

Traffic Impact Assessment Report

Yarranlea Solar

within
Toowoomba Regional Council

for

YARRANLEA SOLAR PTY LTD



Project 15-282



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1. Introduction

icubed was commissioned by Yarranlea Solar Pty Ltd to undertake a traffic impact assessment to be included with a development application to Toowoomba Regional Council for a proposed Solar Photovoltaic (PV) Facility located at the intersection of the Yarranlea Road and Yarranlea-Murlaggan Road, Yarranlea. The Solar PV Facility is to be built by Yarranlea Solar Pty Ltd.

This report details the results of this assessment, including an evaluation of:

- Existing conditions;
- The proposed access arrangements; and
- The impact of the proposed development on the surrounding road network.

Will be completed in four (4) stages. Below is a brief synopsis of development that will occur on site.

1.1 Limits of Report

The above tasks have been carried out based on information supplied by other members of the project team, together with observations on site. These are detailed in the report.

While icubed has taken care in the preparation of this report, it neither accepts liability nor responsibility whatsoever in respect of;

- Any use of this report by any third party; and
- Any third party whose interests may be affected by any decision made regarding the contents of this report.

2. Existing Conditions

2.1 Site Location

The subject site is located at intersection of the Yarranlea Road and Yarranlea-Murlaggan Road, Yarranlea, and is described as Lot 3347 on CP A341649, Lot 2 on RP18249, Lot 2 on RP7475 and a 150Ha Portion of Lot 2 on CP A34925. It has frontages to both the Yarranlea Road and Yarranlea-Murlaggan Road as shown in Figure 3.1.

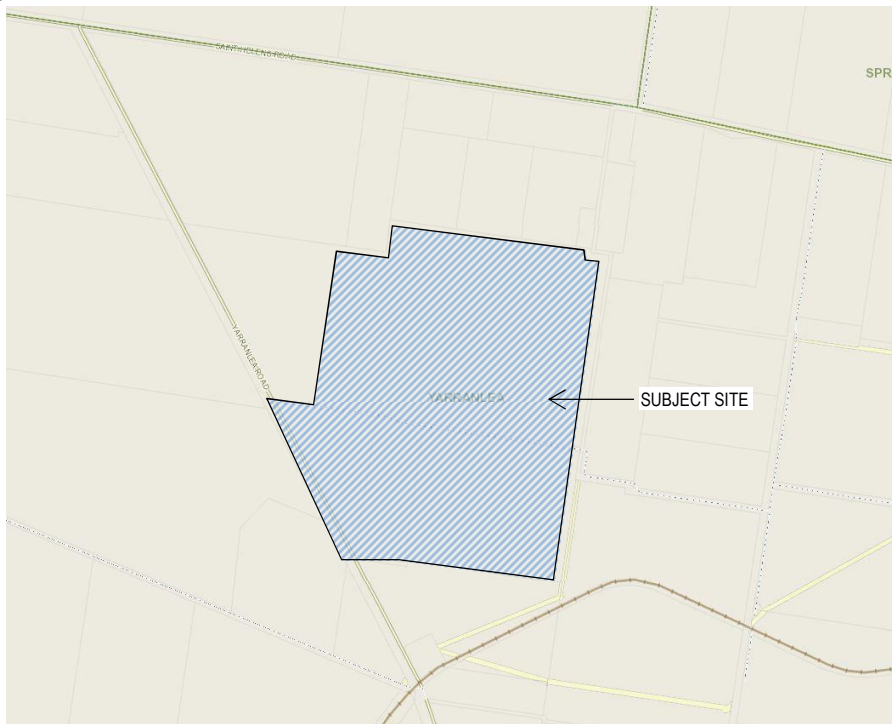


Figure 1 - Locality Plan
Source: NearMap, 2016

2.2 Local Road Network

Yarranlea Road and Yarranlea-Murlaggan Road are under the control of the Toowoomba Regional Council (TRC) and are currently a Local Road in the TRC Road Hierarchy. It is a two-way road with a speed limit of 100kph in the vicinity of the site. On site measurements noted that the maximum sealed width of Yarranlea Road adjacent to the site is approximately 3.2m. Yarranlea-Murlaggan Road is not sealed and used not frequently used.

Yarranlea Road within the vicinity of the site is illustrated in Figure 2.1.



Figure 2.1 Yarranlea Road

Yarranlea-Murlaggan Road within the vicinity of the site is illustrated in Figure 2.2.



