Spotto CONSULTING

people-oriented traffic and transport solutions

Traffic Impact Assessment

Solar Project

BroughansRoad

Finley NSW

April 2020

Prepared by:

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For:

Bison Energy

Ref	Version	Date	Revision Details	Author
P0091	A	22 April 2020	Draft	SWS
	B	24 April 2020	Final	SWS

CONTENTS

1 INTRODUCTION

Spotto Consulting have been engaged by Bison Energy to complete a Traffic Impact Assessment. The study is in response to a proposed development at Lot 126 DP752299, on Broughans Road, Finley. The development involves construction of a solar facility, with 16,500 solar photovoltaic panels with a total capacity of 7MW, mounted in arrays on frames, cabling from the panels to inverters and transformers with a connection into the local electricity network, ancillary facilities including sheds, staff amenities and parking plus perimeter fencing and an internal road network.

The purpose of the assessment is to review the existing conditions in the vicinity of the site, including traffic, parking and servicing, as well as the performance of the surrounding network. An evaluation is then required of the traffic and parking requirements for the proposed development, and the impacts on the surrounding road network.

The assessment concluded that:

- Traffic volume data and assessment of key roads and intersections in the vicinity of the site (including Canalla Road, Broughans Road and the Newell Highway as well as their intersections) shows that they currently operate with low volumes of traffic and good levels of service;
- The proposed development will generate traffic of five vehicle trips per hour in the peak hour and 16 vehicles per day during construction, as well as one vehicle trip per hour and two vehicles per day during operation, which will not have a significant impact on the performance of the surrounding road network (midblock or intersection);
- Adequate provision has been made for entry and exit to the site for vehicles up to and including a 19m semi-trailer, with all vehicles able to enter and exit the site in a forward direction;
- Space is available off-street for vehicles to travel through the site in a forward direction, and to park safely clear of through traffic;
- Adequate provision has been made for staff, servicing and delivery vehicles; and
- There is no significant impact of the proposed development on pedestrians and cyclists.

The assessment recommended that:

- Construction traffic should be managed through the development and implementation of a Construction Traffic Management Plan (CTMP) written in accordance with the requirements of *Australian Standard AS1742.3 Manual of Uniform Traffic Control Devices – Traffic Control for Works on Roads* and the *RMS (TfNSW) Traffic Control at Work Sites – Technical Manual*; and
- The primary access into the site from Broughans Road (approximately 1.9km west of the Newell Highway) be upgraded to comply with the requirements of Berrigan Shire Council's *Engineering Guidelines for Subdivisions and Development Part 2: Roads (2014)*.

2 EXISTING CONDITIONS

2.1 Site

The site is located on Broughans Road, approximately 4.5km south-west of Finley, as shown in Figure 2-1.

