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Barnawartha Solar Farm

Barnawartha Solar Farm - Traffic
Assessment

ARP Australian Solar

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1 Introduction

1.1 Background

A planning permit is currently being sought for a proposed solar energy and battery storage facility, and associated connection to the Barnawartha Substation, in Barnawartha, Victoria. The proposal includes:

- The installation of a ~64 MW (AC) solar energy farm.
- The construction of ~64 MW battery storage.
- Underground power cables internally to connect the sites to the substation.
- The construction of 2.5 km of overhead or underground power cables between the proposed facility and the existing Barnawartha Substation.

Aurecon Australasia Pty Ltd (Aurecon) has been engaged by ARP Australian Solar Ltd (ARP) the Proponent to prepare a Transport Impact Assessment (TIA). The purpose of the TIA is to support an application for a Planning Permit to the Department of Environment, Land, Water and Planning (DELWP) for the proposed Barnawartha Solar Farm (the proposal) at Barnawartha North, Victoria.

1.2 Purpose of this Report

This report specifically sets out a desktop assessment of the anticipated parking, traffic and transport implications of the proposed Barnawartha solar energy farm facility, including consideration of the following:

- Traffic movements generated by the proposed solar energy farm during construction and operation & maintenance phases.
- Adequacy of proposed access arrangements and impacts to the wider local road network, including construction and operation & maintenance phases.
- Adequacy of proposed car parking provision and layout arrangements.
- Adequacy of proposed internal vehicle and loading access and layout arrangements.

In the course of preparing this assessment, a desktop review of the subject site and its environs has been completed, plans of the development reviewed (*Indicative basic overall site layout - Planning submission - BARNSF-GN-LAY-0226-V2*)

Relevant standards and guidelines relied upon are noted and referenced as necessary throughout this report.

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2 Existing Conditions

2.1 Subject Site

The subject site comprises approximately 132 hectares of land, located at 49 Hermitage Road, Barnawartha. The site is located 20 km west of the regional city of Wodonga and approximately 9 km north-east of the Barnawartha township. The site sits either side of Hermitage Road and is bound by Murray Valley Highway on the northern boundary and Baxter-Whelans Road on the southern boundary.

The proposal is located within a Farming Zone (FZ) and is bordered on the northern side by a Transport Zone Schedule 2 - Principal Road Network-(TRZ2) under the Indigo Planning Scheme. The subject site is currently used as grazing land and other farming uses surround the site.

The location of the subject site is shown in Figure 1 and the site area (red) and cable route to substation (blue) are shown in Figure 2, and the Land Zoning is shown in Figure 3.

