

# Appendix I

## Traffic Impact Assessment

# Goorambat East Solar Farm

Traffic Impact Assessment

## Goorambat East Solar Farm

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## 1.0 Introduction

AECOM Australia Pty Ltd (AECOM) have been commissioned by Neoen Australia Pty Ltd (the Client) to produce a Traffic Impact Assessment (TIA) to support a planning permit application for the use and development of a renewable energy facility.

It is proposed to develop a photovoltaic solar farm, including associated infrastructure and signage on part of the land described in Section 3.0. The project is referred to as the Goorambat East Solar Farm (the Project).

### 1.1 Scope

The Project is located approximately 12 kilometres north of Benalla within the Goorambat locality (the site). This TIA will assess the operational capability of the local road network to facilitate the additional traffic associated with the construction of the Project.

### 1.2 Consultation

A pre-application telephone meeting was held on Monday 15 July 2019 with VicRoads to discuss the Project, discuss access points and the potential impact of the development in the North East Region on regional roads (Regional Roads Victoria Reference # 03603/18). Participants from VicRoads, Neoen and Benalla Rural City Council were present.

### 1.3 Report structure

Following this introduction this TIA is structured as follows:

- Chapter 2.0: Provide details of the existing road and transport conditions near the site.
- Chapter 3.0: Outlines the development proposal.
- Chapter 4.0: Outlines the vehicle access proposals and potential traffic impacts on the local road network.
- Chapter 5.0: Identifies the required mitigation measures to safely facilitate the movements of vehicles to and from the development site.
- Chapter 6.0: Concludes the TIA report.

### 1.4 References

The following reports and/or parties have been referenced or consulted in the preparation of this TIA report:

- Victoria Government Gazette – *Road Management Act 2004*, Code of Practice, Worksite Safety, Traffic Management 2010.
- *Road Management Act 2004*.
- VicRoads – General Guidance.
- VicRoads Heavy Vehicle Network Maps in Victoria.
- National Heavy Vehicle Regulator (NHVR) website / journey planner.
- Benalla Rural City Road Management Plan.

## 2.0 Existing conditions

### 2.1 Site location

The site is located approximately 12 kilometres north of Benalla, Victoria and approximately 500 metres to the south of the Goorambat Township (refer Figure 1 below). The site is generally bound by Goorambat-Thoona Road / Saunders Road to the north west, Hooper Road to the north east, Spinks Lane and Peck Road to the south east and Benalla-Tocumwal Road to the south west. The site is traversed by Goorambat-Chesney Road and a railway track that runs north west to south east, as well as Spinks Lane that runs south west to north east and an existing power transmission line that runs generally east to west through the site.