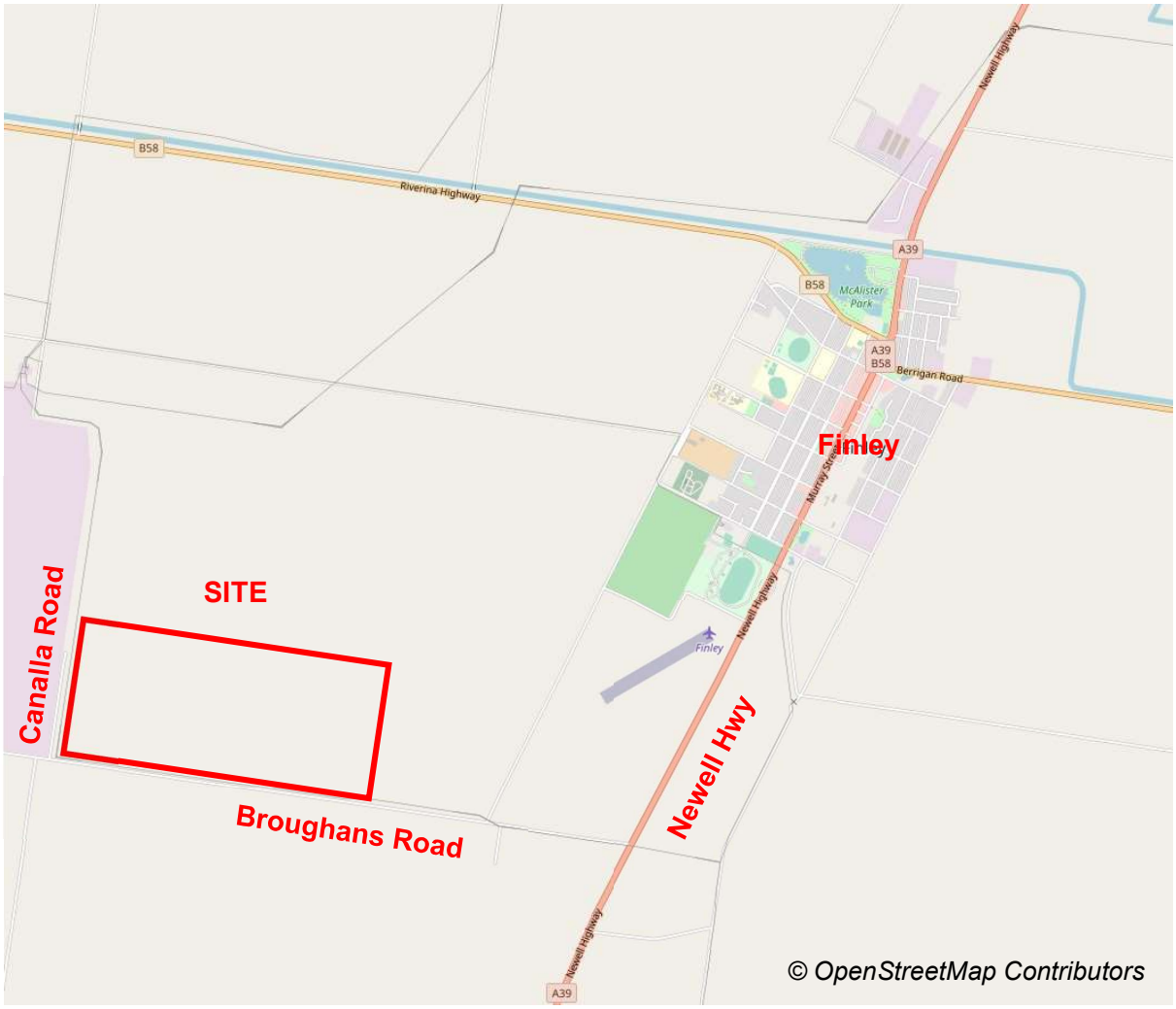

Figure 2-1: Locality Plan

The site is described as Lot 126 DP752299, which has an area of approximately 204 hectares. The site is bounded by Broughans Road to the south and Canalla Road to the west, with private land to the north and east.

Vehicular access to the site is available from both Broughans Road (in two locations, approximately 1.9km and 2.9km west of the Newell Highway) and Canalla Road (500m north of Broughans Road).

The site is in close proximity to, and is also traversed by, several irrigation channels, and is currently used for agricultural purposes.

2.2 Surrounding Land Use

The site and immediate surrounds are currently zoned RU1 Primary Production under the Berrigan Local Environmental Plan 2013. Surrounding land uses are predominantly rural and agricultural, with some housing.

2.3 Consultation

In preparing this report, consultation has been undertaken with officers from Berrigan Shire Council and Transport for NSW (TfNSW). Spotto Consulting appreciates the opportunity to discuss key issues relating to the local transport network with these officers, and acknowledges the insights gained through this consultation.

2.4 Road Network

2.4.1 Broughans Road

Broughans Road runs roughly east/west for a distance of approximately 11km between the Newell Highway and James Road. In the vicinity of the site, it is a local road under the control of Berrigan Shire Council, and is classified as a Residential Access Rural Sealed Road under the *Berrigan Shire Transport Asset Management Plan 2014*. It is authorised for travel by vehicles up to and including B-Doubles. The road's role balances through movement with direct property access.