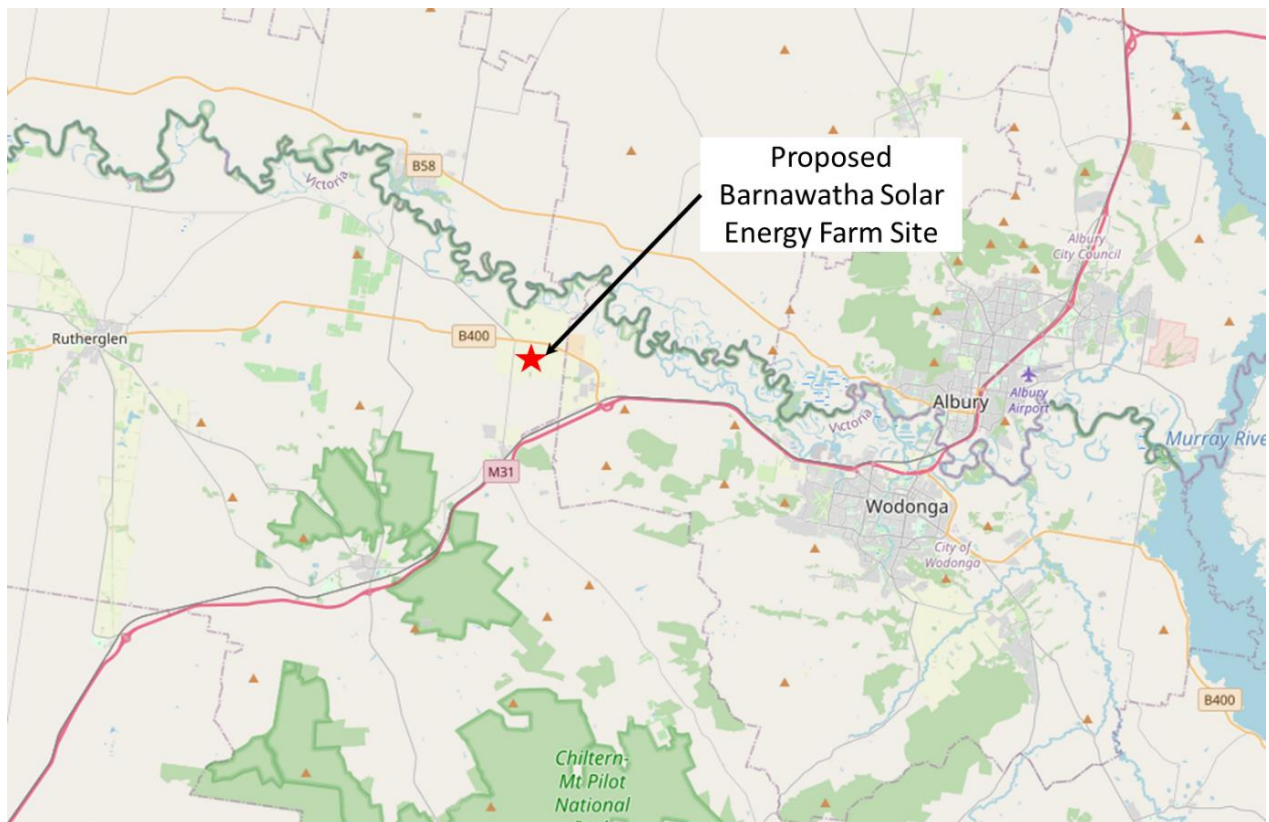


Figure 1 Barnawartha Solar Energy Farm Location

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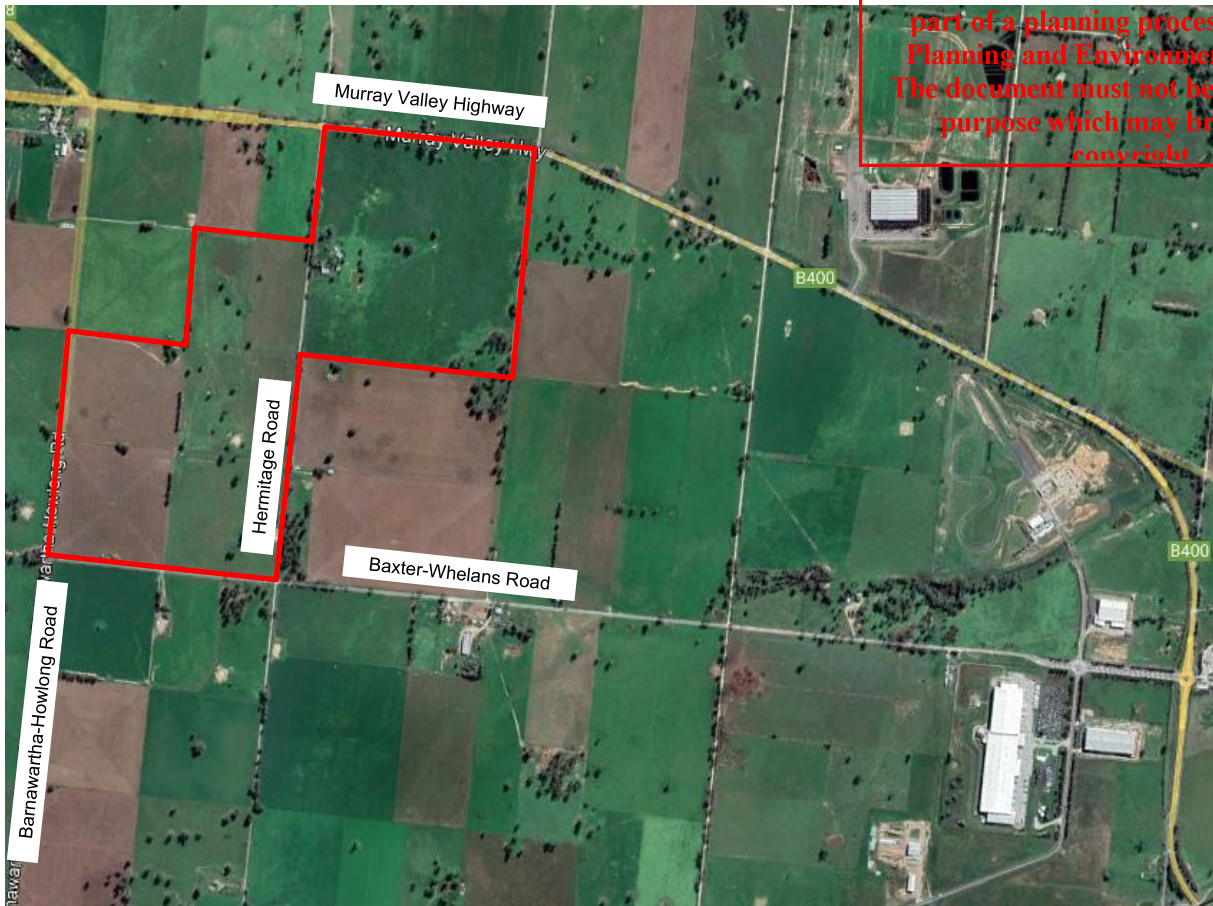


Figure 2 Barnawartha Solar Energy Farm Project Area



Figure 3 Land Zoning Map

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2.2 Transport Network

2.2.1 Road Network

Murray Valley Highway

The Murray Valley Highway is an arterial road aligned west to east in the vicinity of the subject site. It comprises a 6.8 m sealed two-lane two-way carriageway with 2.0 m unpaved shoulders and generally set within a 20 m road reserve (in the vicinity of the site and approximate). There are no provisions for bicycles or pedestrians along this section of the Murray Valley Highway.

The Murray Valley highway provides a connection along the Murray River from Euston (NSW) in the west to the Brigenbrong Bridge in the east. It provides connections to major towns along the way.

The Murray Valley Highway has a 100 km/hr posted speed limit and carries in order of 5,500 vpd (vehicles per day) (11% HV)¹.

The northern end of Hermitage Road is accessed off the Murray Valley Highway via a full turning movement priority-controlled intersection. The Murray Valley Highway looking west and looking east from Hermitage Road is shown below in Figure 4 and Figure 5, respectively.



Figure 4 Murray Valley Highway (facing west)



Figure 5 Murray Valley Highway (facing east)

Hermitage Road

Hermitage Road is a two-way local access road managed by Indigo Shire Council and is aligned in a north-south direction bisecting the subject site. It comprises an unsealed 5.5 m carriage way set within a 20 m wide road reserve (approximate). There are no provisions for bicycles or pedestrians along Hermitage Road.

Hermitage Road's cross section can be seen below in Figure 6.



Figure 6 Hermitage Road (facing north)

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¹ DoT Open Data Traffic Volume Data.



Baxter–Whelans Road

Baxter-Whelans Road is a two-way local road managed by Indigo Shire Council and is aligned in an east-west direction. It comprises a 5.0-5.5 m sealed two-way carriageway with 2.0 m unpaved shoulders and generally set within a 20.0 m road reserve (in the vicinity and approximate). There are no provisions for bicycles or pedestrians along Baxter–Whelans Road.

Baxter–Whelans Road provides a connection between Indigo Creek in Browns Plains in the west and the Murray Valley Highway in Barnawartha North in the east.

Baxter–Whelans Road has a 100 km/hr posted speed limit.

The southern end of Hermitage Road is accessed off Baxter-Whelans Road at a full turning movement priority-controlled intersection.

Barnawatha-Howlong Road

Barnawartha–Howlong Road is two-way local road managed by Indigo Shire Council and is aligned in a north-south direction. It comprises a 7.0 m sealed two-lane two-way carriageway with unpaved shoulders and generally set within a 20 m road reserve (in the vicinity and approximate). There are no provisions for bicycles or pedestrians along this section of Barnawartha–Howlong Road.

Barnawartha–Howlong Road provides a connection between the Murray Valley Highway in the north and the Barnawartha township in the south.

