APPLICATION ON NOTIFICATION – CROWN DEVELOPMENT

Applicant:	The Solar River Project Pty Ltd
Development Number:	010/V082/17
Nature of Development:	The Solar River Project comprising single axis tracking photovoltaic arrays with a combined 200MW capacity; 20MWh battery storage system, 275kV transmission line to Robertstown substation, and ancillary infrastructure including substation, access roads and temporary construction facilities
Type of development:	Public Infrastructure
Zone / Policy Area:	Remote Areas Zone
Subject Land:	Section 1352 Dartmoor Road, Maude
Contact Officer:	Laura Kerber
Phone Number:	7109 7073
Start Date:	Wednesday 17 January 2018
Close Date:	Thursday 8 February 2018

During the notification period, hard copies of the application documentation can be viewed at the Department of Planning, Transport and Infrastructure, Level 5, 50 Flinders Street, Adelaide during normal business hours. Application documentation may also be viewed during normal business hours at the local Council office (if identified on the public notice).

Written representations must be received by the close date (indicated above) and can either be posted, hand-delivered, faxed or emailed to the State Commission Assessment Panel (SCAP). A representation form is provided as part of this pdf document.

Any representations received after the close date will not be considered.

Postal Address:
The Secretary
State Commission Assessment Panel
GPO Box 1815
ADELAIDE SA 5001

Street Address:
Development Division
Department of Planning, Transport and Infrastructure
Level 5, 50 Flinders Street
ADELAIDE

Email Address: scapadmin@sa.gov.au
Fax Number: (08) 8303 0753

Government of South Australia

Department of Planning, Transport and Infrastructure

DEVELOPMENT ACT 1993

NOTICE OF APPLICATION FOR CONSENT TO DEVELOPMENT

SECTION 49 – PUBLIC INFRASTRUCTURE

Notice is hereby given that an application has been made by **The Solar River Project Pty Ltd** for consent to construct **the Solar River Project comprising single axis tracking photovoltaic arrays with a combined 200MW capacity; 20MWh battery storage system, 275kV transmission line to Robertstown substation, and ancillary infrastructure including substation, access roads and temporary construction facilities** (Development Number: **010/V082/17**).

The land is situated at **Section 1352 Dartmoor Road, Maude** being Crown Lease Volume 1156, Folio 3.

The subject land is located within the **Remote Areas Zone** of the **Land Not Within a Council Area (Riverland) Consolidated 18 October 2012.**

The application may be examined during normal office hours at the office of the State Commission Assessment Panel, Level 5, 50 Flinders Street. Application documentation may also be viewed on the State Commission Assessment Panel (SCAP) website: www.saplanningcommission.sa.gov.au/scap.

Any person or body who desires to do so may make representations concerning the application by notice in writing delivered to the Secretary, State Commission Assessment Panel, GPO Box 1815, Adelaide 5001 **NOT LATER THAN Close of Business Thursday 8 February 2018.**

Each person or body making a representation should state the reason for the representation and whether that person or body wishes to be given the opportunity to appear before the SCAP to further explain the representation.

Submissions may be made available for public inspection. Please indicate in writing if you object to your submission being made available in this way.

Should you wish to discuss the application and the public notification procedure please contact **Laura Kerber** on **7109 7073.**

Alison Gill
SECRETARY
STATE COMMISSION ASSESSMENT PANEL
www.saplanningcommission.sa.gov.au/asap

PN2401

PN2401
19x2 (63mm)
Adelaide Advertiser, Northern Argus
17 January 2018

DEVELOPMENT ACT, 1993
S49/S49A – CROWN DEVELOPMENT
REPRESENTATION ON APPLICATION

Applicant:	The Solar River Project Pty Ltd
Development Number:	010/V082/17
Nature of Development:	The Solar River Project comprising single axis tracking photovoltaic arrays with a combined 200MW capacity; 20MWh battery storage system, 275kV transmission line to Robertstown substation, and ancillary infrastructure including substation, access roads and temporary construction facilities
Zone / Policy Area:	Remote Areas Zone
Subject Land:	Section 1352 Dartmoor Road, Maude
Contact Officer:	Laura Kerber
Phone Number:	7109 7073
Close Date:	Thursday 8 February 2018

My name:_____

My phone number: _____

PRIMARY METHOD(s) OF CONTACT: Email address: _____

Postal address:_____

_____Postcode_____

<u>You may be contacted via your nominated PRIMARY METHOD(s) OF CONTACT if you indicate below that you wish to be heard by the State Commission Assessment Panel in support of your submission.</u>

My interests are:
[ ] owner of local property
[ ] occupier of local property
[ ] a representative of a company/other organisation affected by the proposal
[ ] a private citizen

The address of the property affected is .....Postcode.....

The specific aspects of the application to which I make comment on are: .....

.....

.....

.....

.....

.....

.....

.....

I
[ ] wish to be heard in support of my submission
[ ] do not wish to be heard in support of my submission
(Please tick one)

by
[ ] appearing personally
[ ] being represented by the following person : .....
(Cross out whichever does not apply)

Date: ..... Signature: .....

Return Address: The Secretary, State Commission Assessment Panel, GPO Box 1815, Adelaide, SA 5001 or scapadmin@sa.gov.au

DEVELOPMENT APPLICATION FORM

PLEASE USE BLOCK LETTERS

COUNCIL: PASTORAL UNINCORPORATED AREA

APPLICANT: The Solar River Project Pty Ltd

Postal Address: ThincLab, WS.G17.04, Ground Floor,

10 Pulteney Street Adelaide

Owner: _____

Postal Address: _____

_____

BUILDER: _____

_____

Postal Address: _____

_____

_____ Licence No: _____

CONTACT PERSON FOR FURTHER INFORMATION

Name: Jason May

Telephone: +61 499 365 086 [work] _____ [Ah]

Fax: _____ [work] _____ [Ah]

EXISTING USE: _____

FOR OFFICE USE

Development No: _____

Previous Development No: _____

Assessment No: _____

☐ Complying	Application forwarded to DA
☐ Non Complying	Commission/Council on
☐ Notification Cat 2	/ /
☐ Notification Cat 3	Decision: _____
☐ Referrals/Concurrences	Type: _____
☐ DA Commission	Date: / /

	Decision required	Fees	Receipt No	Date
Planning:				
Building:				
Land Division:				
Additional:				
Development Approval				

DESCRIPTION OF PROPOSED DEVELOPMENT: 200MW Photovoltaic solar array and 20MWh Battery Storage system

LOCATION OF PROPOSED DEVELOPMENT: Dartmoor Rd, Maude SA 5320 Title: CL1156/3

House No: _____ Lot No: ____ Street: _____ Town/Suburb: Warnes

Section No [full/part] 1352 Hundred: OH(BURRA) Volume: 1156 Folio: 3

Section No [full/part] _____ Hundred: _____ Volume: _____ Folio: _____

LAND DIVISION:

Site Area [m^2] 53,350,000 Reserve Area [m^2] _____ No of existing allotments _____

Number of additional allotments [excluding road and reserve]: _____ Lease: **YES** ☒ **NO** ☐

BUILDING RULES CLASSIFICATION SOUGHT: _____ Present classification: _____

If Class 5,6,78 or 9 classification is sought, state the proposed number of employees: Male: _____ Female: _____

If Class 9a classification is sought, state the number o persons for whom accommodation is provided: _____

If Class 9b classification is sought, state the proposed number of occupants of the various spaces at the premises: _____

DOES EITHER SCHEDULE 21 OR 22 OF THE DEVELOPMENT REGULATIONS 2008 APPLY? **YES** ☐ **NO** ☐

HAS THE CONSTRUCTION INDUSTRY TRAINING FUND ACT 2008 LEVY BEEN PAID? **YES** ☐ **NO** ☒

DEVELOPMENT COST [do not include any fit-out costs]: $ 465,000,000

I acknowledge that copies of this application and supporting documentation may be provided to interested persons in accordance with the Development Regulations 2008

SIGNATURE: _____ Dated: 01 / 12 / 2017

Development Application

Submission Date: 4th December 2017

Approved:

Mr Jason May

Managing Director

The Solar River Project Pty Ltd

Clarification please contact Mr Aju Yeldhose Project Manager aju@maybros.net

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Glossary

MW	Mega Watt
AC	Alternating Current
AEMO	The Australian Energy Market Operator
AIS	Air-insulated switchgear
CASA	Civil Aviation Safety Authority
CEMP	Construction Environmental Management Plan
DC	Direct Current
DEWNR	Department of Environment, Water and Natural Resources
DPTI	Department for Transport, Energy and Infrastructure
EPC	Engineering, Procurement and Construction
FIRB	Foreign Investment Review Board
ha	Hectares
HV	High Voltage
kV	Kilo Volt
mm	millimetre
MWh	Megawatt hour
OTR	Office of the Technical Regulator
PV	Photovoltaics
RMU	Ring Main Unit
SA	South Australia
SEB	Significant Environmental Benefits
SRP	Solar River Project
T&D	Transmission and Distribution

EXECUTIVE SUMMARY

The Solar River Project Pty Ltd is as a proposed ground mounted 200MW solar photovoltaic array with a 20MWh battery storage system located 110km north of Adelaide Near Robertstown on a property Out of Hundreds, the site locally named (Dartmoor). The project has gained crown sponsorship from Department of Premier and Cabinet. This development application is submitted pursuant to Section 49 of the Development Act 1993 with the endorsement of the Department of State Development. The Section 49 process is appropriate for electricity infrastructure such as the proposed solar plant, as generation is provided to the people of South Australia and represents a service historically provided by the State Government.

The project will generate (150) jobs in the development phase, (1000) jobs in the two-year construction phase and (45) jobs whole of life to support field operations and maintenance activities. The project will reduce energy sector air pollution by 350,000 tonnes of carbon dioxide each year.

The proposed development incorporates the following key elements:

- Solar modules- Single axis tracking racks;
- Module piled footings and racking for solar Photovoltaic modules;
- DC/AC Containerised Inverter stations;
- Associated underground cables connecting groups of solar panels to inverter stations and inverter stations to the 11/33/275kV Transformer in a Substation and then connecter to Robertstown Substation via a low profile double circuit 275kV transmission line;
- Administration and controls area these includes a control room, HV switchgear building and site office with conveniences, an area for maintenance and spare parts building, and a carpark for employees and contractors sufficient space allocated during (construction) operations;
- Laydown/compound area and battery storage area (similar in appearance to hay shed);
- Drainage works, including stormwater management systems;
- Security fencing for main facility and stock fencing in appropriate area and CCTV (Optional);
- Low-level night time lighting for safety and security purposes;
- Lightning protection spires and flood lighting in the substation;
- Temporary works include access tracks, site offices and laydown areas.

The block dimension for the 2MW tracker array will be approximately 310 by 180 metres. There will be 100 blocks of 2MW to complete the 200MW project. The project requires a new transmission line connection from Robertstown substation to the Dartmoor Site. This includes installation of mono-pole and conductor wires.

The Solar farm is not visible from the Goyder Highway as it is 6km north of the road. The assessment indicates that surrounding vegetation and topography will limit direct lines of sight to the Project and that significant landscape or visual impacts are not an issue. Existing vegetation will be retained as well as vegetation offset areas in a buffer between the array perimeter and the site boundary.

High volume of traffic to site is expected during construction phases. A detailed traffic assessment and controls will be included in a construction management plan. The plan will address traffic safety and access issues inherent with using heavy, oversized vehicles and general light construction traffic.

Construction noise and dust will have no impact as there is no nearby residents. The one dwelling 2.3 km away is occupied only occasionally. Construction activities are unlikely to affect the occupant/s.

Dust suppressions methods such as water trucks will be used during construction to limit dust emissions due to vehicle movements.

No State or Commonwealth threatened flora species or plant communities were recorded during the desktop assessment. Given the highly degraded nature of the subject site, it is not considered likely that any threatened plant species or communities are present. Mitigation plans will be employed and detailed environmental assessment will take prior to detail design with will identify the avoidance area.

The subject site has been assessed as being of low Aboriginal archaeological sensitivity due to the lack of temporary or permanent water sources. In addition, the site has been subject to ground disturbance through pastoral, agricultural and grazing activities.

Overall, the development assessment finds the Project will comply with the standards, codes and policies included in the Development Act, the Development Plan and the Guide to the Assessment of Crown Development and Public Infrastructure.

The Solar River Project aligns with several of the SA Government economic strategic priorities refer 2.2 herein.

A construction management plan will be implemented with detailed risk register addressing safety in design, visual, heritage and environmental factors during detailed design, construction and operational phases. The development is essential as the electrical infrastructure can meet the current and future electricity requirements of South Australia with stable baseload power generation.

1. INTRODUCTION

1.1. OUTLINE OF PROJECT

The project is a 200MW Mega Watt photovoltaic PV array with an integrated 20MWh battery system. The location of the project is 110km north of Adelaide, South Australia near Robertstown, Out of Hundred Burra, Dartmoor Property. The site is located in a high solar region on a large allotment of pastural land well suited to board acre PV installation and operation. The 200MW PV Ground Mounted Array will be connected via a 275,000-volt Transmission Connection to the Australian National Grid and the 20 Mega Watt hours battery will be used to store energy for grid stability and retail consumption. The project entity is named The Solar River Project Pty Ltd.

Figure 1: Example of single axis ground mounted solar panel array

1.2. COMPANY BACKGROUND

May Brothers & Co First Established in 1885 has 32 Years T&D Energy Sector experience. The firm specialises in project management and development, focusing on innovations in energy, scale renewable infrastructure projects. May Brothers are specialist in grid connections operating in the South Australian, India and Asia Pacific.

1.3. THE DEVELOPMENT APPLICATION PROCESS

The Solar River Project Pty Ltd has prepared this development application for submission to the Department of Premier and Cabinet (DPC) for lodgement to the Development Assessment Commission (DAC). The application is being lodged under the public infrastructure provisions of section 49 of the Development Act 1993 (SA), for the approval of construction and operation of the proposed project and ancillary infrastructure.

1.4. THE SOLAR RIVER PROJECT

The Solar River Project Pty Ltd. Registered Address of Company is 10 Pulteney Street Adelaide South Australia 5000, Adelaide University Building.

1.5. APPLICANT DETAILS

The applicant's details are as follows:

Applicant Name	: The Solar River Project Pty Ltd
Contact	: Jason May (Managing Director)
Address	: 10 Pulteney Street Adelaide South Australia 5000, Adelaide University Building, ThincLab, Suite WS. G17.04
ACN	: 622113517

The Developer has long history of development in Australia, India and Asia Pacific. Refer attached in Appendix G

2. A STATEMENT OF ECONOMIC EFFECTS OF DEVELOPMENT

2.1. CAPITAL ESTIMATE OF DEVELOPMENT AND EMPLOYMENT OPPORTUNITIES

The Solar River Project is an integrated grid connected 200MW Solar PV and 20MWh battery storage that comprises capital estimate in investment of AUD $454 million.

The project is in the expected to generate (150) jobs in the development phase, (1000) regional jobs in the two-year construction phase and (25) regional jobs whole of life to support field operations and maintenance activities.

This is an opportunity for job creation in regional communities whilst participating in the step change to a cleaner world eliminating millions of tonnes of pollutants emitted through conventional fossil fuel electricity generation.

2.2. ALIGN AND WILL ASSIST THE STATE OF SOUTH AUSTRALIA IN ACHIEVING STATE GOVERNMENT PRIORITIES

This development will deliver clean low-cost energy generating 480,000MWh/ year. This is equivalent power of approximately 96,000 households and as well as reducing CO_2 emissions by an estimated 350,000 tonnes a year (based on 5000kWh for South Australian 'representative consumer' (AEMC 2016).

The project is aligned with the State of South Australia in achieving State Government priorities, including the following: South Australia's Strategic Plan 2011 is provided in Table 1.

Table 1: Main Target's that are aligned with South Australia's Strategic Plan 2011

	Targets	Description
1	**Target 38: Business investment**	Exceed Australia's ratio of business investment as a percentage of the economy by 2014 and maintain thereafter.
2	**Target 47: Jobs**	Increase employment by 2% each year from 2010 to 2016.
3	**Target 59: Greenhouse gas emissions reduction**	Achieve the Kyoto target by limiting the State's greenhouse gas emissions to 108% of 1990 levels during 2008-2012, as a first step towards reducing emissions by 60% (to 40% of 1990 levels) by 2050 (baseline: 1990).
4	**Target 64: Renewable energy**	Support the development of renewable energy so that it comprises 33% of the State's electricity production by 2020 (baseline: 2004-05). Milestone of 20% by 2014.
5	**Target 65: Green Power**	Purchase renewable energy for 50% of the government's own electricity needs by 2014 (baseline: 2010).
6	**Target 66: Emissions intensity**	Limit the carbon intensity of total South Australian electricity generation to 0.5 tonnes of CO2/MWh by 2020 (baseline: 2011).

South Australia's Ten Economic Priorities

Priority: The vision for the State involves a series of Economic Priorities which includes unlocking the full potential of South Australia's resources, energy and renewable assets.

Objective: Expand investment in renewable energy to be on track to increase the proportion of electricity generated from renewable sources from 33% in 2013-14 which is already achieved to 50% in 2025.

3. TECHNICAL DESCRIPTION

3.1. THE MANAGEMENT OF SOUTH AUSTRALIA'S POWER SYSTEM SECURITY

The project with its battery integration and Fast Frequency Control system will improve the security of the South Australian power system increased inertia in the following ways:

- As per the approval of The Solar River Project by the Office of the Technical Regulator:
  - It can support the frequency in the event of a contingency with response times within 250 milliseconds of a system disturbance to achieve balanced power and frequency.
  - This is achieved with flywheel, lithium ion battery technology and state of the art large scale inverters with capacity to respond to inertia and network stability constraints.
- Network augmentation can be deferred as this project has the ability to address some of South Australia's network congestion thus creating deferred expenditure for network owners and roll on savings to the end consumers.
- Large-scale battery deployment can remove price spikes in electricity prices to create a more stable market with reduced costs for consumers.
- Installation of local generation will reduce South Australian dependence on interconnectors and in the long term suppress energy prices.
- Supports the variability of renewable generation by smoothing output, whilst absorbing excess capacity during low demand and release during peak occurrences.
- The project facilitates the transition to a low carbon economy, and the increased penetration of new technologies to ensure that South Australia will continue to be at the forefront of solar technology.
- Finally, by supporting the security of supply, inertia and frequency response of the grid, additional renewable energy systems may be installed, above the currently accepted levels.

3.2. CERTIFICATE OF COMPLIANCE FROM THE TECHNICAL REGULATOR

The proposal submitted by The Solar River Project Pty Ltd to the Office of the Technical Regulator (OTR) was assessed under section 37 of the Development Act 1993. The Project will consist of a 200MW Photovoltaic system in combination with battery energy storage and with energy being dispatched by Inverter which is capable of 150% overload for 60 seconds that will provide Fast Frequency response. The OTR granted approval for the Solar River Project, a copy of which is attached in Appendix A

4. DESCRIPTION OF THE PROPOSED DEVELOPMENT

This section provides a description of the proposed development such as project description, development program, key operational components and health and safety.

4.1. DESCRIPTION OF THE PROPOSED LAND USES AND ACTIVITIES

The proposed site is located 110km North of Adelaide, South Australia which is 33km away from the nearest township, Robertstown. Address- Dartmoor Rd, Maude SA 5320 (Coordinate: -33.802191, 139.390296 Lat/long). The land will be used for renewable electricity generation and energy storage. The total land area is 5335 ha held under a perpetual Crown Lease forming a single land of parcel. The Certificate of this land is provided as an attachment to this application (the Certificate title being-CL 1156/3). The sub-lease to the Project will cover section 1352 in the area named Warnes. The total development footprint will be significantly less than this area approximately 200ha and may vary slightly subject final design layout of the PV plant.

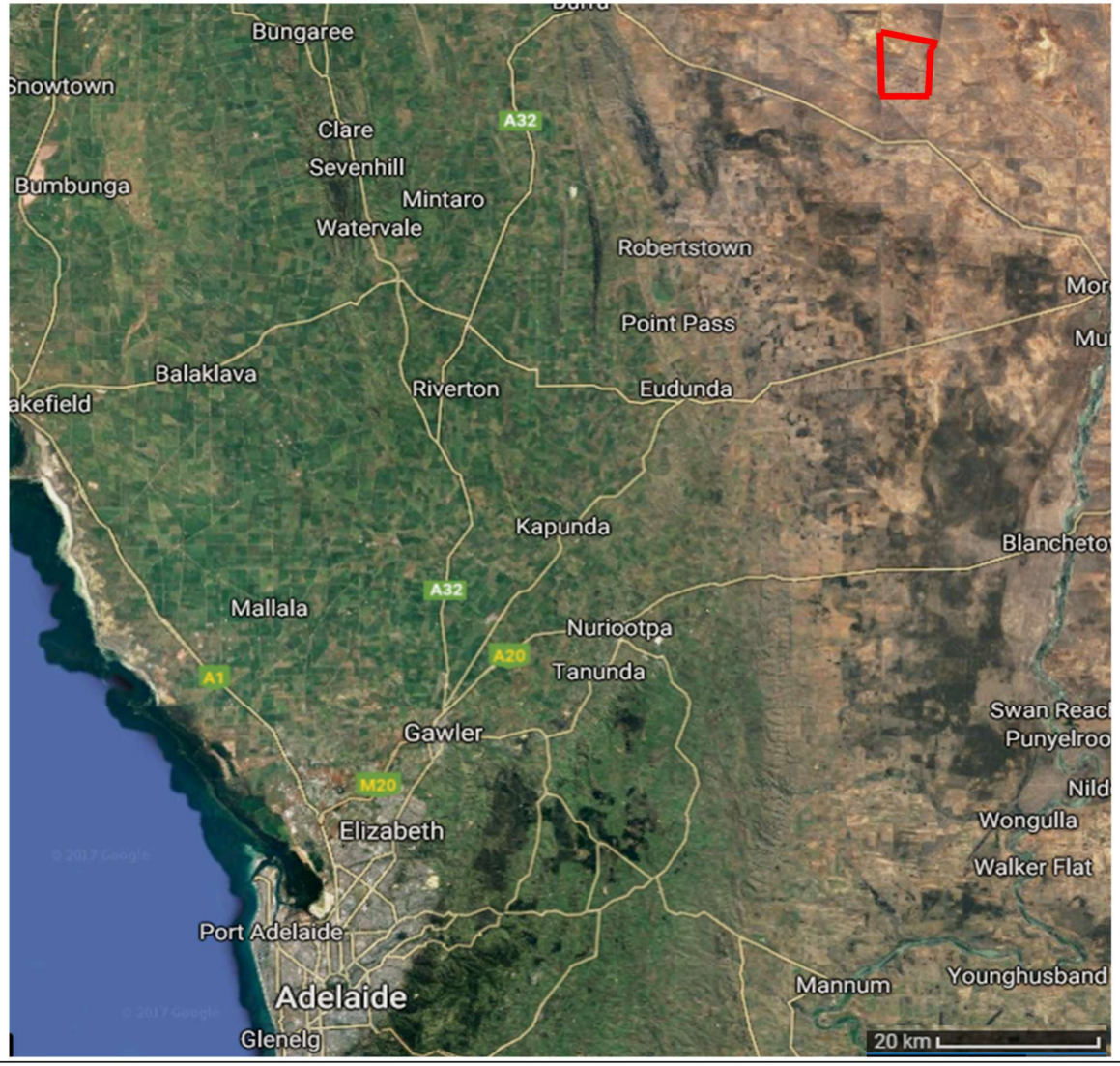
The existing environment at the Project site is characterised by vacant rural land. This part of the region is recognised as having a semi-arid climate. This includes hot summers with mild to cool winters. Light precipitation throughout the year less than 240mm. The regional topography is flat. Figure 2 below shows the typical views of the site from three different areas:


North east side of site


Entrance to site from Dartmoor Rd


Centre of Site

Figure 2: These figures shows the typical views of the site.



Legend

Site Boundary

Major highways

Dated: 14/11/2017

Image Reference: Google maps © 2017

Figure 3: Site location from Adelaide in South Australia

4.2. SCALED PLANS OF THE SITE AREA INCLUDING PROPOSED STRUCTURES

The proposed development incorporates the following elements:

- Solar modules- Single axis tracking racks;
- Module piled footings and racking for solar Photovoltaic modules;
- DC/AC Containerised Inverter stations;
- Associated underground cables connecting groups of solar panels to inverter stations and inverter stations to the 11/33/275kV Transformer in Substation and then connecter to Robertstown Substation via a low profile double circuit 275kV transmission line;
- Administration and controls area these includes a control room, HV switchgear building and site office with conveniences, an area for maintenance and spare parts building, and a carpark for employees and contractors sufficient space allocated during (construction) operations;
- Laydown/compound area and battery storage area (similar in appearance to hayshed);
- Drainage works, including stormwater management systems;
- Security fencing for main facility and stock fencing in appropriate area and CCTV (Optional);
- Low-level night time lighting for safety and security purposes;
- Lightning protection spires and flood lighting in the substation;
- Temporary works include access tracks, site offices and laydown areas.

4.3. PROJECT INFRASTRUCTURE

4.3.1. SOLAR PHOTOVOLTAIC MODULES

Solar PV modules absorb the sunlight as source of energy to generate electricity. The installation of the modules is to have a generational capacity of circa 200MW generating 480,000MWh per annum. The final configuration will be finalised during a detailed design phase.

The layout shown in **Error! Reference source not found.** is an estimate area for a 2MW tracker array block. The solar panel are the same or similar in appearance and electrical performance to the Sunpower-455Wp (Si-mono SRP-455NJ-WHT). Module dimensions are width 1.04m and length 2.06m. This indicative configuration includes 7 panel in a string formation. The string formation combines the wires of several different solar panel and combines them into one main feed. A string combiner will be used to combine the output of multiple strings to form the block of 2MW. The block dimension for the 2MW tracker array will be approximately 310 by 180 metres. There will be 100 blocks of 2MW to complete the 200MW project. This is shown in the attached site layout; this model is subjected to change depending on ultimate configuration done in the detailed design. A possible configuration in shown in Figure 4.

Figure 4: Example of a solar PV array system

The Figure 5 shows an example of solar panel tracking configuration and the distance from string to string. The nominal height the panels will be fixed from ground will be 1.5m. The panel will be single axis tracking with an east to west tracking orientation. This will increase the energy production as it will be tracking the sun path. String combiners take the wires from several different solar panels and combine them into one main feed. A string combiner will be used to combine the output of multiple strings (String configuration shown in **Error! Reference source not found.**) of solar PV modules, and will be connected to the inverter.

Figure 5: Tracking axis system and the distance from string to string

4.3.2. INVERTER STATION

Inverter station converts the DC electricity that PV modules generate into AC current and exports to the National electricity grid. The inverter will be set up in the middle of the block or as per the detailed design configuration. The size of the station is going to be approximately the size of a shipping container. An example of 2MW central inverter is show bellow and will need approximately 100 inverters, this will be adjusted with detailed engineering design on selection of the inverter, size and placement of them in the site.

Figure 6: Example of an Inverter station (ABB, 2017)

4.3.3. RING MAIN UNIT (RMU)

The inverters are connected to 415V / 33kV step up transformers. The transformers are connected to RMU's. The RMU is a high voltage 33kV group of switches connecting HV underground cable in loops or rings. Each collector ring is connected to a High Voltage 33kV circuit breaker and associated switch board. The 2 x main boards are connected to the 33/275kV substation transformer. The transformer is protection by 275kV AIS switchgear. The switchgear is connected to the proposed 37km transmission line. The line is connected to the ElectraNet Robertstown Substation via a newly constructed 275kV Circuit Breaker and a half exit. The new system is protected by high-speed protection, SCADA over fibre communications. The infrastructure is similar in appearance to existing ElectraNet infrastructure in the region.

4.3.4. BATTERIES AND BATTERY BUILDING

The battery will be located adjacent the newly constructed substation in a typical industrial/agricultural shed similar to a large hay shed. The building will be secure and architecturally design to blend in with the surroundings.

The battery will be housed inside the shed. The battery will be a large-scale lithium Ion system. (An upgrade to the system may include flow batteries to improve the overall performance of the battery) The building will be designed and certified for human occupancy. Fire suppression and monitoring systems will be installed. Drainage and surface water will be contained on site. Rain water tanks are proposed for the collection of water for use at the facility.

4.3.5. SUBSTATION

The Project will include a substation that will be located adjacent to the array 1km North West of the southern boundary. The size of the substation is approximately 120m x 220m. The substation will house two 11/33/275kV step-up transformer, a 33kV switch room and control room.

4.3.6. TRANSMISSION LINE

The substation will be connected to the new high voltage transmission lines and the built form will be consistent with other transmission line pole construction in the area. At the ElectraNet Robertstown Substation a new 275kV diameter will be constructed and connected to the 2 x transfer bus (inclusive of NGM, SCADA, Protection and Control). The connection to the ElectraNet system will be via the transmission lines from Robertstown substation to the project site. Refer to transmission line route in Figure 8.

The transmission line consists of a lighter construction intermediate line pole, terminal and Angle poles. Terminal pole is used when the overhead power line terminates, and is connected to substation equipment, or transitions to underground cable. Angle poles are used where the line changes direction. The examples of poles used are shown in Figure 7. This will be installed according to the transmission line regulation and legislation Act of South Australia. The line route from Dartmoor (site) to Robertstown substation goes through several properties, the transmission line easement will be subjected to environmental and ecological assessment while detailed design is in progress. There will be minimal disturbance to vegetation and the ecology during the construction of the transmission line. The solar river transmission line pole height will not exceed 30m, similar to other ElectraNet lines in the region.

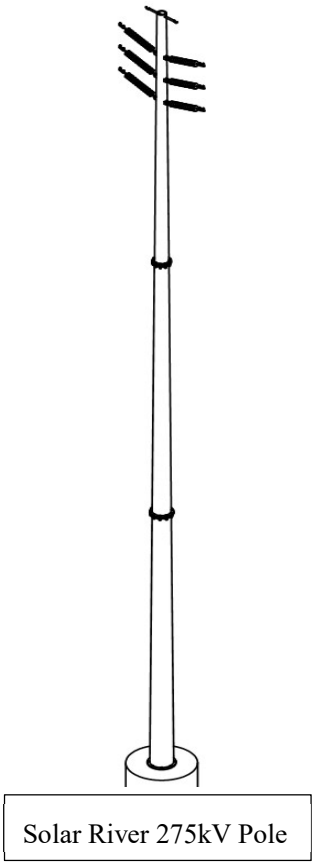


Figure 7: Example (132kV) Transmission line and structural pole (line, terminal and angle) and proposed 275kV Pole

The new transmission line will be constructed from the Robertstown substation to site. The proposed 50m line easement for the new transmission line is shown in Figure 8. The line length is approximately 37km, the final length will be secured after detailed design as there will be changes in harmony with avoidance of Flora, fauna and heritage areas. The optimum line route with this 150m corridor will be determined during detailed design. The line will be limited to sections as nominated in Figure 9. The design and pole location will consider minimal disruption to flora fauna, avoiding public roads and dwellings. Construction methodology as detailed in the CEMP will consider access, heritage and vegetation protection zones. Every pole location will be subject to a detailed ecological and heritage site survey as detailed in the CEMP.

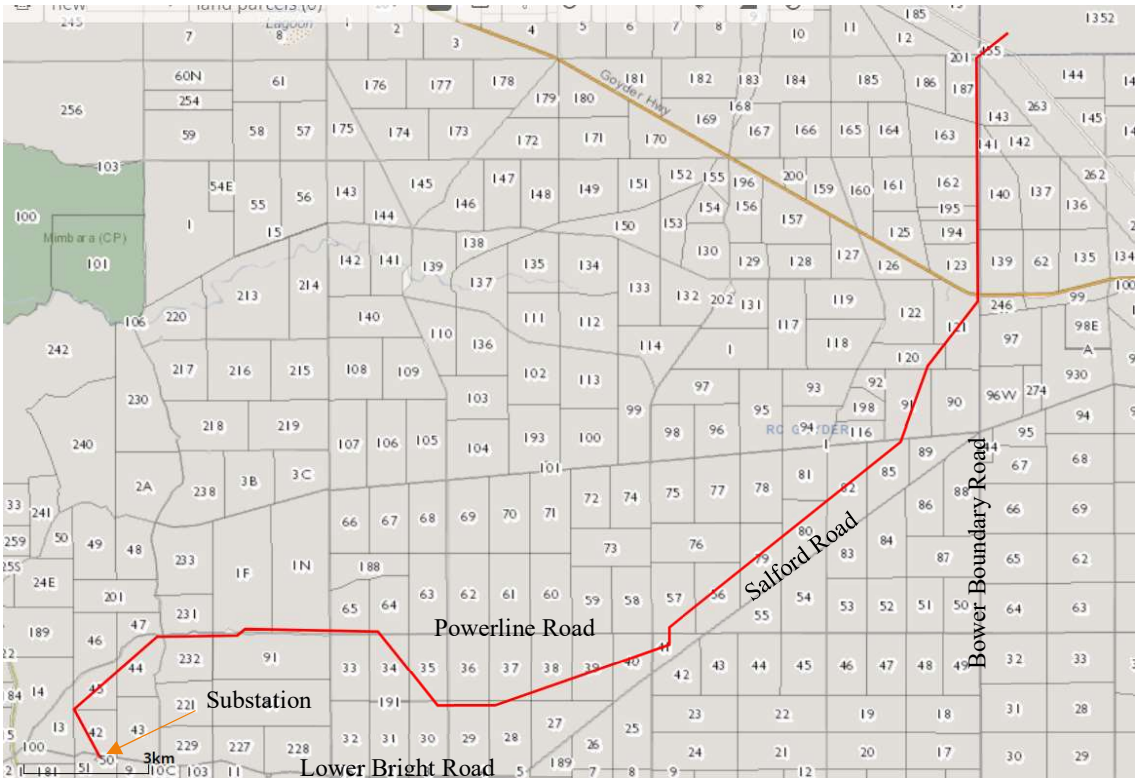


Figure 8: Transmission route from the substation (Section 50) to site (Section 1352)

4.3.7. ARRAY CABLING

The installation of cabling will result in minimal earthworks, only where required for piling and levelling for cabling and trenching related with the solar panels and other associated infrastructure. Underground cabling for DC cables and 33 kV cables would be installed in accordance with Australian and international standards and established practice. The trenches for cabling is expected to be 900mm to 1200mm in depth and 300mm to 2000mm in width.

4.3.8. ADMINISTRATION AND CONTROL AREA.

The operational infrastructure will be constructed in the south west corner of the land which will include a demountable site office, parking space, waste storage area, and block area for maintenance, storage of materials. The location of the administration area considers proximity to Goyder Highway.

4.4. LEGAL DELINEATION OF THE SITE OF THE DEVELOPMENT

Crown lease paper is attached in Appendix I.

Title Details

Crown Lease

Title Reference	CL 1156/3
Status	CURRENT
Easement	YES
Owner Number	70778870
Address for Notices	300 RUNDLE ST ADELAIDE, SA 5000
Area	5335HA (CALCULATED)

Estate Type

Crown Lessee

Owner

The Crown

Crown Lessee

PASTORAL PURSUITS PTY LTD (ACN: 112 873 515)
OF PO BOX 3 MORGAN SA 5320

Description of Land

SECTION 1352
OUT OF HUNDREDS (BURRA)

TOTAL AREA: 5335HA (CALCULATED)

Lease Details

Lease Number	OP008501
Lease Type	PERPETUAL
Commencing On	15/12/1954
IN PERPETUITY	

Last Sale Details

Dealing Reference	Transfer (T) 11451408
Dealing Date	26/08/2010
Sale Price	$0
Sale Type	Change of ownership for no monetary consideration or undisclosed consideration

Figure 9: Land Title Details

4.5. CRITERIA OF "PUBLIC INFRASTRUCTURE" UNDER SECTION 49 OF THE DEVELOPMENT ACT 1993

The public infrastructure provisions of the Development Act do not involve specific terms of reference or guidelines for the assessment. This development application has been prepared in accordance with the guidance provided in the Guide to the Assessment of Crown Development and Public Infrastructure (Planning SA 2002). The Development Regulations 2008 also require that prescribed particulars are contained in an application under Section 49, including:

a) A description of the nature of the proposed development in sufficient detail for the scope of the intended activity to be fully understood (Referred herein)
b) details of the location, siting, layout and appearance of the proposed development (Referred herein)
c) a certificate from the Office of the Technical Regulator (OTR) certifying that the proposed development complies with the OTR (Refer to the Appendix A for copy of the certificate of the OTR)
d) information about potential pollution impacts, hazards or other activities which relate to the Environmental Protection Act (set out in Schedules 21 and 22) (Referred herein)

4.6. CURRENT ZONING/S IMPACTED BY THE DEVELOPMENT

The plan is zone pastoral lease (refer to section 4.7). The nearest township is located approx. 33km away in Robertstown. Visual amenity concerned have been addressed by the sheer size of the properties for the powerline selected and the in-land positioning of the array. The array will not be visible to the public unless in an aircraft. CASA will be notified of the development with no airports or convention flight paths noted in the region. The transmission line will be a low-profile design similar to existing ElectraNet infrastructure in the region. The line route will avoid occupied dwellings to minimise / eliminate the view shed from said dwellings. Heavy Construction traffic will be restricted by the traffic management plan as incorporated in DA, this also includes light vehicle traffic to accommodation in Burra and Robertstown.

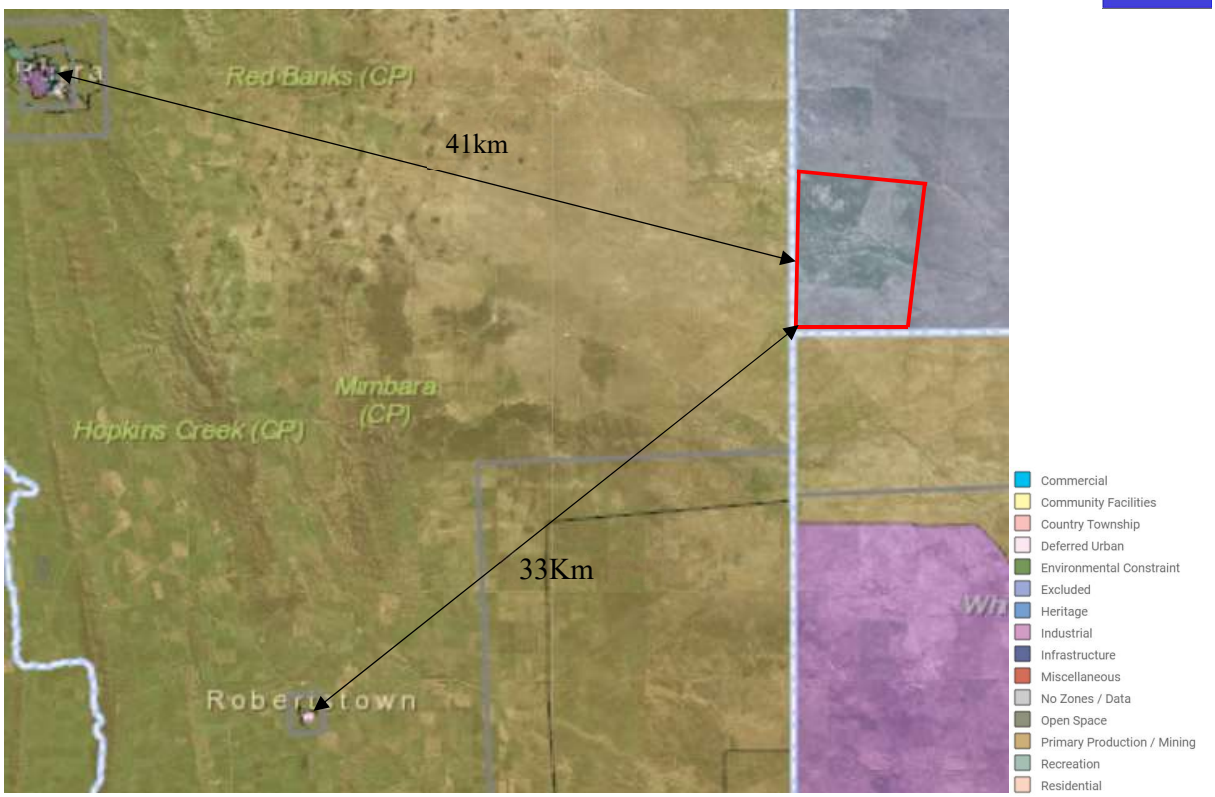


Figure 10: The distance from the nearest township

4.7. IDENTIFICATION OF ANY LAND TENURE REQUIREMENTS OVER ADJACENT AND SUBJACENT LANDS (SEABED) OR OTHER CROWN LAND INCLUDING HELD BY LOCAL OR FEDERAL GOVERNMENT

Pastoral lessees have the opportunity to participate in renewable energy (wind and solar) developments thanks to changes to the Pastoral Land Management and Conservation Act 1989. Pastoral lessees have the opportunity to contact renewable energy developers directly to discuss options for diversification, providing a new income stream to landholders.

The South Australian Government is committed to renewable energy production and supporting investment in the industry, already reached its target of achieving 33 per cent renewable energy production by 2014.

South Australia has now committed to achieving 50 per cent renewable energy production by 2025 – with the changes made by the Pastoral Land Management and Conservation (Renewable Energy) Amendment Bill 2014 one of many initiatives planned to achieve this.

The Bill, which came into effect September 2015, provides renewable energy investors with more opportunity to access land for renewable energy projects, with investors now able to access 40 per cent of South Australia's land mass that is Crown land subject to pastoral lease.

Renewable Energy not only helps the environment; it stimulates growth in the clean energy industries of the future, and provides employment and economic opportunities for many regional communities.

Pastoral lessees can negotiate a clear process for the initial development of any project with renewable energy developers. A land access agreement is negotiated between the pastoral lessee and the renewable energy developer with all other interest groups (eg Native Title holders) being fully consulted before a licence can be granted.

The Minister can then grant renewable energy licences in relation to pastoral land for a term of 25 years, with a right to renew for an additional term. All Crown land subject to a pastoral lease is eligible regardless of its approved land use except for the Woomera Prohibited Area due to potential interference with the Woomera defence equipment.

The project site is Crown Land 1156/3, the parcel is held under Crown Land "rangeland" perpetual lease. This "rangeland" leasehold tenure is administered under the Crown Land Management Act 2009 and associated "CL perpetual lease policy". SRP will sub lease the land on the 25 plus 25-year lease from the incumbent lessor.

4.8. IF LOCAL, STATE OR FEDERAL GOVERNMENT OWNED LAND, EVIDENCE THAT THE APPLICANT HAS GAINED IN-PRINCIPLE SUPPORT TO BE ABLE TO DEVELOP OVER THESE LANDS

We have principle support from the effected land owners

4.9. PROVISION OF EVIDENCE THAT THE PROPONENT HAS SECURED ITS INTEREST OR HAS TENURE OVER THE PRIVATELY HELD LAND PROPOSED TO BE DEVELOPED

Not Applicable.

4.10. ARE THERE GOING TO BE ANY OTHER USERS OF THE DEVELOPED FACILITY? IF YES, PROVIDE DETAILS OF WHO WILL BE THE OTHER USERS AND HOW WILL THEY BE MANAGED INCLUDING ACCESS ARRANGEMENTS. PROVIDE ANY EVIDENCE OF ANY AGREEMENTS IN PLACE

The development will include a cohabitation pastoral practises with the introduction of sheep, kangaroos, wombats and to the solar array for the purpose of weed / property management. A trial section of the array will be fenced off and sheep introduced for a 12-month period. The fence will be constructed in such a way to allow access to sheep and allow for the movement of kangaroos and wombats. The impact on the array and the condition of live stock will be monitored. If successful, the concept will be deployed across the array.

4.11. A STATEMENT ON WHOM WILL OWN EXISTING OR FUTURE INFRASTRUCTURE TO BE UTILISED IN THE DEVELOPMENT AND WHAT ACCESS TO THE INFRASTRUCTURE WILL BE AVAILABLE TO THIRD PARTIES

The infrastructure will be owned 5% by Australian investors and 95% by foreign investors. The composition of shareholding will comply with FIRB.

Third party access will be restricted via stock and security fencing in high value locations on site. Access must be approved by the site manager. A carpark for general access will be constructed for third party use and requests to access the site will be via contact phone numbers.

4.12. PROJECT SCHEDULE

An Indication for the project is outlined in table below.

Table 2: Expected project schedule/ Milestones

Phase	2017	2018				2019			
	Q4	*Q1*	*Q2*	*Q3*	*Q4*	*Q1*	*Q2*	*Q3*	*Q4*
Approvals									
Detailed Design									
Construction									
Commissioning									
Full Commercial Operation									

4.13. CONSTRUCTION

4.13.1. CONSTRUCTION EQUIPMENT

The Project will require specialist plant and equipment which will be mobilised to site, these include but not limited to:

- Generators;
- Vegetation roller (If required);
- Excavators;
- Grader;
- Cranes;
- Trenching machine;
- Wheeled crane;
- Forklift;
- Dump trucks and water trucks;
- Cement trucks
- Pile driver.

Pile driving of the solar panel foundations would be undertaken using a machine which screws or hammers poles into the ground, similar to that used for driving farm and vineyard fence poles into the ground.

4.13.2. CONSTRUCTION ACTIVITIES

Construction activities will be sequential and overlapping. The main construction activities include Site preparation, Mechanical, structural and electrical works and commissioning. The site preparation will include establishment of the temporary construction compound and preparation for construction such as vegetation removal, preliminary civil works and drainage and fencing.

Mechanical, structural and electrical works will involve the installation of solar panels, battery, inverter station and substation. This involves in construction of the battery building and installation of batteries,

construction of the substation, installation of steel post support system for the solar panels, installation of underground cabling (trenching), installation of PV arrays, inverters containers and delivery station, connection of communications equipment and construction of other permanent operational facilities (e.g. site office, ablutions block, parking, access tracks).

The Commissioning phase will include the demobilising of temporary constructed facilities. The solar will be commissioned line with industry best practice, codes of conduct and licencing requirements to ensure that the system is safe, high performing and in accordance with the predicted and actual energy performance.

The construction and commission of the project is expected to last approximately 18 months.

4.13.3.CONSTRUCTION WORKFORCE AND HOURS

It is estimated that a peak amount of 250 personnel by two shifts total 500 personnel would be requires on the site during the periods of peak construction activities plus engineering and project management of 250 professionals, logistics supply chain of 250 people. The construction workforce for the project will vary and construction labour force will be sourced locally and for specific skill sets that are not available locally, workers will be sourced externally to be filled by contractors.

Construction works are typically 10 hour shifts from 7am to 5 pm, the construction activities are proposed to be undertaken 6 days per week and some critical path works is expected to be undertaken at nights from time to time.

It is anticipated that most workers would be accommodated at existing accommodation within the local area (i.e. towns within an 80 to 100 km radius of the site). Bus transport would be provided to minimise traffic volumes and transit risks during construction. Consideration will be given to a temporary accommodation facility constructed on site.

4.13.4.TEMPORARY CONSTRUCTION FACILITIES

Temporary construction compound and laydown areas will be established in the area of the proposed permanent operations and maintenance facility. The compound/s will primarily provide:

- Parking;
- Storage containers;
- Mechanical workshop;
- Ablutions demountable;
- Temporary site offices and lunch room;
- Waste storage area;
- Infrastructure laydown area; and
- Fuel storage and refuelling area.

Figure 11: Example of demountable office & Ancillary Building (Temporary compound)

4.13.5.ROADS

The main access point to the site is expected to be from Goyder highway through Bower Boundary Road to Dartmoor. This is the shortest and straight route for accessing the site during construction and operation. The location of the main construction access will be determined during detailed design. Potential access location is shown in Figure 12.

A detailed traffic management plan addressing site access will be submitted as part of the CEMP post DA approval. The plan will be developed in consultation with DPTI the Goyder council and the Mid Murray Council and will cover all relevant issues including line of sight, slip lanes, surface suitability and maintenance, vehicle management and other road safety matters.

To allow vehicle access to the battery warehouse, substation, internal access tracks will be build. The width size of the track will be approximately 5-6 m in width and will be capped unsealed tracks.

Solar PV module rows will be spaced approximately 3.5 m to 5 m apart to allow access for service and cleaning. The spaces between module rows will not be graded or gravelled. Wide tracked vehicles will be used to minimise impact to soil structures.

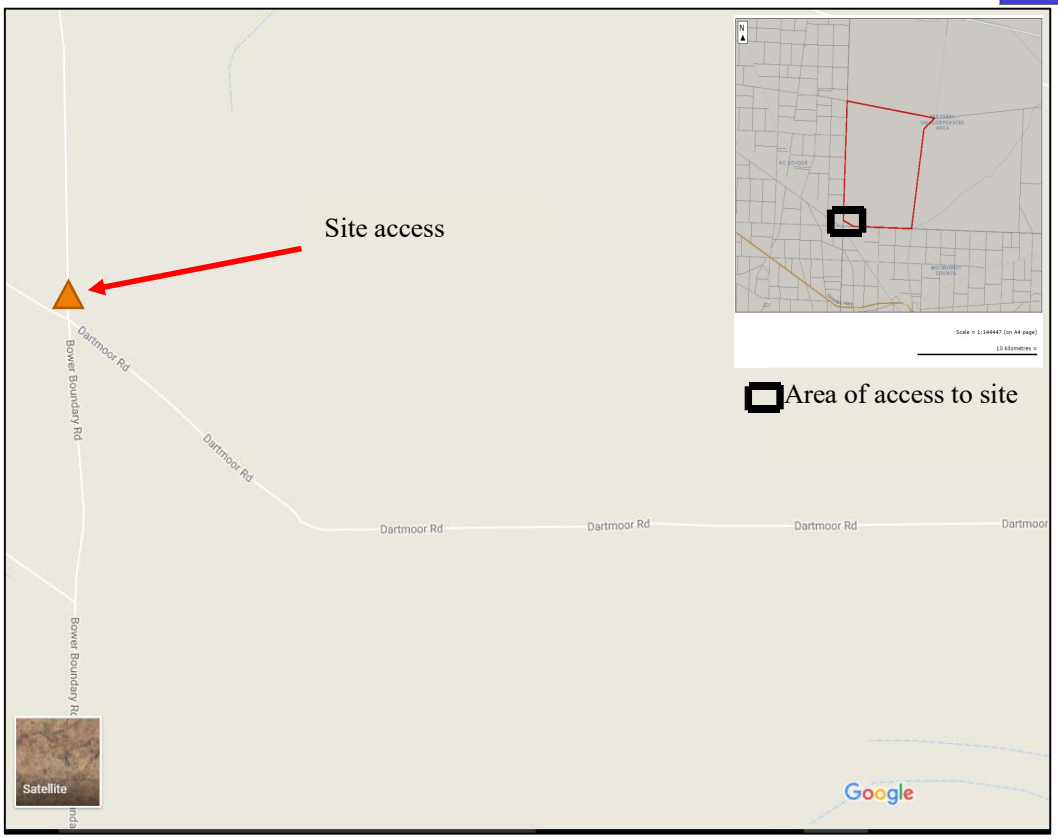


Figure 12: Access to Site through Dartmoor RD Via Bower Boundary or Kingara Rd

5. TRANSMISSION LINE ROBERTTOWN SUBSTATION TO DARTMOOR SITE

5.1. INTRODUCTION AND LOCATION

It is proposed a new transmission line to be installed from Dartmoor site to Robertstown substation. The proposed transmission line to be 275kV line, this consists of new conductor and supporting pylons will be installed between the site and substation. The Proponent describes the following actions as part of the Project:

- New mono- poles and conductor will be installed
- The number of poles installed will be approximately will be 110
- Holes will be excavated for the placement of the poles
- Ecological specialist will develop control measures to protect flora and fauna species and soil stability during construction. A whole of life maintenance plan will reflect same.
- Establishment of a temporary site compound and several pole-laydown areas during the construction process

The project will be located on land in the Goyder council and in Warnes Out of Hundreds Burra (Pastoral Unincorporated Area). There are already existing 132kV and 275kV lines in the area. The line route is shown Figure 13, From the Robertstown substation the line heads North-west, then turns and travels east adjacent Powerline Road. Before intersection of Powerline Road and Salford Road the line travels north-east alongside Salford road. Then the line travels north along Bower Boundary Road crossing over the Goyder highway to site. The line route may vary subjected to detailed design taking into account of sensitive areas up to 150m either sides of line route within the land parcels identified.

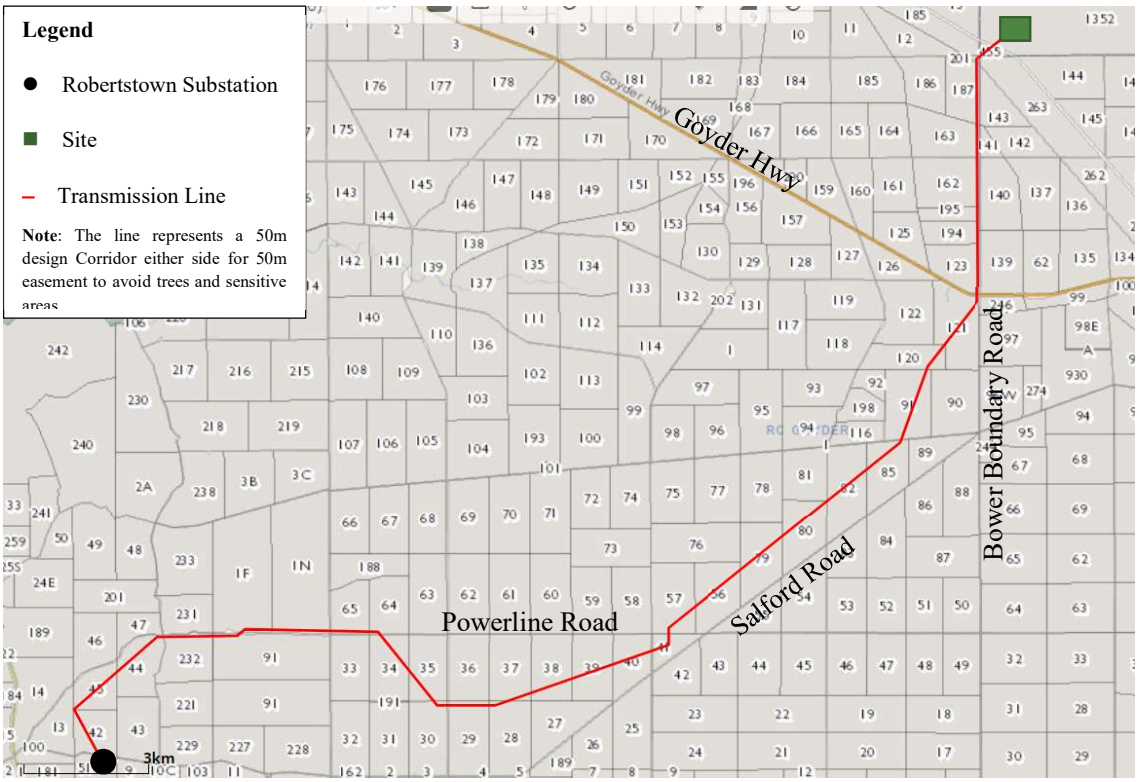


Figure 13: Transmission line route from the Robertstown substation to Dartmoor

5.2. LAND DESCRIPTION

The transmission line will cross 40 parcels of land as well as Goyder Highway. The table details the land parcels included in the development. The affected land holders table 3 have been consulted re the proposed development.

