VAST SOLAR

Preliminary Environmental Assessment

JEMALONG HYBRID SOLAR PARK: 50MW PHOTOVOLTAIC (PV) PROJECT

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1 INTRODUCTION

1.1 OVERVIEW

Vast Solar Pty Limited ('Vast Solar') is developing the Jemalong Hybrid Solar Park at Jemalong in central New South Wales. The proposed Jemalong Hybrid Solar Park comprises a solar photovoltaic ('PV') plant ('PV Project') and a Concentrating Solar Thermal Power Plant ('CSP Plant').

This Preliminary Environmental Assessment ('PEA') pertains to Vast Solar's proposed 50 megawatt (MW) PV Project at Jemalong ('the proposal').

The proposal is classified as State Significant Development ('SSD') and is subject to assessment and determination by the NSW Minister for Planning and Environment. Applications for SSD must be accompanied by an Environmental Impact Statement ('EIS'), prepared in accordance with Secretary's Environmental Assessment Requirements ('SEARs') issued by the NSW Department of Planning and Environment ('DP&E') on behalf of the Secretary.

The proposal site is subject to an existing application (SSD 14_6588) for the development of the Jemalong Solar Station 30 MW CSP Plant and associated infrastructure. The application for the CSP Plant was submitted to DP&E in September 2016 and Vast Solar expects to lodge an amendment to SSD 14_6588 on or about the same time as it lodges the Development Application and EIS for the PV Project, which will seek to amend the proposed location of the CSP Plant.

1.2 SITE LOCATION

The proposal site is located approximately 36 kilometres west south west of Forbes, within the Forbes Local Government Area (LGA), refer Figure 1-1. The site is accessed from the north via the Lachlan Valley Way, Wilbertroy Lane and Naroo Lane. The proposal would connect to the West Jemalong substation located on Lachlan Valley Way north of the site.

The site is part of the 15,478 hectare Jemalong Station, a rural property managed for agricultural production. The proposal site is a 165 hectares ('ha') lot known as 'Hallidays', which is part of Lot 13 DP753118.

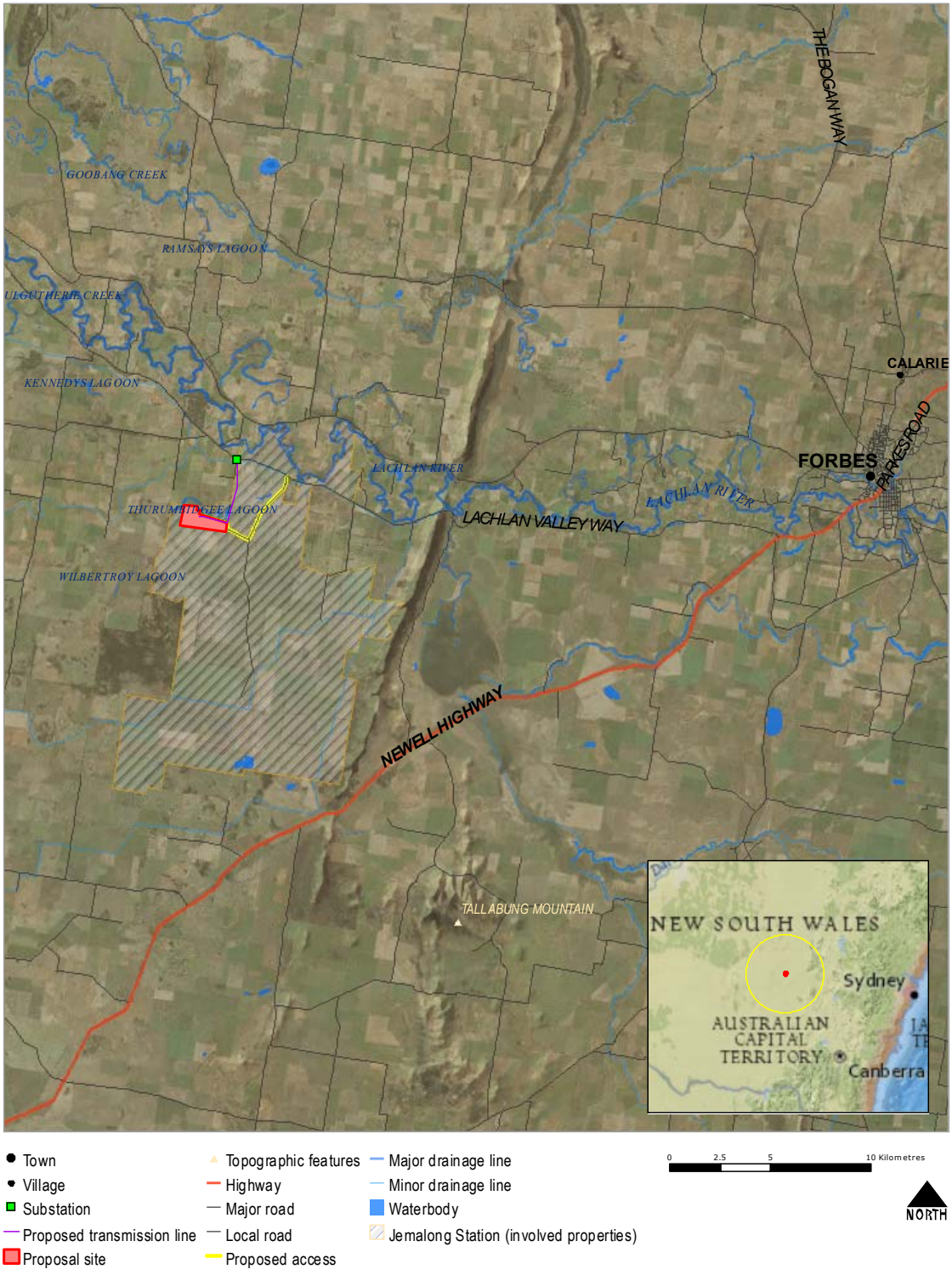

Figure 1-1 Regional location of proposal site

1.3 PURPOSE OF THE REPORT

This PEA has been prepared to support Vast Solar's request to DP&E for the SEARs in relation to the proposal. This PEA will assist DP&E's development of the SEARs by 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 environmental assessments likely required.

The SEARs will guide the preparation of the EIS for the proposal under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

Much of the information set out in the PEA is taken from the detailed and comprehensive assessment prepared by NGH Environmental for the CSP Plant proposal and included within the: *Environmental Impact Statement: Jemalong Solar Station 30MW Concentrating Solar Thermal Power Plant* (NGH Environmental 2016), referred to here as the 2016 EIS. The 2016 EIS was prepared on behalf of Vast Solar and identified the environmental constraints on the proposal site.

1.4 THE PROPONENT

Vast Solar is an Australian company developing low-cost, utility scale, modular Concentrated Solar Thermal Power ('CSP') technology. Since 2009 the Company has been undertaking research and demonstration activities to invent and deliver solutions to address the issues that have held back the adoption of CSP.

Vast Solar's world leading technology includes affordable utility scale storage that offers the capacity to dispatch renewable energy at any time of day. The technology is poised to play a key role in the energy transition from coal to more renewable energy sources. CSP technology complements other renewable energy sources by offering systemic capacity to deliver affordable storage, dispatchable power and the ability to address power intermittency issues associated with renewable energy without storage. CSP technology with thermal storage promises to deliver reliable, dispatchable power at a comparable cost to PV and wind and with the benefit of very cost competitive storage technology.

Vast Solar's innovative designs have been developed through several pilot and demonstration facilities in regional NSW with ongoing funding provided by private investors and from the Australian Renewable Energy Agency ('ARENA').

Vast Solar is currently in the final stages of completion of the Jemalong Solar Farm CSP Pilot Project. This CSP Pilot Project (1MWe, 6MWth) is the first stage of commercial deployment of the company's CSP technology. A development application for the 30MW CSP Plant is currently in process, which promises to be Australia's first commercial-scale, grid connected CSP project.

The proposed 50 MW PV Project at Jemalong, together with the proposed CSP Plant (location to be amended) would form the *Jemalong Hybrid Solar Park*. Together, these two projects offer NSW the opportunity to realise a world leading solar hybrid facility that will have the capacity to generate and dispatch renewable energy throughout the day and during the critical evening and morning peak periods.

2 PROPOSAL

2.1 SITE DESCRIPTION

2.1.1 The proposal site

The proposal site is approximately 165 ha and the PV Project infrastructure would occupy the majority of this area. It is largely cleared, relatively flat farmland as illustrated in Figure 2-1. The site also supports small remnants of Poplar Box woodland, ranging from 0.1 to 0.5 ha in area.

Figure 2-1 View looking south to south east across the proposal site

The proposal layout would be designed to avoid more sensitive natural and heritage features.

Situated within the Lachlan River Floodplain, the proposal site is approximately 3.7 km south of the Lachlan River. Thurumbidgee Lagoon is located to the north of the proposal site, which occasionally floods to form a lagoon.

The properties surrounding Jemalong Station share a history of agricultural production and are similarly mostly cleared. They are predominantly large holdings engaged in rural activities with low population density. East of the proposal site is a small air strip with a north-south and east-west runway within a fenced off grassed paddock. The air strip is typically used one to two times per year by the property owner.

The proposal site is accessed from Lachlan Valley Way to the north, via Wilbertroy Lane and Naroo Lane.