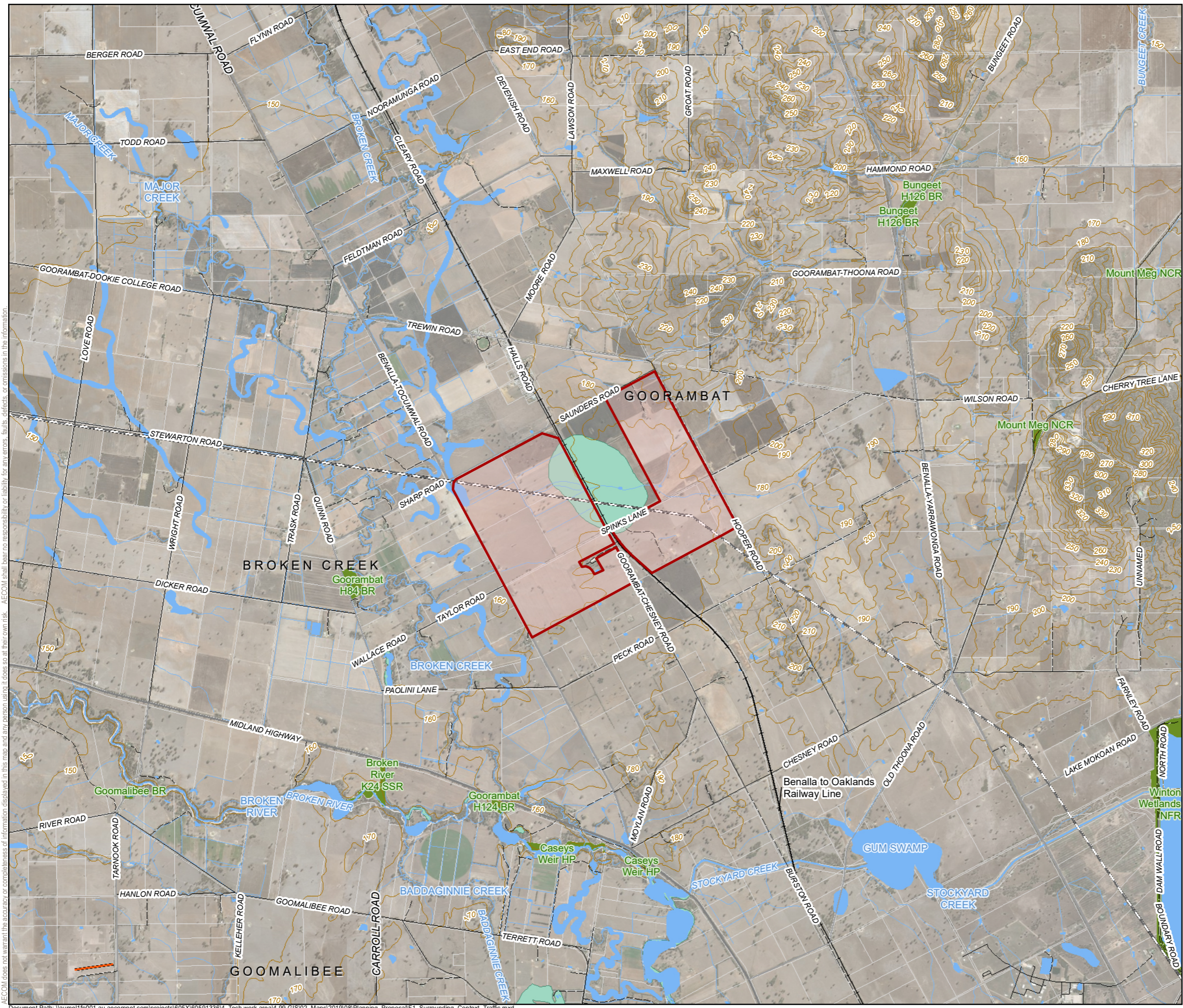
The local road network around the site investigation area is shown in Figure 2 (below).

An indicative design for the project is shown in Appendix A. This indicative design shows the road network in the immediate vicinity of the project, as well as the proposed site access points discussed in this report.



**Legend**

- Site Investigation Area
- Existing 220kV Overhead Transmission Line
- Airstrip
- Highway
- Arterial
- Sub-Arterial
- Local
- 2WD
- 4WD
- Railway
- Contours
- Watercourses
- Cadastre
- Parks & Reserves
- Wetlands
- Waterbodies



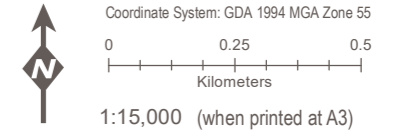
Data Sources:  
 Locality, Railway, Drainage Line, Streets, Features © VICMAP - 2018  
 Disclaimer:  
 Victoria State Government - Environment, Land, Water and Planning © (VICMAP) 2018  
 Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

**Goorambat East Solar Farm**  
**SURROUNDING CONTEXT**

PROJECT #:	60591336	<b>Figure 1</b>
CREATED BY:	JB	
LAST MODIFIED:	brierej; 16/08/2019	
VERSION:	1	