In the vicinity of the site, Broughans Road is a two-lane, two-way rural sealed road that runs roughly east/west and lies south of the site. Contained within a 20m wide road reserve, the main carriageway consists of a 6.5m-wide seal with no linemarking. No pedestrian or cyclist facilities are present, and there is no street lighting. Overhead power lines and irrigation channels are located near the road. The speed limit is the default rural speed limit of 100km/h.

Figure 2-2: Looking west along Broughans Road adjacent to the site

2.4.2 Canalla Road

Canalla Road runs roughly north/south for a distance of approximately 7km between the Olympic Highway and Broughans Road. In the vicinity of the site, it is a local road under the control of Berrigan Shire Council and is classified as a Residential Access Rural Gravel Road under the *Berrigan Shire Transport Asset Management Plan 2014*. The road's role favours direct property access over through movement.

In the vicinity of the site, Canalla Road is a two-lane, two-way rural unsealed road that runs roughly north/south and lies west of the site. Contained within a 20m wide road reserve, the main carriageway consists of a 6m-wide gravel road. No pedestrian or cyclist facilities are present, and there is no street lighting. The speed limit is the default rural speed limit of 100km/h.

Figure 2-3: Looking north along Canalla Road adjacent to the site

2.4.3 Newell Highway

The Newell Highway is a significant north-south route. It provides the main inland link between Victoria (near Tocumwal) and Queensland (near Goondiwindi), providing access to western NSW regional centres including Finley, Narranderra, West Wyalong, Dubbo and Narrabri and carrying a large volume of freight. Signposted as the A39, it is a State Road under the control of Transport for NSW (TfNSW), and is suitable for travel by vehicles up to and including AB-triples. The highway's role favours through movement over property access.

In the vicinity of the site, the Newell Highway is a two-lane, two-way rural sealed road that runs roughly north/south and lies approximately 1.9km east of the site. Contained within a 100m wide road reserve, the main carriageway contains one 3.4m wide through lane in each direction, with 1.0-1.5m wide sealed shoulders and roadside table drains. No pedestrian or cyclist facilities are present, and there is no street lighting. The speed limit is the default rural speed limit of 100km/h.

At the time of the site inspection, works were underway on the Newell Highway to provide an overtaking lane south of Broughans Road. Discussions with TfNSW indicated that these works would have no impact on the intersection with Broughans Road, and there are no other plans for works on the Newell Highway in the vicinity of the site.

Figure 2-4: Looking north along the Newell Highway towards Finley

Figure 2-5: Looking south along the Newell Highway, just north of the intersection with Broughans Road

2.4.4 Intersections

The intersection of the Newell Highway and Broughans Road is located approximately 1.9km east of the site. It is a three-legged “T” intersection, with priority given to vehicles on the Newell Highway. The intersection has no street lighting. Property access driveways are located to the east and north-west of the intersection. Pavement widening on the eastern side of the Newell Highway carriageway provides a BAR (Basic Right Turn) auxiliary lane, allowing southbound through traffic to pass traffic turning right into Broughans Road. Some pavement widening on the western side of the carriageway provides a BAL (Basic Left Turn) auxiliary lane for northbound traffic. Sight distance from Broughans Road along both directions of the Newell Highway exceeds the minimum Safe Intersection Sight Distance (SISD) of 248m for a vehicle travelling at 100km/h under the *Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections* (Table 3.2).

Figure 2-6: Looking north along the Newell Highway towards the intersection with Broughans Road (noting the pavement widening on the northbound and southbound lanes)

The intersection of Broughans Road and Canalla Road is located south-west of the site. It is a three-legged “T” intersection, with Canalla Road forming the northern leg of the intersection and priority given to vehicles on Broughans Road, which runs east/west. There are no auxiliary lanes or street lighting. Sight distance from Canalla Road along both directions of Broughans Road exceeds the minimum SISD of 248m for a vehicle travelling at 100km/h under the *Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections* (Table 3.2).

Figure 2-7: Looking west along Broughans Road at the intersection with Canalla Road

2.5 Existing Traffic Conditions

No traffic volume data was available for Broughans Road or Canalla Road. As these are local roads with limited through movements, it is possible to estimate traffic volumes on these roads. Traffic generation levels are typically determined by reference to published standards such as the *RTA (TfNSW) Guide to Traffic Generating Developments*, with the amount of traffic generated depending on the type and scale of land use.