An existing 66kV overhead electricity transmission line runs in a northwest-southeast direction approximately 3.2 km north of the site. This transmission line is owned and operated by Essential Energy. The West Jemalong substation is located on this transmission line, and is located at the intersection of Lachlan Valley Way and Whispering Pines Lane. The proposal would connect to the West Jemalong Substation, approximately 3.2 km to the north of the site, adjacent to the Lachlan Valley Way.

The proposal site is zoned Primary Production (RU1) under the *Forbes Local Environmental Plan 2013* ('Forbes LEP').

2.1.2 The locality

Forbes LGA occupies around 4,700 km^2 of land in the Central Tablelands of NSW, with Forbes as its main town centre containing 95% of the population. Smaller villages within Forbes include Bedgerabong, Corinella, Ootha and Wirrinya.

The Forbes LGA has a population of approximately 10,500 as recorded in the 2016 census (idcommunity, 2017), which has been rising since 2011 (FSC, 2017). The population density is 0.02 persons per ha, reflecting its predominantly undeveloped, rural setting (idcommunity, 2017).

The region was originally inhabited by the Wiradjuri peoples, who inhabited a widespread area from the Great Dividing Range west to the Macquarie, Lachlan and the Murrumbidgee rivers (Coe,1989). European settlement of the area dates from 1817 (idcommunity, 2017). The population in the district boomed when gold was discovered in the 1860s, and by the end of decade gold had become secondary to the pastoral and developing agricultural wealth of the district (FSC, 2017).

Agriculture is a significant land use in the local area today, with over 679, 000 ha of land dedicated to agriculture within the Council area (ABS, 2011). Agriculture is the largest industry in the LGA in terms of output, and is valued at $183 million (FSC, 2017).

The proposal site is located within the South Western Slopes Bioregion, which is dominated by a sub-humid climate with hot summers and no dry season (NSW National Parks and Wildlife Service, 2003). As recorded by the closest Bureau of Metrology ('BoM') Automatic Weather Station at Forbes Airport over the period 1995 to 2017 (BoM, 2017), the mean annual minimum temperature is 9.6°C and the mean maximum temperature is 24.4°C. The mean annual rainfall is 499.1 mm, with 55.8 days being the mean annual number of rain days (rain ≥ 1 mm) (BoM, 2017).

2.2 PROJECT DESCRIPTION

The proposal involves the construction of ground-mounted PV solar arrays which would generate up to 50 MW of renewable energy, containerised power stations containing electrical switchgear and high voltage electrical connection to the Jemalong Substation (Figure 2-2).

The solar array layout would be designed to avoid impacts wherever feasible. The proposal design would consider existing and known site constraints, along with consultation with all relevant stakeholders. The design process would be augmented with additional information obtained during the preparation of the EIS. The EIS will detail how the relevant studies will be used to produce the final proposal design.

Development within the proposal site would consist of the following components:

- approximately 170 000 solar panels mounted on either a fixed or single axis tracking system;
- a single access point to the site via Lachlan Valley Way to the north, Wilbertroy Lane and Naroo Lane;
- internal access tracks;
- operations and maintenance building with associated car parking;
- an electrical substation and switching yard;
- overhead and underground electrical cable reticulation;
- security fencing and CCTV;
- native vegetation plantings to provide visual screening for specific receivers, if required; and
- subdivision for the project site and for the electrical substation (and switching yard) and transmission line upgrade.

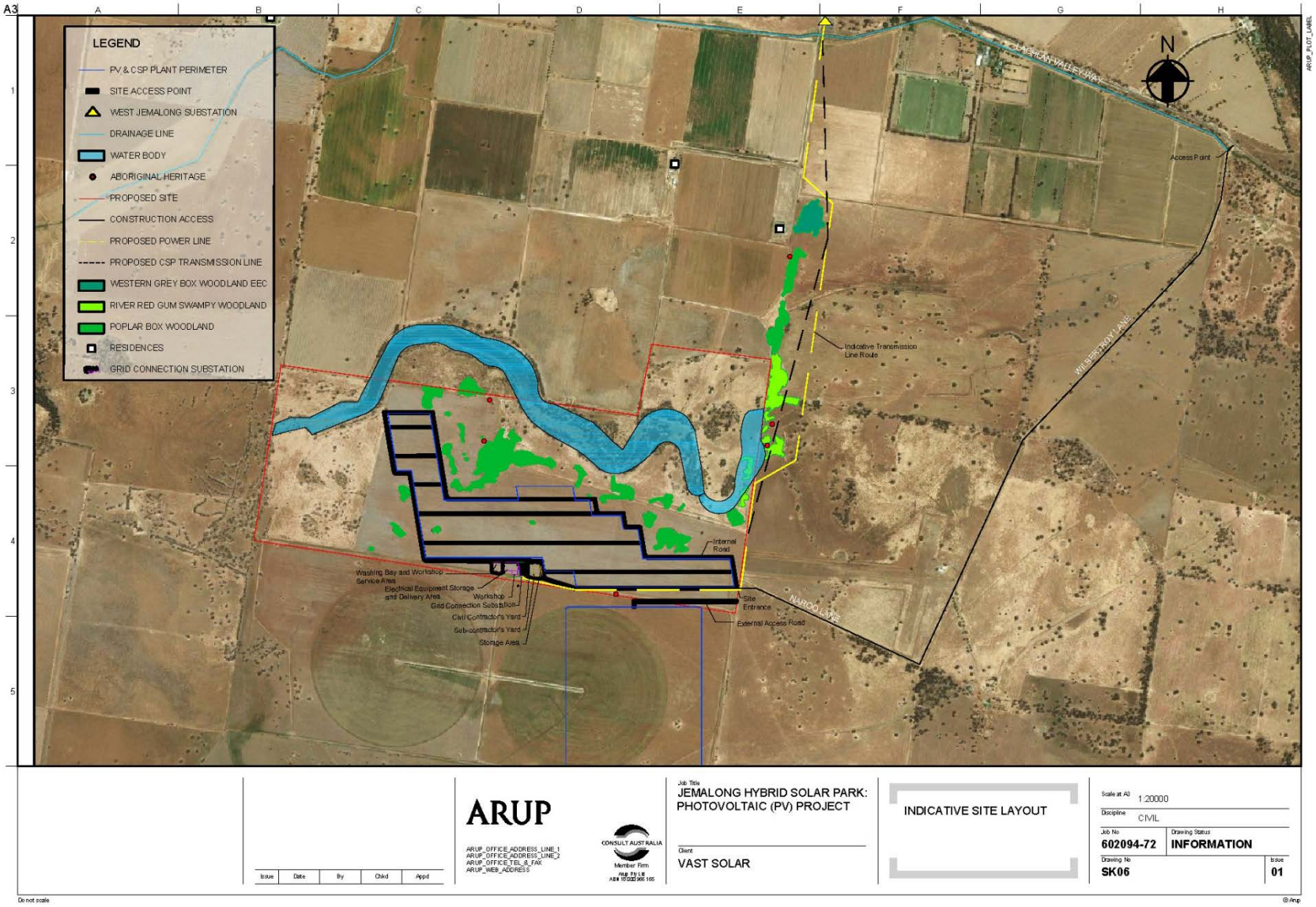

Figure 2-2 Indicative Site Layout with power line easement options.