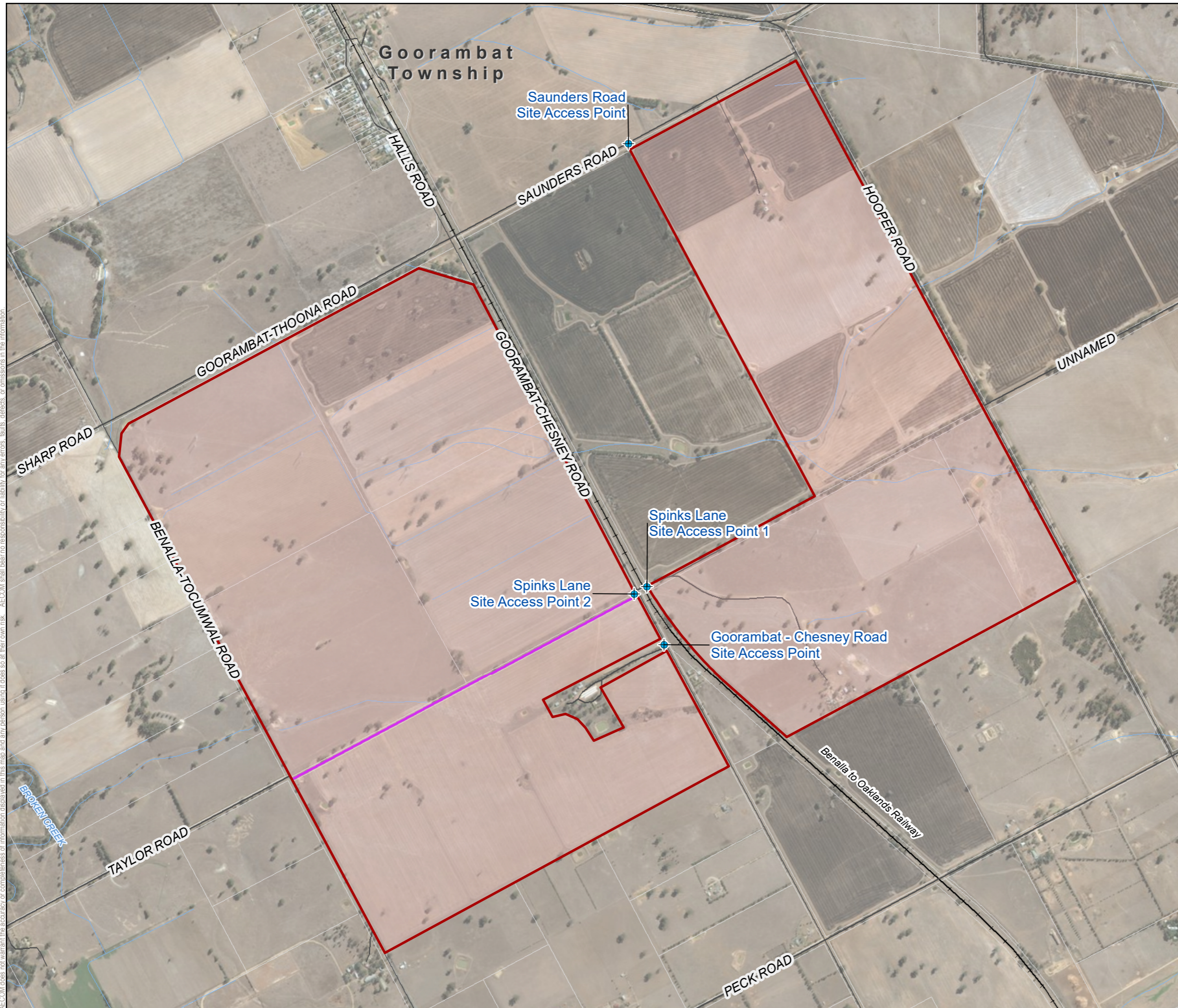
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**Legend**

- ▭ Site Investigation Area
- ◆ Indicative Site Access
- Unused Government Road
- Roads
- Railway
- Watercourses
- Cadastre



Data Sources:  
Locality, Railway, Drainage Line, Streets, Features © VICMAP - 2018

