Renew estate.

Bomen Solar Farm

Preliminary Environmental Assessment

October 2017

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1. INTRODUCTION

1.1. Overview

Renew Estate Pty Ltd is proposing to develop a 120 megawatt (peak) (MWp) solar farm in Bomen NSW, approximately 7km northeast of the Wagga Wagga CBD. The solar farm will be approximately 250 hectares in size.

Key elements of the proposed infrastructure include photovoltaic (PV) modules mounted on a tracking array structure, containerised power stations containing electrical switchgear and an electrical substation for connection to the National Electricity Market (NEM) (the Project). Two connection options are under consideration, with one option additionally requiring the construction of an overhead transmission line. The Project description including the two connection options are described further in Section 2.2.

The Project is classified as a State Significant Development (SSD) under *State Environmental Planning Policy (State and Regional Development) 2011* and is subject to assessment and determination by the NSW Minister for Planning and Environment (Minister). SSD projects comprise developments that are deemed to have State significance due to their size, economic value or potential impacts. Applications for SSD must be accompanied by an Environmental Impact Statement (EIS) which is prepared in accordance with Secretary's Environmental Assessment Requirements (SEARs) issued by the NSW Department of Planning and Environment (DP&E).

1.2. Purpose of this report

This Preliminary Environmental Assessment (PEA) has been prepared to support Renew Estate's request to DP&E for the SEARs in relation to the Project. The EIS must address the SEARs.

The PEA will assist DP&E's development of the SEARs through providing:

- an overview of the proposal, including justification and alternatives considered;
- an outline of the planning and statutory framework;
- a description of the stakeholder and community consultation undertaken to date;
- characterisation of the existing environment and site constraints;
- a preliminary assessment of key potential environmental issues and risks; and
- identification of further assessments likely required during the EIS.

1.3. The Proponent

Renew Estate is developing medium to large scale renewable energy projects whilst maintaining a position on strong community values. Renew Estate is passionate about meeting the goals of all stakeholders and delivering appropriate and considerate uses of land, technology and investment. Renew Estate's goal is to embed sustainable energy into rural and urban lifestyles whilst enhancing energy security and affordability. Renew Estate develops utility scale solar farms that are flexibly designed to work with the natural and built environments.

Wirsol Energy (subsidiary of WIRCON Group) is Renew Estate's largest shareholder. The WIRCON Group is a globally operating group of companies that specialise in the development, construction and operation of PV systems (ground & rooftop mounted) and wind farms.

WIRCON can demonstrate significant know-how through its engineering of more than 850 MWp of installed power that is of the highest quality. WIRCON consistently uses state-of-the-art technology.

Beast Solutions is also a shareholder of Renew Estate. The Beast Solutions team brings high-end consultancy experience to a small personable consultancy practice. The team provides advisory, due diligence and design management support for property and renewable generation developments, low carbon precincts, smart grids and microgrids. Beast Solutions has played a key role in some of the most advanced and recognisable projects in the field.

2. THE PROPOSAL

2.1. Site Description

2.1.1. The Site

The Bomen Solar Farm Proposal Site is located in the suburb of Bomen within the City of Wagga Wagga (CWW) local government area (LGA), NSW and is approximately 7km northeast of the Wagga Wagga CBD (Figure 1).

The Project will be approximately 250 hectares in size, located on the following lots (Figure 2):

- Lot 11 DP1130519 (part)
- Lot 2 DP590756 (part)
- Lot 174 DP751405 (part)
- Lot 108 DP751405 (part)
- Lot 110 DP751405
- Lot 109 DP751405
- Lot 3 DP594679 (part) (only potentially required for connection option 2)
- Lot 2 DP1228221 (part) (only potentially required for connection option 2)
- Lot 22 DP1085826 (part) (only potentially required for connection option 2)
- Lot 2 DP594679 (part) (only potentially required for connection option 2)
- Lot 15 DP1108978 (part) (only potentially required for connection option 2)

(the Proposal Site).

The Project includes an option for connection to an existing substation via a ~2.8 km transmission line easement. The corridor within which the easement will be located is shown on Figure 2. The easement width and alignment will be dependent on environmental constraints and TransGrid requirements.

The Proposal Site lies east of the Main Southern Railway line and runs parallel to Byrnes Road. Trahairs Road, a public local road, runs in an east-west direction separating the northern-most site parcels (Lot 11 DP1130519 and Lot 2 DP590756) from the southern site parcels (Figure 2). The Trahairs Road corridor has been included in the Proposal Site to capture potential road upgrade works that may be required by Council or Roads and Maritime Services (RMS).

An easement for an existing overhead electricity transmission line traverses Lot 2 DP594679 in a southwest-northeast direction. A 20m easement for two parallel buried high pressure gas pipelines also runs through the southern portion of the Proposal Site through Lots 174, 108 and 102 in a southwest-northeast direction (Figure 2).

The current land zoning of the Proposal Site is illustrated in Figure 3. The majority of the Proposal Site is currently used for cropping and was rezoned from Primary Production (RU1) to General Industrial (IN1) in 2010 under the *Wagga Wagga Local Environmental Plan 2010* (LEP), along with other nearby blocks in Bomen. Part of the proposed transmission line corridor is located land zoned as Primary Production (RU1) and Public Recreation (RE1).

The Proposal Site is largely cleared with few scattered trees and rows of trees along fencelines. The topography of the Proposal Site is generally flat. There are three drainage lines mapped within the Proposal Site, including one within the southern portion of the Proposal Site and two which traverse the proposed transmission line easement (Connection Option 2). All three drainage lines are presently dry. The Proposal Site also contains a number of dams.

The surrounding area to the east, west and north is characterised by broad acre farming enterprises with scattered residential dwellings. The area to the southwest is characterised by industrial land uses. West of the Proposal Site in Lot 12 DP1130519 is the Riverina Oils and BioEnergy Facility. This facility involves the operation of an integrated oilseed processing plant including oilseed crushing, a solvent extraction plant, a meal blending shed, a vegetable oil refinery and storage and handling facilities.

South of the Proposal Site in Lot 3 DP594679 is Buckman Laboratories Administration and Technical Centre which is licenced for pesticides and related production including dangerous goods production. Warehouses sit within Lot 1 and 2 of DP771340. A number of artificial ponds are also located adjacent to the Proposal Site in Lot 1 DP771340, Lot 11 DP1130519 and Lot 2 DP590756 which were part of a former wool combing facility.

There are 32 mapped residences within 2km of the Proposal Site, of which five are located within 1km. The closest residences are approximately 500m ('Rose Hill') and 650m ('Yamba') from the Proposal Site, both of which are not

involved in the Project. There is also a wedding chapel approximately 1.7km northwest of the Proposal Site as part of Brucedale Estate.

2.1.2. The Locality

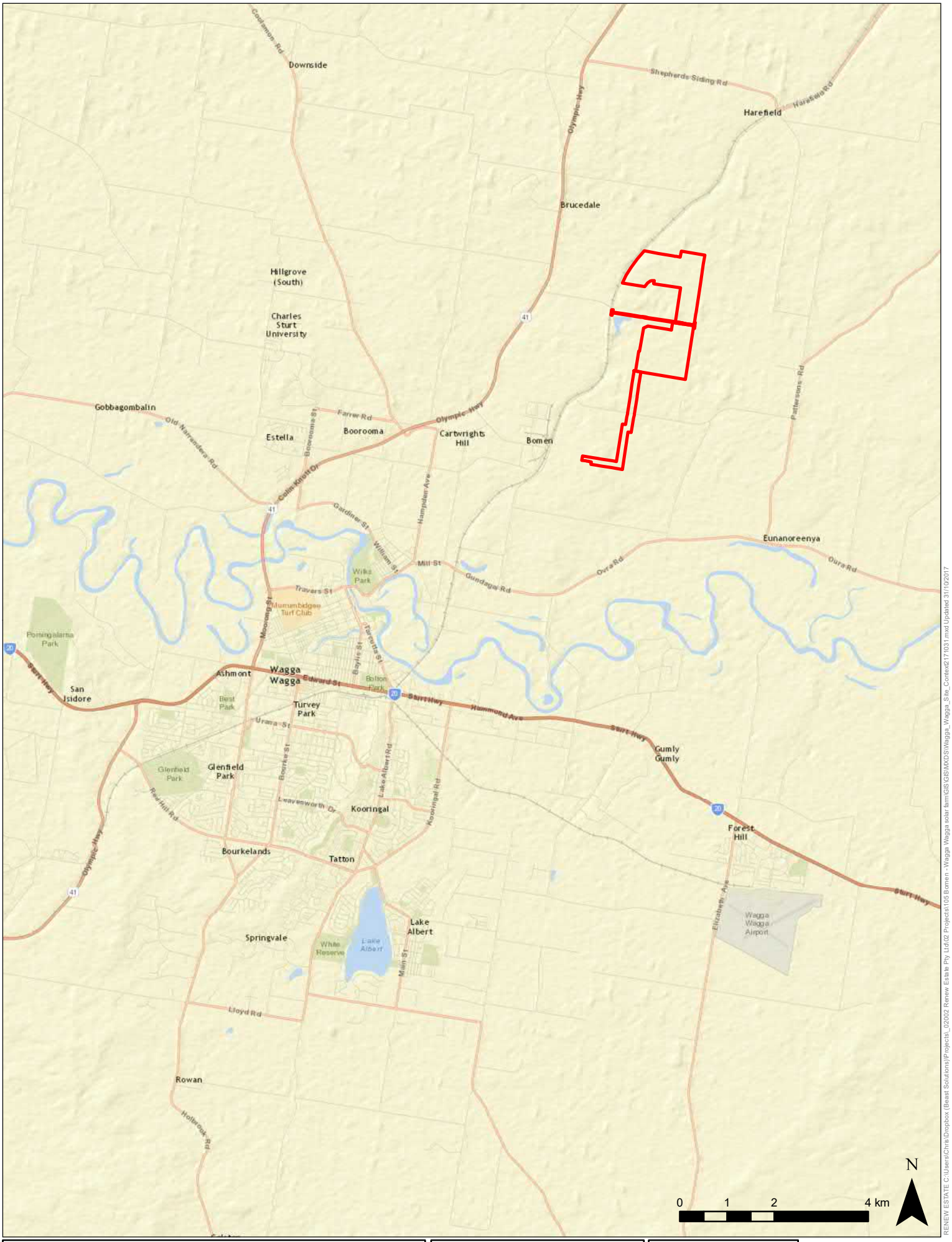
The Proposal Site is located within the Riverina - Murray region of south-western NSW. The Riverina – Murray is known for its production of food and fibre and as the major freight and logistics hub of South East Australia (CWW, 2017a). The Riverina – Murray region contains Albury as well as Wagga Wagga, which are the two largest inland cities in NSW. Wagga Wagga and Albury are approximately 7km and 130km southwest of the Proposal Site respectively.

The Bomen locality is referenced in the Riverina Murray Regional Plan (DP&E, 2017) as the home of the Bomen Business Park, which has been identified as a [future] significant contributor to regional jobs and economic growth. The Plan outlines supporting the development of the Bomen Business Park as a priority for the Wagga Wagga area, as well as the need to protect industrial areas from the encroachment of growing cities, and potentially incompatible surrounding land uses.

The Bomen locality is referenced in the Council's Draft Activation Strategy (CWW, 2017a), which identifies the Bomen Industrial Estate as being a key source of economic growth and jobs for the city, through its development and investment. The Strategy also aims to position Wagga Wagga as a "smart city" and home to innovation and new technology as a draw for talent and investment. This will help create higher quality and sustainable jobs, deliver higher business competitiveness and profitability, and act as a signal that the city is a modern and agile economy and a great place to do business. The Strategy specifically identifies a solar farm as one of the key features of the Bomen Industrial Precinct.

The Bomen locality is referenced in the Bomen Strategic Master Plan (CWW, 2009) and the Riverina Intermodal Freight and Logistics Hub Program Background Document (CWW, 2017b), which identifies the vision of the precinct to be a high-quality and nationally renowned place for transport and logistics-based enterprises and nurture a more sustainable city and Riverina Region. The Master Plan also outlines a vision of Bomen's future as one of the most resource and energy efficient places of business nationally and supplied with infrastructure for transport, energy, communications and resource and materials

The Project demonstrates alignment with the these strategic planning documents by supporting the development of an innovative, well-resourced and flourishing industry hub in Bomen. The Project will provide a low-cost energy source for local industry and alleviates future energy supply constraints likely to emerge as the precinct develops. The Project maintains a compatible surrounding land use to the precinct which will draw investment, development, jobs, new technologies and opportunities for local business. The Project therefore supports and implements the strategies outlined in each of the documents. It will provide essential infrastructure which to support the growth and longevity of the Bomen Industrial Estate.