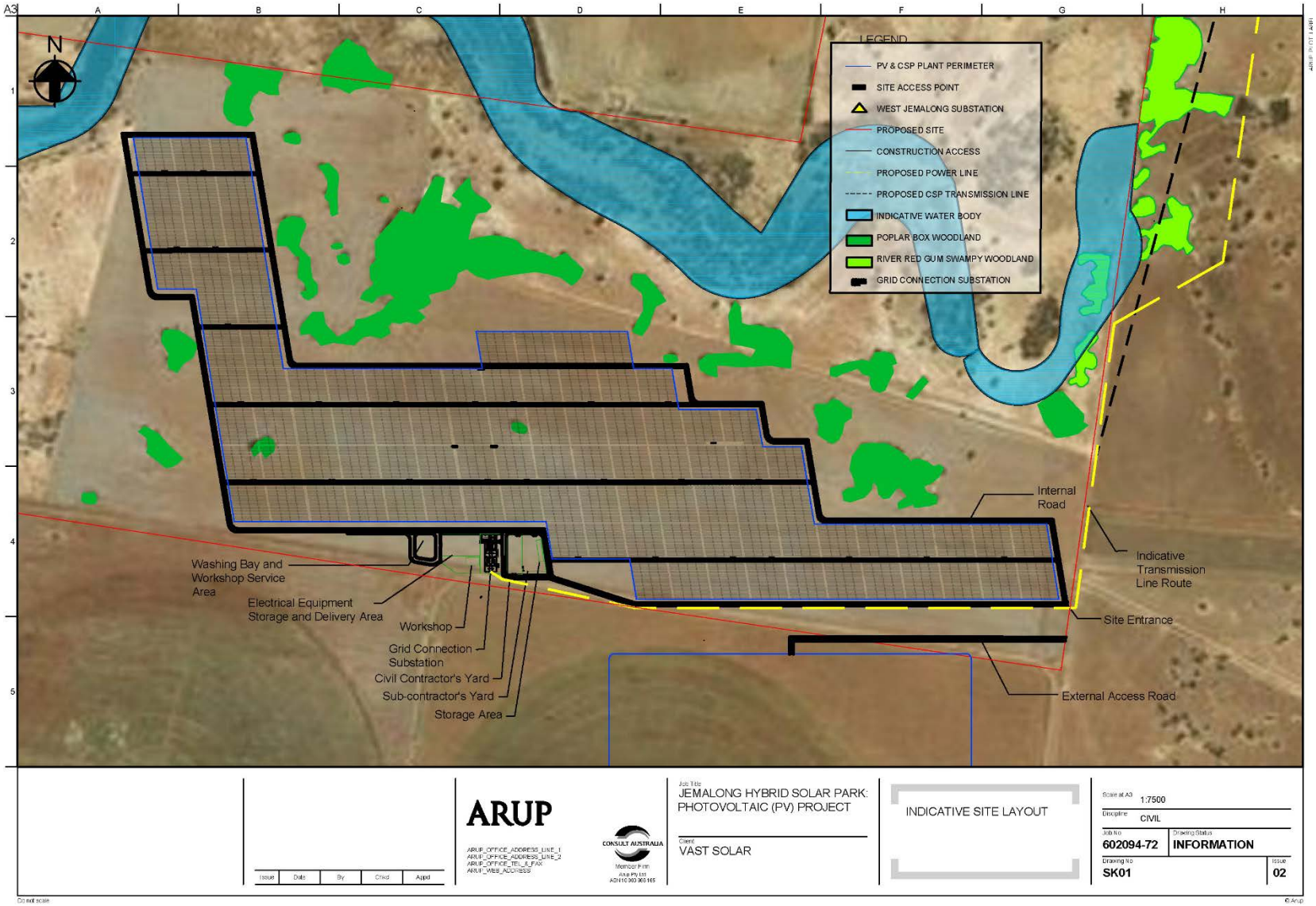

Figure 2-3 Indicative Site Layout, Photovoltaic array.

The following elements that form part of the proposal would connect to the proposal site:

- a 3.2 km (approx.) 66kV overhead power line would be installed to connect into the existing West Jemalong Essential Energy substation; and
- an unsealed all weather access track, within Jemalong Station, along the route of the existing farm gravel road access (Naroo Lane). This existing road was constructed and is maintained to carry large grain trucks during harvest, and would need only minimal upgrading.

The new overhead 66kV transmission line would be constructed to connect the proposal to the existing West Jemalong Substation at the junction of Whispering Pines Lane and Lachlan Valley Way, located approximately 3.2 km to the north of the proposal site. It would be similar in design to the 66kV transmission line recently installed by Essential Energy from the West Jemalong Substation to Forbes, and likely constructed with steel poles approximately 22 m high and spaced approximately 200 m apart. The transmission line would be located within an easement approximately 40 m wide. The easement location has been selected to minimise visual impacts to residents on Whispering Pines Lane.

Ancillary facilities would be located within the site boundary and would include:

- material laydown areas;
- temporary construction site offices;
- temporary car and bus parking areas for construction workers transportation. Once the plant has been commissioned a small car park would remain for the minimal staff required and occasional visitors; and
- basic staff amenities.

The construction phase of the proposal is expected to take approximately twelve months and its expected operating life is 30 years. After the initial operating period, the PV Project would either be decommissioned, removing all above ground infrastructure and returning the proposal site to its existing land capability, or upgraded with new PV equipment for continued operation.

2.3 CAPITAL INVESTMENT

Based on the initial design and the current solar engineering, procurement and construction (EPC) market the estimated gross capital expenditure cost of the proposal would be approximately $62.5 million.

3 PROPOSAL JUSTIFICATION AND ALTERNATIVES

3.1 STRATEGIC JUSTIFICATION

3.1.1 Technical feasibility

The proposal would employ proven and mature solar technology. The solar resource at the proposal site is highly suited to efficient, high-output generation.

The proposal site is flat and predominantly cleared, making it an ideal location for a utility scale solar project.

An 66kV Essential Energy transmission line is located approximately 3.2 km north of the proposal site, allowing connection to the transmission network.

3.1.2 Climate change

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.

3.1.3 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* supports the national target of 20% renewable energy by 2020 and comprises 24 actions to achieve the goals of:

- attracting renewable energy investment and projects;
- building community support for renewable energy; and
- attracting and grow expertise in renewables.

The proposal would contribute to the *NSW Renewable Energy Action Plan*.

The *NSW 2021: A plan to Make NSW Number One* (NSW Government 2011) has the following goal:

- *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*.

The proposal would also contribute to the Commonwealth Government's objective to achieve an additional 33GW of electricity from renewable sources by 2020 under the RET.

3.1.4 NSW Climate Change Policy Framework

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

3.1.5 Australian Renewable Energy Target

The large-scale RET is an Australian 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.

3.1.6 COP21

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

3.1.7 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 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 industries 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.

3.1.8 Local Economic Benefits

It is anticipated that the proposal will generate around 150 direct jobs during construction and around 100 indirect supply chain jobs. In addition, it will employ approximately 2-3 full time staff during the operation and maintenance phase (expected to be 30 years).

The employment benefits extend through the local supply chains to fuel supply, vehicle servicing, uniform suppliers, hotels/motels, B&B's, cafés, pubs, catering and cleaning companies, tradespersons, tool and equipment suppliers and many other businesses. In 2012, 24,000 Australians were employed in the renewable energy sector and the industry is set to generate an additional 18,400 jobs by 2020 (CEC 2015).

3.2 ALTERNATIVES TO THE PROPOSAL

A number of alternative sites were considered based on the ability to share the electrical supply from the site, flooding and land usage. The proposal site was selected because it provides the optimal combination of:

- low environmental constraints;
- level terrain for cost effective construction;
- high quality solar resource;
- low density population and limited neighbouring properties;
- suitable planning context;
- road access;
- Close proximity to the transmission network; and
- high levels of available capacity on the grid transmission system.

The proposal site is of a scale that allows for flexibility in the design, allowing Vast Solar to avoid ecological and other constraints which may be identified during the EIS process. The factors that determine the final design area will be detailed in the EIS.

PV solar technology was chosen because it is cost-effective, low profile, durable and flexible regarding layout and siting. It is a proven and mature technology which is readily available for broad scale deployment at the proposal site.

4 PLANNING CONTEXT

4.1 NSW LEGISLATION

4.1.1 Environmental Planning and Assessment Act 1979

The EP&A Act and its associated regulations and instruments set the framework for development assessment in NSW. The PV Project would be assessed under Part 4 of the EP&A Act.

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

Clause 20 of Schedule 1 of *State Environmental Planning Policy (State and Regional Development) 2011* defines SSD as including:

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 has a:

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

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

The proposal would have an estimated capital investment cost greater than $30 million and is therefore classified as SSD under Part 4 of the EP&A Act.

SSDs are major projects which require approval from the Minister for Planning and Environment ('Minister'). Whilst the Minister the consent authority for SSD, the Minister may delegate the consent authority function to the Planning Assessment Commission ('PAC'), the Secretary or to any other public authority.

Applications for SSD must be accompanied by an EIS which is prepared in accordance with the SEARs. In determining the SEARs, the Secretary must consult with relevant public authorities and have regard to the need to assess key issues raised by those public authorities.

4.1.3 State Environmental Planning Policy (Infrastructure) 2007

Clause 34(7) of *State Environmental Planning Policy (Infrastructure) 2007* ('ISEPP') provides 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 proposal is located within a rural zone and is permissible with consent under the ISEPP.

4.1.4 Other relevant NSW legislation

Table 4-1 NSW legislation relevant to proposal.

Legislation	Discussion
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 PV Project array site does not contain Crown land. If there are potential impacts to Crown land, consultation would be undertaken with the Department of Industry - Lands & Forestry.
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 Roads and Maritime Services ('RMS') and other public authorities including local Councils as 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 from the relevant roads authority would be sought under section 138 of the Roads Act.
Local Land Services Amendment Act 2016	The *Local Land Services Amendment Act 2013* was established to repeal the *Native Vegetation Act 2003,* and amend the *Local Land Services Act 2013* in relation to native vegetation and land management in rural areas. The Act establishes that the clearing of native vegetation in a regulated rural area is authorised where there is a development consent under Part 4 of the EP&A Act.

Legislation	Discussion
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*. 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. Clause 28 of the *Biodiversity Conservation (Savings and Transitional) Regulation 2017*, identifies that the Savings and Transition provisions would apply to the project where the; i) proponent has already undertaken substantial environmental assessment, and ii) Secretary of the Department of Planning and Environment determines in writing that the proponent had undertaken substantial environmental assessment in connection with the EIS before the commencement of the BC Act Substantial environmental assessment has taken place in relation to the CSP Plant components of the Jemalong Hybrid Solar Park. Vast has requested that the Secretary make a determination in respect to the work completed in relation to meeting the requirements of the *BC Act.* The potential to impact threatened species, populations and ecological communities listed under the BC Act is discussed in Section 6.3 of this PEA and will be further assessed in the EIS. If the proposal has an unacceptable impact on biodiversity values, credits may be retired to off-set that impact.
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. Despite this, under Section 89J of the EP&A Act, an Aboriginal Heritage Impact Permit is not required for SSD. The closest nature reserve is the Lachlan Valley National Park. The Lachlan Valley National Park is comprised of multiple land parcels, of which the closest to the proposal site is approximately 2.2 km to the south. Another parcel of the Lachlan Valley National Park is located approximately 5km north of the proposal site. No impacts to the Lachlan Valley National Park are expected. The potential impacts to Aboriginal heritage and native fauna and flora are discussed in Section 6.3 and 6.4 of this PEA respectively.

Legislation	Discussion
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 Project is unlikely to impact any items of heritage significance, as discussed in Section 6.9.
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 site is discussed in Section 6.9.
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 6.9.