Table 3 : Land Descriptions

PARCEL IDENTIFIER	PROPERTY HOUSE	PROPERTY ST NAME	PROPERTY SUBURB	TITLE	CROWN REF
D51338AL50	192	LOWER BRIGHT	BRIGHT	CT5689/927	
F212508AL91	LOT 91	POWERLINE	BRIGHT	CT5550/784	
H200300SE1F	641	POWERLINE	BRIGHT	CT5831/550	
H200300SE1N	LOT 1N	POWERLINE	BRIGHT	CT5550/786	
H200300SE42	LOT 13	GOVT	BRIGHT	CT5464/828	
H200300SE44	LOT 44	POWERLINE	BRIGHT	CT5951/34	
H200300SE44	LOT 45	POWERLINE	BRIGHT	CT5951/34	
H200300SE45	LOT 45	POWERLINE	BRIGHT	CT5951/34	
H200400SE28	LOT 28	GOVT	GERANIUM PLAINS	CT5455/693	
H200400SE29	LOT 28	GOVT	GERANIUM PLAINS	CT5455/693	
H200400SE30	957	LOWER BRIGHT	GERANIUM PLAINS	CT5974/451	
H200400SE34	LOT 34	GOVT	BUNDEY	CT5951/131	
H200400SE35	LOT 34	GOVT	BUNDEY	CT5951/131	
H200400SE37	LOT 27	SALFORD	GERANIUM PLAINS	CT5982/467	
H200400SE38	LOT 27	SALFORD	GERANIUM PLAINS	CT5982/467	
H200400SE39	LOT 27	SALFORD	GERANIUM PLAINS	CT5982/467	
H200400SE40	LOT 27	SALFORD	GERANIUM PLAINS	CT5982/467	
H200400SE41	LOT 41	GOVT	BUNDEY	CT5516/507	
H200400SE56	LOT 57	POWERLINE	BUNDEY	CT6135/434	
H200400SE57	LOT 57	POWERLINE	BUNDEY	CT6135/434	
H200400SE64	LOT 63	GOVT	BUNDEY	CT5951/131	
H200400SE65	LOT 63	GOVT	BUNDEY	CT5951/131	
H200400SE79	LOT 57	POWERLINE	BUNDEY	CT6135/434	
H200400SE80	LOT 57	POWERLINE	BUNDEY	CT6135/434	
H200400SE82	LOT 57	POWERLINE	BUNDEY	CT5295/472	
H200400SE85	LOT 57	POWERLINE	BUNDEY	CT6135/434	
H200400SE91	4568	GOYDER	BUNDEY	CT6135/435	
H200300SE232	LOT 232	GOVT	BRIGHT	CT5431/659	
H200400SE120	4568	GOYDER	BUNDEY	CT6135/435	
H200400SE121	4568	GOYDER	BUNDEY	CT6135/435	

H200400SE123	4568	GOYDER	BUNDEY	CT6135/435	
H200400SE162	4568	GOYDER	BUNDEY	CT6135/435	
H200400SE163	4568	GOYDER	BUNDEY	CT6135/435	
H200400SE187	4568	GOYDER	BUNDEY	CT6135/435	
H200400SE194	4568	GOYDER	BUNDEY	CT6135/435	
H200400SE195	4568	GOYDER	BUNDEY	CT6135/435	
H200400SE201	4568	GOYDER	BUNDEY	CT6135/435	
H835800SE455		GOVT	WARNES	CL6194/953	OP006237
H835800SE1352		GOVT	WARNES	CL1156/3	OP008501

5.3. ENVIRONMENTAL IMPACT ASSESSMENT

Environmental impact assessment is a process for identifying, predicting, planning for and managing the physical, ecological, economic and social impacts of development proposals prior to approval being considered.

5.3.1. FLORA

The project will result in some disturbance of species and ecological community. The Solar River Project will avoid heavy vegetation areas. The Native vegetation present in the land sections are described in Table 4

Table 4: Parcel/ Land and the Vegetation Description of vegetation present in the land

PARCEL IDENTIFIER	D51338AL50, F212508AL91, H200300SE1F, H200300SE1N, H200300SE42, H200300SE44, H200300SE44, H200300SE45, H200400SE28, H200400SE29, H200400SE30, H200400SE34, H200400SE35, H200400SE37, H200400SE38, H200400SE39, H200400SE40, H200400SE41, H200400SE57, H200400SE64, H200400SE65, H200300SE232
Description of Vegetation	Eucalyptus gracilis, Eucalyptus oleosa ssp. oleosa, Eucalyptus socialis ssp., +/-Eucalyptus dumosa mid mallee woodland over Enchylaena tomentosa var., Senna artemisioides ssp Senna artemisioides ssp. petiolaris (NC), Grevillea huegelii, Olearia muelleri mid open shrubland over Zygophyllum aurantiacum ssp., +/-Maireana pentatropis low sparse shrubland
PARCEL IDENTIFIER	H200400SE56, H200400SE79
Description of Vegetation	Casuarina pauper, +/-Alectryon oleifolius ssp. canescens low open woodland over Senna artemisioides ssp. coriacea, Senna artemisioides ssp. petiolaris (NC), Senna artemisioides ssp. filifolia mid open shrubland over Maireana sedifolia, Enchylaena tomentosa var., Maireana georgei/turbinata, Atriplex stipitata, +/-Rhagodia spinescens low open shrubland over Schismus barbatus, Calotis hispidula, Sclerolaena diacantha

PARCEL IDENTIFIER	H200400SE80, H200400SE82, H200400SE85
Description of Vegetation	Maireana sedifolia, Maireana pyramidata low open shrubland over Sclerolaena obliquicuspis, Eriochiton sclerolaenoides, Carrichtera annua, Austrostipa scabra ssp., Rhodanthe pygmaea
PARCEL IDENTIFIER	H200400SE91, H200400SE120, H200400SE120
Description of Vegetation	Eucalyptus camaldulensis var., +/-Eucalyptus largiflorens low woodland over Acacia victoriae ssp. mid sparse shrubland over Maireana pyramidata, Rhagodia spinescens, Enchylaena tomentosa var. low sparse shrubland over Brassica tournefortii, Sisymbrium erysimoides
PARCEL IDENTIFIER	H200400SE123, H200400SE162, H200400SE163, H200400SE187, H200400SE194, H200400SE195, H200400SE201, H835800SE455, H835800SE1352
Description of Vegetation	Maireana sedifolia, Maireana pyramidata low open shrubland over Sclerolaena obliquicuspis, Eriochiton sclerolaenoides, Carrichtera annua, Austrostipa scabra ssp., Rhodanthe pygmaea

The over lay of the proposed transmission line route with Native vegetation is shown in Figure 14. A detailed environmental site assessment at each pole location will be undertaken during detailed design, where the route is established with minimal disruption of vegetation. A detailed 50-metre-wide environmental assessment will be undertaken for the transmission line to avoid any sensitive areas. The line route can be adjusted to avoid said areas.

Mitigation plans will be implemented as following:

- Development and implementation of a CEMP
- In accordance with the CEMP a defined disturbance zones will be established at each pole replacement site prior to works commencing.
- Vehicle and equipment parking/storage sites should be established in previously disturbed areas (i.e. areas already cleared of native vegetation in all strata)
- Movement of machinery and vehicles should occur along/within the proposed power line easement, or to utilise existing road and track to avoid unnecessary disturbance.
- Rehabilitation of soils and vegetation within PDZs, within 1 month of the completion of works at each individual Pole Disturbance Zone.
- Disturbed areas are to be re-vegetated with a mixture of native grass species seeds, preferably collected from the local region.

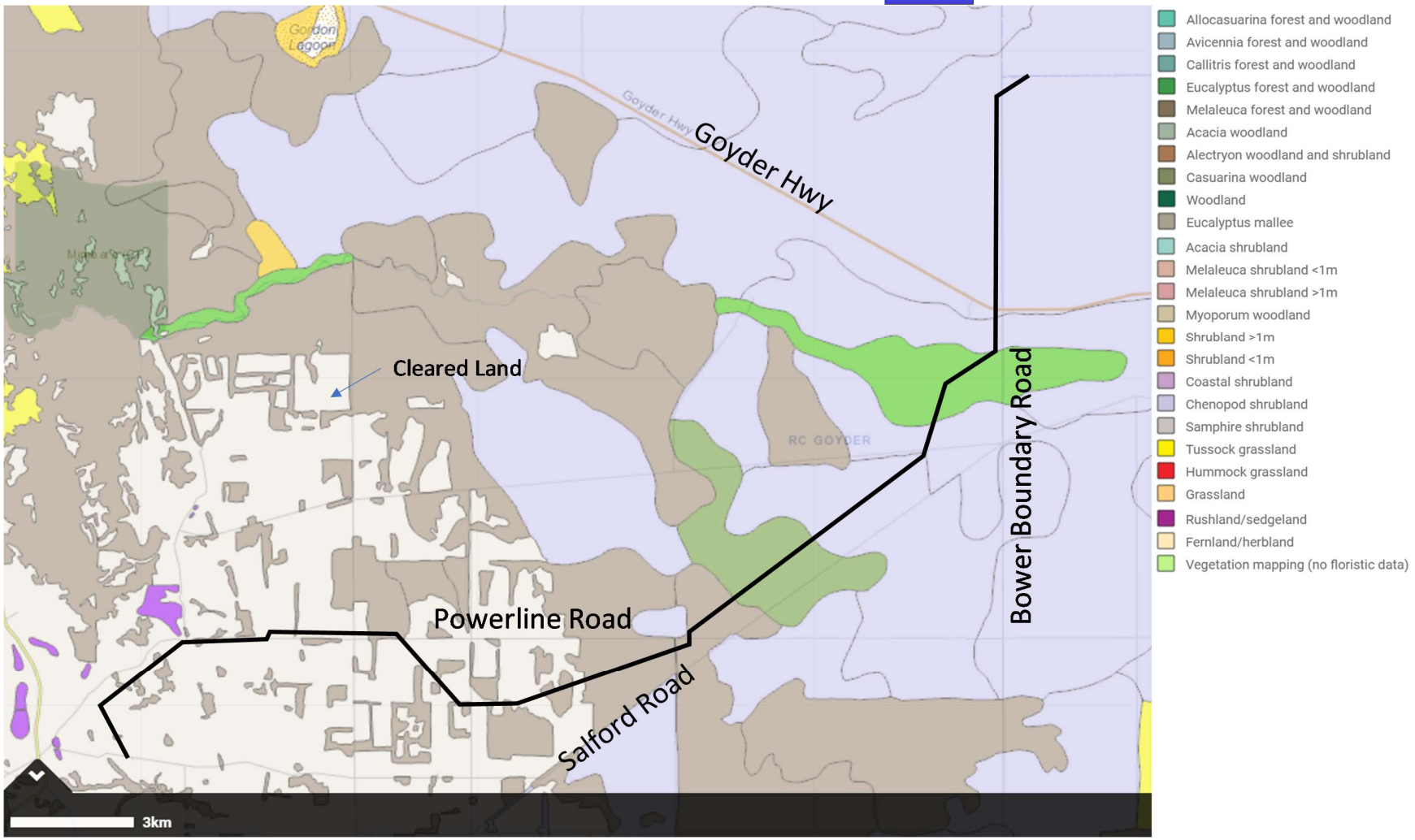


Figure 14: Native Vegetation along the transmission line easement

5.3.2. FAUNA

The Fauna species listed in Table 5 is on 1 km buffer zone from the proposed transmission line route. As seen there is only one rare species the white winged chough that is been identified in the region.

The mitigation of any of the rare species will be;

- Engage a suitably qualified ecologist to implement White Winged Chough Protection and Management Plan if necessary.
- Any areas identified during detailed site inspection to have fauna species habitat will be avoided
- No detrimental impact to these species is envisaged, regardless SRP will contribute to offsets and breading programs.

Table 5: NatureMaps List of possible Fauna species on the Transmission line route

CLASS NAME	SPECIES	COMMON NAME	NATIVE	STATE RATING	COUNT	LAST SIGHTED
AVES	Anthochaera carunculata	Red Wattlebird	Y		1	15-Oct-1992
AVES	Barnardius zonarius	Australian Ringneck	Y		1	02-Feb-2010
AVES	Cacatua sanguinea	Little Corella	Y		1	16-Oct-1992
AVES	Corcorax melanorhamphos	White-winged Chough	Y	R	1	02-Feb-2010
AVES	Corvus mellori	Little Raven	Y		1	20-Oct-2010
AVES	Dromaius novaehollandiae	Emu	Y		3	22-Jun-2015
AVES	Elanus axillaris	Black-shouldered Kite	Y		1	15-Oct-1992
AVES	Eolophus roseicapilla	Galah	Y		1	20-Oct-2010
MAMMALIA	Macropus fuliginosus	Western Grey Kangaroo	Y		5	22-Jun-2015
MAMMALIA	Macropus rufus	Red Kangaroo	Y		5	22-Jun-2015
AVES	Malurus lamberti	Variegated Fairywren	Y		1	13-Oct-1992
AVES	Manorina flavigula	Yellow-throated Miner	Y		1	21-Oct-2010
AVES	Pomatostomus ruficeps	Chestnut-crowned Babbler	Y		2	21-Oct-2010
AVES	Psephotus haematonotus haematonotus	Red-rumped Parrot (eastern SA except NE)	Y		1	16-Oct-1992
AVES	Smicrornis brevirostris	Weebill	Y		1	20-Oct-2010
AVES	Strepera versicolor	Grey Currawong	Y	ssp	1	12-Oct-1992
AVES	Sturnus vulgaris	Common Starling	N		1	20-Oct-2010

5.4. TRAFFIC

The key mitigation measures to be implemented in the detailed traffic management plan include:

- Provision of advanced warning signs of construction vehicle movements
- Provision of flagmen at points where vehicles and equipment are required to cross roadways (this will only be required for Powerline conductor installation as detailed in the CEMP)

5.5. VISUAL IMPACT ON TRANSMISSION LINE

There is a limited number of residential properties which have direct lines of sight to the transmission line. These residential properties are uninhabited. The transmission lines are highly visible from certain locations along the Goyder Highway. There is no perceived negative impact on the landscape associated with the proposed design. A Viewshed analysis is attached in Appendix C, like similar lines in the area this is a representation as seen by the general public in transit along the Highway.

The view from nearby dwellings has been taken into account. Figure 15 shows the surrounding dwellings to the proposed transmission line. The stars show the rural access point to the dwellings. For most the transmission line route is not visible. The Table 6 shows the summary of dwellings in related to the visibility of the transmission line.

Table 6: The dwelling and the visibility of the transmission line from the dwelling.

Rural Access point	**Occupied/unoccupied**	**Visible (Yes/No)**	**Consulted (Yes/No)**	**Objections (Yes/No)**
235	Unoccupied	Yes	Yes	No
641	Unoccupied	Yes	Yes	No
631	Occupied	No	Yes	
957	Occupied	No	Yes	No
735	Partially Occupied (Rents to students for research purposed)	Yes (partially at 2 km)	Yes	No
4568	Occupied	Yes	Yes	No

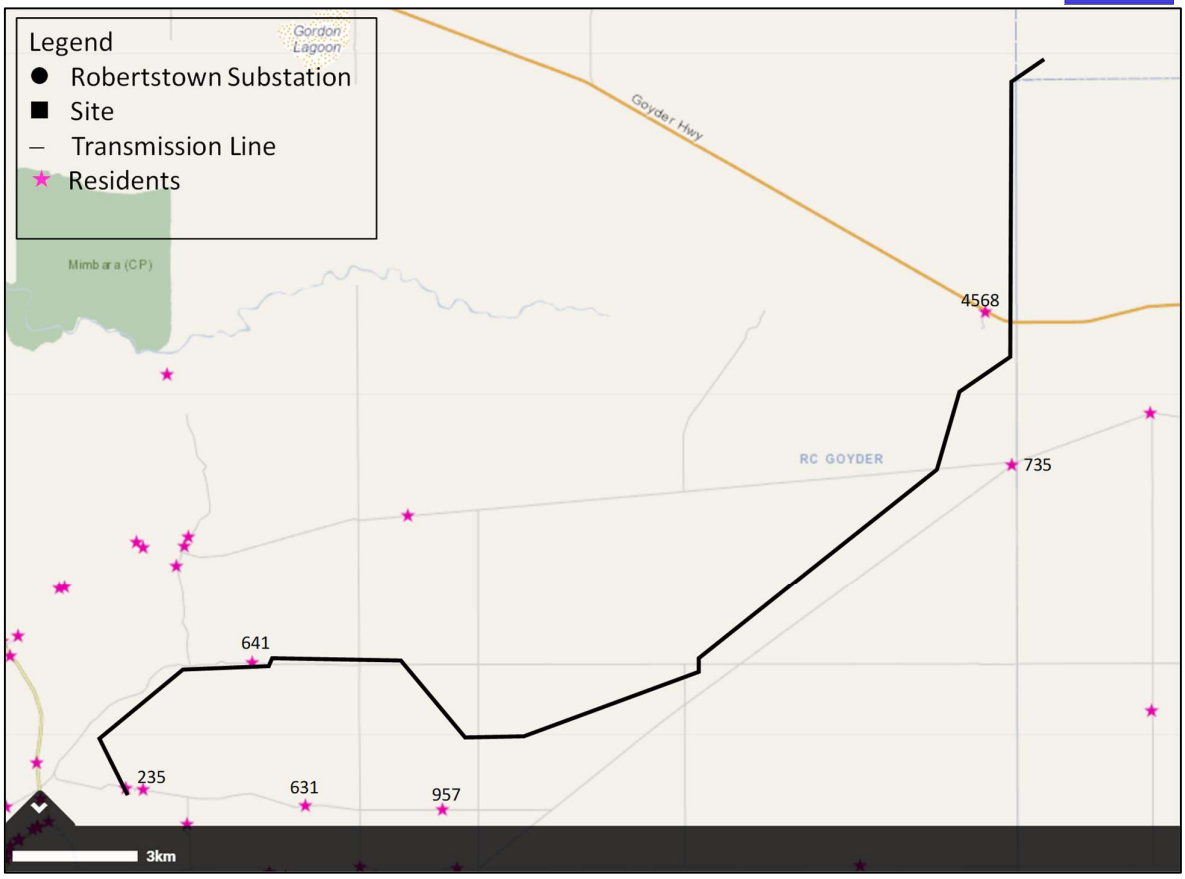


Figure 15: Residents Surrounding the proposed transmission line

5.6. DETAILED CONSIDERATIONS

Comprehensive Construction Environment Management Plans CEMPs should be developed prior to the undertaking of any construction or development activities. These plans should include as a minimum:

- Measures to avoid impacts on areas outside of development footprints;
- Erosion and Sediment controls to be implemented during construction and remediation;
- Flora and Fauna Protection and Management Plan;
- Waste management plans for construction activities;
- Workplace health and safety plans to protect workers and the public from harm;
- Unanticipated Discovery Protocols for the management of impacts unexpected heritage object finds;
- Traffic management plans;
- Revegetation/remediation plans.
- The transmission line route suggested has a 50m design Corridor (Contained within the land parcels nominated) on either side of the array and proposed line route for 50m easement to avoid trees and sensitive areas.

6. HEALTH, SAFETY AND FIRE RESPONSE

The Solar River Project consider safety as first priority. The Work Health and Safety Act 2012 governs health and safety management requirements. All site staff will be trained and have access to the appropriate emergency and safety equipment in the event of an emergency at the facility according to The WHS Act. In order to address potential Project and weather-related emergencies an Emergency Response Plan (ERP) will be developed prior to construction.

For all the project phases such as construct, operation and decommissioning, Emergency Plan Response will be developed. This will be the guide actions that reduces the impacts and accidents and incidents on sites. The ERP will consist of a number of elements that contain relevant information relating to the site including; plans and drawings, risk management, first aid requirements, incident control, site contacts, securing the site, procedures for controlling site specific hazards and records. ERPs will be reviewed and updated on a regular basis to incorporate new information arising from any incidents, near misses and hazards and emergency response simulation training sessions.

A designated track will be provided with the buffer to enable maintenance and emergency vehicular access. Emergency response drills will also be undertaken at regular intervals to ensure that personnel are familiar with the plans and the types of emergencies to which it applies, and that there will be a rapid and effective response in the event of a real emergency occurring.

The following practices will be incorporated into the Project construction and operations phases:

- Smoking will not be permitted on-site, other than in designated smoking areas;
- Fire extinguishers will be provided in all buildings and construction vehicles;
- Prohibition of on-site burning of any material; and
- Regular maintenance of on-site fire-fighting equipment and adequate staff training.
- Barricading, fencing and signage to address public safety.

7. STAKE HOLDERS AND COMMUNITY ENGAGEMENT

7.1. APPROACH

Table 7: Stakeholder in Solar River Project

Group	Stakeholders
Landholder	▪ The entire project is located on a perpetual Crown Lease leased to a single lessee
Local community	▪ Community of Warnes, Community members who reside or work in the area or surrounding region
Local government	▪ Mid Murray Council, Regional Council of Goyder
Native Title / Cultural heritage groups	▪ Native title- Ngadjuri (and representative body Ngadjuri Nation Aboriginal Corporation)
Industry	▪ ElectraNet ▪ Potential suppliers
Media	▪ Regional, state and national media organisations
State Government	▪ Department of Premier and Cabinet (DPC) ▪ Department of State Development (DSD) ▪ Department of Environment, Water and Natural Resources (DEWNR) ▪ Native Vegetation Council (NVC) ▪ SA Murray-Darling Basin Natural Resources Management (SA MDB NRM) ▪ Department of Planning, Transport and Infrastructure (DPTI) ▪ Environment Protection Authority (EPA) ▪ State Commission Assessment Panel (SCAP) ▪ Country Fire Service (CFS) ▪ Office of the Technical Regulator (OTR)
Local, State and Federal members of Parliament	▪ The Hon. Jay Wetherill MP, State Premier ▪ The Hon. Tom Koutsanonis MP, State Minister for Mineral Resources and Energy ▪ The Hon. Martin Hamilton Smith MP, State Minister for Investment and Trade, Defence Industries and Veterans' Affairs ▪ The Hon. Stephen Mulligan MP, State Minister for Transport and Infrastructure ▪ The Hon. Geoff Brock MP, State Minister for Local Government ▪ Rowan Ramsey MP, Federal Member for Grey ▪ Eddie Hughes MP, State Member for Giles ▪ Mark Parnell MLC, State Member for the Legislative Council ▪ The Hon. Josh Freedenberg MP, Federal Minister for the Environment and Energy ▪ Peter Matey the mayor of Regional Council of Goyder

In accordance with Section 49(7)(d) of the Development Act, this development application will undertake a public exhibition of at least 15 business days. Solar River Project has a website that contains relevant information for pubic (http://www.srproject.com.au/)

The key principles that underpin The Solar River approach to stakeholder and community engagement as detailed in Project Management Plan includes:

- Defines strategy for media releases and community forums
- Defines the strategy for heritage engagement
- Defines the strategy for land owner engagement
- Incorporated community concerns in the development application
- Understanding what is important to stakeholders and communities
- Achieving genuine outcomes for communities
- Providing a flexible and proactive approach
- Transparency and ongoing, open communication
- Where investment in communities is undertaken, supporting projects that encourage community self-sufficiency and sustainability
- Solar River Project will as part of its offsets to contribute to community and environmental organisations
- Enhancing social return on investment through strategic reviews of outcomes.

Key stakeholders are identified in Table 7, (above).

7.2. GOVERNMENT

Inclusive of the project crown sponsorship process Solar River Project and its representatives have consulted with South Australian elected officials and relevant departmental officers to discuss the project, the approvals process and management approach to minimise environmental impact and optimise social benefits. Key issues that have been addressed in this document include grid integration, native vegetation offsets, impacts and benefits to community, traffic management and site access, and opportunities for local employment / services engagement.

7.3. KEY THEMES AND MANAGEMENT

The top key themes identified as critical components of the project's development from the community's perspective were Employment, Energy/Electricity, Traffic, infrastructure and accommodation, Security and suppliers.

The employment for the local community/ workforce is preference for Solar River Project. This delivers dual benefits of providing positive contribution to the community and efficiencies for the project through local engagement, which ultimately reduces travel and accommodation expenses. Engagement with local council/ neighbouring council will be considers for registration process for those who are interested in the employment with Solar River Project.

The information about the infrastructure and technology was another theme that the people in the community wanted to know. The low profile nature of the solar PV array over wind and the low profile design of the transmission line with proposed environmental off sets was well received.

Local suppliers will be considered for construction materials and services. Solar Panels, inverters and batteries will likely be sourced from international suppliers. This is due to the high volume in short timeframe and products with high efficiency are not manufactured in Australia.

Traffic management plan will be considered for the transportation of goods from Port Adelaide to site. This includes in minimal disruption of current traffic flow and will be planned to avoid times of local traffic congestion.

7.4. ONGOING CONSULTATION

Solar River Project will undertake an ongoing program of engagement during construction and operation of the project. The resident and local land owners, Goyder Council and Government official will be fully informed as to activities and the project progress prior to and during construction.

8. DESCRIPTION OF THE DEVELOPMENT LOCALITY

Description of the 'environment' including the ecology/natural resources, social/community, economic/infrastructure aspects;

8.1. TOPOGRAPHY AND SOILS

General description of the land is gently sloping pediment plains. pediments are the remnants of worn down land surfaces, created primarily by water erosion. Hence this zone is characterised by open, flat to gently sloping plains and rises, dissected by broad, shallow drainage channels. The pediment plains are dominated by red soils with loamy sands to sandy loams over clay. Soils on the low rises generally are calcareous, sometimes with rubble. The flats and drainage lines commonly have sodic soils, which are prone to scalding. Other soil types in the zone include deep, moderately fertile calcareous loams, clays and non-calcareous red soils. Water erosion is a risk on the pediment plains, due to the combined effects of erodible soil types and run-off received from the adjoining slopes and hills.

The 5335ha of land lies in two land system according to DEWNR, they are Finger Post Land System and Eurovale Land System. The Eurovale Land System consists of a gently sloping calcareous plain with broad drainage channels transgressing low angle, calcareous pediment and fan deposits. Clay loam texture contrast soils with friable subsoils occur on the broader drainage lines and flood-out areas, with variable loamy to clay loamy gradational calcareous soils (some shallow over calcrete) dominate plains and rises. The Finger Post Land System contains the flood-out plain of the Baldina Creek with many stream channels, typically with extensively scalded areas of red pedaric texture contrast soils and gradational calcareous soils, often rubbly, on rises. Summary of the soil type mix in included in the table.

Table 8: Soli type summary of the site, from DEWNR report 2017

Eurovale Land system		**Finger Post Land System**	
	Main Soil		
A6	Gradational calcareous clay loam	D4	Loam to clay loam over pedaric red clay
A4	Deep (rubbly) calcareous loam to sandy loam	A3	Deep moderately calcareous loam to sandy loam
D4	Clay loam to loam over pedaric red clay	A6	Gradational calcareous clay loam
	Minor Soils		
A2	Shallow calcareous loam	A4	Deep (rubbly) calcareous sandy loam to loam
A3	Deep moderately calcareous clay loam to loam	A5	Rubbly calcareous loam on clay
A8	Gypseous calcareous loam	M1	Deepalluvial sandy loam
B2	hallow calcareous sandy loam on calcrete		
C3	Gradational clay loam to loam		

8.2. CLIMATE

The site is located in The Eastern Districts which has a semi-arid to arid climate with hot, very dry summers and cool to mild, dry winters. Rainfall is low and unreliable, characterised by extremely infrequent heavy falls. There is little seasonal variation in the average monthly rainfall pattern over most of the District, although in the west, along the eastern slopes of the Northern Mount Lofty Ranges (where the highest average annual totals occur), there is a slight winter rainfall maximum.

Average rainfall across the is low with little marked seasonality. Average annual rainfall ranges from 200mm to 400mm. Widespread, significant rainfall is infrequent, but is most likely to result from tropical inflow in summer (from the north or northeast), or from slow moving cut-off low pressure systems, or northwest cloud bands at any time of the year. These latter systems, which originate over the northeast Indian Ocean, are associated with a well-established north-westerly flow in the upper atmosphere, but at sea level easterly, north-easterly, or even light variable winds, may prevail.

Rainfall in the warmer months is highly erratic, and most often in the form of heavy showers, associated with thunderstorms. It is in this season that extreme falls may occur. The intrusion of copious moist air, associated with a trough extending from the tropics can, in some years, produce prolonged widespread rain.

In the hotter part of the year (November to March) average daily maximum temperatures exceed 28°C, and during January and February average over 32°C. Average minimum temperatures for the period November to March are in the low to mid-teens. The mildest (warmest) overnight temperatures occur in January and February.

For the cooler months (April to October) average maximum daily temperatures range from around 24°C in April and October to near 15°C in winter, Average minimum temperatures are less than 10°C and dip to around 3°C or lower in July. Thunderstorms can occur at any time of the year, but are more frequent and intense during the warmer months when they may produce heavy showers. Thunder will be heard on about 6 days per year. Storms capable of causing major structural damage from wind gusts, tornadoes or hail are less frequent, averaging about 5 per decade over any 100-square kilometre area.

Across the District, the annual average bright sunshine per day is 8 to 8.5 hours. Global (shortwave) radiation includes that energy reaching the ground directly from the Sun plus that received indirectly from the sky, scattered downwards by cloud, dust and other aerosols. The average daily amount of global radiation across the District is between 500 and 525 milliwatt hours per square centimetre (mWh.cm-2), and varies from around 750 mWh.cm-2 per day in January to 310 mWh.cm-2 per day in July.

8.3. BIOLOGICAL ENVIRONMENT ASSESSMENT

8.3.1. FLORA

Pearl bluebush (Maireana sedifolia) low open shrubland is the predominant vegetation type of the pediment plains. Associated chenopod species on the plains and rises include bladder saltbush (Atriplex vesicaria) and black bluebush (Maireana pyramidata). Drainage areas have low open shrublands of black bluebush, or Australian boxthorn (Lycium autrale) and nitre-bush (Nitraria billardiera). Areas of black oak (Casuarina pauper) low open woodland with sugarwood (Myoporum platycarpum) and an understorey of pearl bluebush and spinebush (Acacia nyssophylla) are scattered throughout the zone.

Patches of open grassland dominated by spear-grass species (Stipa spp.) are common, and grasses and herbs also provide ground cover between the chenopod shrubs.

The site is principally chenopod low shrubland composed of Pearl Bluebush (Maireana sedifolia), Thorny Lawrencia (Lawrencia squamata) and Nitre-bush (Nitraria billardieri). There are patches, particularly in lower lying areas and around waterpoints, where the ground is quite bare, with the low (<20cm) shrub Bindyi (Sclerolaena spp.) forming a patchy cover with occasional emergent larger shrubs (particularly Nitre-bush (Nitraria billardieri)). There are also open patches of mallee (Eucalyptus spp.), which includes some old growth trees with hollows. There are very scattered small trees including False Sandalwood (Myoporum platycarpum) and Bullock Bush (Alectryon oleifolius) across the whole site.

The spread of less palatable black bluebush from drainage areas onto the plains is considered a problem by some land managers. However, in these situations black bluebush often acts as a "nurse" crop for regeneration of other plant species and communities. Seedlings of more palatable plants such as bladder saltbush can germinate and grow under black bluebush canopies, where they are protected from grazing pressure until established. Generally, the pediment plains are not severely affected by annual and perennial weeds. However, weeds are still a significant threat to biodiversity and the pediment plains are particularly susceptible to weed invasion in run-on areas.

Of the sparse vegetation that is present on site visit shown from Figure 16-15. The plains lack the density of chenopod shrubs found on the pediment slopes, they support heavy grass cover in open areas between the shrubs, as seen in Figure 19.

Figure 16: Vegetation (tree on site)

Figure 17: Vegetation at the array site

Figure 18: Vegetation purple bluebush (The array will not be constructed in areas of native vegetation)

Figure 19: Vegetation at entrance to site (grass land)

The vegetation map from LocationSAMapViewer shown in Figure 20 that the board vegetation is chenopod shrubland consists of vegetations that are less than 1m in height. The environmental description for this area is Hill foot slopes; Stony rises with shales and ironstone. The Vegetation description of plants in area is Maireana sedifolia, Maireana pyramidata low open shrubland over Sclerolaena obliquicuspis, Eriochiton sclerolaenoides, Carrichtera annua, Austrostipa scabra ssp., Rhodanthe pygmaea

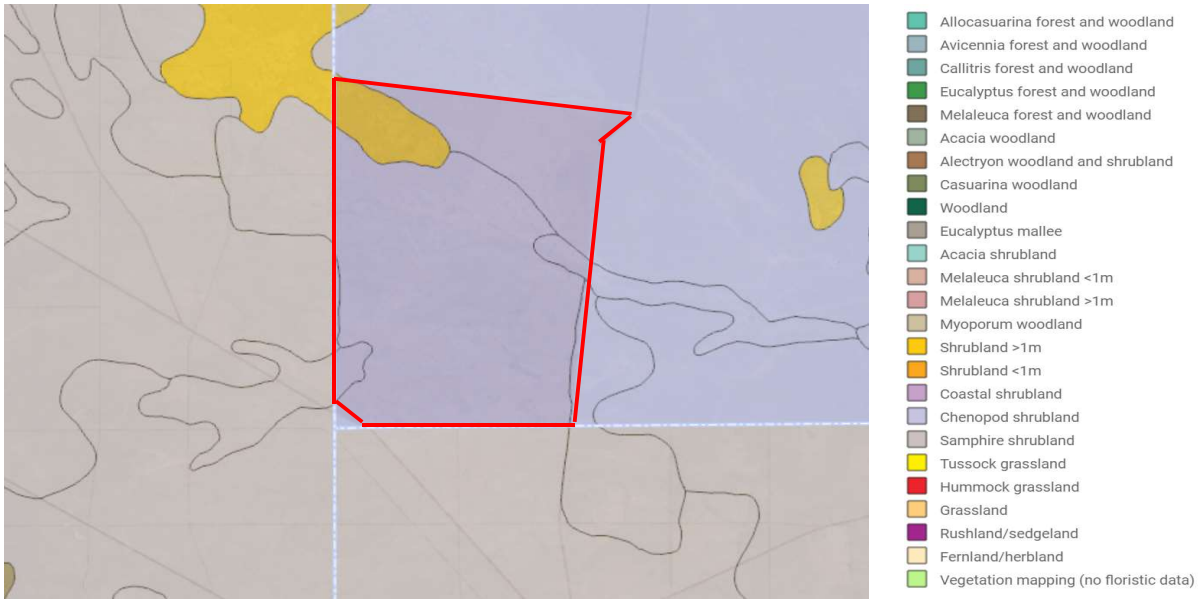


Figure 20: LocationSAMapViewer (A online source of vegetation and council details)

Figure shows the vegetation that has been observed by DEWNR in the area. The table summarises the vegetation species and location.

Table 9: The vegetation identified in Figure 9

Flora Supertable (BDBSA)			
	Description		
Species	Pleurosorus rutifolius	Schinus molle	Bolboschoenus caldwellii
Common Name	Blanket Fern	Pepper-tree	Salt Club-rush
Family Name	Aspleniaceae	Anacardiaceae	Cyperaceae
Flora Code:	AD97507067	AD99318072	AD98118475
Latitude	-33.7614	-33.8	-33.75
Longitude	139.3781	139.4167	139.4167
Genus Name	Pleurosorus	Schinus	Bolboschoenus
NRM Region	South Australian Murray-Darling Basin		
NRM District	Rangelands		

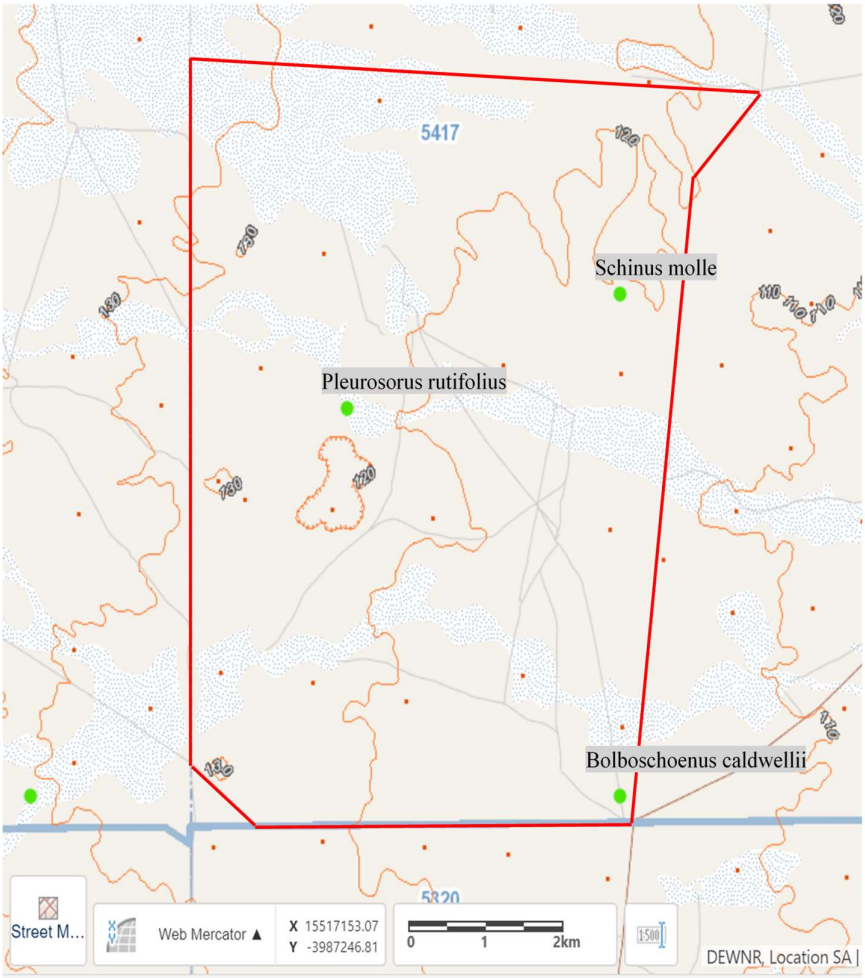


Figure 21: Vegetation identified from DEWNR Natures Map (These sites will be avoided)

Peep Hill Hop Bush (Dodonaea subglandulifera) and Slender Bell-fruit (Codonocarpus pyramidalis), listed as endangered and vulnerable, respectively, under the Commonwealth Environment Protection Biodiversity and Conservation Act 1999 (EPBC Act), have been recorded within the SA Murray Darling Basin Region. Although not recorded within the 6km buffer area of the proposed site location, these species have both been recorded within 25km. An experienced botanist will be engaged to identify these species and advise on appropriate management as included in the CEMP.

The species are shown in Table 9, The fern does exist up there in season. The peppercorn tree is an introduced species and not a native species and it wasn't successful. The club rush does not exit is the area as it is a marsh type species and won't be able to survive in the site region.

8.3.2. FAUNA

Although not as species-rich as vegetation types in some other land zones, the chenopod shrublands, grasslands and black oak woodlands of the pediment plains provide important feeding and breeding areas for many bird species as well as mammals, reptiles and invertebrates. Bird species of conservation significance in chenopod shrublands of this zone include the blue winged parrot (Neophema chrysostoma) and the redthroat (Pyrrholaemus brunneus). Plains wanderers (Pedionomus torquatus) and the Australian bustard (Ardeotis australis) are likely to occur in open chenopod shrublands and grasslands. The common dunnart (Sminthopsis murina), no longer regarded as a common species, is recorded from open woodlands and chenopod shrublands of the pediment plains. The fat-tailed dunnart (Sminthopsis crassicaudata) and southern hairy-nosed wombat (Lasiorhinus latifrons) inhabit saltbush and bluebush shrublands and the little pied bat (Chalinolobus picatus) is likely to occur in black oak woodlands in the zone.

The shrubland habitats in the area support a small range of fauna species, including reptiles, small terrestrial mammals, bats, larger mammals such as wombats and kangaroos and a suite of bird species. Habitat value across the site is variable, with the heavily disturbed shrubland areas providing limited habitat for fauna. Figure 22 and Table 10 shows the species observed by the DEWNR and the date it was sited. A number of migratory species have been recorded and have been advised by DEWNR or are predicted to occur in the broader region.

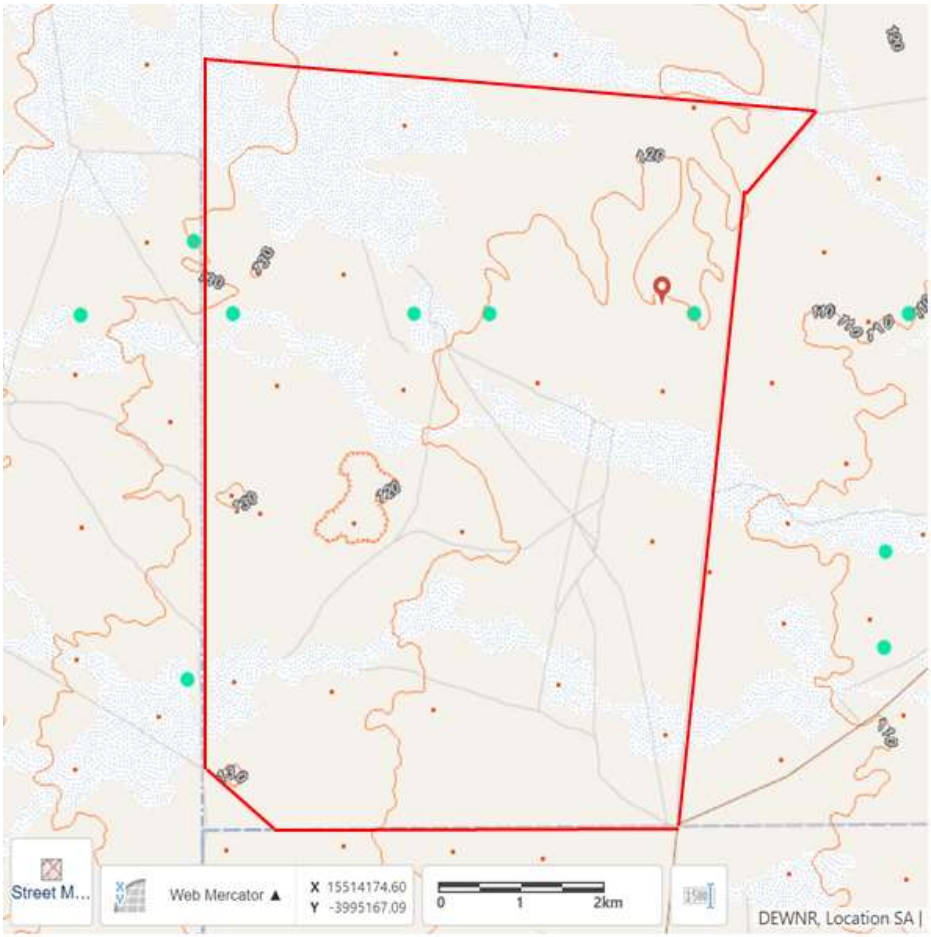


Figure 22: Animals Identified from DEWNR Natures Map

Table 10: The species that are identified in Figure 10

Fauna Supertable (BDBSA)		
	Description	
Species	MACROPUS RUFUS	CAPRA HIRCUS
Common Name	Red Kangaroo	Goat (Feral Goat)
Class name	MAMMALIA	MAMMALIA
Flora Code:	OPM642704-2	OPM642787-1
Date Sited	22/6/2015	17/6/2013
NRM Region	South Australian Murray-Darling Basin	
NRM District	Rangelands	

During site vist Red Kangaroo, Eastern grey and sleepy lizards where spotted. And a wombat burrow was sighted in one location near the boundary fence. There are no threatened species considered likely

to be using the site as a favoured habitat. This will be varified in detailed enviromental and habitat study undertaken prior to construction with sensative areas avoided in detailed design. Controls as defined by a flora fauna specialist will be incorporated in the CEMP.

TOTAL GRAZING PRESSURE

The pediment plains are the land zone most favoured by kangaroos. They are major contributors to the total grazing pressure, and without active management their numbers can rapidly build up to equal that of sheep. Kangaroos move into the pediment plains from adjoining land zones and congregate in the open, well grassed areas, kangaroos spotted during site visit in Figure 23. Population surveys by DEH in bumper seasons have recorded red kangaroos at up to 15-24/km2, and total kangaroo numbers as high as 50-60/km2.

Rabbits have been a problem in this zone in past, but as in other areas of the District the numbers have declined due to warren ripping, myxomatosis and the spread of rabbit virus disease. Ongoing control measures such as warren destruction are still vital to prevent the build-up of populations.

The open, grassy country also favours plague locusts and they are a regular seasonal grazing problem.

The pediment plains are generally too open for feral goats and they are easily mustered on this site. Hence goat numbers and grazing pressure are very low. Hairy-nosed wombats have moved into this land zone from the adjoining calcareous plains in recent years, and their numbers are increasing. Their grazing impact is localised to around their burrows. They also cause problems with fence damage and soil subsidence. Wombats prefer spear grasses but will feed on pearl bluebush and bindyi (Sclerolaena spp.) in droughts.

Figure 23: Animals identified from site visit (kangaroo and wombat burrows)

DEWNR (Natural Resources SA Murray-Darling Basin) conducted a cursory desktop search within a 6km buffer of the area for listed flora and fauna species. The fauna species listed under the National Parks and Wildlife Act 1972 have been recorded within this area, refer to Table 11.

Table 11: Threatened fauna species under the National Parks and Wildlife Act 1972

SPECIES	COMNAME	EPBC	NPWSA	
Acanthiza iredalei	Slender-billed Thornbill	previously listed as vulnerable EPBC		
Climacteris affinis	White-browed Treecreeper		Rare	
Falco peregrinus	Peregrine Falcon		Rare	
Melanodryas cucullata	Hooded Robin		Rare	
Neophema chrysostoma	Blue-winged Parrot		Vulnerable	
Northiella haematogaster	Bluebonnet			

A flora and fauna survey will be conducted prior to detailed design, with regular inspections during construction will be conducted by a suitably qualified professional to compliance with the Act.

Mitigation plan such as avoiding the area and offsets, will be implemented species are identified. EPBC or NPW act described in section 7.5.1.1 and 7.5.2.5.

8.3.3. WATER SYSTEM

Surface water is the only source of water available in the pediment plains, hence capture of run-on from the adjoining land zones is very important. Most dams in this zone hold well, but careful placement of dams is essential to maximise surface water storage.

The site is located in the Murray Darling Basin. The Murray River lies to the south of the site and is the dominant surface water feature in the area. The Murray River is within the River Murray Prescribed Watercourse area, which is proclaimed under the Natural Resources Management Act and controls water allocations from the River.

The local catchment on the site is limited. Several shallow gullies or depressions in the immediate vicinity of the watercourse (i.e. within a few hundred metres) would provide some runoff in high rainfall events, however much of the site is not within its catchment. The water courses and waterbodies that runs through the site is shown in

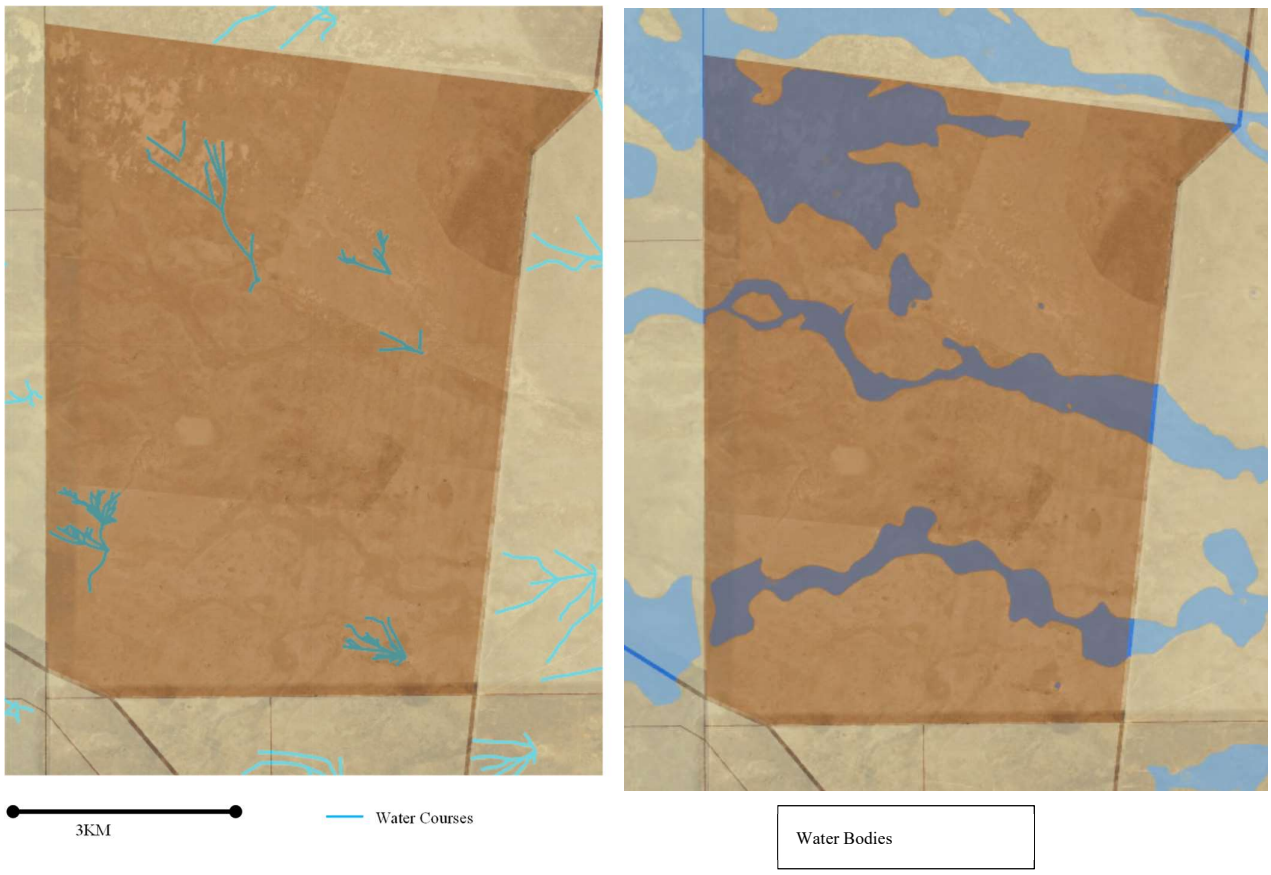


Figure 24: Water courses (left) and water bodies (right) in the site from NatureMaps (DEWNR)

8.4. PLAN OF THE LOCALITY (LOCALITY DETERMINED BY THE EXTENT OF DIRECT IMPACTS)

8.4.1. NOISE IMPACT

Noise emission at the site will primarily be generated during construction phase as a result of site preparation, earthwork, vehicle traffic and emissions from vehicles and machinery. These impacts can be a nuisance to nearby receivers up to 1km (residences, farm workers). The site is located in agricultural land that has been used for grazing sheep's. The nearest occupied dwelling is outside the 6km buffer zone.

The Environment Protection (Noise) Policy generally restricts construction activities resulting in noise with an adverse impact on amenity to between 7 am and 7 pm, Monday to Saturday. Although this restriction does not apply to public infrastructure, noise-generating activities will generally be scheduled within these times, but may be on a 7 day per week basis.

Depending on construction scheduling, some work may need to occasionally be undertaken at night (e.g. for critical path activities where there needs to be minimal personnel or other activities on site). However, noisier activities will be scheduled, wherever possible, to coincide with business hours.

8.4.2. VISUAL AND VEGETATION IMPACT

The PV array direct landscape and visual amenity impacts from the Project, erection of permanent site buildings, placement of high vertical structures (substation towers) and widespread placement of solar panels throughout the site.

During the operational phase, potential impacts will be associated with a change in the visual landscape due to the widespread placement of the solar arrays, the battery building, project offices, security lighting and fencing.

The development footprint will be low in form with solar panel infrastructure relatively uniform in height (approximately 1.2 m). The highest structure in the development will be the substation tower (15 m), which will be viewable for some distance. The visibility of substation from highway 6km south of the site is minimal (if not nil). The PV Array is not visible to the public situated within a private property, far from public access ways and dwellings

Visual Impact is based on three criteria which has values assigned to it as low, medium or high rating. The three criteria are Distance, Nature and sensitivity of surrounding landscape and Exposure. The subject site is located outside of any township nearby, the nearest township is outside 35km zone from site. Distance wise criteria the ranking is low as the proposed development would be difficult to discern as it in the far distance. The site has moderately disturbed landscape, displaying remnant natural features and limited introduction of artificial elements with a medium scenic quality, the site is used for sheep grazing. The exposure of the development site is low as the number of viewers able to see the development and experience in visual amenity is low. This is due to infrequently visited locations which are separated from populated areas and major thoroughfares, including local roads and farm dwellings

The assessment indicates that the project is not visible to the public in the region and the topography will limit the line of sight. Given the relatively low scenic quality of the project site and adjacent land, it is not expected that the project will result in significant visual impacts.

The proposed transmission line overall rating is low with the exception of (5) road crossings as medium impact, as the line is consistent in type and function to other transmission lines crossing roads in the area/region.

8.4.3. EROSION IMPACT

The potential for wind erosion will be low, given the nature of the soils and the stabilisation provided by vegetation that will be allowed to remain (or regenerate) across the site. Areas that are temporarily disturbed (e.g. laydown areas) will be rehabilitated following the completion of construction. Drainage features or structures associated with permanent access tracks, hardstand areas, buildings and other site infrastructure to minimise potential for erosion or transport of sediment off the site.

Concentrated runoff from the solar panels could result in increased soil erosion below the solar arrays during significant rainfall events. This will be managed through feathering the PV array back and forth during rain events or other means. The potential for significant erosion from rainfall runoff is low given the very low rainfall and relatively flat nature of the site, and is further reduced by retaining vegetation cover and minimising soil disturbance. Monitoring will be undertaken to identify whether any areas of erosion develop and further mitigation measures would be implemented where required.

8.5. PAST AND CURRENT LAND USES ASSOCIATED WITH THE SITE AND SURROUNDING LOCALITY

Land was low lying salt bush, this was cleared 90 years ago for cropping, but this failed due to lack of rainfall. The land is currently used for sheep grazing. There are some water tanks in the site.

8.6. MAPPING AND DESCRIPTION OF KEY PHYSICAL FEATURES OF THE SITE AND LOCALITY (NATURAL, CULTURAL AND BUILT)

8.6.1. NATURAL

Figure 25 shows the topographic maps that are detailed, accurate graphic representations of features that appear on the Earth's surface. The counter lines show that the land is flat as the distance between the line are further and the elevation showed varies minute between 120 and 130 metres above sea-level.

The nearest property to the site is 2.4km from the south-east corner of the site, refer to Figure 26. This is usually unoccupied. There is a building that is 3 km to middle-east of site which is not occupied and might be used as a shed by the owner.

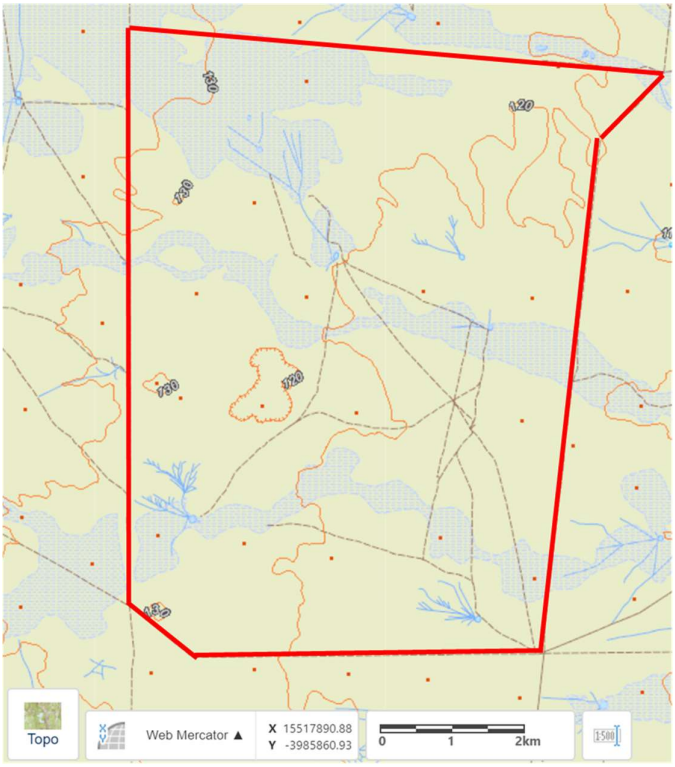


Figure 25: The Topography of the site, counters shows it is a flat land

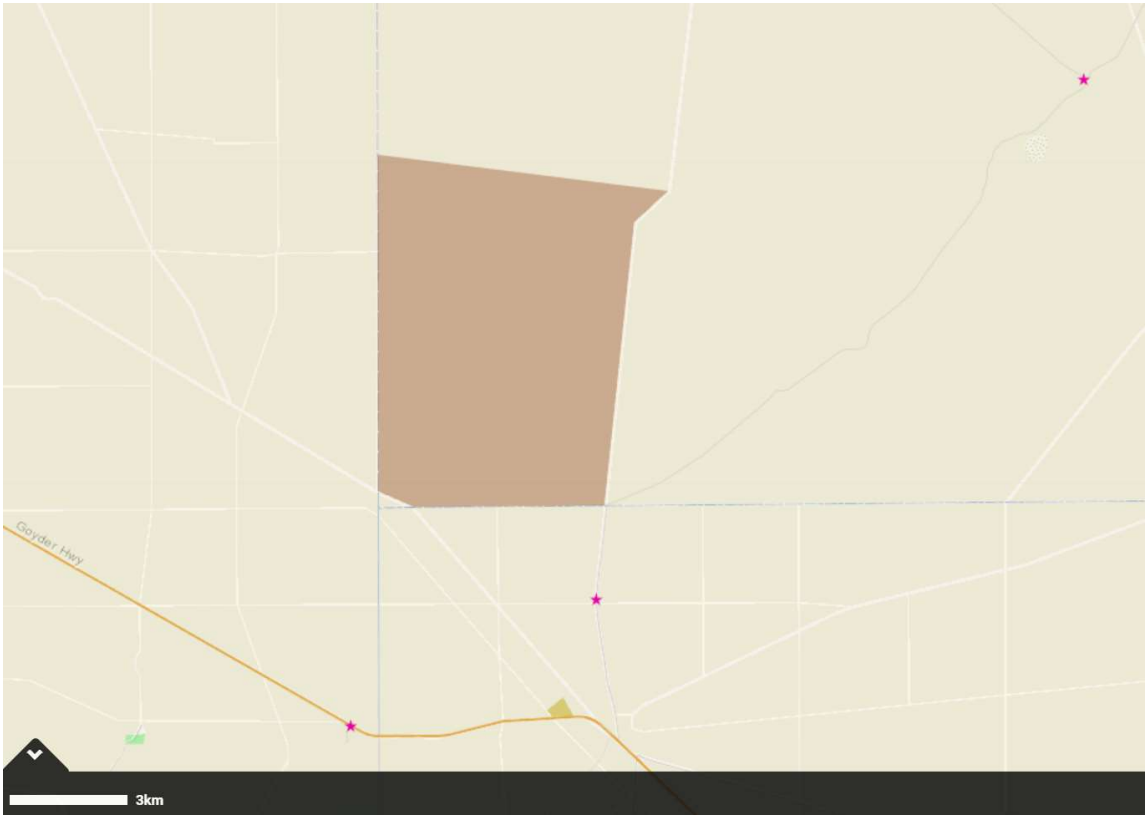


Figure 26: ★Provides all occupied rural properties near the site

8.6.2. ABORIGINAL HERITAGE AND CULTURE

Aboriginal sites are easily damaged or destroyed by weathering processes, soil erosion, grazing and burrowing animals and by vehicles and human intervention. The slow destruction of sites by natural weathering is uncontrollable, whereas the disturbance by land managers or visitors is avoidable.

