
APPENDIX K
TRAFFIC IMPACT ASSESSMENT

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Report Prepared for
LMS Energy Pty Ltd

11 March 2022

Proposed Solar Energy Facility

290-304 Yan Yean Road & 193-213
Heard Avenue, Plenty

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traffic:impact

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Version	Date	Issue	Prepared By	Checked By
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Appendix A Development Plans

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1 Introduction:

1.1 Introduction

Ratio Consultants was commissioned by LMS Energy Pty Ltd (the permit applicant) to assess the traffic and parking implications of the proposed solar energy facility at 290-304 Yan Yean Road & 193-213 Heard Avenue in Plenty.

The proposed development involves the construction and operation of a solar energy facility on the site. The facility will provide up to 1.2MW of electricity per annum. The site will be accessed using the existing access point from Yan Yean Road and the internal driveway.

A designated car parking area with four on-site car parking spaces and turnaround area are also to be provided at the end of the existing driveway.

For reference, a copy of the development plans are provided in Appendix A of this report.

This report has been prepared to respond to Item 5 of the Request for Information (RFI) from the Department of Environment, Land, Water and Planning (DELWP), dated 23/11/2021.

Specifically, Item 5 requests:

“5. A traffic impact assessment, to assess the potential impact of the proposed facility (during construction and operation) on the surrounding road network.”

1.2 Purpose & Structure of this Report

This report sets out an assessment of the anticipated parking, traffic and transport implications of the proposed development, including consideration of the:

1. Existing traffic conditions surrounding the site.
2. Parking demand likely to be generated by the proposed development.
3. Suitability of the proposed parking in terms of supply and layout.
4. Traffic generation characteristics of the proposed development.
5. Proposed access arrangements for the site.
6. Transport impact of the development proposal on the surrounding road network.

1.3 References

In preparing this report, reference has been made to the following:

- Plans for the proposed development prepared by LMS Energy, Drawing No. 30032-GA-111, Rev B, dated 24/8/21.
- Nillumbik Planning Scheme.
- Australian/New Zealand Standard, Parking Facilities Part 1: Off-Street Car Parking (AS2890.1:2004).
- Australian Standard, Parking Facilities Part 2: Off-Street Commercial Vehicle Facilities (AS2890.1:2002).
- Australian/New Zealand Standard, Parking Facilities Part 6: Off-Street Parking for People with Disabilities (AS/NZS 2890.6:2009).

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- 'Further Information Request' letter from the Department of Environment, Land, Water & Planning (DELWP), dated 23/11/21.
- A desktop inspection of the subject site and its surrounds.
- Other documents as nominated.

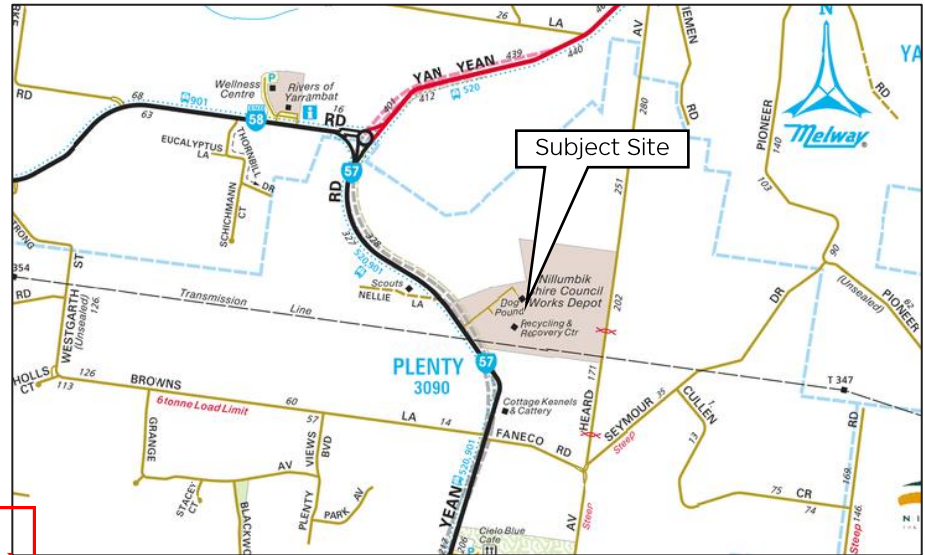
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2.1 Location and Environment

The subject site is located on the northern side of Yan Yean Road and the western side of Heard Avenue in Plenty. The site's location relative to the surrounding road network is shown in Figure 2.1.