4.2 LOCAL GOVERNMENT LEGISLATION

4.2.1 Forbes Local Environmental Plan

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

a) to encourage and manage ecologically sustainable development in Forbes,
b) to reinforce the existing urban character of Forbes as the urban focus,
c) to reinforce the rural character of Forbes while promoting sustainable development,
d) to protect the agricultural land of Forbes for continued agricultural production while allowing for planned expansion at the urban fringe,
e) to promote Forbes as a premier tourist-destination building on its unique heritage and environmental attributes as well as sporting and leisure facilities,
f) to protect, enhance and conserve the natural environment, including the Lachlan River, Lake Forbes, wetlands, native vegetation, environmentally sensitive land and other natural features that provide habitat for fauna and flora, provide scenic amenity and that may prevent or mitigate land degradation,
g) to provide a range and variety of housing choices to cater for the different needs and lifestyles of residents.

The proposal site is located on land zoned RU1 – Primary Production under the LEP. Electrical generation is not listed as permissible with consent in this zone, however, the ISEPP takes precedence over the LEP to the extent of any inconsistency and permits solar developments with development consent in the RU1 zone (refer Section 4.1.3).

4.3 COMMONWEALTH LEGISLATION

4.3.1 Environmental Protection and Biodiversity Conservation Act

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, 2017a). A search radius of 5km was applied. The results of the search are summarised in Appendix A. Potential impacts to threatened species and ecological communities are further discussed in Sections 6.3 and 6.4.

Table 4-2 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	18
Listed Migratory Species	11
Other Matters Protected by the EPBC Act	
Commonwealth land	None
Commonwealth Heritage places	None
Listed Marine Species	17 (note the 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 proposal 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

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 STAKEHOLDER CONSULTATION

Community and stakeholder consultation will be integral to the proposal and will build upon the relationships and communication channels that Vast Solar developed as part of ongoing stakeholder communications associated with the Jemalong CSP pilot project and 30 MW CSP Project.

5.1 AGENCY CONSULTATION

SEARs were provided to Vast Solar for the CSP Project in August 2014, which encompassed environmental assessment requirements from relevant NSW Government Agencies. The SEARs were used to guide the structure and content of the 2016 EIS.

Additional consultation was undertaken with several of the Government Agencies to clarify some of the issues raised in the SEARs or seek further advice. Upon receipt of the SEARs for the Jemalong PV Project, Vast Solar would again engage with relevant NSW Government Agencies to clarify some of the issues.

5.2 COMMUNITY CONSULTATION

A Community Consultation Plan ('CCP') is being prepared to provide a framework to engage with the community and stakeholders about the proposal and to ensure opportunities to provide input into the assessment and development process are understood.

Stakeholders will be identified as those potentially impacted by the proposal, or those having an interest in the proposal. The CCP will set out consultation requirements with interested parties including adjacent neighbours, near neighbours, local businesses, any special interest groups and representative bodies. The CCP will include strategies for consultation for the local community and the broader community within the region.

The CCP will aim to ensure that there is effective, ongoing liaison with the community. Consultation tools and strategies will be selected to enable clear and timely communication about the rationale and benefits of the proposal as well as continuing to provide neighbours and stakeholders with timely updates and progress reports about Vast Solar's CSP pilot facility and future CSP project plans. Measures to reduce adverse impacts and promote positive impacts would be identified in the EIS and appropriate management plans developed for the proposal. Agency consultation would also be undertaken in accordance with any requirements of the SEARs.

To date, the following activities, have been undertaken in relation to the Jemalong PV Project proposal:

- Vast Solar has commenced consultation with Forbes Council about the proposal; and
- Vast Solar will liaise directly with neighbours to update them about plans for the Jemalong Hybrid Solar Park and the role that this PV Project will have in relation to the hybrid solar park.

The CCP would aim to ensure that there is effective, ongoing liaison with the community. Measures to reduce adverse impacts and promote positive impacts would be identified in the EIS and appropriate management plans developed for the proposal.

6 PRELIMINARY ENVIRONMENTAL ASSESSMENT

6.1 METHODOLOGY

This Section provides a preliminary environmental assessment of the proposal to identify key environmental issues and risks that will require a more detailed assessment within the EIS. The assessment is based on a desktop review and covers the construction, operational and decommissioning phases of the proposal. The 2016 EIS has also been used as an information source where relevant and where the 2016 EIS covers the proposal site. This information will be augmented and updated as required.

A preliminary environmental risk assessment has been completed in order to identify;

1. key environmental issues with a higher assessment priority, and
2. secondary environmental issues that are likely to result in low level impacts.

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 6-1. 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 6-1 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 ENVIRONMENTAL RISK ASSESSMENT RESULTS

Table 6-2 summarises the results of the preliminary environmental risk assessment. Key identified environmental risks associated with the proposal are biodiversity, Aboriginal heritage, flooding and hydrology, visual amenity, traffic and access and land use. A map showing environmental constraints that occur on the proposal site is included as Appendix B.

Table 6-2 Results of the Preliminary Risk Assessment (unmitigated risks)

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

6.3 BIODIVERSITY

6.3.1 Existing Environment

Potential ecological constraints within the proposal site have been identified based on desktop database searches and the biodiversity assessment undertaken for the 2016 EIS.

Database searches

The following database searches were undertaken:

- a search of matters protected by the EPBC Act was undertaken in September 2017 using the PMST (DEE, 2017). A search radius of 5 km was applied; and
- a search of the Atlas of NSW Wildlife (a NSW Bionet database administered by NSW OEH, 2017a) was undertaken in September 2017. The minimum search extent of 10 km X 10 km was used. The NSW Bionet databases include species and communities listed as threatened Nationally and in NSW.

The PMST identified that the following three threatened ecological communities are likely to occur in the search area:

- Grey Box (*Eucalyptus macrocarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia –Endangered under the EPBC Act and not listed in NSW under the BC Act;
- Weeping Myall Woodlands – Endangered under the EPBC Act and not listed in NSW under the BC Act; and
- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland – Critically Endangered under the EPBC Act and Endangered under the BC Act.

The PMST identified 16 threatened species (excluding fish) as potentially occurring in the search area. NSW Bionet returned 2 records of 1 threatened species within the search area. The threatened species identified through the searches are listed in Appendix A. The PMST additionally identified 11 migratory species protected under the EPBC Act as potentially occurring within the search area.

Site surveys undertaken for the CSP Project

Flora and fauna field surveys were undertaken in November 2014 as part of the 2016 EIS.

The following three native vegetation communities were observed during the vegetation surveys including one Endangered Ecological Community:

- Western Grey Box – Poplar Box – White Cypress Pine tall woodland on red loams mainly of the eastern Cobar Peneplain Bioregions - Endangered under the BC Act. The community does not meet the condition requirements for the equivalent listing under the EPBC Act;
- Poplar Box grassy woodland on alluvial clay-loam soils mainly in temperate (hot summer) climate zone of central NSW (wheatbelt) – not listed as threatened under the BC Act or EPBC Act; and
- River Red Gum, swampy woodland wetland on cowals (lakes) and associated flood channels in central NSW – not listed as threatened under the BC Act or EPBC Act.

Appendix B illustrates the location of the vegetation communities.

Fifty-four flora species were recorded during the surveys of which 17 were not indigenous to the region. One declared noxious weed species, African Boxthorn, was observed (NGH, 2016). No threatened flora species were detected during the surveys. In consideration of the habitat attributes of the study area, a risk based assessment considered it unlikely that any threatened flora species occur within the study area (NGH, 2016).

Eighty-four fauna species were detected during the fauna surveys including 59 bird, three amphibian, 16 bat and six other mammal species (NGH, 2016). No reptile species were recorded. Only birds were surveyed within the PV plant Site subject of this PEA.

The following five threatened bird species were recorded within the study area:

- Grey-crowned Babbler (*Pomatostomus temporalis temporalis*);
- Spotted Harrier (*Circus assimilis*);
- Brown Treecreeper (Eastern Sub-species) (*Climacteris picumnus victoriae*); and
- Turquoise Parrot (*Neophema pulchella*).

The following four microbat species are considered to potentially occur in the study area based on possible to probably identifications from Anabat recordings:

- Little Pied Bat (*Chalinolobus picatus*);
- Yellow-bellied Sheathtail-bat (*Saccolaimus flaviventris*);
- Inland Forest Bat (*Vespadelus baverstocki*); and
- Corben's Long-eared Bat (*Nyctophilus corbeni*).

No threatened amphibians were recorded.

6.3.2 Potential impacts

The proposal site is mainly comprised of cleared agricultural land that is continually cropped. Development of the proposal is likely to result in the removal of patches of moderate to good condition native vegetation with potential to include Poplar Box grassy woodland and River Red Gum swampy woodland wetland. However, the majority of the impact would occur within exotic-dominated vegetation. An objective of the proposal would be to avoid impact on Western Grey Box – Poplar Box – White Cypress Pine open woodland, which is listed as an Endangered Ecological Community (EEC) under the BS Act that occurs at the proposal site.

No threatened flora species have been recorded at the proposal site, nor has the previous intensive assessment considered that any are likely to occur. Five threatened bird species and four threatened microbats are considered likely to occur in the study area. Avoidance and minimisation measures would be developed with an objective of protecting areas of better habitat from direct and indirect impacts where practical.