Archaeological sites are places with prehistoric or historic remains left by the Aboriginal people and many of the sites continue to be important to people today. For some Aboriginal communities, the sites left by their ancestors are the only remaining source of knowledge about past lifestyle, domestic living and hunting styles. Aboriginal people traditionally remember their history and described their Law and Culture in elaborate songs, stories, body paintings, ceremonies and in carvings and paintings on cave walls, in sand and on ceremonial implements. Aboriginal communities still describe their culture and history in this way, as well as in written, form but in some cases this knowledge has been lost and can only be unravelled from archaeological evidence.

Some sites may be significant to Aboriginal people but have no obvious remains at all. These areas or sites may be a feature in the landscape, or artefacts of human manufacture such as campsites or rock carvings or a combination of the two. These may be important to Aboriginal people for their mythological, religious or cultural significance. The mythological sites are not easily identified by anyone who does not have knowledge of Aboriginal cultures. Such knowledge comes from Aboriginal people themselves. Aboriginal sites are not only important to Aboriginal people, but can teach other Australians and scientists about the prehistory of the country.

The site is located in Ngadjuri territory. The tribal area of the Ngadjuri, an alternate name for this group was Wirameju ([‘wira] = gum tree, [’meju] = men) indicating that they inhabited gum forest areas. Prior to the arrival of Europeans in the area, the Ngadjuri people were the instigators of aggressive attempts to impose the circumcision rite on the River people near Morgan. The last few members of the Ngadjuri lived at Quorn, at Riverton, and on Willochra Creek. The Mimbara horde (name of the most northern horde) is believed to be one of the last remaining "wild" groups in South Australia, until they finally disappeared in 1905.

The Central Archive is maintained by DSD-AAR and includes the Register of Aboriginal Sites and Objects. The Central Archive is a record of previously recorded heritage sites in South Australia and facilitates the identification of known sites within a project development area. The Central Archive is not an exhaustive list of heritage sites in a specific area, it contains only sites that have been reported and/or registered. There is No AAR Heritage Site near the proposed site. One registered AAR heritage site is approximately 5.8km south of south west corner of site. A copy is attached in Appendix F. The proposed area of array installation is considered a moderate risk area in comparison with the EBS assessment and site layout plan attached in Appendix E. Detailed assessment will be taken prior to detailed design and construction phases to mitigate any issues.

8.7. POTENTIAL IMPACTS AND PROPOSED MITIGATION MEASURES

8.7.1. FLORA

IMPACT

The detailed design will avoid areas of native vegetation, as identified through ecology site survey. The area of clearance is approximated to 200 ha for PV array. In accordance with the NVC Guidelines for a Native Vegetation Significant Environmental Benefit Interim Policy, vegetation clearing for the

Project has been assumed to be 100% of the Project area. However, it should be noted that in the absence of detailed design, it is not expected the long-term impact will be across the site as there are uncertainties in relation to the medium to long-term impacts of shading on vegetation health over time.

No vegetation communities of conservation significance were observed during the baseline field survey. Significant Environmental Benefit payment (under the Native Vegetation Act) to a third-party SEB provider or into the Native Vegetation Fund will provide a suitable offset for this clearance.

The following formula is specified under NVC policy document Guidelines for a Native Vegetation Significant Environmental Benefit Interim Policy to calculate the SEB offset value for a payment into the Native Vegetation Fund:

$$[SEB\ offset\ area\ required\ (ha) \times Land\ Value] + [Vegetation\ cleared\ (ha) \times Management\ fee^2]$$

It is expected to clear 200ha, as clearing is determined 'seriously at variance' with the principle, a minimum SEB ratio value of 8:1 must apply to the entire impact area. Potential impacts from operation of the solar farm have been considered, and are likely to be primarily associated with increased shading, potentially leading to changes in the structure and composition of vegetation community's underneath. The shade created by a large number of solar PV panels has been identified as a potential impact on slowing the growth of vegetation and hence a potential impact on the vegetation communities on the site. However, there is scientific uncertainty regarding the level of impact from shading on grass growth and upon bush species in South Australia.

Therefor for significant environmental benefit fund payment into the Native Vegetation Fund is expected to be for offset area required for 1600 ha, hence the amount allocated for the offsets will be approximately $1.4M this includes a contingency of any extra offsets. Due to the minimal amount of native vegetation present on site the vegetation clearance amount will be minimal to nil subjected to detailed design and further inspection by an ecology specialist.

The spread of environmental weeds through construction activities can potentially inhibit the regeneration of indigenous species on the disturbed construction sites, forming a longer term, perhaps permanent, weed cover, and can result in the invasion of adjoining, non-disturbed vegetation, particularly by species not currently present. Weed hygiene protocols will be implemented during construction activities to minimise the risk of weed spread and ongoing weed management will be undertaken where required, in consultation with the landowner and NRM Board where relevant.

MITIGATION AND MANAGEMENT MEASURES

Management and mitigation measures for flora values are developed to achieve the following outcomes:

- Implementation of a Construction Environment Management Plan (CEMP)
- Implementation of an Operational Environment Management Plan (OEMP)
- Prevention of unnecessary clearance of vegetation during construction
- Retain small shrubs and groundcover across the site where possible.
- Avoid works beyond the boundaries of the approved area including vehicle entry, personnel entry, storage of goods and materials and stockpiling of topsoil or cleared vegetation.

- If required, an application will be made for the clearance of native vegetation in accordance with the Native Vegetation Act 1991.
- Utilise procedures to restrict the spread of weed and pest species from the subject site.
- Rehabilitate areas that no longer need to be cleared of vegetation; and
- Develop and implement a rehabilitation and revegetation program post-construction.
- Monitor the health of vegetation on-site, in particular, how the shading of the solar panels impacts vegetation communities;
- A detailed assessment will be conducted prior to detail design and again during construction to mitigate areas of subject to Threatened species, if any.

8.7.2. FAUNA

IMPACTS

During construction period the region with high habitat will be avoided. Some direct mortality of fauna such as lizards and small mammals may occur during construction, from collision with machinery or vehicle or entrapment in trenches and excavations. Where excavations are planned to be left open and represent a fauna entrapment risk, escape routes for fauna will be provided or alternatively they will be checked regularly for trapped fauna. An appropriately training and licenced fauna catcher will then relocate the animal.

The potential impacts of the physical structure of the solar facility also needs to be considered, these are potential collision of birds with project structure and secondly burning or singeing effect of exposure to concentrated sunlight from high solar flux. The potential for bird species to confuse between solar array to water bodies, this may end in collision with the structures. There is hypothesis where the species can get confused more when there is a nearby water bodies present to the solar array. The second impact is unlikely as the photovoltaic array does not involve concentrated solar panels.

Hairy-nosed Wombats are present in the central area of the site and evidence of wombat presence was noted during the site visit. Wombat numbers in parts of the SA Murray-Darling Basin appear to have increased in recent years and they have been observed in areas where historically they have not been seen.

MANAGEMENT AND MITIGATION

Management and mitigation measures for fauna values are developed to achieve the following outcomes:

- Minimise vegetation clearance as related/discussed in flora
- Ensure that where excavations are to be left open and represent a fauna entrapment risk, escape routes are provided or the excavations are checked regularly to release trapped fauna.
- Minimise the lighting needed to minimise the attraction of insects or birds such as bats
- Undertake any active wombat management (if required) in consultation with an ecologist and the NRM Board.
- During operation the impacts will be monitored and actions needed to be taken to mitigate it and studies to be done.
- CEMP will do a detailed assessment prior to detail design and construction to mitigate the areas of Threatened species, if any.

8.7.3. HERITAGE

IMPACT

A desktop heritage assessment and Aboriginal archaeological survey of the subject site was completed to determine the presence of non-Aboriginal and Aboriginal archaeological material within the boundary of the subject site. The subject site has been assessed as being of low Aboriginal archaeological sensitivity due to the lack of temporary or permanent water sources. In addition, the site has been subject to moderate to high ground disturbance through pastoral, agricultural and industrial use.

It is anticipated that the Project will have no impact on known Indigenous or non-Indigenous heritage. Unidentified Indigenous and non-Indigenous cultural heritage sites and objects have the potential to occur and may be damaged during ground disturbance associated with construction and operation of the Project. the probability of encountering a site or object of significance within the Project area is minimal, as the area contains no rock outcrops, prominent hills or ridgelines which might obscure any such site or object from view.

Should the development require any areas of ground disturbance outside of the survey coverage, additional heritage assessment would be undertaken for these areas.

MANAGEMENT AND MITIGAITON

Management and mitigation measures for heritage values are developed to achieve the following outcomes:

- If any unexpected objects or skeletal remains that may be of heritage significance are identified during the construction period, stop work procedures will be implemented such as Stop Works, Restrict Access, assess object/ site, manage the area and access.
- For Assess object/ site a suitably qualified Aboriginal Monitor or Archaeologist to assess the archaeological material and advise on nature and significance. Contact the local Police if suspected human remains have been discovered.
- During construction phase minimise vegetation clearance as far as practicable through design, layout and controls during construction.
- Avoid any areas or locations of heritage significance during the design stage and construction stage, this will be implemented via the Construction Environment Management Plan

Solar River project will produce a CEMP with a detailed risk and mitigating implementation issues and risks register. This will manage and mitigate issues and risks that occurs during the projects construction.

9. A DESCRIPTION OF THE EXPECTED ENVIRONMENTAL AND SOCIAL EFFECTS AND A STATEMENT OF HOW THOSE EFFECTS COULD BE MANAGED

9.1. A STATEMENT OF ENGAGEMENT AND SUPPORT (BOTH NEGATIVE AND POSITIVE) ACROSS STATE GOVERNMENT AGENCIES

As a crown sponsored project the DPC will coordinate approvals though out the State Government with the full support of the SRP management (Refer Mark Jackson- DPC).

9.2. EVIDENCE OF SUPPORT FROM FEDERAL GOVERNMENT AGENCIES

Federal Government support has not been sourced at this stage.

9.3. EVIDENCE OF SUPPORT FROM LOCAL GOVERNMENT AGENCIES

DEWNR, DPTI and DSD no objection to the project at this stage.

9.4. A STATEMENT OF KNOWN COMMUNITY CONCERNS AND OPPOSITION TO PROJECT (IF APPLICABLE)

No concerns at this stage, SRP has enjoyed general support for solar development over wind development, some of the land owners have had bad experiences with Wind Developers in the area,

One resident raised concern re the proposed powerline and the line has been relocated to address said concern.

The Solar River Project will work closely with community and land holders in a proactive manner and address concerns if they arise.

9.5. AN INITIAL DESK TOP SCOPING STUDY OF KEY LEGISLATION THAT MIGHT BE RELEVANT

A range of other legislation is potentially relevant for project approvals, including:

- Commonwealth Legislation
  - Environmental Protection and Biodiversity Conservation Act 1999
  - Aboriginal and Torres Strait Islander Heritage Protection Act 1984
  - Native Title Act 1993
- South Australian Legislation
  - Aboriginal Heritage Act 1988
  - Electricity Act 1996
  - Environment Protection Act 1993
  - Heritage Places Act 1993
  - Local Government Act 1999
  - National Parks and Wildlife Act 1972
  - Native Title (South Australia) Act 1994
  - Native Vegetation Act 1991
  - Natural Resource Management Act 2004
  - Roads (Opening and Closing) Act 1991

- South Australian Public Health Act 2011 and South Australian Public Health (Wastewater) Regulations 2013.

Key legislation relevant to project approvals is discussed further below.

9.5.1. COMMONWEALTH LEGISLATION

ENVIRONMENTAL PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999

The Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) is the Australian Government's key piece of environmental legislation. The EPBC Act enables the Australian Government to join with the states and territories in providing a truly national scheme of environment and heritage protection and biodiversity conservation. The EPBC Act focuses Australian Government interests on the protection of matters of national and international environmental significance such as important flora, fauna, ecological communities and heritage places. The EPBC Act provides a legal framework to protect and manage Matters of National Significances (MNES)

There are no World Heritage properties, National Heritage Places or Commonwealth Marine Areas in the vicinity. This Act may be applicable as there are species in the site, refer to section 6.1.2.

ABORIGINAL AND TORRES STRAIT ISLANDER HERITAGE PROTECTION ACT 1984

The Aboriginal and Torres Strait Islander Heritage Protection Act 1984 (ATSIHP Act) is responsible for protecting areas and objects of particular significance to Aboriginal and Torres Strait Islander people which are under threat, if it appears that State and Territory laws have not provided effective protection.

The purposes of this Act are the preservation and protection from injury or desecration of areas and objects in Australia and in Australian waters, being areas and objects that are of particular significance to Aboriginals in accordance with Aboriginal tradition. The ATSIHP Act places responsibility with the Minister for Environment with making an emergency declaration to protect an area, object or class of objects from a threat of injury or desecration. It is an offence to contravene such a declaration.

There are no declared areas within or in proximity to the proposed Project area. However, should SRP or its contractors discover anything that it has "reasonable grounds to suspect to be Aboriginal remains" [s20(1)], SPR will report the discovery to the Commonwealth Minister in accordance with Part 2, Division 3 of the ATSIHP Act.

NATIVE TITLE ACT 1993

The Native Title Act 1993 is to provide a national system for the recognition and protection of native title and for its co-existence with the national land management system. The Australian legal system recognises native title where:

- The rights and interests are possessed under traditional laws and customs that continue to be acknowledged and observed by the relevant Indigenous Australians,
- By virtue of those laws and customs, the relevant Indigenous Australians have a connection with the land or waters,
- The native title rights and interests are recognised by the common law of Australia.

The Ngadjuri people have been recognised as native title holders in areas

The project site is located within a perpetual Crown lease conferring exclusive possession on the incumbent Crown lessee and is accordingly not subject to any native title.

9.5.2. STATE LEGISLATION

ABORIGINAL HERITAGE ACT 1988

The Aboriginal Heritage Act 1988 is the primary legislation in SA to protect and preserve Aboriginal heritage. The Aboriginal Affairs and Reconciliation Division of the Department of Premier and Cabinet administers the legislation. The Act applies to all parts of SA and its provisions are intended to protect Aboriginal remains, sites and objects of traditional or historical significance. This legislation recognises the minister as having overall responsibility for the protection of Aboriginal heritage. However, there are provisions that allow the minister to delegate some powers to an Aboriginal Heritage Committee.

Section of note within the Act includes:

- Section 23, provides that it is an offence to damage, disturb, interfere with any Aboriginal object, Aboriginal site, and Aboriginal remains, without the consent of the Minister for Aboriginal Affairs and Reconciliation; and
- Section 20, which mandates that any person who discovers any Aboriginal object, Aboriginal site, or Aboriginal remains must report the discovery to the Minister as soon as practicable.

Solar River Project will work with the Ngadjuri Peoples and Aboriginal Affairs and Reconciliation as the project progresses through detailed design and construction to ensure that project activities comply with the requirements of the Act.

ELECTRICITY ACT 1996

The Electricity Act 1996 and its associated regulations provide a legislative framework to ensure that South Australian consumers have access to safe, reliable and quality electricity supply, as well as safe electrical installations in a competitive market.

The Act promotes efficiency and competition in the electricity supply industry, promotes the establishment and maintenance of safe and efficient systems for generating, transmitting and distributing electricity, establishes and enforces appropriate standards of safety, reliability and quality in the South Australian electricity supply industry, establishes and enforces appropriate safety and technical standards for electrical installations and electricity infrastructure, protects the interests of South Australian consumers, The Electricity Act 1996 provides the Office of the Technical Regulator with the authority to enforce the requirements of the legislation and its associated regulations.

Electricity generation licensing under the Electricity Act 1996 and registration with the Australian Energy Market Operator are being undertaken outside this development application.

ENVIRONMENT PROTECTION ACT 1993

The Environment Protection Act 1993 provides a regulatory framework for protection of South Australia's environment, including land, air and water. The main objects of the act are to promote the principles of ecologically sustainable development, to protect, restore and enhance the environment. Offences under the EP Act include environmental pollution caused by noise, air, water or waste. The

Environmental policies that are relevant to the project are Air Quality Policy 2016, Noise Policy 2007, Water Quality Policy 2015 and Waste to Resource Policy 2010.

Air Quality Policy (under Section 28 of the Environment Protection Act 1993)

Air pollution from an activity is regulated under this policy. This policy provides clear criteria to be adhered to during an activity. The policy sets the types of air pollutants and maximum concentrations. It is noted that the Project is for a zero-emission power generation plant; however, the Project will comply with the requirements set out in the policy, for related activities during construction and operation.

Noise Quality under the Environment Protection Act 1993

This policy identifies the noise criteria that the Project must meet. The Project's main noise source will be during construction, and will therefore be required to meet the noise criteria as defined in Division One – Construction Noise, of the Noise Policy.

Water Quality under the Environment Protection Act 1993

This policy manages the quality of water and water usage through standards and guidelines. The main objective of the policy is 'to ensure that all reasonable and practicable measures are taken to protect, restore and enhance the quality of the environment while having regard to the principles of ecologically sustainable development'. The policy refers to the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC 2000). The Project will comply with water quality criteria that is specified in the policy. The Project will also comply with general obligations to avoid the discharge of pollutants to receiving water

Waste to Resource under the Environment Protection Act 1993

This policy aims to reduce waste to landfill and promotes the implementation of the waste management hierarchy. The policy also states disposal obligations for activities.

HERITAGE PLACES ACT 1993

The Heritage Places Act 1993 provides for the identification and conservation of places and related objects of State heritage significance. The Act provides protection for archaeological artefacts of heritage significance and under section 36 of the Act it is an offence to damage a Heritage Place. There are no known Heritage Places or objects within the Project area.

NATIONAL PARKS AND WILDLIFE ACT 1972

The National Parks and Wildlife Act 1972 (the Act) provides the legislative framework for dealing with native fauna in South Australia. Native mammals, reptiles, most native birds and some frogs are protected in South Australia.

There appears to be a number of fauna species listed under the National Parks and Wildlife Act 1972 that have been recorded within the area, discussed in section 6.1.2 (Fauna). Permits may be required for the Project where protected native animals are involved. For example, permits may be granted as part of a threatened species recovery program.

NATIVE TITLE (SOUTH AUSTRALIA) ACT 1994

The Commonwealth Native Title Act 1993 and the Native Title (South Australia) Act 1994 provide for the recognition and protection of native title. (Refer to section 6.5.1.3)

NATIVE VEGETATION ACT 1991

The Native Vegetation Act 1991 and Native Vegetation Regulations 20032 apply to the management and clearance of native vegetation on private and public land in South Australia. Section 3 of the NV Act identifies native vegetation as meaning a plant or plants of a species indigenous to South Australia including a plant or plants growing in or under waters of the sea and does not include a plant or part of a plant that is dead or a plant intentionally sown or planted by a person unless the plant was sown or planted in certain circumstances. This definition includes not only trees, but also includes shrubs, grasses, groundcovers, moss, lichen, reeds and seaweed.

In regards to clearing, clearance in relation to native vegetation is identified in Section 3 of the NV Act as:

a. The killing or destruction of native vegetation;
b. The removal of native vegetation;
c. The severing of branches, limbs, stems or trunks of native vegetation;
d. The burning of native vegetation;
e. Any other substantial damage to native vegetation, and includes the draining or flooding of land, or any other act or activity, that causes the killing or destruction of native vegetation, the severing of branches, limbs, stems or trunks of native vegetation or any other substantial damage to native vegetation.

The project will fall under Regulation 5(1)(d) of the Native Vegetation Regulations as it is classed as building or provision of infrastructure, including infrastructure in the public interest. Regulation 5(1)(d) permits clearance of vegetation for the construction or expansion of a building or infrastructure that the Minister for Environment & Conservation considers to be in the public interest or provision of infrastructure or services to an existing or approved building or site that may not be located in native vegetation. Relevant authorisation must also be obtained as required by the Development Act 1993. The aim of the regulation is to allow for the establishment of a building or infrastructure (considered to be in the public interest), or for the provision of infrastructure or services to an existing or proposed building or to any other place, provided that it is located such that it avoids or minimises the impact on significant areas of native vegetation. A submission to the Native Vegetation Council will need to establish that:

- The building or structure cannot be established without the need to clear some vegetation, and
- The site chosen contains the least significant native vegetation, provided that construction is practicable on that site.

In particular, a proponent should seek to avoid areas containing an intact stratum of native vegetation (see definition page 5). Approval for vegetation clearance for such developments is conditional on the achievement of a significant environmental benefit elsewhere on the property or within the region to compensate for the vegetation to be cleared. A management plan must be prepared that describes the works that will result in the environmental benefit, which may include providing for the management of other native vegetation, the restoration of native vegetation, or the replanting of a cleared area. If this is not achievable on the property, the applicant may apply to the Native Vegetation Council to make a

payment into the Native Vegetation Fund that will be used by the Native Vegetation Council to achieve an environmental benefit elsewhere in the region

NATURAL RESOURCE MANAGEMENT ACT 2004

The Natural Resource Management Act 2004 (NRM Act) provides the guiding principles for Natural Resources Management in South Australia through an integrated & sustainable framework. It Establishes the Natural Resources Management (NRM) Council as the state-wide peak body for administration of the Act and Establishes Eight Regional NRM Boards across South Australia to

- assist the NRM Council to monitor & evaluate the condition of natural resources across the State
- promote public awareness & understanding of sustainable, regional NRM
- provide grants to researchers, farmers & engineers (among others) to undertake NRM projects
- develop a Natural Resources Management Plan for their region
    - Plans may cover weed, pest & animal management, salinity control, biodiversity enhancement, landholder advice & incentives

The Act also regulates the taking and use of water in Prescribed Wells Areas or Prescribed Water Resources Areas. It is not proposed and no intention to undertake activities that would require authorisations for the taking and use of water.

ROADS (OPENING AND CLOSING) ACT 1991

The Roads (Opening and Closing) Act 1991 administers activities that require the closure of roads and identifies the process for road closure. SRP are not proposing any works that would require the closing of public roads.

9.6. OTHER LIKELY APPROVALS/LICENCES REQUIRED

Other approvals potentially required include:

- Authorisation to place infrastructure and access tracks across road reserves under the Local Government Act 1999 and possibly the Roads (Opening and Closing) Act 1991
- Approval for on-site sewage handling or treatment systems under the South Australian Public Health (Wastewater) Regulations 2013.

10. MANAGEMENT ARRANGEMENTS

10.1. WATER MANAGEMENT

Water is expected to be trucked to site during construction and during operation. The amount of water will be considerably low during operation compared to construction period due to the low number of employees during operational period. During construction period water temporary water tanks will be installed in the site. Water will be required for construction dust suppressions, wheel washing and workforce facilities.

Water storage facility will be installed in site which will be harvested from the building and in ways of possible. This can be used for operational use of cleaning the site, materials or even used as a fire fighting service if needed.

The Solar panels require minimal water for cleaning as they have a high-tech dust resistant coating. This is high-tech technology which doesn't require water, this has been considered for installation at the site.

Any waste water generated during construction will be captured in septic tanks and removed from site by a licensed waste contractor.

10.2. WASTE MANAGEMENT

A range of general waste products will be generated during the construction and to a lesser extent the operational phase. Waste will be managed in accordance with the waste hierarchy which is identified in Section 3(2) of the Zero Waste SA Act 2004. The hierarchy to be adopted is in the follows figure.

Figure 27: Waste Management Hierarchy

The waste management hierarchy is a nationally and internationally accepted guide for prioritising waste management practices with the objective of achieving optimal environmental outcomes. It sets out the preferred order of waste management practices, from most to least preferred.

Recyclable materials are expected to constitute a large proportion of the waste generated this will include wooden pallets used to transport the solar panel modules, plastic wrapping, cans and bottles, and metal offcuts.

Any waste will be disposed of safely in accordance with South Australian regulations and spill kits will be provided in hazardous material storage areas for batteries. Unused or excess chemicals and material will be removed and disposed of correctly, in accordance with safety data sheets (SDS) and waste disposal guidelines. Licensed waste transporters will be used to collect and dispose of waste. The materials will be also tracked using dockets and receipts, in and out of the site.

10.3. TRAFFIC MANAGEMENT

10.3.1. EXISTING ROAD NETWORK

The main construction access is expected to be from Bower Boundary Road on the southern boundary of the project site. In consultation with DPTI a suitable location will be confirmed in detailed design. The road network covers metropolitan roads near Port Adelaide, Expressways and Highways and wood and forest road. Woods and Forest Road is a gravel road which is mainly used by trucks (Bower Boundary Road). The main roads that are expected to be used for the transport of construction materials and equipment's includes the following. The traffic flow map from DPTI is also attached in Appendix H, this will be used for detailed planning of the traffic management and route to the site.

- Port river Expressway
- Port Wakefield Road
- Northern Expressway
- Sturt Highway
- Thiele Highway
- Bower Boundary Road and
- Goyder highway

Table 12: Existing road network from Port Adelaide to site

Port Adelaide to Dartmoor Rd 175km 2h 9 min	
Port Adelaide, South Australia 5015	
Take Church Pl to Nelson St	55s (210 m)
1.Head north towards Quebec St	34m
2.Turn left onto Quebec St	18m
3.Turn right onto Church Pl	160m
Take Northern Expy/National Highway M20 and Thiele Hwy/B81 to Bower Boundary Rd in Bower	1h 33 min (133Km)
4.Use any lane to turn slightly left onto Nelson St	700m
5.Use the right 2 lanes to turn right onto Port River Expy/A9 Continue to follow A9	9.9 Km
6.Use the left lane to take the National Hwy A1/Pt Wake eld Rd slip road to Pt Wake eld	500m
7.Merge onto National Highway A1	11.4Km
8.Keep left to continue on Northern Expy/National Highway M20, follow signs for National Hwy M20/Gawler/Renmark	22.2Km
9.Continue onto National Highway A20	2.5Km
10.Use the left lane to take the Horrocks Hwy slip road to B82	400m
11.Turn left onto Horrocks Hwy/Main N Rd/A32	450m

↱	12.Turn right onto Thiele Hwy/B81	30.8Km
↱	13.Turn right onto South Terrace/Thiele Hwy/B81 Continue to follow Thiele Hwy/B81	53.6Km
↰	14.Turn left onto Bower Boundary Rd	30 Min (36.7Km)

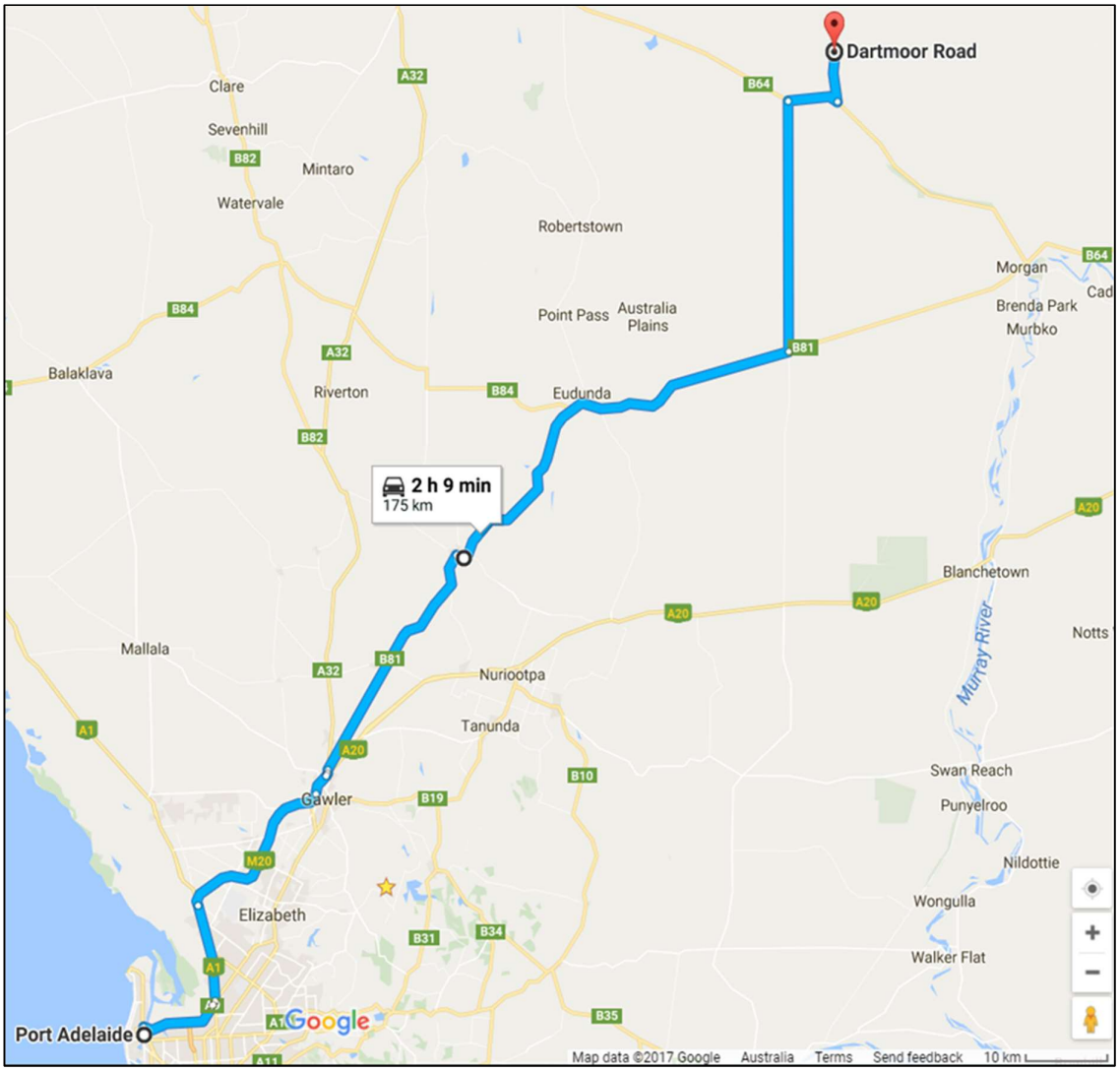


Figure 28: The Route from Port Adelaide to Site

10.3.2. TRAFFIC MANAGEMENT PLAN

The Traffic Management Plan will consider the following aspects:

- Routes to be used by project construction traffic (including alternate routes where feasible
- Assessment of road condition prior to construction
- Traffic controls (e.g. speed limits, signage) where appropriate
- Scheduling of deliveries (e.g. to reduce project construction traffic near locations such as schools at certain times of the day or week where appropriate)
- Permitting and approval of over-mass and oversized vehicles

- Procedure to monitor traffic impacts and adapt controls (where required) to reduce impacts
- Community consultation regarding traffic impacts for nearby residents
- Maintenance of road pavement conditions during construction e.g. removal of gravel / dirt from the sealed road surface at the main site access
- A program for monitoring road condition, to repair damage aggravated by construction traffic.
- Police escort if required
- Department of Transport and local Council/s notification for crossing of bridges if heavy loads

Examples of the Structures transported via road is shows in the folowing Figure 29-31

Figure 29:Transmission Pole structure example and transportation method truck

Figure 30: Transformer size and possible transportation truck example

Figure 31:Demountable office site, transportation oversized truck vehicle

Project-related traffic will include a range of vehicle types. These are expected to include:

- Truck or truck and trailer - delivery of gravel and concrete
- 19 m semi-trailer – mobilisation of construction plant and equipment, delivery of piles, fencing, electrical cable, building materials
- 19 m semi-trailer or tanker – delivery of potable water and fuel and waste disposal
- 26 m B-double – transport of solar panels, trackers, inverters and batteries
- Bus (12 seater) – transport of workforce
- Light vehicles – management / supervisory.

It is expected that the substation similar in size shown in Figure 30 is the highest and widest load to be delivered to site. The size will be known in detailed design.

11. CONCLUSION

The Solar River Project is a key renewable energy and storage project which will deliver additional capacity of 200 MW of clean renewable energy and 20 MWh of grid connected advanced battery storage into South Australia, resulting in an emission saving of approximately 350,000 tonnes a year of carbon dioxide. This development application has outlined the associated infrastructure with the 200MW PV system and 20MWh of battery and the grid connection transmission line. The PV array site area encompasses a small part of the 5335ha of the section land. The Project will primarily consist of PV solar panel rows (set in large blocks), access tracks, inverters, a maintenance shed, and substation with electricity grid connection, site office and ablution facilities.

This document provides a detailed description of the Project and the site, a justification for the development, consideration of the Project's likely impacts and an assessment against South Australian legislation and key criteria of the Development Plan. The Project will proceed using the Public Infrastructure provisions under Section 49 of the Development Act and the Assessment Manager will be the independent DAC.

The location of the site has high solar resources hence an ideal opportunity for the project for high efficiency generation of renewable energy. Offset vegetation will be considered either through third party payment or rehabilitation zone. No significant species are present at the site and management and mitigation plan will be implemented for noise, air, health and safety, ecology and heritage throughout the project from detailed design, construction to operation. Solar River project will produce a CEMP with a detailed risk and mitigating implementation issues and risks. This will manage and mitigate issues and risks that occurs during the project. This will be reviewed periodically.

The impact assessment identified various environmental, cultural, social and economic benefits from the Project and confirmed that adverse impacts could be appropriately managed. With the implementation of mitigation and management measures identified in this Development Application,

Impacts related with geology, topography, soils, surface water, landscape and visual amenity, cultural heritage, social, economic and traffic are expected to be minimal. The development of the electrical infrastructure is beneficial for South Australians

It is considered that the project exhibits sustainable planning merit and is consistent with the intention for the locality outlined in the Development Plan. In particular it represents establishment of renewable energy facility that supports and envisioned by National and State strategic policies. There are no significant impacts likely to adjacent land use or soil and water resources.

12. REFERENCES

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13. APPENDIX

Please see the attachments

Appendix A- OTR Certificate

Appendix B- Site Layout

Appendix C- SRP Viewshed Analysis

Appendix D- EBS Flora and Fauna Desktop Assessment

Appendix E- EBS Heritage Desktop Assessment

Appendix F- AAR Heritage Site Map

Appendix G- Company CV

Appendix H-Traffic Flow Map

Appendix I- Crown Lease

14. ATTACHMENTS

Please see the attachments

Attachment A-Development Application from

Attachment B-Electricity declaration form

Attachment C- Letter to Ngadjuri Nation Aboriginal Corporation

DEVELOPMENT APPLICATION FORM

PLEASE USE BLOCK LETTERS

COUNCIL: PASTORAL UNINCORPORATED AREA

APPLICANT: The Solar River Project Pty Ltd

Postal Address: ThincLab, WS.G17.04, Ground Floor,

10 Pulteney Street Adelaide

Owner: _____

Postal Address: _____

_____

BUILDER: _____

_____

Postal Address: _____

_____

_____ Licence No: _____

CONTACT PERSON FOR FURTHER INFORMATION

Name: Jason May

Telephone: +61 499 365 086 [work] _____ [Ah]

Fax: _____ [work] _____ [Ah]

EXISTING USE: _____

FOR OFFICE USE

Development No: _____

Previous Development No: _____

Assessment No: _____

☐ Complying	Application forwarded to DA
☐ Non Complying	Commission/Council on
☐ Notification Cat 2	/ /
☐ Notification Cat 3	Decision: _____
☐ Referrals/Concurrences	Type: _____
☐ DA Commission	Date: / /

	Decision required	Fees	Receipt No	Date
Planning:				
Building:				
Land Division:				
Additional:				
Development Approval				

DESCRIPTION OF PROPOSED DEVELOPMENT: 200MW Photovoltaic solar array and 20MWh Battery Storage system

LOCATION OF PROPOSED DEVELOPMENT: Dartmoor Rd, Maude SA 5320 Title: CL1156/3

House No: _____ Lot No: ____ Street: _____ Town/Suburb: Warnes

Section No [full/part] 1352 Hundred: OH(BURRA) Volume: 1156 Folio: 3

Section No [full/part] _____ Hundred: _____ Volume: _____ Folio: _____

LAND DIVISION:

Site Area [m^2] 53,350,000 Reserve Area [m^2] _____ No of existing allotments _____

Number of additional allotments [excluding road and reserve]: _____ Lease: **YES** ☒ **NO** ☐

BUILDING RULES CLASSIFICATION SOUGHT: _____ Present classification: _____

If Class 5,6,78 or 9 classification is sought, state the proposed number of employees: Male: _____ Female: _____

If Class 9a classification is sought, state the number o persons for whom accommodation is provided: _____

If Class 9b classification is sought, state the proposed number of occupants of the various spaces at the premises: _____

DOES EITHER SCHEDULE 21 OR 22 OF THE DEVELOPMENT REGULATIONS 2008 APPLY? **YES** ☐ **NO** ☐

HAS THE CONSTRUCTION INDUSTRY TRAINING FUND ACT 2008 LEVY BEEN PAID? **YES** ☐ **NO** ☒

DEVELOPMENT COST [do not include any fit-out costs]: $ 465,000,000

I acknowledge that copies of this application and supporting documentation may be provided to interested persons in accordance with the Development Regulations 2008

SIGNATURE: _____ Dated: 01 / 12 / 2017

DEVELOPMENT REGULATIONS 2008
Form of Declaration (Schedule 5 clause 2A)

Government of South Australia

To: Department of Planning, Transport & Infrastructure

From: The Solar River Project Pty Ltd

Date of Application:01/12/2017

Location of Proposed Development: _____

House No: _____ Lot No: _____ Street: Dartmoor Rd (GOVT Rd)

Town/Suburb: Warnes-5417

Section No (full/part): 1352 Hundred: OH (Burra)

Volume: 1156 Folio: 3

Nature of Proposed Development:

The project is on a 200MW PV with an integration of 20MWh battery system. The location of the project is 110km north of Adelaide, South Australia near Robertstown, in Warnes Suburb. The site is located in a high solar region on large allotments of pastural land well suited to board acre PV installation and operation. The 200 Mega Watt Photo Voltaic Ground Mounted Array will be connected to 275,000 volts Transmission Connection to the Australian National Grid and the 20 Mega Watt hours battery will be used to for storage and stability of the system.

I JASON MAY **being the applicant/ ~~a person acting on behalf of the applicant~~ (delete the inapplicable statement) for the development described above declare that the proposed development will involve the construction of a building which would, if constructed in accordance with the plans submitted, not be contrary to the regulations prescribed for the purposes of section 86 of the Electricity Act 1996. I make this declaration under clause 2A(1) of Schedule 5 of the Development Regulations 2008.**

Signed: _____ **Date:01/12/2017**

Government of South Australia

Note 1

This declaration is only relevant to those development applications seeking authorisation for a form of development that involves the construction of a building (there is a definition of 'building' contained in section 4(1) of the Development Act 1993), other than where the development is limited to –

a) an internal alteration of a building; or
b) an alteration to the walls of a building but not so as to alter the shape of the building.

Note 2

The requirements of section 86 of the Electricity Act 1996 do not apply in relation to:

a) an aerial line and a fence, sign or notice that is less than 2.0 m in height and is not designed for a person to stand on; or
b) a service line installed specifically to supply electricity to the building or structure by the operator of the transmission or distribution network from which the electricity is being supplied.

Note 3

Section 86 of the Electricity Act 1996 refers to the erection of buildings in proximity to powerlines. The regulations under this Act prescribe minimum safe clearance distances that must be complied with.

Note 4

The majority of applications will not have any powerline issues, as normal residential setbacks often cause the building to comply with the prescribed powerline clearance distances. Buildings/renovations located far away from powerlines, for example towards the back of properties, will usually also comply.

Particular care needs to be taken where high voltage powerlines exist; or where the development:

- is on a major road;
- commercial/industrial in nature; or
- built to the property boundary.

Note 5

An information brochure: 'Building Safely Near Powerlines' has been prepared by the Technical Regulator to assist applicants and other interested persons.

This brochure is available from council and the Office of the Technical Regulator. The brochure and other relevant information can also be found at **sa.gov.au/energy/powerlinesafety**

Note 6

In cases where applicants have obtained a written approval from the Technical Regulator to build the development specified above in its current form within the prescribed clearance distances, the applicant is able to sign the form.

1st December 2017

Ngadjuri Nation Aboriginal Corporation
Mr Quenten Agius
Chairperson
46 Maitland Road
POINT PEARCE
South Australia 5573
Mobile: 0429 367 121
Email: Traditionalowners@adjahdura.com.au

The Solar River Project Pty Ltd (SRP)
ACN 622 113 517
Thinclab Office
Adelaide University Building
10 Pulteney Street
Adelaide, South Australia 5000

The Solar River Project

Dear Quenten

The Solar River Project is a proposed large-scale photo voltaic solar array with battery storage and associated national grid powerline connection.

We have a deep respect for Aboriginal Cultural beliefs and the community's connection with the land. As part of the project we seek to maintain and enhance relationships with community programs, support for the Aboriginal Arts and employment programs.

I have attached a link to the project fact sheet www.SRProject.com.au

Background

As an Adelaide based company May Brothers & Co has been developing and constructing sustainable power generation facilities in Australia, India and Asia Pacific for many years. The recent and dramatic increases in South Australia's electricity prices offers an opportunity to build renewable base load generators reducing electricity costs to the public as well as dramatically reducing air pollution.

Our policy "To tread lightly on the earth working in harmony with the land leaving a positive legacy for our children".

The Project

The Solar River Project is a proposed large-scale photo voltaic solar array with battery storage and associated national grid powerline connection. The proposed array is located on a perpetual crown lease CL1156/3 and the powerline runs between this site to the ElectraNet Substation located at Section 50 near Robertstown South Australia (refer attached layout).

I would like to meet with you to discuss the project in more detail, inspections, sponsorships and employment opportunities.

Our Commitment

We are committed to sustainable development leaving a legacy of positive outcomes for the land owners, the environment and the community.

Mr Jason May
Managing Director
The Solar River Project Pty Ltd
E jason@maybros.net
W: www.SRProject.com.au
Mobile 0499 365 086
International +61 499 365 086

Attached

Proposed Project Layout, Powerline & PV Solar Array

"Thank you for your time"

Government of South Australia
Department of the Premier and Cabinet

Ref: 2017/01873.01, D17043521

Energy and Technical Regulation

Office of the Technical Regulator

Level 8, 11 Waymouth Street
Adelaide SA 5000

GPO Box 320
Adelaide SA 5001

Telephone: 08 8226 5500
Facsimile: 08 8226 5866

www.sa.gov.au/otr

17 October 2017

Aju Yelhose
Project Manager
May Bros & Co
Thinclab
10 Pultney St
Adelaide SA 5000
By email: aju@maybros.net

Dear Aju,

RE: CERTIFICATE FOR YOUR SOLAR RIVER PROJECT (200MW PHOTOVOLTAIC SYSTEM, IN ADDITION TO A 63.8MW BATTERY ENERGY STORAGE SYSTEM AND ABB INVERTER TECHNOLOGY)

Thank you for your email to Reinhard Struve dated 16 Oct 2017, outlining the final version of your proposed Solar River Project. Based on the documents provided and previous discussions with Reinhard Struve we understand that the project will consist of a 200MW photovoltaic system in combination with a 63.8MW battery energy storage system, with energy being dispatched by ABB inverters. You advised that the inverters will be capable to operate at 150% overload for up to 60 seconds, thus increasing the effective output of the batteries to 95.7MW for that period in order to provide Fast Frequency Response.

The proposal as described above has been assessed by the Office of the Technical Regulator (OTR) under Section 37 of the Development Act 1993.

Regulation 70 of the *Development Regulations 2008* prescribes if the proposed development is for the purposes of the provision of electricity generating plant with a generating capacity of more than 5 MW that is to be connected to the State's power system – a certificate from the Technical Regulator is required, certifying that the proposed development complies with the requirements of the Technical Regulator in relation to the security and stability of the State's power system.

In making a decision on your application, our office has taken the following information into account:

- Your email dated 16 October 2017 containing your proposal to achieve the required Fast Frequency Response, in addition to technical information about the ABB inverter technology.

After assessing the information provided, I advise that approval is granted for the Solar River Project as described above.

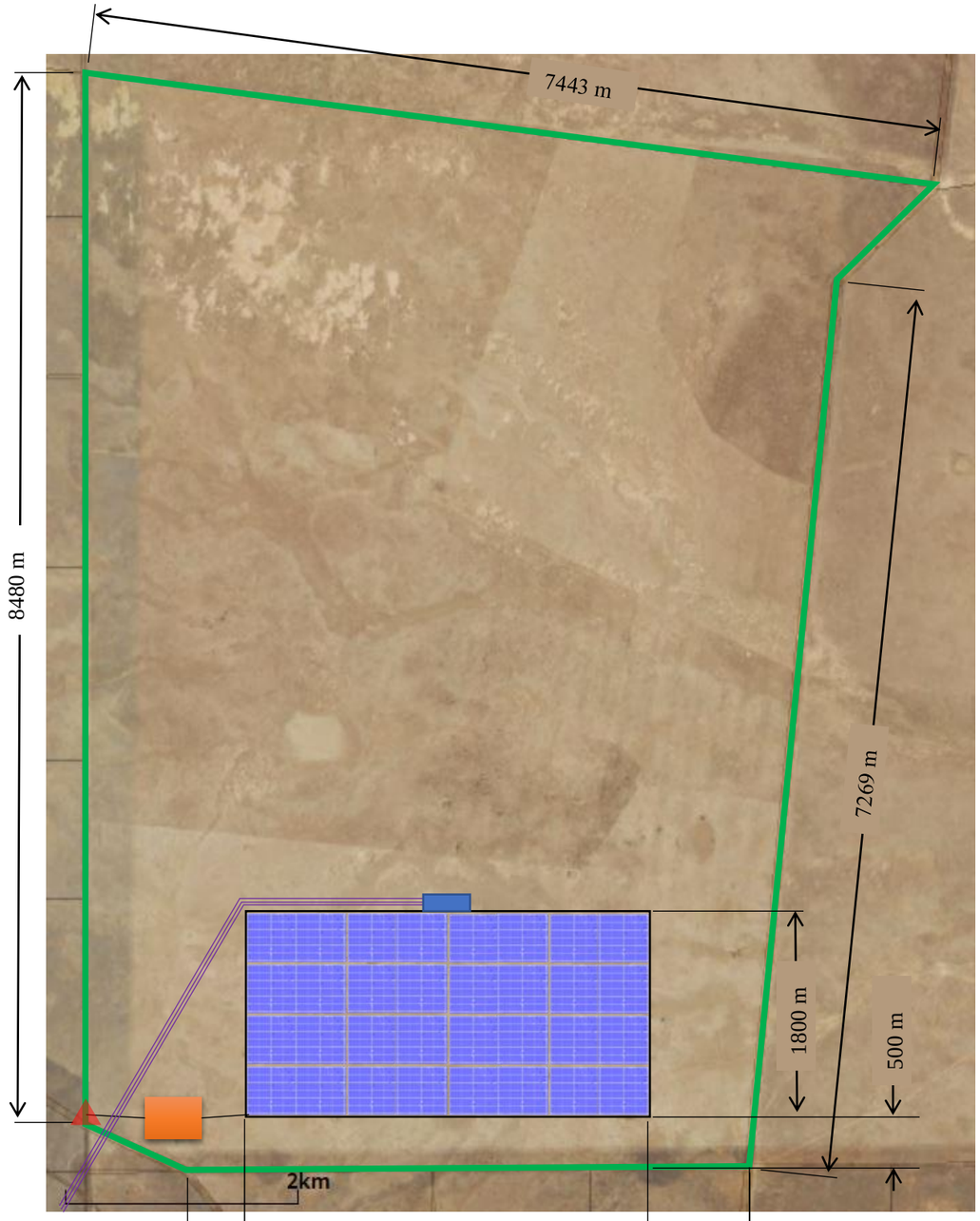
Please note that you will be required to apply for a generation licence from the Essential Services Commission of SA (ESCOSA) at a later stage, and will be required to meet their technical conditions.

Should you have any questions regarding this matter, please do not hesitate to call Reinhard Struve on (08) 8226 5879.