Figure 2.1: Site Location



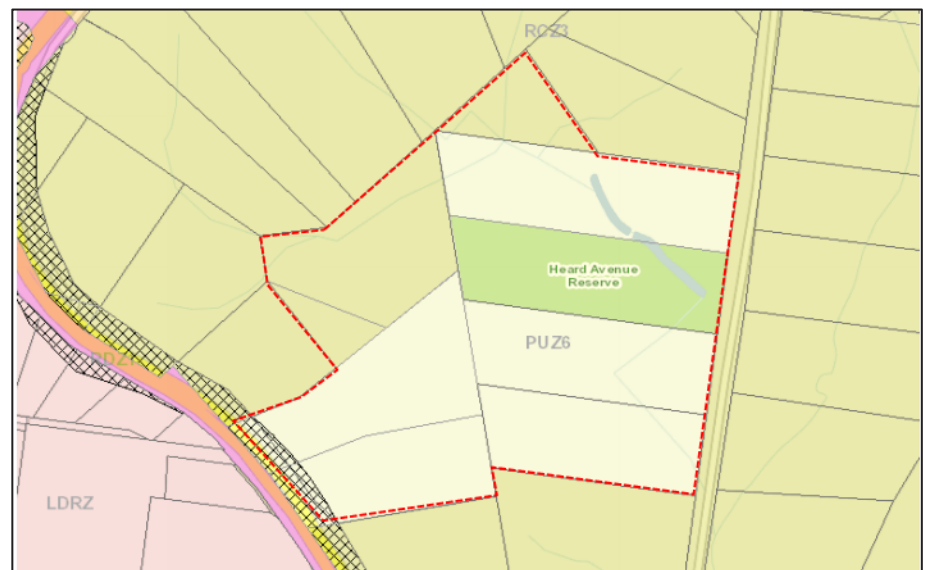
Source: Melways

The site consists of two separate land titles owned by the Nillumbik Shire Council and covers 18.7Ha of total site area. The subject site is irregular in shape with primary frontage to Yan Yean Road and secondary frontage to Heard Avenue to the east.

The subject site is currently occupied by Nillumbik Council waste depot and recycling depot operations centre. The predominant land uses in the area include agricultural, rural living and conservation.

The site is located within a Public Use Zone – Local Government (PUZ6) and Rural Conservation Zone (RCZ3). Figure 2.2 shows the location of the site and the Nillumbik Planning Scheme Zones.

Figure 2.2: Planning Scheme Zones



Source: Planning Maps Online

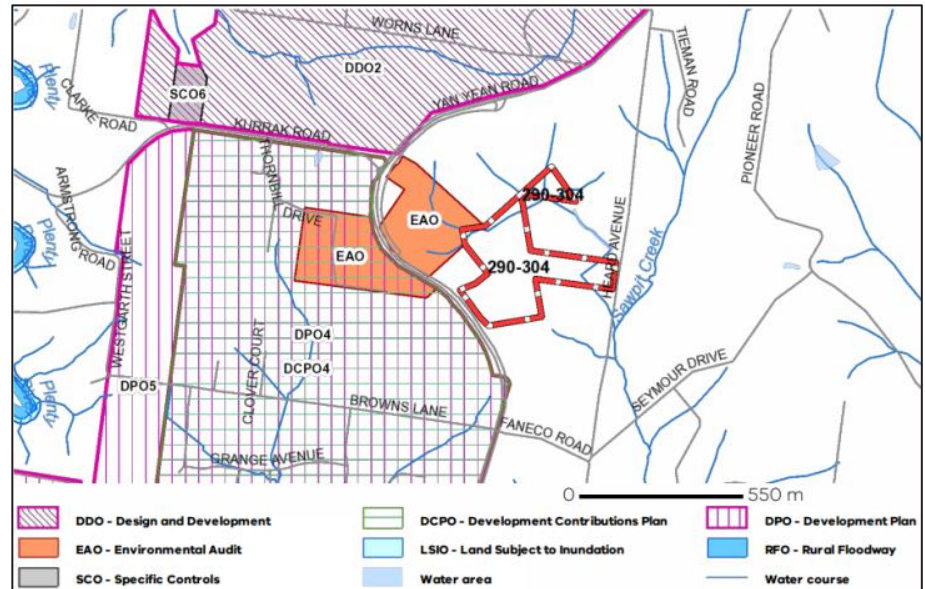
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The subject site is subject to a Bushfire Management Overlay (BMO) and Environmental Significance Overlay (ESO1).

Figure 2.3 shows the location of the site and the Nillumbik Planning Scheme Zones.

Figure 2.3: Surrounding Planning Overlays



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Figure 2.4 shows an aerial view of the site and its immediate surrounds.

Figure 2.4: Aerial View of the Site and Surrounds



Source: www.nearmap.com

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2.2 Road Network

Frontage Roads

Yan Yean Road functions as an arterial road (under DoT jurisdiction) that runs in a northwest-southeast direction along the western frontage of the site.

In the vicinity of the subject site, it has a typical carriageway width of approximately 20 metres, accommodating two lanes in each direction separated by a central median.

Yan Yean Road operates at a posted speed of 70km/hr. A sealed footpath is provided on the western side of the road with a shared path provided on the eastern side.

A typical view of Yan Yean Road in the vicinity of the site is shown in Figure 2.5 and Figure 2.6.

Figure 2.5: Yan Yean Road, looking north



Figure 2.6: Yan Yean Road, looking south



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Heard Avenue functions as a local Council Road that runs in a north-south direction along the eastern frontage of the site.

In the vicinity of the subject site, it has a typical carriageway width of approximately 5.8 metres, accommodating one lane in each direction.

Heard Avenue operates at a default speed of 50km/hr. Footpaths are not provided on either side of the road.