6.3.3 Assessment of Impact

It is proposed that a detailed assessment of potential impacts to biodiversity will be undertaken as part of the EIS. This will primarily rely on investigations completed during the preparation of the 'Biodiversity assessment – Jemalong Solar Station' (NGH Environmental 2015). The potential for significant impacts and methods for the avoidance of impacts through, for example, avoidance through design, management practices and biodiversity offsets will be incorporated into the assessment. The assessment will be informed and undertaken in accordance with the SEARs.

6.4 ABORIGINAL HERITAGE

6.4.1 Existing environment

Potential Aboriginal heritage constraints within the proposal site have been identified based on the Aboriginal Cultural Heritage Assessment ('ACHA') undertaken for the 2016 EIS.

The ACHA included the following:

- a description of the land and history of peoples living on the land;
- a review of previous archaeological work and heritage listings on the NSW OEH Aboriginal Herita ge Information Management System ('AHIMS');
- a predictive model of Aboriginal site distribution relevant to the proposal site;
- a field inspection;
- Aboriginal community consultation;
- an analysis of background information;
- an assessment of the impact of the proposal on Aboriginal objects and places;
- consideration of management and mitigation measures.

The proposal site is located on land which was traditionally occupied by the Wiradjuri peoples (NSW Archaeology, 20016). The archaeological context of Aboriginal objects/sites is considered to be disturbed due to the extensive prior disturbance associated with land clearing and agricultural practices (NSW Archaeology, 2016) undertaken at the proposal site.

Thurumbidgee Lagoon, approximately 400 m north of the proposal site, and adjacent land is archeologically sensitive, likely containing Aboriginal items associated with the use of this land for exploitation of flora and fauna. It is considered unlikely that items would occur in any significant density further than c. 100 – 200 m from the lagoon (NGH, 2016).

In 2014, a search of the AHIMS was undertaken in respect of the CSP Project. Five Aboriginal heritage sites were recorded within a 400 km^2 buffer of the site, none of which occur in the proposal site.

In September 2017, a Basic Search of the online AHIMS (OEH, 2017b) database was undertaken for the purposes of this report. The search identified that no Aboriginal items are recorded in the database within 1 km of Lot 13 DP753118.

The cultural heritage and archaeological survey undertaken for the proposal site by NSW Archaeology (2015) identified six low density stone artefact locales (Figure 6-1), all of which have been found to be of low archaeological sensitivity and significance which do not warrant further archaeological investigation (NSW Archaeology, 2015). No Aboriginal objects or survey units with potential conservation value were identified to have a high probability of being present within the proposal site (NSW Archaeology 2015).

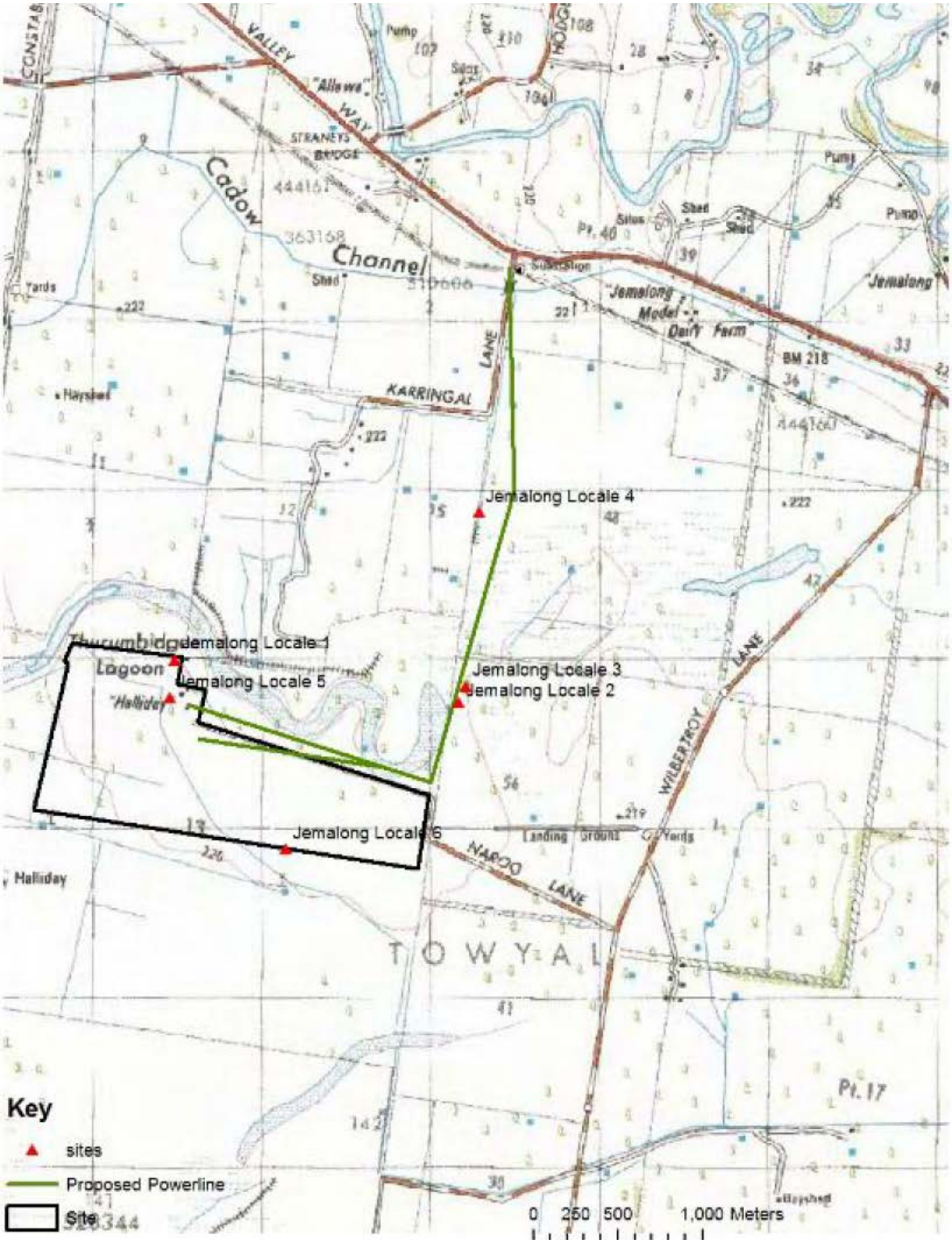

Figure 6-1 Location of Aboriginal object locales recorded during the field assessment for the CSP site (NSW Archaeology 2015)

6.4.2 Potential impacts

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

6.4.3 Assessment of Impact

Assessment of the impact of the proposal on Aboriginal items within the proposal site and potential impacts to Aboriginal heritage resulting from the proposal will be undertaken as part of the EIS. It will utilise the existing assessment completed by NSW Archaeology. Aboriginal heritage items will be avoided through design where possible.

The management of any identified potential impacts will be determined in consultation with Aboriginal stakeholders and OEH. An unexpected finds protocol will be implemented during construction to minimise the potential for impacts to unanticipated heritage items.

6.5 FLOODING AND HYDROLOGY

6.5.1 Existing environment

The assessment of the impacts of the proposed Jemalong Solar Station on flood behaviour in this part of the Lachlan River Floodplain was assessed in the 2016 EIS by Southeast Engineering and Environmental (SEE, 2015).

The proposal site is located on the Lachlan River floodplain, immediately downstream of Jemalong Gap, which is a significant hydraulic control (SEE, 2015). Almost all floodwaters pass through Jemalong Gap, with large flows in the Lachlan River spilling onto the northern southern floodplains downstream of the Jemalong Gap (SEE, 2015). The proposal site is located in the southern floodplain. Floods in the area are common, and cover a vast area of the floodplain for prolonged periods (DECC, 2009a).

The area immediately downstream of the Jemalong Gap is particularly sensitive to hydraulic modifications, as it determines how flows are distributed to the northern and southern floodplains and the Lachlan River (SEE, 2015). The Lachlan River (Jemalong Gap to Condobolin) Floodplain Management Plan ('FMP') (OEH, 2012) categorises the floodplain into four hydrologically independent Floodway Network Zones, each with different potentials for generating adverse hydraulic impacts (SEE, 2015). The proposal site is predominantly located outside of these zones, however parts of the proposal site in its northwest and northeast sections are located in Flood Network Zone A (Figure 6-2 and Appendix C). An indicative site layout map with the flood network zones is included as Appendix C.

Any works within the Flood Network Zone A would need to comply with the FMP as it pertains to that flood zone.