Yours sincerely

Rob Faunt
TECHNICAL REGULATOR

Solar River Project™



Legend

- Property Boundary
- Solar Panel
- Maintenance and Battery Building
- 33/132/275kV Substation
- Site Access
- Tracks

DRAWN ajuyeldhose	2/12/2017	
CHECKED		
QA		TITLE: Site Layout
MFG		
APPROVED		SIZE: D; DWG NO; REV
		SCALE; SHEET 1 OF 1

The Solar River Project
View Shed Analysis

Date of issue: 1st Dec 2017
Revision date: 12th Dec 2017
Author: Aju Yeldhose
Approver: Jason May

Legend

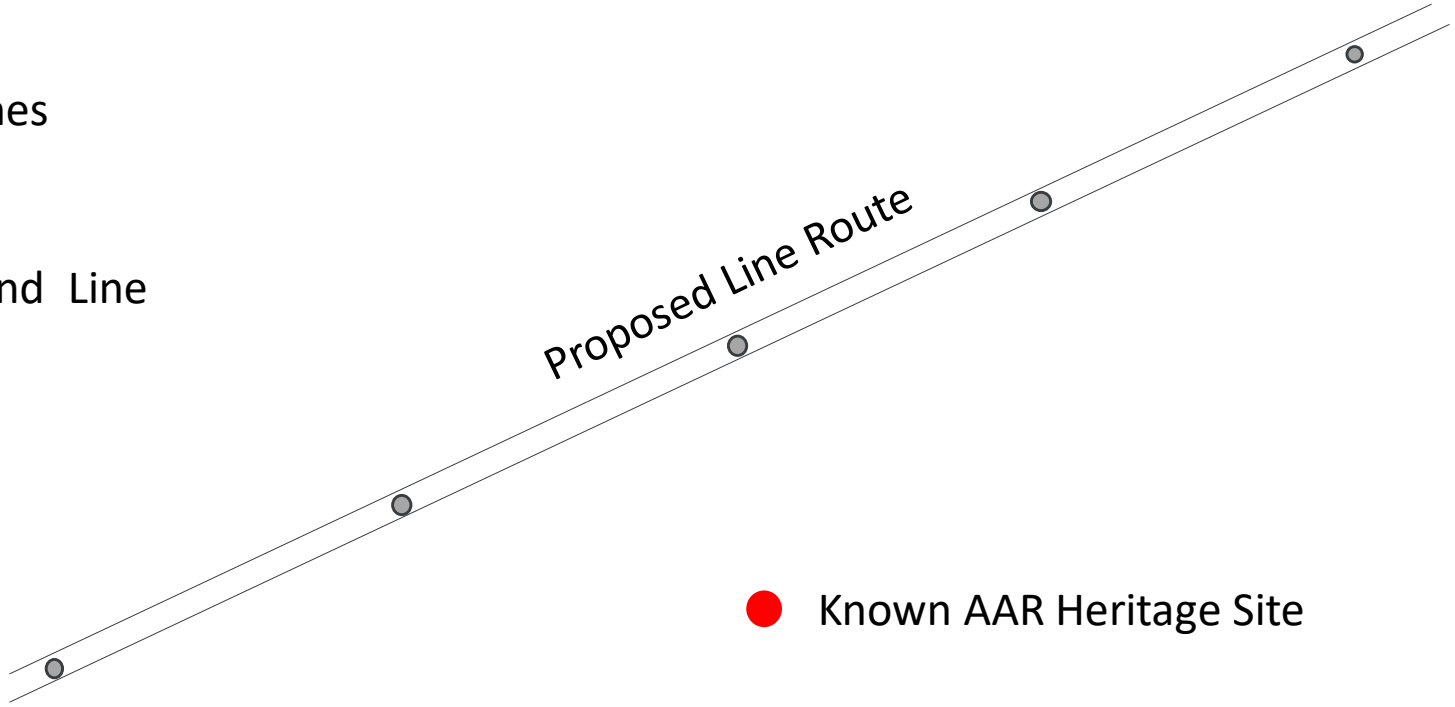
Existing Transmission lines

Proposed Underground Line

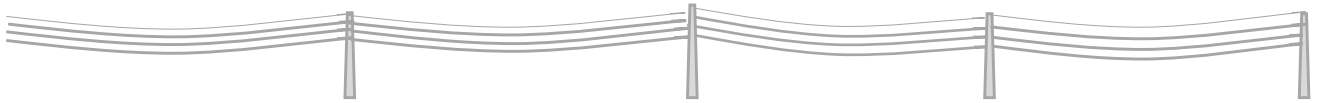
Proposed Line

PV Array

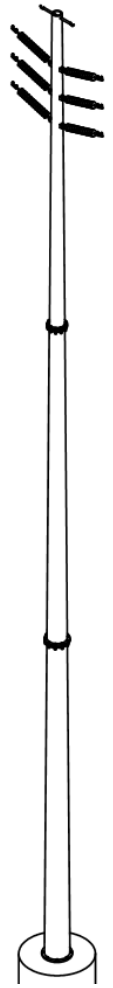
Direction of View



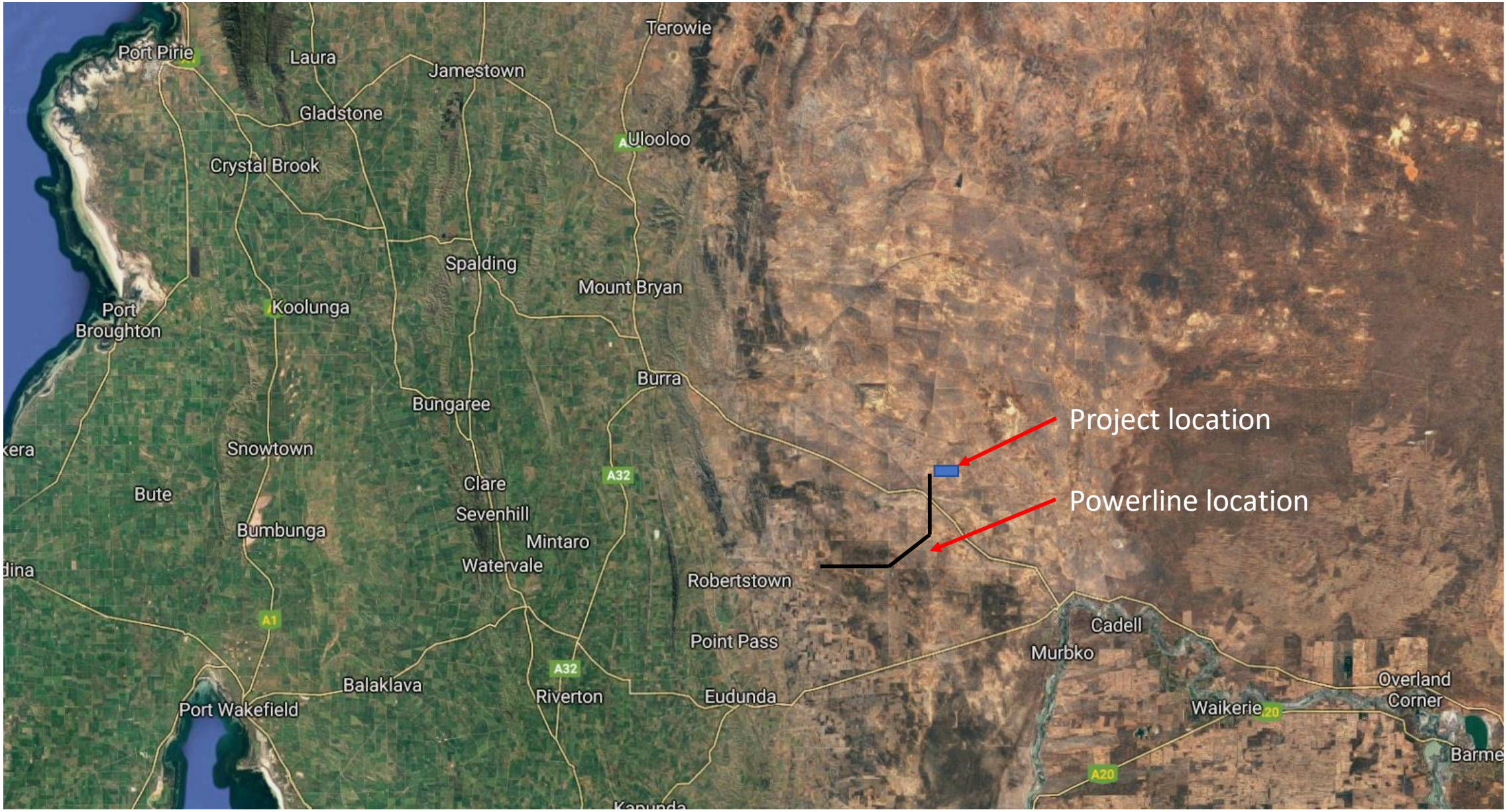
Known AAR Heritage Site



Powerline



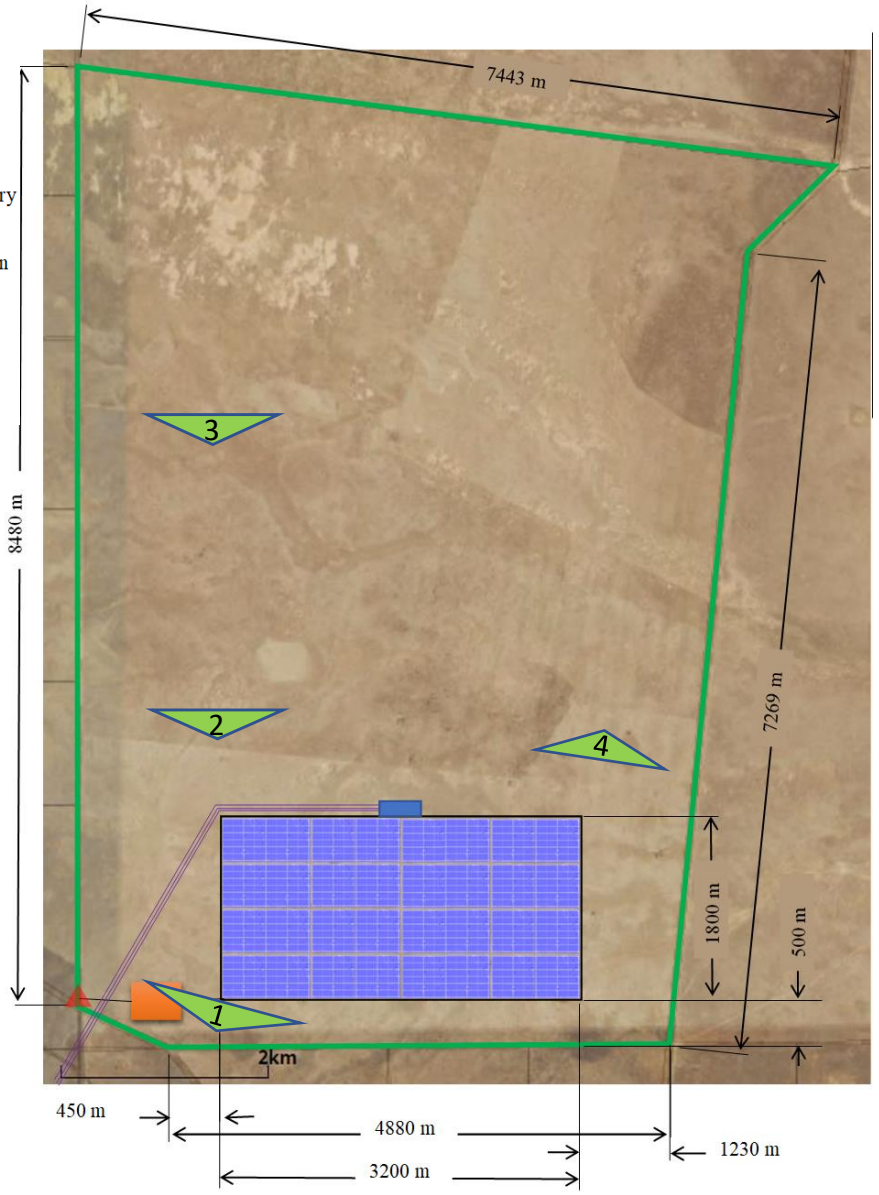
Power Pole

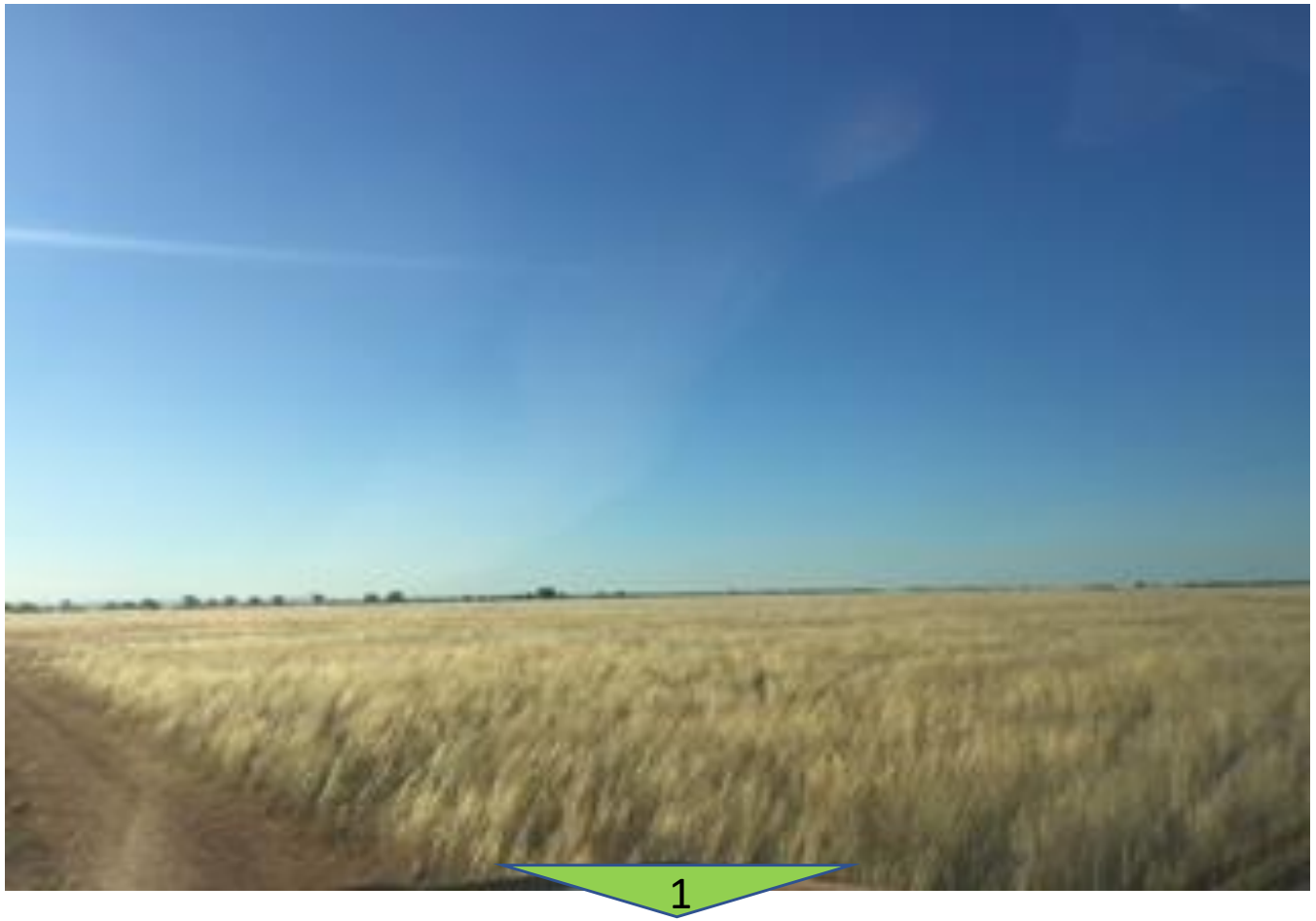

Terowie
Port Pirie
Laura
Jamestown
Gladstone
Ulooloo
Crystal Brook
Spalding
Mount Bryan
Port Broughton
Koolunga
Burra
Bungaree
Snowtown
Clare
Bute
Sevenhill
Bumbunga
Mintaro
Watervale
Robertstown
Point Pass
Cadell
Murbko
Balaklava
Riverton
Eudunda
Overland Corner
Waikerie
Port Wakefield
A1
A32
A20
Project location
Powerline location

Solar River Project

Legend

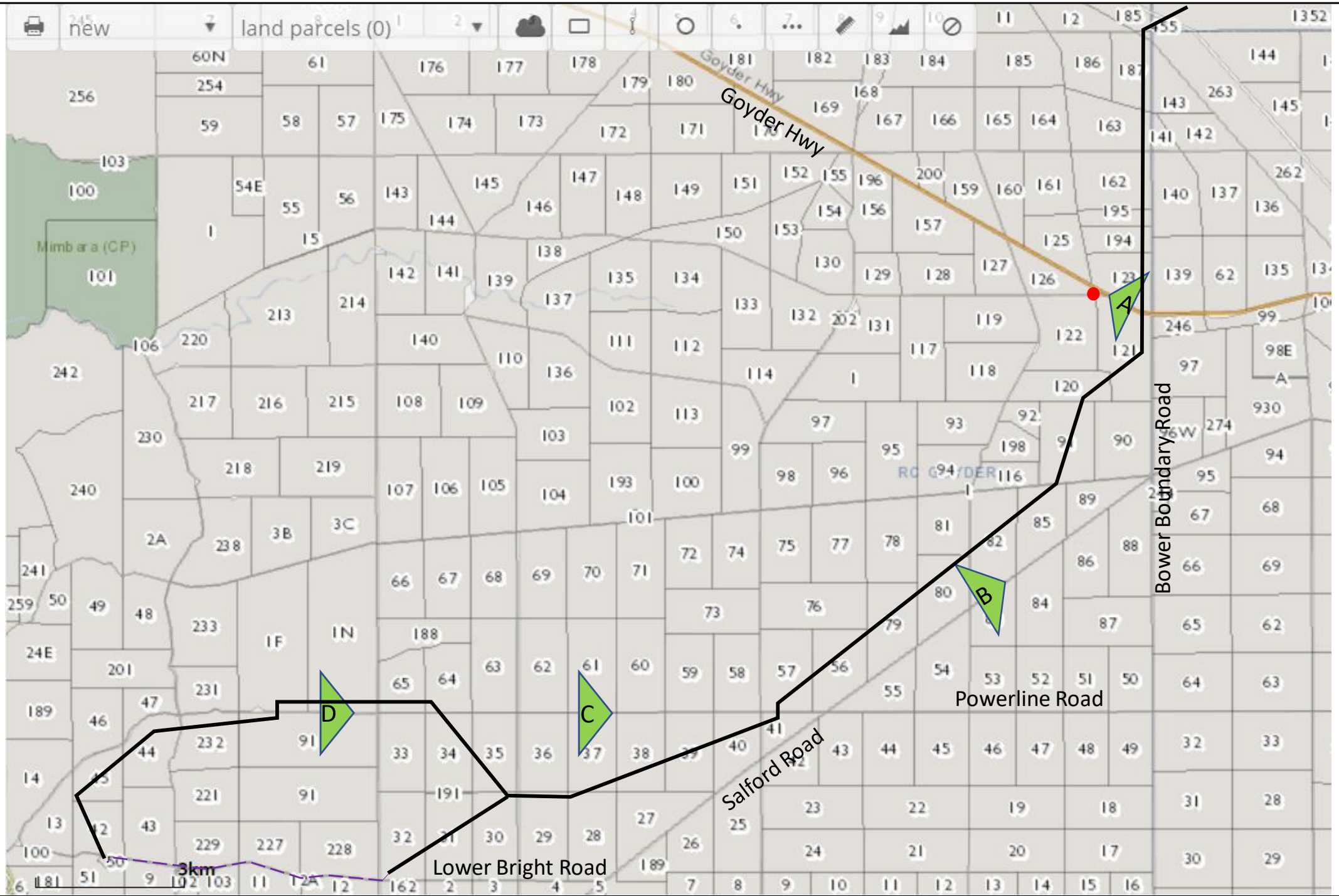
- Property Boundary
- Solar Panel
- Maintenance and Battery Building
- 33/132/275kV Substation
- Fence
- Site Access
- Tracks

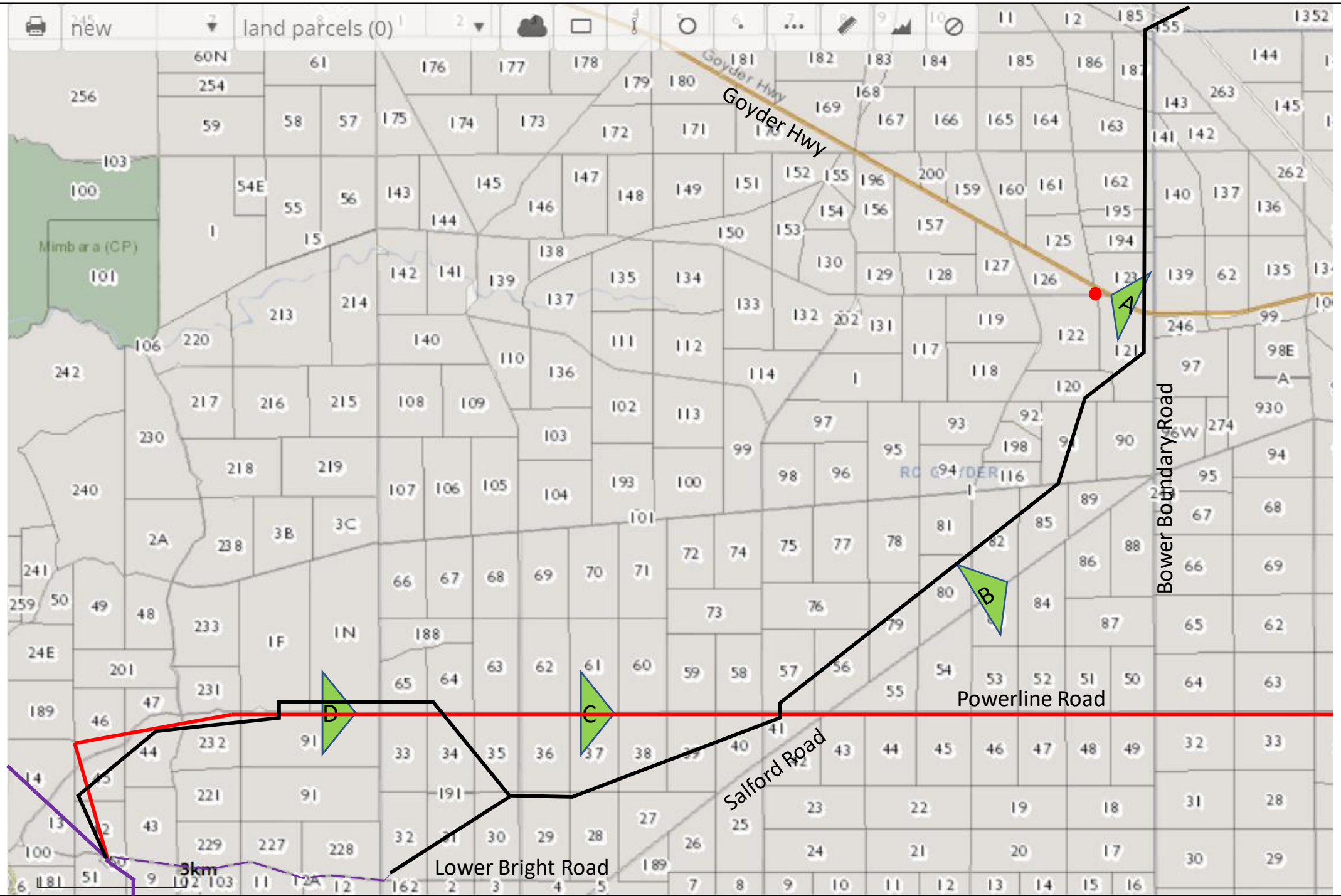





3


4


Goyder Hwy
Bower Boundary Road
Powerline Road
Salford Road
Lower Bright Road
Mimbara (CP)
A
B
C
D
3km
Proposed
OH Line
Underground line
Solar River Project


Goyder Hwy
Bower Boundary Road
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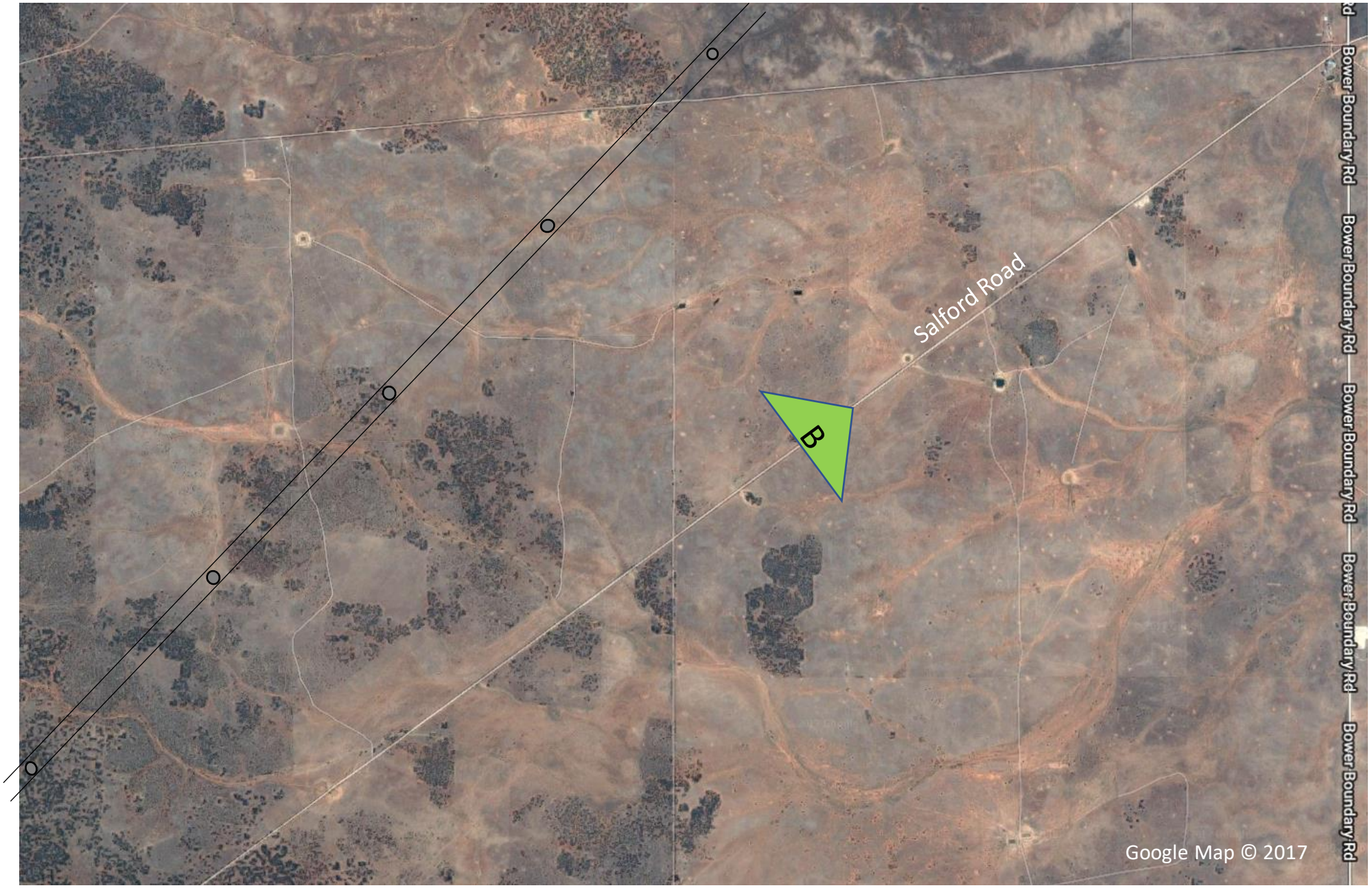
Lower Bright Road
3km
A
B
C
D
Proposed
OH Line
Underground line
Existing
132kV line
275kV line

Solar River Project



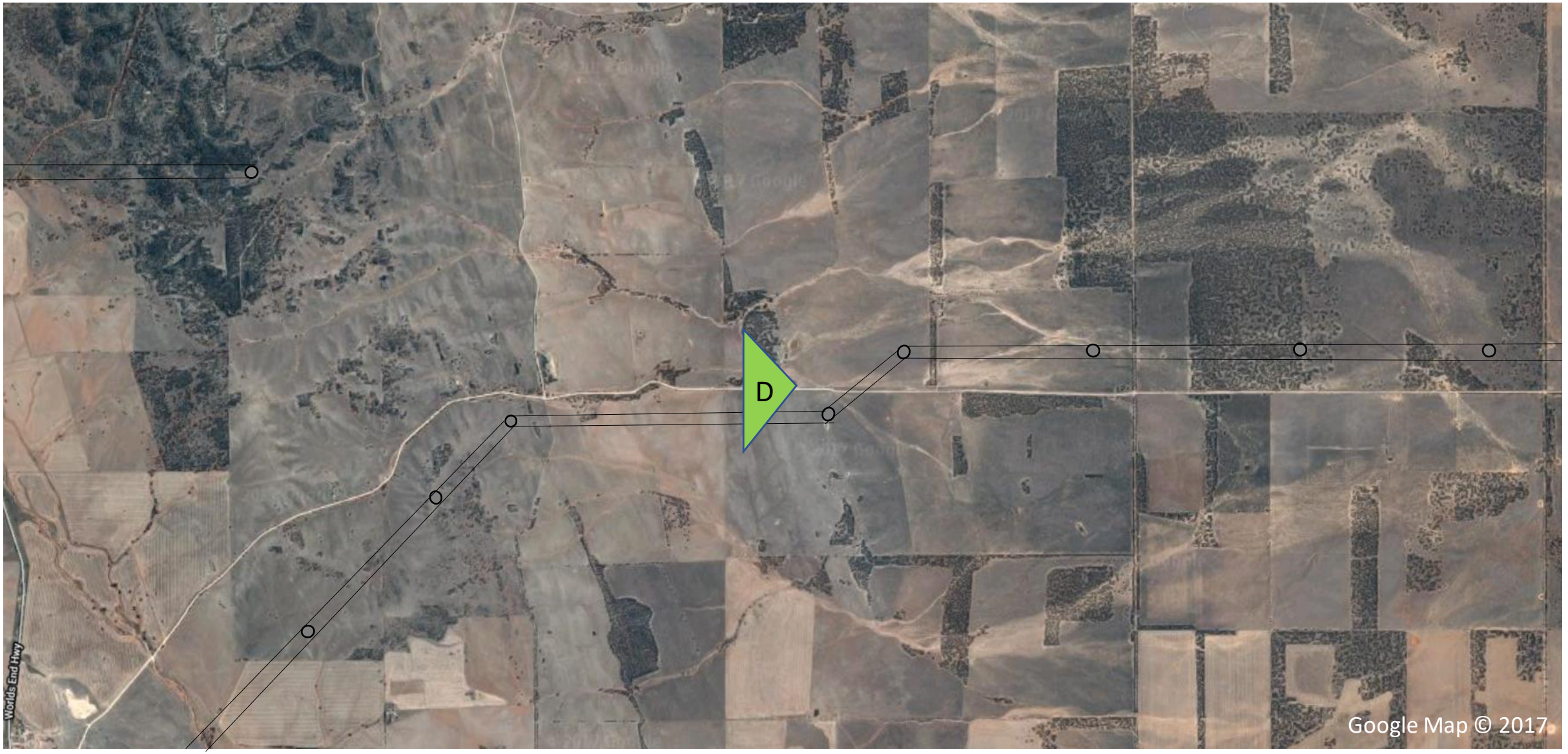
View from Salford Road

View Along Salford Road

View Powerline Road

C

View Crossing Powerline Road



View Powerline Road

D

View Adjacent Powerline Road

Note:

1. Care has been taken to avoid sensitive areas. Detailed design will consider and avoid sensitive areas.
2. For road safety and reduced visual impact care has been taken to avoid poles road ways.
3. Care has been taken to avoid homes and native vegetation.
4. There are No poles located on public roads.
5. The line will be constructed 100% on private land average distance half a kilometre from any public road.
6. The line avoids all residential dwellings.
7. The line will be constructed in an area with two existing transmission lines.
8. The line has been design to limit visual impact from public road or public vantage points.
9. Effected land owners have been consulted.
10. The poles will be grey in colour.
11. View shed at road crossings included in the attached.
12. The Array is not visible to the general public.

ebs ecology

Solar River Project

Flora and Fauna Assessment

Solar River Project Flora and Fauna Assessment

1 December 2017

Version 2

Prepared by EBS Ecology for May Bros & Co

Document Control					
Revision No.	Date issued	Authors	Reviewed by	Date Reviewed	Revision type
1	30/11/2017	Dr M. Louter	A. Derry	30/11/2017	Draft
2	01/12/2017	Dr M. Louter	-	-	Final

Distribution of Copies			
Revision No.	Date issued	Media	Issued to
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EBS Ecology Project Number: G71102

CITATION: EBS Ecology (2017). Solar River Project Flora and Fauna Assessment. Report to May Bros & Co. EBS Ecology, Adelaide.

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http://www.ebsecology.com.au
email: info@ebsecology.com.au

GLOSSARY AND ABBREVIATION OF TERMS

BDBSA	Biological Databases of South Australia
CP	Conservation Park
DA	Development Application
DEWNR	Department of Environment, Water and Natural Resources (SA Government)
DOE	Department of the Environment (Australian Government)
DOEE	Department of the Environment and Energy (previously DOE) (Australian Government)
DPTI	Department of Planning, Transport and Infrastructure (SA Government)
EBS	EBS Ecology
EPC	Engineering, Procurement and Construction
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
ha	Hectares
HV	High Voltage
LGA	Local Government Area
MW	Mega Watt
MWh	Megawatt hour
NPW Act	*National Parks and Wildlife Act 1972*
NVC	Native Vegetation Council
PV	Photovoltaic
SA	South Australia
SEB	Significant Environmental Benefit
spp.	Species (plural)
SRP	Solar River Project
ssp.	Subspecies
WoNS	Weed of National Significance

EXECUTIVE SUMMARY

EBS Ecology (EBS) was engaged by May Brothers & Co to review a preliminary desktop assessment completed by the proponent, and to conduct a desktop flora and fauna assessment for the Solar River Project (SRP). The assessment will provide ecological information to determine if there are any gaps, and propose the best method to ground truth the project site during future field surveys.

The report presents (1) a summary of the results of a preliminary desktop assessment conducted by May Brothers & Co; and (2) the results of a desktop study assessment, which are gathered from DEWNR databases. The database searches determine the potential presence of species or habitats listed as threatened and or migratory under the *Environment Protection and Biodiversity Conservation* (EPBC) *Act* and *National Parks and Wildlife* (NPW) *Act*. The likelihood of occurrence within the Project area for each EPBC Act and NPW Act listed species identified on the database was then assessed based on the species distribution, habitat availability, date of last record and the conspicuousness of the species. Further assessment including field survey is recommended to ground-truth these results and confirm presence or absence of threatened species and habitats.

An EPBC Protected Matters search report was generated, which lists matters of national environmental significance, listed under Commonwealth legislation (*Environment Protection and Biodiversity Conservation Act 1999*). A BDBSA search was also undertaken, which lists matters of State environmental significance, listed under South Australian legislation.

Flora

Native vegetation including grassland and chenopod shrubland is present within the SRP Project area, as determined by the preliminary desktop assessment by May Brothers & Co. The Project area is located within the South Australian Murray Darling Basin Natural Resources Management Board region, which is subject to the *Native Vegetation Act 1991* and *Native Vegetation Regulations 2017*. Principally, it is recommended to avoid any clearance of native vegetation. A native vegetation clearance application will be required for any areas with native vegetation, including degraded areas.

Two Threatened Ecological Communities (TECs) were identified in the 10 km EPBC search. The Nationally Endangered Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions and the Nationally Critically Endangered Peppermint Box (*Eucalyptus odorata*) Grassy Woodland of South Australia are potentially occurring within the SRP Project area. These TECs were not previously identified in the ecological impacts assessed by May Brothers & Co. It is recommended that the presence of TECs is ground truthed by undertaking a targeted vegetation survey, in particular in areas with remaining native vegetation.

The 10km EPBC database search identified one nationally listed flora species, *Codonocarpus pyramidalis* (Slender Bell-fruit, Camel Poison), under the EPBC Act, as potentially occurring or having suitable habitat potentially occurring within the SRP project boundary. *C. pyramidalis* (Slender Bell-fruit, Camel Poison) is nationally listed as Vulnerable and occurs as scattered individuals across areas of the Flinders Ranges, Northern Lofty Ranges and the eastern regions of SA, such as within the Murray Darling Basin, Eyre Peninsula, Yorke and Adelaide.

No state conservation rated flora species were identified in the BDBSA Search within 10 km of the SRP Project area.

Fauna

The results of the 10 km EPBC search identified a total eleven EPBC listed fauna species as potentially occurring or having habitat potentially occurring within the 10 km of the Project area, including eight bird, two fish and one mammal species. None of these species have BDBSA records within 10 km of the Project area.

Fifteen bird species listed as migratory under the EPBC Act were identified in the EPBC Protected Matters Report as potentially occurring or having habitat potentially occurring within the vicinity of the Project area. The Fork-tailed Swift (*Apus pacificus*) and the Cattle Egret (*Ardea ibis*) could possibly occur as occasional visitors to the Project area.

The BDBSA Search identified four state threatened fauna species with records within 10 km of the Project area, all of which were birds. None of the bird species identified in the EPBC and BDBSA search are likely to occur based on species records and known distribution, and lack of preferred habitat.

Weeds and other introduced species

The 10 km EPBC and BDBSA database searches identified 55 invasive species under the EPBC Act as potentially occurring or having suitable habitat potentially occurring within the SRP Project area, consisting of seven bird, nine mammal and 39 plant species.

Recommendations

Due to the limitations of this desktop assessment, it is recommended that targeted flora and fauna field assessments are implemented to ground truth and confirm the likelihood of occurrence of the threatened species and ecological communities, as identified within the BDBSA search and PMST. Results of targeted flora and fauna field assessments will further inform project planning to avoid or minimise impacts to vegetation, and to identify the risk to biodiversity associated with clearance activity for the construction of the proposed Solar River Project.

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1 INTRODUCTION

The Solar River Project (SRP) is the proposal of a 200MW Photovoltaic (PV) with an integration of a 20MWh battery system, located 110km North of Adelaide (Figure 1). The SRP is a key renewable energy and storage project which will deliver additional capacity of 200MW of clean renewable energy and 20MWh of grid connected advanced battery storage into South Australia, resulting in an emission saving of tonnes of carbon dioxide. The project will primarily consist of PV solar panel rows (set in large blocks), access tracks, inverters, a maintenance shed, and substation with electricity grid connection, site office and ablution facilities. This project is undertaken under new entity named *The Solar River Project Pty Ltd*.

EBS Ecology was engaged by May Brothers & Co to review a preliminary desktop assessment completed by the proponent, and to conduct a baseline flora and fauna desktop assessment of the SRP Project area to determine if there are any gaps, and propose the best method to ground truth the project site during future field surveys.

This report presents the findings of (1) a succinct review of a preliminary desktop assessment completed by the proponent; (2) a desktop environmental impact assessment including an EPBC Protected Matters Search and a Biological Database of South Australia (BDBSA) search; and (3) recommendations on the best field survey method to ground-truth target areas at the site in 2018.

1.1 Objectives

The objectives of the ecological impact assessment were to:

- Undertake database searches (EPBC Protected Matters and Biological Databases of South Australia, NatureMaps and Atlas of Living Australia) for the area that may be impacted by the proposed works;
- Review existing biological surveys undertaken in the area;
- Review existing mapping data (vegetation communities, vegetation condition and aerial photographs);
- Review existing information on flora and fauna species likely to occur in the area;
- Conduct a review of biological databases to identify potential threatened species;
- Conduct background research of threatened species identified and determine if they are likely to occur within the Project area; and
- Use the information collated as part of the review, to confirm areas to target during future field surveys to ensure.

1.2 Project area

The proposed SRP Project area is located 110km North of Adelaide, South Australia which is 33km away from the nearest township, Robertstown (Figure 1). The SRP Project area is located in a high solar region on large allotments of pastoral land well suited to board acre PV installation and operation. The total land area is 5335 ha and is a perpetual lessee land; this is a single land parcel. The total development footprint will be significantly less than this area and is expected to be approximately 200ha, which will depend on the Engineering, Procurement and Construction (EPC) final design layout of the PV plant. The existing environment at the project site is characterised by vacant rural land.

Figure 1. Location of the SRP Project area.

2 COMPLIANCE AND LEGISLATIVE SUMMARY

2.1 Environment Protection and Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act* 1999 (EPBC Act) and *the Environment Protection and Biodiversity Conservation Regulations 2000* provide a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places – defined in the Act as 'matters of national environmental significance'. There are nine matters of national environmental significance protected under the EPBC Act:

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

Any action that has, will have, or is likely to have a significant impact on matters of national environmental significance requires referral under the EPBC Act. Substantial penalties apply for undertaking an action that has, will have or is likely to have significant impact on a matter of national environmental significance without approval.

The EPBC Act Significant Impact Guidelines provide overarching guidance on determining whether an action is likely to have a significant impact on a matter of national environmental significance. In terms of nationally threatened species, the guidelines define an action as likely to have a significant impact if there is a real chance or possibility that it will:

- lead to a long term decrease in the population;
- reduce the area of occupancy of the species;
- fragment an existing population;
- adversely affect critical habitat;
- disrupt breeding cycles;
- modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline;
- result in the establishment of invasive species that are harmful to the species;
- introduce disease that may cause the species to decline; and
- interfere with the recovery of the species.

This report includes an assessment of EPBC-listed threatened species, ecological communities and migratory species which are recognised as a matter of national environmental significance.

2.2 Native Vegetation Act 1991

The SRP Project area fall inside the area designated under the *Native Vegetation Act 1991*. Native vegetation within the Project area is protected under the *Native Vegetation Act 1991* and *Vegetation Regulations 2017.* Any proposed clearance of native vegetation in South Australia (unless exempt under the *Vegetation Regulations 2017*) is to be assessed against the Principles of Clearance under the Act, and requires approval from the Native Vegetation Council (NVC). A net environmental benefit is generally conditional on an approval being granted.

Native vegetation refers to any naturally occurring local plant species that are indigenous to South Australia, from small ground covers and native grasses to large trees and water plants.

“Clearance", in relation to native vegetation, means:

- the killing or destruction of native vegetation;
- the removal of native vegetation;
- the severing of branches, limbs, stems or trunks of native vegetation;
- the burning of native vegetation; and
- any other substantial damage to native vegetation, and includes the draining or flooding of land, or any other act or activity, that causes the killing or destruction of native vegetation, the severing of branches, limbs, stems or trunks of native vegetation or any other substantial damage to native vegetation.

Approval must be obtained before performing any activity that could cause substantial damage to native plants. This also applies to dead trees that may provide habitat for animals. These activities include but are not limited to:

- the cutting down, destruction or removal of whole plants;
- the removal of branches, limbs, stems or trunks (including brush cutting and woodcutting);
- burning;
- poisoning;
- slashing of understorey;
- drainage and reclamation of wetlands; and
- grazing by animals (in some circumstances).

Under the *Native Vegetation Act 1991*, the NVC considers applications to clear native vegetation under ten principles. Native vegetation should not be cleared if it is significantly at odds with these principles:

- it contains a high level of diversity of plant species;
- it is an important wildlife habitat;
- it includes rare, vulnerable or endangered plant species;
- the vegetation comprises a plant community that is rare, vulnerable or endangered;

- it is a remnant of vegetation in an area which has been extensively cleared;
- it is growing in, or association with, a wetland environment;
- it contributes to the amenity of the area;
- the clearance of vegetation is likely to contribute to soil erosion, salinity, or flooding;
- the clearance of vegetation is likely to cause deterioration in the quality of surface or underground water; and
- after clearance, the land is to be used for a purpose which is unsustainable.

The principles apply in all cases, except where the vegetation has been considered exempt under the *Native Vegetation Regulations 2017* or can be classified as an 'intact stratum'. 'Intact stratum' means that applications will usually be denied when the vegetation has not been seriously degraded by human activity within the last 20 years.

All approved vegetation clearance must also be conditional on achieving a Significant Environmental Benefit (SEB) to offset the clearance. The requirement for a SEB also applies to several of the exemptions. Potential SEB offsets include:

- the establishment and management of a set-aside area to encourage the natural regeneration of native vegetation;
- the protection and management of an established area of native vegetation;
- entering into a Heritage Agreement on land where native vegetation is already established to further preserve or enhance the area in perpetuity; and
- a payment to the Native Vegetation Fund.

The proposed SRP project would likely fall under *Native Vegetation Regulation* **Exemption 5(1)(d) Building or provision of infrastructure, including infrastructure in the Public Interest** (see below). Even if this is the case, an application is still required to the Native Vegetation Council (NVC).

Regulation 5(1) (d) Building or provision of infrastructure, including infrastructure in the Public Interest

Pursuant to Section 27(1) (b) of the Act, native vegetation may, subject to any other Act or law to the contrary, be cleared if-

(i)

(A) the clearance is incidental to the construction or expansion of a building or infrastructure, and the Minister has, by instrument in writing, declared that he or she is satisfied that the clearance is in the public interest; or

(B) the clearance is required in connection with the provision of infrastructure or services to a building or proposed building, or to any place; and

(ii) any development authorisation required by or under the *Development Act 1993* has been obtained; and

(iii) the Council is satisfied (on the basis of information provided to the Council by the person seeking the benefit of this paragraph and such other information as the Council thinks fit) that, after taking into account the need to preserve biological diversity and the nature and purposes of any proposed building or infrastructure that is yet to be constructed, the proposed Project area of the building or infrastructure is the most suitable that is available; and

(iv) the Council is satisfied (on the basis of information provided to the Council by the person seeking the benefit of this paragraph and such other information as the Council thinks fit) that there is no other practicable alternative that would involve no clearance or the clearance of less vegetation or the clearance of vegetation that is less significant or (if relevant) the clearance of vegetation that has been degraded to a greater extent than the vegetation proposed to be cleared; and

(v) the clearance is undertaken in accordance with a standard operating procedure determined or approved by the Council for the purposes of this provision or a management plan that has been approved by the Council, and either -

(A) there will be a significant environmental benefit on the property where the clearance is being undertaken or within the same region of the State; or

(B) either the owner of the land (or a person acting on his or her behalf); or person connected with the construction or expansion of the building or infrastructure, or the provision of the infrastructure or services (as the case requires), has an application to the Council to proceed with clearing the vegetation in accordance with this provision, made a payment into the Fund of an amount considered by the Council to be sufficient to achieve a significant environmental benefit in the manner contemplated by section 21(6) of the Act.

2.3 National Parks and Wildlife Act 1972

Native plants and animals in South Australia are protected under the *National Parks and Wildlife Act 1972* (NPW Act). It is an offence to take a native plant or protected animal without approval. Threatened plant and animal species are listed in Schedules 7 (endangered species), 8 (vulnerable species) and 9 (rare species) of the Act. Persons must not:

- take a native plant on a reserve, wilderness protection area, wilderness protection zone, land reserved for public purposes, a forest reserve or any other Crown land.
- take a native plant of a prescribed species on private land.
- take a native plant on private land without the consent of the owner (such plants may also be covered by the *Native Vegetation Act 1991*).
- take a protected animal or the eggs of a protected animal without approval.
- keep protected animals unless authorised to do so.
- use poison to kill a protected animal without approval.

2.4 Natural Resources Management Act 2004

Under the *Natural Resources Management Act 2004* (NRM Act) landholders have a legal responsibility to manage declared pest plants and animals and prevent land and water degradation.

Key components under the Act include the establishment of regional Natural Resource Management (NRM) Boards and development of regional NRM Plans; the ability to control water use through prescription, allocations and restrictions; requirement to control pest plants and animals and activities that might result in land degradation.

A ‘duty of care’ is a fundamental component of this Act, i.e. ensuring one’s environmental and civil obligation by taking reasonable steps to prevent land and water degradation. Persons can be prosecuted if they are considered negligent in meeting their obligations.

3 BACKGROUND INFORMATION

3.1 Environmental setting

3.1.1 Interim Biogeographical Regionalisation of Australia (IBRA) zones and remnancy

The Interim Biogeographical Regionalisation of Australia (IBRA) identifies geographically distinct bioregions based on common climate, geology, landform, native vegetation and species information. The bioregions are further refined into subregions and environmental associations. Native vegetation remnancy figures for IBRA subregions and environmental associations are used to assess and plan for the protection of biodiversity (DEWNR 2011). The Project area is located within the Murray Darling Depression (MDD) IBRA bioregion and the Breamer sub-region (Table 1). Approximately 100% (957367 ha) of the Breamer subregion is mapped as remnant native vegetation, of which 0% (3461 ha) is formally conserved.

Table 1. IBRA bioregion, subregion, and environmental association environmental landscape summary.

Murray Darling Depression IBRA bioregion	
An extensive gently undulating sand and clay plain of Tertiary and Quaternary age frequently overlain by aeolian dunes. Vegetation consists of semi-arid woodlands of Black Oak / Belah, Bullock Bush/ Rosewood and Acacia spp., mallee shrublands and heathlands and savanna woodlands.	
Breamer IBRA subregion	
Remnant vegetation	Approximately 100% (957367 ha) of the subregion is mapped as remnant native vegetation, of which 0% (3461 ha) is formally conserved.
Landform	Plains with variable dune cover, from dune formations with relatively small plains between to plains with isolated tracts of dunes. Claypans, saline soils, swamps, and intermittent lakes in low-lying areas.
Geology	Exposed caliche & crusty loamy soils; colluvial sand, silt, clay & gravel along footslopes of Olay Spur. Evaporite deposits; gypsum & halite.
Climate	Semi-arid climate that is too dry to support field crops. Soil moisture tends to be greatest in winter.
Soil	Brown calcareous earths, Highly calcareous loamy earths, Cracking clays, yellow grey, Hard setting loamy soils with red clayey subsoils.
Vegetation	Chenopod shrubland.
Conservation significance	29 species of threatened fauna, 14 species of threatened flora. 0 wetlands of national significance.
Breamer Subregion - Associations Not Updated for IBRA Version 7.0 IBRA environmental association	

3.1.2 Administrative boundaries

The Project area is located within the South Australian Murray Darling Basin Natural Resources Management (NRM) Board region and falls within the PUA Local Government Area (LGA).

3.1.3 Protected areas

There are no conservation areas within 10 km of the Project area. The nearest three protected areas are:

- White Dam Conservation Park (CP), located 15 km southeast of the Project area;
- Mimbara CP, located 20 km southwest of the Project area; and
- RebBanks CP, located 22 km northwest of the Project area.

3.1.4 Topography

The existing environment at the Project area is characterised by vacant rural land. This part of the region is recognised as having a semi-arid climate. The regional topography is flat.

3.1.5 Climate

The most comprehensive available climate dataset in the vicinity of the SRP Project area is from Eudunda, approximately 35 km south-west of the Project area. Both rainfall and temperature follow a semi-arid to arid climate with hot, very dry summers and cool to mild, dry winters (Figure 2). Rainfall is low and unreliable, characterised by extremely infrequent heavy falls. The long-term mean annual rainfall for the area is 448.3 mm, with June through to August typically the wettest months. The data used to create the graph displayed in Figure 2 is provided by the Bureau of Meteorology (Commonwealth of Australia 2017).

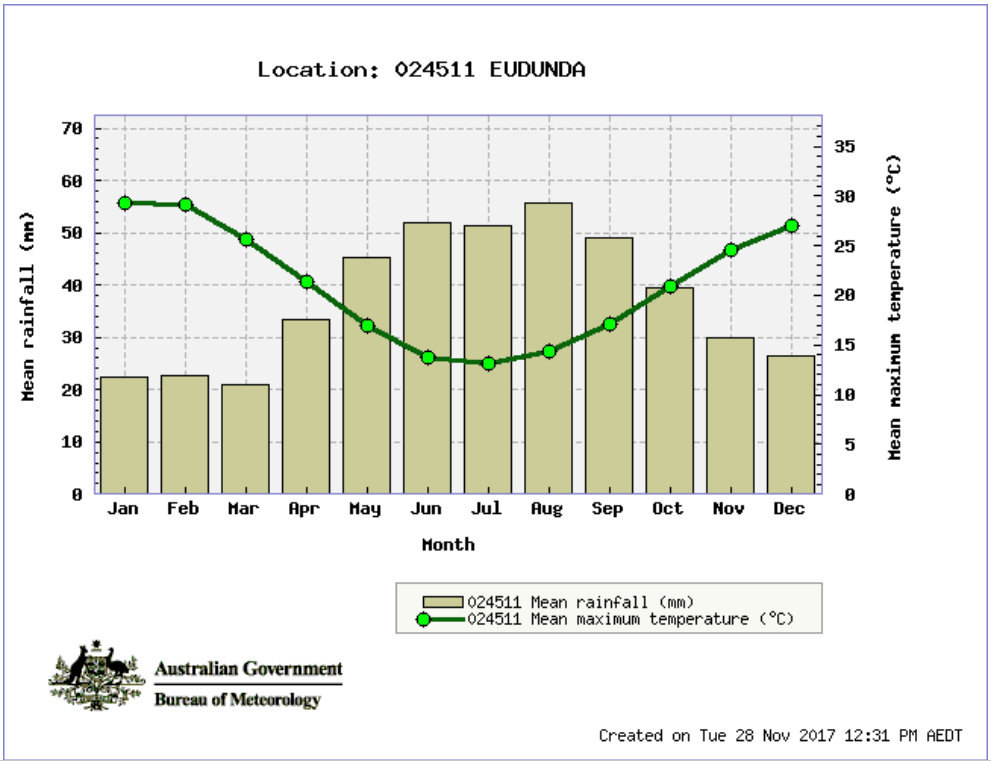


Figure 2. Long term means for temperature and rainfall for Eudunda (1880 to 2017).

4 METHODS

The methods used to undertake the environmental impact assessment for the proposed Solar River Project development are outlined below. Data-bases compiled and managed by Department of the Environment and Energy (DotEE), and Department of Environment, Water and Natural Resources (DEWNR) (South Australia) were consulted for existing information on flora and fauna in the vicinity of Project area.

The desktop ecological assessment was extended to the near surroundings of the proposed Solar River Project (the Project area) with a 10 km buffer zone. This area was assessed to (1) account for fauna movements; and (2) account for database search limitations (e.g. EPBC Online Protected Matters Search minimum search buffer is 1 km).

4.1 Desktop assessment

4.1.1 EPBC Act Protected Matters Search Tool (PMST)

The online EPBC Act Protected Matters Search Tool (PMST) maintained by the DotEE was used to generate a Protected Matters Report (data extracted on 27 November 2017) to identify matters of national environmental significance under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) that may occur or may have suitable habitat occurring within the Project area. A 10 km buffer was applied to the search.

4.1.2 Biological Database of South Australia (BDBSA) – NPW Act

A search of the Biological Database of South Australia (BDBSA) maintained by Department of Environment, Water and Natural Resources (DEWNR) was obtained (28/11/2017, *Recordset number DEWNRBDBSA171129-1*) to identify flora and fauna species previously recorded within 10 km of the Project area. The BDBSA is comprised of an integrated collection of corporate databases which meet DEWNR standards for data quality, integrity and maintenance. In addition to DEWNR biological data, the BDBSA also includes data from partner organisations (Birds Australia, Birds SA, Australasian Wader Study Group, SA Museum, and other State Government Agencies). The data are included under agreement with the partner organisation for ease of distribution, but they remain owners of the data and should be contacted directly for further information.

4.1.3 Assessment of the likelihood of occurrence

An assessment of the likelihood of each threatened flora and fauna species occurring within the 10 km buffer was undertaken. A likelihood of occurrence rating was assigned to each threatened species identified in the desktop database searches. This rating, 'Highly Likely', 'Likely', 'Possible' and 'Unlikely' takes the following criteria into consideration:

- date of the most recent record (taking into consideration the date of the last surveys conducted in the area);
- proximity of the records (distance to the Project area);

- landscape location of the records, vegetation remnancy and vegetation type of the record location (taking into consideration the landscape, remnancy and vegetation type of the Project area, with higher likelihood assigned to species that were found in similar locations/condition/vegetation associations); and
- knowledge of the species habitat preferences, causes of its decline, and local population trends. A summary of the likelihood criteria is shown below in Table 2.

Table 2. Likelihood criteria for the presence of threatened species.

Likelihood category	Criteria
Unlikely	No records despite survey effort considered adequate, or No records and survey effort is considered not adequate, and no suitable habitat is known to occur in the area, or No records and survey effort is not considered adequate, and no suitable is known to occur in the area, and species of similar habitat needs have no records either.
Possible	No records, survey effort is considered not adequate, suitable habitat does occur (or isn't known if it does occur) and species of similar habitat needs have been recorded in the area, or Records within the last 40 years, and the area is not largely intact, or Records in the last 10 years, the species does not have highly specific needs, and habitat is largely intact.
Likely	Records in the last 10 years, the species does not have highly specific habitat needs and the habitat is largely intact, or Records in the last 10 years, the species does have highly specific habitat needs and these needs occur in the area.
Highly likely/Known	Records in the last 10 years, the species does not have highly specific needs, and the habitat is largely intact.

4.2 Limitations

The content of this report was derived from a desktop assessment using existing datasets and references from a range of sources. EBS Ecology has not attempted to verify the accuracy of any such information.

Flora and fauna records were sourced from the EPBC Act Protected Matters Search Tool (PMST) and Biological Database of South Australia (BDBSA). The BDBSA only includes verified flora and fauna records submitted to DENWR or partner organisations. It is recognised that knowledge is poorly captured and it is possible that significant species occur that are not reflected by database records. Although much of the BDBSA data has been through a variety of validation processes, the lists may contain errors and should be used with caution. DENWR give no warranty that the data is accurate or fit for any particular purpose of the user or any person to whom the user discloses the information.

EPBC protected matters records and BDBSA flora and fauna records were limited to a 10 km buffer around the Project area. The reliability of the BDBSA data ranges from 100 m to over 100 km. Fauna species, in particular birds, also have the ability to traverse distances in excess of 20 km. It is also acknowledged that the presence of species may not be adequately represented by database records. Hence the EPBC and BDBSA results may not highlight all potential threatened flora and fauna species that may occur in the area, within a 10 km radius.

It is difficult to comment on the likelihood of occurrence of threatened species without observing the condition of vegetation within the Project area and along the proposed transmission corridors. A precautionary approach has therefore been adopted, with reference to existing EPBC and BDBSA records and native vegetation cover.

The findings and conclusions expressed by EBS Ecology are based solely upon information in existence at the time of the assessment. The combination of database records and background research have provided a solid foundation for determining the flora and fauna that are likely to, or are known to, occur within the SRP Project area.

5 RESULTS

5.1 Summary of preliminary desktop assessment

A preliminary desktop assessment (completed by the proponent as part of the Development Application (DA) for the Solar River Project) was based on DEWNR flora and fauna records (Natural Resources SA Murray-Darling Basin) within a 6km buffer of the SRP Project area.

Flora

The desktop assessment identified that *Maireana sedifolia* (Pearly Bluebush) low open shrubland, less than 1m in height, is the predominant vegetation type across the project site. The environmental description for this area is Hill foot slopes; Stony rises with shales and ironstone. The Vegetation description of plants in the area is *Maireana sedifolia*, *Maireana pyramidata* low open shrubland over *Sclerolaena obliquicuspis*, *Eriochiton sclerolaenoides*, *Carrichtera annua*, *Austrostipa scabra* ssp., and *Rhodanthe pygmaea*. Associated chenopod species on the plains and rises include bladder saltbush (*Atriplex vesicaria*) and black bluebush (*Maireana pyramidata*). Drainage areas have low open shrublands of black bluebush, or Australian boxthorn (*Lycium autrale*) and nitre-bush (*Nitraria billardiera*). Areas of black oak (*Casuarina pauper*) low open woodland with sugarwood (*Myoporum platycarpum*) and an understorey of pearl bluebush and spinebush (*Acacia nyssophylla*) are scattered throughout the zone. Patches of open grassland dominated by spear-grass species (*Stipa* spp.) are common, and grasses and herbs also provide ground cover between the chenopod shrubs.

The few vegetation types that where observed within the Project area during the previous preliminary field survey are shown in Appendix 1 (Figure 4 to Figure 9). The plains lack the density of chenopod shrubs found on the pediment slopes, instead they support heavy grass cover in open areas between the shrubs, as shown in Appendix 1 (Figure 5 and Figure 7).

Fauna

The preliminary desktop assessment identified that habitat value across the site is variable, with the heavily disturbed shrubland areas providing limited habitat for fauna. The shrublands in the area support a small range of fauna species, including reptiles, small terrestrial mammals, bats, larger mammals such as wombats and kangaroos and a number of bird species.

The preliminary desktop assessment identified that eight bird species of conservation significance were likely to occur in chenopod shrublands and grasslands of the SRP Project area:

- *Ardeotis australis* (Australian bustard);
- *Climacteris affinis* (White-browed Treecreeper);
- *Falco peregrinus* (Peregrine Falcon);
- *Melanodryas cucullata* (Hooded Robin);
- *Neophema chrysostoma* (Blue Winged Parrot);
- *Northiella haematogaster* (Bluebonnet);

- *Pyrrholaemus brunneus* (Redthroat); and
- *Pedionomus torquatus* (Plains wanderer).

A number of migratory bird species have also been recorded and have been advised by DEWNR or are predicted to occur in the broader region.

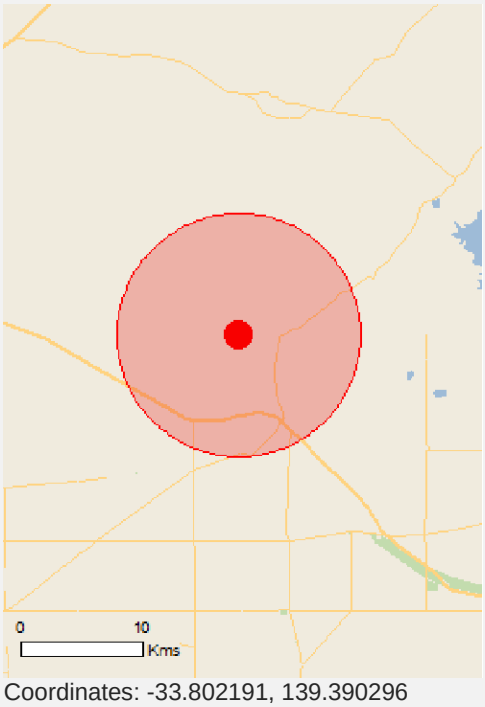
The preliminary desktop assessment identified that four mammal species of conservation significance were likely to occur in chenopod shrublands and grasslands of SRP Project area:

- *Sminthopsis murina* (Common Dunnart);
- *Sminthopsis crassicaudata* (Fat-tailed Dunnart);
- *Lasiorhinus latifrons* (Southern Hairy-nosed Wombat); and
- *Chalinolobus picatus* (Little Pied Bat).

