

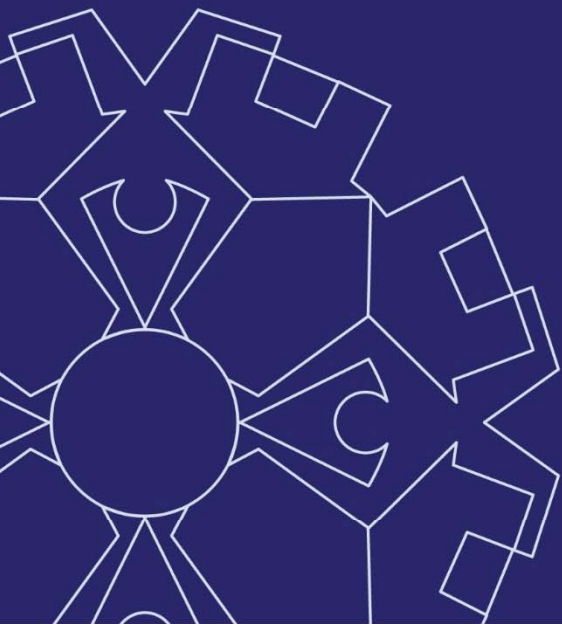


GEOLYSE

**WALGETT SOLAR FARM
SECRETARY'S ENVIRONMENTAL ASSESSMENT REQUIREMENTS**

**PREPARED FOR
EPURON ISLAND GP**

NOVEMBER 2016



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

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POSTAL ADDRESS PO Box 1963
LOCATION 154 PEISLEY STREET
TELEPHONE 02 6393 5000
EMAIL ORANGE@GEOLYSE.COM

ORANGE NSW 2800
ORANGE NSW 2800
FACSIMILE 02 6393 5050
WEB SITE WWW.GEOLYSE.COM

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The preparation of this report has been in accordance with the project brief provided by the client and has relied upon the information, data and results provided or collected from the sources and under the conditions outlined in the report.

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Site Details

1.1 LOCATION AND REGIONAL CONTEXT

The proposed Walgett Solar Farm (WSF) is located approximately 5 km north of Walgett in the North West Slopes and Plains of New South Wales. The site can be accessed off the Castlereagh Highway.

The site in a regional context is shown in **Figure 1** and the immediate site locality in **Figure 2**.