A typical view of Heard Avenue in the vicinity of the site is shown in Figure 2.7 and Figure 2.8.

Figure 2.7: Heard Avenue, looking north



Figure 2.8: Heard Avenue, looking south



Site Access Intersection – Yan Yean Road

The site access is currently signalised to Yan Yean Road, as per Figure 2.9.

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Figure 2.9: Site Access Intersection/Yan Yean Road



As shown, left turn slip lanes and right turn lanes are provided to maximise traffic capacity at the intersection, along with pedestrian crossing points and zebra crossings over the slip lanes.

2.3 Sustainable Transport

Public Transport

The site has convenient access to a range of public transport facilities with the following services provided within close proximity to the site:

Table 2.1: Public Transport Services - Bus

Route No.	Route Description	Nearest Stop	Walking Distance	Service Frequency
385	Whittlesea - Greensborough	Yan Yean Road	Site Frontage	30 minutes
901	Frankston - Melbourne Airport			30 minutes

Source: ptv.vic.gov.au

It should be noted that the Route #385 and #901 bus services listed above utilise a bus stop along the western site frontage of the site to Yan Yean Road.

For reference, the existing bus stop is shown in Figure 2.10.

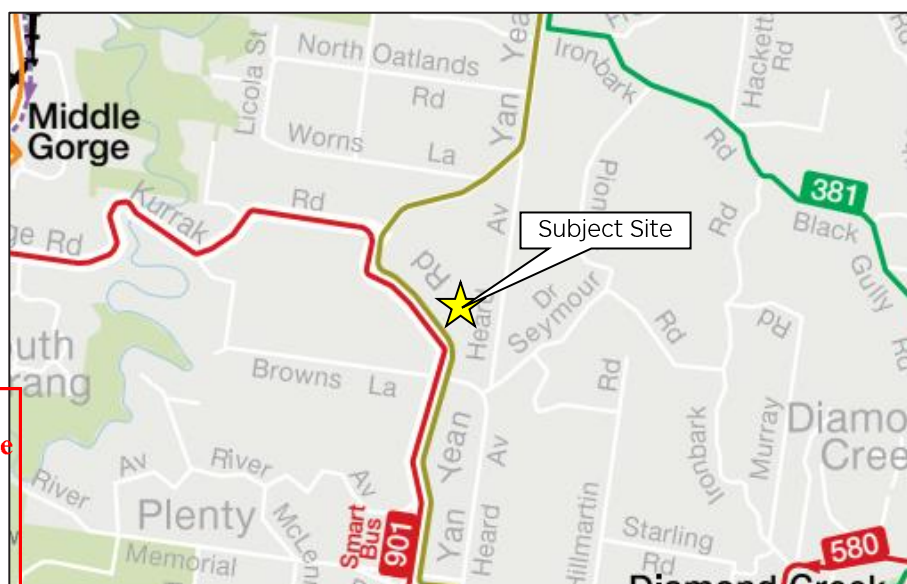
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Figure 2.10: Existing Bus Stop



Figure 2.11: Public Transport Map



Source: ptv.vic.gov.au

Bicycle Network

The site also has reasonable access to bicycle facilities, including a shared path along Yan Yean Road.

2.4 Crash Analysis

A review has been conducted of VicRoads ‘Crashstats’ database for the five-year period of available data for any reported casualty crashes.

This database records all accidents causing injury that have occurred in Victoria since 1987 (as recorded by Victorian Police) and categorises these accidents as follows:

- *Fatal injury: at least one person was killed in the accident or died within 30 days as a result of the accident.*
- *Serious injury: at least one person as sent to Hospital as a result of the accident.*

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- *Other injury: at least one person required medical treatment as a result of the accident.*

A summary of the accidents in the vicinity of the subject site for the last five-year period is presented in the below table.

Table 2.2: Summary of Crashes in the vicinity of the Subject Site (previous 5-year period)

Location	Accident No.		
	Fatality	Serious Injury	Other Injury
<i>Site Frontages</i>			
Yan Yean Road	0	0	0
Heard Avenue	0	0	0
<i>Nearby Intersections</i>			
Yan Yean Road / Site Access intersection	0	0	0
Total	0	0	0

Table 2.2 indicates that over the last available five-year period, there were no crashes recorded within the immediate vicinity of the subject site.

Critically, only no crashes were reported along the site frontage or at the site intersection to Yan Yean Road.

A review of the crash history data indicates that no fatalities have been reported and there does not appear to be any crash trends that should warrant an unconventional site access strategy.

Given the road classifications and associated traffic volumes, it is considered that the road network is operating in a relatively safe manner.

2.5 Traffic Data

In order to determine the current traffic conditions in the vicinity of the subject site, Ratio Consultants sourced traffic volume data for the Yan Yean Road / Ironbark Road signalised intersection on Thursday 4 November 2021.