5.2 Protected matters of national environmental significance

The EPBC Protected Matters Report (data extracted on 27/11/2017) identified 11 threatened species, 10 migratory species, and two nationally Threatened Ecological Communities (TEC's) protected under the EPBC Act that may be relevant to the Project area (DotEE 2017). The results of the EPBC Protected Matters Report are summarised in Table 3 and the relevant matters of national environmental significance are further discussed below. Any listed marine species are likely to be oceanic and are not likely to be affected by the development of the proposed project. These oceanic species are not discussed further.

Table 3. Summary of the results of the EPBC Act Protected Matters Search (10 km buffer).

Search area (10 km buffer around Project area)	Matters of National Environment Significance under the EPBC Act 1999	Identified within the search area
 Coordinates: -33.802191, 139.390296 (Lat/Long)	World Heritage Properties	None
	National Heritage Properties	None
	Wetlands of International Significance	1
	Great Barrier Reef Marine Park	None
	Commonwealth Marine Areas	None
	Threatened Ecological Communities	2
	Threatened Species	11
	Migratory Species	10
	Commonwealth Land	None
	Commonwealth Heritage Places	None
	Listed Marine Species	15
	Whales and other Cetaceans	None
	Critical Habitats	None
	Commonwealth Reserves Terrestrial	None
	Commonwealth Reserves Marine	None
	State and Territory Reserves	none
	Regional Forest Agreements	None
	Invasive Species	23
	Nationally Important Wetlands	None

Search area (10 km buffer around Project area)	Matters of National Environment Significance under the EPBC Act 1999	Identified within the search area
	Key Ecological Features (Marine)	None

5.2.1 Wetlands of international importance

The Coorong, and lakes Alexandrina and Albert wetland is located 150 - 200km upstream from the SRP Project area and therefore no environmental impact is expected.

5.2.2 Threatened ecological communities

Two Threatened Ecological Communities (TECs) were identified in the Protected Matters Search. A summary of the two TEC's and comments regarding their likelihood of occurrence within the Project area is provided in Table 4. They are further discussed below.

Table 4. Threatened ecological communities in the SRP Project area and the likelihood of their presence, as identified in the Protected Matters Search Tool.

Threatened Ecological Community	EPBC Status	Likelihood of occurrence within SRP Project area
1. Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions	Endangered	Possibly
2. Peppermint Box (*Eucalyptus odorata*) Grassy Woodland of South Australia	Critically Endangered	Possibly

Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions

The ecological community is listed as Endangered under the EPBC Act. The nominated woodland's component communities are generally characterised as woodland or open woodland with a well-developed ground stratum that is usually grassy, but also includes many subshrubs and herbs; some component communities have understoreys that are predominantly shrubby or herbaceous (Thackway and Cresswell 1995). Most component communities lack a well-developed tall shrub layer. Buloke is common to all component communities, but slender cypress-pine and grey box may be structurally dominant in some. Native grasses often include wallaby grasses, *Danthonia* spp., and spear grasses, *Austrostipa* spp. (Thackway and Cresswell 1995). The woodlands have been extensively cleared in the past, and the remnants that survive face ongoing major threats from incremental clearance, grazing by rabbits and stock, invasion by exotic plants, weedicide application and fertiliser drift. The community is poorly represented in conservation reserves throughout its range.

Peppermint Box (*Eucalyptus odorata*) Grassy Woodland of South Australia

This TEC is listed as Critically Endangered Community under the EPBC Act. It was listed as Critically Endangered in 2007, due to a severe decline in distribution and an ongoing loss of integrity. The dominant tree species is *Eucalyptus odorata*, however, other species of Eucalypt commonly co-occur. A grassy understorey is most often present, although some shrubs may exist such as *Bursaria spinosa* (Sweet Bursaria) and *Acacia pycnantha* (Golden Wattle). The majority of remnants occur between Victor Harbor and Port Augusta, encompassing the mid-north region, as well as the Adelaide region, Mount Lofty Ranges

and part of Yorke Peninsula. The key threats to this community are clearing, grazing and invasion by weeds (DEWNR 2017).

5.2.3 Threatened flora

The PMST identified one EPBC listed flora species as potentially occurring or having habitat potentially occurring within the 10 km of the Project area: *Codonocarpus pyramidalis* (Slender Bell-fruit, Camel Poison). *C. pyramidalis* is nationally listed as Vulnerable. This flora species occurs as scattered individuals across areas of the Flinders Ranges, Northern Lofty Ranges and the eastern regions of SA such as within the Murray Darling Basin, Eyre Peninsula, Yorke and Adelaide. It grows along the crests of hills and ridges, slopes and along creeks, where the soil is either a loamy sand, or sandy clay loam, or where the pH is between 8.5–9. Throughout its range it is never common and only scattered trees are to be found. The study area is located within the current distribution of *C. pyramidalis* (assessed on the Atlas of Living Australia (ALA), accessed on 27/11/2017) and therefore it is possible that this species occurs within the Project area.

5.2.4 Threatened fauna

The PMST identified a total eleven EPBC listed fauna species as potentially occurring or having habitat potentially occurring within the 10 km of the Project area (Table 5). This includes eight bird, two fish and one mammal species. None of these species have BDBSA records within 10 km of the Project area. None of the bird species identified are likely to occur based on species records and known distribution, and lack of preferred habitat.

Table 5. Threatened fauna species identified by EPBC Protected Matters Search Tool as possibly occurring within the Project area.

Scientific name	Common name	Conservation status		Likelihood of occurrence within Project area
		Aus	SA	
Aves				
1. *Apus pacificus*	Pacific Swift (Fork-tailed Swift)	VU, M		Possible
2. *Calidris ferruginea*	Curlew Sandpiper	CE, MiW, M		Unlikely
3. *Grantiella picta*	Painted Honeyeater	VU	V	Unlikely
4. *Leipoa ocellata*	Malleefowl	VU	V	Unlikely
5. *Numenius madagascariensis*	Far Eastern Curlew	CE, MiW, M	V	Unlikely
6. *Pedionomus torquatus*	Plains-wanderer	CE	E	Unlikely
7. *Pezoporus occidentalis*	Night Parrot	EN	E	Unlikely
8. *Rostratula australis*	Australian Painted-snipe	EN	V	Unlikely
Fish				
9. *Galaxias rostratus*	Flathead Galaxias	CE		Unlikely
10. *Maccullochella peelii*	Murray Cod	VU		Unlikely
Mammalia				
11. *Nyctophilus corbeni*	Corben's Long-eared Bat	VU	V	Unlikely

Aus: Australia (*Environment Protection and Biodiversity Conservation Act 1999*). **SA**: South Australia (*National Parks and Wildlife Act 1972*). Conservation Codes: **CE**: Critically Endangered. **EN/E**: Endangered. **VU/V**: Vulnerable. **R**: Rare. **Mi**: Migratory (**Ma**: Marine, **T**: Terrestrial, **W**: Wetland).

5.2.5 Migratory fauna

Fifteen bird species listed as migratory under the EPBC Act were identified in the EPBC Protected Matters Report as potentially occurring or having habitat potentially occurring within the vicinity of the Project area (Table 6). The Fork-tailed Swift (*Apus pacificus*) and the Cattle Egret (*Ardea ibis*) could possibly occur as occasional visitors to the Project area. Listed Marine species have not been listed as the rating is only relevant to Commonwealth Marine areas, which is not relevant to the project.

Table 6. Threatened fauna species identified by EPBC Protected Matters Search Tool as possibly occurring within the Project area.

Scientific name	Common name	Conservation status		Likelihood of occurrence within Project area
		Aus	SA	
1. *Actitis hypoleucos*	Common Sandpiper	MiW, M	R	Unlikely
2. *Apus pacificus*	Pacific Swift (Fork-tailed Swift)	VU, M		Possible
3. *Ardea alba*	Great Egret	M		Unlikely
4. *Ardea ibis*	Cattle Egret	M	R	Possible
5. *Calidris acuminata*	Sharp-tailed Sandpiper	M		Unlikely
6. *Calidris ferruginea*	Curlew Sandpiper	CE, MiW, M		Unlikely
7. *Calidris melanotos*	Pectoral Sandpiper	MiW, M	R	Unlikely
8. *Gallinago hardwickii*	Latham's Snipe	MiW, M	R	Unlikely
9. *Haliaeetus leucogaster*	White-bellied Sea-Eagle	M	E	Unlikely
10. *Merops ornatus*	Rainbow Bee-eater	M		Unlikely
11. *Motacilla cinerea*	Grey Wagtail	MiT, M		Unlikely
12. *Motacilla flava*	Yellow Wagtail	MiT, M		Unlikely
13. *Myiagra cyanoleuca*	Satin Flycatcher	MiT, M	E	Unlikely
14. *Numenius madagascariensis*	Far Eastern Curlew	CE, MiW, M	V	Unlikely
15. *Rostratula benghalensis*	Painted Snipe	M		Unlikely

Aus: Australia (*Environment Protection and Biodiversity Conservation Act 1999*). **SA**: South Australia (*National Parks and Wildlife Act 1972*). Conservation Codes: **CE**: Critically Endangered. **EN/E**: Endangered. **VU/V**: Vulnerable. **R**: Rare. **Mi**: Migratory (**Ma**: Marine, **T**: Terrestrial, **W**: Wetland).

5.3 Biological Database of South Australia (BDBSA)

This section provides a summary of the BDBSA search results for flora and fauna that are matters of state environment significance.

5.3.1 Flora

The BDBSA Search identified a total of 112 flora species as potentially occurring or having habitat potentially occurring within the vicinity of the Project area, including 79 native species and 33 introduced species (DEWNR 2017). A list of all the flora species recorded in the 10km BDBSA search can be found in Appendix 3.

No state conservation rated flora species were identified in the BDBSA Search within 10 km of the SRP Project area (DEWNR 2017).

5.3.2 Fauna

The BDBSA Search identified a total of 85 fauna species as potentially occurring or having habitat potentially occurring within the vicinity of the Project area, including 79 native species and six introduced species (DEWNR 2017). A list of all the fauna species recorded in the 10km BDBSA search can be found in Appendix 3.

The BDBSA Search identified four state threatened fauna species with records within 10 km of the Project area (Figure 3) (DEWNR 2017), all of which were birds. These species are shown in Table 7 with an assessment of their likelihood of occurrence within the Project area.

Table 7. Threatened fauna species identified from the BDBSA search.

Scientific name	Common name	Conservation status			Last sighting (year)	Likelihood of occurrence within Project area
		Aus	SA	Bioregion		
1. *Neophema chrysostoma*	Blue-winged Parrot		V	RA	1992	Unlikely
2. *Acanthiza iredalei*	Slender-billed Thornbill	ssp	R	EN	1992	Unlikely
3. *Neophema elegans*	Elegant Parrot		R	VU	2010	Unlikely
4. *Falco peregrinus*	Peregrine Falcon		R	RA	1990	Unlikely

Aus: Australia (*Environment Protection and Biodiversity Conservation Act 1999*). **SA:** South Australia (*National Park and Wildlife Act 1972*). **Conservation Codes: CE:** Critically Endangered. **EN/E:** Endangered. **VU/V:** Vulnerable. **R:** Rare. **ssp**: the conservation status applies at the sub-species level.

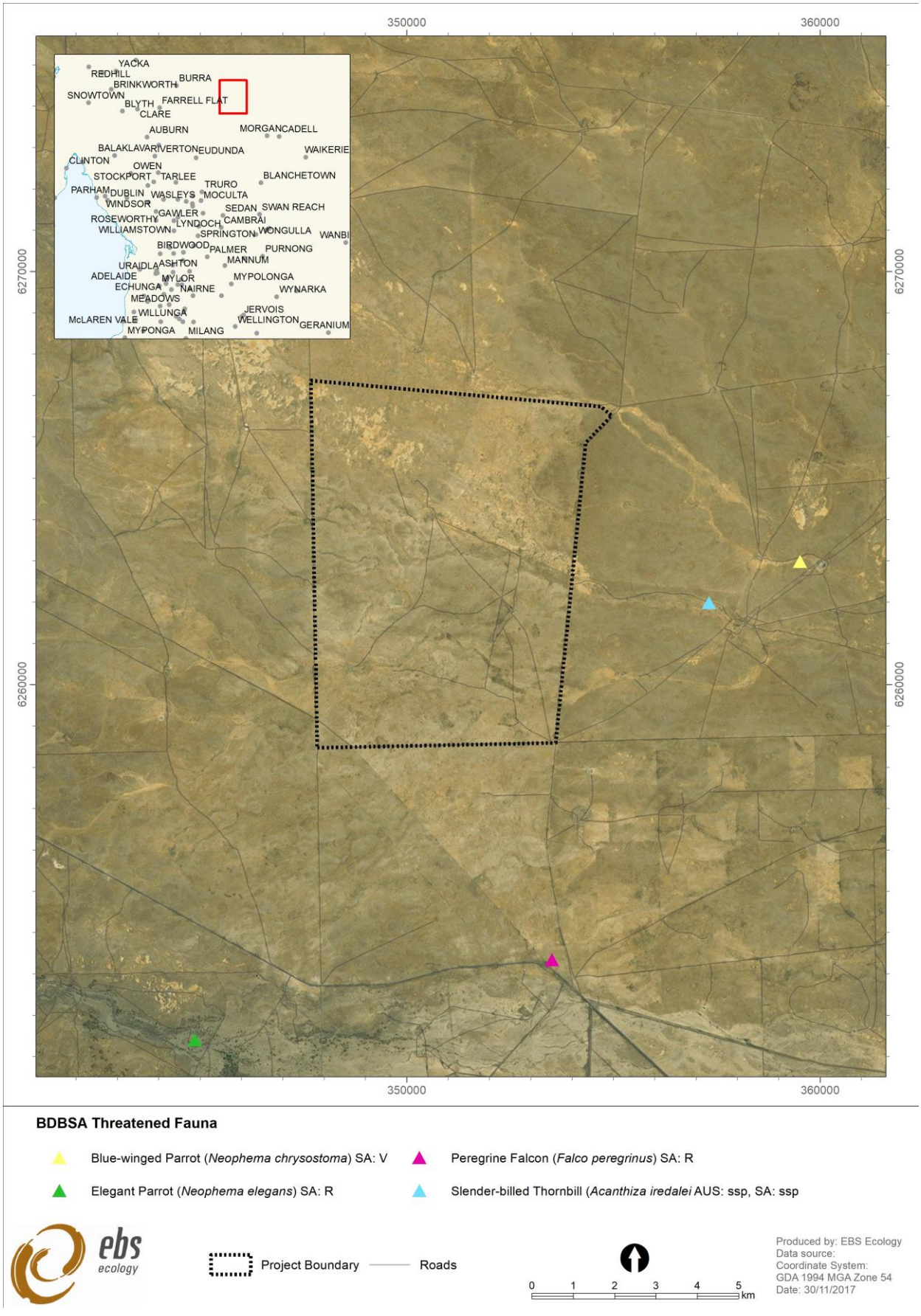


Figure 3. BDBSA search results: Threatened fauna species located in the vicinity of the Project area.

5.4 Weeds and other introduced species

The 10 km EPBC and BDBSA database searches identified 55 invasive species under the EPBC Act as potentially occurring or having suitable habitat potentially occurring within the SRP Project area (Table 8).

The 55 species consisted of:

- seven bird species;
- nine mammal species; and
- 39 plant species.

Five out of the 39 plant species are a declared as a Weed under the NRM, and the remaining 33 plant species are declared as a Weed of National Significance (WoNS) (Table 8).There are no *Phytophthora cryptogea*, or *Phytophthora cinnamomi* records within the Project area.

Table 8. Invasive species potentially occurring within the Project area.

Scientific name	Common name	Weed status	Source of information
PLANTS			
1. *Alyssum linifolium*	Flax-leaf Alyssum	WoNS	2
2. *Asparagus asparagoides*	Bridal Creeper	WoNS	1
3. *Asphodelus fistulosus*	Onion Weed	WoNS	2
4. *Austrocylindropuntia spp.*	Prickly Pears	WoNS	1
5. *Avena barbata*	Bearded Oat	WoNS	2
6. *Brassica sp.*		WoNS	2
7. *Carrichtera annua*	Ward's Weed	WoNS	1,2
8. *Carthamus lanatus*	Saffron Thistle	WoNS	2
9. *Chrysanthemoides monilifera*	Bitou Bush, Boneseed	WoNS	1
10. *Critesion sp. (NC)*	Barley-grass	WoNS	2
11. *Cylindropuntia spp*	Prickly Pears	WoNS	1
12. *Dittrichia graveolens*	Stinkweed	WoNS	2
13. *Echium plantagineum*	Salvation Jane	W	2
14. *Erodium cicutarium*	Cut-leaf Heron's-bill	WoNS	2
15. *Fumaria sp.*	Fumitory	WoNS	2
16. *Hordeum glaucum*	Blue Barley-grass	WoNS	2
17. *Hordeum vulgare*	Barley	WoNS	2
18. *Lagurus ovatus*	Hare's Tail Grass	WoNS	2
19. *Lycium ferocissimum*	African Boxthorn	W	1,2
20. *Malva parviflora*	Small-flower Marshmallow	WoNS	2
21. *Malvella leprosa*	Alkali Sida	W	2
22. *Marrubium vulgare*	Horehound	W	2
23. *Medicago sp.*	Medic	WoNS	2
24. *Mesembryanthemum nodiflorum*	Slender Iceplant	WoNS	2
25. *Nicotiana glauca*	Tree Tobacco	WoNS	2
26. *Olea europaea*	Common Olive	WoNS	1
27. *Oxalis pes-caprae*	Soursob	WoNS	2
28. *Peganum harmala*	African Rue	W	2
29. *Salix spp., except S.babylonica, S.x calodendron & S.x reichardtii*	Willows	WoNS	1
30. *Salvia verbenaca var.*	Wild Sage	WoNS	2
31. *Schinus molle*	Pepper-tree	WoNS	2
32. *Schismus barbatus*	Arabian Grass	WoNS	2
33. *Sisymbrium erysimoides*	Smooth Mustard	WoNS	2
34. *Sisymbrium irio*	London Mustard	WoNS	2

Scientific name	Common name	Weed status	Source of information
35. *Sisymbrium orientale*	Indian Hedge Mustard	WoNS	2
36. *Sisymbrium sp.*	Wild Mustard	WoNS	2
37. *Sonchus oleraceus*	Common Sow-thistle	WoNS	2
38. *Spergularia diandra*	Lesser Sand-spurrey	WoNS	2
39. *Triticum aestivum*	Wheat	WoNS	2
AVES			
1. *Alauda arvensis*	Skylark		1
2. *Carduelis*	European Goldfinch		1
3. *Columba livia*	Rock Pigeon		1
4. *Passer domesticus*	House Sparrow		1,2
5. *Streptopelia chinensis*	Spotted Turtle-Dove		1
6. *Sturnus vulgaris*	Common Starling		1,2
7. *Turdus merula*	Common Blackbird		1
MAMMALIA			
1. *Bos taurus*	Cattle (European Cattle)		1,2
2. *Capra hircus*	Goat (Feral Goat)		1,2
3. *Felis catus*	Domestic Cat		1
4. *Lepus capensis*	Brown Hare		1
5. *Mus musculus*	House Mouse		1
6. *Oryctolagus cuniculus*	Rabbit (European Rabbit)		1,2
7. *Ovis aries*	Sheep (Feral Sheep)		2
8. *Rattus*	Black Rat		1
9. *Vulpes*	Red Fox		1

Conservation status

Aus: Australia (Environment Protection and Biodiversity Conservation Act 1999). **SA**: South Australia (National Parks and Wildlife Act 1972). W: Declared NRM Act Weed - not for sale. WoNS: Weed of National Significance.

Source of Information

1. EPBC Act Protected Matters Report (data extraction 27/11/2017) – 10 km buffer applied to project boundary.
1. Biological Database of South Australia data extract (data extraction 28/11/2017) - 10 km buffer applied to project boundary.

6 RECOMMENDATIONS

6.1 Native vegetation clearance

The Project area is located within the South Australian Murray Darling Basin Natural Resources Management Board region, which is subject to the *Native Vegetation Act 1991* and *Native Vegetation Regulations 2017*. Principally, it is recommended to avoid any clearance of native vegetation. A native vegetation clearance application will be required for any areas with native vegetation, including degraded areas.

The existing environment at the project site is characterised by vacant rural land. Two nationally threatened TECs, the Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions and Peppermint Box (*Eucalyptus odorata*) Grassy Woodland of South Australia were also identified within the proposed Project area. These TECs were not identified in the preliminary ecological assessment conducted by May Brothers & Co.

A vegetation survey and fauna assessment should be undertaken to ground truth and confirm the outcomes and findings of the desktop assessment, in particular those areas with remaining native vegetation. Results of targeted field surveys will inform further project planning to avoid or minimise impacts to vegetation and to identify the risk to biodiversity associated with clearance activity for the proposed SRP construction.

6.2 Impact on threatened species

Based on a desktop assessment to date, the Solar River Project may possibly impact on approximately eleven nationally and/or state listed threatened or migratory wetland and coastal fauna species, and one state listed flora species (only if these species were to occur within the Project area, which would be determined through ground truthing).

Fifteen bird species listed as migratory under the EPBC Act were identified in the EPBC Protected Matters Report as potentially occurring or having habitat potentially occurring within the vicinity of the Project area. The Fork-tailed Swift (*Apus pacificus*) and the Cattle Egret (*Ardea ibis*) could possibly occur as occasional visitors to the Project area.

Due to the limitations of this desktop assessment, it is recommended that a targeted flora and fauna field assessment is implemented to ground truth and confirm the likelihood of occurrence of the threatened species and ecological communities, as identified within the BDBSA search and PMST. Results of targeted a flora and fauna field assessments will inform further project planning to avoid or minimise impacts to vegetation and to identify the risk to biodiversity associated with clearance activity for the construction of the proposed Solar River Project.

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8 APPENDICES

8.1 Appendix 1. Photos of vegetation within the SRP Project area.

Figure 4. Example of tree on the SRP site.

Figure 5. Vegetation on site (small weed).

Figure 6. Vegetation (purple bluebush) on the SRP site.

Figure 7. Vegetation (grassland) at entrance to the SRP site, from Dartmoor road.

Figure 8. Vegetation in the north east side of SRP site.

Figure 9. Vegetation in the centre of the SRP site.

8.2 Appendix 2. List of flora species recorded in the BDBSA within 10 km of the Project area (DEWNR 2017).

*	Scientific name	Common name	Family	Conservation status			Last sighting (year)
				Aus	SA	Bioregion	
	Acacia nyssophylla	Spine Bush	LEGUMINOSAE				1961
	Acrotriche patula	Prickly Ground-berry	EPACRIDACEAE			EN	1977
	Aizoaceae sp.	Pigface Family	AIZOACEAE				1991
	Alectryon oleifolius ssp. canescens	Bullock Bush	SAPINDACEAE				2002
*	*Alyssum linifolium*	Flax-leaf Alyssum	CRUCIFERAE				1963
	Arabidella nasturtium	Yellow Cress	CRUCIFERAE				1963
	Arabidella trisecta	Shrubby Cress	CRUCIFERAE				1961
*	*Asphodelus fistulosus*	Onion Weed	LILIACEAE				2008
	Atriplex eardleyae	Eardley's Saltbush	CHENOPODIACEAE				1961
	Atriplex holocarpa	Pop Saltbush	CHENOPODIACEAE				1991
	Atriplex nummularia ssp.	Old-man Saltbush	CHENOPODIACEAE				2002
	Atriplex pseudocampanulata	Spreading Saltbush	CHENOPODIACEAE			RA	2010
	Atriplex semibaccata	Berry Saltbush	CHENOPODIACEAE				1923
	Atriplex stipitata	Bitter Saltbush	CHENOPODIACEAE				2010
	Atriplex vesicaria	Bladder Saltbush	CHENOPODIACEAE				2010
	Atriplex vesicaria ssp. (NC)	Bladder Saltbush	CHENOPODIACEAE				2008
	Austrostipa mollis	Soft Spear-grass	GRAMINEAE				2002
	Austrostipa nitida	Balcarra Spear-grass	GRAMINEAE				1961
	Austrostipa sp.	Spear-grass	GRAMINEAE				2008
*	*Avena barbata*	Bearded Oat	GRAMINEAE				2002
	Bolboschoenus caldwellii	Salt Club-rush	CYPERACEAE				1900
	Brachyscome lineariloba	Hard-head Daisy	COMPOSITAE				1991
*	*Brassica sp.*	(blank)	CRUCIFERAE				2002
	Bromus sp.	Brome	GRAMINEAE				1991
	Calotis hispidula	Hairy Burr-daisy	COMPOSITAE				2010
*	*Carrichtera annua*	Ward's Weed	CRUCIFERAE				2004
*	*Carthamus lanatus*	Saffron Thistle	COMPOSITAE				2004
	Casuarina pauper	Black Oak	CASUARINACEAE				1991
	Chamaesyce drummondii (NC)	Caustic Weed	EUPHORBIACEAE				1991
	Chenopodiaceae sp.	Goosefoot Family	CHENOPODIACEAE				1991
	Compositae sp.	Daisy Family	COMPOSITAE				2002
	Convolvulus recurvatus ssp. nullarborensis	(blank)	CONVOLVULACEAE			NE	1993
	Convolvulus remotus	Grassy Bindweed	CONVOLVULACEAE				2002
	Convolvulus sp.	Bindweed	CONVOLVULACEAE				2008
	Crassula colligata ssp. lamprosperma		CRASSULACEAE				2010
	Crassula colorata/sieberiana complex	Crassula	CRASSULACEAE				1991
*	*Critesion sp. (NC)*	Barley-grass	GRAMINEAE				1991
	Dissocarpus paradoxus	Ball Bindyi	CHENOPODIACEAE				1999
*	*Dittrichia graveolens*	Stinkweed	COMPOSITAE				2002
*	*Echium plantagineum*	Salvation Jane	BORAGINACEAE				2004
	Enchylaena tomentosa var. tomentosa	Ruby Saltbush	CHENOPODIACEAE				2010
	Enneapogon nigricans	Black-head Grass	GRAMINEAE				2002
	Eremophila oppositifolia ssp. oppositifolia	Opposite-leaved Emubush	MYOPORACEAE				1946
*	*Erodium cicutarium*	Cut-leaf Heron's-bill	GERANIACEAE				1991

*	Scientific name	Common name	Family	Conservation status			Last sighting (year)
				Aus	SA	Bioregion	
	Erodium crinitum/cygnorum/carolinianum/jannzii	Blue Heron's-bill	GERANIACEAE				1991
	Erodium sp.	Heron's-bill/Crowfoot	GERANIACEAE				1991
	Eucalyptus porosa	Mallee Box	MYRTACEAE				2010
	Eucalyptus porosa	Mallee Box	MYRTACEAE			RA	2008
	Eutaxia diffusa	Large-leaf Eutaxia	LEGUMINOSAE				1979
*	*Fumaria sp.*	Fumitory	FUMARIACEAE				1991
	Geijera linearifolia	Sheep Bush	RUTACEAE			RA	1961
	Geococcus pusillus	Earth Cress	CRUCIFERAE				1963
	Goodenia pusilliflora	Small-flower Goodenia	GOODENIACEAE				1991
	Goodenia sp.	Goodenia	GOODENIACEAE				1991
	Gramineae sp.	Grass Family	GRAMINEAE				1999
	Heliotropium sp.	Heliotrope	BORAGINACEAE				2004
*	*Hordeum glaucum*	Blue Barley-grass	GRAMINEAE				2010
*	*Hordeum vulgare*	Barley	GRAMINEAE				2002
	Isoetopsis graminifolia	Grass Cushion	COMPOSITAE				1991
*	*Lagurus ovatus*	Hare's Tail Grass	GRAMINEAE				2002
	Lichen sp.		Major Group only - Lichens				1991
*	*Lycium ferocissimum*	African Boxthorn	SOLANACEAE				2010
	Maireana aphylla	Cotton-bush	CHENOPODIACEAE				1999
	Maireana brevifolia	Short-leaf Bluebush	CHENOPODIACEAE				2008
	Maireana erioclada	Rosy Bluebush	CHENOPODIACEAE				2002
	Maireana lobiflora	Lobed Bluebush	CHENOPODIACEAE				1961
	Maireana pyramidata	Black Bluebush	CHENOPODIACEAE				2010
	Maireana sedifolia	Bluebush	CHENOPODIACEAE				2010
*	*Malva parviflora*	Small-flower Marshmallow	MALVACEAE				1999
*	*Malvella leprosa*	Alkali Sida	MALVACEAE				1995
*	*Marrubium vulgare*	Horehound	LABIATAE				2008
*	*Medicago sp.*	Medic	LEGUMINOSAE				1991
*	*Mesembryanthemum nodiflorum*	Slender Iceplant	AIZOACEAE				2010
	Minuria leptophylla	Minnie Daisy	COMPOSITAE				1961
	Moss sp.		Major Group only - Mosses				1991
	Myoporum platycarpum ssp.	False Sandalwood	MYOPORACEAE				2004
*	*Nicotiana glauca*	Tree Tobacco	SOLANACEAE				2002
	Nicotiana sp.	Tobacco	SOLANACEAE				1991
	Omphalolappula concava	Burr Stickseed	BORAGINACEAE				1961
	Oxalis perennans (NC)	Native Sorrel	OXALIDACEAE				1991
*	*Oxalis pes-caprae*	Soursob	OXALIDACEAE				2010
*	*Peganum harmala*	African Rue	ZYGOPHYLLACEAE				2010
	Pittosporum angustifolium	Native Apricot	PITTOSPORACEAE				1991
	Pleurosorus rutifolius	Blanket Fern	ASPLENIACEAE				1974
	Pycnosorus pleiocephalus	Soft Billy-buttons	COMPOSITAE				1961
	Rhagodia parabolica	Mealy Saltbush	CHENOPODIACEAE				2010
	Rhagodia spinescens	Spiny Saltbush	CHENOPODIACEAE				2010
	Rhagodia ulicina	Intricate Saltbush	CHENOPODIACEAE				1923
	Rhodanthe pygmaea	Pigmy Daisy	COMPOSITAE				1991
	Salsola australis	Buckbush	CHENOPODIACEAE				2008
*	*Salvia verbenaca var.*	Wild Sage	LABIATAE				2004
*	*Schinus molle*	Pepper-tree	ANACARDIACEAE				2004

*	Scientific name	Common name	Family	Conservation status			Last sighting (year)
				Aus	SA	Bioregion	
*	*Schismus barbatus*	Arabian Grass	GRAMINEAE				2010
	Sclerolaena obliquicuspis	Oblique-spined Bindyi	CHENOPODIACEAE				2002
	Sclerolaena patenticuspis	Spear-fruit Bindyi	CHENOPODIACEAE				2010
	Sclerolaena sp.	Bindyi	CHENOPODIACEAE				2004
	Senna artemisioides ssp. X coriacea	Broad-leaf Desert Senna	LEGUMINOSAE				2002
*	*Sisymbrium erysimoides*	Smooth Mustard	CRUCIFERAE				2010
*	*Sisymbrium irio*	London Mustard	CRUCIFERAE				2010
*	*Sisymbrium orientale*	Indian Hedge Mustard	CRUCIFERAE				1961
*	*Sisymbrium sp.*	Wild Mustard	CRUCIFERAE				1991
*	*Sonchus oleraceus*	Common Sow-thistle	COMPOSITAE				2010
*	*Spergularia diandra*	Lesser Sand-spurrey	CARYOPHYLLACEAE				1961
	Tetragonia eremaea	Desert Spinach	AIZOACEAE				2010
	Tetragonia eremaea/tetragonoides	Native Spinach	AIZOACEAE				1991
	Teucrium racemosum	Grey Germander	LABIATAE				1946
*	*Triticum aestivum*	Wheat	GRAMINEAE				2002
	Vittadinia gracilis	Woolly New Holland Daisy	COMPOSITAE				2002
	Vittadinia sp.	New Holland Daisy	COMPOSITAE				2008
	Zygophyllum billardierei (NC)	Coast Twinleaf	ZYGOPHYLLACEAE				1991
	Zygophyllum ovatum	Dwarf Twinleaf	ZYGOPHYLLACEAE				1991
	Zygophyllum simile	White Twinleaf	ZYGOPHYLLACEAE				2010

Aus: Australia (*Environment Protection and Biodiversity Conservation Act 1999*). **SA**: South Australia (*National Parks and Wildlife Act 1972*). **Bioregion**: regional status based on IUCN classification. Conservation codes: **CE/CR**: Critically Endangered. **EN/E**: Endangered. **VU/V**: Vulnerable. **R/RA**: Rare. **RE** = Regionally Extinct, **NT** = Near Threatened.
*: Introduced.

8.3 Appendix 3. List of fauna species recorded in the BDBSA within 10 km of the Project area (DEWNR 2017).

*	Scientific name	Common name	Conservation status			Last sighting (year)
			Aus	SA	Bioregion status	
	AVES					
	Acanthagenys rufogularis	Spiny-cheeked Honeyeater				2010
	Acanthiza chrysorrhoa	Yellow-rumped Thornbill				2010
	Acanthiza iredalei	Slender-billed Thornbill	ssp	ssp	EN	1992
	Acanthiza uropygialis	Chestnut-rumped Thornbill				2000
	Anas gracilis	Grey Teal				1992
	Anthus australis	Australian Pipit				2000
	Aphelocephala leucopsis	Southern Whiteface				2005
	Aphelocephala leucopsis	Southern Whiteface			NT	2010
	Artamus cinereus	Black-faced Woodswallow				2000
	Artamus personatus	Masked Woodswallow			NT	1992
	Artamus superciliosus	White-browed Woodswallow			NT	1992
	Barnardius zonarius	Australian Ringneck				2010
	Cacatua sanguinea	Little Corella				1992
	Cacomantis pallidus	Pallid Cuckoo			NT	2000
	Calamanthus (Calamanthus) campestris	Rufous Fieldwren			RA	2001
	Chalcites basalis	Horsfield's Bronze Cuckoo				2010
	Chenonetta jubata	Maned Duck				1992
	Cincloramphus cruralis	Brown Songlark				1992
	Cincloramphus mathewsi	Rufous Songlark				1992
	Climacteris picumnus	Brown Treecreeper			NT	2010
	Colluricincla harmonica	Grey Shrikethrush				2010
	Coracina novaehollandiae	Black-faced Cuckooshrike			NT	2010
	Corvus bennetti	Little Crow				2005
	Corvus coronoides	Australian Raven				2005
	Corvus coronoides	Australian Raven			NT	2010
	Corvus mellori	Little Raven				2010
	Cracticus torquatus	Grey Butcherbird				2001
	Cracticus torquatus	Grey Butcherbird			NT	2010
	Dromaius novaehollandiae	Emu				2015
	Eolophus roseicapilla	Galah				2010
	Epthianura albifrons	White-fronted Chat			RA	2000
	Epthianura aurifrons	Orange Chat				1992
	Falco berigora	Brown Falcon				2000
	Falco cenchroides	Nankeen Kestrel				2010
	Falco peregrinus	Peregrine Falcon		R	RA	1990
	Gavicalis virescens	Singing Honeyeater				2010
	Grallina cyanoleuca	Magpielark				2010
	Gymnorhina tibicen	Australian Magpie				2010
	Hirundo neoxena	Welcome Swallow				2005
	Malurus lamberti	Variegated Fairywren				2001
	Malurus leucopterus	White-winged Fairywren				2000
	Malurus splendens	Splendid Fairywren				2000
	Manorina flavigula	Yellow-throated Miner				2010
	Melopsittacus undulatus	Budgerigar			NT	1992
	Merops ornatus	Rainbow Bee-eater				2010

*	Scientific name	Common name	Conservation status			Last sighting (year)
			Aus	SA	Bioregion status	
	Neophema chrysostoma	Blue-winged Parrot		V	RA	1992
	Neophema elegans	Elegant Parrot		R	VU	2010
	Northiella haematogaster (NC)	Bluebonnet		ssp		2000
	Ocyphaps lophotes	Crested Pigeon				2000
	Pardalotus striatus	Striated Pardalote				2010
*	*Passer domesticus*	House Sparrow				1900
	Petrochelidon nigricans	Tree Martin			NT	2010
	Petroica goodenovii	Red-capped Robin				2005
	Petroica goodenovii	Red-capped Robin			NT	2010
	Platycercus elegans	Crimson Rosella				2010
	Pomatostomus ruficeps	Chestnut-crowned Babbler				2010
	Pomatostomus ruficeps	Chestnut-crowned Babbler			NT	2010
	Pomatostomus superciliosus	White-browed Babbler				2000
	Porzana pusilla	Baillon's Crake				1934
	Psephotellus varius	Mulga Parrot			NT	2010
	Psephotus haematonotus	Red-rumped Parrot				2000
	Psephotus haematonotus	Red-rumped Parrot (eastern SA except NE)				2010
	Ptilotula ornata	Yellow-plumed Honeyeater				2010
	Pyrrholaemus brunneus	Redthroat				2000
	Rhipidura leucophrys	Willie Wagtail				2005
	Smicrornis brevirostris	Weebill				2010
	Stiltia isabella	Australian Pratincole			RA	1992
	Struthidea cinerea	Apostlebird			RA	2010
*	*Sturnus vulgaris*	Common Starling				2010
	Taeniopygia guttata	Zebra Finch				1992
	Todiramphus pyrrhopygius	Red-backed Kingfisher			RA	2010
	MAMMALIA					
*	*Bos taurus*	Cattle (European Cattle)				2010
*	*Capra hircus*	Goat (Feral Goat)				2013
	Lasiorhinus latifrons	Southern Hairy-nosed Wombat			NT	2010
	Macropus fuliginosus	Western Grey Kangaroo				2015
	Macropus rufus	Red Kangaroo				2015
	Macropus sp.					2010
*	*Oryctolagus cuniculus*	Rabbit (European Rabbit)				2010
*	*Ovis aries*	Sheep (Feral Sheep)				2010
	Sminthopsis crassicaudata	Fat-tailed Dunnart				1978
	REPTILIA					
	Gehyra variegata complex					1978
	Lerista timida	Dwarf Three-toed Slider				2001
	Menetia greyii	Dwarf Skink				2003
	Parasuta nigriceps	Mitchell's Short-tailed Snake				1950
	Tiliqua rugosa	Sleepy Lizard				1992

Aus: Australia (*Environment Protection and Biodiversity Conservation Act 1999*). **SA**: South Australia (*National Parks and Wildlife Act 1972*). **Bioregion**: regional status based on IUCN classification. Conservation codes: **CE/CR**: Critically Endangered. **EN/E**: Endangered. **VU/V**: Vulnerable. **R/RA**: Rare. **RE** = Regionally Extinct, **NT** = Near Threatened.
*: Introduced.

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ebs heritage

Solar River Project

Desktop Heritage Risk Assessment

Solar River Project: Desktop Heritage and Risk Assessment

1 December 2017

Version 2

Prepared by EBS Heritage for May Brothers & Co

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Table of Contents

1 INTRODUCTION

EBS Heritage has been engaged by May Brothers & Co to undertake a heritage desktop and risk assessment of the Solar River Project. The Solar River Project (SRP) is the proposal of a 200MW Photovoltaic (PV) with an integration of a 20MWh battery system, located 110km North of Adelaide (Figure 1). The SRP is a key renewable energy and storage project which will deliver additional capacity of 200MW of clean renewable energy and 20MWh of grid connected advanced battery storage into South Australia, resulting in an emission saving of tonnes of carbon dioxide. The project will primarily consist of PV solar panel rows (set in large blocks), access tracks, inverters, a maintenance shed, and substation with electricity grid connection, site office and ablution facilities. This project is undertaken under new entity named The Solar River Project Pty Ltd.

The following report contains a summary of the available previous heritage work carried out for the Project Area, and heritage management recommendations in light of the desktop risk assessment and the relevant heritage protection legislation.

1.1 Cultural Heritage Desktop Assessment Objectives

The specific objectives of EBS Heritage were to:

- Conduct background research, including a review of heritage register searches and the South Australian Heritage Database as well as background research of primary and secondary sources and previous heritage reports for the Project Area;
- Review archival aerial photographs where available, to determine levels of historical disturbance in Project Area;
- Identify State and Commonwealth legislative requirements pertinent to heritage in the current Project Area;
- Determine the likelihood or risk of cultural heritage sites being present as well as the potential impacts for any known heritage within the Project Area in accordance with the South Australian *Aboriginal Heritage Act 1988*; and
- Prepare risk management recommendations for future works and provide recommendations in relation to any potential impacts the proposed activities could have on locations of heritage significance, in light of clients' responsibilities under the South Australian *Aboriginal Heritage Act 1988.*

2 SA LANDSCAPE CONTEXT

In order to understand the archaeological context of an area it is important to have a good understanding of local environmental landscape features. Past and present environmental factors have an impact on the type, presence and location of cultural material.

2.1 Project Area

The proposed Project Area is located 110km North of Adelaide, South Australia which is 33km away from the nearest township, Robertstown (Figure 2). The SRP project area is located in a high solar region on large allotments of pastoral land well suited to board acre PV installation and operation. The total land area is 5335 ha and is a perpetual lessee land; this is a single land parcel. The total development footprint will be significantly less than this area and is expected to be approximately 200ha, which will depend on the Engineering, Procurement and Construction (EPC) final design layout of the PV plant. The existing environment at the project site is characterised by vacant rural land.

2.2 The Murray Basin

The Project Area is located within the Murray Basin. The Murray Basin is made up of 22 water catchments which are grouped into the northern Darling basin and the southern Murray basin. Australia's four longest rivers are located within the basin. The basin itself stretches from Queensland, into NSW in the north down to the River Murrays mouth in South Australia. The Murray Valley has arisen from the changed in sea level during the las glacial maximum. At 18,000 before present (BP) the sea levels were approximately 100 metres below the current levels. During the end of the Pleistocene the perennial lakes throughout the Murray Basin began to dry out on a more regular basis. Lunettes also formed around the eastern banks of these exposed lake edges, formed by string westerly winds. As the sea level continued to rise, reaching the current level around 7,000 BP, the climate has improved. There was increased rainfall in the area, creating flooding events throughout the basin (Wood & Westell 2008).

2.3 Bioregion

2.3.1 The Murray Darling Depression

The Murray Darling Depression bioregion is located in the south-eastern portion of SA, and extends into both NSW and VIC. Within SA the bioregion makes up to 19 % and includes the River Murray. The climate is semi-arid and has a mean annual rainfall of between 200- 550 mm. The bioregion lies in the Murray Basin on Tertiary and Quaternary sediment deposited from a shallow sea, lakes and rivers. The landscape is characterised by dune fields, sandplains and undulating plains of brown calcareous soils. Some dunes have consistent east-west linear patterns, others are parabolic. The southern part of South Australia contains the Mediterranean biome. The climate of the Mediterranean biome is cool to warm; tending to winter rains. The biome is characterised by undulating plains and foothills, low ranges, steep rocky gorges and creek lines. The highly fragmented vegetation includes chenopod shrub lands, native grassland, sedge

lands, samphire shrub lands, native grassland, open Mallee, eucalypt woodlands and sand dune fields. Its watercourses and rivers range from ephemeral to permanent (NRM, no date).

2.3.2 Climate

The most comprehensive available climate dataset in the vicinity of the SRP project area is from Eudunda, approximately 35 km south-west of the project area. Both rainfall and temperature follow a semi-arid to arid climate with hot, very dry summers and cool to mild, dry winters (Figure 1). Rainfall is low and unreliable, characterised by extremely infrequent heavy falls. The long-term mean annual rainfall for the area is 448.3 mm, with June through to August typically the wettest months. The data used to create the graph displayed in Figure 1 is provided by the Bureau of Meteorology (Commonwealth of Australia 2017).

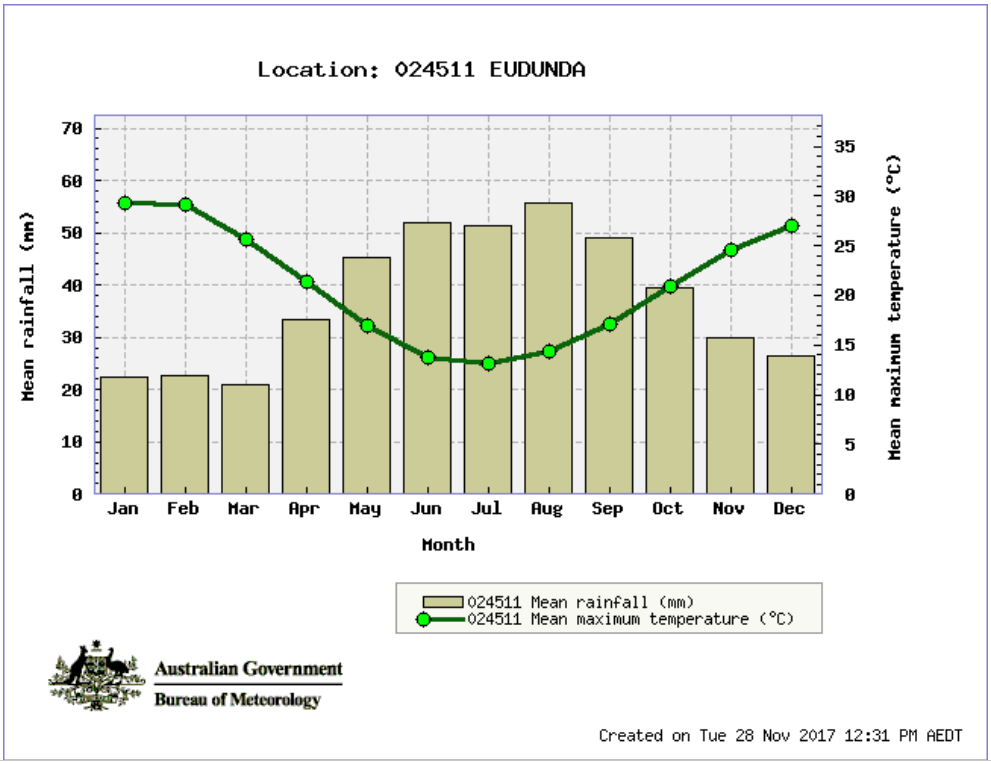

Figure 1. Long term means for temperature and rainfall for Eudunda (1880 to 2017).

Figure 2. Location of the Project area.

3 SA COMPLIANCE AND LEGISLATIVE SUMMARY

3.1 Commonwealth Legislation

3.1.1 The Australian Heritage Commission Act 1975

The Australian Heritage Commission is required to maintain a register of natural and cultural sites of national significance under the terms of this Act. Section 30 of the Act requires that a Minister should take no action which will have adverse effect on a listed place unless there is no feasible and prudent alternative, and if, in their view there is no such alternative they must only take action as will minimise the adverse effect. The Commission must also be consulted about any proposed action which would affect a listed place, and it does require that the Commonwealth acts responsibly. It should be noted that the Commission itself makes no decisions on these proposed actions. All decision are the responsibility of the Minister or the Authority proposing to take Action (Garnett and Hydnes 1992). No sites on the register are located within the current Project Area.

3.1.2 Environmental Protection & Biodiversity Conservation Act 1999 (amended 2003).

The Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) (amended 2003) protects places of national cultural and environmental significance from damage and interference by establishing a National Heritage List (for places outside of Commonwealth land) and a Commonwealth Heritage List (for places within Commonwealth land). Under the EPBC Act any action that has, will have, or is likely to have a significant impact on a place of national culture and/or environmental significance must be referred to the Minister for the Environment for approval. The EPBC Act sets out a procedure for obtaining approval, which may include the need to prepare an environmental impact statement for the proposed action (an action is defined in section 523 to include a project, development or undertaking or an activity or series of activities).

The EPBC Act is only relevant in relation to Aboriginal heritage sites if the site is entered onto the National Heritage List or the Register of the National Estate (previous list frozen 2007 under Australian Commission Act 1975). None of these sites are located within the Project Area.

3.1.3 Aboriginal & Torres Strait Islander Heritage Protection Act 1984

The Commonwealth *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* provides a mechanism for the Commonwealth Minister for Environment to make declarations regarding the protection of an Aboriginal area when the Minister is not satisfied that under State or Territory Law there is effective protection of the area from a threat of injury or desecration. Declarations made under this Act involve restricting activities and/or access to an Aboriginal site.

Under Section 21H of the *Aboriginal and Torres Strait Islander Protection Act 1984* it is an offence to conduct behaviour or partake in an action that contravenes a declaration made by the Minister. Penalties under this section are $10,000 or imprisonment for 5 years, or both for an individual, or $50,000 for a corporate body where an Aboriginal place is concerned and $5,000 and imprisonment for 2 years or both for an individual, or $25,000 for a corporate body where an Aboriginal object is concerned.

If the requirements of the *South Australian Aboriginal Heritage Act* are adhered to and sufficiently protect any Aboriginal heritage in the eyes of the Federal Minister, the *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* will not be relevant for any cultural heritage site that may be in the Project Area.

3.1.4 Native Title Act 1993

The Commonwealth *Native Title Act 1993* (NTA) is part of the Commonwealth's response to the High Court's decision in Mabo VS Queensland (No.2) and adopts the common law definition of Native Title which is defined as the rights and interests that are possessed under the traditional laws and customs of Aboriginal people in lands and waters.

The NTA recognises the existence of Indigenous land ownership tradition where connections to country have been maintained and where Acts of government have not extinguished this connection.

The following list is indicative of the type of land that might be subject to native title:

- Vacant Crown Land;
- State forests;
- National Parks;
- Public Reserves;
- Beaches and foreshores;
- Land held by the government agencies;
- Land held in trust for Aboriginal communities;
- Any other public or Crown lands including oceans and inland waterways, and
- Pastoral leases.

Under the amended NT Act, native title is extinguished by the following:

- Private freehold land;
- Valid grants of private freehold land or waters;
- Residential or commercial leases;
- Exclusive possession of leases;
- Mining dissection leases;
- Community purpose leases; and
- Public works.

The NTA recognises the existence of Indigenous land ownership tradition where connections to country have been maintained and where acts of government have not extinguished this connection. The current Project Area is within the Nagadjuri Nation #2 native claim area. It is a requirement of this Act that when a developer is carrying out certain activities or development in areas where native title exists or may exist, the developer will need to consider the possible impacts of their actions on native title rights and interests.

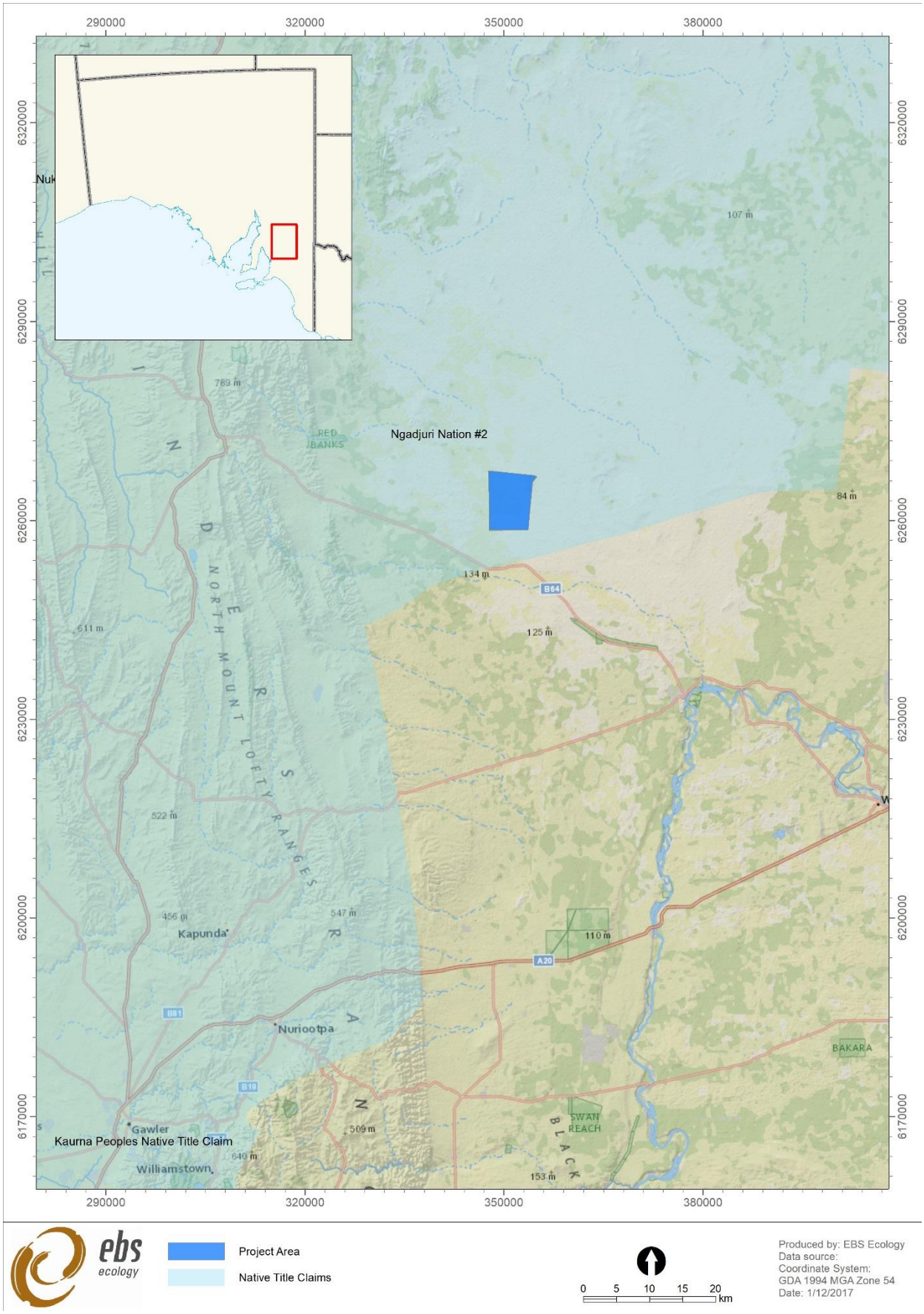

Figure 3: Location Of Project Area and the Nagadjuri National # 2 Native Title claim

3.2 SA State Legislation – Aboriginal Heritage

3.2.1 Aboriginal Heritage Act 1988 (SA)

The South Australian *Aboriginal Heritage Act 1988* (AHA) is administered by the South Australian Department of State Development, Aboriginal Affairs and Reconciliation division (DSD-AAR). This legislation outlines that any Aboriginal site, object or remains whether previously recorded or not, are covered by the AHA. The Act provides the following definition of an Aboriginal site in Section 3.

"Aboriginal Site" means an area of land;

a) That is of significance according to Aboriginal tradition; and / or

b) That is of significance according to Aboriginal archaeology, anthropology or history.

The AHA states that it is an offence under Section 23 (s.23) of the AHA to 'damage, disturb or interfere' with an Aboriginal site, object or remains unless written authorisation is obtained from the Minister for Aboriginal Affairs and Reconciliation. Penalties for an offence under s.23 are up to $10,000 or six months' imprisonment for an individual or $50,000 in the case of a corporate body. An owner or occupier of private land, or an employee or agent of such an owner or occupier, who discovers on the land an Aboriginal site or Aboriginal object must as soon as practicable report the discovery to the Minister. Penalties for an offence under s.23 are up to $50,000 for a body corporate and $10,000 or 6 months imprisonment for an individual.

It is also an offence under Section 35 of the Act to divulge information relating to an Aboriginal site, object, remains or Aboriginal tradition without authorisation from the relevant Aboriginal group or groups. Penalties for an offence under this section are up to $10,000 or six months imprisonment.

The *Aboriginal Heritage Act 1988* is the most relevant piece of legislation for this particular project.

Section 12 of this report details those registered sites in close proximity to the Project Area.

3.3 SA State Legislation – European Heritage

3.3.1 Heritage Places Act 1993

The *Heritage Places Act 1993* makes provision for the identification, recording and conservation of places and objects of non-Aboriginal heritage significance in SA. A State Heritage Place is entered in the SA Heritage Register or contained within an area established as a State Heritage Area. Once registered, State Heritage Places are protected under the *Heritage Places Act 1993* and the *Development Act 1993*.