Proposal Site

Project: Bomen Solar Farm	Scale: 1:100,000 @ A4	
Drawing Title: Site Location	Drawn by: LL	Fig: 1
Client: Renew Estate	Date: Oct 2017	Rev: B

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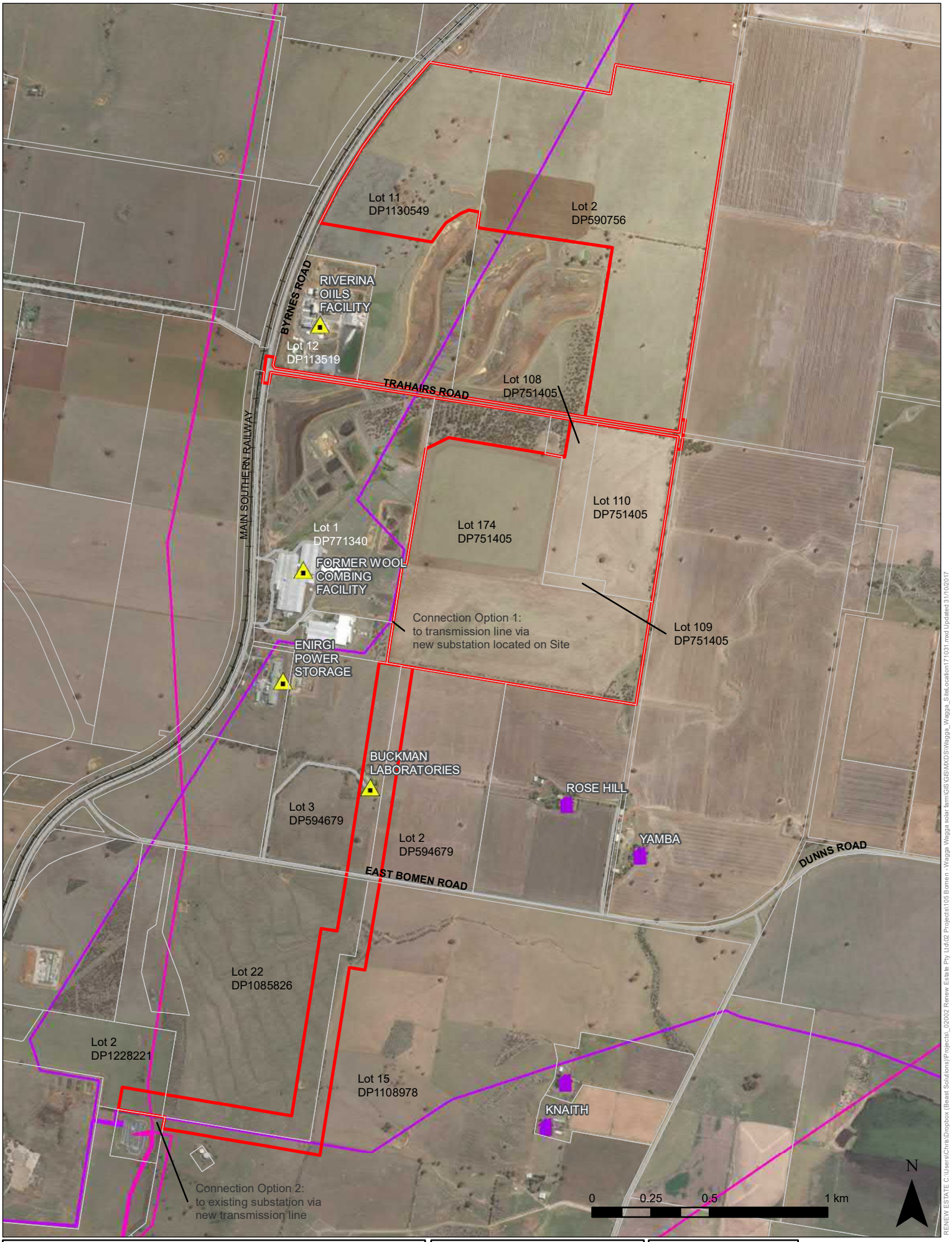
BEAST SOLUTIONS



Proposal Site
Residence
Industrial Facility/Area
Essential Energy transmission line
Transgrid transmission line
Local road
Railway

Project: Bomen Solar Farm	Scale: 1:20,000 @ A4	
Drawing Title: Site Location	Drawn by: LL	Fig: 2
Client: Renew Estate	Date: Oct 2017	Rev: C

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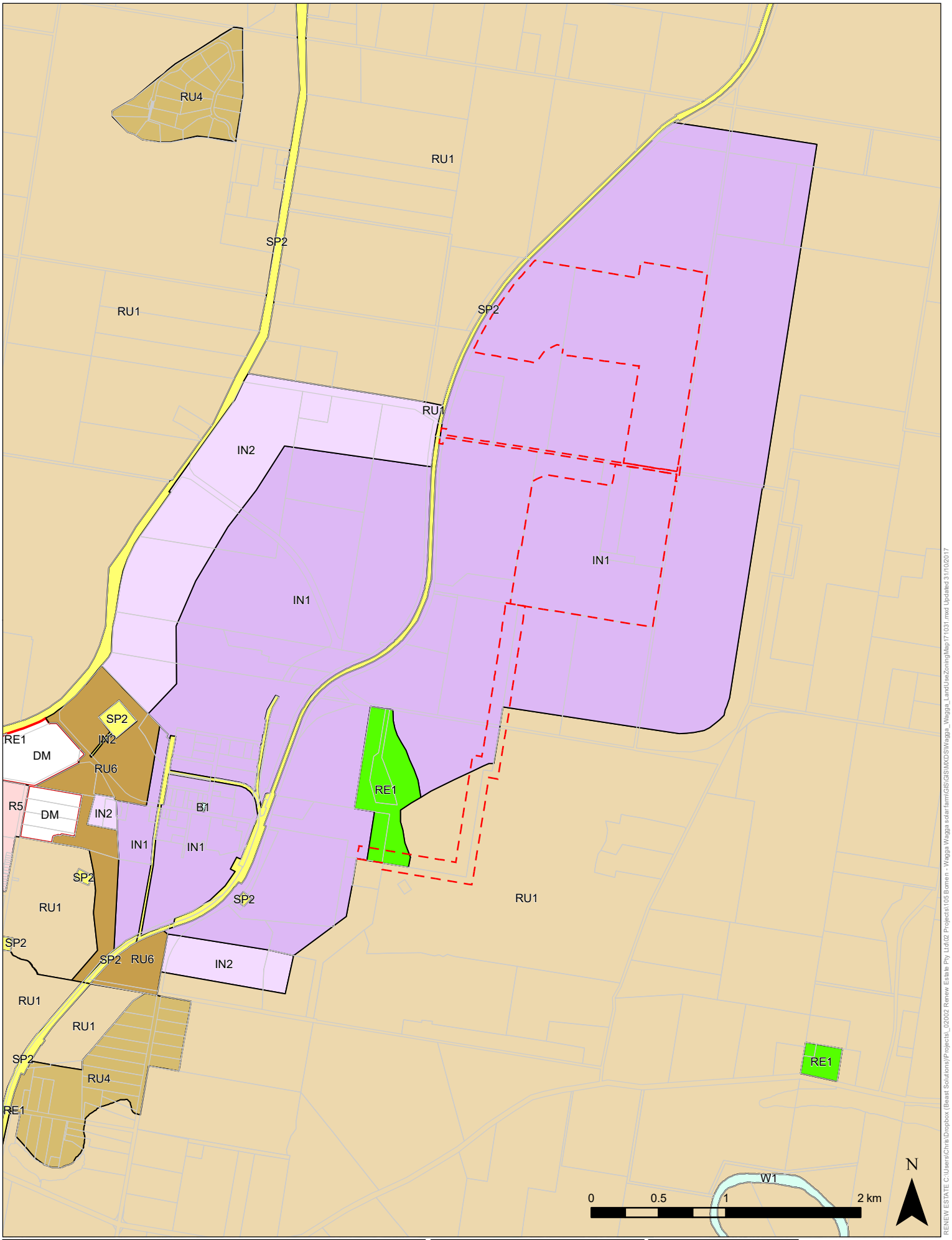
BEAST SOLUTIONS



Proposal Site

LAND USE ZONE

- B1 Neighbourhood Centre
- IN1 General Industrial
- IN2 Light Industrial
- R5 Large Lot Residential
- RE1 Public Recreation
- RU1 Primary Production
- RU4 Primary Production Small Lots
- RU6 Transition
- SP2 Infrastructure
- W1 Natural Waterways
- DM Deferred Matter

Project: Bomen Solar Farm	Scale: 1:35,000@ A4	
Drawing Title: Site Location	Drawn by: LL	Fig: 3
Client: Renew Estate	Date: Oct 2017	Rev: B

Renew estate

BEAST SOLUTIONS

2.2. Description of the Project

The Project will contain up to 120MWp of solar generation equipment. The primary Project components will consist of:

- PV solar modules (modules);
- single-axis tracking system mounted on steel piles;
- containerised power conversion stations, containing the electrical switchgear, inverters and MV transformers;
- electrical switchyard and substation;
- overhead transmission line and easement (only required if 'Connection Option 2' proceeds; refer below);
- control building including office, SCADA systems, operation and maintenance facilities and spare parts;
- internal all-weather access tracks;
- internal fire trail and bushfire asset protection zones as required;
- security fencing;
- internal underground DC and AC cabling for electrical reticulation;
- meteorological station;
- potential battery storage system; and
- potential upgrade works to Trahairs Road and site access points as required.

Up to 90 modules will be mounted on each tracker arm, with the tracking angle ranging from +60 to -60 degrees to the horizontal each day. The modules will be oriented to face east for first light in the morning, and will track to follow the position of the sun throughout the course of the day. At solar noon, the position of the modules will be zero degrees (parallel to the ground) and they will finish facing west in the late afternoon.

The system will have the capability to stow the trackers into flat position to reduce loading as required. Local weather conditions including average and gusting winds speed will be monitored by the onsite meteorological station 24 hours a day.

The tracking structures will be mounted on piles, which will be screwed or pile driven depending on final geotechnical analysis. This eliminates the need for concrete and foundations which significantly reduces ground disturbance during construction. In turn, this facilitates the retention of grass cover and habitats under the array.

This construction methodology keeps ground disturbance to a minimum and allows the final site design to follow the existing lie of the Proposal Site. The intention of the Project is to maintain the existing vegetation on the Proposal Site and all future vegetation management, as dictated by the final bushfire management and environmental management plans. It is the intention of the Project to graze sheep under the arrays.

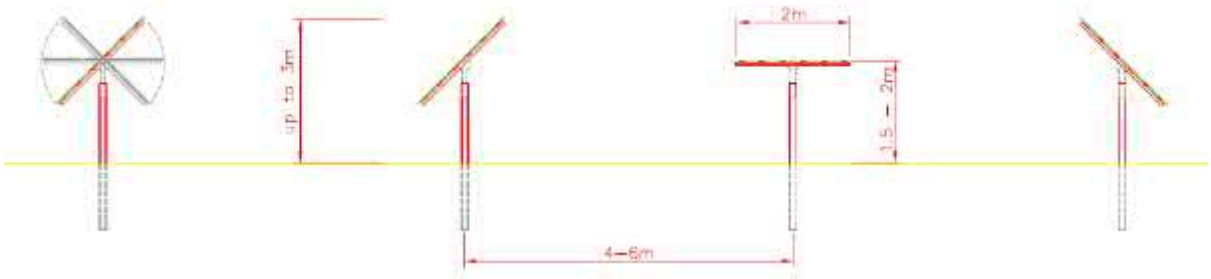


Figure 4: Indicative Tracker Elevations

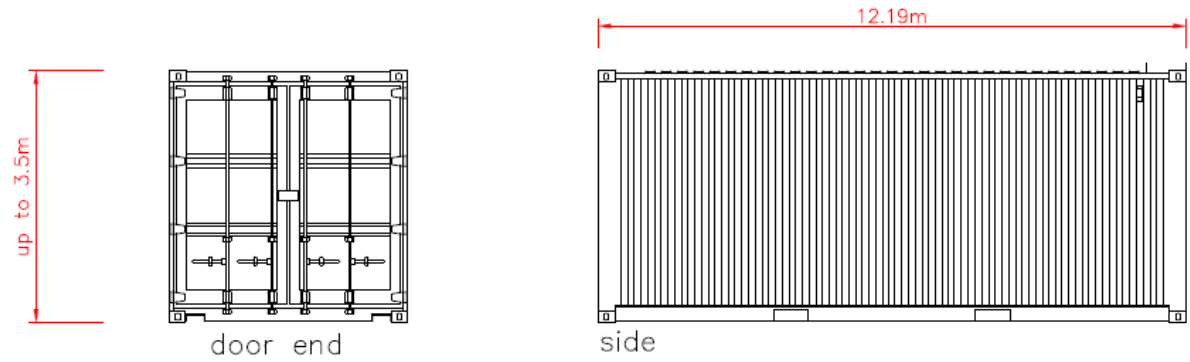


Figure 5: Indicative Power Conversion Station Dimensions

Figure 6: Example of Nextracker system at the Moree Solar Farm in Northern NSW

The Project may include battery storage technology to improve the generators reliable output and provide frequency control and ancillary services to the NEM. The battery storage system consists of modular units on pad mounted foundations, ideally located near the Projects electrical switchyard and substation. The storage system will be containerised and bunded.

The output and storage capacity of the battery system is notionally 10MW and 40MWh respectively, however the recent announcement of the National Energy Guarantee (NEG) and sequent requirements will influence the ultimate design of the project. The battery technology type, system size and location will be further refined during the EIS and design process. Currently there are a number of suitable technologies in the market that provide a range of benefits to the Project and the wider electricity market.

There are currently two options for interconnection into the NEM being assessed by the project team, as follows:

- the first option (Connection Option 1) is to connect into the local distribution network operated by Essential Energy. This would involve connecting into the exiting Essential Energy circuit (Feeder 83F) which traverses the Proposal Site through Lot 2 DP590756 and abuts Lot 174 DP751405. This option would involve construction of a substation and switchgear within the Proposal Site on Lot 174 DP751405 adjacent to the existing easement, and a connection would be made directly into the existing Essential Energy circuit; and
- the second option (Connection Option 2) is to connect into the local transmission network operated by TransGrid. This would involve connection into the existing Wagga North substation via a new transmission line and easement (~2.8km long). A substation and associated switchgear would be constructed within the Proposal Site on Lot 174 DP751405 to step the voltage up to 132kV. This would then reticulate south likely

via an overhead line into the Wagga North Substation. The final transmission line easement width and alignment will be dependent on environmental constraints and TransGrid requirements.

At this stage, it is expected that planning approval will be sought for both of these options to enable sufficient time for the detailed design to be developed and negotiations with both Essential Energy and Transgrid to occur.

Site access will be via Trahairs Road accessed from the west via Byrnes Road. Site access will be in accordance with the requirements of Council and/or RMS following an analysis of the adequacy of the access route.