In the case of Broughans Road and Canalla Road, the predominant traffic-generating land use is rural residential dwellings. The total traffic on each road can be determined by counting the total number of dwellings on or near each road, and assuming each dwelling will generate the following traffic (based on figures for residential dwellings in regional areas identified in *TfNSW Technical Direction TDT2013/04a Guide to Traffic Generating Developments – Updated Traffic Surveys*):

- Daily vehicle trips: 7.4 trips per dwelling per day;
- Weekday average morning peak hour vehicle trips: 0.71 trips per dwelling per hour; and
- Weekday average evening peak hour vehicle trips: 0.78 trips per dwelling per hour.

The following dwelling numbers have been identified from aerial photography and site inspections as likely to travel past or near the site:

- Canalla Road – North of Broughans Road: 1 dwelling;
- Broughans Road – West of Kelly Road: 5 dwellings;
- Broughans Road – Kelly Road to McMurrays Road: 3 dwellings;
- McMurrays Road – South of Broughans Road: 2 dwellings;
- Broughans Road – McMurrays Road to Dales Road: 3 dwellings; and
- Broughans Road – Dales Road to Newell Highway: 7 dwellings.

It is noted that while there are other dwellings on these roads, due to their location, they are likely to use alternative routes. For example, dwellings on Broughans Road further west are likely to use the shorter and quicker route of James Road and the Riverina Highway to access Finley, rather than Broughans Road and the Newell Highway.

A summary of existing traffic volumes on key sections of local roads in the vicinity of the site is shown in Table 2-1, below.

Table 2-1: Midblock traffic data – Local Roads

Location	Dwellings	Daily	AM Peak	PM Peak
		Veh/d	Veh/h	Veh/h
Canalla Road – Adjacent Site (North of Broughans Rd)	1	7	1	1
Broughans Road – Adjacent Site (Dales Rd to Canalla Rd)	14 Canalla – 1 McMurrays – 2 Broughans – 11	104	10	11
Broughans Road – East of Site (Newell Hwy to Dales Rd)	21 Canalla – 1 McMurrays – 2 Broughans – 18	155	15	16

Traffic data on the Newell Highway was obtained from several different sources, including:

- Transport for NSW Traffic Volume Viewer application, which includes a permanent counter on the Newell Highway north of Jerilderie which has data from 2010 to 2020, as well as sample counts on the Newell Highway at Finely and Tocumwal from 2010 and 2011; and
- Transport for NSW *Newell Highway Corridor Strategy*, which details traffic volumes and heavy vehicle proportions on sections of the Newell Highway (including the section from Tocumwal to Finley).

A summary of the data from these sources is provided in Table 2-2 below.

Table 2-2: Midblock traffic data – Newell Highway

Location	Daily Traffic Volume Veh/d
Tocumwal to Finley (Corridor Strategy 2011) Northbound Southbound	2,891 N/A N/A
30m South of McNamara St, Finley (Sample Counter 2011) Northbound Southbound	2,576 1,295 1,281
300m East of Showground Rd, Jerilderie (Permanent Counter 2011) Northbound Southbound	1,752 876 876
300m East of Showground Rd, Jerilderie (Permanent Counter 2019*) Northbound Southbound	2,053 1,036 1,017

** 2020 data not used due to impact of COVID-19 pandemic on traffic levels*

The key points to note from this data include:

- Traffic volumes decrease along the Newell Highway the further north the site is, while traffic volumes are higher in urban areas than in rural areas (as noted in the TfNSW *Newell Highway Corridor Strategy* for southern parts of the highway);
- Analysis of the traffic volume at the permanent counter near Jerilderie shows that traffic volumes grew by 17.2% over the eight years between 2011 and 2019, which equates to an average growth rate of approximately 2.0% per annum. It is likely that traffic volumes on the Newell Highway at Broughans Road would grow at a similar rate;
- Analysis of the traffic volume at the permanent counter near Jerilderie shows that the peak hour represents approximately 8% of the total daily traffic volume, which is within the range of 8-12% that is typical for most roads; and
- Heavy vehicles represent a significant proportion of traffic on the Newell Highway – the sites detailed in Table 2-2 had heavy vehicle proportions between 25-40%, with rates being higher in rural areas than in urban ones.