Barnawartha–Howlong Road has a 100 km/hr posted speed limit and carries in order of 2,800 vpd².

Barnawartha-Howlong Roads cross section can be seen below in Figure 7.



Figure 7 Barnawartha-Howlong Road (facing south)

2.2.2 Public Transport Network

There are currently no active public transport services, or stops, along the Murray Valley Highway, Hermitage Road, or Baxter–Whelans Road in the vicinity of the Project Area. However, the Melbourne – Albury V/Line service runs parallel to the nearby Hume Fwy. There is a station in nearby Barnawartha that has been closed since the 1980s.

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² Provided by Client



2.2.3 Active Travel

There are currently no formal pedestrian or cyclist paths along the Murray Valley Highway or within the general vicinity of the subject site. Whilst there are no formal facilities, it is understood that Murray Valley Highway is a popular cyclist route.

2.3 Traffic Volumes

Existing available traffic data has been collated from DoT open data traffic volumes and from the client. Table 1 has been prepared to summarise existing traffic volumes on the Murray Valley Highway and Barnawartha-Howlong Road within the vicinity of the subject site.

Table 1 Murray Valley Highway – Existing Traffic Volumes

Location	Direction	AM Peak	PM Peak	Daily
Murray Valley Highway (btwn Barnawartha Rd & Hume Fwy)	Eastbound	260 vph	260 vph	2,600 vpd (13% HV)
	Westbound	290 vph	290 vph	2,900 vpd (15% HV)
Barnawartha-Howlong Road (btwn Chiltern-Howlong Road and Murray Valley Highway)	Southbound	130 vph	130 vph	1,300 vpd
	Northbound	140 vph	140 vph	1,400 vpd

vph (vehicles per hour (10% vpd), vpd (vehicles per day (approximate)), HV (heavy vehicles))

There is no other traffic volume information available for the surrounding roads proposed to be utilised for the construction of the solar energy facility.

2.4 Crash History

Two crashes are reported to have occurred in the vicinity of the subject site in the last available five-year period from 2014 to 2019 (VicRoad's crash statistics) and are illustrated in Figure 8.

The first, a collision of two vehicles whilst one was undertaking a U-turn (not at an intersection), occurred in 2014, and resulted in one "serious injury" and 6 people with no injury. This occurred slightly west of the Murray Valley Highway / Barnawartha Road / Barnawartha – Howlong Road intersection.

The second, a rear end collision (not at an intersection), in 2018, resulted in one "other injury" and one non-injury, and occurred on the Murray Valley Highway between Mildrens Road and Margerys Road.

Both incidents involved light vehicles only.

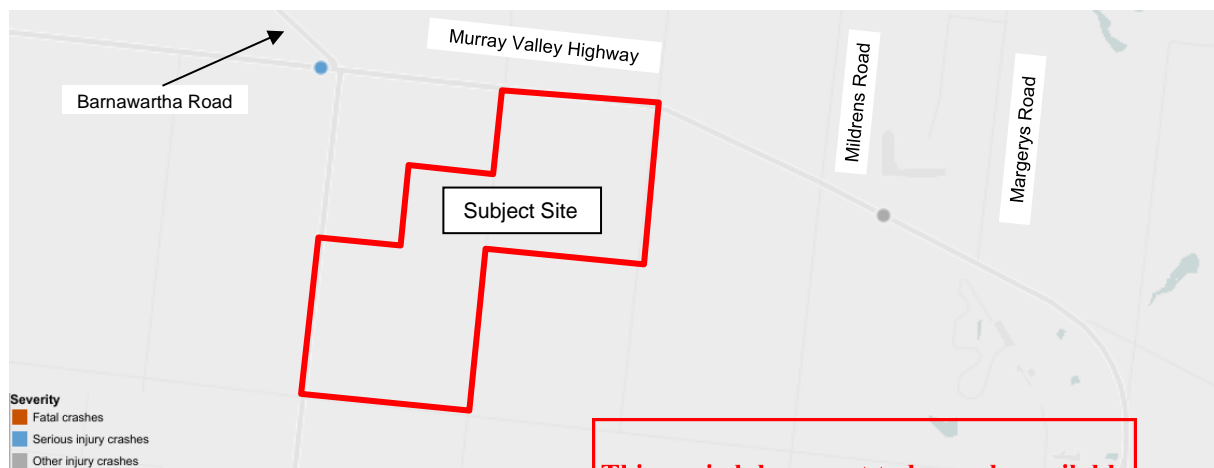


Figure 8 Crash Locations (source: DoT)

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3 Development Proposal

3.1 Solar Energy Farm

A planning permit is currently being sought for a proposed solar energy facility near Barnawartha, Victoria.

The proposal includes the construction of approximately 120,000 600W solar panels, ~64MW of battery storage, inverters, and associated power cables. The proposed development is split over two properties, bisected by Hermitage Road, with the indicative layout illustrated below in Figure 9, and included at a larger scale as Appendix A.

The solar energy farm construction phase is anticipated to last for 12-18 months consisting of a civil works component, mechanical and structural component, electrical works, and testing and commissioning phases. The operational life is expected to be around 25 years.



Figure 9 Proposed Site Layout

Vehicle access is possible via a number of existing full turning movement intersections along the Murray Valley Highway, Logic Blvd, Baxter-Whelans Road, and Hermitage Road with the preferred access route discussed in Section 3.2.1 of this report.

A total of six (6) car parking spaces are ultimately proposed to service staff parking demands during the operation and maintenance phase.

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3.2 Construction Phase

Construction will be largely limited to the preparation of footings, delivery and construction / installation of prefabricated items (solar panels, control room, switching station, battery units, connection components etc.).

Construction related vehicle movements will comprise construction workers and deliveries. It is expected that the majority of equipment and plant deliveries will occur via vans, heavy rigid vehicles (12.5 m trucks) and 19m semi-trailer trucks.

Construction vehicle types will be confirmed following appointment of a construction team (after a planning permit has been issued). At this post approval stage, specific traffic management measures will be identified for each as necessary and detailed in an appropriate Construction Traffic Management Plan (CTMP) or Traffic Management Plan (TMP). This is especially the case for OD / OSOM (Over Dimension / Over Size Over Mass) vehicles.

Staff will travel to the site in light vehicles.