The control building and car parking will be located near the access point of Trahairs Road. The control building and substation will both have dedicated septic systems and rainwater tanks for water supply.

The construction schedule for the Project is approximately 9 months from site establishment to commissioning. Subject to planning and environmental approvals, the timeline for construction would be as follows:

- Possession of Site: May 2018
- Construction Commences: June 2018
- Energisation: February 2019
- Full Production: March 2019

The operational lifetime of the solar farm is 30 years, at which time the Proposal Site will either be retrofitted and continue to operate or be decommissioned. Decommissioning will return the Proposal Site generally to its predevelopment condition.

2.3. Capital Investment

Based on the initial design and the current solar engineering, procurement and construction (EPC) market, the estimated gross CAPEX cost of the Project will be approximately $150,000,000.

2.4. Existing Development Consent

Part of the Proposal Site is the subject of an existing development consent for a 22MW solar farm (DA16/0135) which was approved by the Southern Joint Regional Planning Panel.

Due to changes in technology and market demand, at this stage, Renew Estate has elected not to rely on this development consent, particularly due to the community title subdivision component which was to be used as a financing mechanism.

Should DP&E form the view that the development consent is inconsistent with the Project, a condition can be imposed as part of the SSD approval requiring its surrender.

3. PROPOSAL JUSTIFICATION AND ALTERNATIVES

3.1. Supporting Regional Development, Employment and Industry

3.1.1. Supporting local industry

At no point in history have the benefits of renewable energy been as apparent as they are today for industry in NSW. Significant increases in the cost of energy over recent years have been paralleled by significant reductions in the cost of renewable energy technologies, providing industry with the opportunity to secure substantial energy cost savings while improving their environmental footprint.

The need to address the record high power prices currently faced by NSW businesses cannot be understated. Power prices are now regularly identified as a major concern to industry groups, and growing threat to NSW industry and employment; for example, the recent Energy Shock report, Australian Industry Group (AIG, 2017).

The Council has identified the Bomen Industrial Precinct as area of strategic industry growth in a number of strategy and planning documents, including the Bomen Strategic Master Plan (CWW, 2009), Draft Activation Strategy 2040 (CWW, 2017a), and the Riverina Intermodal Freight and Logistics Hub Program Background Document (CWW 2017b). These documents highlight the Council's vision for establishing a hub for local industry, which leverages benefits from the location, accessibility and infrastructure and is supplied with infrastructure for transport, energy, communications and resources which are economically and environmentally effective. In particular, the Draft Activation Strategy includes planning for a solar farm in the precinct.

The Project will support the Council's vision of establishing an industrial area that will support a flourishing local industry through the provision of abundant and low-cost energy supply. Figure 6 illustrates Renew Estate's preliminary analysis of the current and future energy demands for the precinct and the current supply constraints. The figure shows that the current industrial load in the Bomen Industrial Precinct is ~25MVA, with up to ~60MVA available through the local Essential Energy substation. However the expected growth of the industrial precinct, will require a supply of approximately 160MVA (based a similar energy density as current). The proposed project will supply ~100MVA to the precinct, meeting the growing industry demands and mitigating future supply risks.

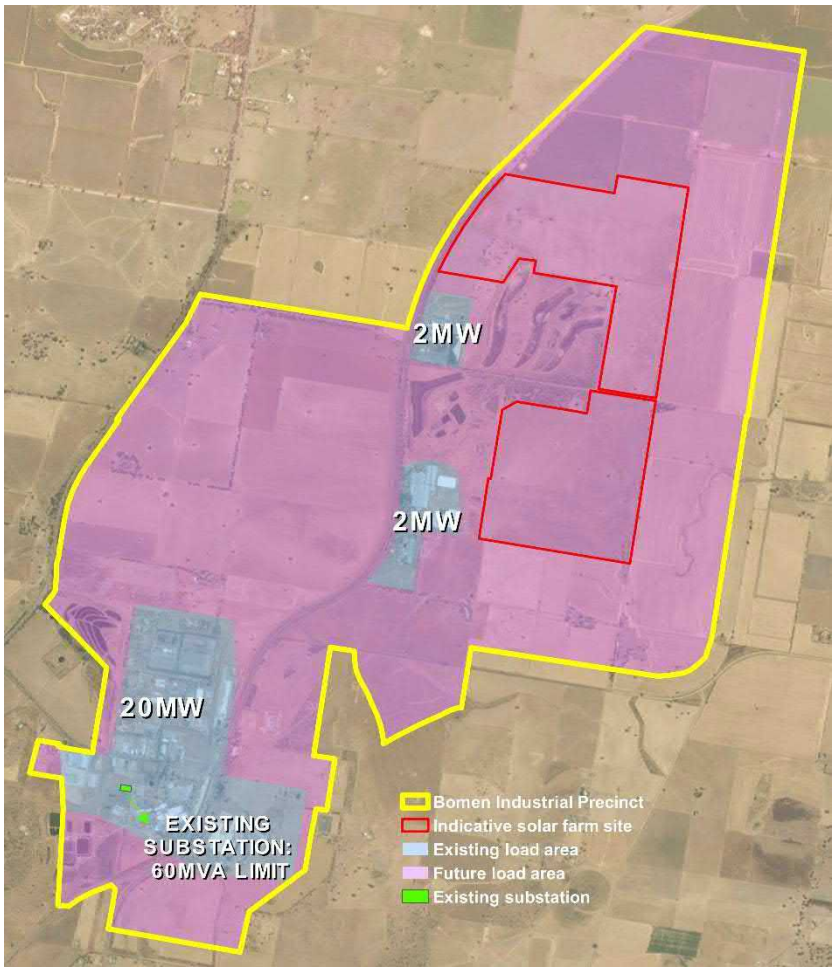


Figure 6: Current and future energy loads

Renew Estate has already begun engaging with neighbouring industrial entities in the Bomen Industrial Precinct, who have expressed their specific concerns regarding the impact of energy prices on their operations, as well as their interest in securing a direct energy supply from the Project. The Project has the ability, and intent, to supply power to the Bomen industrial users at a significantly lower cost than achievable through grid-energy purchasing.

There are a number of mechanisms by which the industrial businesses based in the Bomen Industrial Precinct, and those further afield, could benefit from the low-cost energy source created by the Project. The simplest method is via a direct cable (private wire) connection to their premises, with the solar feed-in sized to meet the industrial load. For industrial users further afield, the energy can be provided through via a power-purchase agreement (PPA) mechanism. Under this mechanism, users will contract power from the solar farm and use an energy retailer to perform the function of 'transmitting' the energy from the solar farm to the local load (using the existing electrical network) – this will be subject to retailer and network charges. Under a PPA, energy users large and small from across the region could benefit from a low-cost energy contract with the solar farm.

In addition to the opportunity to secure a low-cost energy source, all energy users in the region will benefit from reduced 'loss factors' from sourcing energy across the distant electricity network. 'Loss factors' are charged by energy retailers to all customers to reflect the extra energy that was sourced to account for the transmission losses along the way. Analysis of current energy bills in the Bomen Precinct show loss factors to represent an additional 4% on energy costs. By locating a solar farm in the heart of the Bomen Precinct, the associated loss factors will be notably suppressed, yielding energy savings for all consumers regardless of whether they secure energy from the solar farm.

By establishing a source of low-cost power in the heart of the Bomen Industrial Precinct, the Project would provide significant potential to effectively relieve the energy cost burden faced by local business and improve the competitive advantage of local industry. Other industrial users in the region will also have the potential to benefit from the Project through purchasing agreements and reduced loss factors.

3.1.2. Contribution to regional development and employment

The Project is expected to provide a significant contribution to regional development and employment, and ongoing economic benefits to the local region. The Wagga Business Survey (BWW, 2010) identified a broadly skilled and strong industrial sector, which would be well-placed to benefit from the Project through its delivery and operation. Local supporting industries such as freight and logistics, hospitality and business services sectors are also expected to benefit.

While the Council's three-year economic development strategy is currently being drafted, other NSW regional councils have identified a strategic intent to attract investment and create new employment opportunities to manage a transition to a more skilled workforce (The Yass Valley Council Economic Development Strategy (YVC, 2014)). Renewable energy infrastructure projects attract significant regional investment and have the potential create lasting employment and skills in regional areas.

3.2. Alignment with national energy and climate change policy objectives

There is a growing global recognition of the mounting imperative to mitigate the environmental impacts associated with fossil fuel-based energy generation. This growing realisation has manifested into international, national and state-wide commitments from government and industry in support of the development of clean renewable energy projects.

In addition to the environmental imperative for reducing energy sector related emissions, the economic benefits of renewable energy projects have also been highlighted. Federal, state and local governments understand the importance of regional investment and job creation offered by renewables energy projects, which will also help to put downward pressure on the soaring energy prices currently impacting household budgets and industry.

3.2.1. National Electricity Supply

In Australia, energy security is defined as "the adequate, reliable and competitive supply of energy to support the functioning of the economy and social development" (DRET, 2011). A National Energy Security Assessment (NESA) carried out in 2011 (DRET, 2011) found that Australia's energy security was deemed 'moderate'. In addition, significant amounts of new capacity will be needed over the medium to long term to compensate for the retirement of emissions intensive coal plants and to help achieve emissions reduction targets.

Significant increases in energy prices in recent years has highlighted the vulnerability of households and industry to energy supply costs. Renewable energy projects are seen as a key mechanism for putting downward pressure on the energy prices currently impacting our vulnerable households and industries.

3.2.2. NSW Renewable Energy Action Plan

The NSW Government's Renewable Energy Action Plan was released in 2013 (NSW Government, 2013) in support of the Australian Government's Renewable Energy Target (RET) and to guide renewable energy development in NSW to achieve maximum benefits to the State. The Renewable Energy Action Plan comprises 24 actions to achieve the goals of:

- attract renewable energy investment and projects;
- build community support for renewable energy; and
- attract and grow expertise in renewables.

3.2.3. NSW Climate Change Policy Framework

The NSW Government has developed the NSW Climate Change Policy Framework (OEH, 2016) in support of Australia's COP21 commitments and to demonstrate action on climate change. The Framework outlines the Government's long-term objectives to achieve net-zero emissions by 2050 and to make NSW more resilient to a changing climate.

The Framework highlights the new opportunities in 'advanced energy' sectors which will help the world adapt to climate change. The NSW Government will seek and support opportunities to grow these emerging industries in NSW.

3.2.4. Australian Renewable Energy Target

The large-scale RET is a Federal Government policy which commenced in 2001 to ensure that at least 20% of Australia's electricity consumption comes from renewable sources by 2020. Following review, the RET was confirmed in early 2015 as 33,000 gigawatt hours (GWh) by 2020. To meet the RET, significant new renewable energy capacity is needed.

To assist in achieving the 20% target and emphasise the imperative to invest in clean energy technologies, the Federal Government has committed funding of $1.5 billion to the Solar Flagships program. The program has been designed to accelerate the delivery of large scale solar powerstations into the NEM, demonstrating the Federal Government's commitment to large scale solar projects and cleaner energy generation.

3.2.5. COP21

At the COP21 climate talks in Paris in December 2015, the Federal Government committed an emissions target of a 26-28% reduction by 2030 compared to 2005 levels. The Federal Government announced at the end of 2016 that the Australian climate and energy policies will be reviewed in 2017 to ensure the 2030 targets are met.

3.3. Alternatives to the Proposal

The Council has identified the Bomen Industrial Precinct as area of strategic industry growth in a number of strategy and planning documents. Most specifically, the Draft Activation Strategy (CWW, 2017), includes planning for a solar farm in the precinct. The Project will support the Council's vision of establishing an industrial area that will support a flourishing local industry through an abundant, low-cost energy supply. In addition, preliminary analysis of the current and forecasted energy demands and the existing network capacity constraints, has identified a growth constraint for the future precinct (Section 3.1.1).

The proponent has considered the following alternates to undertaking the proposed development:

- a 'do nothing' approach; and
- alternative site location.

The 'do-nothing' approach would fail to meet the current and future industry need and alignment with the local planning intent of the Bomen Precinct. Local industry would suffer from high energy prices without mitigation and potential future capacity shortfalls risk constraining the growth of the precinct. The local planning intent of the Bomen precinct would not be realised.

In addition to the regional implications, a 'do-nothing' approach would fail to contribute to achieving the strategic targets and goals of the NSW and Federal Governments outlined in section 3.2. Industry, businesses and household energy users would fail to benefit from the Project's potential to put downwards pressure on wholesale electricity prices in the NEM and regional loss factors.

While an alternative site location may still support the strategic targets and goals of the NSW and Federal Governments outlined in section 3.2, it would fail to meet the needs of local industry and the local planning intent of the precinct. Alternate site locations are extremely limited due to challenges in topography, necessary site scale and land uses, whereas the Proposal Site is currently zoned for industrial land uses.

4. PLANNING CONTEXT

4.1. NSW Legislation

4.1.1. Environment Planning and Assessment Act

The *Environmental Planning and Assessment Act 1979* (EP&A Act), *Environmental Planning and Assessment Regulation 2000* and associated environmental planning instruments (including State Environmental Planning Policies and Local Environmental Plans) (EPIs) provide the framework for the assessment of environmental impacts and approval of development in NSW.

The EP&A Act authorises the making of environmental planning instruments such as *State Environmental Planning Policy (State and Regional Development) 2011* (S&RD SEPP) including the scope, power and content of plans. The EP&A Act also establishes the process for the assessment and approval of development which requires consent under Part 4.

Relevantly to this Project, section 89C of the EP&A Act provides for a process where development can be declared as SSD either by a SEPP or Ministerial order published in the Gazette. Section 89D of the EP&A Act provides that the Minister is the consent authority for SSD. Part 4.1 of the EP&A Act sets out provisions which apply to the assessment and determination of SSD.