Based on this data and analysis, a summary of the midblock data for key roads in the vicinity of the site in 2020 is provided in Table 2-3 below.

Table 2-3: Midblock traffic data - 2020

Location	Daily	AM Peak	PM Peak
	Veh/d	Veh/h	Veh/h
Canalla Road (North of Broughans Rd)	7	1	1
Broughans Road (West of Newell Hwy)	155	15	16
Newell Highway (North of Broughans Rd)	3,079	246*	246*

** AM and PM peak hour on Newell Highway assumed to be 8% of daily total, in line with observations of Newell Highway permanent count site near Jerilderie*

No turning movement data has been collected as part of this assessment. However the data from Table 2-3 shows that traffic volumes on Canalla Road and Broughans Road are relatively low, and in turn, the turning movements at the intersections of Canalla Road/Broughans Road and Broughans Road/Newell Highway would also be relatively low (likely to be in the range of 1-10 vehicles per hour in any one direction).

2.6 Parking Supply and Demand

No vehicles were observed parked on-street on the Newell Highway, Broughans Road or Canalla Road in the vicinity of the site during data collection and site inspections. This is as expected for rural areas, where vehicles are typically parked off-street.

2.7 Public Transport

There are no broad public transport services such as town buses within Finley. School buses operate, and community transport services provide free or subsidised services for eligible community members.

Buses provide regional public transport from Wollamai Street, Finley, to locations such as Echuca, Wagga Wagga and Albury, from where rail services may be accessed (providing access to more distant destinations such as Sydney and Melbourne).

2.8 Pedestrians and Cyclists

There are no dedicated cyclist or pedestrian facilities in the vicinity of the site, which is common in rural areas.

3 PROPOSED DEVELOPMENT

The proposed development is a solar facility capable of collecting solar energy and converting it into electricity to be fed into the local electricity network.

The proposed development consists of the following components:

- Access to the site via an upgraded property access driveway from Broughans Road (approximately 1.9km west of the Newell Highway), with alternative access (for emergency purposes only) available from Canalla Road (approximately 500m north of Broughans Road) and Broughans Road (approximately 2.9km west of the Newell Highway);
- 16,500 solar photovoltaic (PV) panels with a total capacity of 7MW, covering approximately 15 hectares of the site, mounted in arrays on frames capable of adjusting in order to track the sun and maximise solar energy collection efficiency;
- Cabling from PV panels to inverters and transformers, with a connection into the local electricity network;
- Perimeter fencing and internal access road network; and
- Ancillary facilities including sheds, parking, staff amenities and water tanks.

Plans of the proposed development are included below.

NOTES

Finley SOLAR PROJECT
Region: Victoria.
Country: Australia.
Altitude: 108 m.a.s.l.
Suitable Area: 16 ha.
Perimeter fence: 1,984 m.

Peak Power: 7.42995MWdc.
Rated Power: 4.95MWac.
Ratio DC/AC: 1.50.
Structure: Single-axis N-S Tracker.
PV Module: 450Wp, Mono-c Si.

Power Station: MV Power station 4950.
Pitch distance: 6.0m.
Modules per string: 19.

PV Modules: 16,511.
Inverters: 2xSMA SC2475.
Power Stations: 1.