The *Heritage Places Act 1993* is governed by the Department of Environment, Water and Natural Resources (DEWNR) and the South Australian Heritage Council. No Heritage Places related to the current Project Area.

Under Sections 26, 27 and 28 of this Act it is an offence to carry out the following actions without a permit from the Council:

- Excavate or disturb a State Heritage Place designated as a place of archaeological significance; or remove archaeological artefacts from such a place.
- Excavate or disturb any land (not designated as a place of archaeological significance) for the purpose of searching for or recovering archaeological artefacts of heritage significance; or excavate or disturb any land (not designated as a place of archaeological significance) knowing or having reasonable cause to suspect that the excavation or disturbance will or is likely to result in an archaeological artefact of heritage significance being discovered, exposed, moved, damaged or destroyed.
- Damage, destroy or dispose of an archaeological artefact removed from a State Heritage Place designated as a place of archaeological significance (whether removed before or after the entry of that place in the Register) and to damage, destroy or dispose of an object entered in the Register (either as a provisional or confirmed entry).

Penalties for any offences under Section 26, 27 and 28 of the *Heritage Places Act 1933* are up to $75,000.

Under section 36 of the *Heritage Places Act*, a person who intentionally or recklessly damages a heritage place or engages in conduct knowing that it will or might destroy or reduce the significance to a State Heritage Place can be fined a maximum penalty of $120,000.

There is no penalty if damage results from an action authorised by an approval or authorisation under the *Development Act 1993*.

3.3.2 Development Act 1993

The *Development Act 1993* deals with planning and development measures in the State and specifically deals with any proposed activity which may materially affect a heritage place or the context within which the place is situated. If a proposed development is likely to affect a registered State Heritage Place, it is necessary for an application to be lodged with the Development Assessment Commission.

The *Development Act 1993* also enables local councils to include places of local heritage value in a given Development Plan. Places of local heritage value are listed in an inventory attached to the State Heritage Register.

Approval under the Development Act must be obtained if a site or place on the State Heritage Register is to be affected. A heritage site may be affected if it is directly disturbed or if work is proposed in the vicinity of the site or place. A Crown development application should be submitted to the Development Assessment Commission (DAC) for approval if this is the case.

Where construction is likely to take place in the vicinity of heritage listed places, and direct disturbance is possible, the client should seek advice from construction, vibration and sound engineers on mitigation measures that may be required, such as buffer zones to protect the integrity of the building or structure. Where disturbance is likely the client may also need a more detailed assessment of sub-surface deposits associated with historical buildings, such as an archaeological assessment. Should it be determined that disturbance is unavoidable a DAC application is required.

4 BACKGROUND RESEARCH

4.1 Aboriginal Occupation

4.1.1 Ngadjuri

The Ngadjuri territory was identified by Tindale to stretch from south of Angaston and Gawler to north of Port Pirie and Orroroo. The area then stretched eastward to the Mount Lofty Ranges and westward to Crystal Brook. The Ngadjuri were known to the neighbouring people the Kaurna as the Wirra meju, which mean the gum tree men. They were also known as Manu and Manuri by the Nukunu people, which means the back and inland people (Tindale 1937; Wood 2007) (see Figure 5 and Figure 6). .

Norman Tindale describes the Ngadjuri as:

> **Location**: From Angaston to Freeling north to Clare, Crystal brook, Gladstone, Carrieton, and north of Waukaringa to Koonamore; east to Mannahill; in Orroroo, Peterborough, Burra, and Robertstown districts; inhabitants of the gum forest areas. In the period just before the arrival of white people, they were making movements towards the Murray River near Morgan in aggressive attempts to impose the rite of circumcision on the river people. Miranda was a leading male until his death in 1849. The Mimbra horde remained living in the northern bushlands until 1905, the last "wild" group in South Australia. In their last years these people lived near Quorn, at Riverton, and on Willochra Creek. The term Aluri, also spelled variously as *Hilleri*, *Yilrea*, *Eeleeree*, etc., is a general term used for several tribes here and on the west coast of South Australia.
>
> **Coordinates**: *139°0'E x 33°5'S*
>
> **Area:** *11,500 sq. M. (29,900 sq. km).*
>
> **Alternatives:** *Ngadluri, Ngaluri, Aluria, Alury, Eeleeree, Hilleri, Yirrea, Wiramaju* ([wira] = gum tree [meju] = men, lit. Gum forest men), *Wirrameyu, Wirramayo, Wirramaya, Wiramaya, Wirra, Weera, Eura* (general term for several tribes), *Manuri* (Nganguruku tribe term, means "big goanna people") *Manuri* (Nukunu term claimed to mean inland people), *Manu, Monnoo, Manuley, Youngye,* (name on the language), *Boanawari* (term meaning "bat people", and linked with circumcision; applied by non circumcising eastern tribes who feared their proselytising urges), *Doora, Burra Burra or Abercrombie Tribe* (two names for one horde of this tribe), *Mimbara* (name of the northernmost horde)
>
> **References:** Angas, 1847; Noble in Taplin, 1879; LeBrun in Curr, 1886; Valentine in Curr, 1886; East, 1889; Matthews, 1900 (Gr. 5626, 6448), Hossfeld, 1926; Gray, 1930; Elkin, 1931; Tindale, 1937, 1940, 1952, and 1964 MSS, Berndt and Vogelsang, 1941; Tindale and Lindsey, 1963; Bernt 1965; R.D.J. Weathersbee, 1971 MS
>
> Tindale 1974:214

Barney Waria, was an Ngadjuri man born in 1873 in Orroroo. He came to Adelaide in the 1930's and 1940's and became a great informant on the Ngadjuri culture and language. During his visits he talked to Norman Tindale, Ronald Berndt and Charles Mountford. Tindale (1937) recorded two stories. The first tells the story of an older lady and her two dogs traveling across the Ngadjuri country. Although no specific locations were noted, the blood of one of the dogs is meant to form the large ochre deposit at Parachilna Gorge, which is outside of the Project Area north of the Flinders Ranges. The second story is related to an Aboriginal campsite near Orroroo and tells the story of the Eagle and the Crow. This story is also shared by neighbouring Aboriginal group the Adnyamathanha and the Nukunu (Walshe & Bonell 2003). Horton (1994) also states that a dreaming track that travels through the country near the southern end of the great trading and exchange route, which ends at the Gulf of Carpentaria.

Waria also provide information on the spirt beings that inhabited the Ngadjuri country include the Mirlki giant that's left a large footprint near Mt. Bryan. The people living in this area apparently fled north from the giant to a cave southeast of Orroroo and walked underground to Carrieton (Warrior et al. 2005; Wood 2007). Another Ngadjuri man named Jim Mooney later gave Berndt the story of Yuru and Wudlu, which talks about how the country and the rocks around Yunta and the Panaramittee Station came to be (Berndt 1987, Anderson 2000; Wood 2007).

The Ngadjuri would join the Karna and Narungga from the Yorke Peninsula at Port Wakefield to jointly exploit the local fishing resources. The Ngadjuri would have had a diverse diet of Kangaroo, Emus, Bandicoots, Wild Turkeys, ossums, lizards, snakes, ducks and other plant foods. Twine was obtained by cooking rushes and was used to form fishing nets. Certain leaves have also been noted that were placed in freshwater holes when targeting certain fish (Berndt 1940, Brown 1897;; Warrior et al 2005; Wood 2007).

As previously stated, specific Ngadjuri ethno-history is limited in available publications, partly due to European interaction. Nobbs details a generalised argument for the lack of material as:

> *"Berndt's informant, Barney Waria gave the following information: 'On the north too, the Ngadjuri interacted closely with people belonging to territories called by Tindale (1940) Jadliaura and Wailpi. As far as the Ngadjuri were concerned the territories and people of these two groups were Adnyamathanha...Barney said that, with the reduction of Ngadjuri numbers after European settlement of the region, those remaining either scattered across the country, living in the main townships or joined the Adnyamathanha"* (Berndt 2000:24).

Tindale further articulates the absence of published material for the Ngadjuri:

> "*It is probable that less has been written about this tribe than any other in South Australia...The territory of the Ngadjuri people extended from Angaston and Gawler in the south to Port Pirie and Orroroo in the north. Westward they ranged to Crystal Brook, but they scarcely touched the coast at Spencer Gulf except when on visits to the [Nar:aŋga] people of Yorke Peninsula. In the south their boundaries marches with those of the ['Kaurna] between Hamley Bridge and Gawler. Their eastern boundary was the eastern scarp of the Mount Lofty ranges. Their northern neighbours were the ['Nukunu], who lived on the highlands and coast near Mount Remarkable. To the north east was ['Maraura] country. In accordance with the general practice that each neighbouring*

> *people has its own term for a tribe, we find that several names have been applied to the members of the Ngadjuri tribe by surrounding peoples"* (Tindale 1937:149).

The dispersal of Ngadjuri people has resulted in specific cultural research being limited, due to the geographical distance from place and the possibility of the establishment of what Morris (1994) calls cultural distance; being the deliberate attempt of one group to withhold knowledge from another group in a relative position of privilege. Considering the aforementioned possibilities, some cultural information is available for reproduction.

Tindale, after revising earlier entries of the '*Wira*' tribe and accrediting them to the '*Ngadjuri*', narrates the following account of Ngadjuri behaviour observed by former Kapunda resident Mrs. A. Moyle:

> *"Mrs. A. Moyle, who arrived in South Australia as a child in 1847 relates the following incident regarding the Wirra Natives. A woman was stolen from the Burraburra natives by a Kapunda man, one of a party who often made their camp at Allandale. The Burra natives therefore came down to Kapunda in force. A group of fully armed men from both camps stood and watched a set combat between the two principals. At first songs were sung and there was much shouting. The two men, both old then came out of the crowd each armed with a spear, spear thrower and shield. The Burra man first pierced the Kapunda man through the left arm; his opponent thereupon retaliated with a blow that pierced him through the heart. His body was placed on a bier and was carried back to the Burra, accompanied by a group of wailing mourners. In 1850 the natives in the district around Kapunda were still wild. They camped near the local dam (as it is now)"* (Tindale 1932)

Tindale (1936) also recounts detailed renditions of two Ngadjuri Dreamtime stories. The first centres on the relationship between an old woman and her dogs. The second explains the relationship between the Eagle and Crow. The account of the old women and her two dogs is centred on an explanation of how red and black deposits of ochre are formed. Peripherally the story provides an explanation for the first setting sun in the west. Tindale links this story with an unpublished Western Desert legend involving a hero 'bringing back the sun after it had been eclipsed' and proposes the Ngadjuri legend may incorporate an actual eclipse of the sun, the nearest occurring in 1793 (refer to Figure 3 below).

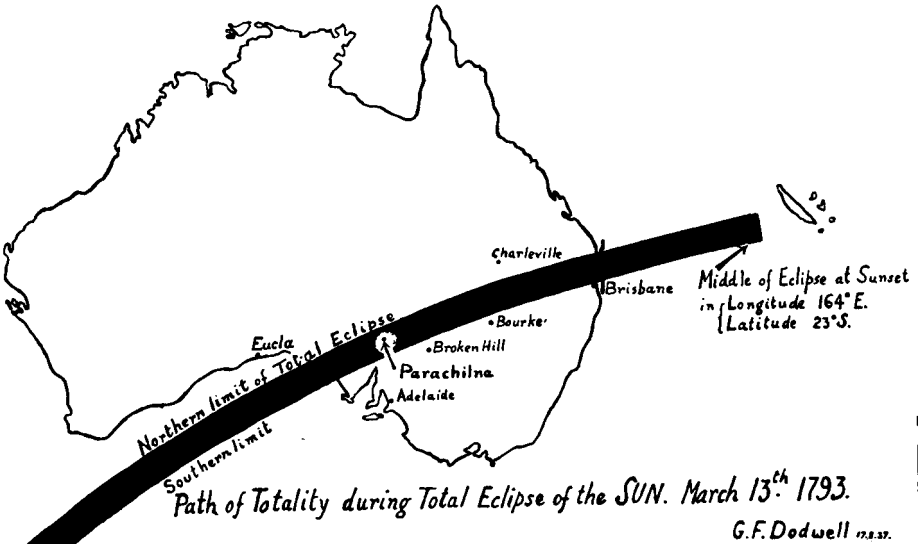

Figure 4: Map indicating path of total eclipse of the sun, 13th March 1793 (from Tindale 1937:152)

The incorporation of perceived events, changes to the environment and unexpected occurrences have been included in other Ngadjuri traditions. The introduction of the bullock to the traditional lands of the Ngadjuri, and the impact of the bullock on the environment is explained by the following:

> *"WipaRu was a well known Ancestral Being who was originally in human form. He came from Tea Tree (on Lake Frome) to Reaphook Hill where he camped. He then went to a waterhole where he drank and he went off to a small hill (5km south of Reaphook Hill) that was streaked with red, yellow and white colours. It was here that WipaRu Man painted himself with ochre and turned himself into a WipaRu snake. In that form he continued to Coffin Spring, Where he bored a hole in the limestone cliff. It is said to be a perfectly round depression that always contained water. WipaRu had come along a saltwater creek and the waterhole was a raised mound. He became a monster snake and lived in the mound of the freshwater spring. He lived there until disturbed by a bullock drinking in the waterhole. When WipaRu tried to swallow the bullock he choked to death."* (Berndt 1987:19 in Nobbs 2000:29).

The bullock impacted greatly on the water sources on the region, as well as on the ochre deposits. The incorporation of changes to the environment demonstrates a dynamic culture and through tracing changes, such as the aforementioned, continuity in belief systems is maintained through adaptation.

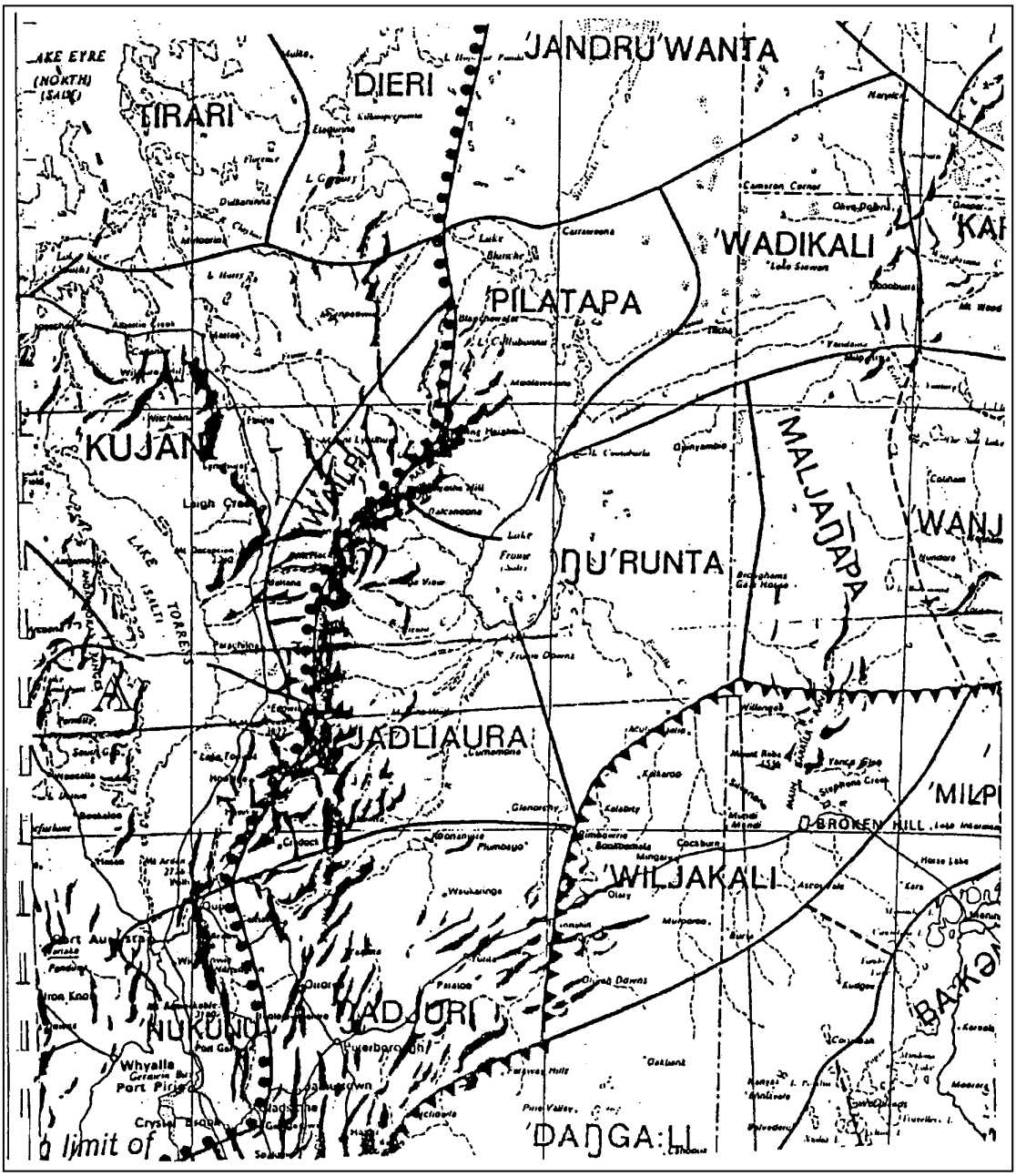

Figure 5: Map showing Tribal Boundaries in North East South Australia [from Tindale, 1974] NB: Ngadjuri territory at lower left).

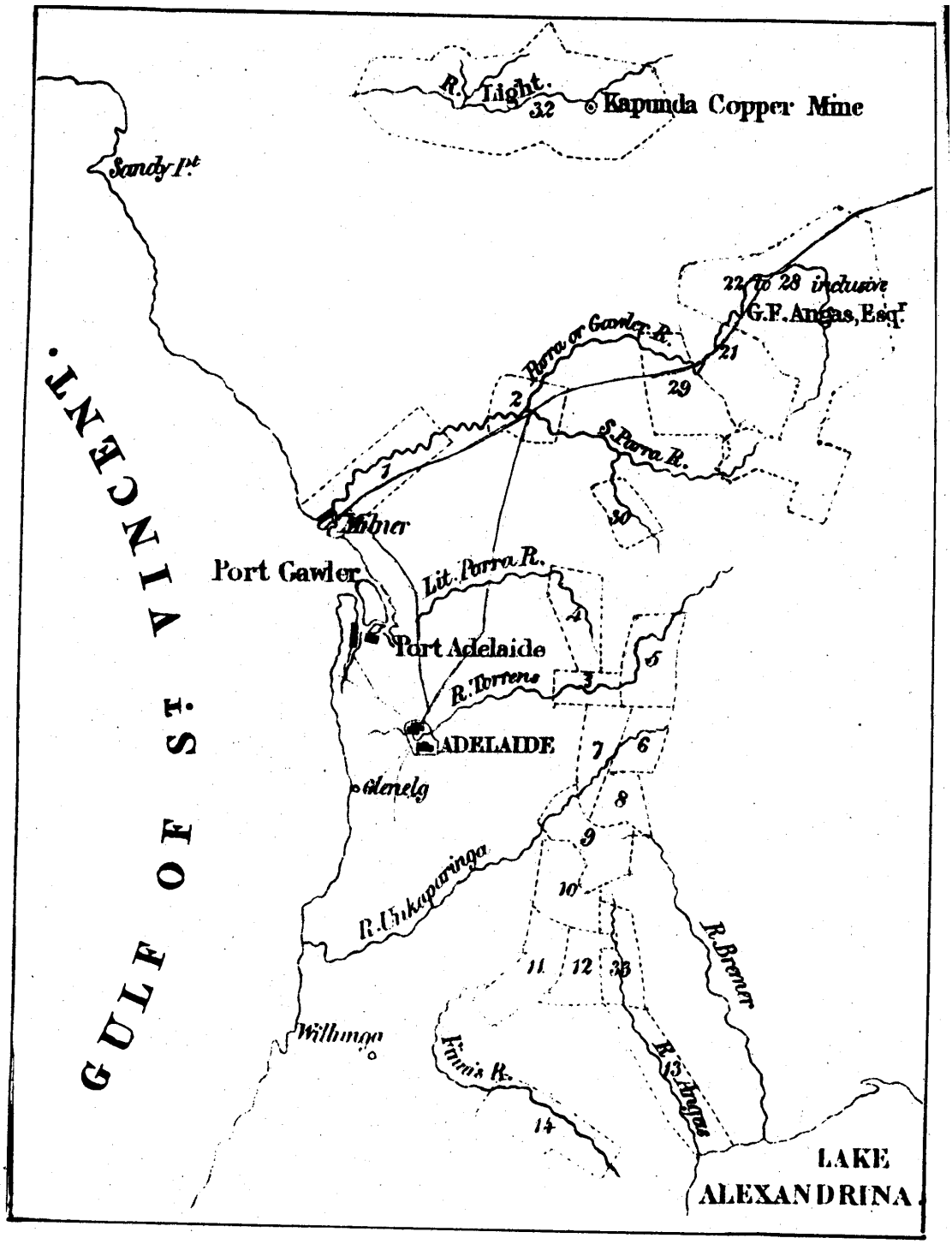

Figure 6: Map indicating some special land surveys taken in Permangk and Ngadjuri tribal territories [from "Agricola" 1849] (Chilman 1990:20).

1.1.1 European contact and historical research for the Ngadjuri

Specific ethno-historical data on the region is limited. Two early accounts of European expeditions into the area are from Eyre in 1839 and Sturt in 1844. The Eyre (1845) expedition passed the region to the west and Sturt (1849). Both expeditions failed in their purpose seeking the centre of the continent. Journal accounts of both explorers display little contact with Aboriginal people, even though the area supported large numbers of Aboriginal people. Eyre writes:

> *"In going up the watercourse I again found a native fire, where the natives had been encamped within a mile of us during the night, without our being aware of it..."* (Eyre 1845:93).

Early accounts of European interaction relate to pastoral activities. Hayward, a pastoralist who occupied a station near Pekina used information supplied by Aborigines living at Pekina to search for new range-land and water sources (Smith 1980:56). Another early pastoralist, Stephen King, established a property at Outalpa Well in 1855 and within ten years most of the Olary uplands had been occupied (Gibbons 1973:5).

Isaac Palmer Hall, Manager of the Boolcoomata Station (1859 – 1866), and J.P. Buttfield, Sub – Protector of Aborigines in the far north (1960s) provide the only documents mentioning Aborigines in the region during this period (Smith 1980:52). The nature of work and low populations of Europeans available for labour required Hall to employ persons from the local Aboriginal community for station work. An 1865 Hall letter indicates a significant population of Aboriginal people.

> *"We have been without blacks for some time but now that they have all swarmed in they mustered over 150 the other day miserable and thin they looked. They had been right away from the white fellows and living on seeds and vegetables"*(Hall 20.4.1865).

The Aboriginal reluctance to spend any time near European settlements, as seen above, can be partly attributed to the history of violent clashes between the two groups. Hall also notes the changes in Aboriginal life:

> "*The Blacks are becoming more and more dependent upon white men every year and now come in at regular seasons to look for work for the sake of blankets, flour, tobacco etc. – they are generally decreasing in number too – the deaths of this tribe are treble the births."*(Hall 14.6.1863).

4.2 European Settlement History

The history of European settlement within South Australia, or Adelaide, had its beginning in 1836 when Colonel William Light (the inaugural surveyor-general for the colony of South Australia) undertook a survey of the Adelaide plains to identify a suitable location for the future capital city. Before Adelaide was first surveyed, Captain Mathew Flinders, sailed his ship the *Investigator* into the head of Spencers Gulf on the 21 February 1802. This was one of his many stops made during his discovery and circumnavigation of Australia. The gulf was named by Flinders in honour of the First Lord of Admiralty, George John the Second Earl Spencer (Flannery 2000). By March the 10th 1802 Flinders' party had already ascended a nearby peak, now named Mount Brown, which is located 40 km south east of the current Project Area (Walshe 2005).

When the Province of South Australia was established in 1834 by an Act of British Parliament, provisions were made for local government when the colony's population passed 50,000. That figure was reached in 1849, but the first attempt of establishing local government outside of Adelaide was made in the form of District Boards of Roads, based on the surveyed Hundreds. By the 1850s the South Australian government had established a standard hierarchy of Counties, Hundreds, rural sections and town allotments. By 1860 no land could be sold unless located within a proclaimed County and Hundred (Susan 2012). Bellow is the gernal chrologly for the area (see Table 1)>

Table 1: General chorology of the local area (Austral Archaeology 2001, Walshe and Bonnell 2003, Wood 2009a).

Date Range	Event
1841	European explorer Horrocks in the area.
1842	European explorer Burr and Tolmer come through the area.
	John Hallett is believed to have been the first to bring sheep into the district. He made a selection of land in the Hallett district, named Willogoleeche.
1843	Frome
1840s.	John Bristow established Bundaleer Station. This run extended from the Broughton River in the south to Mount Lock in the north and comprised an area of 799 square kilometres.
1845	John Hallet and his brother Alfred, had acquired 160 square miles of pastureland and 20 years later they held an extensive area of land in the district, including the sheep stations of Winninie and Mutooroo.
1850s	Most of the suitable grazing land was taken up.
1865	Joseph Gilbert took over Willogoleeche and Mount Bryan stations.
1869	*Strangways Act* was passed through parliament. Vast changes to what became known as the North Agricultural Areas. During the following years the whole of the area was resumed by the Government and surveyed into farms with an average size of 130 hectares. Large sheep runs were broken up and made available to small farmers. Many of the smaller farmers used their newly acquired land for wheat growing. By 1875, 400,000 hectares of land were under wheat.
1870	The town of Hallett was offically surveyed.

Date Range	Event
1875	The first railway line from Port Pirie through Crystal Brook Gap to Peterborough. The line was extended to Gladstone in 1876, Caltowie in 1878 and Jamestown in 1877. A line was built from Burra to Hallett in 1878.
25 July 1878	Corporation of Jamestown was proclaimed. The town was named after the then Governor of South Australia, Sir James Fergusson.
1881	The town of Jamestown had a population of 995.
1880s	The wheat farmers of Jamestown and district formed the Farmers Co-operative Union. It heralded the start of a number of well-known brands including Farmers Union, Southern Farmers, Safcol and Fine Foods.

4.3 Previous Work

A number of cultural heritage studies have been undertaken for various development projects in the area. However, information relating to some of these reports is limited due to the fact that a letter from the relevant Indigenous organisations is required to get more detailed access to the database of reports held by AARD. Following are some details of these studies.

4.3.1 Gara 1983

Gara conducted an archaeological survey of a 275kV transmission line from Port Augusta to Eudunda, which is south west of the current Project Area. During this assessment a total of five Aboriginal archaeological sites were located. The sites consisted of stone artefact scatters and a scar tree.

4.3.2 Dowling 1990

This report summarises that work done by Woolmer (n.d) that included undertaking surveys in locations throughout the Upper Murray. A total 13 sites were recorded in the Lake Bonney area. Although extensive descriptions were not given about the sites they included artefacts scatters, shell middens and area of extensive occupation including ‘well used area, ‘major living areas’ and ‘hundreds of graves’.

4.3.3 Crow & Clark 1995

Crow and Clark undertook a heritage assessment of Burra Creek Gorge (Worlds end), which is situated 20 km north of Robertstown. During the assessment a total of 15 Aboriginal sites were located. Seven were artefact scatters, one was an isolated artefact and the other seven were scarred trees. All scarred trees were found on Red River Gums and all were located in creek banks.

4.3.4 Stockton 1995

Stockton undertook a survey of the road between Morgon and Burra. This Survey Area would have run just south of the current Project Area. During the assessment a total of five stone artefact scatters were located. Three of these sites are located just south of the current Project Area. Four were in line with the road alignment and would be destroyed. The fifth was next to an eroding gully. The main stone material noted was quartz, which is available from fossil river gravels. These occur throughout the plains. The sites were located on hill slopes or ridgetops, all well drained locations.

4.3.5 Wood 2001

Wood undertook a heritage survey of the proposed location of communication infrastructure for the emergency serves network at Bumbunga Hill, near Clare. The survey was the result of a previous study undertaken by Rhondda Harris, on behalf of the Native Title Unit. No Aboriginal archaeological sites were found during the survey by Harris, but it was suggested that Bumbunga Hill was a possible anthropological site. Wood suggested further work be undertaken into the significance of the area and subsequently undertook a heritage survey.

4.3.6 Walsh and Bowell 2003

Walsh and Bowell were engaged by Wind Prospect Pty Ltd to undertake an archaeological and anthropological desktop assessment of known Aboriginal and non-Aboriginal archaeological sites and heritage places for the proposed Willogoleche Wind Farm, located near Hallet. The recommendations from the assessment included that a ground survey be undertaken across the development area due to the high likelihood of finding stone cairns, culturally modified trees, quarries and a lower possibility of finding stone tool scatters, campsites, engravings, painting sites and burials.

4.3.7 Fitzpatrick 2007

Fitzpatrick was engaged by the Department of Water, Land and Biodiversity Conservation to undertake a heritage survey as a result of the proposed closure of nine wetlands as part of the South Australian Emergency Drought Responses on the River Murray. The nine wetlands included Murbko South Lagoon, Ross Lagoon, Jaeschke Lagoon, Lake Bonney, Yatco Lagoon, Gurra Lake, Nelwart Swamp, Horseshoe Swamp and Nelwood Swamp.

Cultural material in the form of artefact scatters and scarred trees were noted at Murbko South Lagoon, Ross Lagoo, Lake Bonney and Gurra Lake. The resulting report indicated that there are no Indigenous Heritage constraints at five of the closure sites (Jaeschke Lagoon, Yatco Lagoon, Nelwart Swamp and Horseshoe Swamp); that there are minor constraints that could be managed at two of the closure sites (Jaeschke Lagoon and Nelwood Swamp); that there were significant constraints at one closure site that would require institution of a monitoring program (Gurra Gurra Lake); and one site (Lake Bonney) that would require a management plan.

4.3.8 Wood 2007

Wood was engaged to undertake an Indigenous cultural heritage survey of the proposed Willogoleche Hill Wind Farm, near Hallet. No archaeological or anthropological sites were identified during the survey. It was recommended that monitoring occurred during the initial ground disturbance of the project.

4.3.9 Lower 2009

Lower Master's thesis focused on landscape archaeology and Indigenous nation building in Ngadjuri Country. Lowers work included comparing site types recorded in the area by previous studies to those recorded by Smith's work at Plumbago (1980). When comparing this data it was evident that there was a greater occurrence of rock art, particularly engravings outside of Smith's survey area. Lower suggested this was probably indicative of selective recording/sampling practices, rather than a reflecting the genuine distribution of sites. This research showed that landscape archaeology can play a vital role in the re-acquisition of cultural knowledge, assertion and authentication of identity. Her work also detailed all the known archaeological sites in the area at the time (see Figure 7).

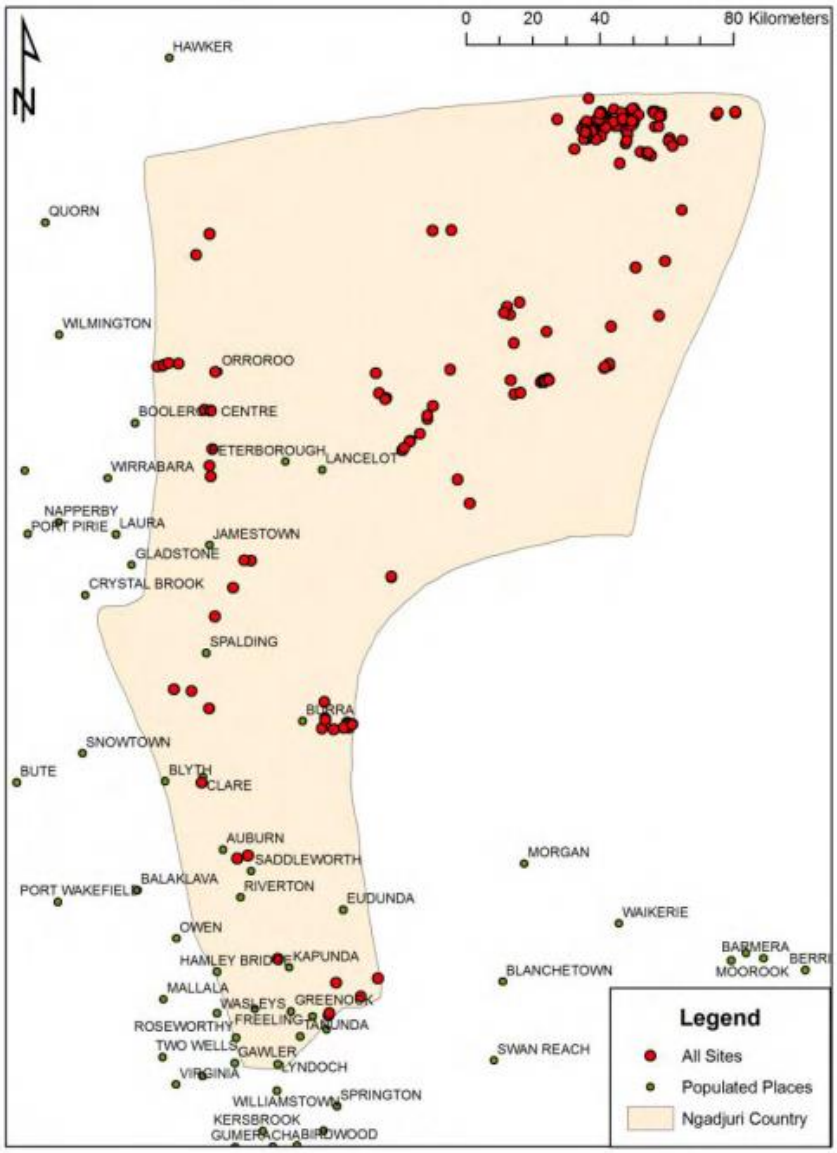

Figure 7: Map showing the location of all known sites in 2009 in Ngadjuri land

4.3.10 Wood 2009a

Wood undertook a heritage desktop assessment of the proposed transmission line connection the Bluff Wind Farm to the southern end of the North Brown Hill Wind Farm in Jamestown. The development was considered to have a low impact and was unlikely to impinge into location that have elevated archaeological sensitivity.

4.3.11 Wood 2009b

Wood undertook a heritage survey of the North Brown Hill Range Wind Farm. During the assessment a total of three Aboriginal archaeological sites were noted including stone artefact scatters and a stone cairn.

4.3.12 Wood 2009c

Wood undertook a field cultural heritage assessment of the Willogoleche Wind Farm Project Area. No Indigenous sites of significance to archaeology, anthropology, history or tradition were identified during the study.

4.3.13 Wood 2010

Wood was engaged by International Power Pty Ltd to undertake a desktop study for the proposed amendments to the Willogoleche Hill Wind Farm previously investigated. The report summarised previous work done in the area and concluded that were was still a risk of encountering Aboriginal sites and objects in the area.

4.3.14 EBS Heritage 2017

EBS Heritage undertook a gap analysis desktop and field inspection for the Barn Hill Wind Farm. The survey identified eight previously recorded Aboriginal sites in the Project Area. New locations were surveyed but no new sites were identified. All the sites were stone artefact scatters.

4.3.15 Not accessible

A number of other cultural heritage surveys are known to have been undertaken for wind farms in the region (it is likely there are others as well, but without access to the AARD database this remains unknown at this stage):

• Brown Hill Range Wind Farm – Anderson 2004

• Mt Bryan Wind Farm – ACHM 2004, Anderson 2008

• Hallett Hill Wind Farm – Anderson 2005, Wood 2005, 2007a

• North Brown Hill Wind Farm – Anderson 2008

4.3.16 Summary

Based on the previous archaeological work done in the area, it can be seen that there is a higher risk of encountering archaeological sites in locations within the Murray Darling Basin compared to areas around Hallet and Clare. This is due to the presence of the Murray River, which was an important area. The Project Area is located within the basin and is approximately 33 km North West of the river.

5 HERITAGE REGISTER SEARCHES

5.1 DSD-AAR Register Search

The Central Archive is maintained by DSD-AAR and includes the Register of Aboriginal Sites and Objects. The Central Archive is a record of previously recorded heritage sites in South Australia and facilitates the identification of known sites within a project development area. The Central Archive is not an exhaustive list of heritage sites in a specific area, it contains only sites that have been reported and/or registered.

A request for a search of the DSD-AAR records for information on previously recorded Aboriginal sites located within the development area was submitted on the 27th of November 2017. There is one registered Aboriginal site within the area of the proposed transmission line, which was not assessed during this desktop. There are no registered sites within the current Project Area (see Section 10).

5.2 SA Museums Database

The South Australian Museum Database (SAM) contains information regarding culturally sensitive finds such as human remains and items recorded prior to the establishment of the DSD-AAR Register. Where available, the database contains information on how the item(s) came into the collection, the location in which it was found and the date it was acquired.

EBS Heritage conducted a search of the SAM Database for Section 1 for references to Burra, Robertstown, Florieton, Mooney Dam, Morgon, Eudunda, Oakview Homestead Balah Home stead. A total of 527 entries were found that made reference to the Burra region. Out of these 134 are related to human remains, however a number are noted to be from the Booborowie Govt. Experimental Farm (See Section 11).

As the SAM database does not always specify exactly where cultural material items and human remains were found and its contents are often the result of specifically targeted expeditions and accidental finds, the database is best viewed as an indicative tool. The SAM search results indicate that a significant level of cultural activity has occurred in the vicinity of the Project Area. Of note are the entries regarding human remains. This information, combined with the other research indicates that it is likely that unrecorded Aboriginal sites are located within undisturbed sections of the Project Area.

5.1 European Heritage

The South Australian Heritage Places Database is maintained by the South Australian Government Department of Planning and Local Government. This database holds information relating to places on the SA Heritage Register, Local Heritage Places from SA Development Plans and Contributory Items from SA Development Plans (see Section 42).

5.1.1 Commonwealth Heritage Places

The National Heritage List records places with outstanding natural, Indigenous or historic heritage value to the nation of Australia. Places on the National Heritage List and their heritage value are recorded on the list and are protected by the EPBC Act 1999. In order to be listed on the National Heritage List, the item must meet one or more of nine criteria. These criteria are as follows:

(a) the place has outstanding heritage value to the nation because of the place's importance in the course, or pattern, of Australia's natural or cultural history;
(b) the place has outstanding heritage value to the nation because of the place's possession of uncommon, rare or endangered aspects of Australia's natural or cultural history;
(c) the place has outstanding heritage value to the nation because of the place's potential to yield information that will contribute to an understanding of Australia's natural or cultural history;
(d) the place has outstanding heritage value to the nation because of the place's importance in demonstrating the principal characteristics of:
    (i) a class of Australia's natural or cultural places; or
    (ii) a class of Australia's natural or cultural environments;
(e) the place has outstanding heritage value to the nation because of the place's importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;
(f) the place has outstanding heritage value to the nation because of the place's importance in demonstrating a high degree of creative or technical achievement at a particular period;
(g) the place has outstanding heritage value to the nation because of the place's strong or special association with a particular community or cultural group for social, cultural or spiritual reasons;
(h) the place has outstanding heritage value to the nation because of the place's special association with the life or works of a person, or group of persons, of importance in Australia's natural or cultural history; and
(i) the place has outstanding heritage value to the nation because of the place's importance as part of Indigenous tradition.

No listings were found for places of Commonwealth level historical significance within the Project Area.

5.1.2 State Heritage Places

The South Australian Heritage Register is a list of places of heritage value in the state of South Australia. The list is on the Department of Environment, Water and Natural Resources South Australian Heritage Register. In order for a place to be listed as a State Heritage Place it must satisfy one or more of the criteria listed in Section 16 of the *Heritage Places Act 1993*. These places are also identified and protected by the *Development Act 1993*. The State Heritage Place criterion are as follows;

- Demonstrates important aspects of the evolution or pattern of the state's history;
- Has rare, uncommon or endangered qualities that are of cultural significance;
- May yield information that will contribute to an understanding of the state's history, including its natural history;
- Is an outstanding representative of a particular class of places of cultural significance;
- Demonstrates a high degree of creative, aesthetic or technical accomplishment or is an outstanding representative of particular construction techniques or design characteristics;
- Has a strong cultural or spiritual association for the community or group within it; and
- Has a special association with the life or work of a person or organisation or an event of historical importance.

No listings were found for places of State level historical significance within the Project Area.

5.1.3 Local Heritage Places

A Local Heritage Place is a place of heritage value due to its history, architectural and design qualities, built form character and integrity. These places are listed in the Development Plan and may be considered to have local heritage value if they meet one or more of the listed criteria in the *Development Act 1993* section 23(4). The criteria are as follows:

- Displays historical, economic or social themes that are of importance to the local area;
- Represents customs or ways of life that are characteristic of the local area;
- Has played an important part in the lives of local residents;
- Displays aesthetic merit, design characteristics or construction techniques of significance to the local area;
- Is associated with a notable local personality or event;
- Is a notable landmark in the area; and
- Is a tree of special historical or social significance or importance within the local area.

No listings were found for places of local level historical significance within the Project Area.

6 PREDICTIVE STATEMENTS AND RISK ASSESSMENT

6.1 Predictive Statements

The archaeological predictive statements and risk assessment have been formulated based on the results of the locations and type of Aboriginal sites that have been recorded with the regional area and information about previous archaeological work. The results are presented in Table 2below.

Table 2: Table with predictive statements and risk assessments for the Project Area.

Site Type	Site Description	Associated Landform / Environment	Statement
Artefact Scatters / Isolated Artefacts	Debris which results from flaking stone and will include unmodified flakes, cores and flaked pieces. Actual stone tools such as deliberately formed artefacts (such as scrapers, backed blades or adzes) or pieces which possess evidence of use are generally present in low frequencies.	Stone artefacts are located either on the ground surface and/or in subsurface contexts. Within alluvial plains this site type is normally located to high terraces and sand bodies on the floodplain adjacent to drainage features.	Due to the widespread and common nature of this site type there is a high change of finding this site type in the Project Area, especially considering the areas close location to the River Murray.
Engravings	Creation of geometric shapes, patterns or symbols into rock surface. There are many different styles including pecked, grooved etc.	This site type is located on bedrock outcrops are varying sizes and formations.	At this stage of the assessment there appears to be few rock outcrops, suggesting a low risk of locating this site type within the Project Area. However, if there were rock outcrops then this site type could be located.
Quarries	They consist of sources of stone that is used to manufacture stone artefacts. There are also quarries of ochre. Quarries are procurement sites and normally have an associated artefact scatter and areas of reduction or knapping areas.	Located in areas where there are large bedrock outcrops that are available for quarrying.	At this stage of the assessment there appears to be few rock outcrops, suggesting a low risk of locating this site type within the Project Area. However, if there were rock outcrops then this site type could be located.
Scarred Trees	This site type consists of tress that have been modified through the removal	These site types can occur anywhere that trees of sufficient age are present,	At this stage of the assessment there appears to be no trees

Site Type	Site Description	Associated Landform / Environment	Statement
	of bark sections to construct canoes, shields and dishes. Typically river red gums or river box are targeted. Sculpted trees are when the tree has been carved for ceremonial purposes.	however, in an Aboriginal land use context would most likely have been situated on flat or low gradient landform units in areas suitable for either habitation and/or ceremonial purposes.	suitable, suggesting a low risk of locating this site type within the Project Area. However, if there were then this site type could be located.
Burials	This site type can include an isolated bone fragment to a complete individuals or group of burials. Burials include flexed, extended and cremated inhumations with common comprising extended inhumations with an east-west attitude. Bundle burials are restricted to the late Holocene (Pardoe 1995; Woods and Westel 2008)	Burials in this area tend to be associated with ridges and lunettes and other sand bodies, such as source boarding dunes, perched dunes, and point bar deposits, spits and sandy river or creek banks.	There appears to be a number of environmental locations within the Project Area that could contain this site type including lunettes and sandy areas associated with ephemeral water lines.
Middens	This site type typically comprise of shell remains and other faunal materials. In the region middens will be dominated by freshwater mussels, but are also likely to contain animal bones, stone artefacts, ash, charcoal and other remnants of hearths such as heat retainer stones (Dibden 2007).	These site types are located in associated with waterways. They are present on floodplain and riverbanks. Older middens are found along prior streams and within lunette sediments.	There are a number of prior streams or ephemeral water channels that run though the Project Area towards the Murray River. There is a moderate chance of locating this site type.
Rock Art / Paintings	Rock art is found across the continent as paintings, drawings, and pecked or abraded imagery and mechanically produced motifs such as stencils.	Art in the Australian semi-arid zone is associated with rock shelters and other stone feature, in open contexts as pecked or abraded art.	At this stage of the assessment there appears to be few rock outcrops, suggesting a low risk of locating this site type within the Project Area. However, if there were rock outcrops then this site type could be located.
Stone Arrangements	Stone arrangements are formed by placing rocks in a variety of different patterns and shapes. These can	Anywhere that suitable rock is located. Fish traps are normally located in association with waterways.	A number of stone cairns have been noted in the local area. If there are suitable rocks in the

Site Type	Site Description	Associated Landform / Environment	Statement
	include standing stones, cairns, bora rings and fish traps. Bora Rings are Aboriginal ceremonial places.		Project Area there is some chance of locating this site type.

From the predictive statements it is evident that there is a higher chance of encountering stone artefact scatters / isolated artefacts, potential archaeological deposits, early middens and burials sites within the Project Area. These site types are common in the environmental zones in close proximity to the River Murray.

6.2 Risk Assessment

There are generally three levels of heritage risk assigned; low, medium and high risk.

High Risk: identifies landforms where traditionally, cultural heritage sites have been found and where there is a high risk of proposed works encountering heritage sites. This risk has been assessed on the understanding that these areas have not experienced high levels of disturbance or geotechnical data indicates that the disturbance has not significantly impacted sub-surface soils. Areas traditionally considered to be of 'high' risk include the margins of undisturbed waterways, sand dunes and remnant trees.

Moderate Risk: identifies landforms where traditionally opportunistic use cultural heritage sites have been found and where there is a moderate risk of proposed works encountering unidentified heritage sites. Areas traditionally considered to be of 'moderate' risk are areas which may have once been classified as 'high' risk but appear to have been impacted by modern disturbance.

Low Risk: are areas where there is a very low to no chance of encountering cultural heritage sites and where there is low likelihood of proposed work impacting heritage sites. Areas assessed as having a 'low' risk are areas where there has been considerable modern impact and/or where geotechnical data indicates soils have been heavily impacted by modern activities and there is therefore a lower risk of cultural heritage sites to remain undisturbed.

Based on a review of the previous heritage work and the landforms present in the current Project Area, EBS has assessed that there is a ***high*** to ***moderate*** risk of works impacting archaeological sites in areas not previously disturbed. There is a ***low*** risk of works encountering archaeological sites and items in areas previously disturbed (see 8).

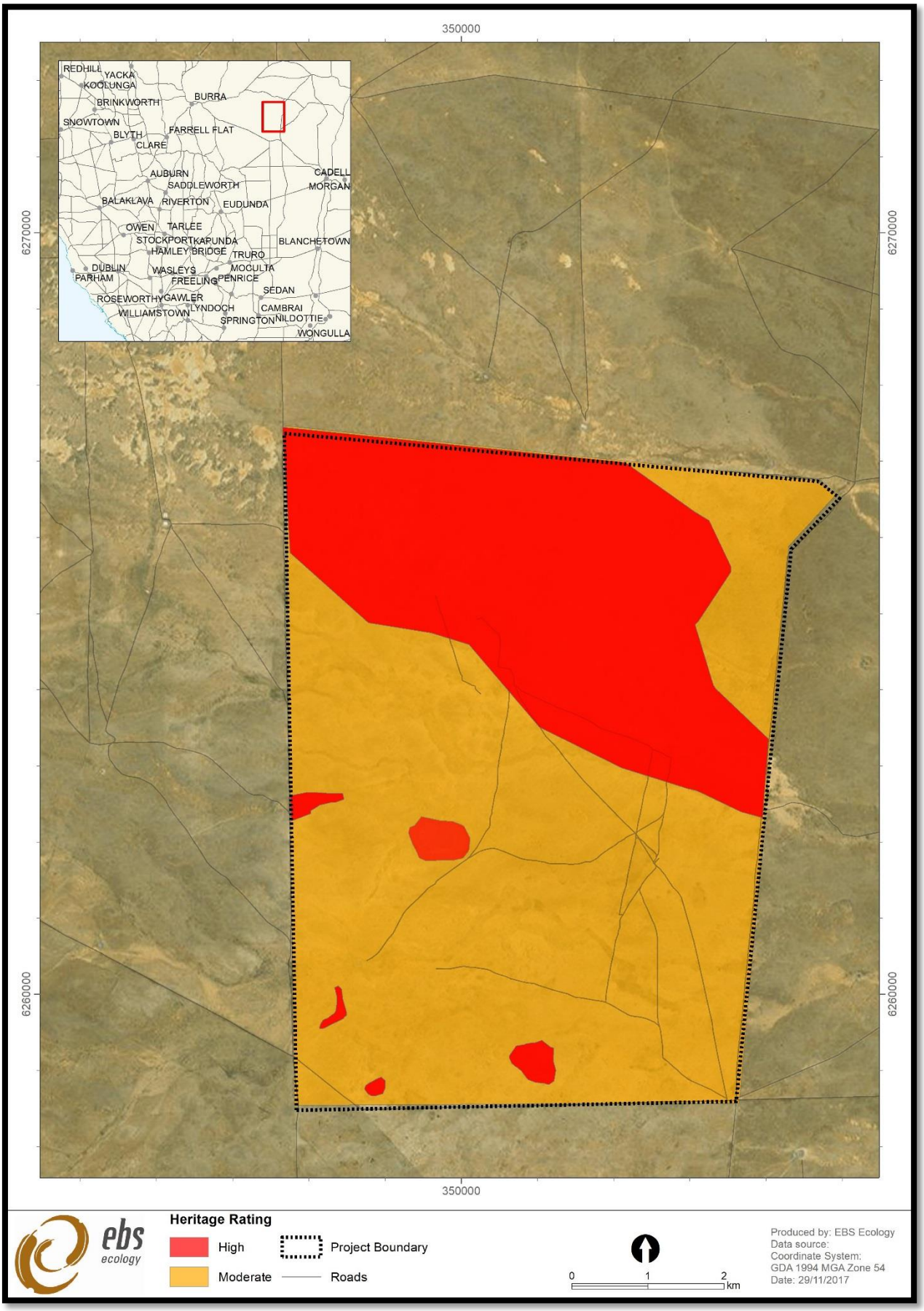

Figure 8: Heritage Risk Assessment

7 SUMMARY AND RECOMMENDATIONS

EBS Heritage has carried out a desktop risk assessment based on the information available. As a result of this assessment, EBS Heritage recommend the following:

- May Brothers & Co should undertake an archaeological inspection of impact areas to mitigate the ***moderate*** to ***high*** risk of encountering archaeological sites during the proposed works. This work should be conducted by qualified archaeologists.
- Any previously recorded archaeological sites should be avoided as it is an offence under the AHA to damage, disturb or interfere with sites without Ministerial approval.
- EBS recommends that May Brothers & Co construction personnel receive a heritage induction prior to works as a minimum requirement to manage heritage risk.
- EBS recommends that May Brothers & Co have a stop work/site discovery procedure in place in the event of an unexpected find. EBS has included a site discovery procedure in the appendix of this report for May Brothers & Co's convenience.
- May Brothers & Co's may wish to engage the services of an archaeologist "on-call" to assist in the identification of any unexpected finds.

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9 SITE DISCOVERY PROCEDURE

Discovery of Aboriginal Heritage Procedure

Have you found a site, object or skeletal remains that may be Aboriginal Heritage?

- See example pictures on next page.

STOP

All works in Vicinity of Site

- **Do not disturb/remove/touch or displace the site**, object or skeletal remains.
- It is an offence to disturb or interfere with Aboriginal heritage or skeletal remains.
- (*SA Aboriginal Heritage Act 1988*)
- ***Leave objects in place*** –Supervisor to take photos and send to archaeologists for verification.

PROTECT

Restrict access. Site supervisor to take note of:

- Location in relation to site works (pref GPS).
- Identify any immediate threats to heritage e.g. construction activities, vandalism, water level.
- Name and contact details of the person who made the discovery.
- Do not proceed with any works (or move ot touch objects) until advice has been sought from site archaeologists

NOTIFY

Site Supervisor to immediately notify:

- Client Representative
- Archaeologists
- Local Police or 131 444. If suspected human remains have been discovered.

MANAGE

Manage the incident with appropriate guidance from:

- Local Police (where skeletal remains have been discovered).
- Aboriginal Affairs and Reconciliation .
- The local Aboriginal community.
- An Archaeologist /Cultural Heritage Advisor

RESUME

- The Site Manager will advise contractors when work can resume.
- This decision will be made in consultation with the archaeologists
- There may be conditions that need to be followed to allow work to resume.

10 DSD-AAR REGISTER SEARCH

Physical Id. AHRCA17D0434
File No. AHRCA17/09

Government of South Australia
Department of State Development

Martyn England
Department of State Development – Commercial Investment
Martyn.England@sa.gov.au

Dear Martyn

Thank you for your correspondence (email) dated 27 November 2017, regarding the lodgement of a Development Application by May Bros & Co in the area of Bundey. The search was based on the parcel details and maps provided.

I advise that the Central Archive, which includes the Register of Aboriginal Sites and Objects (the Register), administered by the Department of State Development, Aboriginal Affairs and Reconciliation (DSD-AAR), has an entry for a Aboriginal site in the proposed development location.

This entry for an Aboriginal site is described as one archaeological site. The enclosed map identifies the approximate site location. It should be noted however that the site indicator does not reflect the actual area of the site; as this will vary from site to site, depending on the site information contained in the Central Archive.

The applicant is advised that sites or objects may exist in the proposed development area, even though the Register does not identify them. All Aboriginal sites and objects are protected under the *Aboriginal Heritage Act 1988* (the Act), whether they are listed in the Register or not. Land within 200 metres of a watercourse (for example the River Murray and its overflow areas) in particular, may contain Aboriginal sites and objects.

Pursuant to the Act, it is an offence to damage, disturb or interfere with any Aboriginal site, object or remains (registered or not) without the authority of the Minister for Aboriginal Affairs and Reconciliation (the Minister). If the planned activity is likely to damage, disturb or interfere with a site, object or remains, authorisation of the activity must be first obtained from the Minister under Section 23 of the Act. Section 20 of the Act requires that any Aboriginal sites, objects or remains, discovered on the land, need to be reported to the Minister. Penalties apply for failure to comply with the Act.

It should be noted that this Aboriginal heritage advice has not addressed any relevant obligations pursuant to the Native Title Act 1993.

Please be aware in this area there are various Aboriginal groups/organisations/traditional owners that may have an interest, these may include:

NGADJURI NATION ABORIGINAL CORPORATION

Chairperson:	Quenten Agius
Address:	46 Maitland Road POINT PEARCE SA 5573
Mobile:	0429 367 121
Email:	Traditionalowners@adjahdura.com.au

SOUTH AUSTRALIA

Aboriginal Affairs and Reconciliation
Level 7, 11 Waymouth Street | GPO Box 320 Adelaide SA 5001
Tel (+61) 08 8226 8900 | Fax (+61) 08 8226 8999 | www.statedevelopment.sa.gov.au | ABN 83 524 915 929

Government of South Australia
Department of State Development

Terms and conditions for use of information derived from the central archive:

• Information derived from the central archive may not be re-utilised and/or copied (whether electronic or hard copy format) for any commercial or business purpose including but not limited to, trading, building commercial databases, reselling or redistribution of such information.

• The reproduction, copying, downloading, storage, recording, broadcasting, retransmission, distribution, decompilation, or disassembly of any part of the information derived from the central archive is not permitted without prior written consent from the traditional informant and must be in accordance with any associated copyright.

• It is the responsibility of any person provided with information derived from the central archive to:
o Ensure that the information accessed is not made available, either in electronic or in hard copy format, to any third party.
o Inform DSD-AAR immediately if they become aware of a third party using information derived for the central archive in contravention to these terms and conditions.