4.1.2. State Environmental Planning Policy (State and Regional Development) 2011

State Environmental Planning Policy (State and Regional Development) 2011 (S&RD SEPP) identifies development that is classified as SSD. Clause 20 of Schedule 1 of the S&RD SEPP states that the following is SSD for the purposes of s89D of the EP&A Act:

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

(a) has a capital investment value of more than $30 million, or

(b) has a capital investment value of more than $10 million and is located in an environmentally sensitive area of State significance.

As the Project will have an estimated capital investment cost greater than $30 million, the Project is classified as SSSD and is subject to assessment and determination under Part 4 of the EP&A Act. The Minister or his delegate is the consent authority for SSD.

4.1.3. State Environmental Planning Policy (Infrastructure) 2007

State Environmental Planning Policy (Infrastructure) 2007 (ISEPP) aims to facilitate the effective delivery of infrastructure across NSW. Clause 34(7) of ISEPP states that development for the purpose of a solar energy system may be carried out by any person with consent on any land (except land in a prescribed residential zone). The majority of the Proposal Site is zoned General Industrial (IN1) under the LEP. Part of the proposed transmission corridor is located land zoned as Primary Production (RU1) and Public Recreation (RE1).

As General Industrial (IN1), Primary Production (RU1) and Public Recreation (RE1) are all not a "prescribed residential zone" for the purposes of Division 4, Part 3 of the ISEPP, the Project is permissible with consent pursuant to subclause 34(7) of the ISEPP.

4.1.4. Other relevant NSW legislation

Crown Lands Act 1989	The *Crown Lands Act 1989* (CL Act) contains provisions which regulate the occupation, use, sale, lease and licence of Crown land, along with its proper management having regard to the principles contained in the CL Act. The Byrnes Road easement abutting the northwest boundary of Lot 11 DP1130519 is Crown Land. Cadastral data provided by the NSW government (DFSI, 2017) also identifies Trahairs Road easement as shared Crown/Council land. DP&E will request comments from NSW Department of Primary Industries – Lands regarding the Project.
Roads Act 1993	The *Roads Act 1993* (Roads Act) regulates the carrying out of various activities on public roads, and provides for the declaration of RMS and other public authorities including local Councils as a roads authority for different types of roads (classified and unclassified). Under section 138 of the Roads Act, the consent of the appropriate roads authority (Council or RMS) is required before a person can, for example, 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. The potential need for upgrade works on local roads is discussed in Section 6.7 of this report and would be further investigated during the design and preparation of the EIS. If required, approval and concurrence from the relevant roads authority and concurrence body would be sought under section 138 of the Roads Act.
Local Land Services Act 2013 (LLSA)	The LLSA regulates the clearing of native vegetation on land in rural areas (generally being, land other than urban areas as defined in *State Environmental Planning Policy (Vegetation in Non-Rural Area) 2017*). Section 60O of the LLSA provides that the clearing of native vegetation is authorised for the purposes of the LLSA if that clearing was authorised by a development consent under Part 4 of the EP&A Act. As such, any clearing which forms part of the approved Project does not require further approval or authorisation under the LLSA.

Biodiversity Conservation Act 2016	The Biodiversity Conservation Act 2016 (BC Act) commenced on 25 August 2017, repealing and replacing the *Threatened Species Conservation Act 1996* (TSC Act). The BC Act now contains provisions for the assessment of impacts on biodiversity values of a proposed development, calculating measures to offset those impacts and establishing market-based conservation measures, including biodiversity credits. Pursuant to Section 79B of the EP&A Act, for SSD concurrence by the Chief Executive of the Office of Environment and Heritage is not required for development that is likely to significantly affect a threatened species, population, or ecological community, or its habitat. The majority of the Proposal Site is within a biodiversity certified area, originally established under the TSC Act. Biodiversity certification that was conferred on land under the TSC Act and that was in force on repeal of that Act is taken to be biodiversity certification under the BC Act. As such, the provisions of the BC Act and any existing conservation obligations under that certification must still be met. Under Section 8.4 of the BC Act, an assessment of the likely impact on biodiversity of development on biodiversity certified land is not required for SSD. However, the likely impacts of development outside certified land will be required. Biodiversity values within the Proposal Site and the applicability of biodiversity certification is discussed in Section 6.3 of this PEA.
National Parks and Wildlife Act 1974	Under the *National Parks and Wildlife Act 1974* (NP&W Act), the Director-General of the National Parks and Wildlife Service is responsible for the care, control and management of all national parks, historic sites, nature reserves, Aboriginal areas and state game reserves. The Director-General is also responsible under this legislation for the protection and care of native fauna and flora, and Aboriginal places and objects throughout NSW. A permit is required under section 90 of the NP&W Act before harming or desecrating an Aboriginal object, otherwise, such action is an offence under the NP&W Act. Although a permit is required for development under Part 4, because the Project is SSD, section 89J of the EP&A Act provides that such permit is not required for SSD. The closest nature reserve is more than 30km west of the Proposal Site. The potential impacts to Aboriginal heritage and native fauna and flora are discussed in Section 6.5 and 6.3 of this PEA respectively.
Heritage Act 1977	The *Heritage Act 1977* (Heritage Act) aims to conserve heritage values. Heritage items are listed on the State Heritage Register which is established under the Heritage Act. Items of local heritage significance are also found in local environmental plans, which contain provisions to ensure the protection of such items. Under Section 89J of the EP&A Act, an approval under Part 4 or an excavation permit under section 139 of the Heritage Act is not required for SSD. The potential for impacts to heritage is discussed in Section 6.5 and Section 6.6.

Water Management Act 2000	Water use approval, water management work approval and activity approvals are required under Sections 89, 90 and 91 of the *Water Management Act 2000* (WM Act). Pursuant to Section 89J of the EP&A Act, these approvals are not required for SSD.
Contaminated Land Management Act 1997	Section 60 of the *Contaminated Land Management Act 1997* (CLM Act) imposes a duty on landowners to notify OEH, and potentially investigate and remediate land if contamination is above levels set by the Environmental Protection Authority (EPA). The CLM Act also contains provisions relating to the regulation of 'significantly contaminated land' by the EPA. The potential for contamination at the Proposal Site is discussed in Section 6.8.
Protection of the Environment Operations Act 1997	The *Protection of the Environment Operations Act 1997* (POEO Act) contains provisions relating to pollution offences committed in respect of land, water and air. The POEO Act also contains provisions relating to need to obtain an environment protection licence (EPL) for certain scheduled activities. Solar energy generation does not fall within the definition of electricity generation under Schedule 1 of the POEO and therefore does not require an EPL.
Waste Avoidance and Resource Recovery Act 2001	The *Waste Avoidance and Resource Recovery Act 2001* (WARR Act) introduces a scheme to promote extended producer responsibility for the life-cycle of a product. The WARR Act outlines the resource management hierarchy principles of priority as: - avoidance of unnecessary resource consumption; - resource recovery (including reuse, reprocessing, recycling and energy recovery); and - disposal. Waste is discussed in Section 6.13.

4.2. Local Government

4.2.1. Wagga Wagga Local Environmental Plan 2010

The LEP sets out the framework for the planning and development of land within the Wagga Wagga LGA. The aims of the LEP are as follows:

a) to optimise the management and use of resources and ensure that choices and opportunities in relation to those resources remain for future generations,
b) to promote development that is consistent with the principles of ecologically sustainable development and the management of climate change,
c) to promote the sustainability of the natural attributes of Wagga Wagga, avoid or minimise impacts on environmental values and protect environmentally sensitive areas,
d) to co-ordinate development with the provision of public infrastructure and services.

The Project is located on land zoned General Industrial (IN1), Primary Production (RU1) and Public Recreation (RE1) under the LEP. Electrical generation is not listed as permissible with consent in these zones, however, the ISEPP takes precedence over the LEP to the extent of any inconsistency and permits solar developments with development consent in the IN1, RU1 and RE1 zones (refer Section 4.1.3).

4.3. Commonwealth Legislation

4.3.1. Environmental Protection and Biodiversity Conservation Act 1999

The *Environmental Protection Biodiversity and Conservation Act* 1999 (EPBC Act) aims to protect matters of national environmental significance (MNES) which include:

- World Heritage properties;
- National Heritage places;
- wetlands of international importance (listed under the Ramsar Convention);
- listed threatened species and ecological communities;
- migratory species protected under international agreements;
- nuclear actions (including uranium mines);
- Commonwealth marine areas;
- the Great Barrier Reef Marine Park; and
- a water resource, in relation to coal seam gas development and large coal mining development.

Approval from the Commonwealth Minister for the Environment is required if an action is likely to have a significant impact on a MNES (a 'controlled action'). Assessments of significance are based on criteria listed in the Significant Impact Guidelines 1.1 issued by the Commonwealth (DoE, 2013).

A search of matters protected by the EPBC Act was undertaken in September 2017 using the EPBC Act Protected Matters Search Tool (PMST) (DEE, 2017). A search radius of 10km was applied. The results of the search are summarised in Table 1 and a copy of the PMST report is provided in Appendix B. Potential impacts to threatened species and ecological communities are further discussed in Section 6.3.

Table 1 Results of the EPBC Act Protected Matters Search

Matters of National Environmental Significance	
World Heritage Properties	None
National Heritage Places	None
Wetlands of International Significance (Ramsar)	4 (note the closest Ramsar site is 400-500km upstream)
Great Barrier Marine Park	None
Commonwealth Marine Area	None
Listed Threatened Ecological Communities	3
Listed Threatened Species	21
Listed Migratory Species	10
Other Matters Protected by the EPBC Act	
Commonwealth land	11 (the Proposal Site does not contain Commonwealth land)
Commonwealth Heritage places	None
Listed Marine Species	16 (note the Proposal Site is not near a marine environment)
Whale and Other Cetaceans	None
Critical habitats	None
Commonwealth reserves Terrestrial	None
Commonwealth reserves Marine	None

If further investigations identify that the Project is likely to have a significant impact on a MNES, a referral will be submitted to the Commonwealth Department of the Environment and Energy (DEE). DEE will then determine whether the proposal is a 'controlled action' requiring approval from the Commonwealth Environment Minister or their delegate.

4.3.2. Native Title Act 1993

The *Native Title Act 1993* (Native Title Act) provides a legislative framework for the recognition and protection of native title rights. Native title is the recognition that, in certain circumstances, Indigenous people continue to hold rights to their land and waters, which come from their traditional laws and customs.

The Native Title Act sets up processes to determine whether native title exists, how future activity impacting upon native title may be undertaken, and to provide compensation where native title is impaired or extinguished.

When a native title claimant application is registered by the National Native Title Tribunal, the people seeking native title recognition gain a right to consult or negotiate with anyone who wants to undertake a project on the area claimed.

The National Native Title Tribunal does not identify any Native Title applications or determinations that affect the Proposal Site. Further review of Native Title considerations will be undertaken during the EIS.

5. CONSULTATION

5.1. Engagement and Consultation Strategy

Renew Estate has developed its Engagement and Consultation Strategy (ECS) to ensure a broad, exemplar and authentic engagement process with all Government and community stakeholders relevant to the Project, throughout the life of the Project.

Renew Estate has been proactive in commencing early consultation with the local community and a range of local and State government agencies for the purposes of this PEA. The Project ECS will be refined on receipt of the SEARS and consultation will continue and increase throughout the EIS process to ensure all stakeholders have a deep understanding of the nature and scope of the Project. Finalisation of the Project ECS will be informed by a range of resources and experts, including reference to the NSW Government report "Community Attitudes to Renewable Energy in NSW" (OEH, 2015)

For community stakeholders, implementation of the ECS will ensure:

- broad dissemination of information on both the impact and the benefits of the Project for those stakeholders; and
- genuine opportunity to provide input throughout the assessment and development phases.

It is noted that agency consultation will also be undertaken in accordance with the specific requirements to be set out in the SEARs.

Following development, the ECS will provide for the ongoing and effective liaison with community stakeholders, landowners and applicable government agencies throughout the life of the Project.

5.2. Government agencies and other key stakeholders

Below is a list of meetings held with government agencies and other key stakeholders to date:

- Meeting with the Department of Environment and Planning - 3rd August 2017
- Meeting with TransGrid – 10th August 2017
- Meeting with Wagga City Council – 14th September 2017 and 25th October 2017
- Meetings with ROBE (Local Industry) in June and September 2017 and 25th October 2017
- Meeting with Enirgi (Local industry) in September 2017 and 25th October 2017

5.3. Community Engagement

Initial consultation with neighbouring properties has been undertaken. In line with the ECS outlined in Section 5.1 above, Renew Estate will continue to proactively engage with the community.

6. PRELIMINARY ENVIRONMENTAL ASSESSMENT

6.1. Methodology

This Section provides a preliminary environmental assessment of the Project to identify key environmental issues and risks that will require a more detailed assessment within the EIS. The assessment is based on desktop review and site inspections and covers, construction, operational and decommissioning phases of the Project.

The southern portion of the Site (Figure 7) is the subject of a separate development consent for a 22MW solar energy system (DA16/0135) as determined by the Southern Region Joint Regional Planning Panel. The Statement of Environmental Effects (SEE) prepared to inform the development (Geolyse, 2016) has also been used as an information source where it informs existing environmental conditions for the Site subject of this PEA.