LEGEND

REV	DESCRIPTION	BY	DATE

FOR INFORMATION ONLY

BISON ENERGY PTY LTD

CLIENT:

BISON ENERGY 博时金科

PROJECT:

FINLEY SOLAR PROJECT

DRAWING:

Single Line Diagram

SCALE:	SHEET:
Not to scale	1 OF 1
REVISION:	DATE:
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4 IMPACT OF PROPOSED DEVELOPMENT

4.1 Traffic Generation and Impact

4.1.1 Traffic Generation During Construction

It is anticipated that construction of the proposed development will take six months from site establishment to completion of works, with works being undertaken between Monday to Saturday. During this period, traffic volumes will vary depending on the scale and type of work being undertaken, however peak traffic volumes are anticipated to be:

- Light vehicles – eight vehicles per day, primarily for construction workers who will typically arrive in the morning (four vehicles inbound) and depart in the afternoon (four vehicles outbound); and
- Medium and heavy vehicles – eight vehicles per day, primarily for delivery of plant and equipment associated with the solar facility (eg. Photovoltaic panels and frame materials), but also including some construction workers who will arrive by bus. These vehicles will generally arrive throughout the day (four vehicles inbound plus four vehicles outbound).

It is anticipated that construction activities at the site will generate the following additional traffic:

- 16 vehicles per day, a maximum of six days per week, resulting in 96 vehicles per week;
- Five vehicles per hour in the morning peak period (four light plus one heavy), travelling inbound to the site; and
- Five vehicles per hour in the afternoon peak period (four light plus one heavy), travelling outbound from the site.

Construction traffic will generally travel between Finley and the site via the Newell Highway and Broughans Road. This should be managed through the development and implementation of a Construction Traffic Management Plan (CTMP). The CTMP should be written in accordance with the requirements of *Australian Standard AS1742.3 Manual of Uniform Traffic Control Devices – Traffic Control for Works on Roads* and the *RMS (TfNSW) Traffic Control at Work Sites – Technical Manual*.

It is anticipated that deliveries will occur using vehicles up to and including 19m semi-trailers. Some deliveries of specialised or heavy equipment may require larger vehicles, which should be managed in accordance with the CTMP.

4.1.2 Traffic Generation During Operation

The principal traffic generated during operation of the site would be movement of staff in light vehicles to and from the site. Vehicles will generally travel between Finley and the site via the Newell Highway and Broughans Road. There may also be occasional large vehicles delivering parts, plant or equipment, however these will be much less frequent.

No more than two staff would typically be present on-site for activities such as monitoring, inspection and maintenance of plant and equipment. Assuming both staff members travel in one vehicle, it is anticipated that operational activities will generate the following additional traffic:

- Two vehicles per day, a maximum of seven days per week, resulting in 14 vehicles per week;
- One vehicle per hour in the morning peak period, travelling inbound to the site; and
- One vehicle per hour in the afternoon peak period, travelling outbound from the site.

As with construction, it is anticipated that deliveries will occur using vehicles up to and including 19m semi-trailers. Some deliveries of specialised or heavy equipment may require larger vehicles, however all deliveries are expected to be infrequent, and should be managed using appropriate traffic management planning.

4.1.3 Traffic Impact and Management

Based on the traffic generation detailed in Section 4.1.1 for construction, and Section 4.1.2 for operation, a summary of the midblock data for key roads in the vicinity of the site is provided in Table 4-1 (for construction), and Table 4-2 (for operation), below.

Table 4-1: Midblock traffic data – With proposed development (Construction)

Location	Daily	AM Peak	PM Peak
	Veh/d	Veh/h	Veh/h
Canalla Road (North of Broughans Rd)			
Existing	7	1	1
With proposed development	7	1	1
Change	+0.0%	+0.0%	+0.0%
Broughans Road (West of Newell Hwy)			
Existing	155	15	16
With proposed development	171	20	21
Change	+10.3%	+33/0%	+31.3%
Newell Highway (North of Broughans Rd)			
Existing	3,079	246	246
With proposed development	3,095	251	251
Change	+0.5%	+2.0%	+2.0%

Table 4-2: Midblock traffic data – With proposed development (Operation)