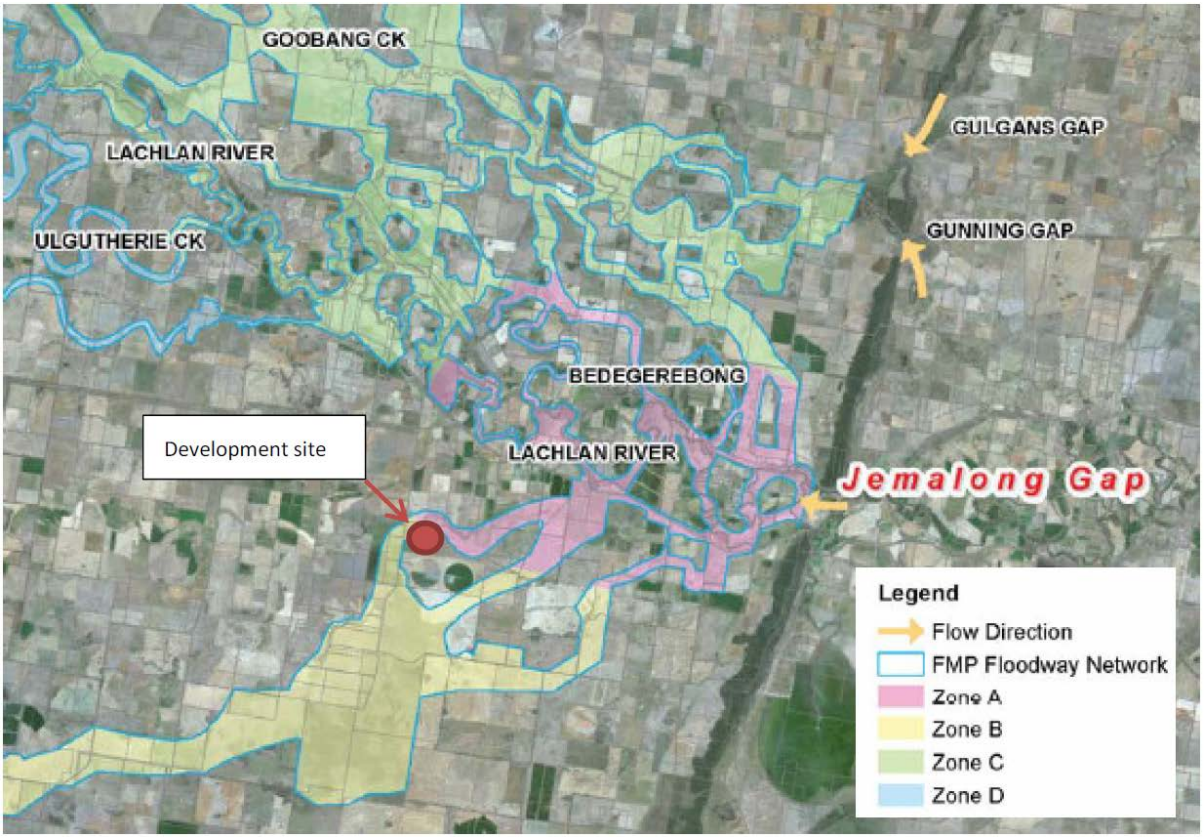

Figure 6-2 Flood Network Zones for management (OEH, 2012)

6.5.2 Potential impacts

The project would be designed with the objective of:

1. avoiding/minimising impact to flood behaviour in this part of the Lachlan River Floodplain; and
2. designing and constructing the development in a manner that minimises flooding risks.

6.5.3 Assessment of Impact

A major flood study is now underway. This would include flood modelling to determine the impact of the proposal on flood behaviour, flood mitigation measures to be adopted through the design and during construction and operation, and compliance with the FMP. This will allow for mapping that identifies areas of the project site affected by flooding, including those parts located in Flood Network Zone B.

6.6 VISUAL AMENITY

6.6.1 Existing environment

The proposal has potential to result in visual impacts to neighbouring houses and road users. However, the proposal site is located within a rural area with large lot agricultural production and sparsely distributed residences, with the closest non-involved residence to the proposal site being approximately 1.7 kilometres from the proposal site. The terrain is primarily flat, and the area includes intermittent tree cover.

6.6.2 Potential impacts

An assessment of the level of visual impact of the CSP was included in the 2016 EIS by Fresh Landscape Design (2015). Based on this assessment, impact of the proposal and associated infrastructure would be of 'low significance', a consequence of the developments height, the presence of screening vegetation throughout the study area, the relatively low population density and the distance of publicly and available views from the proposal site.

It is noted that solar panels are designed to absorb as much sunlight as possible. They therefore reflect a very low percentage of the light, and are not considered likely to result in glare or reflections that would affect traffic or nearby receivers.

6.6.3 Assessment of Impact

An assessment of the level of visual impact would be undertaken as part of the EIS process. This would rely on the Visual Impact Assessment -Jemalong Solar Station completed by Fresh Landscape Design (2015).

6.7 TRAFFIC AND ACCESS

6.7.1 Existing environment

The proposal site is accessed from Lachlan Valley Way to the north, via Wilbertroy Lane and Naroo Lane. Naroo Lane and Wilbertroy Lane are both unsealed local public roads managed by Forbes Shire Council. Naroo Lane extends from the eastern proposal site boundary to the east for approximately 1.2 km before connecting with Wilbertroy Lane. Wilbertroy Lane generally runs in a southwest-northeast direction for before intersecting with Lachlan Valley Way approximately 4 km northeast of the proposal site. Lachlan Valley Way is a sealed two lane Classified Regional road with a posted speed limit of 100 km per hour, and is a school bus route for Forbes and surrounding areas (NGH, 2016).

Wilbertroy Lane and Naroo Lanes contain sharp corners and are not considered "all weather roads", being unpassable during high periods of rainfall (NGH, 2016). These unsealed roads, as well as Lachlan Valley Way, are infrequently affected by flooding.

Beyond Lachlan Valley Way, it is expected that major project components of the proposal would be delivered by road from Sydney via either:

- Sydney, Bathurst, Cowra, Forbes:
    - Great Western Highway, Mitchell Highway, Mid-Western Highway, Newell Highway.
- Sydney, Bathurst, Orange, Parkes, Forbes:
    - Great Western Highway, Mitchell Highway, The Escort Way, Orange Road, Newell Highway.

The above major roads are all Classified roads. Classified roads include State and Regional roads. Regional roads are managed by local councils, though receive funding support from RMS, while State Roads are entirely managed by RMS. Usually, RMS will take an active role in the approvals process in respect of Classified Roads.

6.7.2 Potential impacts

Construction and decommissioning

At the peak of construction there could be up to 100 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 the proposal site per day.

The delivery trucks would likely be Medium Rigid and would not be larger than typical trucks using the existing local roads in the area. It is not anticipated that the maximum length of vehicles utilised during delivery of materials and components, including water, gravel and infrastructure (panels, substation components and transmission line poles) would exceed 26 metres.

During construction and decommissioning there would be an increased number of large vehicles on the road network travelling to and from the proposal site. Potential impacts associated with this increase include:

- Increased collision risks;
- Damage to road infrastructure;
- Reduction of the level of service on the road network;
- Disruption to existing transport services; AND
- Generation of noise and dust.

Operation

With a negligible amount of traffic being generated by the proposal during operation, any impacts to the road infrastructure, level of service, or safety, would be minimal.

6.7.3 Assessment of Impact

Construction traffic impacts will be assessed in the EIS and take into consideration existing traffic volumes and any requirements from RMS and Forbes Shire Council. Consultation would be undertaken before construction with RMS, Forbes Council and local farmers regarding the works that may affect roads or traffic.

The design would also consider any requirements from RMS and other relevant stakeholders on access arrangements to the proposal site, including transmissions line, in particular if any modifications to the current access to the proposal site is required.

A Traffic Management Plan would be developed as part of the CEMP.

6.8 AGRICULTURE, LAND USE AND RESOURCES

6.8.1 Existing environment

The rural land in the locality is used primarily for agriculture including cropping and grazing. There are no current exploration licence applications held for the proposal site.

Agriculture is a significant land use in the local area, with over 679, 000 ha of land dedicated to agriculture within the Forbes LGA and a gross value of over $50.2 million in 2011 (ABS, 2011; RDA Central West, 2012).

The proposal site is located within Jemalong Station which is 15, 478 ha of agricultural land managed by Twynam Agricultural Group. Water entitlements within the locality are held by Jemalong Irrigation Ltd. This

private corporation holds a Water Supply Work Approval and Water Use Approval licence under the *Water Management Act 2000.* The station is also occupied by a polo field, an airstrip, woolsheds and rural residences. The proposal site is located within the Hallidays lot of Jemalong Station.

The site does not fall within the area mapped as Biophysical Strategic Agricultural Land for NSW. However, due to its historical use it occurs within the Department of Primary Industries (DPI) area mapped as 'Important Agricultural Land' (IAL). The Proponent will liaise with DPI through the EIS process to ensure that the proposal is consistent with their long term policies for IAL within the locality. This will include the rehabilitation of the Site and return to its existing use at the end of the solar farm use

Hallidays is a laser levelled paddock that has been used for cropping, but is considered to have a relatively low-value in relation to agricultural production. The proposed 66Kv transmission line connecting the solar plant to the existing West Jemalong Substation would traverse other paddocks within Jemalong Station. It would avoid other private landholdings and Crown land.

6.8.2 Potential impacts

The proposal has the potential to impact on up to 165ha of agricultural land during construction and operation for the life of the project. The relatively small loss of productive land at a regional scale is not considered likely to have a significant impact on the overall agricultural productivity of the region. The PV Project would be decommissioned at the end of its operational life, removing all above ground infrastructure and returning the site to its existing land capability.

6.8.3 Assessment of Impact

The impact on agricultural production in the locality and region would be assessed in detail in the EIS.

6.9 OTHER ENVIRONMENTAL ISSUES

Table 6-3 below discusses issues identified in the preliminary environmental risk assessment as secondary environmental issues. It is considered that these issues are likely to result in low level impacts due to the nature of the proposal and existing environment, and availability of effective mitigation measures. These issues will be further considered as part of the EIS.

Table 6-3 Other Environmental Issues.