Figure 2.2 Yarranlea-Murlaggan Road

The intersection of Yarranlea Road and Yarranlea-Murlaggan Road within the vicinity of the site is illustrated in Figure 2.3.



Figure 2.3 Yarranlea Road and Yarranlea-Murlaggan Road Intersection

2.3 Existing Access

There are some existing building improvements on Lot 2 on CP A34925, which are accessed from Yarranlea-Murlaggan Road. The site more generally is unfenced and used for agricultural cropping activities and as such there is informal access to all road frontages at this time.

The intersection of Yarranlea-Murlaggan Road and the existing building improvements within the vicinity of the site is illustrated in Figure 2.4.



Figure 2.4 Yarranlea Road and Yarranlea-Murlaggan Road Intersection

2.4 Existing Use

The site is currently utilised for agricultural cropping activities and 0.65km South of the existing Ergon Energy Yarranlea Electrical Substation. The frontage of the site extends approximately 0.93 km along Yarranlea Road and is bisected by Yarranlea-Murlaggan Road for a length of 1.66km. The Development areas Comprises approximately 250 Ha. There are a number of building improvements located along Yarranlea-Murlaggan Road, which would be removed as part of Stage 4 of the PV Solar Projects. It is required that these be replaced with a new Agricultural Equipment Storage Building, accessed off Yarranlea-Murlaggan Road, nearer to it's intersection with Yarranlea Road.

3. Proposed Development

3.1 Description of Proposed Development

The proposed development is an 100MW Solar PV Facility, which is intended to be built in up to four stages, the first providing 40MW of capacity, and the balance providing 20MW of capacity, per stage. It is anticipated that construction will begin on the first stage in late 2017. While the exact timing for construction is uncertain at this stage, it is anticipated that the entire project will be completed by 2020. The main operational centre for the PV Solar Project will be located in the South-Western Corner of the site and will be subject to daily traffic as part of the ongoing operations and Maintenance of the facility. Stages two to four are located on the Northern side of Yarranlea-Murlaggan Road and will be accessed with less frequency on an as needs basis for maintenance only. Access for the ongoing agricultural activities will also be maintained from Yarranlea-Murlaggan Road.

The proposed site layout is attached in Appendix A.

3.2 Proposed Access Arrangements

Access to the operations and Maintenance facility for the project shall be from a new Rural Intersection with Yarranlea Road, which will be sealed. Access to the relocated Agricultural Storage Building and Stages two to four shall be from Yarranlea-Murlaggan Road.

3.3 Parking and Internal Layout

There will be sufficient areas set aside for parking during the construction stages of this project to accommodate the anticipated number of employee vehicles (65, based on the maximum employee numbers during the overlap between Site Preparation and PV System Installation phases) and other construction vehicles.

The ultimate site layout will consist of a network of internal access tracks, which will be designed to safely and efficiently allow for the circulation of maintenance vehicles.

The Operations and Maintenance facility will be provided with 4 carparking spaces for the two full time staff likely to be employed at the facility.

4. Traffic Impact Assessment

4.1 Trip Generation – Operational Phase

The completed facility shall employ two full time staff on site to conduct routine maintenance on the installation. There are very few visitors to the site required and as such the impact of operations traffic is considered to be negligible with no more than 6 trips per day being generated by the facility.

4.2 Trip Generation – Construction Phase

The trip generation characteristics of the proposed development are anticipated to be significantly different during the construction phases of the project. The majority of the traffic impact of the development will occur during the construction phase, when a significant number of workers and trucks access the site.

The number of trips generated during the construction phase of the Solar PV Facility was estimated using traffic volumes provided by Yarranlea Solar (the project proponent) for the first 40MW construction stage. The trip generation for the subsequent stages was assumed to be similar to that for the first stage, although the period of construction is expected to be proportionally shorter. There are expected to be two distinct phases of construction:

- Stage 1: Site preparation and Pile Installation – 18 weeks (30 weeks for 40MW stage);
- Stage 2: PV system installation and Substation – 15 weeks (26 weeks for 40MW stage); and

In calculating the peak hour trip generation during construction of the Solar PV Facility, a number of assumptions were made. These include:

- 90% of employees are expected to arrive during the morning peak hour, and depart during the evening peak hour;
- 30% of employees are expected to car pool;
- Heavy equipment is expected to be delivered to site at the beginning of construction phases and removed at the end, and will not be transported to/from the site every day; and
- Gravel and concrete truck arrivals/departures are expected to be evenly distributed throughout the day.