3.2.1 Access Routes

Construction Vehicles & Deliveries

While not yet confirmed, it is expected that delivery of plant, equipment and materials will occur via the Port of Melbourne (for major componentry not manufactured in Victoria) and other areas throughout Victoria and locally in Albury/Wodonga.

The Proponent has confirmed that the preferred delivery movements are to arrive at the proposed solar energy facility via Hermitage Road via Baxter-Wheelan Road, Logic Boulevard and Murray Valley Highway, off the Hume Freeway. No direct access to the site is proposed from the Murray Valley Highway.

Site access for heavy construction vehicles is proposed from Hermitage Road via Baxter-Whelans Road from the east as outlined below in Figure 10.

The Baxter-Whelans Road / Hermitage Road intersection is a full turning movement intersection located south of the project site. The intersection is illustrated below in Figure 11, and access implications discussed further in section 4.2.

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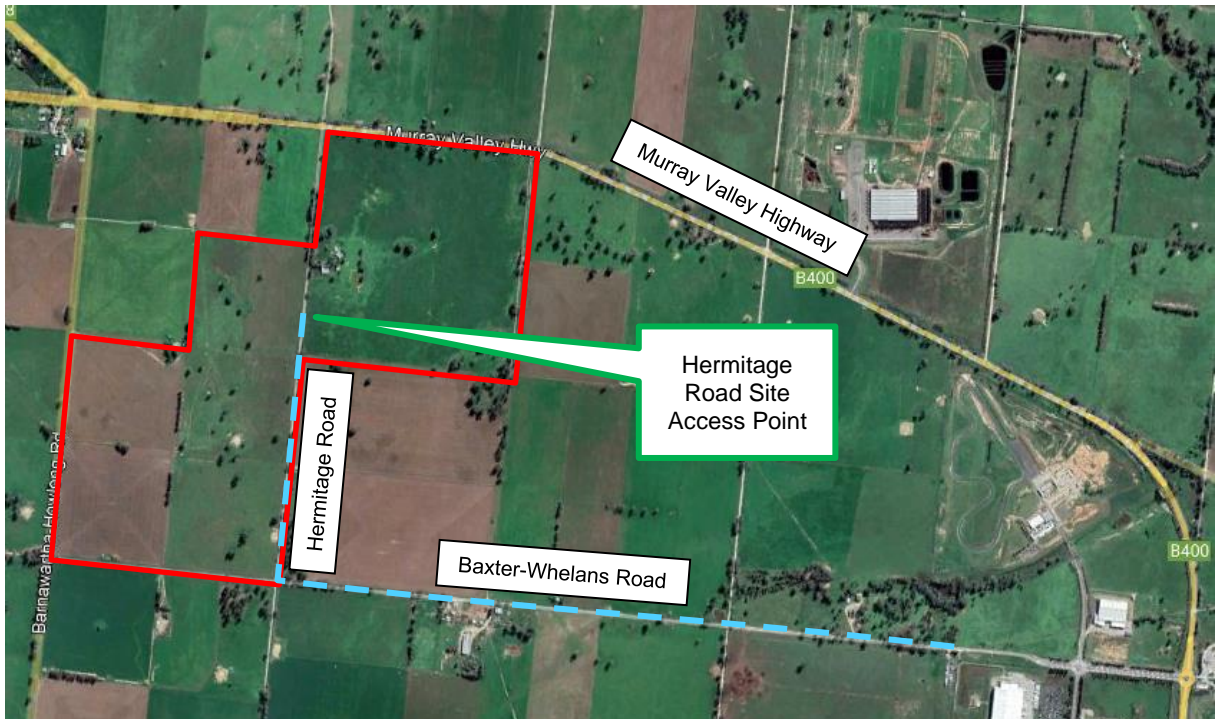


Figure 10 Preferred Barnawartha Solar Energy Farm Heavy Vehicle Access Route



Figure 11 Baxter-Whelans Road / Hermitage Road Intersection

Internal access and circulation for large construction and delivery vehicles during the construction phase will be required to accommodate the staging and unloading of 19m semi-trailers.

Following appointment of a construction team, specific access routes and internal circulation would then be confirmed and adopted for the construction phase and detailed in an appropriate approved CTMP or TMP.

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Workers

In regard to staff vehicle movements, this will depend on where workers live (and/or are housed if from Melbourne or further afield) which is expected to be highly varied. While not yet confirmed, it is an expectation of the Proponent that a large proportion of construction workers will comprise as many local staff as possible.

On this basis, workers may arrive from all directions including Barnawartha-Howlong Road from the south, Murray Valley Highway or Barnawartha Road from the west or Baxter-Whelans Road Murray Valley Highway from the east.

Direct access to enter the site for construction workers will be via Hermitage Road off the Murray Valley Highway north of the site or Baxter-Whelans Road south of the site.

3.2.2 Parking

A total of 20 parking spaces are proposed within the temporary construction compound and laydown area on the west side of the site.

3.3 Operation & Maintenance Phase

Based on information provided by the Proponent, it is understood that up to two (2) staff plus one (1) additional local technician could typically be expected to be on-site at any time. Vehicle movements are expected to include light vehicles (passenger cars), utility vans / maintenance trucks.

3.3.1 Access Routes

Operation and maintenance staff access, much like construction staff, will also depend on where staff live. It is however expected that staff will be from the local area.

Staff access routes to the proposed solar energy facility will therefore be via the Murray Valley Highway to Hermitage Road or via the Hume Freeway then Barnawartha – Howlong Road and then Baxter-Whelans Road to access the site entrances on Hermitage Road.

3.3.2 Site Access

The proposed main site entrances for site 1 and site 2 will both be located on Hermitage Road, as shown on Figure 9 and at greater scale in Appendix A.

Alternative access points are provided further south on Hermitage Road to the western section of the site, and off Coyles Road into the eastern section, at a minimum 30 metres south of the Murray Valley Highway intersection. No direct access to the site is proposed from the Murray Valley Highway.

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4 Car Parking & Access Assessment

4.1 Car Parking

4.1.1 Statutory Requirement

Statutory requirements for the provision of car parking (under the operation & maintenance phase) are set out in Clause 52.06 of the Indigo Planning Scheme, with parking rates specified in Table 1 to Clause 52.06-5.