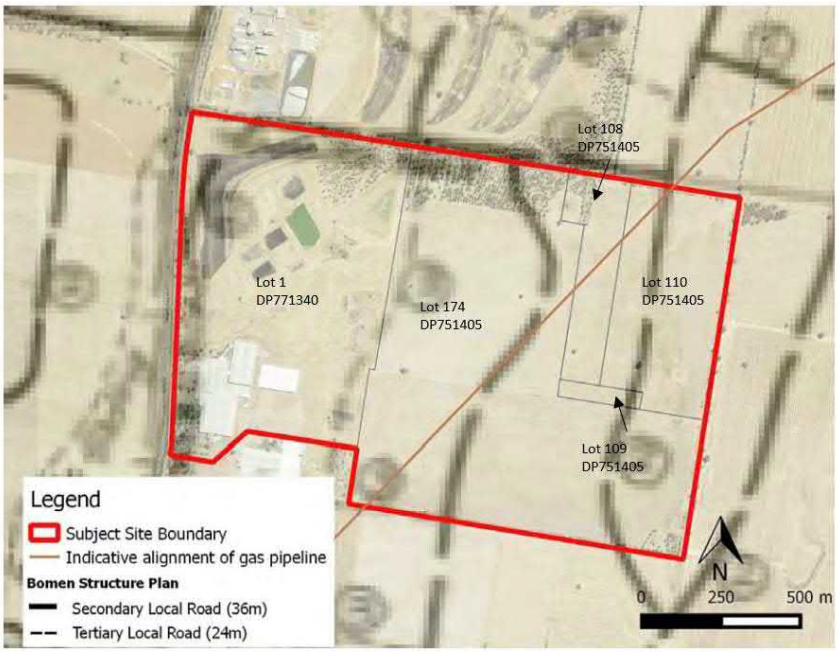


Figure 7: Site subject of DA16/0135 and associated SEE.

The risk rating is a function of the likelihood of the impact occurring and the consequence of the impact, as determined through the risk rating matrix in Table 2. Risks rated High to Extreme warrant a more detailed investigation than risks rated Low to Medium. Where there is a higher degree of uncertainty, a higher rating has been applied as a precaution.

This preliminary risk assessment identifies pre-mitigation risk, assessing potential impacts without the implementation of any controls. An assessment of residual risk following the implementation of proposed mitigation measures will be undertaken as part of the EIS.

Table 2: Risk rating matrix

		Consequence				
		Negligible	Minor	Moderate	Major	Catastrophic
Likelihood	Remote	Low	Low	Low	Medium	Medium
	Unlikely	Low	Low	Medium	High	High
	Possible	Low	Medium	High	Very High	Very High
	Likely	Medium	High	Very High	Very High	Extreme
	Almost certain	Medium	High	Very High	Extreme	Extreme

6.2. Summary of Preliminary Risk Assessment Results

Table 3 summarises the results of the preliminary risk assessment. Key identified environment risks associated with the proposal are Aboriginal heritage and visual amenity.

Table 3: Results of the Preliminary Risk Assessment (unmitigated risks)

Environmental risk	Likelihood	Consequence	Risk rating (unmitigated)
Aboriginal Heritage	Likely	Moderate	Very High
Visual amenity	Likely	Minor	High
Biodiversity	Possible	Minor	Medium
Bushfire	Unlikely	Moderate	Medium
Noise and vibration	Possible	Minor	Medium
Soils	Possible	Minor	Medium
Contamination	Possible	Minor	Medium
Waste	Likely	Negligible	Medium
Traffic and access	Possible	Minor	Medium
Land use	Likely	Negligible	Medium
Utilities	Possible	Minor	Medium
Flooding and hydrology	Unlikely	Minor	Low
Non-Aboriginal Heritage	Remote	Moderate	Low
Air quality	Possible	Negligible	Low
Electromagnetic Fields	Unlikely	Negligible	Low

6.3. Biodiversity

6.3.1. Existing Environment

Due to the historical land use of the Proposal Site, the Proposal Site is highly modified. The Proposal Site is largely cleared and is currently cropped, limiting the presence of native vegetation.

In 2010 the NSW Minister for Climate Change and the Environment made an order conferring biodiversity certification on the LEP effective from the gazettal date of 24 December 2010 until 23 December 2020. The majority of the Proposal Site is within this biodiversity certified area as indicated in Figure 8 below. Any development located within a biodiversity certified area is taken to be development that is not likely to significantly affect any threatened species, population or ecological community (listed in NSW), or its habitat. A portion of the transmission line corridor, within which the transmission line and easement for Connection Option 2 will be located, lies outside the certified area.

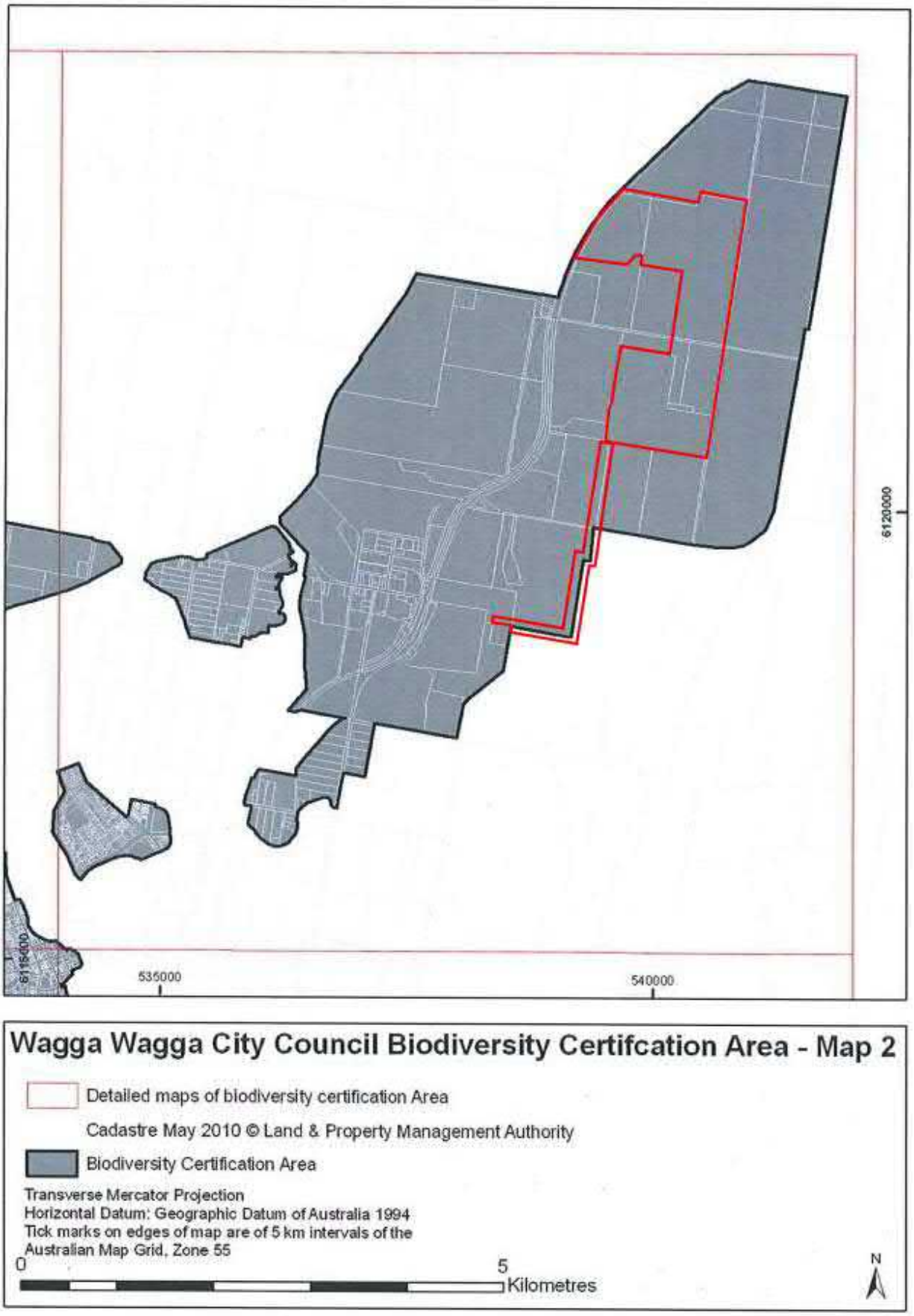


Figure 8: Wagga Wagga City Council Biodiversity Certification Area (NSW Government Gazette No. 140). Red outline = indicative Project Site.

A condition of the biodiversity certification applicable to the Bomen area is as follows"

> "5. Adoption and implementation of the draft Bomen DCP, including provisions that protect all areas of remnant native vegetation including that on Trahairs Road and the areas identified in Figure 14 of the PBC report (*Proposed Biodiversity Certification for the Wagga Wagga Local Environmental Plan 2008*)".

The above-referenced "Figure 14 of the PBC report" is copied below. The areas identified for protection are described as Yellow Box Woodland remnants, with only the patch along Trahairs Road having native understorey. None of the identified areas for protection are within the Proposal Site.

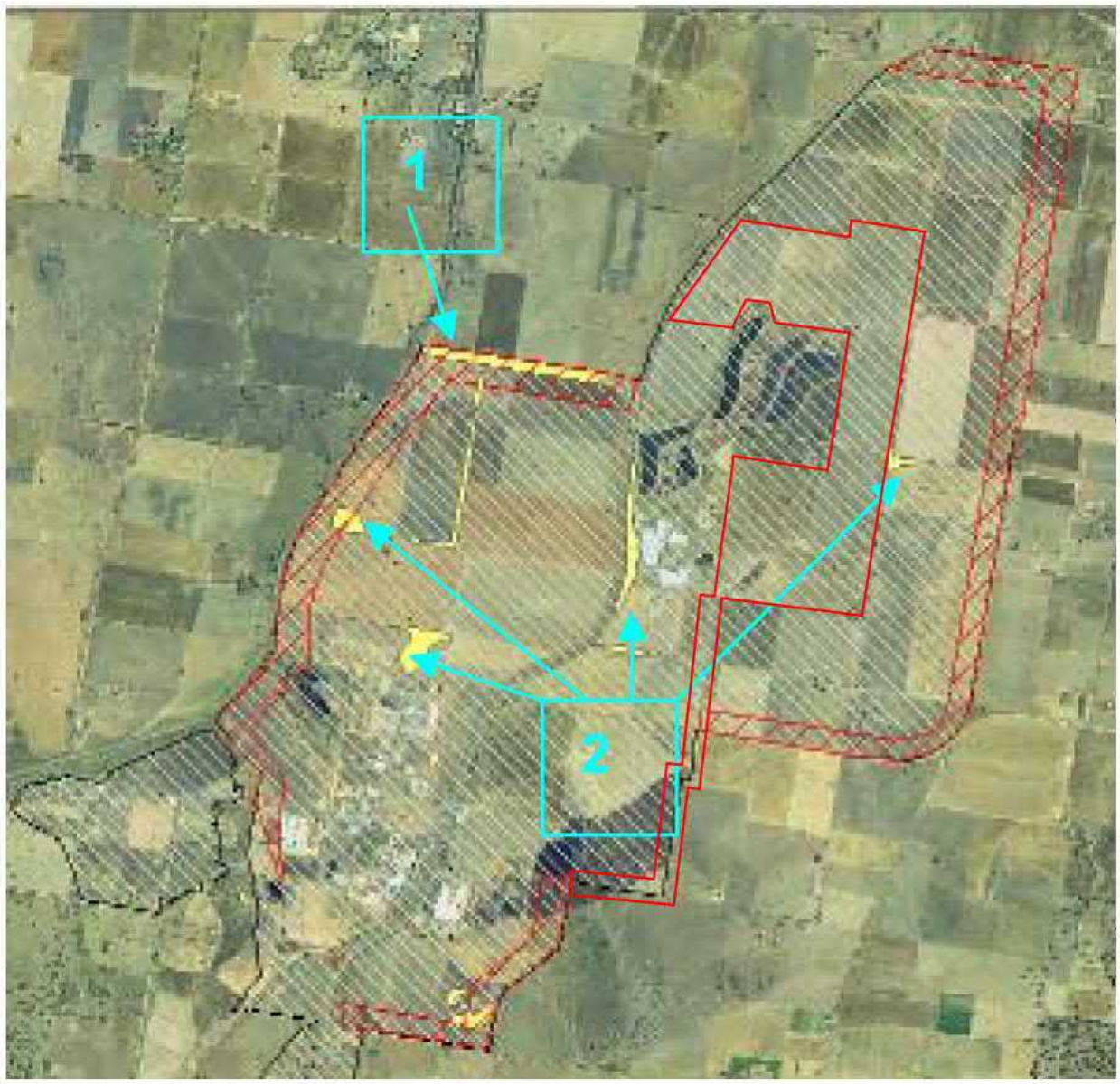


Figure 9: Figure 14 of the PBC report referenced in the Biodiversity Certification Conditions (DECC, 2008). 1= Trahairs Rd, high conservation value remnant patch. 2 = Low conservation value remnant patches, to be protected through Bomen DCP (DECC, 2008). Red outline = indicative Project Site.

6.3.2. Further Assessment

Under Section 8.4 of the BC Act, an assessment of the likely impact on biodiversity of development on biodiversity certified land is not required for SSD. An assessment would be required however for part of the proposed transmission line corridor (Connection Option 2) which extends outside the certified land.

The portion of the transmission line corridor which is outside biodiversity certified land will require an assessment of biodiversity values and likely biodiversity impacts in the EIS, in accordance with the BC Act.

Potential impacts to biodiversity values protected by the EPBC Act will be considered for the entire Proposal Site to identify whether a referral to the DEE is required (refer Section 4.3).

6.4. Visual amenity

6.4.1. Existing Environment

The Project has limited potential to result in visual impacts to surrounding residences and road users.

The Proposal Site is within a rural-industrial setting. The Proposal Site, as well as bordering lots on the eastern side of the railway, were re-zoned from Primary Production to General Industrial under the LEP in 2010 to enable the establishment of Bomen Industrial Estate. Existing structures in proximity to the Proposal Site include an oilseed processing and biodiesel plant (Riverina Oils Facility) west of the Proposal Site, large industrial sheds located south west of the Proposal Site mostly associated with the former wool combing facility, a battery storage supplier south west of the Proposal Site (Enirgi Power Storage), and a pesticides laboratory facility to the south (Buckman Laboratories,) (refer Figure 10).