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Victoria State Government - Environment, Land, Water and Planning © (VICMAP) 2018  
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**Goorambat East Solar Farm**

**LOCAL ROAD NETWORK**

PROJECT #:	60591336	<b>Figure 2</b>
CREATED BY:	JB	
LAST MODIFIED:	brierej; 16/08/2019	
VERSION:	1	

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## 2.2 Local Road Network

### 2.2.1 Goorambat-Chesney Road

Goorambat-Chesney Road is a rural road managed by the Benalla Rural City Council that bisects the site generally in a north-south direction (refer Appendix A). A site access point to the Project is proposed to be located on Goorambat-Chesney Road south of Spinks Lane (refer **Appendix A** and Section 4.1.1).

The road permits two-way travel and is 3.1 metres wide. The road is sealed with unsealed shoulders that are approximately 0.5 to one metre wide and currently provides access mainly to farming land.

Goorambat-Chesney Road has no posted speed limit, therefore rural road speeds of 100 kilometres per hour (km/h) typically apply. The road is overall in good condition, however there are no line markings or signage provided along the length of the road (refer Figure 3).



**Figure 3 Goorambat-Chesney – looking northwest bound**

Source: AECOM – photo taken on Tuesday 21 May 2019

### 2.2.2 Saunders Road

Saunders Road is a rural, gravel road which currently provides access to farming land (see Figure 4). The site will be accessed via Saunders Road to the east of the Goorambat-Chesney Road / Saunders Road intersection (refer **Appendix A** and Section 4.1.3).

Saunders Road is a two-way single lane road of approximately four metres wide with unsealed shoulders along the length of the road, reclaimed by grass and gravel. There is no drainage in the road corridor.



**Figure 4 Saunders Road - looking east bound**

Source: AECOM – photo taken on Tuesday 21 May 2019

### **2.2.3 Spinks Lane**

Spinks Lane (refer Figure 5) is a rural road which provides access to farming land. This two-way road has a varying width of approximately four to five metres. Spinks Lane will be used to access the project (see Appendix A and Section 4.1.2).

Spinks Lane runs through the middle of the solar farm generally in an east-west direction. There is no signage and no constrained sight distances.



**Figure 5 Spinks Lane- looking west bound**

Source: AECOM – photo taken on Tuesday 21 May 2019



#### 2.2.4 Peck Road

Peck Road (refer Figure 6) is a rural road located south of the solar farm. This gravel road is crossed by a level-crossing with no active controls (boom gates). The rail line is used intermittently for freight.



Figure 6 Peck Road intersecting with rail level crossing

Source: AECOM – photo taken on Tuesday 21 May 2019

#### 2.2.5 Benalla-Tocumwal Road

Benalla-Tocumwal Road (refer Figure 7) is an arterial road managed by VicRoads. The road is approximately five metres wide with little or no shoulder provided.

Benalla-Tocumwal Road is a B-Double approved road which connects to the Midland Highway. The road forms the western boundary of the site and generally runs in a north-south direction.



Figure 7 Benalla-Tocumwal Road - looking northeast bound

Source: AECOM – photo taken on Tuesday 21 May 2019

### 2.2.6 Goorambat-Chesney Road and Spinks Lane priority intersection

Goorambat-Chesney Road forms a priority intersection with Spinks Lane (refer Figure 8).

Traffic travelling to the site accesses on Spinks Lane (refer **Appendix A**) will turn either left or right and therefore use this intersection. This intersection allows for a sufficient turning radius due to the presence of gravel shoulders. The flat terrain and geometry of Goorambat-Chesney Road means favourable sight distances for vehicles exiting the intersection. In addition, traffic volumes for these roads were viewed to be low, reducing potential traffic conflicts and safety issues.

It should be noted that a railway crossing is in the immediate vicinity of this intersection (approximately 10 metres into Spinks Lane, west of the intersection). As shown in Figure 9, the level-crossing has passive protection only (i.e. no boom gates provided).