The scheme does not specifically incorporate a recommended parking rate for a solar energy facility (utility installation land use). In such circumstances, the scheme notes:

In instances where a use is noted specific in Table 1 to Clause 52.06-5 or another provision within the planning scheme, car parking spaces are usually provided to the satisfaction of the responsible authority.

To this end, please refer to Section 4.1.2 for an assessment of anticipated parking demand and parking provision.

4.1.2 Parking Demand Assessment

A total of six (6) car parking spaces are proposed to be provided on-site during the operation and maintenance phase of the solar energy farm facility.

As noted in Section 3.3, based on information provided by the applicant it understood that up to two site staff plus additional local technicians could be expected to be on-site at any time.

The proposed provision of total six (6) car parking spaces is therefore considered appropriate for nominal staff demands during the maintenance and operation phase of the solar energy farm facility and also expected to be sufficient to accommodate additional parking demands during infrequent and irregular maintenance and operation activities.

4.1.3 Parking Layout

It is recommended that car parking spaces are provided in accordance with dimensional requirements set out in Clause 52.06-9 of the Indigo Planning Scheme (i.e. minimum 2.6 m wide x 4.9 m long accessed from a 6.4m wide aisle) or alternatively in accordance with the relevant Australian Standard.

A loading bay is also not currently shown on development plans. Should one be required, it is recommended that the loading bay and access is provided in accordance with the dimensional requirements set out in the Australian Standard for Off-street commercial vehicle facilities (AS2890.2-2002).

Notwithstanding, it is noted that sufficient space exists within the proposed site to provide parking in accordance with these requirements.

4.2 Access

As noted in Section 3.3.1 and illustrated in Figure 9, construction vehicle access is proposed via Hermitage Road from Baxter-Whelans Road via the Hume Freeway (to/from the east) and via Hermitage Road from the Murray Valley Highway (to/from the east).

Construction and ongoing operational staff vehicles will be able to access the site via Hermitage Road directly off Murray Valley Highway and Baxter-Whelans Road from the east or west. Ongoing maintenance of the unsealed Hermitage Road during construction will be required to the satisfaction of Indigo Council.

Construction access points to the site off Hermitage Road will be required to accommodate the construction delivery vehicles and the ongoing maintenance access points will need to be provided to the satisfaction of Indigo Shire Council.

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4.2.1 Intersection Sight Distance

A desktop sight distance assessment has been undertaken at the following intersections in accordance with the requirements of *Austrroads' Guide to Road Design (Part 4A)* based on an 100km/hr posted speed limit:

- Murray Valley Highway / Hermitage Road.
- Hermitage Road site access points.
- Barnawartha-Howlong Road and Baxter-Whelans Road
- Baxter-Whelans Road and Hermitage Road

Assessment of the above indicates that available sight distance at these locations exceeds the minimum requirements set out in the *Austrroads Guide*.

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4.2.2 Swept Path Assessment

As noted in Section 3.2, the majority of vehicles expected to service the site during construction include a size up to and including 19 m semi-trailer trucks.

Given that Baxter-Whelans Road extends from Logic Boulevard and the Logic distribution centre off Murray Valley Highway, it is assumed that intersections between Hume Freeway and Baxter-Whelans Road will accommodate heavy vehicles up to 19 m semi-trailer. To this end, concept swept path assessments for 19 m semi-trailer trucks travelling to and from site have been undertaken as follows:

- Figure 12 illustrates movements from Baxter-Whelans Road to Hermitage Road to the site (from the east to the north), and
- Figure 13 illustrates movements from Hermitage Road to Baxter-Whelans Road from the site (from the north to the east), and
- Figure 14 illustrates movements from the Murray Valley Highway to Hermitage Road to the site (from east to south), and
- Figure 15 illustrates movements from Hermitage Road to the Murray Valley Highway from the site (from north to east).

The below indicates that minor road widening at the Hermitage Road approach to both of the intersections will be required to ensure 19m semi-trailers can traverse the intersections.



19m Semi-trailer to the site

Figure 12 Baxter-Whelans Road / Hermitage Road Swept Paths - Ingress



19m Semi-trailer from the site

Figure 13 Baxter-Whelans Road / Hermitage Road Swept Paths - Egress



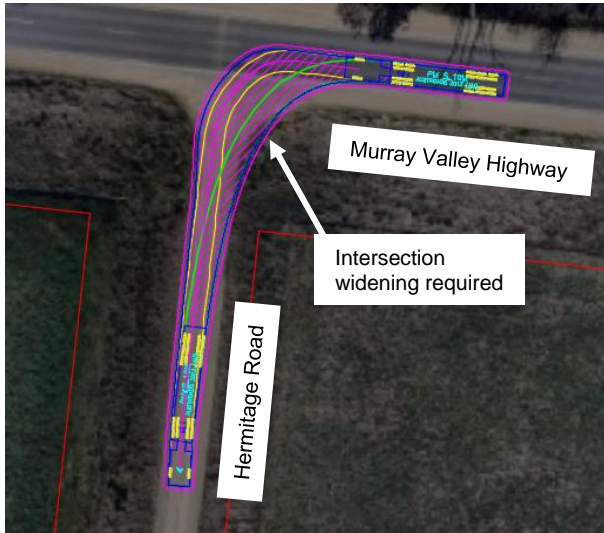


Figure 14 Murray Valley Highway / Hermitage Road Swept Paths - Ingress

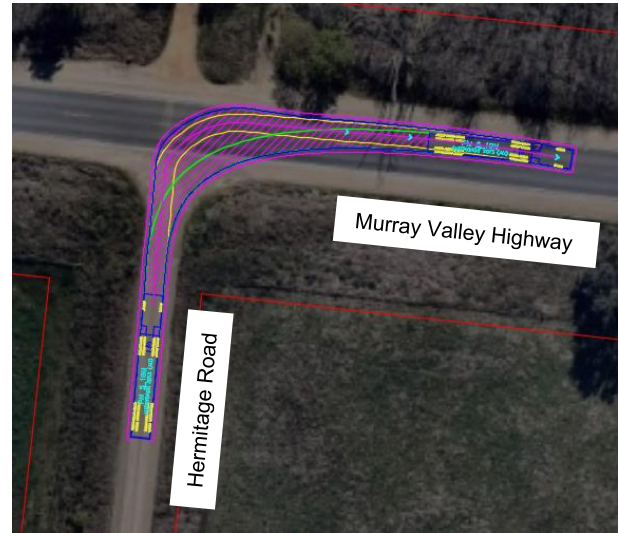


Figure 15 Murray Valley Highway / Hermitage Road Swept Paths - Egress

Figures 12 to 15 indicate that the intersections will be able to accommodate the ingress and egress movements with some minor road widening at the Hermitage Road approach to the intersections to ensure 19m semi-trailers can traverse the intersections. It is noted however, that neither vehicle can turn concurrently with another 19 metre semi-trailer at the intersections.