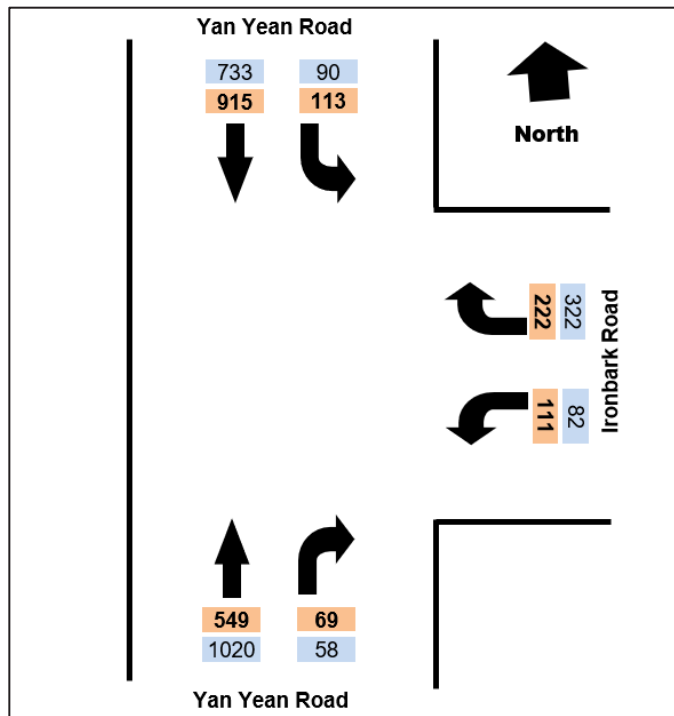
The Yan Yean Road / Ironbark Road signalised intersection is approximately 2km northeast of the subject site. This is the nearest intersection that has available SCATS data, and as such, is considered to be suitable to understand existing through traffic volumes along Yan Yean Road.

The road peak hours were found to be 8:00-9:00am and 3:30-4:30pm and are summarised in Figure 2.12.

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Figure 2.12: SCATS Peak Hour Traffic Volumes



The results of the SCATS reveal that Yan Yean Road, in proximity of the subject site:

- The AM peak hour occurred at 8:00am-9:00am, when 1,644 traffic movements were recorded, comprising 618 northbound movements and 1,026 southbound movements.
- The PM peak hour occurred at 3:30pm-4:30pm, when 1,644 traffic movements were recorded, comprising 1,078 northbound movements and 815 southbound movements.

Based on the above and applying a peak-to-daily ratio of 8% for arterial roads, Yan Yean Road carries approximately 23,000 vehicles per day along the site frontage.

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3 The Proposal:

3.1 General

It is proposed to develop the land at 290-304 Yan Yean Road & 193-213 Heard Avenue in Plenty for the use of a solar energy facility on the site.

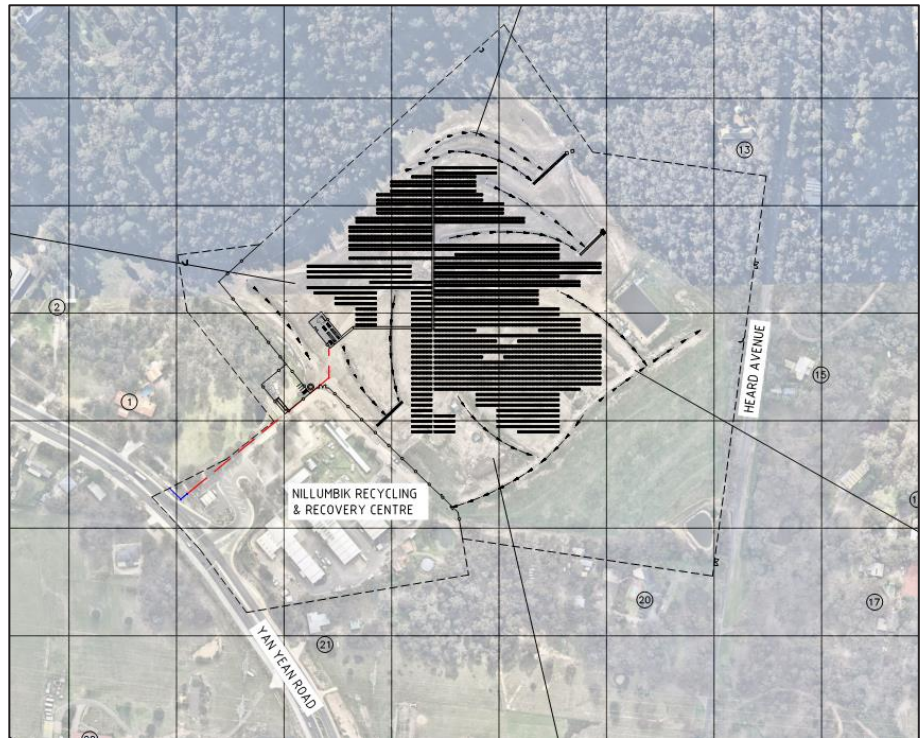
The site will be an unmanned facility and will operate independently from the existing recycling facility on-site. The number of vehicles and personnel accessing the site is anticipated to be limited to irregular inspections and maintenance staff, as and when required.

The site will be accessed using the existing access point from Yan Yean Road and the internal driveway.

A designated car parking area with four on-site car parking spaces and turnaround area are also to be provided at the end of the existing driveway.