Figure 8 Goorambat-Chesney Road and Spinks Lane priority intersection

Source: AECOM – photo taken on Tuesday 21 May 2019

### 2.2.7 Goorambat-Thoona Road, Saunders Road, Halls Road and Goorambat-Chesney Road crossroad priority intersection

Goorambat-Thoona Road, Saunders Road, Halls Road and Goorambat-Chesney Road form a crossroad priority intersection. A rail corridor runs north-south parallel to Goorambat-Chesney Road. A left slip is provided on the north-west corner of the intersection that directs traffic from Goorambat-Thoona Road to Halls Road.

Construction vehicles approaching the site along Goorambat-Thoona Road or Goorambat-Chesney Road will need to cross the rail corridor to access Saunders Road. The rail crossing is only controlled by passive protection (i.e. no boom gates present).

## 2.3 Level-crossings

The site is intersected by the Oaklands Railway Line which runs from Benalla (VIC) to Oaklands (NSW). This line is owned and operated by the Australian Rail Track Corporation (ARTC) and was upgraded in 2009 from broad gauge to standard gauge. This is now a freight only railway line which usually carries seasonal wheat harvest traffic.

Spinks Lane intersects with the rail line approximately 10 to 15 metres from its priority crossroad with Goorambat-Chesney Road. As shown in Figure 9, the level-crossing has passive protection only (i.e. no boom gates provided).

As the use of this line is seasonal, and dependent on harvest yields, volumes vary. In addition, there are two level-crossings located along the potential construction traffic access routes to the site.

- Cowslip Street in Violet Town (refer Figure 10)
- Midland Highway in the town of Benalla (refer Figure 11).

Both are at-grade level-crossings which provide adequate sight distances and active controls (roadside warning equipment with boom, flashing lights and audible warning devices), ensuring that these are suitable for construction traffic movements.



**Figure 9 Level-crossing on Spinks Lane**

Source: AECOM – photo taken on Tuesday 21 May 2019



**Figure 10 Active protection level-crossing intersecting with Nunn Street in Violet Town**

Source: AECOM – photo taken on Tuesday 21 May 2019





**Figure 11 Active protection level crossing on Midland Highway in Benalla**

Source: AECOM – photo taken on Tuesday 21 May 2019

## **2.4 Other transport modes**

### **2.4.1 Pedestrians and cyclists**

No shared pedestrian and cyclist paths are provided along roads anticipated to be used by the construction traffic in the direct vicinity of the site.

During the site visit, no pedestrians or cyclists were observed on any of these roads.

There are shared pedestrian and cyclist paths provided along roads in more urban areas nearby, such as Benalla and Violet Town. Roads in these towns may be used by traffic generated by the Project.

### **2.4.2 Public transport**

Two bus routes run through Benalla:

- Benalla West Bus Service runs through Benalla along Mansfield Street and Bridge Street.
- Benalla East Bus Service runs along Nunn Street and Maginess Street (which turns into the Midland Highway).

These roads are B-double approved roads that are anticipated to be used by the Project generated traffic. Local school bus routes have not been investigated in this TIA and would need to be verified with the local operator.

## **2.5 Existing traffic conditions**

The traffic volumes on the VicRoads' declared road network have been taken from the VicRoads Traffic Volume Data (prepared by Information Management and Technology), updated in April 2019.

No traffic volume data could be obtained for the local roads in the vicinity of the site. Site observations suggest that these local roads accommodate very little traffic.

### **2.5.1 Benalla-Tocumwal Road (C371)**

The traffic growth pattern on Benalla-Tocumwal Road is provided in Table 1 for north bound and south bound traffic. As shown, Benalla-Tocumwal Road has experienced little or no traffic growth in these years.

Using the most recent complete data set for Benalla-Tocumwal Road (2017) it is assumed that this road currently carries approximately 920 two-way vehicle trips per day. Approximately 100 of these are heavy vehicles (11per cent). This is based on the assumption that the roads peak hour volume is around 10 per cent of the Annual Average Daily Traffic (AADT) volume. Accordingly Benalla-Tocumwal Road has a peak hour traffic volume of approximately 92 two-way vehicle trips (or 46 one-way vehicle trips).