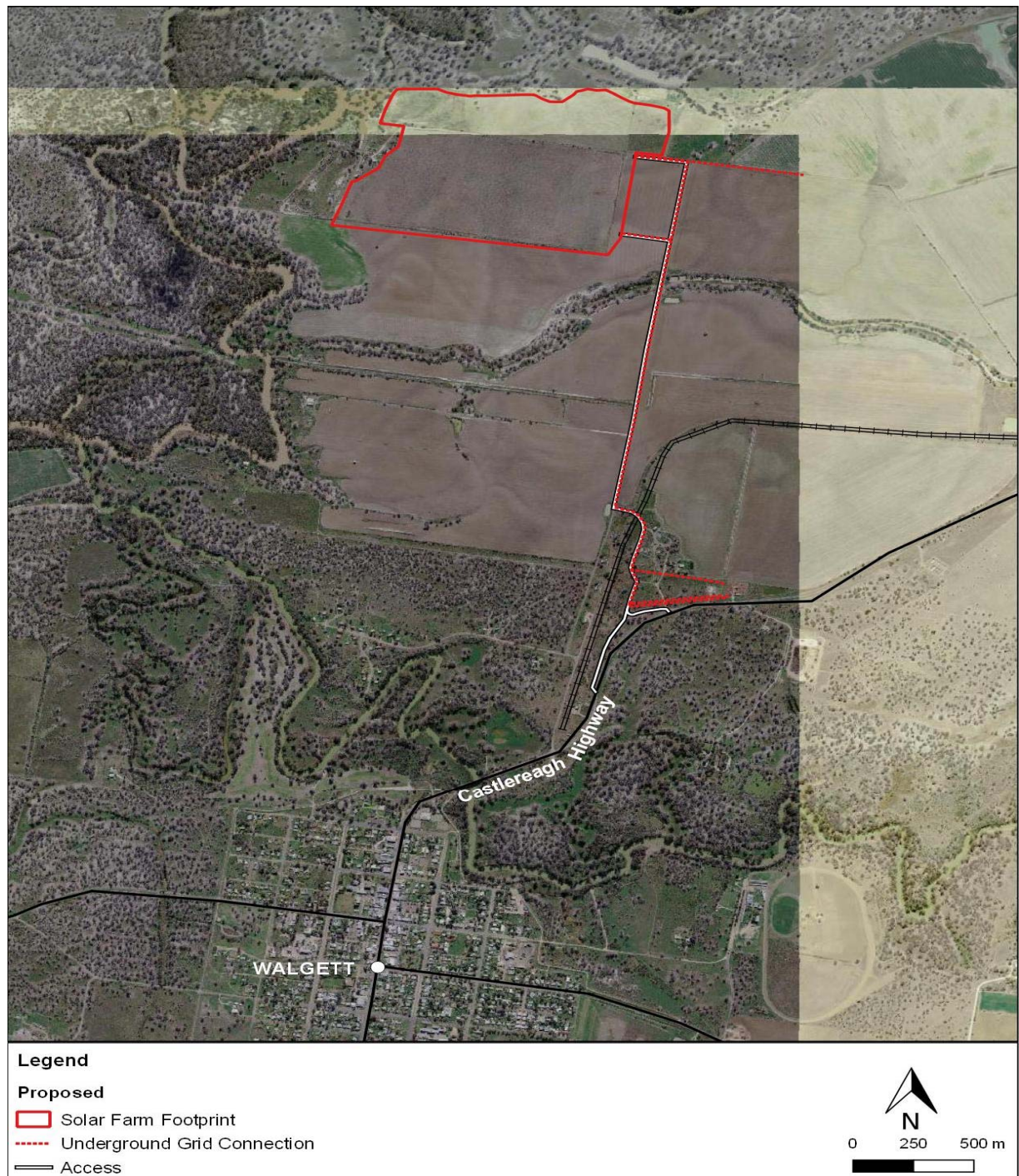


Figure 1: Site location regional context (Source: NSW LPI)



Figure 2: Site Locality (Source: NSW LPI)

1.2 SURROUNDING DEVELOPMENT

The site is located on cleared land used for agricultural purposes, including cropping and grazing. A breakdown of land use within a 5 km radius is provided in **Table 1.1** and depicted in **Figure 3**.

Table 1.1 – Summary of land use within a 5 km radius of the site

Land Use	Percentage Area (%)
River & Drainage System	39.41
Grazing	24.46
Transport & Other Corridors	20.74
Conservation Area	6.71
Cropping	5.72
Urban	2.74
Tree & Shrub Cover	0.09
Special Category	0.06
Wetland	0.06
Mining & Quarrying	0.01
Horticulture	0.003
Power Generation	0.001

Source: NSW Office of Environment and Heritage (GIS Dataset: NSW Land Use)

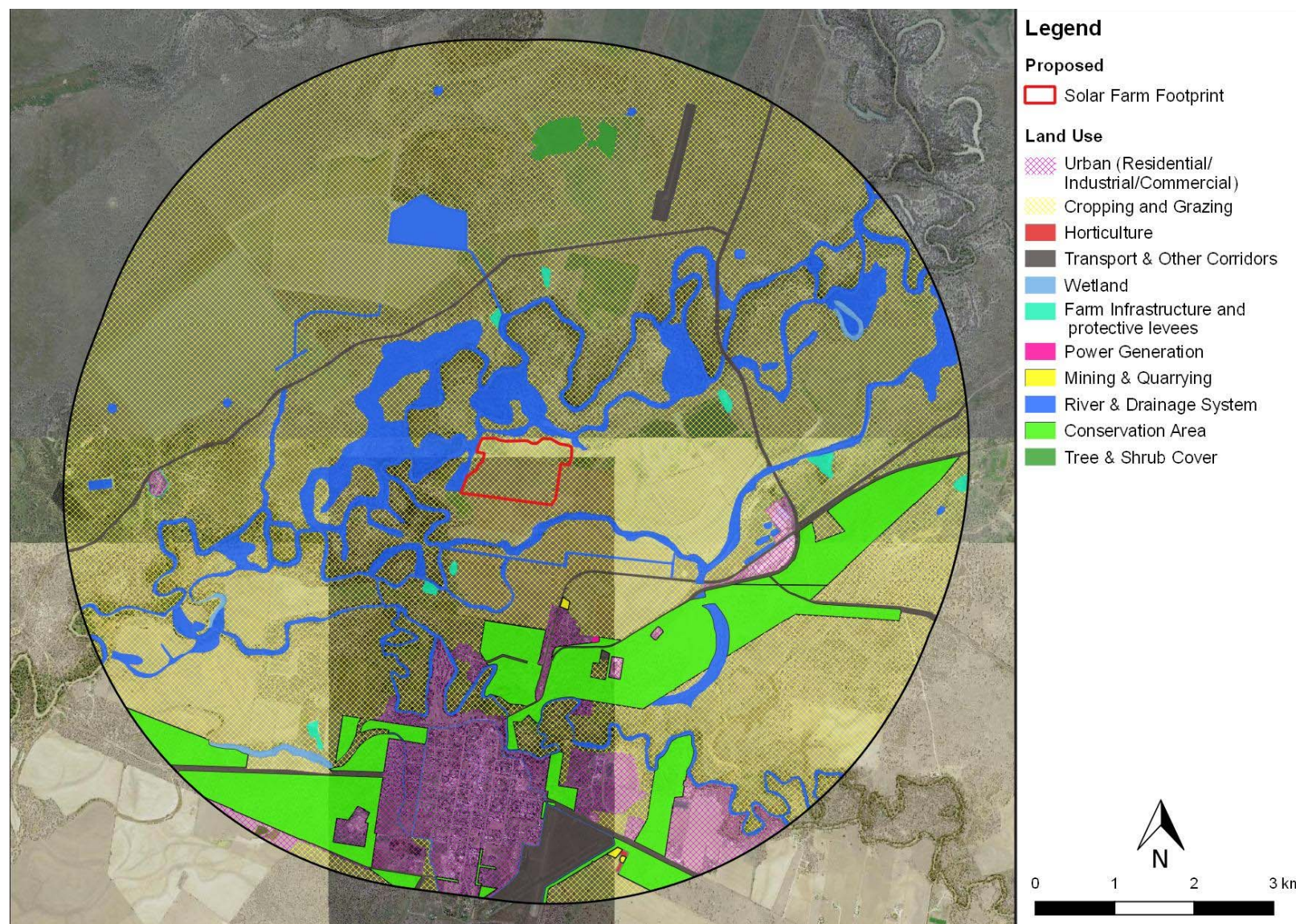


Figure 3: Land use within 5 km radius (Source: NSW OEH)