The proposed site layout excerpt is shown in Figure 3.1, with full site plan provided in Appendix A of this report.

Figure 3.1: Proposed Site Layout



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4.1 Planning Scheme Assessment

Parking requirements for a range of uses are set out under Clause 52.06 of the Nillumbik Planning Scheme. Table 1 of Clause 52.06 sets out the car parking requirement that applies to a use listed in the Table.

Of relevance, Clause 52.06-5 states that:

A car parking requirement in Table 1 is calculated by multiplying the figure in Column A or Column B (which ever applies) by the measure in Column C.

Column A applies unless Column B applies.

Column B applies if:

- *Any part of the land is identified as being within the Principal Public Transport Network Area as shown on the Principal Public Transport Network Area Maps (State Government of Victoria, 2018); or*
- *A schedule to the Parking Overlay or another provision of the Planning Scheme specifies that Column B applies.*

Additionally, the car parking requirement specified for a use listed in Table 1 does not apply if:

- *A car parking requirement for the use is specified under another provision of the Planning Scheme: or*
- *A schedule to the Parking Overlay specifies the number of car parking spaces required for the use.*

The subject site is not located within the PPTN area and is not subject to a car parking overlay. In this regard, the Column A rates outlined in Table 1 of Clause 52.06-5 applies.

Accordingly, the statutory car parking requirements for the proposed development have been assessed against these rates and are summarised at Table 4.1.

Table 4.1: Clause 52.06 Planning Scheme Requirement

Use	Rate	Number	Requirement*
Renewable Energy Facility	To the satisfaction of the Responsible Authority		
Total			0 spaces

**Rounded down to the nearest whole number in accordance with Clause 52.06-5*

A 'Renewable Energy Facility' is not specifically listed under Clause 52.06-5.

Therefore, parking for the Renewable Energy Facility must be provided to the satisfaction of the Responsible Authority, as per Clause 52.06-5.

4.2 Car Parking Demand Assessment

Post Development Conditions

Following construction of the subject site, the Renewable Energy Facility is proposed to operate as an unmanned facility as the equipment is automated and monitored remotely.

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Based on advice from the operator, the Renewable Energy Facility is capable of operating with minimal and irregular staffing. As such it is anticipated that the requirement for on-site staff will be limited to maintenance and site inspections typically undertaken using purpose-built vehicles and equipment.

It is understood that during maintenance and site inspections, personnel will drive directly to the point of work with the four designated on-site parking spaces only to be utilised for periodical site visitors who need to park at the entrance and walk to the facility.

In the unlikely scenario where, multiple contractors are on-site at the same time and require parking at the entrance the four designated car parking spaces are anticipated to accommodate the demand.

Overall, based on the above discussions, the proposed car parking provision of four on-site spaces is considered to be satisfactory.

Temporary Construction Period

Based on information provided to our office, the construction period will require various contractors and machinery to be located on-site to install the associated facility structures and equipment.

Temporary and informal car parking adjacent to the point of work will be provided during this temporary period, meaning there is no demand of designated car parking spaces.

The site of the proposed facility is readily accessible and is a large, cleared area with sufficient space for informal temporary parking. The Environmental Management Plan (EMP) that was submitted with the application, addresses traffic and parking management during this period, to ensure the potential impacts are identified and managed in accordance with the relevant requirements.

4.3 DDA Car Parking

In addition to the statutory car parking requirements in the Planning Scheme, the Building Code of Australia (BCA) outlines the requirements for the provision of car parking for people with disabilities.

The proposed land use does not generate a requirement for a DDA space.

Therefore, the on-site provision of zero spaces for people with a disability meets the BCA requirement and is considered appropriate.

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5 Access and Car Parking Layout:

5.1 Clause 52.06 Design Standard Assessment

An assessment against the relevant design standards of Clause 52.06-9 of the Nillumbik Planning Scheme is provided below.

Design Standard 1 – Accessways

Design Standard 1 of Clause 52.06-9 relates to the design of accessways. The requirements of Design Standard 1 are assessed against the proposal in Table 5.1.

Table 5.1: Design Standard 1 Assessment

Requirement	Comments
Must be at least 3m wide.	<u>Satisfied</u> – Accessways have been designed with a width in excess of 3.0 metres.
Have an internal radius of at least 4m at changes of direction or intersection or be at least 4.2m wide.	<u>Satisfied</u> – The accessway and internal layout have been designed to be at least 4.2 metres wide at all changes of direction.
Allow vehicles parked in the last space of a dead-end accessway in public car parks to exit in a forward direction with one manoeuvre.	<u>Satisfied</u> – All vehicles parked in the end spaces can exit in a forward direction in one manoeuvre.
Provide at least 2.1m headroom beneath overhead obstructions, calculated for a vehicle with a wheelbase of 2.8m.	<u>Satisfied</u> – A minimum headroom clearance of at least 2.1 metres is provided throughout the site.
If the accessway serves four or more car spaces or connects to a road in a Road Zone, the accessway must be designed so that cars can exit the site in a forward direction.	<u>Satisfied</u> – The accessways have been designed so that cars can exit the site in a forward direction.
Provide a passing area at the entrance at least 6.1m wide and 7m long if the accessway serves ten or more car parking spaces and is either more than 50m long or connects to a road in a Road Zone.	<u>Satisfied</u> – Accessways at the entrance of the site has been designed to enable for simultaneous two-way vehicle movements to/from the site and accordingly complies with the requirement to provide a passing area.
Have a corner splay or area at least 50% clear of visual obstructions extending at least 2m along the frontage road from the edge of an exit lane and 2.5m along the exit lane from the frontage, to provide a clear view of pedestrians on the footpath of the frontage road. The area clear of visual obstructions may include an adjacent entry or exit lane where more than one lane is provided, or adjacent landscaped areas, provided the landscaping in those areas is less than 900mm in height.	<u>Satisfied</u> - Pedestrian sight triangles are provided on the vehicle exit point onto Yan Yean Road, in accordance with the requirements of the Nillumbik Planning Scheme.