**Table 1 Benalla-Tocumwal Road traffic growth pattern**

Benalla-Tocumwal Rd	Annual Average Daily Traffic Data (AADT) <sup>1</sup>					
	2007	2014	2015	2016	2017	2019
North Bound	420 (50*)	400 (40*)	400 (40*)	430 (40*)	430 (40*)	452 (58*)
South Bound	420 (50*)	420 (50*)	420 (40*)	460 (50*)	460 (50*)	

Note: numbers in brackets are Heavy Vehicles Volumes.

### 2.5.2 Nunn Street (A300)

The traffic growth pattern on Nunn Street for north-bound vehicles (between Bridge Street and Commercial Road) is provided in Table 2.

Nunn Street has no traffic growth of the past ten years. It currently carries approximately 4,200 two-way vehicle trips per day, with approximately 340 of these being heavy vehicles.

Nunn Street has a peak hour traffic volume of approximately 420 two-way vehicle trips (or 210 one-way vehicle trips).

**Table 2 Nunn Road traffic growth pattern**

Nunn Street	Annual Average Daily Traffic Data (AADT) <sup>2</sup>					
	2007	2014	2015	2016	2017	2019
North Bound	2,100 (200*)	1,800 (180*)	1,900 (150*)	1900 (150*)	2,000 (160*)	2,100 (170*)

Note: numbers in brackets are Heavy Vehicles Volumes

### 2.5.3 Bridge Street (A300)

The traffic growth pattern on Bridge Street (between Midland Highway and Nunn Street) for north-east bound vehicles is provided in Table 3.

This arterial road managed by VicRoads has experienced little growth in the years for which data was obtained. It currently carries approximately 4,000 two-way vehicle trips per day, with approximately 425 (10 per cent) of these being heavy vehicles.

Bridge Street has a peak hour traffic volume of approximately 400 two-way vehicle trips (or 200 one-way vehicle trips).

**Table 3 Bridge Street traffic growth pattern**

Bridge Street	Annual Average Daily Traffic Data (AADT) <sup>3</sup>					
	2007	2014	2015	2016	2017	2019
North-east bound	1,900 (210*)	2,200 (270*)	1,800 (190*)	1800 (190*)	1,900 (200*)	2,000 (212*)

Note: numbers in brackets are Heavy Vehicles Volumes

<sup>1</sup> VicRoads Traffic Volume Data are estimates only. Volume in brackets is number of HGV vehicles.

<sup>2</sup> VicRoads Traffic Volume Data are estimates only. Volume in brackets is number of HGV vehicles.

<sup>3</sup> VicRoads Traffic Volume Data are estimates only. Volume in brackets is number of HGV vehicles.

#### 2.5.4 Dookie-Violet Town Road (C365)

In 2019, there has been an average of 66 vehicles including 10 heavy vehicles (15 per cent) per day on Dookie Violet Road (between Benalla Road and Baird Street) which represents 140 two-way movements per day.

#### 2.5.5 Midland Highway

The traffic growth pattern on Midland Highway (between Benalla Road and Benalla-Tocumwal Road) is provided in Table 4 for eastbound traffic.

Midland Highway has experienced steady but relatively low traffic growth in recent years.

Assuming traffic growth is similar to recent years, it currently carries approximately 3,200 two-way vehicle trips per day, with approximately 540 (17%) of these being heavy vehicles.

Benalla-Tocumwal Road has a peak hour traffic volume of approximately 320 two-way vehicle trips (or 160 one-way vehicle trips).

**Table 4 Midland Highway Traffic Growth Pattern**

Midland Highway	Annual Average Daily Traffic Data (AADT) <sup>4</sup>					
	2007	2014	2015	2016	2017	2019
Eastbound	1,400 (310*)	1,500 (290*)	1,300 (240*)	1,400 (250*)	1,400 (260*)	1,600 (270*)

Note: numbers in brackets are Heavy Vehicles Volumes.