1.3 POTENTIALLY AFFECTED RECEPTORS

There are two (2) residences not associated with the development within one (1) kilometre of the development site and 13 residences within a 2 km radius of the site (refer – **Figure 4**).

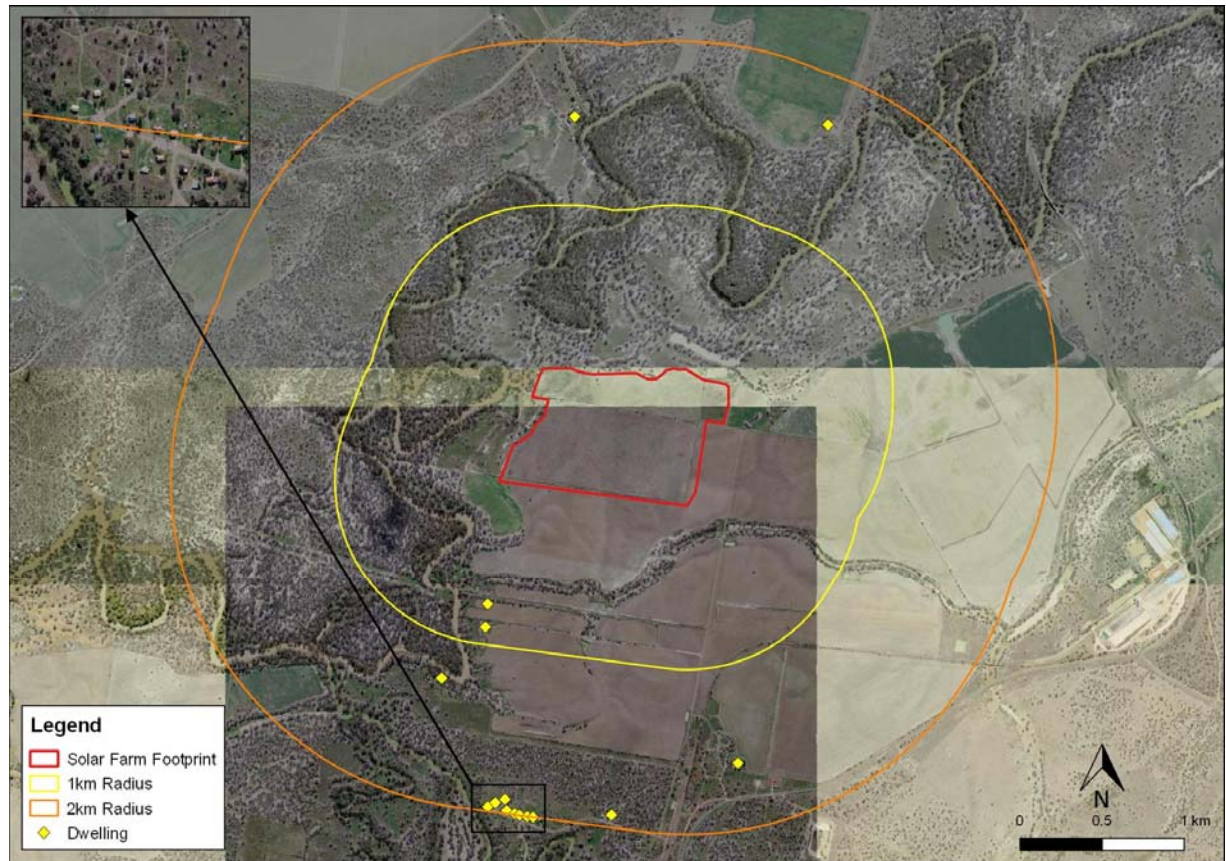


Figure 4: Neighbouring Residences (Source: NSW LPI)

1.4 KEY INFRASTRUCTURE

Essential Energy's 22/66 kV zone substation is located approximately 1.8 km south, south east of the development site. The location of existing infrastructure is provided in **Figure 5**.



Figure 5: Existing Infrastructure (Source: NSW LPI)

1.5 ENVIRONMENTAL FEATURES

The site is characterised by largely flat topography and is predominantly cleared of native vegetation.

There is no bushfire prone land mapped within the solar farm site. The closest mapped bushfire prone land is located approximately 120 m west of the site (refer – **Figure 6**).