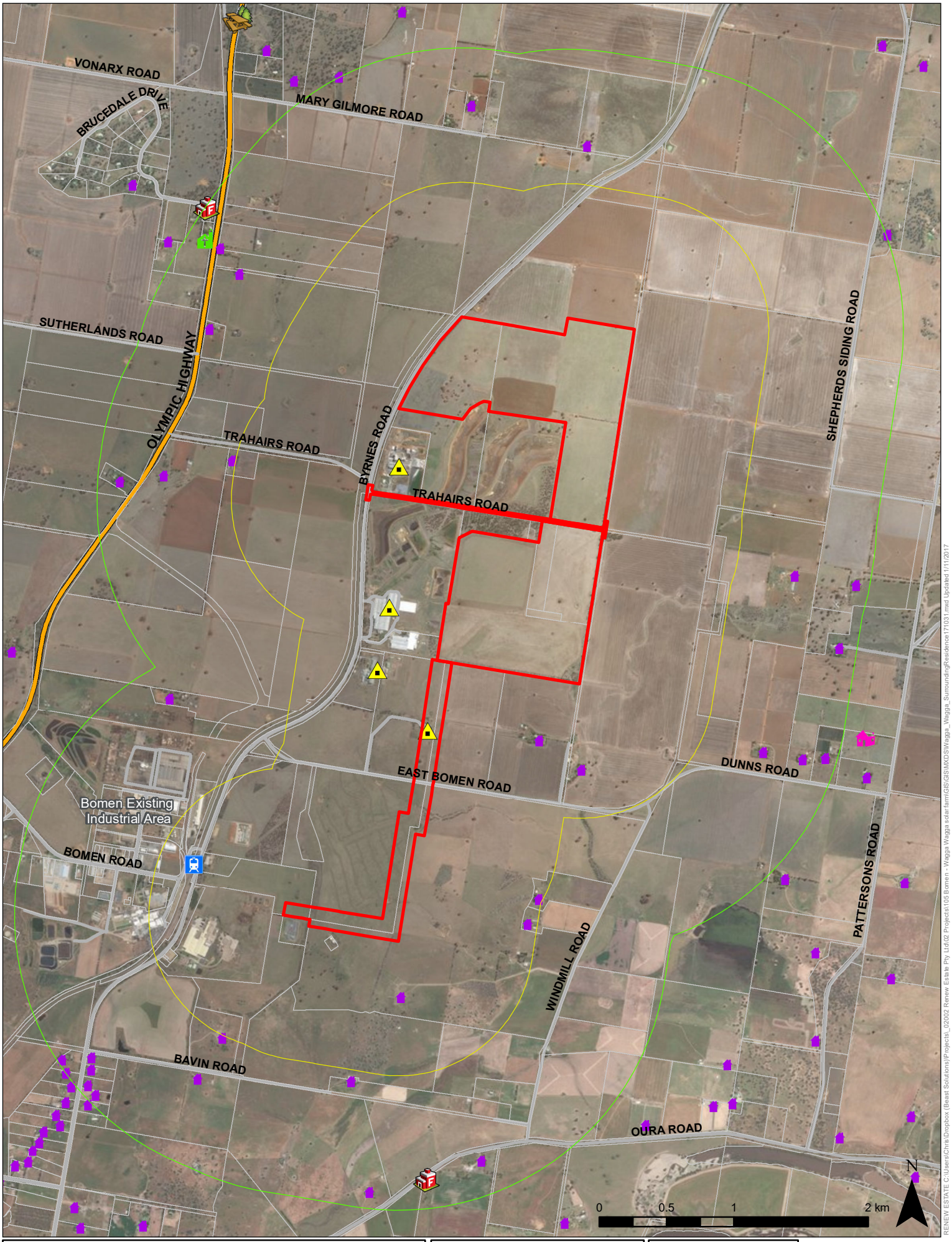
There are five residences within 1km of the Proposal Site to the south, accessed from East Bomen Road and Windmill Road (Figure 10).

Byrnes Road, bounding part of the Proposal Site to the northwest, runs in a north-east south-west direction and parallel to the Main Southern Railway line in this area. Other local roads in the vicinity of the Proposal Site are Trahairs Road and East Bomen Road.

The land surrounding the Proposal Site is undulating and rural in character and is predominantly cleared with scattered native trees.

The abovementioned industrial facilities in proximity to the Proposal Site are not considered sensitive receptors to visual impacts due to being industrial in nature. Residential receptors are considered to have the highest sensitivity due to the perceived value of landscape character and longer duration of views. The industrial zoning of the Proposal Site is expected to result in lower community landscape values in the area compared to areas with a rural or residential land use zoning.

Under the Wagga Wagga DCP, a major ridgeline to the west of the Proposal Site, parallel to the railway, is identified as having significant landscape value and requires protection for visual impacts associated with buildings. The proposed solar farm infrastructure would not protrude above the ridgeline.



Proposal Site
2km from site
1km from site
Community Facility
Firestation - Bush
Residence
Industrial Facility/Area
Wedding Chapel
Railway Station
Roadside Rest Area

Project: Bomen Solar Farm	Scale: 1:35,000 @ A4	
Drawing Title: Surrounding Receivers	Drawn by: LL	Fig: 10
Client: Renew Estate	Date: Oct 2017	Rev: B

Renew estate.

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6.4.2. Further Assessment

Views to the proposed development are dependent on the presence of vegetative screening and the topography between the Proposal Site and viewpoints. Without screening vegetation, the proposed solar farm would be visible or partially visible from surrounding roads, businesses, and some rural residences. Due to the generally flat topography of the Proposal Site, a vegetation buffer established around the Proposal Site would be expected to effectively screen the solar farm from nearby residences. The proposed transmission line associated with Connection Option 2 may visible to nearby residences, however impacts to amenity are unlikely.

A visual and landscape character impact assessment, including view shed analysis, would be undertaken for the EIS to further investigate potential impacts and mitigation options such as vegetation screening.

6.5. Aboriginal Heritage

6.5.1. Existing Environment

The Wiradjuri people are the traditional owners of the land, calling the Wagga Wagga region home for over 40,000 years (CWW, 2017). Changes to the landscape through agricultural practices and urban development has impacted on the direct and physical evidence of Wiradjuri people occupation (CWW, 2017a).

In August 2017, a Basic Search of the online NSW Aboriginal Heritage Information Management System (AHIMS) (OEH, 2017b) database was undertaken for each lot subject of the Proposal Site. The number of Aboriginal sites returned by the search is provided in Table 4.

Table 4: AHIMS Basic Search Results

Lot	Results Returned	
	August 2017	August 2017
	Within 1km	Within lot
LOT 11 DP1130519	2	0
LOT 2 DP590756	4	0
LOT 174 DP751405	7	1
LOT 108 DP751405	4	0
LOT 110 DP751405	3	2
LOT 109 DP751405	4	0
LOT 3 DP594679	10	1
LOT 2 DP1228221	LOT NOT FOUND ON AHIMS	
LOT 22 DP1085826	12	1
Lot 2 DP594679	10	0
Lot 15 DP1108978	8	2

As shown in Table 4 a total of seven records exist within the lots the Proposal Site is located within. Further records exist within 1km radius. It is likely that some of the results within 1km are duplicated across sites due to the spatial overlap of 1km buffers.

Supplementing the above search is a heritage due diligence study undertaken in May 2016 for DA16/0135 (NGH, 2016) covering the southern portion of the Proposal Site (part Lot 174 DP751405). The due diligence study summarises previous Aboriginal heritage assessments undertaken in the area as part of nearby development applications, and includes a reconnaissance level field inspection to identify the likelihood of Aboriginal sites occurring with the Proposal Site subject of DA16/1035.

An Extensive AHIMS search was undertaken as part of the due diligence study, applying a 9km x 9km search area centred on the site subject of DA16/1035, thereby also capturing the Proposal Site and its surrounding properties. The search revealed 14 Aboriginal heritage sites in the search area, predominantly stone artefacts. Two sites with stone artefacts were identified to be within close proximity to the DA16/1035 site and hence close proximity to the Proposal Site subject of this PEA, recorded as:

- Bomen Isolated Find B1F1 (AHIMS # 56-1-0109, a duplicate of deleted site AHIMS #56-1-0111), approximately 190m to the northeast of the DA16/1035 site. This site is a mudstone flake, found on a gentle slope of a small rise between a first and second order drainage line.
- APA36 (AHIMS # 56-1-0122) approximately 180m to the southwest of the DA16/1035 site. This site is an artefact scatter consisting of three quartz cores and five quartz flakes on a hill crest amongst a granite boulder outcrop.

The due diligence study also reviewed findings of six archaeological assessments undertaken within the Bomen district since 1997. The review identified that the previous assessments have resulted in the recording of a number of stone artefacts in the area including a stone quarry (Bomen Axe Quarry, now a declared Aboriginal Place under the NP&W Act).

The due diligence study included a field visit to examine the DA16/1035 site for evidence of Aboriginal objects, and sought to relocate 'B1F1'. The artefact was unable to be relocated, however the area had recently been ploughed suggesting that the item had likely moved. A previously unrecorded site, 'Bomen Solar ISO1' consisting of two quartz flakes, was identified in close proximity to the B1F1 record, along the fenceline.

Of the aforementioned Aboriginal sites recorded from these investigations, 'B1FI' and 'Bomen Solar ISO1' is recorded as being located in within the Site (refer Figure 11).

The due diligence study notes that the recording of these two Aboriginal sites, along with the high archaeological sensitivity of the area as mapped by Kelleher and Nightingale (2008), suggests that there is a potential archaeological deposit (PAD) in this area.

Figure 11: Heritage sites recorded in proximity to the site subject of DA16/0135 (NGH, 2016). The orange line indicates the Site subject of this PEA.

6.5.2. Further Assessment

Potential impacts to Aboriginal heritage include damage to Aboriginal heritage items during construction or indirect impacts to Aboriginal heritage sites due to changes to the landscape.

An assessment of potential impacts to Aboriginal heritage will be undertaken as part of the EIS including consultation with the local Aboriginal community.

6.6. Non-Aboriginal Heritage

6.6.1. Existing Environment

European settlement of the area dates from the 1840s (CWW, 2017a). A review of the NSW State Heritage Register and LEP has identified that there are no sites of non-indigenous heritage recorded within the Proposal Site.

The following non-aboriginal heritage sites are recorded within 2km of the Proposal Site. These sites are all identified within the LEP as having local significance. Bomen Railway Station additionally is identified as having State significance.

- "Hopevale" (I26) located approx. 2km to the west
- "Brucedale Hall and Tennis Courts" (I23) approx. 1.8km to the northwest
- "Holy Family Chapel" (I35) approx. 1.8km to the northwest
- "Brucedale Public School (former)" (I24) approx. 1.8km to the northwest
- "Kurrajong Woolshed and Shearer's Quarters" (I54) located approximately 1.6km to the east.
- "Hareenyha Slab Shed" (I55) approx. 1.6km to the east.
- "Bomen Railway Station" (I8/5001442) approx. 1km to the west.
- "Bomen Stationmaster's Residence" (I9) approx. 1km to the west.

6.6.2. Further Assessment

The Project is considered unlikely to impact the heritage values of the non-indigenous heritage sites in the area due to the distances from these sites. The EIS will detail the non-aboriginal heritage sites in the local area, however as impacts are unlikely, no further detailed investigations of these sites are considered necessary.

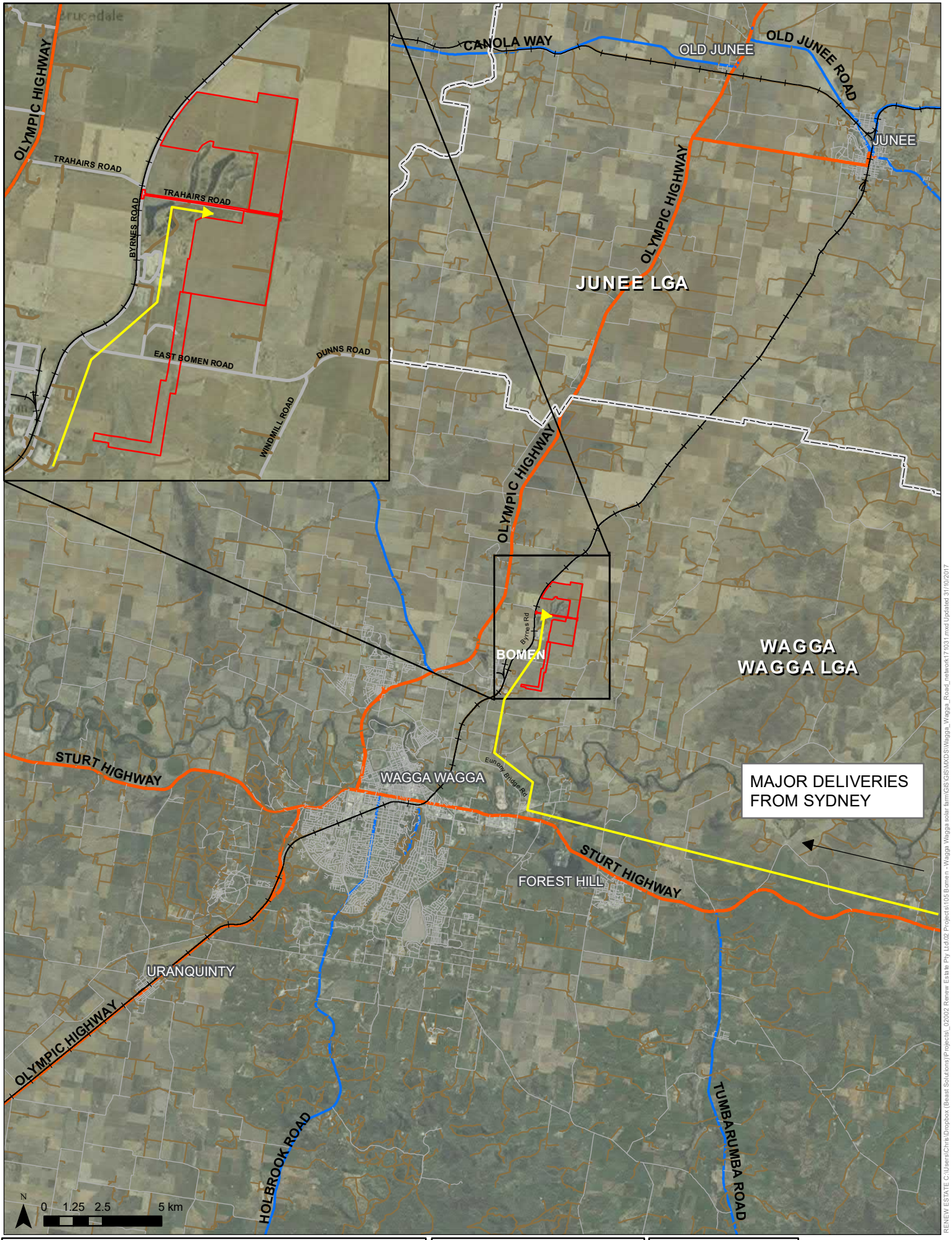
6.7. Traffic and Access

6.7.1. Existing Environment

The Proposal Site is accessed from Trahairs Road, via Byrnes Road and Eunony Bridge Road (Figure 12). Trahairs Road is a local road managed by Council, which is sealed for approximately 400m following the intersection with Byrnes Road, after which it becomes an unsealed road. Trahairs Road divides Lot 11 and Lot 2 from the southern Proposal Site parcels; Lot 174, Lot 110 and Lot 109. Byrnes Road and Eunony Bridge Road are also local roads managed by Council and are sealed. Adjacent to the Proposal Site, the Main Southern Railway line runs parallel to Byrnes Road on its western side.