If you require further information, please contact the Aboriginal Heritage Team on telephone (08) 8226 8900 or send to our generic email address dsdaarheritagesites1@sa.gov.au

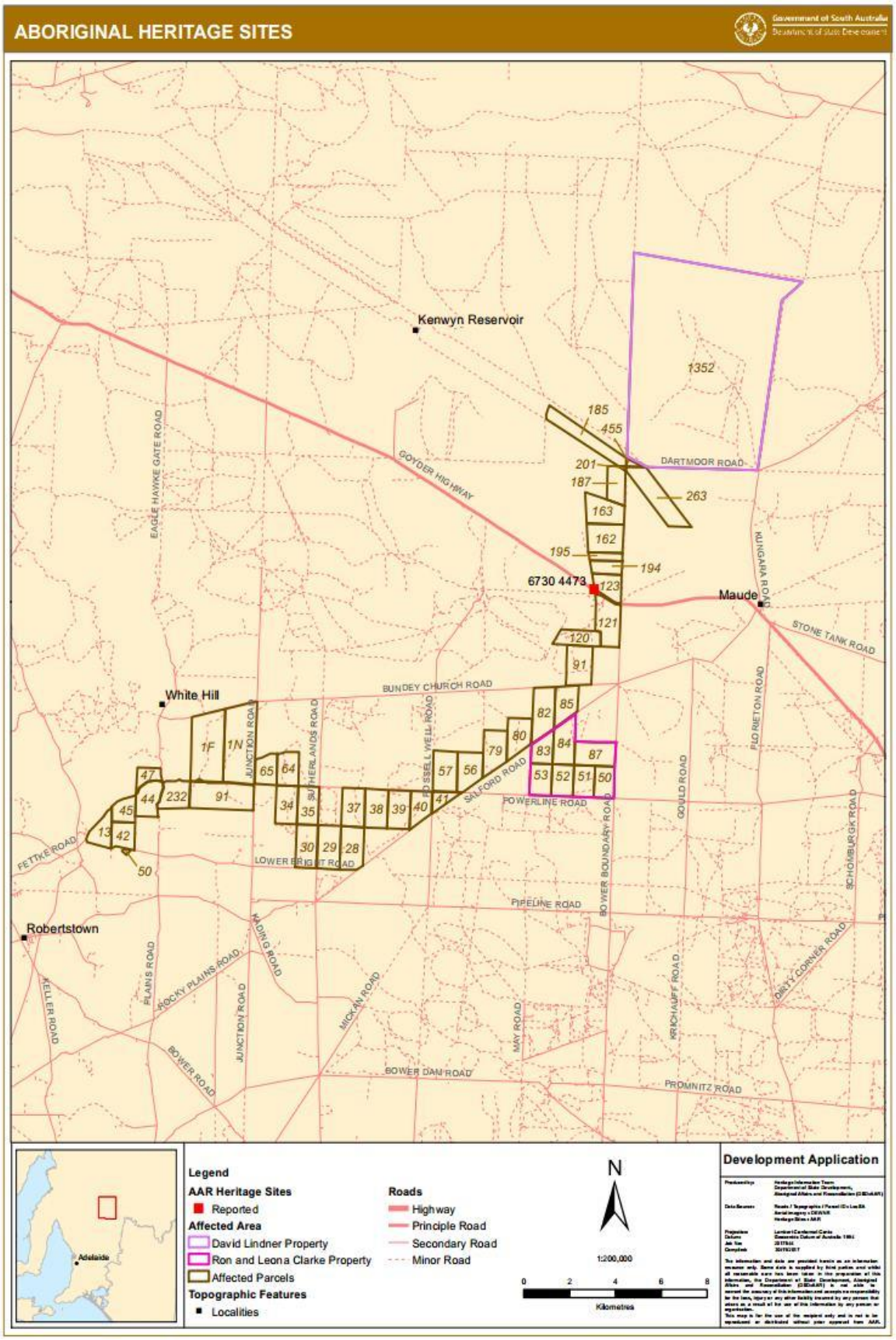
Yours sincerely

Perry Langeberg
SENIOR INFORMATION OFFICER (HERITAGE)
ABORIGINAL AFFAIRS & RECONCILIATION

30 November 2017

Aboriginal Affairs and Reconciliation
Level 7, 11 Waymouth Street | GPO Box 320 Adelaide SA 5001
Tel (+61) 08 8226 8900 | Fax (+61) 08 8226 8999 | www.statedevelopment.sa.gov.au | ABN 83 524 915 929

SOUTH AUSTRALIA


ABORIGINAL HERITAGE SITES
Government of South Australia
Kenwyn Reservoir
Maude
White Hill
Robertstown
6730 4473
GOYDER HIGHWAY
EAGLE HAWKE GATE ROAD
DARTMOOR ROAD
KUNGARA ROAD
STONE TANK ROAD
BUNDEY CHURCH ROAD
JUNCTION ROAD
SUTHERLANDS ROAD
POWERLINE ROAD
SALFORD ROAD
GOULD ROAD
PIO RIETON ROAD
SCHOMBURGK ROAD
FETTKE ROAD
LOWER BRIGHT ROAD
PIPELINE ROAD
BOWER BOUNDARY ROAD
PLAINS ROAD
ROCKY PLAINS ROAD
KELLER ROAD
KLADING ROAD
MICKAN ROAD
MAY ROAD
KRICHAUFF ROAD
DIRTY CORNER ROAD
BOWER ROAD
BOWER DAM ROAD
PROMNITZ ROAD
Legend
AAR Heritage Sites
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David Lindner Property
Ron and Leona Clarke Property
Affected Parcels
Topographic Features
Localities
Roads
Highway
Principle Road
Secondary Road
Minor Road
N
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Kilometres
Development Application

11 SA MUSEUM DATABASE HUMAN REMAINS RESULTS

No.	Description	Region	Locality	How Acquired	Acquired From
A26005	Occipital.	Mid North Burra	Booborowie Govt. Experimental Farm	Presented	Wood-Jones, F., Prof
A25409	Cranium	Mid North Burra	Clare		Rogers, R. S.
A26012	Scapula.	Mid North Burra	Booborowie Govt. Experimental Farm	Presented	Wood-Jones, F., Prof
A26003	Os calcis, pair of.	Mid North Burra	Booborowie Govt. Experimental Farm	Presented	Wood-Jones, F., Prof
A11545	Part skull and femur	Mid North Burra	Clare	Donated	Police
A26011	Vertebrae.	Mid North Burra	Booborowie Govt. Experimental Farm	Presented	Wood-Jones, F., Prof
A25999	Radius	Mid North Burra	Booborowie Govt. Experimental Farm	Presented	Wood-Jones, F., Prof
A26010	Ribs.	Mid North Burra	Booborowie Govt. Experimental Farm	Presented	Wood-Jones, F., Prof
A26004	Os calcis	Mid North Burra	Booborowie Govt. Experimental Farm	Presented	Wood-Jones, F., Prof
A26009	Clavicle, pair of.	Mid North Burra	Booborowie Govt. Experimental Farm	Presented	Wood-Jones, F., Prof
A38022	Pt. skeleton	Mid North Burra	Terowie		Fenner, Frank
A38134	Teeth	Mid North Burra	Hallett	Presented	Cleland, J. B.
A25663	Teeth	Mid North Burra	Leasingham	No data	No data
A38574	Skull, no jaw	Mid North Burra	Burra	Presented	Police
A26000	Radius	Mid North Burra	Booborowie Govt. Experimental Farm	Presented	Wood-Jones, F., Prof
A25401	Jaw	Mid North Burra	Leasingham, via Riverton	Donated	Police
A25715	Skull, jaw and part Skeleton	Mid North Burra	Port Pirie		Atkinson, W.
A26006	Tarsals, etc.	Mid North Burra	Booborowie Govt. Experimental Farm	Presented	Wood-Jones, F., Prof
A25566	Skull	Mid North Burra	Clare		Rogers, S., Dr.
A25805	Tibiae, pair of	Mid North Burra	Bute	Donated	Police
A25621	Skull	Mid North Burra	Port Pirie	No data	No data
A25714	Skull, jaw and part skeleton	Mid North Burra	Port Pirie, Hd. Pirie, Sec. 828		Atkinson, W.
A26007	Teeth.	Mid North Burra	Booborowie Govt. Experimental Farm	Presented	Wood-Jones, F., Prof
A26008	Clavicle	Mid North Burra	Booborowie Govt. Experimental Farm	Presented	Wood-Jones, F., Prof
A11408	Skull with jaw and part skeleton	Mid North Burra	Spalding	Donated	Police

A309	Part skull	Mid North Burra	Wirrabara	Donated	Police
A25983	Temporal.	Mid North Burra	Booborowie Govt. Experimental Farm	Presented	Wood-Jones, F., Prof
A25984	Femur	Mid North Burra	Booborowie Govt. Experimental Farm	Presented	Wood-Jones, F., Prof
A25985	Femur	Mid North Burra	Booborowie Govt. Experimental Farm	Presented	Wood-Jones, F., Prof
A25986	Femur	Mid North Burra	Booborowie Govt. Experimental Farm	Presented	Wood-Jones, F., Prof
A25987	Innominate	Mid North Burra	Booborowie Govt. Experimental Farm	Presented	Wood-Jones, F., Prof
A38214	Skull and lower jaw	Mid North Burra	Upper Wakefield, Hd.		Uppill, D.
A25988	Innominate	Mid North Burra	Booborowie Govt. Experimental Farm	Presented	Wood-Jones, F., Prof
A26001	Ulna	Mid North Burra	Booborowie Govt. Experimental Farm	Presented	Wood-Jones, F., Prof
A25990	Innominate	Mid North Burra	Booborowie Govt. Experimental Farm	Presented	Wood-Jones, F., Prof
A25980	Maxillary, part of.	Mid North Burra	Booborowie Govt. Experimental Farm	Presented	Wood-Jones, F., Prof
A25991	Sacrum	Mid North Burra	Booborowie Govt. Experimental Farm	Presented	Wood-Jones, F., Prof
A25992	Sacrum, part of.	Mid North Burra	Booborowie Govt. Experimental Farm	Presented	Wood-Jones, F., Prof
A25993	Tibia	Mid North Burra	Booborowie Govt. Experimental Farm	Presented	Wood-Jones, F., Prof
A25994	Tibia	Mid North Burra	Booborowie Govt. Experimental Farm	Presented	Wood-Jones, F., Prof
A25995	Tibia	Mid North Burra	Booborowie Govt. Experimental Farm	Presented	Wood-Jones, F., Prof
A25996	0	Mid North Burra	Booborowie Govt. Experimental Farm	Presented	Wood-Jones, F., Prof
A25997	0	Mid North Burra	Booborowie Govt. Experimental Farm	Presented	Wood-Jones, F., Prof
A25998	0	Mid North Burra	Booborowie Govt. Experimental Farm	Presented	Wood-Jones, F., Prof
A25989	Innominate	Mid North Burra	Booborowie Govt. Experimental Farm	Presented	Wood-Jones, F., Prof
A25387	Cranium	Mid North Burra	Leasingham, via Riverton	Donated	Police
A25399	Maxillary	Mid North Burra	Leasingham, via Riverton	Donated	Police
A25398	Temporal	Mid North Burra	Leasingham, via Riverton	Donated	Police
A25397	Temporal	Mid North Burra	Leasingham, via Riverton	Donated	Police
A25395	Frontal	Mid North Burra	Leasingham, via Riverton	Donated	Police
A25393	Part cranium	Mid North Burra	Leasingham, via Riverton	Donated	Police
A25392	Cranium	Mid North Burra	Leasingham, via Riverton	Donated	Police
A25391	Cranium	Mid North Burra	Leasingham, via Riverton	Donated	Police

A25390	Cranium	Mid North Burra	Leasingham, via Riverton	Donated	Police
A25982	Temporal.	Mid North Burra	Booborowie Govt. Experimental Farm	Presented	Wood-Jones, F., Prof
A25388	Cranium	Mid North Burra	Leasingham, via Riverton	Donated	Police
A25981	Jaw, lower.	Mid North Burra	Booborowie Govt. Experimental Farm	Presented	Wood-Jones, F., Prof
A26002	Sternum	Mid North Burra	Booborowie Govt. Experimental Farm	Presented	Wood-Jones, F., Prof
A38713	Skull, edentulous, without lower jaw.	Mid North Burra	Solomontown	Presented	Police
A25806	Tibiae, pair of	Mid North Burra	Bute	Donated	Police
A798	Skull, incomplete and bones	Mid North Burra	Port Pirie	Presented	Police
A25396	Frontal	Mid North Burra	Leasingham, via Riverton	Donated	Police
A25978	Parietal.	Mid North Burra	Booborowie Govt. Experimental Farm	Presented	Wood-Jones, F., Prof
A25979	Jaw, lower.	Mid North Burra	Booborowie Govt. Experimental Farm	Presented	Wood-Jones, F., Prof
A25400	Jaw	Mid North Burra	Leasingham, via Riverton	Donated	Police
A25389	Cranium	Mid North Burra	Leasingham, via Riverton	Donated	Police
A25822	Radius	Mid North Burra	Bute	Donated	Police
A25842	Clavicle	Mid North Burra	Bute	Donated	Police
A25862	Fibula	Mid North Burra	Bute	Donated	Police
A25828	Ulna	Mid North Burra	Bute	Donated	Police
A25827	Ulna	Mid North Burra	Bute	Donated	Police
A25863	Fibula	Mid North Burra	Bute	Donated	Police
A25873	Skull and part skeleton	Mid North Burra	Bute, Hd. Wiltunga, Sec. ?	Exchanged	McElroy, A.
A25874	Teeth	Mid North Burra	Bute		Law, T. W.
A25807	Innominates, pair of	Mid North Burra	Bute	Donated	Police
A25394	Part cranium	Mid North Burra	Leasingham, via Riverton	Donated	Police
A25880	Skull and jaw	Mid North Burra	Bute		Ireland, P. E.
A25826	Ulna	Mid North Burra	Bute	Donated	Police
A25825	Ulnae, pair	Mid North Burra	Bute	Donated	Police
A25811	0	Mid North Burra	Bute	Donated	Police

A25823	Ulnae, pair of	Mid North Burra	Bute	Donated	Police
A25831	Ulna	Mid North Burra	Bute	Donated	Police
A25821	Radius	Mid North Burra	Bute	Donated	Police
A25820	Radii, pair of	Mid North Burra	Bute	Donated	Police
A25819	Radii, pair of	Mid North Burra	Bute	Donated	Police
A25818	Radii, pair of	Mid North Burra	Bute	Donated	Police
A25817	Radii, pair of	Mid North Burra	Bute	Donated	Police
A25816	Radii, pair of	Mid North Burra	Bute	Donated	Police
A25815	Femur	Mid North Burra	Bute	Donated	Police
A25814	0	Mid North Burra	Bute	Donated	Police
A25813	0	Mid North Burra	Bute	Donated	Police
A13197	Skull with jaw and part skeleton	Mid North Burra	Wandearah West	Donated	Police
A25812	0	Mid North Burra	Bute	Donated	Police
A13195	Skull with jaw and part skeleton	Mid North Burra	Snowtown	Donated	Police
A25895	Skull	Mid North Burra	Bute	Donated	Police
A25824	Ulnae, pair of	Mid North Burra	Bute	Donated	Police
A25852	Fibula	Mid North Burra	Bute	Donated	Police
A25844	Clavicle	Mid North Burra	Bute	Donated	Police
A25841	Scapula	Mid North Burra	Bute	Donated	Police
A25840	Sacrum	Mid North Burra	Bute	Donated	Police
A25839	Parietal	Mid North Burra	Bute	Donated	Police
A25838	Parietal	Mid North Burra	Bute	Donated	Police
A25837	Occipital	Mid North Burra	Bute	Donated	Police
A25836	Maxilla	Mid North Burra	Bute	Donated	Police
A25835	Ulna	Mid North Burra	Bute	Donated	Police
A25845	Clavicles	Mid North Burra	Bute	Donated	Police
A25846	Ribs	Mid North Burra	Bute	Donated	Police

A25847	Vertebrae	Mid North Burra	Bute	Donated	Police
A25848	Fibulae, pair of	Mid North Burra	Bute	Donated	Police
A25849	Fibulae, pair of	Mid North Burra	Bute	Donated	Police
A25830	Ulna	Mid North Burra	Bute	Donated	Police
A25856	Fibula	Mid North Burra	Bute	Donated	Police
A25829	Ulna	Mid North Burra	Bute	Presented	Police
A25832	Ulna	Mid North Burra	Bute	Donated	Police
A25861	Tibia	Mid North Burra	Bute	Donated	Police
A25860	Fibulae	Mid North Burra	Bute	Donated	Police
A25859	Fibula	Mid North Burra	Bute	Donated	Police
A25850	Fibula	Mid North Burra	Bute	Donated	Police
A25857	Fibula	Mid North Burra	Bute	Donated	Police
A25851	Fibula	Mid North Burra	Bute	Donated	Police
A25855	Fibula	Mid North Burra	Bute	Donated	Police
A25854	Fibula	Mid North Burra	Bute	Donated	Police
A25833	Ulna	Mid North Burra	Bute	Donated	Police
A25834	Ulna	Mid North Burra	Bute	Donated	Police
A25853	Fibula	Mid North Burra	Bute	Donated	Police
A25843	Clavicle	Mid North Burra	Bute	Presented	Police
A25858	Fibula	Mid North Burra	Bute	Donated	Police
A25810	0	Mid North Burra	Bute	Donated	Police
A25809	Innominate	Mid North Burra	Bute	Donated	Police
A25808	Innominate	Mid North Burra	Bute	Donated	Police
NR121	Skull	Mid North Burra	Burra, 2km. E, in bank of creek on Morgan Road	No Data	No Data
A38830	Bones, jaw fragment, part occipital.	Mid North Burra	Port Pirie	Presented	Rogers, M. N.

12 REGISTERED EUROPEAN HERITAGE PLACES

Table 3: Locations of heritage significance within the Mid Murray Council Area

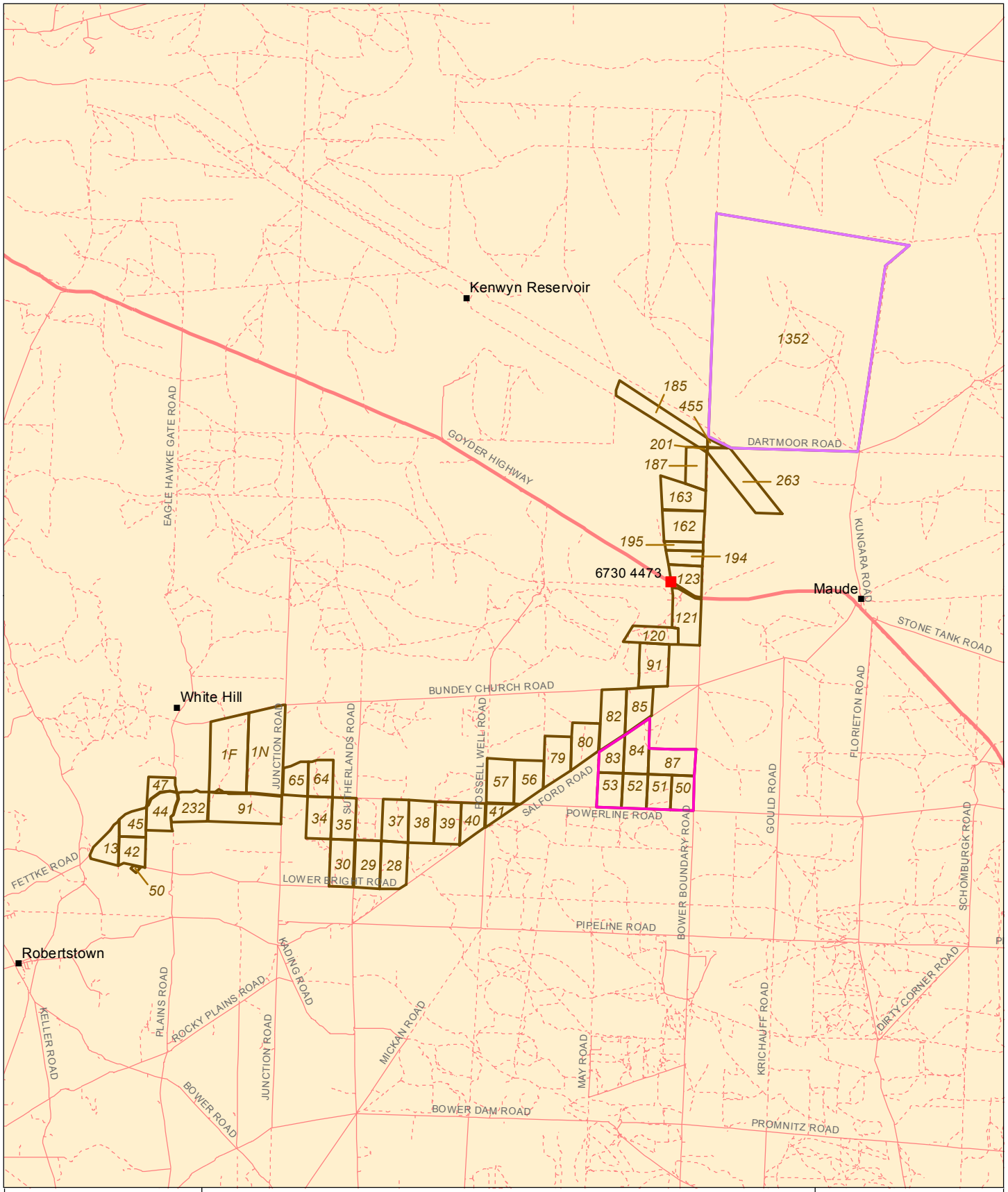
Address	LGA	Details	Class	State Heritage Place No
Adams Street BLANCHETOWN	Mid Murray	Blanchetown Hotel	State	10106
28-30 Egerton Street BLANCHETOWN	Mid Murray	Blanchetown Post Office	State	10084
Off Swan Reach-Blanchetown Road near BLANCHETOWN	Mid Murray	Moorundie (officially Sturt) Settlement Ruins, Portee Station	State	10096
Bower Boundary Road BOWER	Mid Murray	Lime Kiln Ruins	State	11024
CADELL	Mid Murray	Nor'West Bend Station Complex (including Homestead, Cottage, Underground Tank, Woolshed, Paved Wool Scouring Area, Shearing Shed and Stables)	State	10174
Rice Street DUTTON VIA TRURO	Mid Murray	Former St John's Lutheran Manse	State	11028
1 Rice Street DUTTON VIA TRURO	Mid Murray	Former Blacksmith Shop & Dwelling	State	11027
Pine Hut Road KEYNETON	Mid Murray	Engine House for Direct Acting ('Bull') Pumping Engine, North Rhine Mine	State	12846
Sedan-Angaston Road KEYNETON	Mid Murray	Bridge over the River Somme [Under-strutted Timber]	State	12718
Anna Street MANNUM	Mid Murray	Dwelling - David Shearer's former Dwelling & Observatory	State	12696
Cliff Street MANNUM	Mid Murray	Dwelling ('Bleak House', former home of W R Randell)	State	14305
East Front Road MANNUM	Mid Murray	Dwelling ('Wilhaven')	State	13790
Noa No Road near MANNUM	Mid Murray	Noa No Landing (Site of the launching of the PS 'Mary Ann')	State	13782
Randell Street MANNUM	Mid Murray	William Randell's Dry Dock	State	10282
51 - 53 Randell Street MANNUM	Mid Murray	Shearer's Agricultural Implement Factory Site and Stamp Press Relics	State	13788
Off Milendella Road MILENDELLA VIA PALMER	Mid Murray	Milendella Creek Railway Bridge [Concrete Girder]	State	14604
Railway Terrace MORGAN	Mid Murray	Morgan Railway Station & Station Master's House	State	12320
11 Railway Terrace MORGAN	Mid Murray	Post Office Row (Five attached shops and dwellings at rear)	State	12341
25 Railway Terrace MORGAN	Mid Murray	Landseer's Store	State	12347
MORGAN	Mid Murray	Morgan Wharf	State	10173
Walker Flat - Mount Pleasant Road MOUNT PLEASANT	Mid Murray	Rosebank Shearing Shed	State	14482
Adelaide-Mannum Road, near PALMER	Mid Murray	Granite Boulders Area Geological Site	State	13197
Mannum Road PALMER	Mid Murray	Palmer Police Station & Cells	State	13194
Off Mine Road PALMER	Mid Murray	Kitticoola Mine	State	10835
Palmer Road PALMER	Mid Murray	Homestead Complex, including main house, two cottages, shearing shed, stable and piggery.	State	14486
Off Western Boundary Road PALMER	Mid Murray	Reedy Creek Railway Bridge [Concrete Arch]	State	14603

Address	LGA	Details	Class	State Heritage Place No
Billabong Road POMPOOTA VIA MANNUM	Mid Murray	Former Pompoota Post Office, General Store & Butcher	State	14306
Billabong Road POMPOOTA VIA MANNUM	Mid Murray	Pompoota Hall	State	14307
Thiele Road POMPOOTA VIA MANNUM	Mid Murray	Implement Shed, Former Training Farm	State	14308
Loxton Road ROCKLEIGH VIA CALLINGTON	Mid Murray	Grain Threshing Floor	State	10841
Baldon Road TRURO	Mid Murray	Baldon Homestead Complex (including Homestead, Chaff Shed, Workmens Quarters, Stables, Shearing Shed and Quarters and room built into the creek bank)	State	11032
37 Moorundie Street TRURO	Mid Murray	Former Truro Police Station and Cells	State	12314
Off Sturt Highway TRURO	Mid Murray	Stone Wall	State	11030
Off Sturt Highway TRURO	Mid Murray	Accommodation Hill Spring & Pipeline Relics, site of former stock yard for overlanders	State	11031
Hoads Woolshed Road TUNGKILLO	Mid Murray	Shearing Shed, former Terlinga Station	State	14484

3/119 Hayward Avenue
Torrensville, SA 5031
www.ebsheritage.com.au
t. 08 7127 5607
f. 08 8352 1222

ABORIGINAL HERITAGE SITES

Government of South Australia
Department of State Development



Legend

AAR Heritage Sites
- Reported

Affected Area
- David Lindner Property
- Ron and Leona Clarke Property
- Affected Parcels

Topographic Features
- Localities

Roads
- Highway
- Principle Road
- Secondary Road
- Minor Road

N

1:200,000

0 2 4 6 8
Kilometres

Development Application

Produced by:	Heritage Information Team Department of State Development, Aboriginal Affairs and Reconciliation (DSD-AAR)
Data Source:	Roads / Topographic / Parcel ID - LocSA Aerial imagery - DEWNR Heritage Sites - AAR
Projection:	Lambert Conformal Conic
Datum:	Geocentric Datum of Australia 1994
Job No:	2017544
Compiled:	30/11/2017

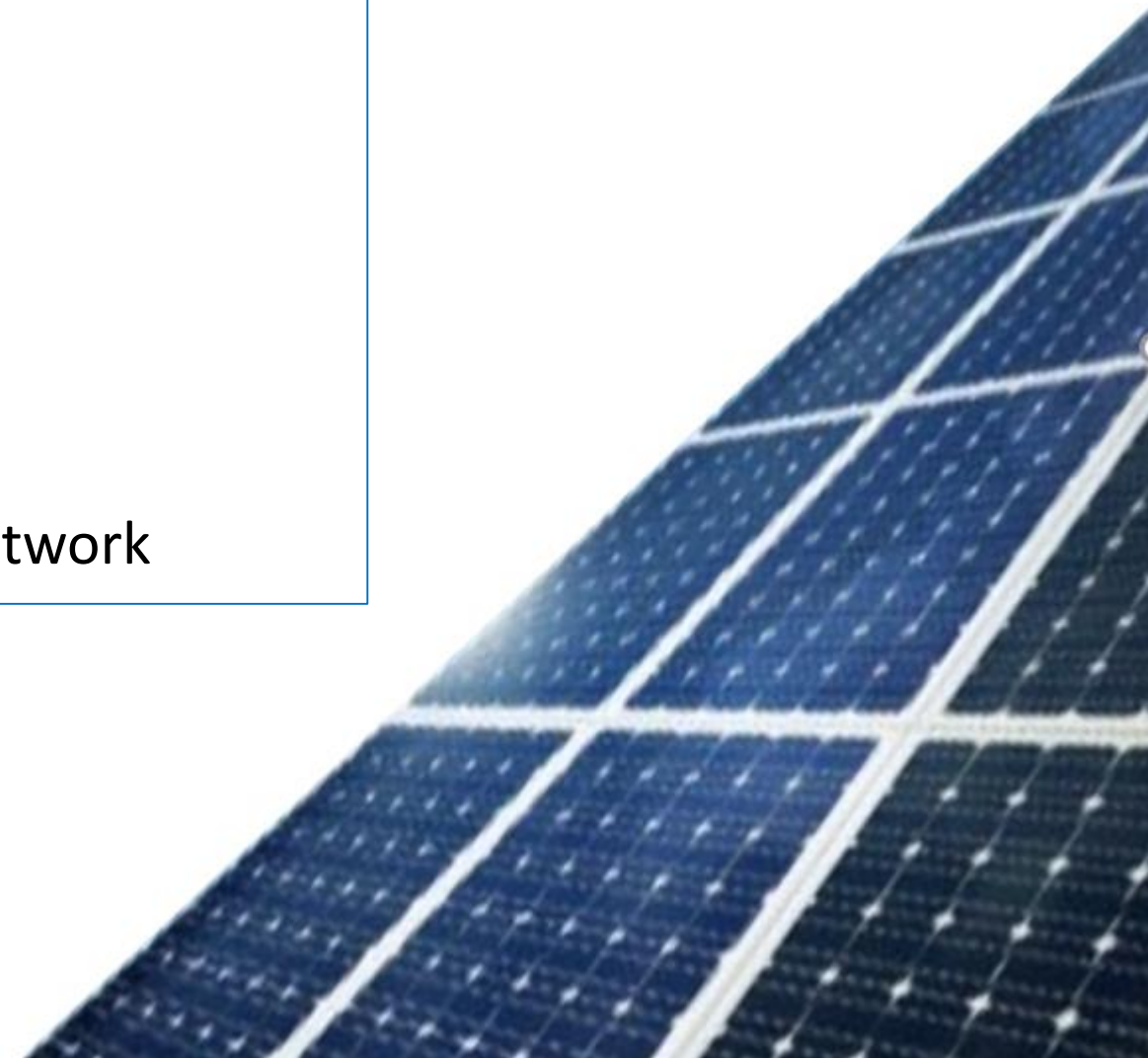
Solar River Project – The Developer

MAY Bros & Co™

- First Established 1885 -

Solar River – The Developer Profile

- ✓ May Brothers & Co First Established in 1885
- ✓ 32 Years T&D Energy Sector experience
- ✓ Award winner
- ✓ 15 Years large scale renewable projects
- ✓ Expert in Grid Connections and Approvals
- ✓ Expert in the South Australian Transmission Network



Solar River Project™

May Brothers & Co – The Developer

MAY Bros & Co™
- First Established 1885 -

Solar River – The Developer Profile

Projects developed;

- ✓ Berri South Australia (SA) 14MW PV array
- ✓ Mawson Lakes South Australia SA CSP Solar Array
- ✓ Two Wells South Australia CSP Array
- ✓ Port Augusta SA 150MW CSP Array
- ✓ Morgan SA 100MW PV Solar Array
- ✓ Redcliff Vic 20MW CSP Solar Array
- ✓ Yokohama Japan CSP Array
- ✓ Toowoomba Qld 100MW PV Array
- ✓ Tonga 50MW PV array with battery storage
- ✓ PNG 2 x 10MW PV Array with battery storage

The Developer Profile - Awards

ENGINEERS AUSTRALIA

Urban Development Institute of Australia SOUTH AUSTRALIA

PROJECT MANAGEMENT ACHIEVEMENT AWARDS

2011

PROJECT MANAGEMENT ACHIEVEMENT AWARDS

2008

Natural Resources Management (NRM) in South Australia

AWA australian water association Victorian Water Awards 2012

VEEA | VICTORIA ENGINEERING EXCELLENCE AWARDS 2014

Annual Average Daily Traffic Estimates
24 hour two-way flows

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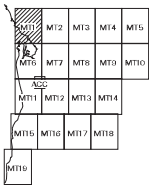
The estimates shown are weighted averages for designated road sections. Since counts may be influenced by various factors, these counts should be used as a guide only. For more detailed information phone (08)8343 2810.

AUSTROADS
Road Class

- 1 or 6
- 2 or 7
- 3 or 8
- 4
- 5
- Section start
- Section end

Map MT1



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Department of Planning, Transport and Infrastructure

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Annual Average Daily Traffic Estimates
24 hour two-way flows

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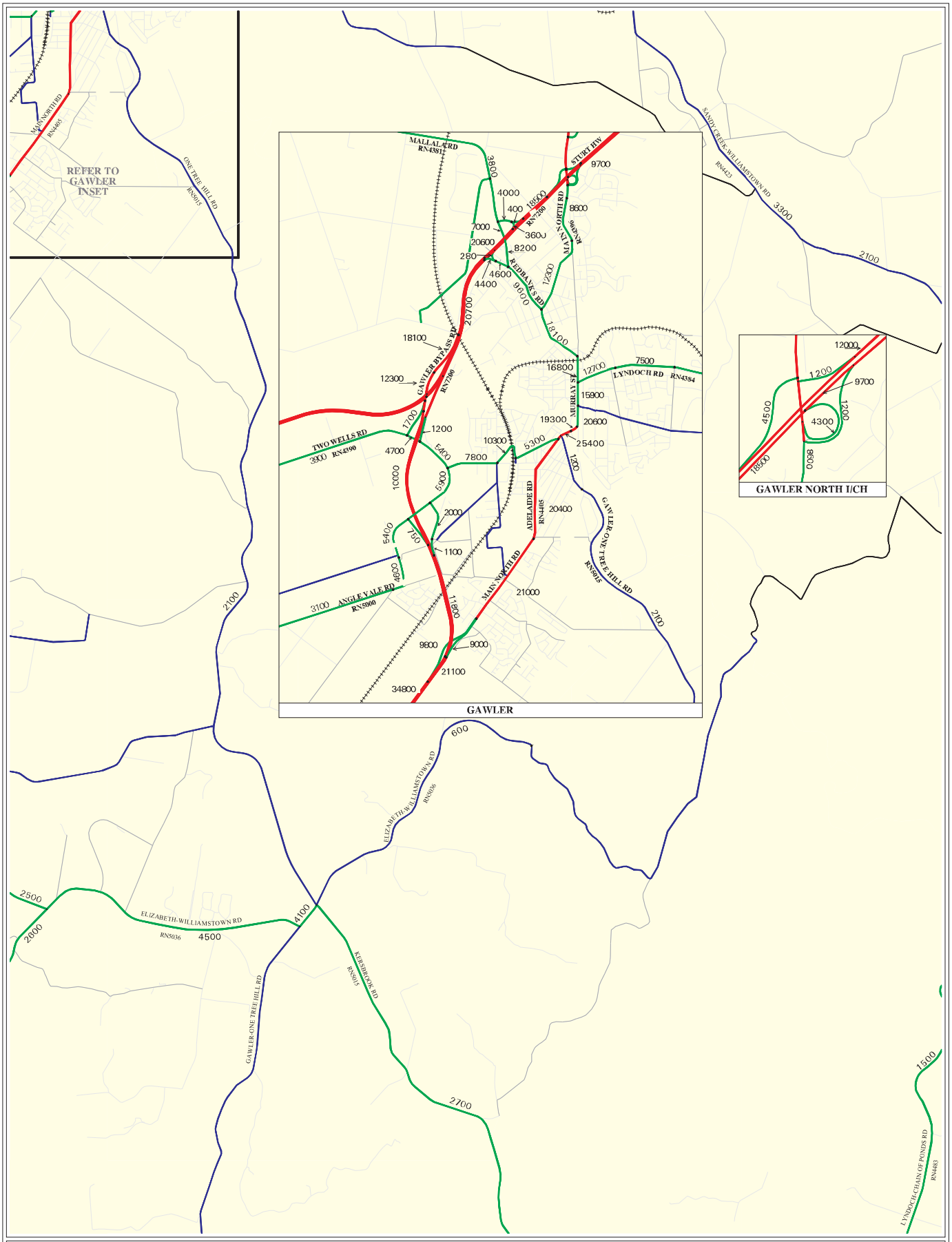

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AUSTROADS
Road Class
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- 3 or 8
- 4
- 5
- Section start
- Section end

Map MT3

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Department of Planning, Transport and Infrastructure

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Annual Average Daily Traffic Estimates
24 hour two-way flows

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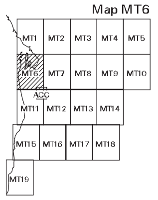
AUSTROADS Road Class

- 6
- 7
- 8
- 9

• Section start

○ Section end

Map MT6



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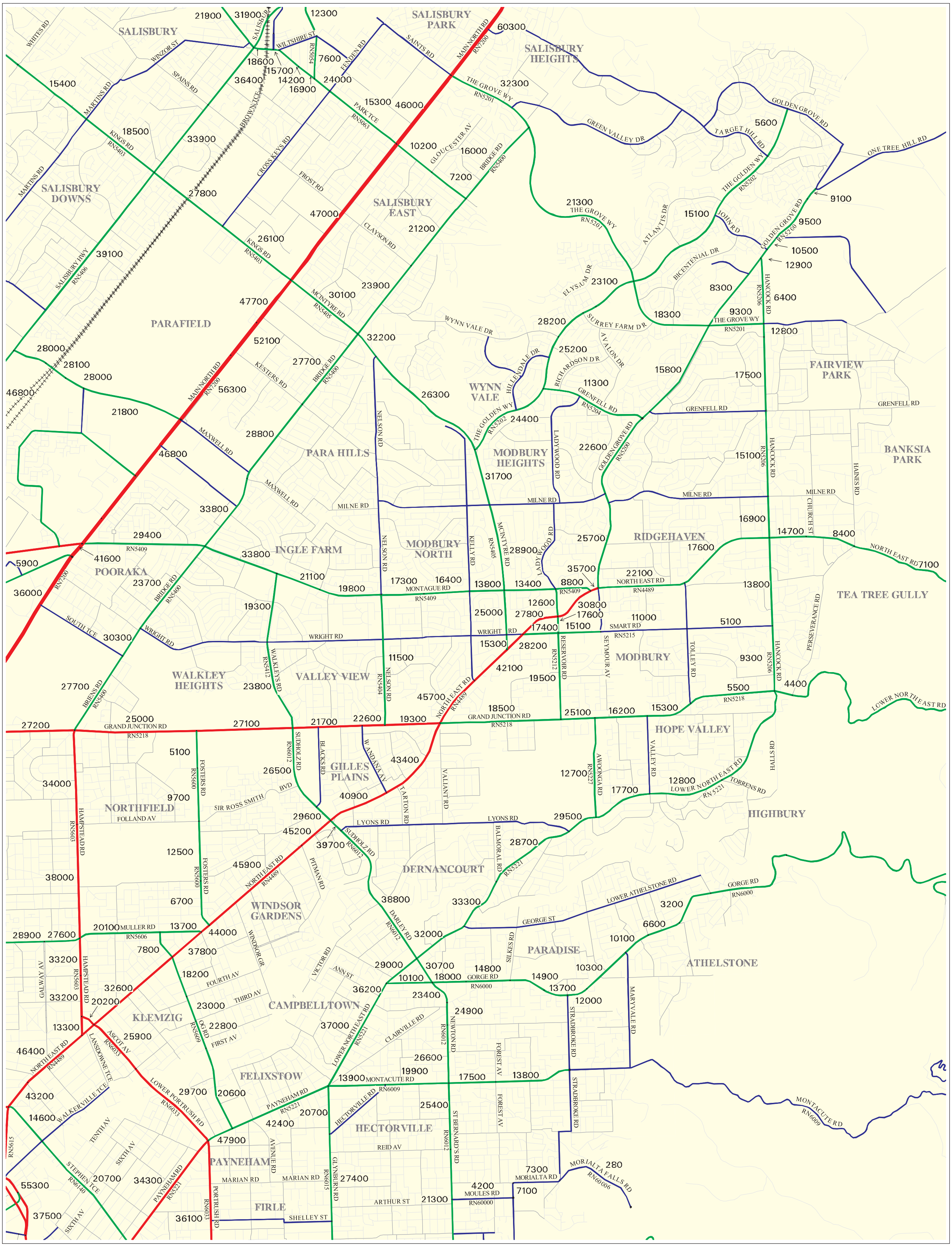

Annual Average Daily Traffic Estimates
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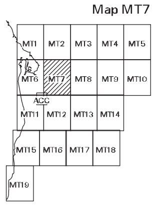
AUSTROADS
Road Class

- 6
- 7
- 8
- 9

• Section start

○ Section end

Map MT7



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Department of Planning, Transport and Infrastructure

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Heavy Vehicle Traffic Estimates
24 hour two-way flows and (Percentages of AADT)

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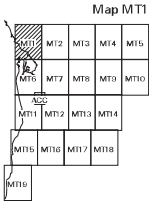
AUSTROADS
Road Class

- 1 or 6
- 2 or 7
- 3 or 8
- 4
- 5
- Section start
- Section end

Map MT1



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Heavy Vehicle Traffic Estimates
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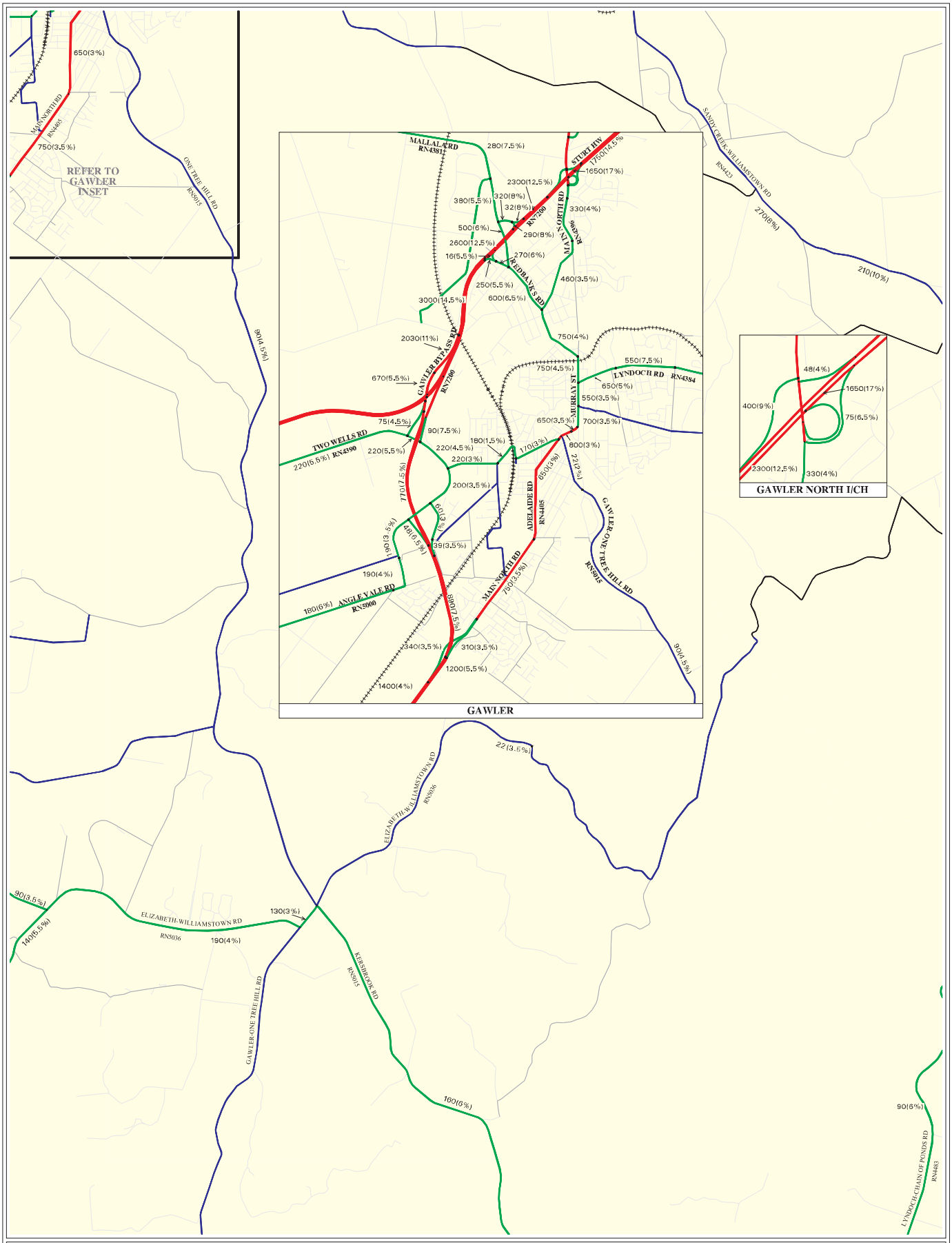

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AUSTROADS Road Class

- 1 or 6
- 2 or 7
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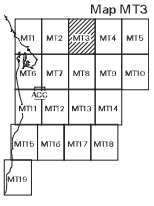
- 4
- 5
- Section start
- Section end

Map MT3



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Heavy Vehicle Traffic Estimates
24 hour two-way flows and (Percentages of AADT)

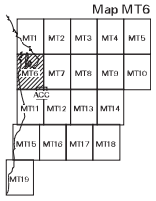
AUSTROADS Road Class

6
7
8
9

Section start

Section end

Map MT6



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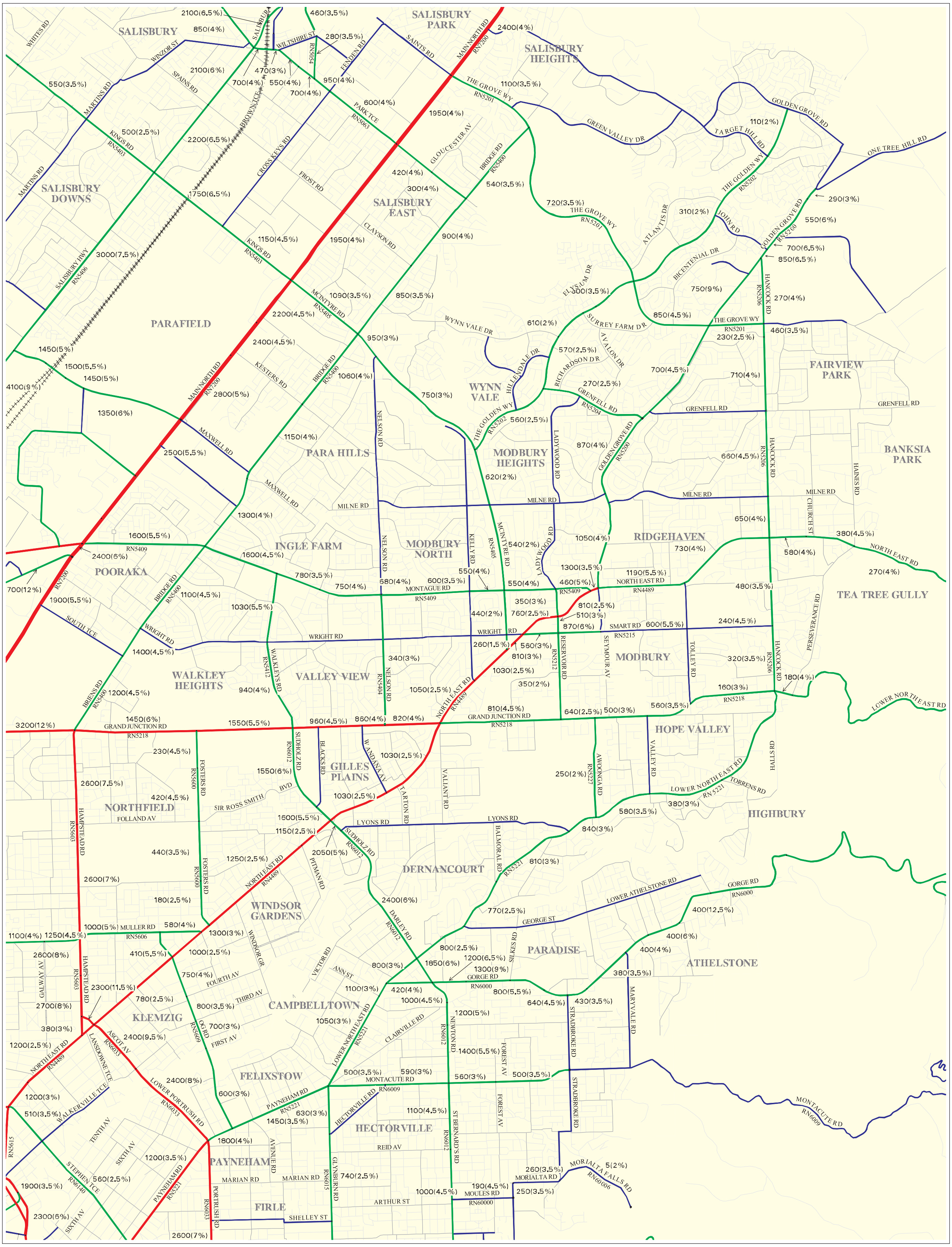
Department of Planning, Transport and Infrastructure

Produced by Road Asset Management Section - 15 September 2015



Heavy Vehicle Traffic Estimates
24 hour two-way flows and (Percentages of AADT)

Please note that this information has been collected for internal use by DPTI and is provided herein as an information resource only. It is not a substitute for independent professional advice and users should exercise their own skill, care and judgement with respect to the use of the material. Whilst all reasonable care has been taken in the preparation, the State of South Australia does not guarantee, and accepts no legal liability arising from or connected to, the accuracy, reliability, currency, suitability, or completeness of this material.

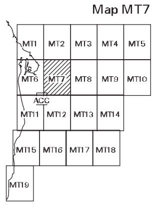
The estimates shown are weighted averages for designated road sections. Since counts may be influenced by various factors, these counts should be used as a guide only. For more detailed information phone (08)8343 2810.

AUSTROADS
Road Class

- 6
- 7
- 8
- 9

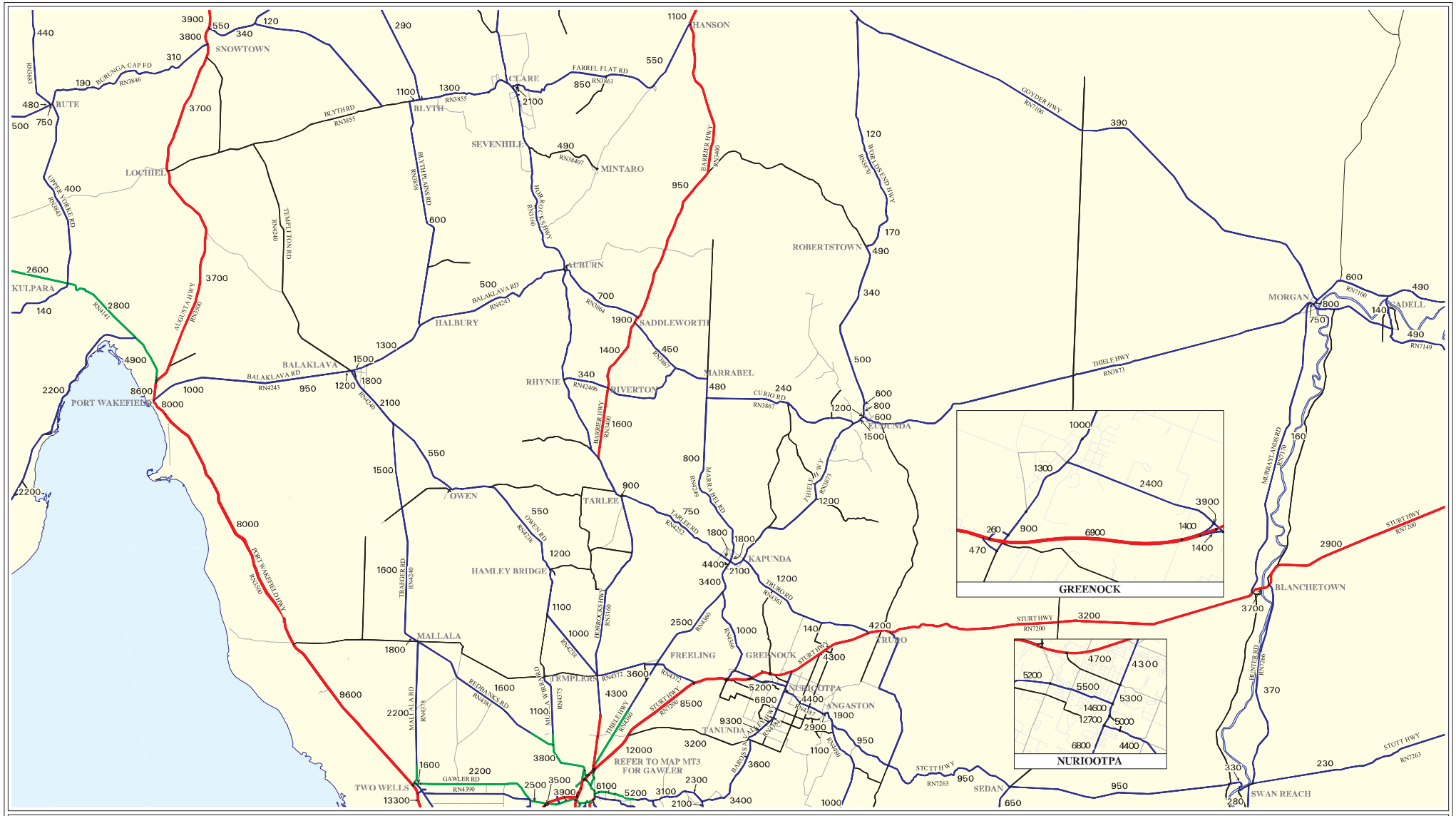
- • Section start
- ○ Section end

Map MT7



Government of South Australia
Department of Planning, Transport and Infrastructure

Produced by Road Asset Management Section - 15 September 2015



Annual Average Daily Traffic Estimates
24 hour two-way flows

Please note that this information has been collected for internal use by DPTI and is provided herein as an information resource only. It is not a substitute for independent professional advice and users should exercise their own skill, care and judgement with respect to the use of the material. Whilst all reasonable care has been taken in the preparation, the State of South Australia does not guarantee, and accepts no legal liability arising from or connected to, the accuracy, reliability, currency, suitability, or completeness of this material.

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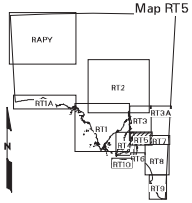
AUSTROADS
Road Class

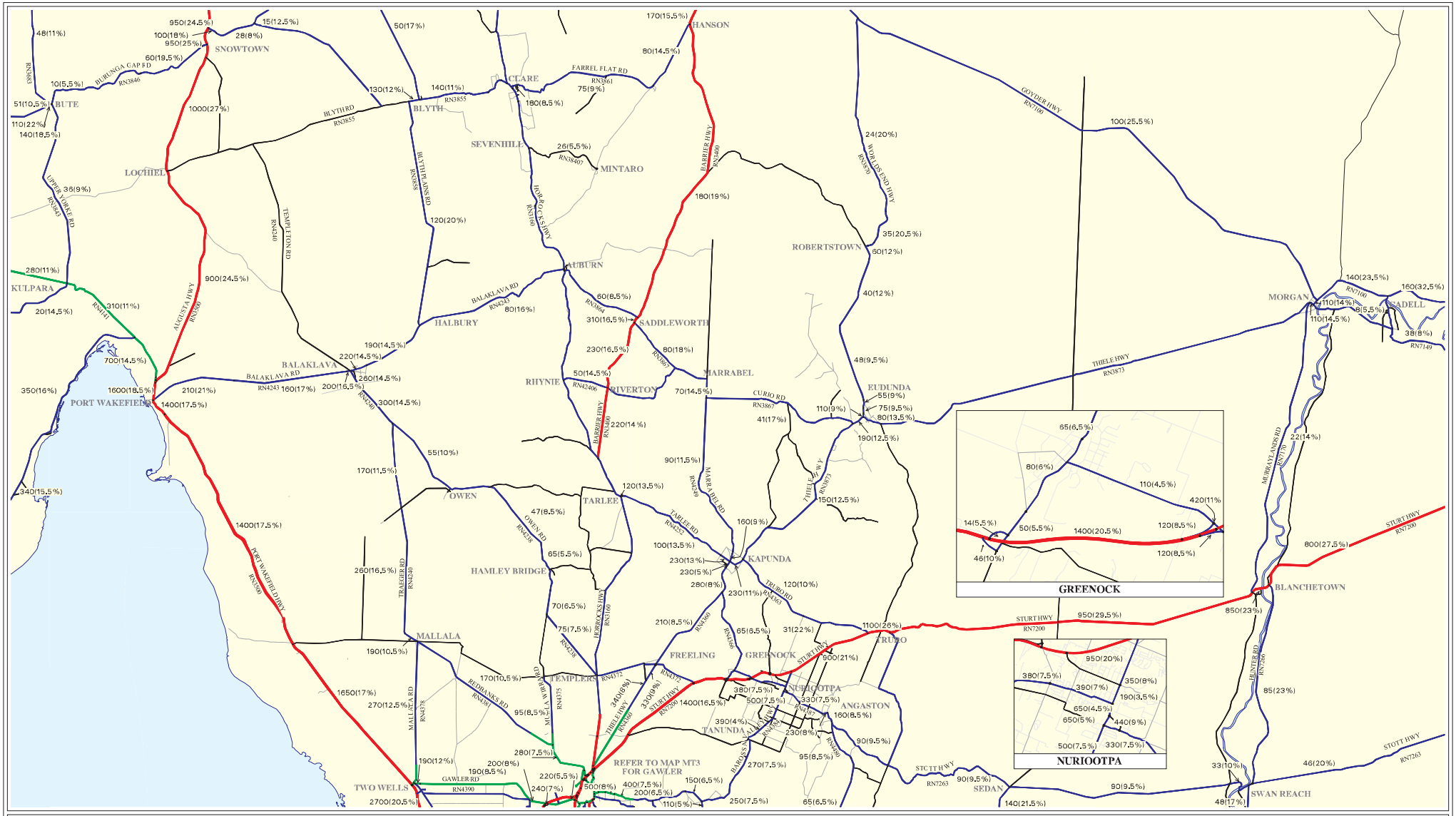
- 1 or 6
- 2 or 7
- 3 or 8
- 4
- 5

- Section start
- Section end



Government of South Australia
Department of Planning, Transport and Infrastructure

Produced by Road Asset Management Section - 14 September 2015



Heavy Vehicle Traffic Estimates
24 hour two-way flows and (Percentages of AADT)

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AUSTROADS
Road Class

- 1 or 6
- 2 or 7
- 3 or 8
- 4
- 5

- Section start
- Section end

Produced by Road Asset Management Section - 15 September 2015

R.A. Thorpe

South Australia

Register Book,

Vol. 1156 *Folio* 3

Release *Registrar-General.*

Crown Lease

(PERPETUAL, No. 8501 .)