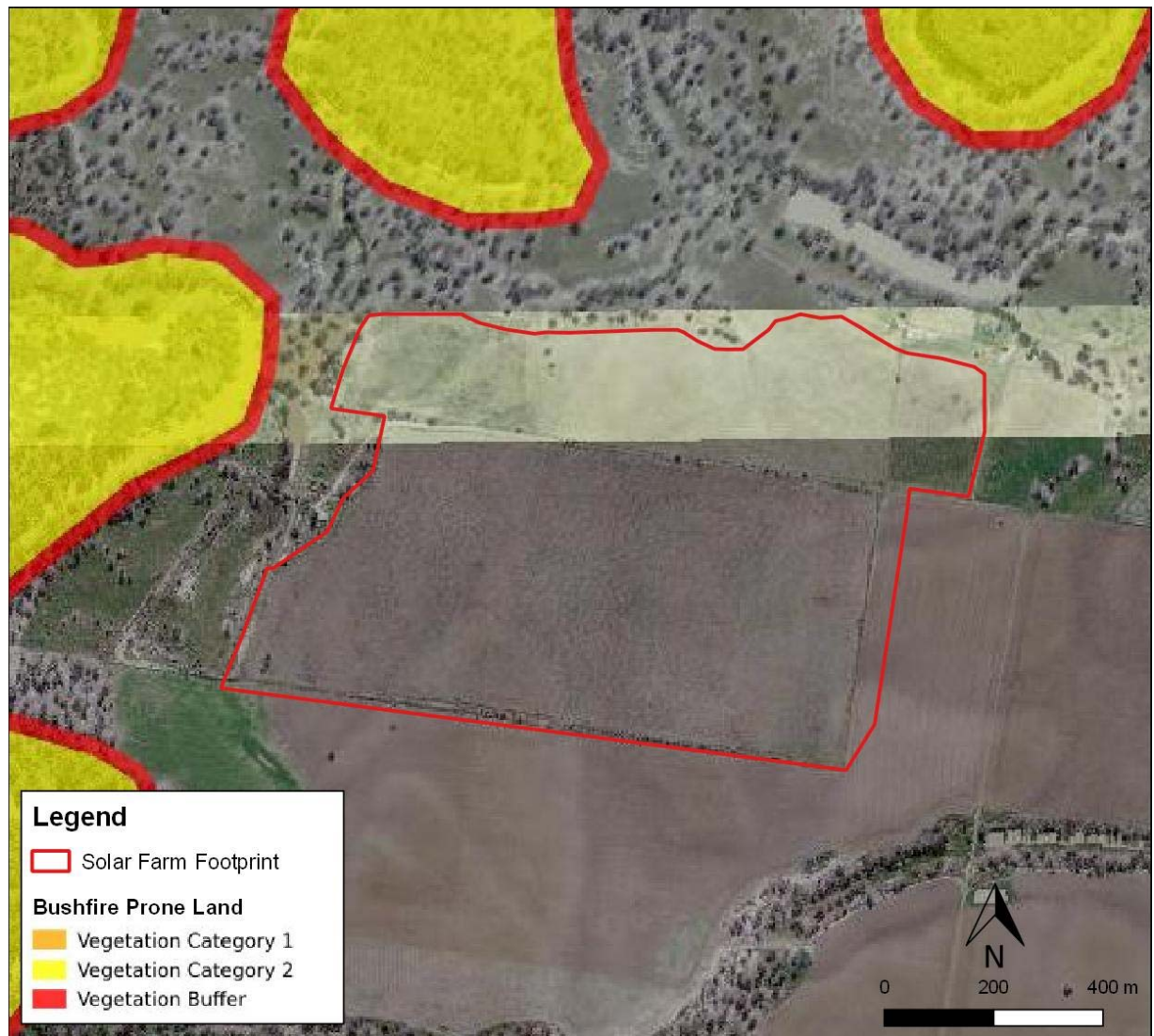


Figure 6: Bushfire Prone Land (Source: NSW Planning Portal)

There are no mapped watercourses or drainage lines within the solar farm footprint. The proposed underground grid connection crosses the watercourse known as “Two Mile Warrambool”.

The closest watercourses to the proposed solar farm site are the Barwon River, located (at its closest point) approximately 200 metres to the west. The watercourse known as “Two Mile Warrambool” is located approximately 200 m south of the proposed solar farm site. The confluence of the Barwon and the Namoi is approximately 1.5 km to the south west of the site.

The development site is subject to flooding.

Surface water features at and surrounding the site are depicted in **Figure 7**.