#### 2.5.6 Local roads

Traffic volumes associated with roads forming part of the boundary of the site were not available. However, these local roads are limited access and access roads. As such, they have for prime function to ensure access to abutting properties, minor movements to rural residences and farming lands. Subsequently, these are lightly trafficked.

Site observations suggest that these local roads accommodate very little traffic.

### 2.6 Local crash history

The VicRoads 'Crashstats' database was reviewed to understand the casualty crash history of the road network near the site for the last five years of available data.

No crashes were found to occur along the site access points of the site.

Four crashes occurred in a radius of one kilometre of the site. All accidents were collisions with a fixed object and lead to no fatalities. Three of these crashes happened on Benalla-Tocumwal Road, an arterial road which forms the eastern boundary of the site.

<sup>4</sup> VicRoads Traffic Volume Data are estimates only. Volume in brackets is number of HGV vehicles.

## 3.0 Proposed Project

### 3.1 Overview

An indicative design response of the Project is provided in **Appendix A**. The final layout and component selection for the proposed solar farm would be subject to a detailed design process.

In addition to the above the following would also be required for the Project:

- A connection to the electricity grid, including a new terminal substation
- Underground electrical cabling
- Approximately 120 inverters (container solution)
- Operations and Maintenance Areas
- Security Features (including fencing and CCTV security system)
- Lighting
- Landscaping
- Site access and internal access roads including upgrades to existing site access points to make them suitable for use by construction and operations vehicles
- Business identification signage.

### 3.2 Construction and operation

#### 3.2.1 Construction activities

It is anticipated that construction activities would occur over an approximate nine to 16 months period. At this stage construction is anticipated to begin in early 2020 pending the Project obtaining required approvals.

The construction of the Project will occur over a number of stages as follows:

1. **Civil works** including (but not limited to) land clearing, levelling and earthworks, internal road construction, drainage installation (if required), laydown area preparation, fencing installation and vegetation screening.
2. **Mechanical works** including (but not limited to) foundation piling, and tracker and module delivery and installation.
3. **Electrical works** including (but not limited to) cabling, module connection, connection to the grid, testing and commissioning.

Construction activities would typically be undertaken during standard construction hours. Delivery of some plant, equipment and materials would be required to occur outside of the standard hours of construction for safety reasons. Emergency work to avoid the loss of lives, property and/or to prevent environmental harm is also permitted outside these standard hours. Communication with local residents would occur before and during construction to inform them of the timing and duration of proposed activities.

Construction is expected to be managed through a Construction Environment Management Plan (CEMP) that will be prepared consistent with the Framework EMP that forms part of the planning permit application.

### 3.2.2 Operation

The solar farm is anticipated to operate for up to 30 years.

The Project will employ six to 11 full-time employees, which would result in a small number of regular movements to the site. Once on site, vehicle movements are anticipated to be occurring within the site daily.

Daily operational activities are expected to be limited to remote monitoring of equipment, whilst full servicing of power conversion units and switchyard equipment would occur on a quarterly basis. It is anticipated that the cleaning of solar panels will also occur quarterly, however this would be dependent on how the panels perform in various weather conditions. There will be no storage of hazardous or dangerous goods or materials on site during the operation of the Project.

### 3.2.3 Decommissioning

Following decommissioning of the Project, rehabilitation of the site will ensure that it continues to be viable for farming purposes or alternatively could be redeveloped for residential purposes depending on the appropriate planning controls at the time of decommissioning.

## 3.3 Construction and operation traffic

The following tasks and vehicular requirements are typical of the construction of a solar farm:

- Site establishment and demobilisation (semi-trailer and low loader).
- Road and hardstand material construction equipment delivery (truck, dog and low loader).
- General equipment delivery (low loader and semi-trailer).
- AC Cable installation (semi-trailer and low loader).
- Overhead line installation (semi-trailer, low loader and Restricted Access Vehicle (RAV)).
- Switchyard construction (concrete agitator, low loader, semi-trailer, RAV and truck).
- Other employee movements, waste, consumables etc. (light vehicle, van and truck).