Existing environment	Potential impacts	Further assessment
Air Quality		
The air quality in the Forbes area is good due to its rural setting and distance from industrial pollution sources (Forbes Shire Council, 2009). Existing sources of air pollution are expected to include vehicle emissions, dust during dry periods, and emissions from agricultural practices and industrial activities. There are several major polluters in the local region including the Kaloola Piggery, the Mount feedlot and the Forbes Sewage Treatment Plan.	During construction, potential impacts to local air quality include dust generation from excavation, earthworks and vehicle movement. Impacts to air quality during operation would be negligible, limited to potential minor dust generation from maintenance vehicles.	A CEMP would be prepared for the construction phase of the proposal which incorporates measures to minimise dust generation.
Noise and Vibration		
The existing noise environment of the study area was characterised in the 2016 EIS. With the surrounding land uses primarily limited to grazing and irrigated agriculture, noise generating equipment would be intermittent and include harvesters, large grain haulage trucks, irrigation systems, quad bikes and 4WD vehicles (NGH, 2016). There is a low density of residences in the locality, with the nearest non-involved residence being approximately 1.5 km from the proposal site. Properties in the locality are known to utilise generators and on demand pump pressurised domestic water systems which generate low levels of background noise (NGH, 2016). Background noise monitoring was undertaken in 2014 for the 2016 EIS at six residential locations in the vicinity of the proposal site. The recorded background noise level (RBL) ranged between 36.8 and 50.0 dBA (L_{A90} (15mins)).	Noise impacts would, for the most part, only occur during construction (generated by construction related vehicles and machinery), with minimal noise likely to be generated during operation. Considering the distance of the proposed works to the nearest sensitive receiver (1.5 km away) and relatively high background noise levels, noise impacts during construction are likely to be negligible.	The operation of the PV solar plant and transmission line would not be expected to have more than a minor noise impact. A construction noise assessment will be undertaken as part of the EIS to assess potential noise impacts. The assessment will be undertaken in accordance with the Interim Construction Noise Guideline (Department of Environment Climate Change and Water, 2009). The CEMP prepared for the proposal will include a component for noise management which includes controls such as standard working hours, an out of hours protocol, and noise minimisation measures.

Existing environment	Potential impacts	Further assessment
Soils		
The proposal site and surrounding area is located within the Lachlan Fold Belt geological region, characterised by deformed, Palaeozoic deep and shallow marine sedimentary rocks, cherts and mafic volcanic rocks (NGH, 2016). The Forbes 1:250,000 Geological Sheet (Lyons et al., 2000) classifies the majority of the proposal site as inactive alluvial plains, and a south-eastern portion of the proposal site as alluvium with active depositional plains and terraces containing present day drainage.	Impacts to the soil environment are most likely during construction. Minor excavations for footings or trenching for underground cables 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 a minimum, a CEMP would be prepared for the construction phase which incorporates erosion and sediment controls and measures to minimise dust.
Non-Aboriginal Heritage		
The following heritage databases were searched as part of the 2016 EIS, and again in September 2017, to identify any historic heritage items in the Forbes LGA which are within or in proximity to the proposal site: - the NSW State Heritage Inventory (SHI); - the Australian Heritage Database; - the Forbes LEP, for locally listed heritage items; and which are not listed on the NSW SHI. The searches indicated that no listed historical items or places occur within the proposal site. Updates searches would be undertaken as part of the EIS.	Due to the rural nature of the proposal site, and previous heritage assessment completed as part of the 2016 EIS, it is considered unlikely that any other heritage artefacts remain unidentified in the proposal area.	A non-Aboriginal heritage assessment is unlikely to be required for the proposal.

Existing environment	Potential impacts	Further assessment
Contamination		
A search of the NSW EPA Contaminated Land Public Record and List of NSW Contaminated Sites Notified to the EPA was undertaken or the 2016 EIS, and again in September 2017. No sites in the Jemalong area were recorded on the List of NSW Contaminated Sites Notified to the EPA.	There is no evidence of contaminated land occurring at the proposal site, and considering the past and present land uses it is considered unlikely that buried contaminants occur onsite.	Risks associated with contamination at the site are considered low and therefore no detailed investigation is likely to be required within the EIS. The mitigation measures would require a CEMP be prepared to manage any contamination identified during site construction.
Bushfire		
The proposal site is not in an area identified as bushfire prone within the NSW Rural Fire Service bush fire prone land online map (RFS, 2017). The local area experiences hot dry summers and hot north-westerly winds during daytime temperatures. The local bushfire season generally occurs between October and March, with the MLVBMC experiencing 150 bushfires on average each year including one major fire per year (MLVBMC, 2008). Fires are predominately grass crop fires. Major ignition sources are identified to be storms, farming machinery, vehicle accidents, powerlines and some industry associated with hay storage (MLVBMC, 2008).	There is a lower risk of the proposal being affected by bushfire as the site is not within bushfire prone lane. The proposal does not pose a significant bushfire risk.	The proposal is unlikely to result in an increased risk of bushfire for the site. This would be assessed in the EIS. During construction and operation phases of the proposal, the industry standard is that staff are trained in bushfire management, bringing additional fire-fighting capability to the locality to mitigate this potential impact.
Waste		
The proposal would generate a number of waste streams and utilise a variety of materials during the construction phase.	During construction, excavated material and green waste would be generated as waste. Packaging from panels and other components would require disposal. Limited operational waste would be associated with this proposal.	A Waste Management Plan would be required to be developed and incorporated into the CEMP, prior to construction. This would incorporate the principles to avoid, re-use and recycle to minimise wastes.

Existing environment	Potential impacts	Further assessment
Socio-economics		
The proposal site is located in Forbes LGA, around 36 km from Forbes township. The main industry of employment in this part of NSW is expected to be agriculture.	The construction of the proposal would result in a local economic benefit. The proposal would generate around 150 direct jobs during construction and around 100 indirect supply chain jobs. In addition, it will employ approximately 2-3 full time staff during the operation and maintenance phase (expected to be 30 years. It is possible that construction workers would relocate their families to Forbes during the construction period, and this may place pressures on services such as accommodation, schools, and health services. It is anticipated that most workers would be accommodated at existing accommodation within the local area. The potential for bus transfers, or vehicle passenger pooling/sharing from Forbes and Parkes will be considered to minimise traffic volumes and transit risks during construction.	Socio-economic impacts will be considered further in the EIS. Vast solar will continue to work closely with Council in relation to the development of strategies designed to manage impacts associated with increased pressure on accommodation facilities.
Aviation		
A small air strip, within a cleared flat paddock area, is located about 500 m to the east of the proposal site.	It is noted that solar panels are designed to absorb as much sunlight as possible. They therefore reflect a very low percentage of the light they receive and are not considered likely to result in glare or reflections that would affect air traffic. There are numerous instances of solar panel installations at airports without adverse impact to airport functions.	The EIS would provide information about glare impacts related to aviation.
Electromagnetic fields (EMF)		
EMFs consist of electric and magnetic fields and are produced whenever electricity is used. EMFs also occur naturally in the environment, e.g., from a build-up of electric charge in thunder storms and Earth's magnetic field (WHO 2012).	During operation, primary EMF sources would include the 66kV transmission line. EMF's are also associated with switchgear, and the solar array incorporating underground cabling. There is low potential for EMF impacts during the	EMF impacts will be considered further in the EIS.

Existing environment	Potential impacts	Further assessment
	construction and decommissioning phases of the proposal. Site staff would be exposed intermittently during works at and around transmission lines, and the maximum magnetic field of existing transmission lines are well under the limits recommended for public and occupational exposure. The effects are therefore likely to be negligible.	

7 CONCLUSION

This PEA has outlined the proposal and established the environmental and planning context. The proposal would be assessed under Part 4 of the EP&A Act and is classes as SSD under *State Environmental Planning Policy (State and Regional Development) 2011*.

The report has been prepared to assist the development of SEARs for the proposal, which will guide the preparation of the EIS.

The EIS will rely on specialist assessments and reports relevant to the proposal site completed for the 2016 EIS.

Based on this PEA, the following key environmental issues associated with the proposal were identified:

- biodiversity;
- Aboriginal heritage;
- flooding and hydrology;
- visual amenity;
- traffic and access; and
- land use.

These issues will be assessed in detail in the EIS, with specialist reports being sourced for items 1 to 4, with items 5 and 6 being assessed within the EIS.

Other issues such as soil and water values, noise and vibration and natural hazards (e.g. bushfire and electromagnetic fields) can be readily addressed by appropriate standard mitigation and management measures. The relevance and importance of issues would be reviewed throughout the EIS process.

8 REFERENCES

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APPENDIX A THREATENED FLORA AND FAUNA DATABASE SEARCH RESULTS

Table 8-1 Threatened flora and fauna species potentially occurring in the search area as indicated in database searches.