Given the temporary nature of the construction and low probability that these vehicles will meet at these intersections at the same time, traffic management measures would be recommended to ensure that vehicle arrival and departures are staged to manage the movement of large vehicles at this intersection.

The above will be confirmed and addressed appropriately by way of an approved CTMP or TMP to be completed by the construction contractor post permit, especially where OD / OSOM vehicle movements are concerned

4.2.3 Internal Access

Internal access roads 4 metres wide are provided throughout the site, including around the perimeter of each site. The internal access network is shown in white in Figure 16.

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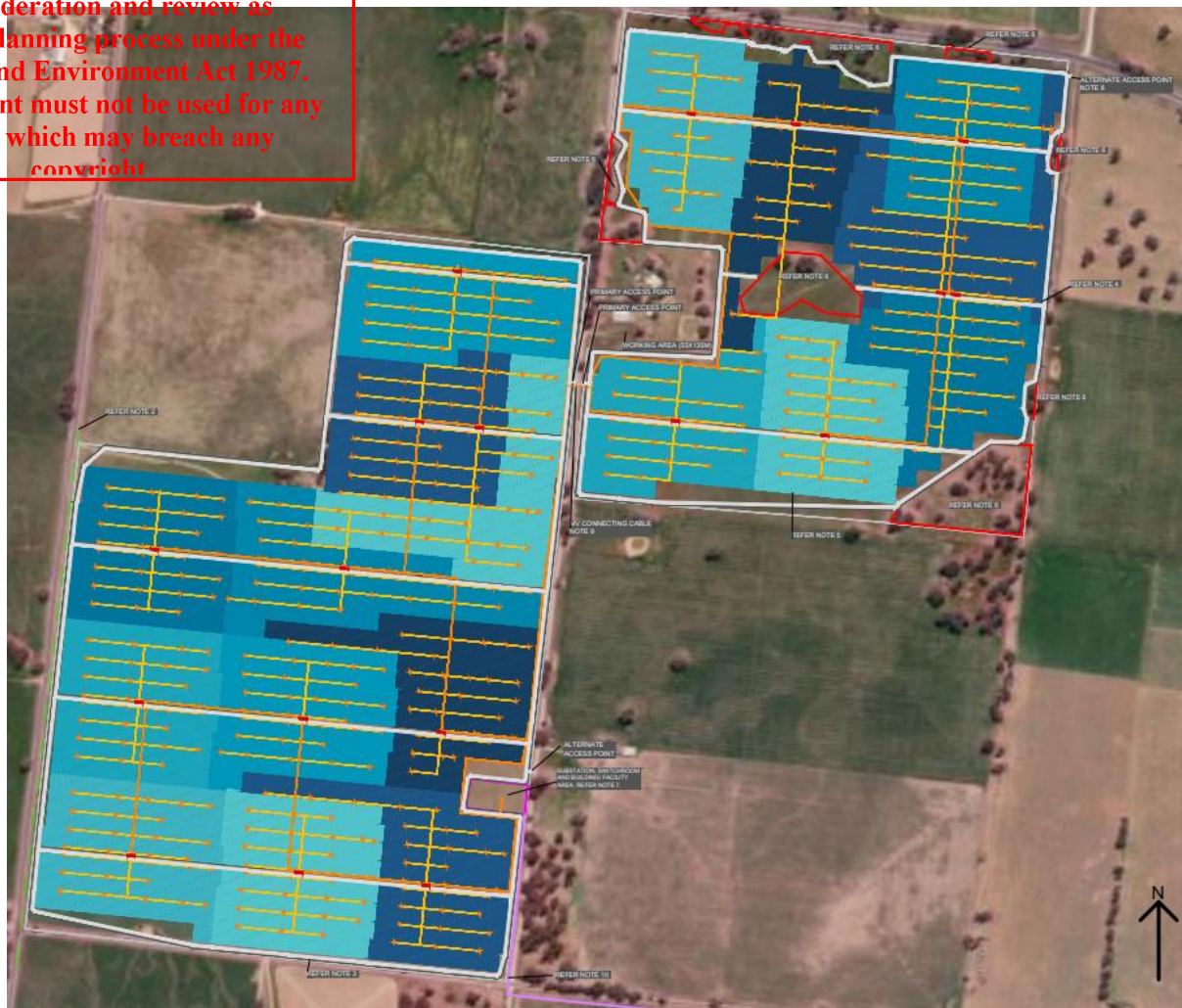


Figure 16 Internal access roads

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4.2.4 CFA Requirements

Internal access to the proposed solar energy farm facility is expected to comply with the access requirements of the CFA, noting the following compliances and/or recommended changes. The Proponent will ensure these requirements are reflected in the detail design phase of the project in consultation with the CFA.

- CFA guidelines require a perimeter road for CFA appliance (vehicle) access to the entire site. While a perimeter road around the whole facility is not currently proposed, subject to CFA approval a number of internal access roads are provided in addition to the southern, northern, and eastern boundary perimeter roads which provides access to the various parts of the facility.
- It is recommended that proposed internal access roads comprise 'all-weather construction' and be able to accommodate 15 tonne CFA appliances (vehicles).
- Internal access roads comprise a min. 4 m trafficable width with a clear min. 4 m vertical clearance.
- Average grades are expected to be less than 1:7 with a max. 1:5 for no more than 50 m.
- Existing and proposed internal access roads are expected to have dips of no more than 1:8 (sag and summit grades).
- The main internal access road is sufficiently wide (6 m) to allow two vehicles to pass (and effectively provide required 20 m x 6 m 'passing bays'). The remainder of secondary internal access roads comprise 4 m wide carriageways, however, are sufficiently short that dedicated passing bays are not required under CFA guidelines.