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If an accessway to four or more car parking spaces is from land in a Road Zone, the access to the car spaces must be at least 6m from the road carriageway.	<u>N/A</u> – Access to the car spaces is not from a Road Zone.
If entry to the car space is from a road, the width of the accessway may include the road.	<u>N/A</u> - Entry to the car spaces is not accessed directly from a road.

Design Standard 2 - Car Parking Spaces

Design Standard 2 of Clause 52.06-9 relates to the design of car parking spaces. The requirements of Design Standard 2 are assessed against the proposal in Table 5.2.

Table 5.2: Design Standard 2 Assessment - Car Parking Spaces

Requirement	Comments
Car parking spaces and accessways must have the minimum dimensions as outlined in Table 2 of Design Standard 2.	<u>Satisfied</u> – All car parking spaces meet the dimensional requirements set out in Table 2 of Design Standard 2. Standard car parking spaces are 2.6 meters wide, 4.9 meters long and are accessed via an aisle in excess of 6.4-metre, in excess of the minimum standards.
A wall, fence, column, tree, tree guard or any other structure that abuts a car space must not encroach into the area marked 'clearance required' on Diagram 1 of Design Standard 2, other than: — A column, tree or tree guard, which may project into a space if it is within the area marked 'tree or column permitted' on Diagram 1. — A structure, which may project into the space if it is at least 2.1m above the space.	<u>Satisfied</u> – The car parking spaces have been designed to accord with Diagram 1 of Design Standard 2.
Car spaces in garages must be at least 6m long and 3.5m wide for a single space and 5.5m wide for a double space measured inside the garage.	<u>N/A</u> – No garage car parking spaces are proposed.
Where parking spaces are provided in tandem (one space behind the other) an additional 500mm in length must be provided between each space.	<u>N/A</u> – No tandem car parking spaces are proposed.
Where two or more car parking spaces are provided for a dwelling, at least one space must be under cover.	<u>N/A</u> – No dwellings are proposed as part of the development.

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Disabled car parking spaces must be designed in accordance with Australian Standard AS2890.6-2009 (disabled) and the Building Code of Australia. Disabled car parking spaces may encroach into an accessway width specified in Table 2 of Design Standard 2 by 500mm.

N/A – No accessible car parking spaces are proposed.

5.2 Summary

The assessment indicates that the access arrangements and car parking layouts have been designed appropriately and in general accordance with the requirements of the Nillumbik Planning Scheme and/or AS/NZS 2890.1:2004.

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6 Bicycle Parking:

6.1 Clause 52.34 – Bicycle Facilities

Clause 52.34 of the Nillumbik Planning Scheme seeks to encourage cycling as a mode of travel through the provision of appropriate bicycle parking and associated facilities.

Table 1 under Clause 52.34-5 of the Nillumbik Planning Scheme does not contain a land use category that aligns with the proposed land use.

As such, bicycle parking is not statutorily required under this Clause.

The provision of zero bicycle parking spaces therefore meets the bicycle parking requirements of the Nillumbik Planning Scheme and is therefore considered satisfactory having regard to the development type and location.

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7 Loading Arrangements:

7.1 Statutory Requirement

Clause 65.01 'Decision Guidelines' of the Nillumbik Planning Scheme outlines the provision of loading requirements, and states the following:

"Before deciding on an application or approval of a plan, the responsible authority must consider, as appropriate:

- *The adequacy of loading and unloading facilities and any associated amenity, traffic flow and road safety impacts."*

7.2 Loading and Waste Arrangements

Loading and unloading activities associated with the proposed development are anticipated to be limited.

Following construction, loading activities associated with the development are anticipated to be undertaken by service vehicles. It is anticipated that these can occur appropriately within a car space.

As the site will be an unmanned facility, waste activities associated with the proposed development are also considered to be limited.

Based on the above, the waste collection and loading arrangements are considered to be acceptable.

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8.1 Traffic Generation

Traffic generation from the site will be limited to the turnover of the four car parking spaces provided on-site for maintenance and site inspections.

On the basis of a conservative assessment on the high side that estimates that each car space will generate a vehicle movement during peak hour periods, the development would generate up to four (4) traffic movements in the AM and PM peak hours. This equates to one vehicle movement approximately every 15 minutes in both the AM and PM peak hour periods.