(In lieu of surrendered Perpetual Lease No. 8501 ~~*(part of)*~~ *Registered Vol.* 511 *, Folio* 85)

PERSONAL RESIDENCE.

Her Majesty the Queen doth hereby lease to D. H. PHILLIPS LIMITED whose registered office is situate at 22 Grenfell Street Adelaide _____ herein designated by the term "Lessee" all that land containing thirteen thousand one hundred and eighty four (13184) _____ acres or thereabouts and being Section No. 53 East of _____

~~in~~ the Hundred of KING _____ County of BURRA _____ as the same is delineated in the public maps deposited in the Land Office in the City of Adelaide to be held in perpetuity at the yearly rent of twenty seven pounds nine shillings and four pence (£27: 9: 4) _____ _____ to be paid in advance on the first day of October —— commencing the fifteenth ——day of December —— One Thousand Nine Hundred and fifty four —— and at a further rent of Five Pounds per centum per annum on any rent in arrear subject to the reservations covenants and conditions shortly stated below and some of which are more fully set out in "The Crown Lands Amendment Act 1898"

By command,

The Minister of Lands.

RESERVATIONS.

1. There are reserved to the Crown all gold silver copper tin and other metals ores minerals and other substances containing metals and all gems and precious stones coal and mineral oil with incidental powers of search and mining

COVENANTS.

2. The Lessee must—

I. Enclose the land with cattle-proof fence before the end of the first — year of the lease and during the remainder of the term hereby granted maintain and uphold such fence in good and substantial repair

II. Keep in good repair all Crown improvements (if any) on the land

III. Personally reside on the land for nine months in each year

IV. Set apart and keep reserved for the purpose of preventing soil erosion such areas of the land comprised in this lease being areas covered with natural scrub growth as The Minister of Lands (hereinafter called the Minister) or his servants shall notify to the Lessee and will not destroy or permit to be destroyed any natural scrub growth growing on the said areas: the said areas will be of the respective sizes and in the respective positions notified to the Lessee by the Minister or his servants provided that the total area of the said areas shall not exceed one-tenth of the area of the land comprised in this lease or such greater area as the Minister on the recommendation of the Land Board may determine

V. Remain a private company as long as the lease is held by the company as lessee

And the Lessee must not—

VI. Transfer sublet encumber or mortgage without the written consent of the Minister first had in each

Certified Correct,

Director of Lands.

EXD.

(1)

P.R. 1898.

Subdivision

CONDITIONS.

3. The lease shall be liable to forfeiture in the following cases:—

I. If default be made in payment of any rent in arrear for six months after written notice requiring its payment or if

II. Default be made in the performance of any Covenant for three months after notice of its non-performance requiring its performance or if

III. The land shall be transferred sublet or mortgaged without the written consent of the Minister first had in such cases or if

IV. The Lessee does not reside on the land nine months in each year or if

V. The Lessee shall not set apart and thereafter keep reserved for the purpose of preventing soil erosion such areas of the land comprised in this lease being areas covered with natural scrub growth of the respective sizes and in the respective positions notified to the Lessee by the Minister or his servants or if the Lessee shall destroy or permit to be destroyed any natural scrub growth growing on the said areas or if

VI The Lessee shall be converted into a public company whilst holding this lease or if

VII The Lessee shall grant consent to or allow any application to transfer or mortgage any share or shares in the company or grant any application for the allotment of any additional share or shares therein without the written approval of the Minister first had in each case

4. The land may be resumed by the Crown for mining or for any public work or purpose full compensation being made to the Lessee for his loss

IN WITNESS whereof the Public Seal of the State of South Australia and the hand and seal of the said Lessee were hereunto set the sixteenth day of February 1955

Signed sealed and delivered by the above-named Lessee in the presence of

THE COMMON SEAL OF D. H. PHILLIPS LIMITED was HEREUNTO AFFIXED IN THE PRESENCE OF THE UNDERSIGN

D. H. Phillips L.S.
Gov. Director

B. J. Phillips L.S.
Secretary.

NSFER No. 3859426 To
hn Theodore Kindner of "Wonga" Morgan
330 Grazier
THE WITHIN LAND. PRODUCED 5.3.1976 AT 12.30pm

ORTGAGE No. 3859427
O THE NATIONAL BANK OF AUSTRALASIA LIMITED
ODUCED 5.3 19 76 AT 12.30 pm
(INCLUDING OTHER LAND)

RTGAGE No. 3859431
TO COMMONWEALTH DEVELOPMENT BANK OF AUSTRALIA
DUCED 5.3 1976 AT 12.30pm.

The within named John Theodore Kindner is the underlessee of a Right of Way and Easement over portion of the land in Crown Lease 436-30 for Term of 99 years commencing on 1.11.1975 as comprised in Underlease No. 3859483 and appurtenant to the within land.
Produced 5.3.1976 at 12.30pm.

CERTIFICATE No. 5330399 OF THE MINISTER OF LANDS WHEREBY THE WITHIN Section 53 IS RENUMBERED SECTION 1352 out of Hundreds (Burra)
PRODUCED 5.11.1984 AT 3.35pm

THE WITHIN LAND IS DISCHARGED FROM MORTGAGE No. 3859431 VIDE 6072885
PRODUCED 26.8.1985 at 10

MORTGAGE No. 6646873 TO
NATIONAL AUSTRALIA BANK LIMITED
PRODUCED 2.12.1988 at 11:50
(INCLUDING OTHER LAND)

THE WITHIN LAND IS DISCHARGED FROM MORTGAGE No. 6646873 VIDE 11451392
PRODUCED 27.8.2010 AT 16:52

THE WITHIN LAND IS DISCHARGED FROM MORTGAGE
No. 3859427 VIDE 11451397
PRODUCED 27.8.2010 AT 16:53

TRANSFER No. 11451408 to
Pastoral Pursuits Pty Ltd of 300
Rundle Street Adelaide 5000
OF THE WITHIN LAND
PRODUCED 27.8.2010 AT 16:53

MORTGAGE No. 11451418 TO
NATIONAL AUSTRALIA BANK LTD.
PRODUCED 27.8.2010 AT 16:53

MOUNT GRANITE

58

NAT.

Dated 16th February 19 55

CROWN LEASE.

No. 8501

PERPETUAL.

~~(Subdivisions)~~

SURRENDER

Elder Smith

Government of South Australia
Department of the Premier and Cabinet

B126691
DPC16/3528

GPO Box 2343
Adelaide SA 5001
DX 56201
Tel 08 8226 3500
Fax 08 8226 3535
www.dpc.sa.gov.au

6 December 2017

Mr Jason May
Chief Executive Officer
The Solar River Project Pty Ltd
ThincLab, 10 Pulteney Street
ADELAIDE SA 5000

Email: jason@maybros.net

Dear Mr May

CROWN SPONSORSHIP SOLAR RIVER PROJECT

Thank you for your letter of 17 October 2017 requesting Crown Sponsorship under section 49 of the *Development Act 1993* to assist with the Solar River Project Pty Ltd's (Solar River) proposed Robertstown Solar and Battery Project.

This project has been considered within the Department of the Premier and Cabinet with input from the Department of Planning, Transport and Infrastructure, the Department of Environment, Water and Natural Resources, the Environmental Protection Agency and the Technical Regulator. In principle, the project is supported, recognising the possible environmental and community issues that will need to be addressed through the development assessment process.

On balance, the development of Solar River's Robertstown Solar and Battery Project has the potential to benefit South Australia and can be considered public infrastructure. Accordingly I, as the Chief Executive of the South Australian Department of the Premier and Cabinet, will support the development and specifically endorse the development application to construct the project comprising up to 200 MW of solar PV capacity and up to 63.8 MW / 20 MWh of battery storage as a development of public infrastructure as required by section 49 of the *Development Act 1993* (the Act).

It is the responsibility of Solar River to prepare all documentation as required by section 49 of the Act. All costs in the preparation of the development application, lodgement and any other subsequent action in relation to this application are the responsibility of Solar River.

The Department of the Premier and Cabinet makes no representations or gives no warranties in relation to the outcome of the development application or time that it takes to secure a planning outcome. It is Solar River's responsibility to obtain all other statutory approvals, licences, connection agreements and permits from relevant authorities, manage community expectations and to fund the project. The State Government makes no commitment to purchase any product or service related to the project.

A development application under this Crown Sponsorship must be lodged with the State Planning Commission on or prior to 5 December 2018. If this is not achieved by that time, my support under Section 49(2)(c) of the *Development Act 1993* for Solar River's Robertstown Solar and Battery Project will lapse.

If you have any questions regarding the preparation of the material to support this section 49 application, please contact Mr Mark Jackson on (08) 8429 5082 or via email: mark.jackson@sa.gov.au.

Yours sincerely

Dr Don Russell
CHIEF EXECUTIVE

RFI Register

Application Number	010/V082/17 (ID 2802)
Applicant	The Solar River Project Pty Ltd
Proposed Development	Construction of 200MW photovoltaic solar arrays; 20MW battery storage system; 275kV transmission line connecting to Robertstown substation; and associated infrastructure
Subject Land	Dartmoor Road, Maude SA
Point of Contact	Solar River Project (Aju Yeldhose, Ph: 0416632301, E-mail: aju@maybros.net) DPTI (Laura Kerber, Ph: 7109 7073 (internal 97073))

DPC Crown Sponsership

Item	Documents & Information Required	Status	Remarks
1	Confirmation that the documentation submitted on 14 December 2017 (as attached) reflects the updated proposal for the transmission line with underground cable. Please provide clarification (including an updated plan) showing which sections of the new transmission line are overhead, and which are underground.	Complete-22/12/2017	Document-Further Information 010_V082_17 (ID 2802) Solar River Solar and Battery Project 19_12_17
2	An amended / supplementary Heritage assessment and Flora / Fauna assessment which includes a desktop assessment of the transmission line route	Desktop submitted -Section 5.3 in DA. Site survey/ Final Report to be submitted in January	
3	An amended Site Layout plan showing: -Location of the administration / controls / car parking area -Location of the temporary laydown area / construction compound	Complete-22/12/2017	Document- Site Layout rev 2
4	Detail of any proposed on-site storage or fuels and/or chemicals during construction or operation of the project. If storage of fuels / chemicals is proposed, please advise: -Total storage capacity -Location of fuels storage area (on the Site Layout plan)	Complete-22/12/2017	Document-Further Information 010_V082_17 (ID 2802) Solar River Solar and Battery Project 19_12_17
5	Page 17 of the application report states that 'consideration will be given to a temporary accommodation facility constructed on site'. Insufficient information is provided for this to be part of this development application, and separate approval will need to be sought. If you are seeking development approval for this activity as part of this development application, further detailed information would be required.	Complete-22/12/2017	Document-Further Information 010_V082_17 (ID 2802) Solar River Solar and Battery Project 19_12_18

1. *Confirmation that the documentation submitted on 14 December 2017 (as attached) reflects the updated proposal for the transmission line with the underground cable. Please provide clarification (including an updated plan) showing which sections of the new transmission line are overhead, and which are underground.*

   Our construction contractor has managed to source a cost-effective solution for underground cable.

   The total overhead line A-B-C shown in Figure 1 with C-D underground transmission cabling through Lower Bright Road. The amendment is included in the attached. There is no visual impact to dwellings and very little in the way of passing traffic along Lower Bright Road.

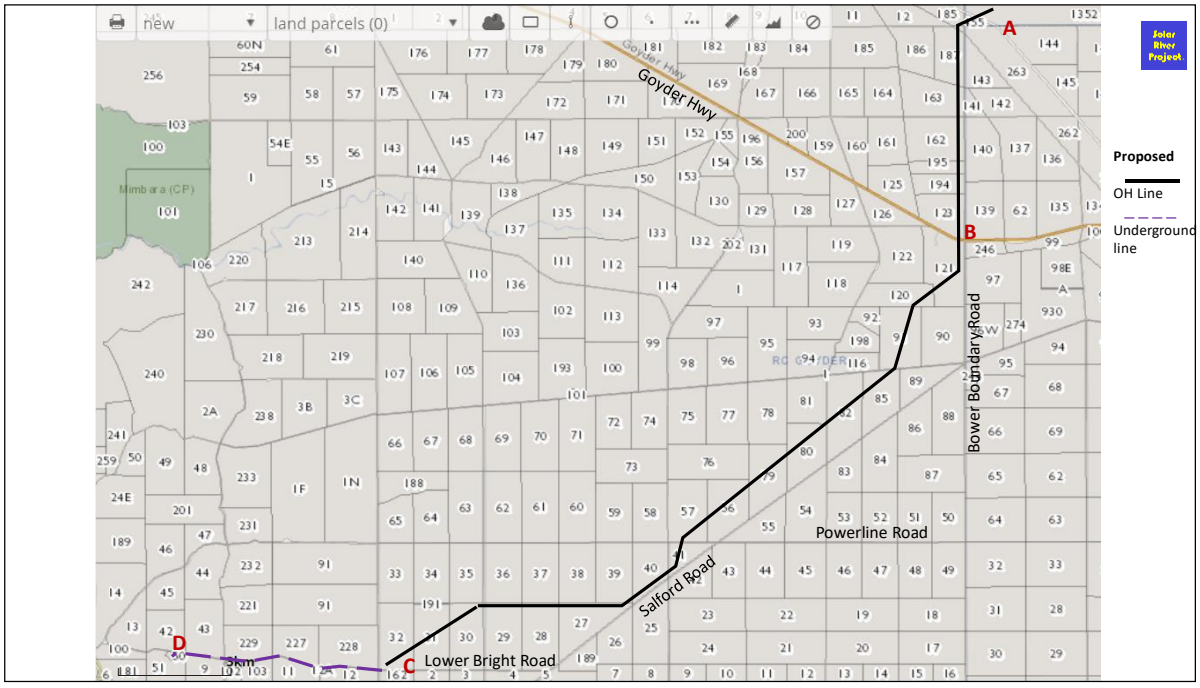


Figure 1: Transmission line route Amended

2. *An amended / supplementary Heritage assessment and Flora / Fauna assessment which includes a desktop assessment of the transmission line route.*

A detailed site survey for the transmission line route and construction site will be completed in January 2018.

3. *An amended Site Layout plan showing:*
   - *Location of the administration / controls / car parking area*
   - *Location of the temporary laydown area / construction compound*

Amended and attached.

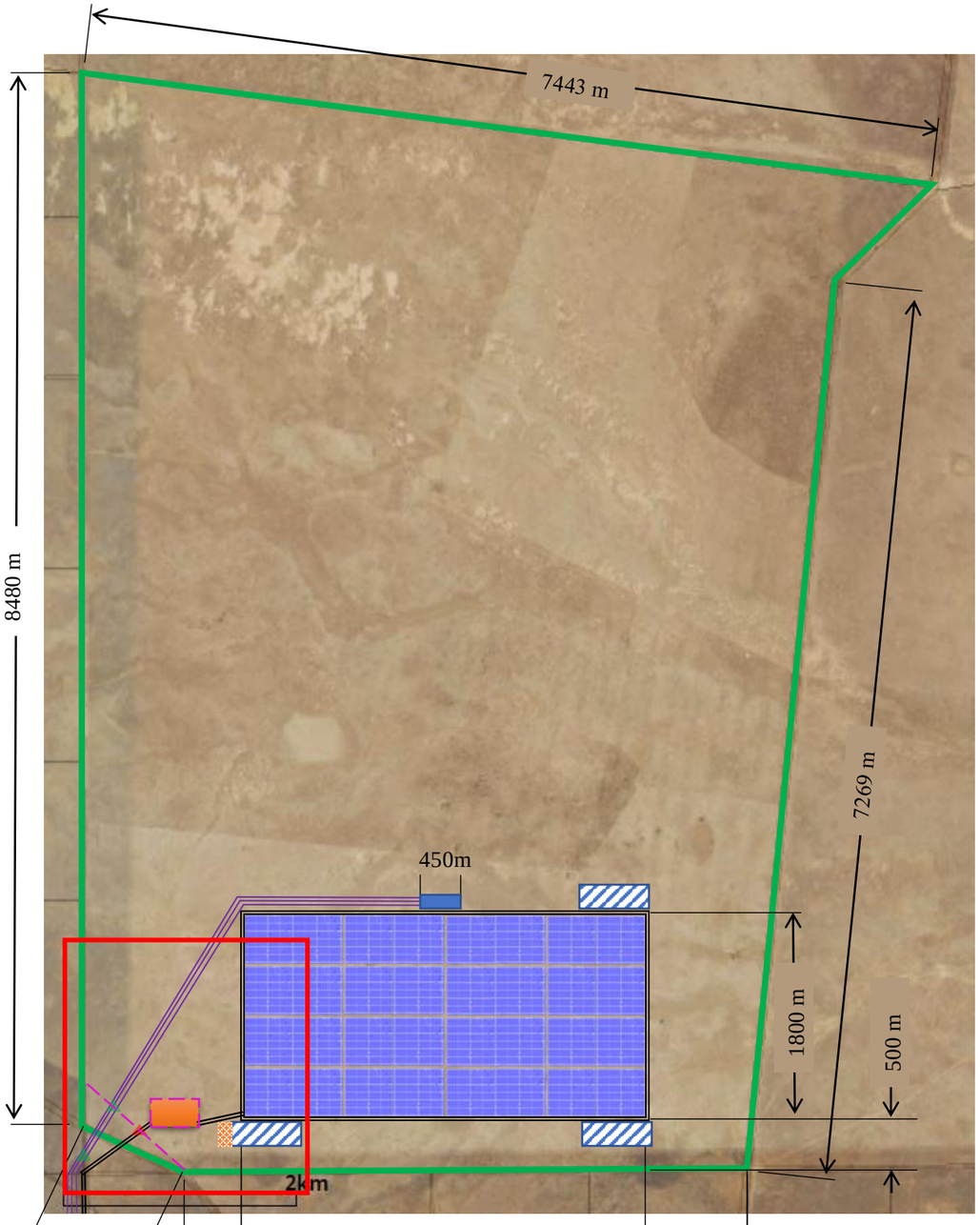
4. *Detail of any proposed on-site storage or fuels and/or chemicals during construction or operation of the project. If storage of fuels / chemicals is proposed, please advise:*
   - *Total storage capacity*
   - *Location of fuels storage area (on the Site Layout plan)*

Self-bunded diesel tank with a capacity of 5000 litres will be located near the Temporary compound (Figure 11: Example of demountable office & Ancillary Building) with locked/fenced compounds.

5. *Page 17 of the application report states that 'consideration will be given to a temporary accommodation facility constructed on site'. Insufficient information is provided for this to be part of this development application, and separate approval will need to be sought. If you are seeking*

development approval for this activity as part of this development application, further detailed information would be required.

If required by the EPC contractor a sperate application will be launched for the temporary accommodation facility constructed on site.



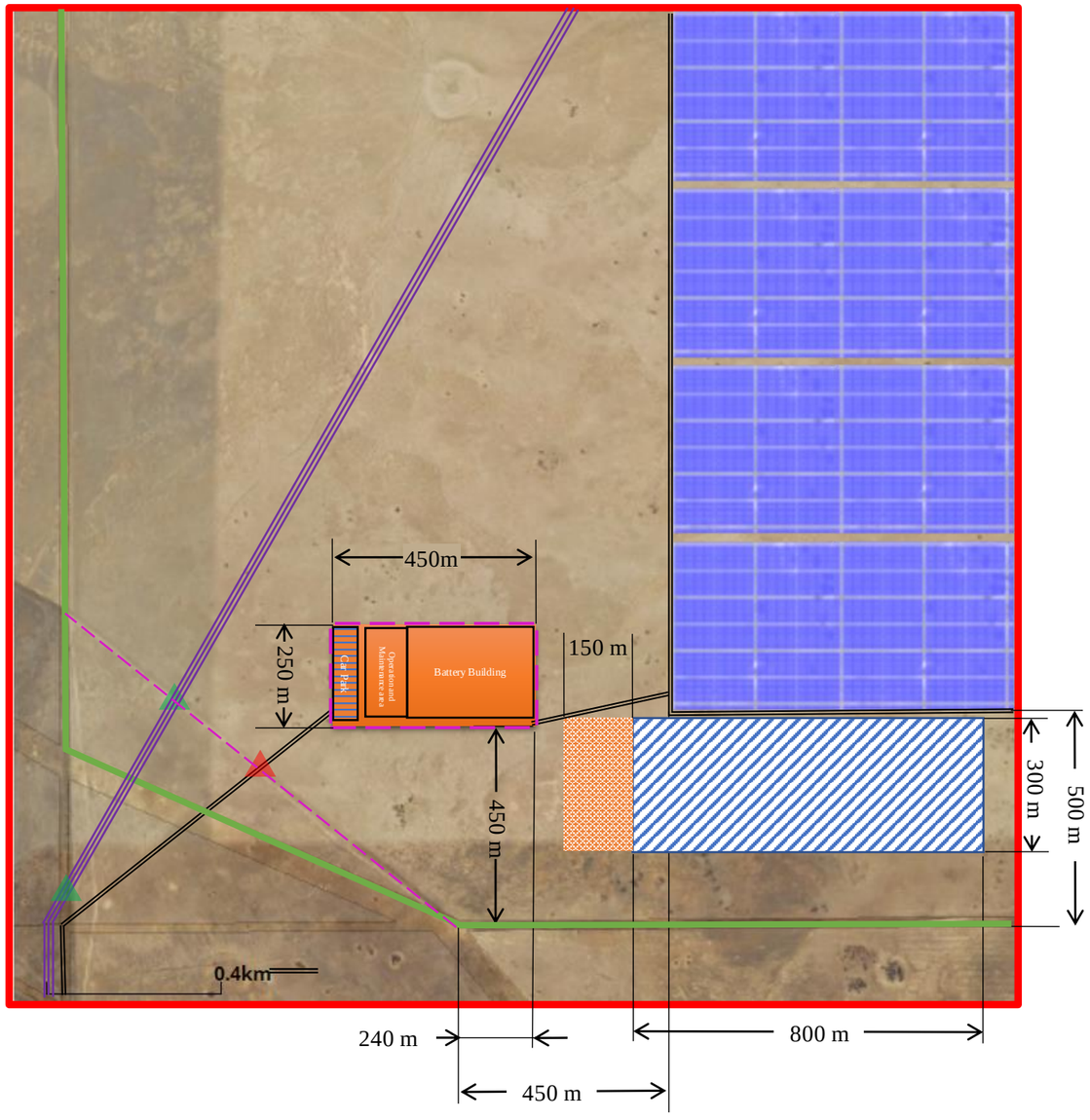
Legend

- Property Boundary
- Solar Panel
- Administration, Office, Carpark, Maintenance and Battery Building
- High Voltage Substation
- Site Access
- Dirt Tracks*
- Temporary Office compound
- Temporary laydown area
- Fence
- Transmission Access Gate
- Detailed view

Fire break will be ploughed and maintained around the construction area (avoiding any native vegetation)
*private road not for public use

DRAWN ajuyeldhose	21/12/2017	The Solar River Project
CHECKED		TITLE: Site Layout 1.0
QA		
MFG		
APPROVED		SIZE D · DWG NO SRP001 · REV 2
		SCALE · Sheet 1of 2

Solar River Project™



Legend

- Property Boundary
- Solar Panel
- Administration, Office, Carpark, Maintenance and Battery Building
- High Voltage Substation
- Site Access
- Dirt Tracks*
- Temporary Office compound
- Temporary laydown area
- Fence
- Transmission Access Gate
- Detailed View

*private road not for public use

DRAWN ajuyeldhose	21/12/2017	The Solar River Project	
CHECKED		TITLE: Site Layout Figure 1.1	
QA			
MFG			
APPROVED		SIZE D	DWG NO SRP002 / REV 1
		SCALE	Sheet 2 of 2

The Solar River Project
View Shed Analysis

Date of issue: 1st Dec 2017
Revision date: 12th Dec 2017
Author: Aju Yeldhose
Approver: Jason May

Legend

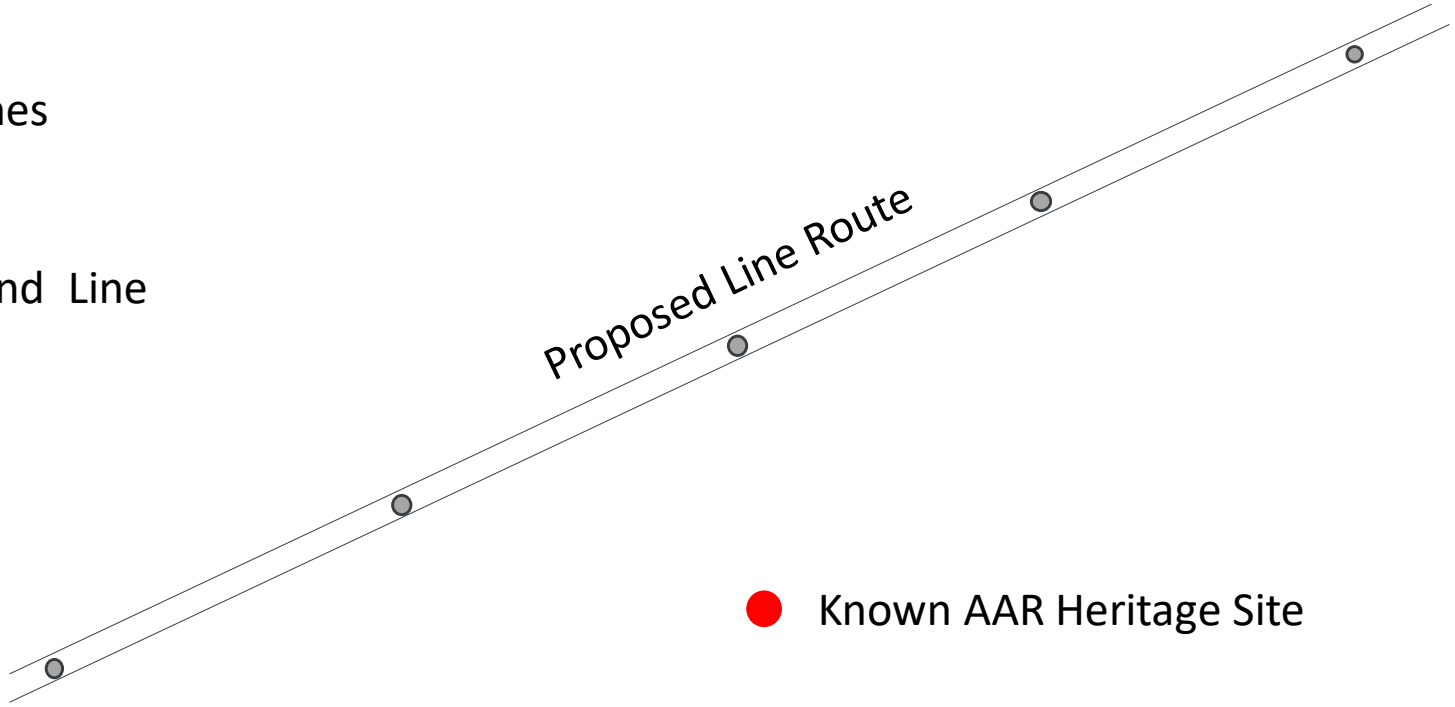
Existing Transmission lines

Proposed Underground Line

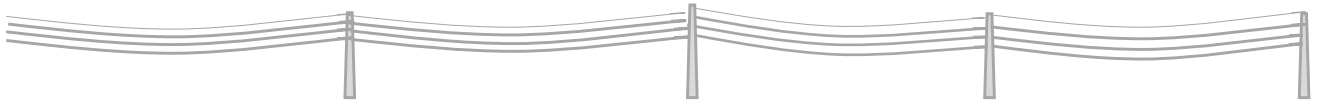
Proposed Line

PV Array

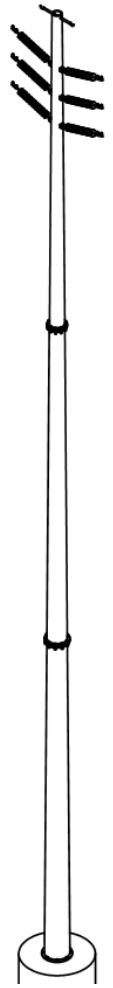
Direction of View



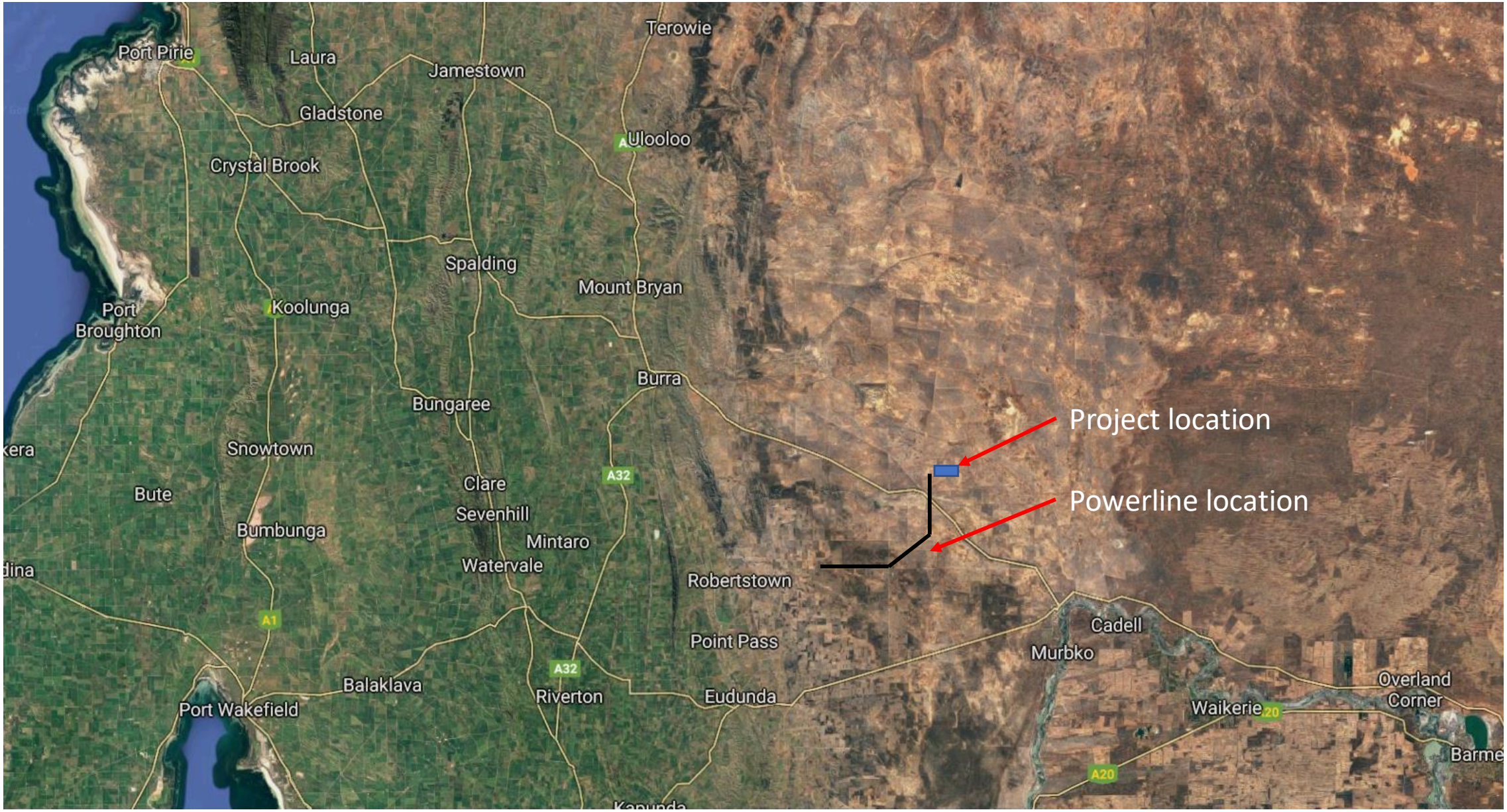
Known AAR Heritage Site



Powerline



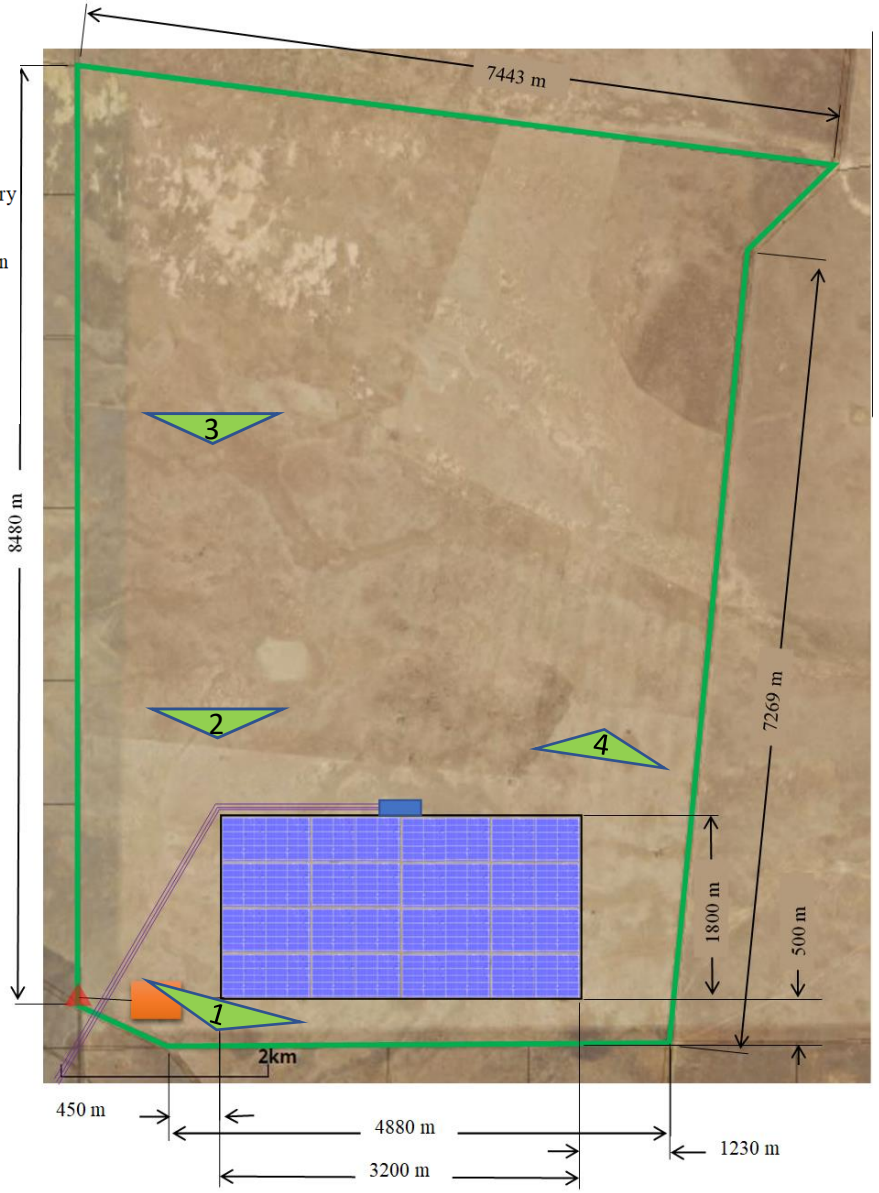
Power Pole

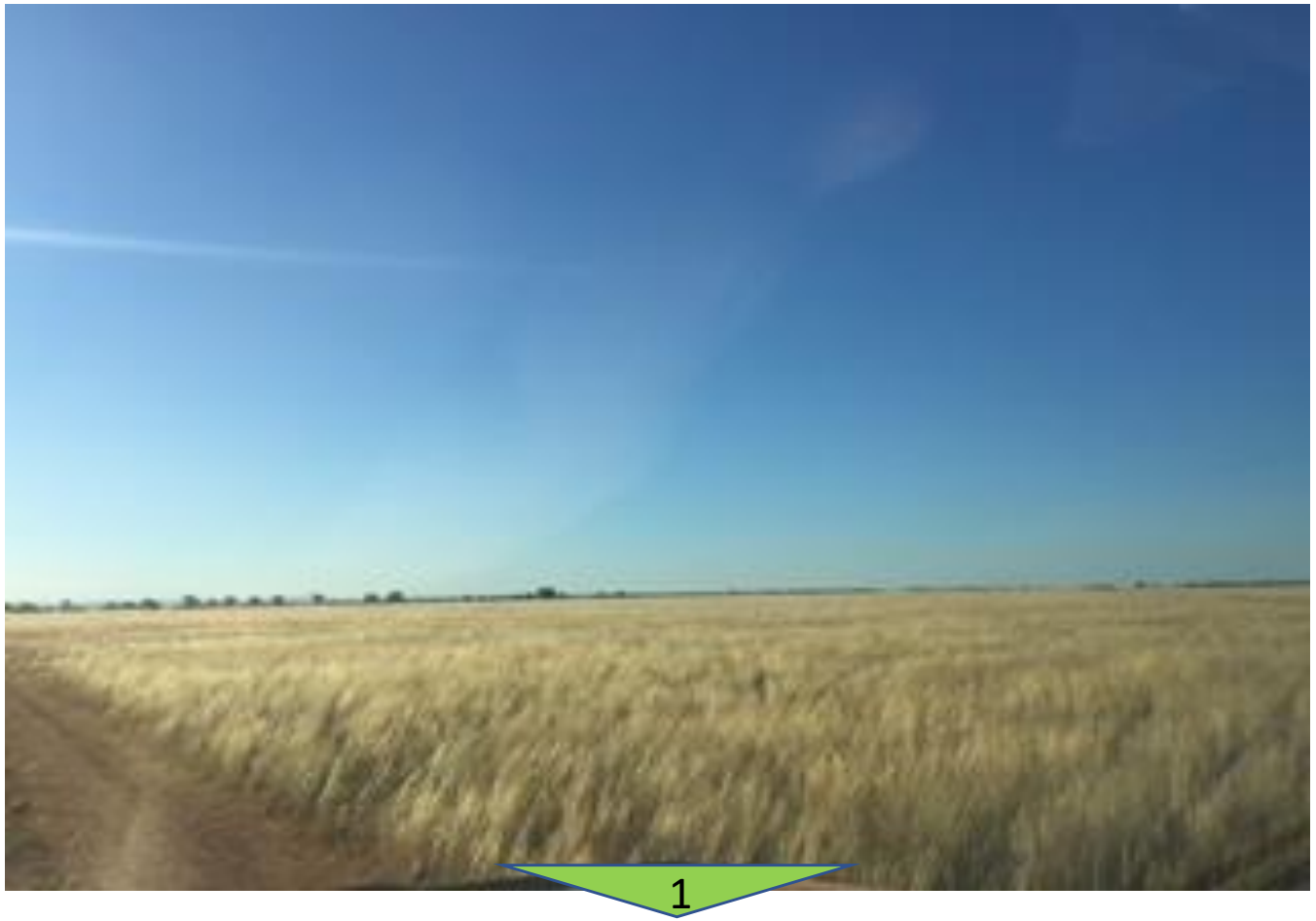

Terowie
Port Pirie
Laura
Jamestown
Gladstone
Ulooloo
Crystal Brook
Spalding
Mount Bryan
Port Broughton
Koolunga
Burra
Bungaree
Snowtown
Clare
Bute
Sevenhill
Bumbunga
Mintaro
Watervale
Robertstown
Point Pass
Cadell
Murbko
Balaklava
Riverton
Eudunda
Port Wakefield
Waikerie
Overland Corner
A32
A1
A20
Project location
Powerline location

Solar River Project

Legend

- Property Boundary
- Solar Panel
- Maintenance and Battery Building
- 33/132/275kV Substation
- Fence
- Site Access
- Tracks



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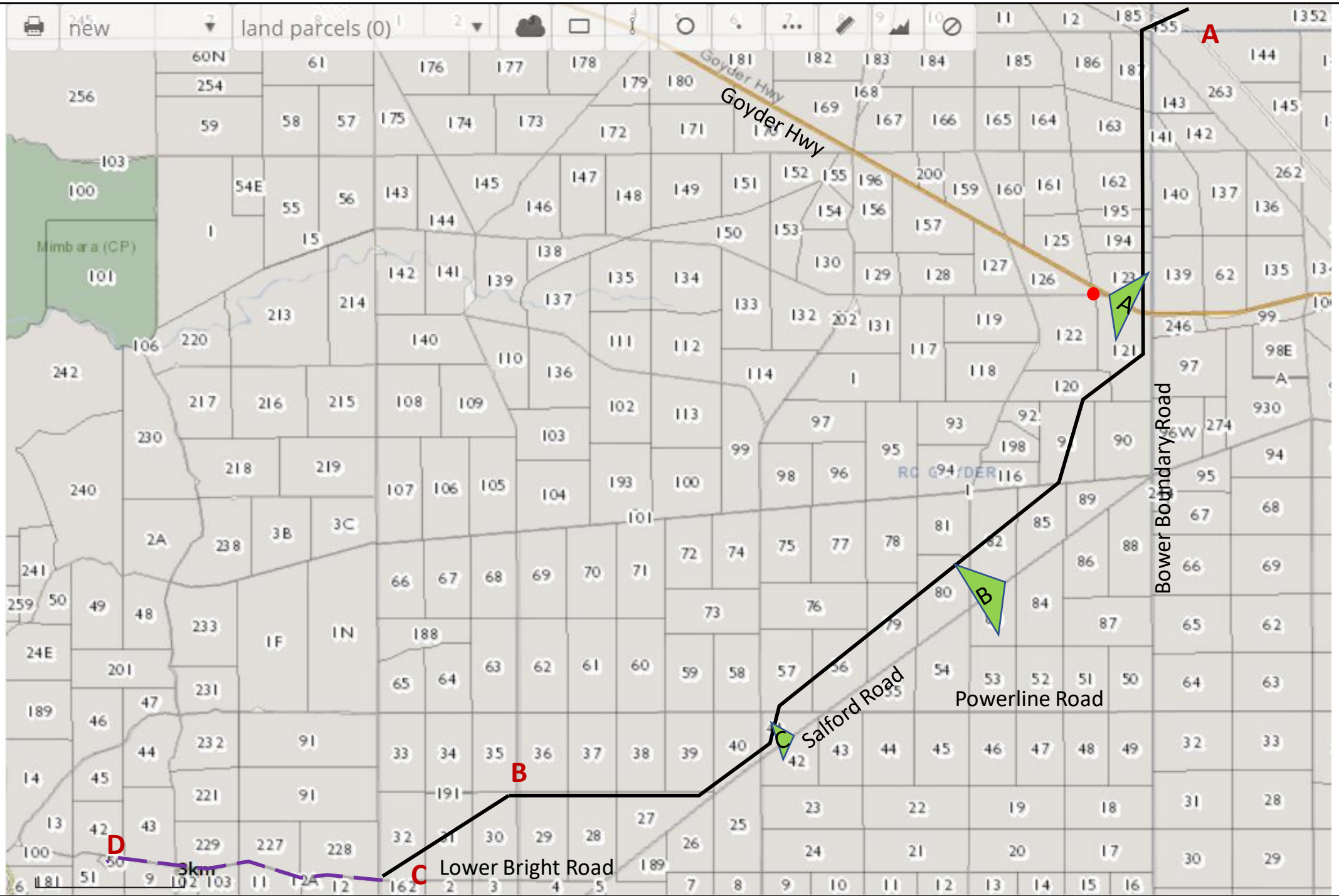
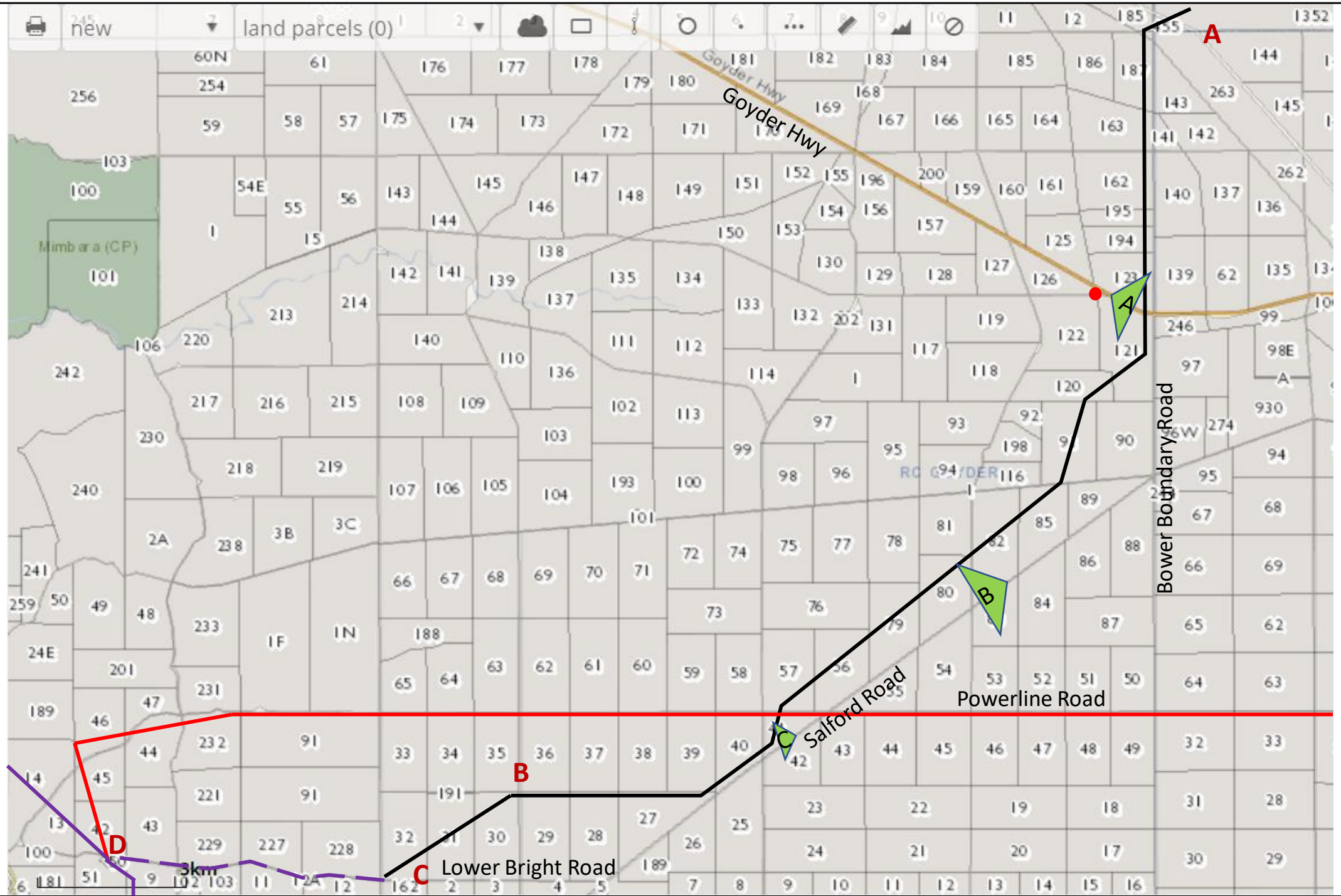
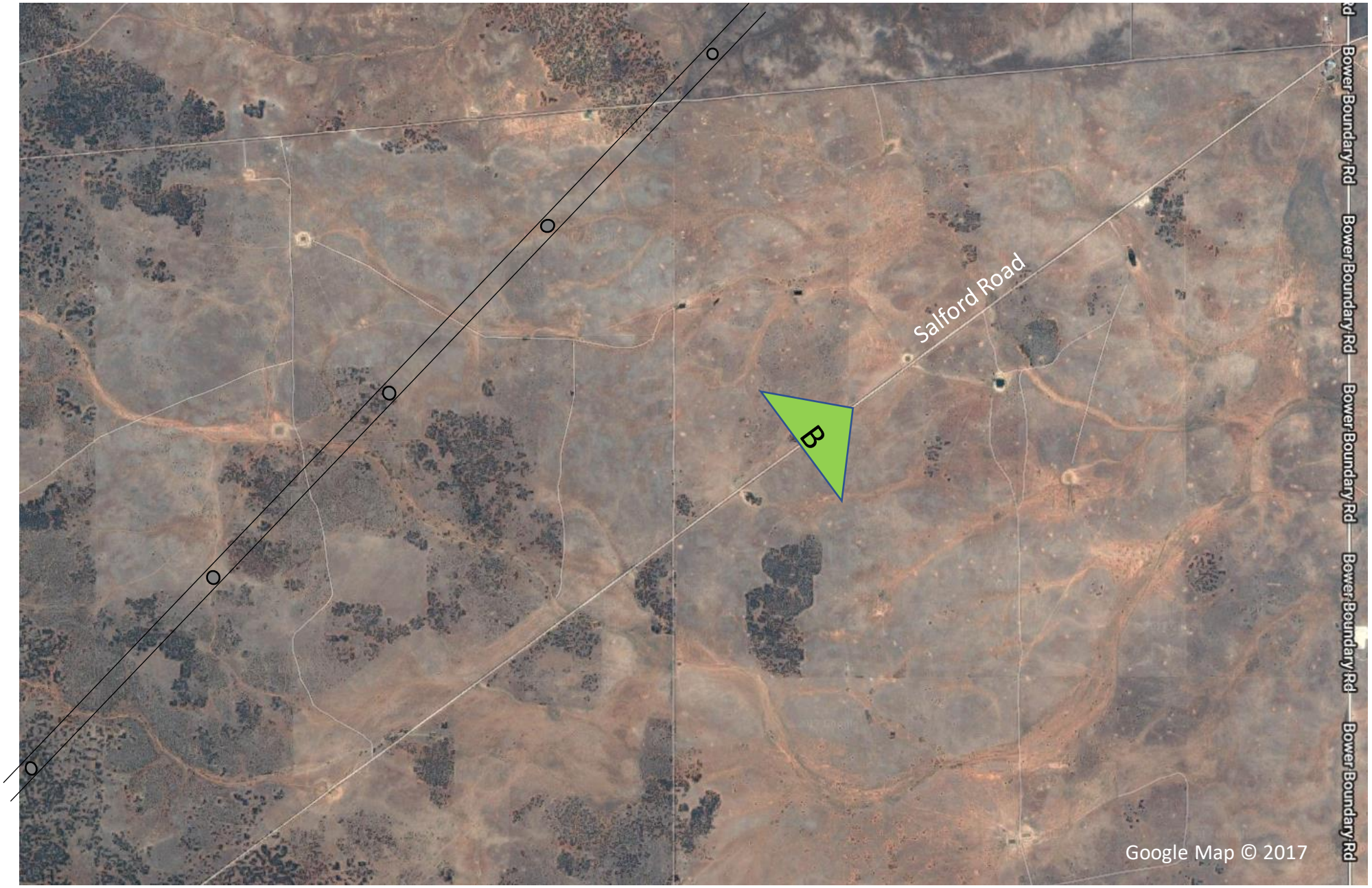

Goyder Hwy
Bower Boundary Road
Powerline Road
Salford Road
Lower Bright Road
A
B
C
D
3km
Proposed
OH Line
Underground line
Solar River Project


Goyder Hwy
Bower Boundary Road
Powerline Road
Salford Road
Lower Bright Road
A
B
C
D
3km
Mimbara (CP)
Proposed
OH Line
Underground line
Existing
132kV line
275kV line
Solar River Project


A
View at 500m


B64
A
Goyder Hwy
Bower Boundary Rd
B64
1 km
Google Map © 2017

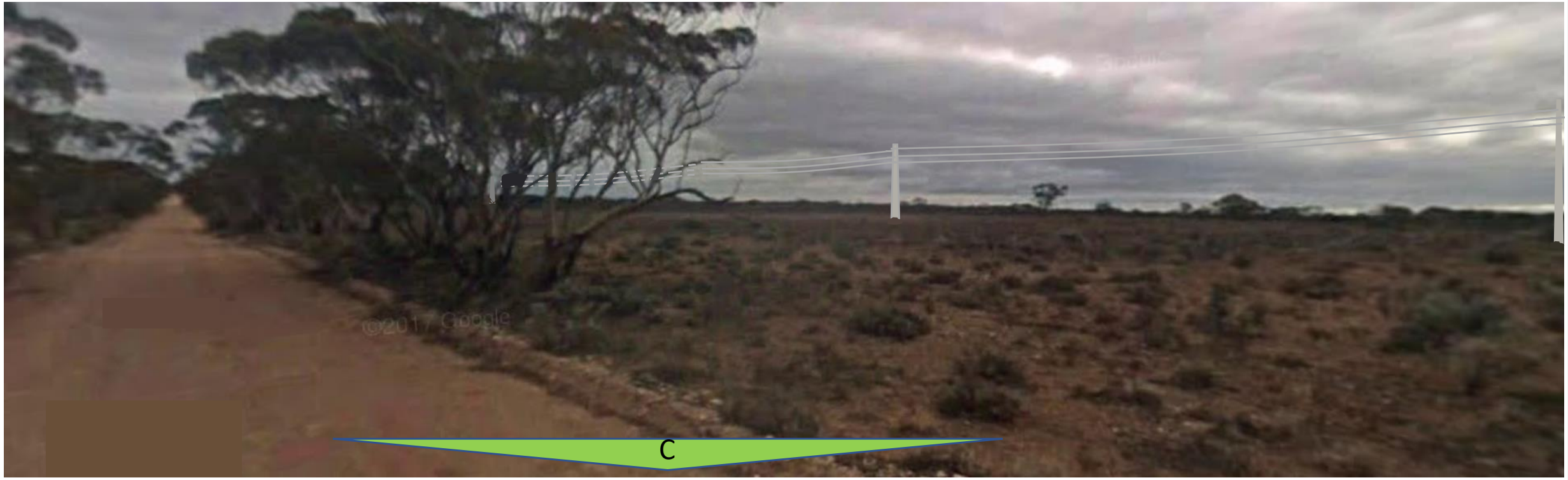


View from Salford Road

View Along Salford Road


Powerline Rd
Salford Road
C
200m

Solar River Project



Note:

1. Care has been taken to avoid sensitive areas. Detailed design will consider and avoid sensitive areas.
2. For road safety and reduced visual impact care has been taken to avoid poles road ways.
3. Care has been taken to avoid homes and native vegetation.
4. There are No poles located on public roads.
5. The line will be constructed 100% on private land average distance half a kilometre from any public road.
6. The line avoids all residential dwellings.
7. The line will be constructed in an area with two existing transmission lines.
8. The line has been design to limit visual impact from public road or public vantage points.
9. Effected land owners have been consulted.
10. The poles will be grey in colour.
11. View shed at road crossings included in the attached.
12. The Array is not visible to the general public.