Beyond Eunony Bridge Road, it is expected that the major project components would be delivered by road from Sydney via the Hume Highway and Sturt Highway. Both of these major roads are Classified State Roads, managed entirely by RMS.

The Wagga Wagga DCP contains a Proposed Road Location and Hierarchy Diagram (Figure – 6 of the DCP) which shows Council's preferred location for collector and local roads within the Bomen Urban Release Area. Although the diagram shows proposed roads which intersect the Proposal Site, the location of these roads are indicative only and are not required where the subdivision of the Proposal Site into standard lots for industrial use is not proposed.



Proposal Site
Local Government Area
Operational railway
Stage road (RMS managed)
Regional road
Local road
Vehicular track

Project: Bomen Solar Farm		Scale: 1:200,000 @ A4
Drawing Title: Surrounding Road Network	Drawn by: LL	Fig: 12
Client: Renew Estate	Date: Oct 2017	Rev: B

Renew estate

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6.7.2. Further Assessment

During construction and decommissioning there would be an increased number of large vehicles on the road network travelling to and from the Proposal Site. The delivery trucks would likely be Medium Rigid (MR) and would not be larger than typical trucks using the existing local roads in the area. At the peak of construction there could be up to 150-200 construction workers travelling to the Proposal Site each day.

Traffic generated during operation would be negligible, limited to approximately two to three operations staff travelling to site per day. With a negligible amount of traffic being generated by the Project during operation, any impacts to the road infrastructure, level of service, or safety, would be minimal.

The EIS would assess the adequacy of the access roads to cater for the construction and operation of the proposal and whether any road upgrades are required. An assessment of potential impacts to traffic during construction will also be included.

Council and RMS may require road upgrades or other road works to be undertaken to facilitate the traffic movements generated by the Project. Such consultation will be undertaken as part of the EIS process.

The Trahairs Rd corridor has been included in the Proposal Site to allow for upgrade works if required.

6.8. Contamination

6.8.1. Existing Environment

In August 2017 searches of the NSW EPA Contaminated Land Public Record and List of NSW Contaminated Sites Notified to the EPA were undertaken. Three results were returned on the NSW EPA Contaminated Land Public Record, though none related to the Proposal Site or adjacent properties. 16 sites were found on the List of NSW Contaminated Sites Notified to the EPA, including one in the Bomen area, however none related to the Proposal Site or adjacent properties.

The Planning Certificate for the Proposal Site of the proposed solar farm (i.e. the Site excluding the transmission line alignment - Connection Option 2), issued in June 2017 under Section 149(2) of the EP&A Act, identifies the following in relation to the *Contaminated Land Management Act 1997* (CLM Act):

The Proposal Site is not:

- significantly contaminated land within the meaning of the CLM Act;
- subject to a management order within the meaning of the CLM Act;
- subject of an approved voluntary management proposal within the meaning of the CLM Act; and
- subject to an ongoing maintenance order within the meaning of the CLM Act.

Due to the land use history of the Proposal Site as a former wool combing operation and agricultural land, potential sources of contamination within the Proposal Site are likely to be those associated with wool facility and agricultural activities (e.g. pesticides, sheep dips etc.).

Large artificial waste water ponds, present adjacent to the Proposal Site, were used to treat waste generated by the wool combing process. The landowner has noted that they contain lanolin and potassium, and no toxic chemicals.

The Wagga Wagga Development Control Plan (DCP) 2010 notes that two areas within the Bomen Industrial Estate were subject of an Environmental Site Assessment (ESA) undertaken by ENSR Australia Pty Ltd, described as:

- the southern part of the Proposal Site that lies to the east of Byrnes Road; and
- the area covering the land owned by Rivco Pty Ltd to the north of East Bomen Road.

The DCP further notes that the ESA found contamination at these sites resulting from wool processing, manufacturing, agricultural and other activities. The exact location of the area referred to as “southern part of the site that lies to the east of Byrnes Road” is unclear. The land “owned by Rivco Pty Ltd” are the lots which the Proposal Site is located within, Rivco Pty Ltd being the previous land owner. The contamination referred to is more likely to be associated with the areas containing built structures and artificial ponds which are outside the Proposal Site. Contamination within the Proposal Site is less likely.

6.8.2. Further Assessment

Risks associated with contamination are low as ground disturbance would be minimal and is mostly limited to pile driving or screw piling tracker mounting structures into the ground during construction. These activities result in minimal soil exposure. As such, the likelihood of encountering contamination is low. The Construction Environmental Management Plan prepared for the Project would include an unexpected finds protocol for the event that any contamination is discovered during construction.

6.9. Flooding and Hydrology

6.9.1. Existing Environment

The Proposal Site is located within the Murrumbidgee Catchment Management Area. The Murrumbidgee River is located approximately 4km south of the Proposal Site where the city of Wagga Wagga is situated on its southern banks. The Proposal Site is at a higher elevation relative to the Murrumbidgee River, with drainage lines in the area flowing south towards the River.

There are three drainage lines mapped within the Proposal Site (Figure 14), including one within the southern portion of the Proposal Site (Lot 174 DP751405) and two which traverse the proposed transmission easement (Lot 2 DP594679 and Lot 15 DP1108978). All three drainage lines are shallow and presently dry within the Proposal Site.

The drainage line within Lot 174 appears to originate at its highest point in the northern portion of Lot 1 DP771340, passing through a number of the artificial water bodies associated with the former Wool Combing facility, then traverses Lot 174, Lot 108 and Lot 110 of DP751405 to the southeast corner of the Proposal Site, connecting a number of dams along the way. This drainage line continues beyond the Proposal Site southeastwards.

The two drainage lines which traverse the proposed transmission easement originate west of the easement before crossing the easement and continuing towards the south east.

Whilst the Murrumbidgee river is prone to flood, the flood maps available on Council's website identify the Proposal Site to be outside the historical flood extents by a significant distance (Figure 13) as well as the modelled 1 in 100 flood (CWW, 2014). Further, the 2011 Wagga Wagga Major Overland Flow Flood Study, and more recent flood studies in 2012 and 2014, excluded the Proposal Site from their assessment area, suggesting that the Proposal Site is not flood affected. The Proposal Site is also not subject to any flood related development controls.

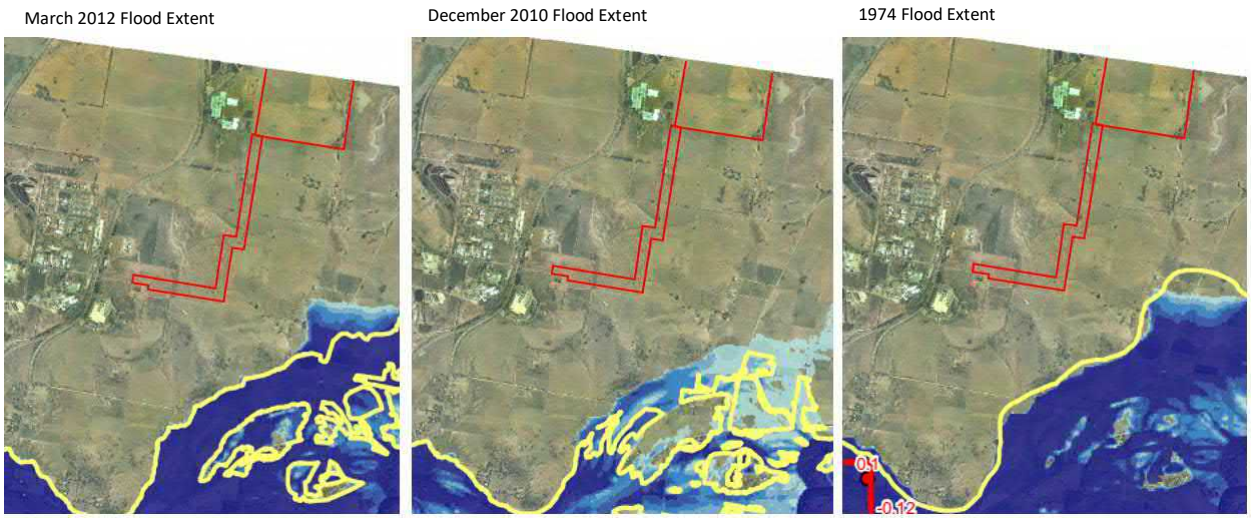
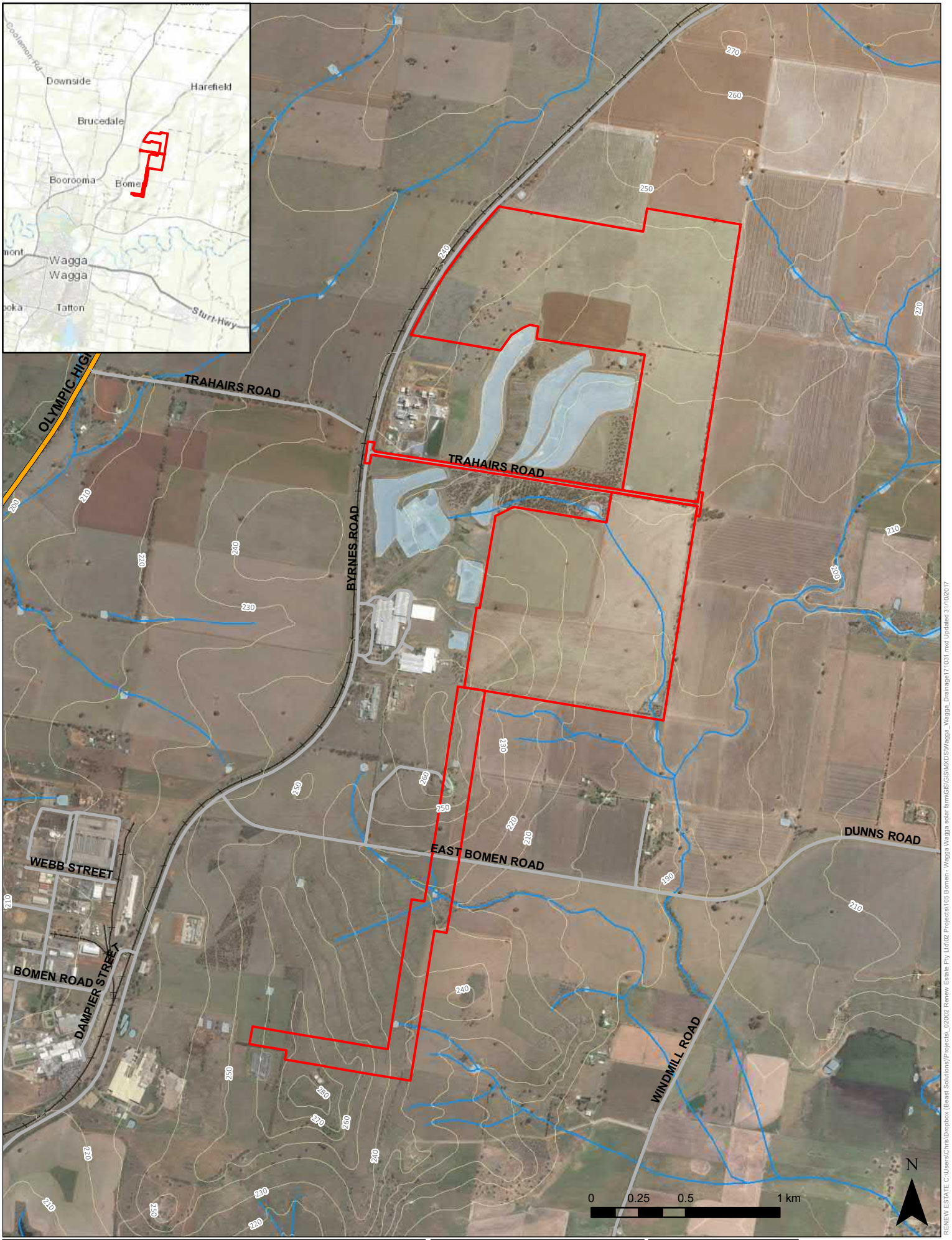


Figure 13 Historical flood extents (yellow outline) relative to the Project Site (red outline) (CWW, 2014).