This is considered to be a conservative assessment, as the Renewable Energy Facility is proposed to operate as an unmanned facility as the equipment is typically automated and monitored remotely.

8.2 Traffic Impact

Post Development Conditions

Based on the preceding assessment, the proposed development is estimated to generate in the order of four vehicle movements during the AM peak period and PM peak period.

The additional four vehicle movements expected during peak hours represent an average additional traffic movement each 15 minutes during the business periods, with reduced volumes at all other times.

The abovementioned trips will be arriving/departing the site via the access from Yan Yean Road. This level of traffic will be imperceptible in the context of the existing function of Yan Yean Road. As such, it is expected that development traffic can readily be accommodated in a safe and effective manner given the provision of signalised access point to Yan Yean Road to facilitate traffic movements.

Having regard to the above analysis and discussion, against the existing traffic volumes in the vicinity of the site, the additional traffic generated by the proposed development could not be expected to compromise the safety and function of the surrounding road network.

Temporary Construction Period

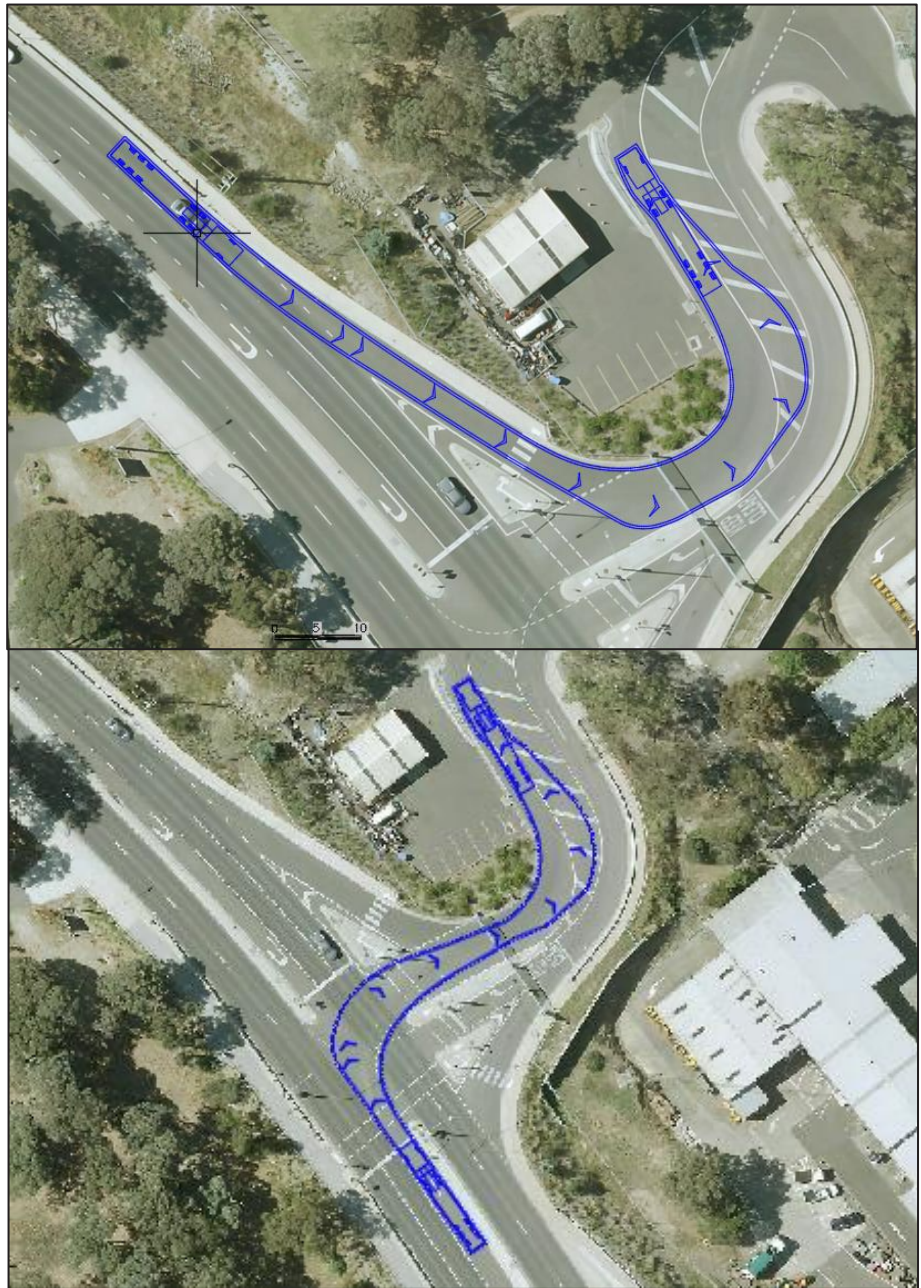
As per typical temporary construction periods, it is expected that there will be sporadic construction vehicles entering and exiting the site to install the associated facility structures and equipment.

The ability for construction vehicles to enter and exit the site has been tested via a swept path assessment as shown in Figure 8.1 and Figure 8.2.