- A minimum of two access points are available for CFA appliances (vehicles) to access each of the two lots comprising the proposed solar energy facility. These alternate access points are illustrated on Figure 9.

Notwithstanding the above, it is recommended that a Bushfire Management Plan (BMP) and/or Emergency Management Plan (EMP) be prepared in consultation with the CFA and other relevant stakeholders.

4.2.5 Access Recommendations

Access for construction and delivery vehicles including 19m semi-trailers and 12.5m trucks are proposed to access the temporary construction area via Hermitage Road, from Baxter-Whelans Road, Logic Blvd, Murray Valley Highway and Hume Freeway and from the Murray Valley Highway to Hermitage Road. The Baxter-Whelans Road / Hermitage Road intersection and the Murray Valley Highway / Hermitage Road intersection will be required to be upgraded to accommodate the turning movements of the 19m semi-trailer trucks from the east. Construction and maintenance access to the site off Hermitage Road will need to meet the requirements of Indigo Shire Council.

Construction workers and post construction employees will be able to access the site via Hermitage Road from either Murray Valley Highway to the north or Baxter-Whelans Road to the south.

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5 Traffic Impact Assessment

5.1 Traffic Generation

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5.1.1 Construction Phase

Based on the information provided by the Proponent, construction of the proposed solar energy farm is understood to generate the following *peak* movements during *peak* construction activities:

- 10 light vehicles one-way ('in' or 'out') vehicle movements per day.
- 20 heavy vehicle (truck) one-way ('in' or 'out') vehicle movements per day.

This equates to a total of 30 'in' or 'out' vehicle movements over an entire day (i.e. one-way movements), or 60 'in' and 'out' vehicle movements over an entire day (i.e. total two-way movements).

It is noted that during non-peak construction activities, construction related traffic movements are expected to be significantly less.

5.1.2 Operational & Maintenance Phase

As noted previously, solar energy farm facilities are usually monitored remotely in real-time and do not require dedicated staff to be on-site. Staff are however required to access the site from time to time for inspections and maintenance activities. Based on information provided by the Proponent it is understood that up to 2 staff and 1 technician could potentially be expected to be on-site at any time.

On this basis up to three entry and egress movements per day (3 'in' and 3 'out') could be expected to be generated by the proposed solar energy facility during normal operation.

5.2 Impact Assessment

The performance measures adopted to assess the mid-block performance of the external road network Murray Valley Highway, are *Level of Service* (LOS) and *Volume over Capacity Ratio* (V/C Ratio) (DOS).

- LOS is defined in the Austroads Guide to Traffic Management (Part 3) as a quantitative measure for ranking operating conditions, based on factors such as speed, travel time, freedom to manoeuvre, interruptions, comfort, and convenience.

LOS is rated from A (best, free flow conditions) to F (worst, breakdown in vehicle flow, congestion). LOS 'C' is considered a minimum desirable service level for both metropolitan fringe and rural areas.

Mid-block LOS levels for V/C Ratios have been adopted from the Highway Capacity Manual (2010).

- V/C Ratio is broadly defined as the volume versus the available capacity (sometimes referred to as DOS) and is calculated by dividing the total one-way volume on a road by the road's mid-block vehicle capacity based on lane types defined in Austroads Guide to Traffic Management (Part 3). For the purposes of this assessment lane capacities of 1,900 vehicles per hour in each direction of travel have been assumed (based on a four-lane divided carriageway).

On the above basis, an assessment of construction phase and maintenance and operation phase related traffic movements is included in the following sections below.

5.2.1 Construction Phase

Table 2 below sets out the mid-block LOS assessment of the Murray Valley Highway between the Hume Freeway and Logic Boulevard, and conservatively assumes all 'in' movements occur in the AM peak hour and all 'out' movements occur in the PM peak hour via Logic Drive (Baxter-Whelans Road).

Table 2 Murray Valley Highway – Existing and Construction Phase Assessment



Direction	Existing AM		Construction		Existing PM		Construction PM	
	Volume	LOS	Volume	LOS	Volume	LOS	Volume	LOS
Eastbound	260	A	290	A	260	A	290	A
Westbound	290	A	320	A	290	A	320	A

Construction vehicles on the Murray Valley Highway between the Hume Freeway and Logic Boulevard are not expected to have a significant impact on the operation or level of service of Murray Valley Highway compared to existing volumes.

While existing traffic volumes on Baxter-Whelans Road are unknown, it is a rural road and expected to carry low traffic volumes in the vicinity of the subject site. An additional 60 vehicle movements per day is not expected to adversely impact safety on, or the operation of Baxter-Whelans Road.

5.2.2 Operational & Maintenance Phase

During normal activities during the operation and maintenance phase up to two site staff plus local technicians could be expected on-site which is expected to result in 3 to 4 vehicle movements 'in' in the AM and 3-4 vehicle movements 'out' in the PM peak periods.

Against existing traffic volumes on the Murray Valley Highway and Barnawartha-Howlong Road, the development proposal's additional vehicle movements generated under the operation and maintenance phase (three vehicles per day), could not be expected to notably impact on the capacity or safety of the surrounding road network.

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6 Summary

On the basis of the above discussion and analysis the following is summarised:

- The solar farm is proposed to be located on two sites on either side of Hermitage Road, in Barnawartha, Victoria.
- Construction vehicle access is proposed via Hermitage Road from Baxter-Whelans Road via the Hume Freeway (to/from the east) and via Hermitage Road from the Murray Valley Highway (to/from the east).
- The current concept design allows for six (6) permanent car park spaces (to be confirmed during the detailed design phase) is considered appropriate considering Clause 52.06 of the Indigo Planning Scheme and anticipated operation and maintenance phase staff parking demands.
- Construction phase vehicles are expected to be able to appropriately access the site via Baxter-Whelans Road and Hermitage Road noting that 19m semi-trailer trucks may access Hermitage Road from Baxter-Whelans Road subject to minor road widening at the intersection, as discussed in Section 4.2.2.
- Construction phase vehicles are expected to be able to appropriately access the site via the Murray Valley Highway and Hermitage Road noting that 19m semi-trailer trucks may access Hermitage Road from the Murray Valley Highway subject to minor road widening at the intersection, as discussed in Section 4.2.2.
- Traffic management measures would be recommended to ensure that vehicle arrival and departures are staged to manage the movement of large vehicles at the Hermitage Road / Baxter-Whelans Road and Murray Valley Highway / Hermitage Road intersections so that there are no concurrent turning movements of large trucks.
- Internal access and circulation for large construction and delivery vehicles during the construction phase will be required to accommodate the staging and unloading of 19m semi-trailers. This requirement will be confirmed during the detailed design phase.
- Any required traffic management treatments and internal and external mitigation works are to be identified and addressed by way of an approved CTMP or TMP to be prepared by the construction contractor. This is the responsibility of the Proponent and would be prepared in consultation with the construction contractor.
- The proposed site layout is expected to comply with access requirements of the CFA. A BMP and/or EMP are recommended to be completed in consultation with the CFA during the Project's detailed design. Secondary, emergency access, points are required into each of the sites, located off Hermitage Road to the west site, and Coyles Road to the east site.
- The proposed Project is estimated to generate the following vehicle movements during the construction phase during the peak construction period:
 - 10 light vehicle one-way movements per day (total 20 vehicle movements per day), and
 - 20 heavy vehicle one-way movements per day (total 40 vehicle movements per day).
- The additional 60 vehicle movements per day during the construction period will not have a notable impact on traffic conditions between the Hume Freeway and the site entrance on Hermitage Road.

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Appendix A – Site Layout Plan

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ADVERTISED PLAN



- General Notes**
1. BASIC INDICATIVE LAYOUT/DESIGN. FOR PLANNING SUBMISSION ONLY. NOT FOR CONSTRUCTION OR CALCULATION PURPOSES. DESIGN IS NOT FINALISED. SOURCE DRAWING IS BARNSF-GN-LAY-0219.
 2. GAS PIPELINE AND COMMS EASEMENT (NOT TO SCALE). ENSURE ADEQUATE STANDOFF OF FENCE AND PERIMETER ROAD. 30M OFFSET FROM PROJECT LANDOWNER PROPERTY BDY TO SOLAR PANELS INC VEGETATION SCREENING.
 3. 30M OFFSET FROM SOLAR PANEL TO NEIGHBOURING PROP BDY.
 4. 30M OFFSET FROM SOLAR PANEL TO NEIGHBOURING PROP BDY INC VEGETATION SCREENING.
 5. RETAINED TREES AREA.
 6. APPROX 100 X 50M AREA RESERVED FOR SUBSTATION AND BUILDINGS. REFER TO DWG BARNSF-GN-GAD-0209 FOR INDICATIVE LAYOUT WITHIN.
 8. ALT ENTRY TO BE >30M SOUTH OF MURRAY VALLEY HWY COYLES RD INTERSECTION.
 9. CONNECTING CABLE TO BE BORED UNDER HERMITAGE RD.
 10. EXISTING AUSNET OHL TO AUSNET OHL S OF BAXTER-WHELANS RD. REFER TO SHEET 2.
 11. 1 X 45,000L WATER TANK TO BE LOCATED CLOSE TO GATE INSIDE EACH SITE PRIMARY ACCESS POINT. EACH PRIMARY ACCESS POINT TO HAVE BUSINESS IDENTIFICATION SIGN AND CFA WATER TANK DIRECTION SIGN ON OR NEAR GATE FACING OUTWARDS (REF BARNSF-GN-GAD-0228).
 12. INTERNAL ROADS 4M. PERIMETER FIRE BREAK 10M INC ROAD.
 13. INDICATIVE DESIGN SPECS:
 - 13.1. LOCATION: BARNAWARTHA, VICTORIA, AUSTRALIA
 - 13.2. UTM CONVERGENCE: 0.1821 °
 - 13.3. ALTITUDE: 162.11 M
 - 13.4. USABLE AREA: 128.93 HA
 - 13.5. PERIMETER FENCE: 7.37 KM
 - 13.6. RATED POWER @ POC: 64MW
 - 13.7. BATTERY CAPACITY: TBC. INDICATIVE 64-192MWH. LOCATION: DISPERSED, NEXT TO PCU.

LEGEND:

- Project area
- Retained trees area
- Substation, switchroom, building/facility
- Colors indicate solar field connection to each power station
- Mounting structure
- Roads
- Medium voltage trenches
- Fences
- Medium voltage lines
- Existing Ausnet overhead line
- New build overhead line within Wodonga easmt
- Vegetation screen location
- Water tank
- CFA direction to water tank sign
- Business identification sign

1	Original	30 Mar 2022
2	Addressed DELWP RFI's	24 Jun 2022
No.	Revision/Issue	Date

Firm Name and Address
WIRSOL
 YOUR PARTNER IN RENEWABLE ENERGY
 Wirsol Energy
 201/39 East Esplanade, Manly, NSW, Australia, 2095
 ARP Solar

Project Name and Address
 BARNAWARTHA SOLAR FARM
 INTERSECTION HERMITAGE RD AND BAXTER-WHELANS RD, BARNAWARTHA, VICTORIA, AUSTRALIA 3688

Drawing number BARNSF-GN-LAY-0226-V2	Sheet 1 of 2
Drawing title Indicative basic overall site layout - Planning submission	
Scale 100m	

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- General Notes**
14. EXISTING AUSNET OVERHEAD LINE SOUTH OF BAXTER-WHELANS ROAD TO BE UPGRADED
 15. NEW BUILD OVERHEAD LINE WITHIN WODONGA COUNCIL LAND PARCEL, SOUTH OF ROAD RESERVE TO AVOID VEGETATION CLEARANCE.
 16. AUSNET BARNAWARTHA ZONE SUBSTATION (BWA)
- LEGEND:**
- Project area
 - Retained trees area
 - Substation, switchroom, building/facility
 - Colors indicate solar field connection to each power station
 - Mounting structure
 - Roads
 - Medium voltage trenches
 - Fences
 - Medium voltage lines
 - Existing Ausnet overhead line
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 ARP Solar

Project Name and Address
 BARNAWARTHA SOLAR FARM
 INTERSECTION HERMITAGE RD AND BAXTER-WHELANS RD, BARNAWARTHA, VICTORIA, AUSTRALIA 3688

Drawing number BARNSP-GN-LAY-0226-V2	Sheet 2 of 2
Drawing title Indicative basic overall site layout - Planning submission	
Scale 1:200m	

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