The estimated number of trips generated during each stage of construction is summarised in Table 4.2, with more detailed calculations provided in Appendix B.

Stage	Morning Peak (veh/hr)	Afternoon Peak (veh/hr)
1	119	119
2	60	60
3	60	60
4	60	60

Table 5.2 Peak hour trip generation during construction

It is noted that there is a period of overlap between construction phases and the critical period for traffic generation is in the weeks when Phases 1 and 2 overlap. These have been provided in table 4.2. Typically, the peak vehicle movements are half of those outlined in table 4.2

Based on the estimates of worker numbers, it is expected that 44% of the inbound vehicles in the morning peak hour and outbound vehicles entering peak hour will be light vehicles. The remainder of the vehicles are expected to be heavy vehicles (trucks), including:

- Flatbed trucks;
- Water trucks;
- Module delivery trucks;
- Tracker delivery trucks; and
- Other equipment delivery trucks and/or heavy equipment mobilising to the site at the beginning and end of each construction phase.

The local community are serviced by a School bus run on the Yarranlea Road which collects children for their education in Pittsworth. To ensure the least impact to this activity the proponents would propose a heavy vehicle ban along this road during the regular hours of operation of the School Bus run.

4.3 Traffic Distribution

It is anticipated that all site traffic will be travelling to/from the south towards the Gore Highway. Workers are expected to originate from, or be based at Toowoomba or Pittsworth, and equipment is expected to be transported from Toowoomba or Brisbane. There may be some limited travel from Oakey and areas North of the site, which would use the Pittsworth Oakey Road and Saint Hellens Road to access the site. The number of these movement is unlikely to be high.

4.4 Intersection Assessment

Due to the very low through traffic using Yarranlea Road a detailed intersection analysis has not been undertaken. It is considered that the upgraded site access proposed as part of the development proposal will adequately cater for construction phase traffic, especially considering increased awareness of through appropriate signage which would be implemented as part of the construction phase Traffic Management plan.

5. Access and Servicing

5.1 Existing Access

Access to the operations and Maintenance facility for the project shall be from a new Rural Intersection with Yarranlea Road, which will be sealed. Access to the relocated Agricultural Storage Building and Stages two to four shall be from Yarranlea-Murlaggan Road.

On site measurements noted that the maximum sealed width of Yarranlea Road adjacent to the site is approximately 3.2m, which is insufficient for two vehicles to pass. Vehicle travelling in opposite directions must utilise the unsealed shoulder while passing which is considered acceptable during the construction phase due to the low traffic volumes using this road and consideration that the majority of construction traffic will be travelling in the same direction. It is recommended that the construction phase TMP implement appropriate signage and controls to create an appropriate level of awareness of increased vehicle movements in the area.

5.2 Design Vehicles

The requirements for access to the development are expected to vary between the construction and operational phases of the project.

During the construction phase, vehicles arriving on site will be a combination of workers in light vehicles and delivery and construction in heavy vehicles. It is expected that the design vehicle during the construction phase will be a 19m Articulated Vehicle (AV).

During the operational phase of the project, there are only expected to be occasional visits for inspection, security, maintenance and system monitoring by staff in light vehicles. The largest vehicles expected to travel to/from the site during the operational phase are panel washing vehicles, which are expected to be Medium Rigid Vehicles (MRVs) of 8.8m length or smaller.

5.3 Proposed Upgrades and Control Measures

It is recommended that the following upgrades and measures be implemented as a condition of approval for this project;

Stage 1

- Construct New Sealed Access to site including local widening of Yarranlea Road to 6.0m as indicated on Drawing 15-282-A04, (provided in Appendix A).
- Conduct Pre and Post Construction Visual Dilapidation Survey and report on Yarranlea Road from the Gore Highway to the intersection of Yarranlea-Murlaggan Road.
- Develop and implement a Traffic Management Plan with appropriate controls and signage for Yarranlea Road from the Gore Highway to the intersection of Yarranlea-Murlaggan Road.
- Implement a School Bus Management plan. This shall require avoidance of heavy vehicles on Yarranlea Road during the morning and afternoon school bus operational times.

Stages 2 to 4

- Conduct Pre and Post Construction Visual Dilapidation Survey and report on Yarranlea Road from the Gore Highway to the intersection of Yarranlea-Murlaggan Road.
- Undertake a patrol grade and rolling of Yarranlea-Murlaggan Road from the intersection of Yarranlea Road and the Stage 2 Access Point.
- Develop and implement a Traffic Management Plan with appropriate controls and signage for Yarranlea Road from the Gore Highway to the intersection of Yarranlea-Murlaggan Road.