6.9.2. Further Assessment

The EIS will consider the potential impacts to watercourses during construction and operation. Potential impacts to downstream watercourses are unlikely and would be limited to erosion and sedimentation impacts during construction if not appropriately managed. No further consideration of flood risk or impacts to flood behaviour is considered necessary.



Proposal Site
Drainage line
Elevation contour
Waterbody

Project: Bomen Solar Farm	Scale: 1:25,000@ A4	
Drawing Title: Water bodies and drainage lines	Drawn by: LL	Fig: 14
Client: Renew Estate	Date: Oct 2017	Rev: B

Renew estate

BEAST SOLUTIONS

6.10. Noise and Vibration

6.10.1. Existing Environment

Existing noise levels are likely to be in low at the Proposal Site. The background noise is likely predominantly influenced by vehicle movements on nearby local roads, and the occasional train on the Main Southern Railway.

There are 32 sensitive receivers within 2km of the Proposal Site, 5 of which are within 1km. The closest sensitive receivers are approximately 500m and 650m from the proposed solar farm.

6.10.2. Further Assessment

Noise generated by construction activities, such as the use of construction vehicles and plant onsite, and construction traffic, has the potential to impact nearby receivers.

During operation minimal noise would be generated by the inverters and substation transformer, though is not expected to be audible to neighbouring properties. The trackers are very quiet. Ongoing maintenance requirements will be negligible and would likely involve light utility vehicles and hand tools.

Traffic associated with the operation of the Project will likely be negligible, limited to around two to three light vehicles travelling to the Site each day.

The Project does not involve vibration-intensive activities during construction or operation.

A construction noise assessment in accordance with the Interim Construction Noise Guideline (DECC, 2009) will be undertaken as part of the EIS. This assessment will determine the likely noise impacts to surrounding receivers and identify any required mitigation measures.

The CEMP prepared for the Project would include a component for noise management which includes controls such as standard working hours, an out of hours protocol, and noise minimisation measures.

6.11. Soils

6.11.1. Existing Environment

The Soil Landscapes of the Wagga Wagga 1:100,000 Sheet (DLWC, 1997) places the Proposal Site within the East Bomen soil landscape. This landscape comprises shallow to moderately deep Eutrophic Red Dermosols on crests and ridges, deep Eutrophic Red Dermosols on slopes and moderately deep Eutrophic Brown Dermosols in drainage lines (DLWC, 1997).

Soil fertility in this landscape is noted to be low, being strong to slightly acid. Nutrient status is also generally very low in top and subsoils.

6.11.2. Further Assessment

Impacts to the soil environment are most likely during construction. Minor excavations for footings or trenching for underground cables, or road upgrade works, could result in soil erosion and sedimentation if not managed appropriately.

Soil compaction could result from development of maintenance and access roads, and pile driving solar panel support poles. Construction activities may also generate dust.

Further assessment of potential soil impacts will be undertaken for the EIS to identify appropriate mitigation during the construction and operation. At minimum a CEMP would be prepared for the construction phase which incorporates erosion and sediment controls and measures to minimise dust.

6.12. Bushfire

6.12.1. Existing Environment

The Proposal Site is not in an area identified as bushfire prone within the Wagga Wagga bushfire prone map and the NSW Rural Fire Service bush fire prone land online map.

The Proposal Site is largely cleared of over storey vegetation with few scattered trees and rows of trees along fencelines.

The Riverina Bush Fire Management Committee (RBFMC) sets out a five year strategic management plan to reduce bush fire risk within certain areas of Riverina area including Wagga Wagga LGA (RBFMC, 2009). The Proposal Site is located within the East bush fire management zone of the RBFMC Bush Fire Risk Management Plan (RBFMP) and the Bomen area is identified as asset 71 (human settlement). The RBFMC identifies the likelihood of a bush fire igniting and spreading in this area as low, with a moderate consequence of such an event occurring. This results in an overall low risk. No specific treatment measures are identified for the Proposal Site.

The Riverina area experiences warm to hot dry summers and cool winters. Rainfall is predominantly in autumn and winter. The local bushfire season generally occurs between October and March, with the RBFMC experiencing 200 bushfires on average each year including 2 major fires per year (RBFMC, 2009). Major ignition sources are identified to be lightning, agricultural machinery, escapes from legal burning off, incendiarism and accidental ignition (RBFMC, 2009).

6.12.2. Further Assessment

There is a lower risk of the proposal being affected by bushfire as the Proposal Site is not within bushfire prone lane. Further the tree corridors in the local area are considered to have low levels of connectivity to other treed areas and would have low potential to spread a bush fire.

The proposed infrastructure would not pose a significant bushfire risk.

An assessment of bushfire risks to the Project would be undertaken as part of the EIS. The assessment would recommend management measures to mitigate the identified risks.

6.13. Waste

6.13.1. Existing Environment

The key waste stream generated by the proposal is expected to be solid waste during construction.

Solid waste types likely generated by construction of the Project include packaging materials, building materials, scrap metal, excess soil, plastic and masonry products and vegetation from clearing.

There would be limited waste generated during the operation phase.

6.13.2. Further Assessment

Waste generated during construction would be removed from the Proposal Site and either recycled or disposed at an appropriate waste disposal facility. The EIS would detail measures to avoid, re-use and recycle to minimise waste, which would be incorporated into the CEMP prepared for the Project.

6.14. Air Quality

6.14.1. Existing Environment

The existing local air quality is expected to be influenced by its proximity to the city of Wagga Wagga. Existing sources of air pollution are expected to include vehicle emissions, emissions from nearby commercial and industrial activities, and agricultural practices. Key industrial sources include the neighbouring Riverina Oils and Bioenergy Plant and other activities in the nearby Bomen Industrial Estate.

There are a number of industrial and commercial operations within the Estate including concrete works, general chemical storage, waste generation, waste storage and waste recovery, general agricultural processing, fuel production and storage, saleyards, sewage treatment processing, slaughtering and processing animals, and rendering and fat extraction.

6.14.2. Further Assessment

During construction and decommissioning, potential impacts to local air quality include dust generation from excavation, earthworks and vehicle movement.

Impacts to air quality during operation would negligible, limited to potential minor dust generation from maintenance vehicles.

The EIS would detail measures to minimise dust generation which would be incorporated into the CEMP prepared for the Project.

6.15. Utilities

6.15.1. Existing Environment

A 30.48m wide easement for an existing 66kV overhead electricity transmission line traverses the Proposal Site through Lot 2 in a southwest-northeast direction, and abuts the western boundary of Lot 174 DP751405. The transmission line is owned by Essential Energy and is referred to as feeder 83F. This feeder connects the Wagga North and Junee Substations.

Essential Energy works are currently underway to upgrade this section of 83F to a 132kV circuit between Wagga North and Junee Substations as part of an augmentation to Temora Supply Area to relieve constraints identified in this region of NSW.

A 20m easement for two parallel buried 450mm high pressure gas pipelines also run through the southern portion of the Proposal Site through Lots 174, 109 and 102 in a southwest-northeast direction.

6.15.2. Further Assessment

The Project is working closely with both TransGrid and Essential Energy on the connection arrangement and interaction with their assets. The Project will comply with all easements and setbacks as required by TransGrid and the National Electricity Rules (NER).

The connection arrangement is currently being determined in collaboration with TransGrid and Essential Energy. Taking into account the ongoing works and upgrades to the Wagga and Temora Supply Area and timing of the Bomen Solar Farm.

The design of the Project will avoid the gas pipeline easement.

The EIS will assess the Project against easement and setback requirements of TransGrid, Essential Energy and the NER, as well as the gas pipeline easement.

6.16. Electromagnetic Fields

6.16.1. Existing Environment

The existing electrical infrastructure around the Proposal Site includes distribution and transmission overhead lines (SWER, 11kv, 66kv and 132kv) and the Wagga North Substation. Nearby is also the Bomen zone substation and the electrical reticulation and infrastructure associated with several local industrial loads and heavy industry.

6.16.2. Further Assessment

The Project proposes a qualitative approach to assessing the Sites contribution to electromagnetic fields (EMF), guided by the World Health Organisation (WHO) and the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA).

6.17. Land Use

With the exception of part of the proposed transmission easement (Connection Option 2), the majority of the Proposal Site is currently used for cropping and was rezoned from Primary Production (RU1) to General Industrial (IN1) in 2010 under the LEP, along with other nearby blocks in Bomen to facilitate the establishment of the Bomen Industrial Precinct.

The Project demonstrates alignment with the Council's strategic planning documents by supporting the development of an innovative, well-resourced and flourishing industry hub in Bomen. This is discussed in Section 2.1.2 and Section 3.

7. CONCLUSION

This report has established the environmental and planning context of the proposed 120MWp solar farm in Bomen, NSW and identified possible environmental impacts which require further assessment.

Classified as SSD under the S&RD SEPP, the Project is subject to assessment and determination by the Minister under Part 4 of the EP&A Act.

Environmental issues considered in this preliminary assessment include:

- Biodiversity
- Flooding and Hydrology
- Visual Amenity
- Air Quality
- Noise and Vibration
- Soils
- Non-Aboriginal Heritage
- Contamination
- Bushfire
- Traffic and Access
- Waste
- Utilities
- Electromagnetic Fields

  Land Use

The PEA identifies that the key issues associated with the Project are likely to be Aboriginal Heritage and Visual Amenity. Risks associated with these issues are expected to be able to be effectively managed.

These key issues, along with other environmental risks identified in this report, will be detailed in the EIS prepared for the Project. The EIS will assess the potential impacts, identify appropriate mitigation measures and assess the residual risks with the implementation of the identified controls. The EIS will be developed in accordance with the project SEARs issued by DP&E.

If further assessment of impacts identify that the Project is likely to have a significant impact on any MNES, the Project may also need approval by the Commonwealth Minister for the Environment, or their delegate.

REFERENCES

Australian Industry Group (AIG) (2017) Energy Shock Report: No Gas, No Power, No Future?

Business Wagga Wagga (BWW) (2010) Wagga Wagga Business Survey 2009: In-depth analysis report.

City of Wagga Wagga (CWW) (n.d.) Bushfire Map, accessed 28 September from <https://maps.wagga.nsw.gov.au/intramaps80/default.htm?project=WaggaEx&module=Bushfire%20Map>.

City of Wagga Wagga (CWW) (2009) Bomen Strategic Master Plan.

CWW (2014) Wagga Wagga Detailed Flood Model Revision.

City of Wagga Wagga (CWW) (2017a) Wagga Wagga City Council Draft Activation Strategy.

City of Wagga Wagga (CWW) (2017b) Riverina Intermodal Freight and Logistics Hub Program Background Document.

Department of Environment and Climate Change (DECC) (NSW) (2008) Proposed Biodiversity Certification for the Wagga Wagga Local Environmental Plan 2008 Under the NSW Threatened Species Act 1995.

Department of Environment and Climate Change (DECC) (NSW) (2009) Interim Construction Noise Guideline.

Department of Environment and Energy (DEE) (Cmwlth) (2017) Protected Matters Search Tool, accessed 21 September 2017 from <http://www.environment.gov.au/epbc/protected-matters-search-tool>.

Department of Finance, Services and Innovation (DFSI) (2017) Digital Cadastral Database Clip and Ship, accessed 28 September 2017.

Department of Industry, Innovation and Science (DIIS) (2016) Australian Energy Update 2016.

Department of Land and Water Conservation (DLWC) (1997) Soil Landscapes of the Wagga Wagga 1:100,000 Sheet.

Department of Planning and Environment (DP&E) (NSW) (2017) Riverina Murray Regional Plan.

Department of Resources, Energy and Tourism (DRET) (2011) National Energy Security Assessment 2011.

EPA (NSW) (2017a) Search the contaminated land record, accessed 21 September 2017 from, <http://www.epa.nsw.gov.au/prclmapp/searchregister.aspx>.

EPA (NSW) (2017b) List of NSW contaminated sites notified to EPA, accessed 21 September 2017 from <http://www.epa.nsw.gov.au/clm/publiclist.htm>.

Geolyse (2016) Statement of Environmental Effects In Support of a Development Application: Proposed solar Energy System and Subdivision. Prepared for Southern Cross Energy Pty Ltd.

Kelleher and Nightingale Consulting Pty Ltd 2008 Wagga Wagga Local Environmental Study: Aboriginal Cultural Heritage Assessment. Report to Willana Associates.

NGH (2016) Due diligence reconnaissance survey. Prepared for Southern Cross Energy Pty Ltd.

NSW Government (2013) NSW Renewable Energy Action Plan.

Office of Environment and Heritage (OEH) (NSW) (2015) Community Attitudes to Renewable Energy in NSW.

Office of Environment and Heritage (OEH) (NSW) (2016) NSW Climate Change Policy Framework.

Office of Environment and Heritage (OEH) (NSW) (2017a) NSW BioNet, accessed 21 September 2017, from < http://www.bionet.nsw.gov.au/>.

Office of Environment and Heritage (OEH) (NSW) (2017b) Aboriginal Heritage Information Management System (AHIMS), accessed 21 September 2017 from <http://www.environment.nsw.gov.au/awssapp/Login.aspx?ReturnUrl=%2fawssapp>.

Riverina Bush Fire Management Committee (RBFMC) (2009) RBFMC Bush Fire Risk Management Plan.

Rural Fire Service (RFS) (2017) Check if you're in bush fire prone land, accessed 9 August 2017 from. <http://www.rfs.nsw.gov.au/plan-and-prepare/building-in-a-bush-fire-area/planning-for-bush-fire-protection/bush-fire-prone-land/check-bfpl>.

Yass Valley Council (YVC) (2014) Economic Development Strategy 2014-2017, accessed 11 August 2017 from <http://www.yassvalley.nsw.gov.au/sites/yassvalley/files/public/Yass%20Valley%20EDS_FINAL%20August%202014.pdf>.

APPENDIX A

SITE PHOTOGRAPHS