Scientific name	Common name	Status		Indicated in Search?	
		Commonwealth	NSW	PMST	NSW Bionet
Birds					
Anthochaera phrygia	Regent Honeyeater	Critically Endangered	Critically Endangered	✓	X
Botaurus poiciloptilus	Australasian Bittern	Endangered	Endangered (population)	✓	X
Calidris ferruginea	Curlew Sandpiper	Critically Endangered	Endangered	✓	X
Grantiella picta	Painted Honeyeater	Vulnerable	Vulnerable	✓	X
Lathamus discolor	Swift Parrot	Critically Endangered	Endangered	✓	X
Leipoa ocellata	Malleefowl	Vulnerable	Endangered (population)	✓	X
Numenius madagascariensis	Eastern Curlew, Far Eastern Curlew	Critically Endangered	-	✓	X
Polytelis swainsonii	Superb Parrot	Vulnerable	Vulnerable	✓	X
Rostratula australis	Australian Painted Snipe	Endangered	Endangered	✓	X
Pomatostomus temporalis temporalis	Grey-crowned Babbler (eastern subspecies)	-	Vulnerable	X	✓
Mammals					
Nyctophilus corbeni	Corben's Long-eared Bat, South-eastern Long-eared Bat	Vulnerable	Vulnerable	✓	X

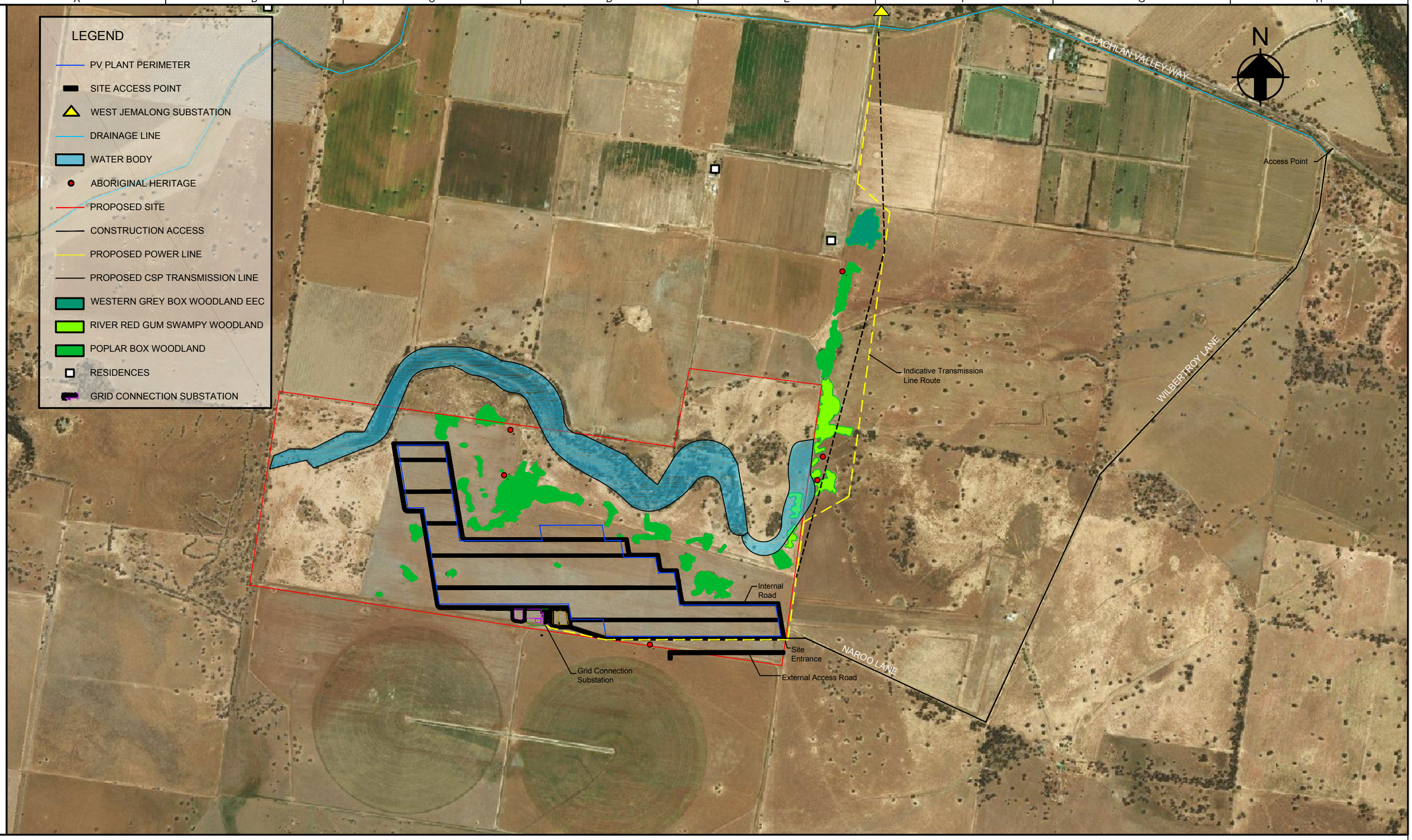
Scientific name	Common name	Status		Indicated in Search?	
		Commonwealth	NSW	PMST	NSW Bionet
Phascolarctos cinereus	Koala	Vulnerable (combined populations of QLD, NSW and ACT)	Vulnerable (species)	✓	X
Pteropus poliocephalus	Grey-headed Flying-fox	Vulnerable	Vulnerable (species and the following populations: - Hawkes Nest and Tea Gardens - Pittwater LGA - between the Tweed River and Brunswick River east of the Pacific Highway)	✓	X
Plants					
Austrostipa metatoris	-	Vulnerable	Vulnerable	✓	X
Austrostipa wakoolica	-	Endangered	Endangered (population)	✓	X
Swainsona murrayana	Slender Darling-pea, Slender Swainson, Murray Swainson-pea	Vulnerable	Vulnerable	✓	X
Tylophora linearis	-	Endangered	Vulnerable	✓	X

APPENDIX B ENVIRONMENTAL CONSTRAINTS MAP WITH INDICATIVE SITE LAYOUT

A3

A B C D E F G H

1 2 3 4 5



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Client
VAST SOLAR

ENVIRONMENTAL CONSTRAINTS

Scale at A3 1:20000

Discipline CIVIL

Job No **602094-72**

Drawing Status **INFORMATION**

Drawing No **SK04**

Issue **02**

Do not scale

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APPENDIX C FLOOD NETWORK ZONES FOR MANAGEMENT AND INDICATIVE SITE LAYOUT

A3

A B C D E F G H

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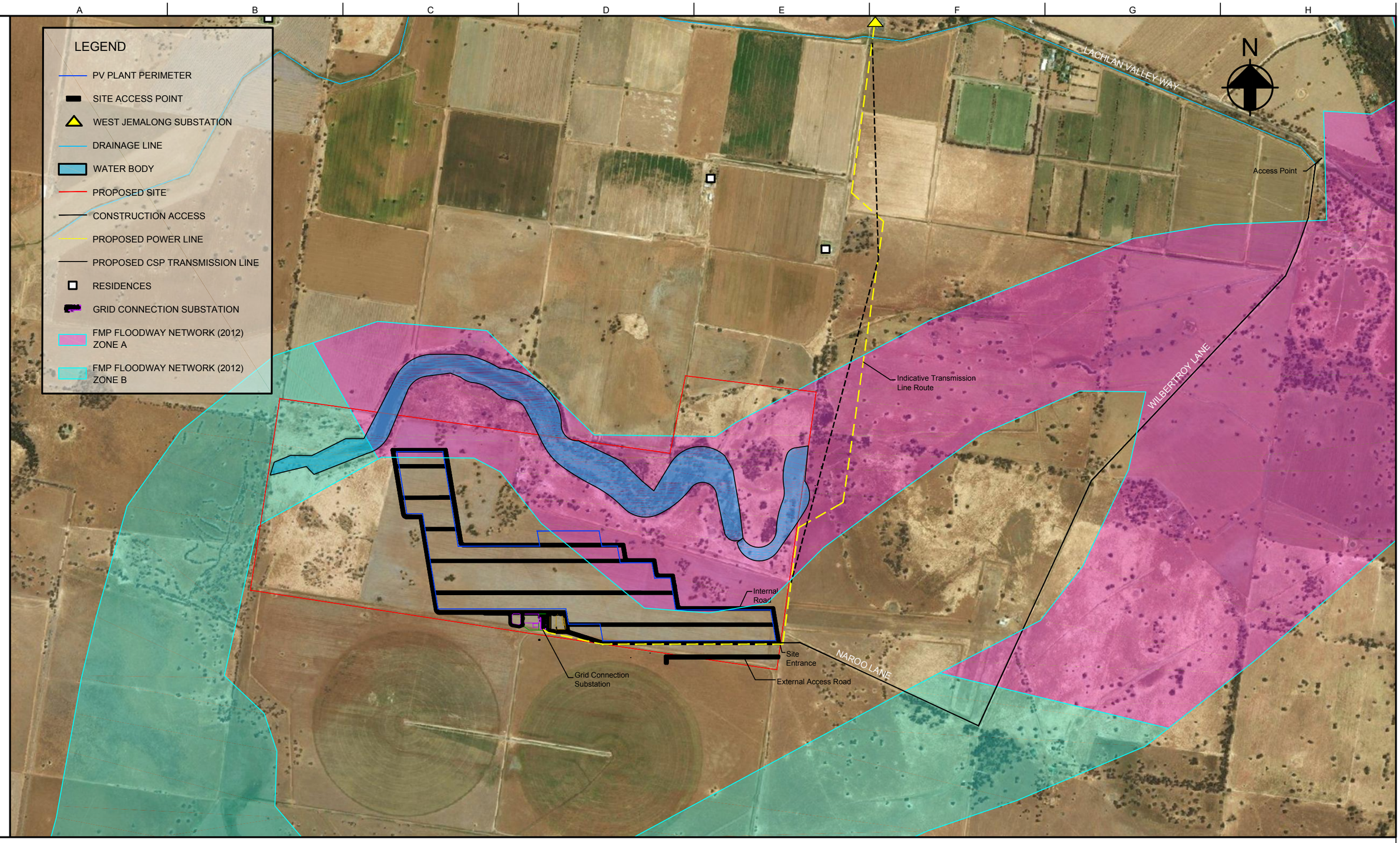

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Client
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FLOODWAY NETWORK ZONE A & B

Scale at A3	1:20000
Discipline	CIVIL
Job No	602094-72
Drawing Status	INFORMATION
Drawing No	SK07
Issue	01

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