- Implement a School Bus Management plan. This shall require avoidance of heavy vehicles on Yarranlea Road during the morning and afternoon school bus operational times.

It is considered that these measures will be appropriate to mitigate the long and short traffic impacts of this development proposal.

6. Conclusion

This report represents the traffic analysis of the proposed 100MW Solar PV Facility located at the intersection of the Yarranlea Road and Yarranlea-Murlaggan Road, Yarranlea. The facility is proposed to be constructed in up to four stages, the first 40MW of generating capacity, and the remaining providing 20MW each of generating capacity. Construction for the first phase is expected to be commenced in 2017, with the project to be completed by 2020.

Analysis of the traffic impact of the facility considered two phases of the project, construction and operation. Based on information provided regarding the activities on site during the operational phase of the project, it was found that there would be negligible traffic generated by the site during that phase. The critical phase of the project with traffic respect to traffic generation is the construction phase, in particular, the 40MW stage of construction. The maximum traffic generation was found to be during the overlap between site preparation and PV system installation.

The key intersection affected by the development during construction is the main site access off Yarranlea Road. It is proposed that this intersection be upgraded to a sealed standard to ensure safe passage of vehicles into the site during construction and operational phases.

Further construction phase controls are recommended as outlined in Section 6.3 of this report.



Appendix A – Site Plans





Appendix B – Trip Generation Calculations

Phase 1 - Site Preparation & Piling				Morning Peak Hour					Evening Peak Hour				
Description	Vehicle Type	Daily Two-way Vehicle Trips	Proportion of Trips in Each Peak	% In	Trips In	% Out	Trips Out	Total Trips	% In	Trips In	% Out	Trips Out	Total Trips
Workers	Passenger	42	90%	100%	38	0%	0	38	0%	0	100%	38	38
Water Truck	HRV	4	100%	50%	2	50%	2	4	50%	2	50%	2	4
Flatbed Truck	HRV	2	100%	100%	2	0%	0	2	0%	0	100%	2	2
Module Delivery	AV	4	100%	90%	4	10%	1	5	10%	1	90%	4	5
Lifter Delivery	AV	2	100%	90%	2	10%	1	3	10%	1	90%	2	3
Foundation Pile Delivery	AV	4	100%	90%	4	10%	1	5	10%	1	90%	4	5
Gravel Truck	HRV	30	0%	50%	0	50%	0	0	50%	0	50%	0	0
Total		94			52		5	57		5		52	57
% Light Vehicles								67%					67%

Notes:

1. 30% of Workers are Assumed to Carpool
2. Average Labour Force has been Considered
3. Gravel deliveries will be spread across the working day
4. Major Construction plant for earthworks and access will be delivered at the start of the project and remain on site for the construction phase..





Phase 2 - System Installation & Substation				Morning Peak Hour					Evening Peak Hour				
Description	Vehicle Type	Daily Two-way Vehicle Trips	Proportion of Trips in Each Peak	% In	Trips In	% Out	Trips Out	Total Trips	% In	Trips In	% Out	Trips Out	Total Trips
Workers	Passenger	30	90%	100%	27	0%	0	27	0%	0	100%	27	27
Water Truck	HRV	4	100%	50%	2	50%	2	4	50%	2	50%	2	4
Flatbed Truck	HRV	25	90%	100%	23	0%	0	23	0%	0	100%	23	23
Module Delivery	AV	4	100%	90%	4	10%	1	5	10%	1	90%	4	5
Tracker Delivery	AV	2	100%	90%	2	10%	1	3	10%	1	90%	2	3
Concrete Truck	HRV	8	0%	50%	0	50%	0	0	50%	0	50%	0	0
Total		73			58		4	62		4		58	62
% Light Vehicles								44%					44%

Notes:

1. 30% of Workers are Assumed to Carpool
2. Average Labour Force has been Considerd
3. Concrete deliveries will be spread across the working day
4. Major Construction plant for lifting and access will be delivered at the start of the project and remain on site for the construction phase..

Trip Generation Summary

Phase	Morning Peal	Afternoon Peak
1	57	57
1 & 2 Overlap	119	119
2	62	62

Stage 2, 3 and 4 Trip generation will be half of that assessed for Stage 1