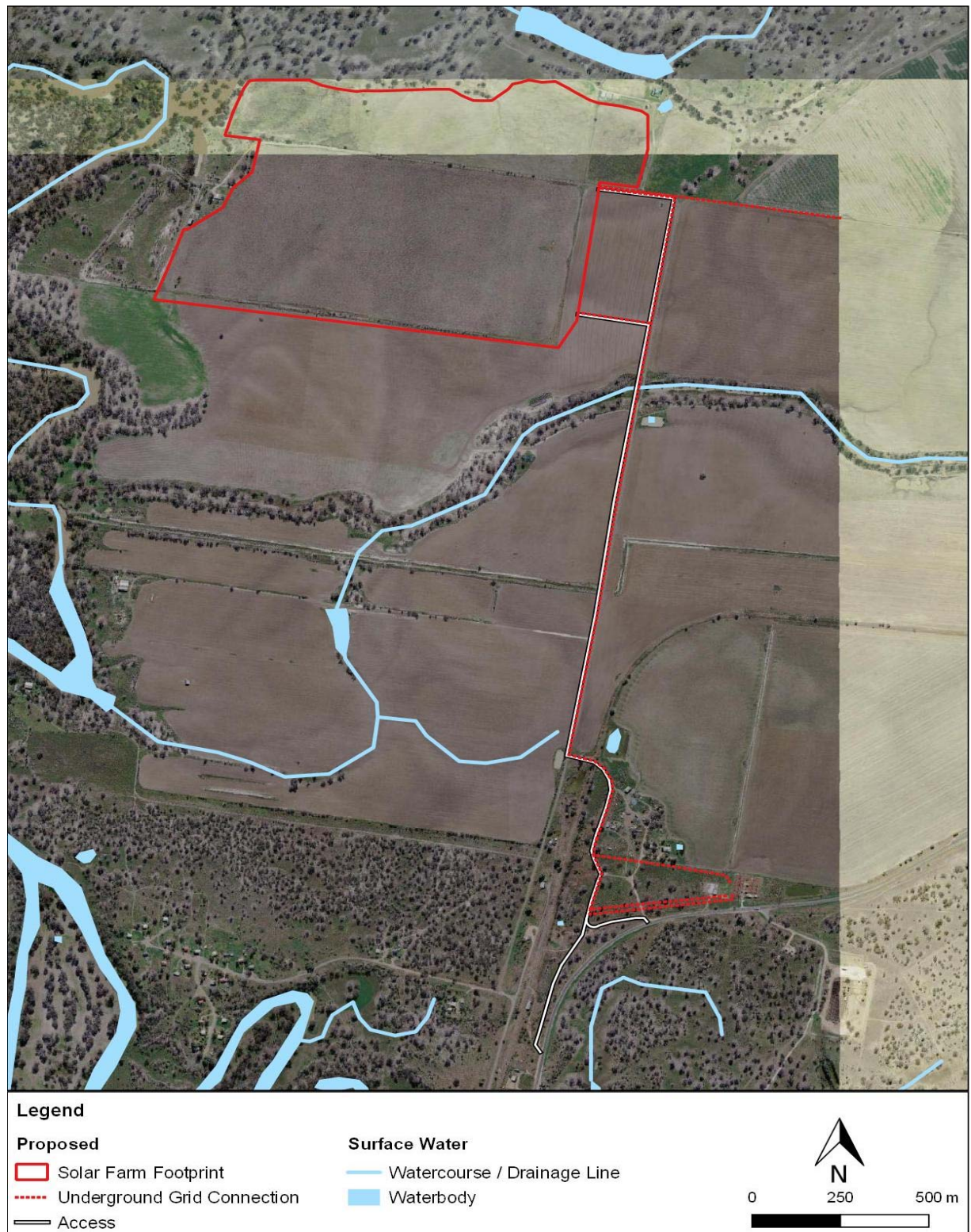


Figure 7: Surface Water Features (Source: NSW LPI)

The site does not contain any groundwater bores. A review of the NSW Office of Water (NOW) online *All Groundwater Map* identifies 12 bores within a 5 km radius of the site. Available data from 10 of those bores indicate that variable water bearing zones (WBZ) exist, with some water accessed from deep aquifers (depth to upper limit of the WBZ is approximately 460.00 – 482.00 m) and shallower WBZ range from 15.00 – 39.00, with an average depth to the upper limit of the WBZ of 22.73 m. Groundwater intersected by these bores is hosted in sedimentary rock at depth (sandstone) and bands of sand in the shallower WBZ.

Development Description

The Walgett Solar Farm will use solar PV panels to convert sunlight into electrical current. Electricity will be sold into the National Electricity Market (NEM) and Large Generation Certificates (LGC's) will be sold to liable entities under the Renewable Energy Act 2000.

The final footprint of the solar farm infrastructure will be refined through consideration of findings as a result of further site investigations and identification of constraints and opportunities mapped through the environmental impact assessment process. The intent, however, is to maximise the built footprint over the development site which, at this stage, includes an area of approximately 90 ha.

Solar PV technology will be either crystalline silicone or thin film. The solar PV modules will be connected together via a direct current (dc) collection system consisting of cables mounted on the module support structure. The support structure may be fixed-tilt or tracking. A fixed system does not move and the panels are tilted at the optimal angle towards the sun. A tracking system tracks the daily movement of the sun and a motorised system rotates the panels constantly towards the sun to maximise energy output performance.

Inverters and transformers will be located in an array within the footprint to convert the dc current to alternating current (ac). Inverter and transformer assemblies would be mounted on a steel platform or slab above the 1 in 100 flood level. The ac collection system will consist of underground cabling at 22kV which connects to each inverter.

Ongoing consultation with Essential Energy and grid connection studies will ultimately determine the requisite grid interface configuration. Two options are currently being investigated.

If the connection voltage is 66 kV a substation will be required on-site. Inverters will produce power at 22 kV or 33 kV and the substation would then transform the voltage to 66kV. In this scenario, grid connection will be via underground cable to the nearby Essential Energy zone substation.

