.

10.12 CONCLUSION

The ecological assessment has been completed in accordance with the NSW *Biodiversity Offsets Policy for Major Projects* (OEH 2014a) and FBA (OEH 20146).

The site assessment identified substantial areas of Coolabah - River Coobah - Lignum woodland wetland of frequently flooded floodplains mainly in the Darling Riverine Plains Bioregion and Coolabah open woodland wetland with chenopod/grassy ground cover on grey and brown clay floodplains within the study area. These PCTs align with Coolabah – Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions endangered ecological community listed under the NSW TSC Act and Commonwealth EPBC Act.

Through an iterative design process, which considered the biodiversity values, the proposed development will limit its impacts to the removal 0.63 hectares of native vegetation.

Measures to avoid and minimise impacts to vegetation were considered during the design and planning stage of the project, resulting in almost complete avoidance of impacts on native vegetation. Residual impacts to native vegetation will require retirement of two (2) biodiversity credits.

The clearing of this vegetation will not result in a significant impact to threatened species, populations or ecological communities.