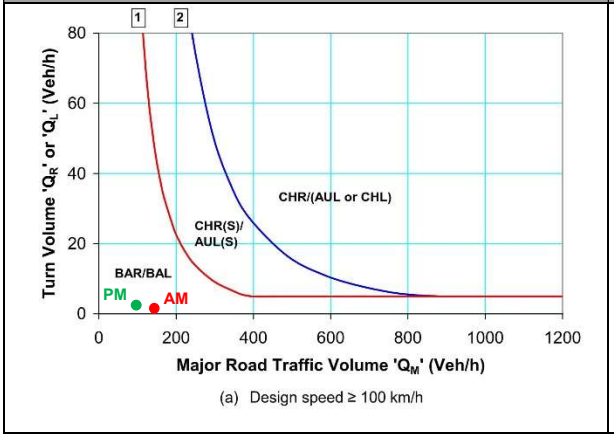
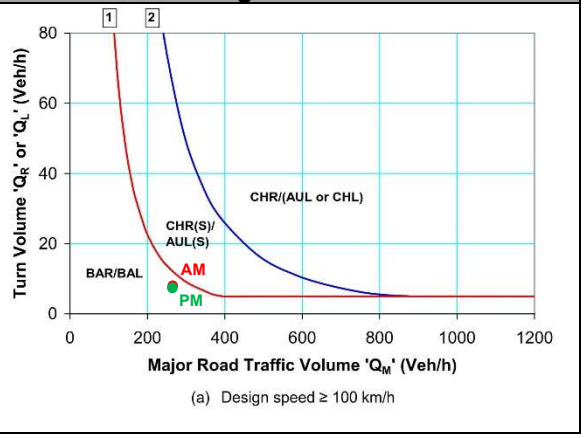
Location	Daily	AM Peak	PM Peak
	Veh/d	Veh/h	Veh/h
Canalla Road (North of Broughans Rd)			
Existing	7	1	1
With proposed development	7	1	1
Change	+0.0%	+0.0%	+0.0%
Broughans Road (West of Newell Hwy)			
Existing	155	15	16
With proposed development	157	16	17
Change	+1.3%	+6.7%	+6.3%
Newell Highway (North of Broughans Rd)			
Existing	3,079	246	246
With proposed development	3,081	247	247
Change	+0.1%	+0.4%	+0.4%

Table 4-1 and Table 4-2 demonstrates that the additional traffic generated during operation of the proposed development will have a negligible impact on key roads in the vicinity of the site. Canalla Road is not expected to be impacted during construction or operation (except in case of emergency). The increase in volumes on Broughans Road will still see the road carry less than the 200 vehicles per day desirable maximum listed in Table 3.6 of the Berrigan Shire Council *Transport Asset Management Plan 2014* for this class of road.

The impact on the Newell Highway is even lower, being less than 2% in both AM and PM peak periods, and across the day, during both construction and operation.

An assessment has also been carried out to determine whether the volume of traffic generated by the proposed development is able to be adequately catered for at the intersection of the Newell Highway and Broughans Road. This has been carried out in accordance with the procedure outlined in Appendix A.8 of the *Austroads Guide to Road Design Part 4: Intersections and Crossings – General*, using the anticipated traffic generated by the proposed development and some assumptions regarding turning movements at the intersection. These movements can then be used to determine the major road and left/right turning volumes (Q_M, Q_L/Q_R, respectively), which can then be plotted onto Figure A 10 from the *Austroads Guide to Road Design Part 4* to determine what turning lanes are warranted at the intersection. This is shown in Table 4-3, below.

Table 4-3: Major road and turning volumes – with proposed development

Left Turn	Right Turn
	

This shows that the following auxiliary lane treatments are warranted at the intersection of the Newell Highway and Broughans Road:

- A Rural BAR (Basic Right Turn) treatment for southbound traffic on the Newell Highway turning right into Broughans Road; and
- A Rural BAL (Basic Left Turn) treatment for northbound traffic on the Newell Highway turning left into Broughans Road.

As noted in Section 2.4.4, above, the existing intersection has both BAR and BAL auxiliary lanes at present, and so no further upgrades are warranted.

As vehicles travel further throughout the network, traffic generated by the proposed development becomes more dispersed, and hence has a lower net impact on other roads. Hence if the impact on roads and intersections in the vicinity of the site is within acceptable limits, then beyond these roads the impact will be even lower.

It is concluded that there will be no significant impact on roads in the vicinity of the site or further afield during the operation of the proposed development, and that impacts from construction can be appropriately managed through the development and implementation of an appropriate CTMP.