Alternatively, if no site sub-station is required, grid connection will be through an underground 22 kV connection to the existing 22 kV transmission line that is located approximately 500 m east of the solar farm site.

A control room with associated parking area will be located conveniently on the site. This will be a relatively small structure which will provide shelter for a limited number of site staff as well as facilities to enable monitoring of the performance of the solar farm and communications connections to the electricity market operator; Essential Energy and the operations team.

Construction is estimated to take up to nine (9) months. The site is expected to require minimal earthworks preparation in advance of installing the PV panel system as it is flat and devoid of vegetation. A security fence will be installed and construction tracks will be laid down if required. Construction will require the use of bull dozers, water trucks, graders, flatbed trucks, skid steers, front end loaders, roller compactors, trenchers, backhoes, gravel trucks, water tankers, cranes, and aerial lifts. Deliveries of modules and other equipment will be made via flatbed trucks on the approved route and site entrance.

Steel piles will be driven into the soil to support the module racking system. A galvanized metal racking assembly will be attached to the piles according to the manufacturer's guidelines. Once the panels have been installed on the racking system, the dc collection cabling is laid out on the structure and connected to the panels. The underground ac and dc cables will then be laid using trenching techniques and connected. The electrical inverter, transformer, and enclosure assemblies are then placed on concrete foundation structures or steel skids. The site substation will require construction of a secure compound, laying of foundations and installation of the transformer, switch gear, protection and cable support structures. Once all modules, inverters, transformers and electrical collection systems have been installed, commissioning will occur. Commissioning will include testing, calibration of equipment, and troubleshooting.

When commissioning is completed, the facility becomes operational and will largely be un-attended. Annual maintenance activities will include control of weeds and grass; maintaining site tracks and fences; maintaining security systems; checking of electrical, communications and mechanical components and cleaning panels if required.

Permissibility and Strategic Planning

3.1 STRATEGIC PLANNING DOCUMENTS

3.1.1 NSW 2021 PLAN

The NSW 2021 plan released in 2011 sets state wide priorities for action and also guides resource allocation. Goal 22 of this plan seeks to protect the natural environment and includes a specific target to increase renewable energy. The plan states:

We will contribute to the national renewable energy target by promoting energy security through a more diverse energy mix, reducing coal dependence, increasing energy efficiency and moving to lower emission energy sources. Specific initiatives include:

- *Building the Moree solar power plant in partnership with the Commonwealth Government under the Solar Flagship Program*
- *Establishing a Joint Industry Government Taskforce to develop a Renewable Energy Action Plan for NSW to identify opportunities for investment in renewable energy sources.*

Since release of the 2021 plan, the NSW Government has overseen the development of the NSW Renewable Energy Action Plan (REAP). The vision of the plan is a 'secure, affordable and clean future for NSW'. Goal 1 of the REAP is to attract renewable energy investment, including to 'support mid-scale solar PV to enable an uptake of solar technologies where they are most cost effective'.

More recently, in November 2016 the State Government released its *Climate Change Fund: Draft Strategic Plan 2017 – 2022*. This plan includes an aspirational objective for New South Wales to achieve net-zero emissions by 2050 through, amongst other things, building on the NSW Government's track record in expanding renewable energy.

The proposed WSF sits comfortably with this state led objective and is consistent with the goal and intent of the REAP and draft Strategic Plan 2017 – 2022.

3.1.2 REGIONAL PLAN

NSW Department of Planning and Environment is preparing regional plans to plan for future population needs for housing, jobs, infrastructure and a healthy environment. At present, a Regional Plan is under preparation that will encompass Walgett. This plan is not yet available for public access to comment.

3.1.3 WALGETT SHIRE COMMUNITY STRATEGIC PLAN

The *Walgett Shire Community Strategic Plan 2012 – 2022* details the communities needs and aspirations under five key themes:

- Economic Development
- Community
- Sustainable Living
- Governance and Civic Leadership
- Infrastructure

The proposed WSF represents economic development and is compatible with Council's strategic objectives which include:

- supporting jobs and attracting business development; and
- clean energy.

More specifically, the WSF supports a Council objective for the Shire's *Economic Development – Strategic Action Plan*. That being:

E2.1 A strong and diverse economic base that supports employment, industry and lifestyle opportunities for residents.

Develop and implement 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.

3.2 ENVIRONMENTAL PLANNING INSTRUMENTS

3.2.1.1 Environmental Planning and Assessment Act 1979

The proposed WSF would be assessed under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

3.2.1.2 State Environmental Planning Policy

State Environmental Planning Policy (State and Regional Development) 2011

Clause 8 of the *State Environmental Planning Policy (State and Regional Development) 2011* (SRD SEPP) provides that development is declared to be State Significant Development (SSD) for the purposes of the EP&A Act if:

1. *The development is not permissible without consent under Part 4 of the EP&A Act; and*
2. *The development is specified in Schedule 1 or 2 of the SRD SEPP.*

Clause 20 of Schedule 1 of the SRD SEPP provides:

"Development for the purpose of electricity generating works or heat or their co-generation (using any energy source, including gas, coal, bio-fuel, distillate and waste and hydro, wave, solar or wind power), being development that:

- (a) has a capital investment value of more than \$30 million, or*
- (b) has a capital investment value of more than \$10 million and is located in an environmentally sensitive area of State significance."*

The proposed development is not located in an environmentally sensitive area of State Significance, but does have a capital investment value in excess of \$30 million.