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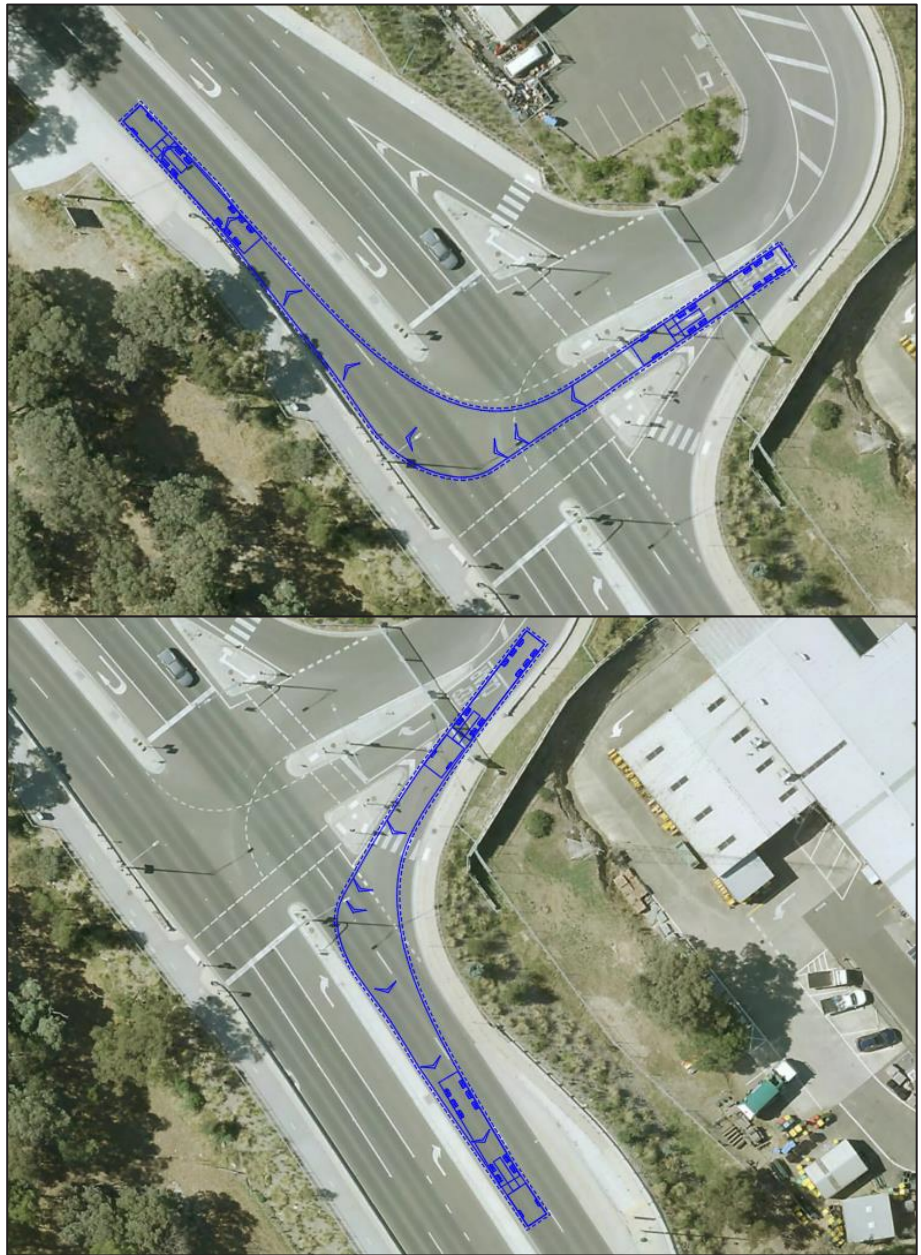
Figure 8.1: Assessment of Entering Trucks



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Figure 8.2: Assessment of Exiting Trucks



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As shown above it is evident that the existing signalised intersection to Yan Yan Road can adequately cater for the construction vehicles that will temporarily require access to the site during this period.

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9 Conclusion:

Based on the analysis and discussions presented within this report, the following conclusions are made:

- The proposed development does align with any land uses listed in Table 1 of Clause 52.06.
- A first principles assessment demonstrates that the four car parking spaces can accommodate the parking demands associated with the Renewable Energy Facility.
- The proposed parking layout and site access arrangements are consistent with the dimensional requirements set out in the Nillumbik Planning Scheme and/or Australian/New Zealand Standards for Off Street Car Parking (AS/NZS2890.1:2004 and AS/NZS2890.6:2009).
- No on-site bicycle parking is statutorily required by the proposed development. The provision of zero bicycle parking spaces therefore meets the bicycle parking requirements of the Nillumbik Planning Scheme and is therefore considered satisfactory.
- The proposed waste/loading arrangements are considered acceptable from a traffic perspective.
- Against the existing traffic volumes on Yan Yean Road, the estimated site generated vehicle movements through the access point cannot be expected to adversely compromise the performance of the surrounding road network. Indeed, the additional four vehicle movements expected during the peak hours represent an average additional traffic movement each 15 minutes during the busiest operating times, with reduced volumes at all other times.

Overall, the proposed development is not expected to create adverse traffic or parking impacts in the precinct.

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