4.2 Site Access

Primary access into the site is proposed to be from Broughans Road, approximately 1.9km west of the Newell Highway. Access into the property exists already at this point, via a farm gate located west of an existing irrigation canal crossing (as shown in Figure 4-1, below).

Figure 4-1: Looking north at the proposed main site access from Broughans Road

Sight distance along Broughans Road is excellent in both directions, exceeding the minimum SISD of 248m for a vehicle travelling at 100km/h under the *Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections* (Table 3.2). The access should be upgraded to comply with the requirements of Berrigan Shire Council's *Engineering Guidelines for Subdivisions and Development Part 2: Roads (2014)* – Section 3.11 details the requirements for vehicular access to rural properties, which includes:

- The driveway access is to be all weather sealed construction from the edge of the existing road to the property boundary; and
- Install 375mm diameter pipe culvert in the table drain with a minimum length of 4.88m and trafficable end walls.

The primary access driveway provides a connection to an internal road network that links to the solar arrays, inverters and on-site facilities. This is proposed to be a gravel road, capable of catering for vehicles up to and including 19m semi-trailers. This internal road network will allow all vehicles to enter and exit the site in a forward direction.

Should the primary site access be unusable (for example, in an emergency), alternative access to the site is available via internal tracks that link to existing farm gates in two other locations:

- Canalla Road (approximately 500m north of Broughans Road); and
- Broughans Road (approximately 2.9km west of the Newell Highway).

It is concluded that appropriate site access is available to facilitate safe forward entry to and exit from the site, under conditions of construction, operation and in an emergency.

4.3 Parking Requirements and Impact

The proposed development involves construction on approximately 15 hectares of a total site area of 204 hectares. There is therefore ample room to designate areas for parking of light vehicles for staff, as well as areas for heavy vehicle manoeuvring, including set-down and pick-up of materials, plant and equipment. These areas should be designated under the CTMP.

In general on-site parking requirements during regular operation of the site will be limited to staff parking (typically one or two vehicles), as well as servicing and delivery of materials. Staff will be able to park near the office/amenities buildings, or in locations near to where they will be working (for example, near the solar arrays) without obstructing other vehicles. Service and delivery vehicles will be able to do likewise.

It is concluded that the proposed development provides adequate off-street parking spaces and manoeuvring areas to meet the anticipated demand, without any adverse effect on the surrounding road network.

4.4 Pedestrian and Cyclist Impact

It is not proposed to make any change to pedestrian or cyclist infrastructure in the vicinity of the site. Therefore it is not anticipated that there would be any significant impact on pedestrians or cyclists as a result of the proposed development.

5 CONCLUSIONS AND RECOMMENDATIONS

It is concluded that:

- Traffic volume data and assessment of key roads and intersections in the vicinity of the site (including Canalla Road, Broughans Road and the Newell Highway as well as their intersections) shows that they currently operate with low volumes of traffic and good levels of service;
- The proposed development will generate traffic of five vehicle trips per hour in the peak hour and 16 vehicles per day during construction, as well as one vehicle trip per hour and two vehicles per day during operation, which will not have a significant impact on the performance of the surrounding road network (midblock or intersection);
- Adequate provision has been made for entry and exit to the site for vehicles up to and including a 19m semi-trailer, with all vehicles able to enter and exit the site in a forward direction;
- Space is available off-street for vehicles to travel through the site in a forward direction, and to park safely clear of through traffic;
- Adequate provision has been made for staff, servicing and delivery vehicles; and
- There is no significant impact of the proposed development on pedestrians and cyclists.

It is recommended that:

- Construction traffic should be managed through the development and implementation of a Construction Traffic Management Plan (CTMP) written in accordance with the requirements of *Australian Standard AS1742.3 Manual of Uniform Traffic Control Devices – Traffic Control for Works on Roads* and the *RMS (TfNSW) Traffic Control at Work Sites – Technical Manual*; and
- The primary access into the site from Broughans Road (approximately 1.9km west of the Newell Highway) be upgraded to comply with the requirements of Berrigan Shire Council's *Engineering Guidelines for Subdivisions and Development Part 2: Roads (2014)*.