Accordingly, the proposed solar farm is declared to be SSD for the purposes of the EP&A Act.

State Environmental Planning Policy (Infrastructure) 2007

By virtue of Clause 34 of Division 4 of Part 3 of the *State Environmental Planning Policy (Infrastructure) 2007* (ISEPP) the development of solar energy systems are permitted with consent on any land by any person.

A solar energy system is defined by the ISEPP as:

solar energy system means any of the following systems:

- (a) a photovoltaic electricity generating system,*
- (b) a solar hot water system,*
- (c) a solar air heating system.*

The proposed development satisfies the above definition and is therefore permissible with consent.

3.2.1.3 Walgett Local Environmental Plan 2013

The site is located within the Walgett LGA and is therefore subject to the provisions of the *Walgett Local Environmental Plan 2013* (LEP). The site is located on land zoned RU1 – Primary Production. The objectives of this land use zoning are to:

- Encourage sustainable primary industry production by maintaining and enhancing the natural resource base.
- Encourage diversity in primary industry enterprises and systems appropriate for the area.
- Minimise the fragmentation and alienation of resource lands.
- Minimise conflict between land uses within this zone and land uses within adjoining zones.
- Enable small-scale rural tourism uses associated with primary production and environmental conservation.

Impact Identification and Assessment

4.1 PRELIMINARY RISK ASSESSMENT

A risk assessment based on a desk-top review of available data, a preliminary site inspection, initial consultations with neighbours and meetings with Walgett Shire Council has been considered to identify potential impacts associated with the development.

It is noted, however, that these impacts are identified and prioritised on the basis of preliminary research alone and their significance (or otherwise) will ultimately be determined following completion of further specialist studies, investigation and assessment.

4.2 KEY ISSUES

4.2.1 ABORIGINAL HERITAGE

Potential impacts of the proposed development may include disturbance of unknown Aboriginal heritage sites. It is proposed that as part of the EIS a full Aboriginal Cultural Heritage Assessment would be undertaken to identify potential impacts and formulate appropriate management and mitigation measures in consultation with the Aboriginal community.

4.2.1 ACCESS

Post construction a solar farm generates negligible ongoing traffic. Typically, this is restricted to a single light vehicle undertaking routine maintenance activities.

During construction, however, relatively significant vehicle movements to and from the site occur over an extended period. Quantifying the number, frequency and peak vehicle movements, before an EPC Contractor is awarded the job to build the solar farm, can only be based on informed assumptions.

Access to the site will require the upgrade of partially formed roads within Crown lands to a standard that is fit for all-weather construction traffic purposes, as well as consultations with Roads and Maritime Services with respect to access/egress to the Castlereagh Highway.

4.2.2 FLOODING

The development site is subject flooding. However consultation with Walgett Shire Council indicates that this flooding is temporary, shallow and with negligible flow velocity.

4.2.3 SOCIO-ECONOMIC IMPACTS

Opportunities to maximise local economic benefits associated with the development will require continued consultation with Walgett Shire Council to identify all options for accommodating and servicing, locally, the construction workforce that may peak at 85 people.

Whilst the prospect of temporary on-site workers accommodation will be considered in the EIS, Epuron's objective is to work closely with Council and the local business community to first fully utilise existing accommodation services.

4.2.4 OTHER ENVIRONMENTAL ISSUES

Other environmental issues that they considered less likely to affect the project are identified in **Table 4.1**. These issues are considered to be manageable due to the availability of appropriate mitigation measures.

Table 4.1 – Assessment of Other Environmental Issues

Issue	Potential Impacts	Strategies
Air quality	Potential impacts during construction may result from dust generation and vehicle emissions.	- Air quality impacts would be assessed in the EIS. - Management of air quality impacts would be addressed in a Construction Environmental Management EMP.
Biodiversity	A key feature of the development site is the absence of native vegetation and an ability to build and operate the solar farm without native vegetation removal.	An ecological assessment of the site and surrounds will be undertaken to identify potential constraints and incorporate mitigation measures into the design and construction to avoid significant impacts to biodiversity.
Bushfire risk	The site is not located on land mapped as bushfire prone land.	Potential bushfire risk and appropriate management/mitigation measures would be addressed in the EIS.
Contamination	A review of the NSW EPA Contaminated Land Record and List of NSW contaminated sites notified to the EPA confirms there are no known contaminated sites at or near the site..	- Based on available information, it is considered unlikely that contamination is present at the site, and therefore no further investigation or assessment is proposed. - A CEMP would address management of contamination if identified during construction.
EMF hazard and risk	Impacts from an electromagnetic field (EMF) may be generated by transmission lines and underground cables. Overhead transmission lines are not proposed. EMF risks are expected to be below the International Commission on Non-Ionizing Radiation Protection (ICNIRP) guidelines (adopted by the Australian Radiation Protection and Nuclear Safety Agency, ARPANSA).	Potential EMF hazards and risks will be assessed in the EIS.
Groundwater	Impacts to groundwater are considered unlikely due to the depth of groundwater bearing zones.	The existing groundwater environment and potential impacts would be addressed in the EIS.
Land use	Impacts to land use would include changes in land use from agriculture to electricity generation.	Impacts to land use will be assessed in the EIS.
Loss of resources	The closest Biophysical Strategic Agricultural Land (BSAL) is approximately 33.1 km north east of the site.	Impacts to existing land resources would be assessed in the EIS.
Noise	Solar farms are a passive land use and typically do not generate intrusive noise during operation. Construction noise is temporary and with the buffers to existing neighbours, standard best practice during construction will ensure acoustic amenity values are not compromised.	Noise impacts will be assessed in the EIS.
Soils and water	Potential impacts to soils and surface water may occur during construction, such as erosion and sedimentation. Impacts are expected to be minimal and manageable.	- Impacts to soil and water would be assessed in the EIS. - Management of soil and water impacts would be addressed in a CEMP.

Table 4.1 – Assessment of Other Environmental Issues

Issue	Potential Impacts	Strategies
Historic Heritage	A search of the NSW Planning Portal (Heritage), inclusive of items listed under the Walgett LEP, the NSW Office of Environment and Heritage State Heritage Register and Department of the Environment Australian Heritage Database indicates that there are no known heritage items that would be affected by the proposed development.	Heritage survey to determine the presence or not of historic heritage items.
Visual	A key feature of the development site is that open, unscreened views of the development site would not be visible from the curtilage of any neighbours' residence, nor from a Public Road. The two dwellings located within 1 km from the development site are located on the southern side of Two Mile Warrambool and riparian vegetation provides screening to the development site.	Visual impacts will be assessed in the EIS.
Waste Management	Potential impacts may include generation of waste during construction.	- Potential wastes generated by the proposal would be addressed in the EIS. - Waste management would be addressed in a CEMP.

Justification

5.1 STRATEGIC CONTEXT

At a State level the NSW Government has a Renewable Energy Action Plan which promotes the development of renewable energy in NSW, and more recently (this month released its *Climate Change Fund: Draft Strategic Plan 2017 – 2022*). This plan includes an aspirational objective for New South Wales to achieve net-zero emissions by 2050 through, amongst other things, building on the NSW Government's track record in expanding renewable energy.

At a local level 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.

The WSF project is consistent with the Commonwealth's RET, NSW's REAP and draft *Climate Change Policy Framework*, and Walgett's *Community Strategic Plan*.

5.2 SITE SUITABILITY

The site for the proposed Walgett Solar Farm was selected for development because it offers a number of key attributes which provide the opportunity to optimise the solar farm configuration and deliver lower cost energy.

It is suitably close to Essential Energy's substation which provides for efficient connection into the transmission network, which has sufficient capacity to accommodate the output of the solar farm.

The solar resource at the Walgett locality is also suitable with enough cloud-free days over the year to generate significant energy.

Importantly, the development of a solar farm at this location is a permissible development, and given surrounding topography, existing vegetation and location of neighbours' dwellings, would have a very localised and limited impact.

The fact that the land is flood prone is not problematic, with the ability to site potentially vulnerable electrical infrastructure (i.e. inverters stations, cabling junction boxes on the arrays and the substation) above the 1 100 year flood level.

Alternative sites were considered in the western network region and were not pursued at this time either due to adequacy of connection infrastructure for a project of this scale, or due to high land value (due to irrigated farming).

Alternative sites were also considered in the town of Walgett and the current site was selected based on land availability, proximity to grid infrastructure, accessibility, avoidance of the Walgett urban area and avoidance of environmental features such as native vegetation.

Epuron also communicated with one neighbour early in the site selection process to ascertain their interest in hosting the solar farm.

Consultation

Epuron will carry out appropriate consultation with community stakeholders affected by the project and the broader Walgett community. The initial consultation effort is already underway with a newsletter and community feedback form to be distributed to the broader Walgett community and surrounds. Initial consultations have also been undertaken with adjoining neighbours and the solar farm development has also been discussed with Walgett Shire Council with two face to face meetings undertaken to date.

Epuron is committed to working closely with Council to ensure all opportunities to maximise local beneficial impacts from the development are realised. To this end, Council has requested that Epuron work closely with Council's Economic Development Officer on the means and delivery of community engagement.

In addition to the local community, consultation will be undertaken with the following agencies and departments during the preparation of the Environmental Impact Statement.

- Department of Industry –Lands
- Roads and Maritime Service
- North West Local Land Services
- Office of Environment and Heritage
- Department of Primary Industries

An Aboriginal Cultural Heritage Assessment is also being undertaken for the development and the four step process of consultation with Aboriginal stakeholders will be completed in accordance the OEH's *Aboriginal Cultural Heritage Consultation Requirements for Proponents (ACHCRP 2010)*.

State and Federal government authorities will be informed of the project to the extent they are affected. This is already underway with advice provided to the NSW Renewable Energy Advocate.

Capital Investment Value

The capital investment value of the 35 MW Walgett solar farm will be above \$30 million.