Site establishment is anticipated to occur over a period of approximately three weeks. It is estimated that during that time there will be on average 25 light vehicles movements and 7 heavy vehicles movements to and from the site per day.

During construction, it is expected that there will be around 90 light vehicle movements and 36 heavy vehicles movements to and from the subject site per day to undertake the construction activities and account for deliveries. It is expected that approximately 11,500 truck movements would occur over the construction period.

There may be instances where the number of heavy or light vehicles movements may be higher or lower than this expected average.

During the demobilisation phase, an average of 140 light vehicles and 38 heavy vehicle movements are expected to occur daily to and from site.

The program and construction volumes would be confirmed once a contractor is hired for the project and a Traffic Management Plan (TMP) is produced.

During operation, the Project is anticipated to generate traffic movements of around 20 movements per day.



## 4.0 Vehicle Access and Vehicle Impact

### 4.1 Vehicle Access

There are three proposed site accesses for the site. The locations of these are shown in Appendix A and include:

- Goorambat-Chesney Road
- Spinks Lane
- Saunders Road.

Each of these is discussed in more detail in the following sections.

#### 4.1.1 Goorambat-Chesney Road

Figure 12 shows the location of the proposed access location via Goorambat-Chesney Road. There are good sight distances from the access location in both directions along Goorambat-Chesney Road.

There is no road laydown and the access location will therefore require construction to accommodate vehicle access for the Project.



**Figure 12 Proposed Solar Farm entrance off Goorambat-Chesney Road**

Source: AECOM – photo taken on Tuesday 21 May 2019

#### 4.1.2 Spinks Lane

Figure 13 shows the location of the site access located via Spinks Lane, which is located approximately 150 metres southwest of the crossroad priority intersection with Goorambat-Chesney Road. There is a culvert at the entrance of the access which is partially uncovered by the gravel surface. There is no road laydown and the road will likely need construction to accommodate heavy vehicle access.

It should also be noted that Spinks Lane intersects with the Oaklands Railway Line which runs from Benalla to Oaklands (NSW). To access this site entry, it is required to travel across the railway crossing with passive protection present.



**Figure 13 Solar Farm entrance access gates - Eastern Front**

Source: AECOM – photo taken on Tuesday 21 May 2019

#### **4.1.3 Saunders Road**

A site access is located on Saunders Road as shown in Figure 14. This proposed access is located approximately 400 metres from the intersection between Saunders Road and Hooper Road. Sight distances are unrestricted as the road's alignment is straight at this location.



**Figure 14 Saunders Road site access - Eastern Front**

Source: AECOM – photo taken on Tuesday 21 May 2019



#### 4.1.4 Proposed traffic routes

The proposed traffic routes can be difficult to predict at the early planning stages of the Project. These will be confirmed as part of the development of the TMP.

However, when considering B-Double approved roads, it is anticipated that construction vehicles coming from Melbourne and Port of Melbourne would travel via the following potential routes (shown in Figure 15):

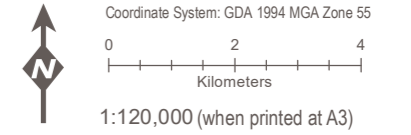
- Hume Freeway exit onto Mansfield Road, and travel via the Benalla CBD, before coming onto the Midland Highway and Benalla-Tocumwal Road.
- Hume Freeway exit onto Cowslip Street to travel via Violet Town before coming onto Dookie-Violet Town Road and Midland Highway.

In addition, operators of B-Double vehicles need to obtain permits from Benalla Rural City Council to operate on any roads which are not part of the approved B-Double network. As shown in Figure 15 below, the following local roads may require B-Double permits as these are not part of the gazetted B-Double approved network:

- Goorambat-Chesney Road
- Spinks Lane
- Saunders Road.

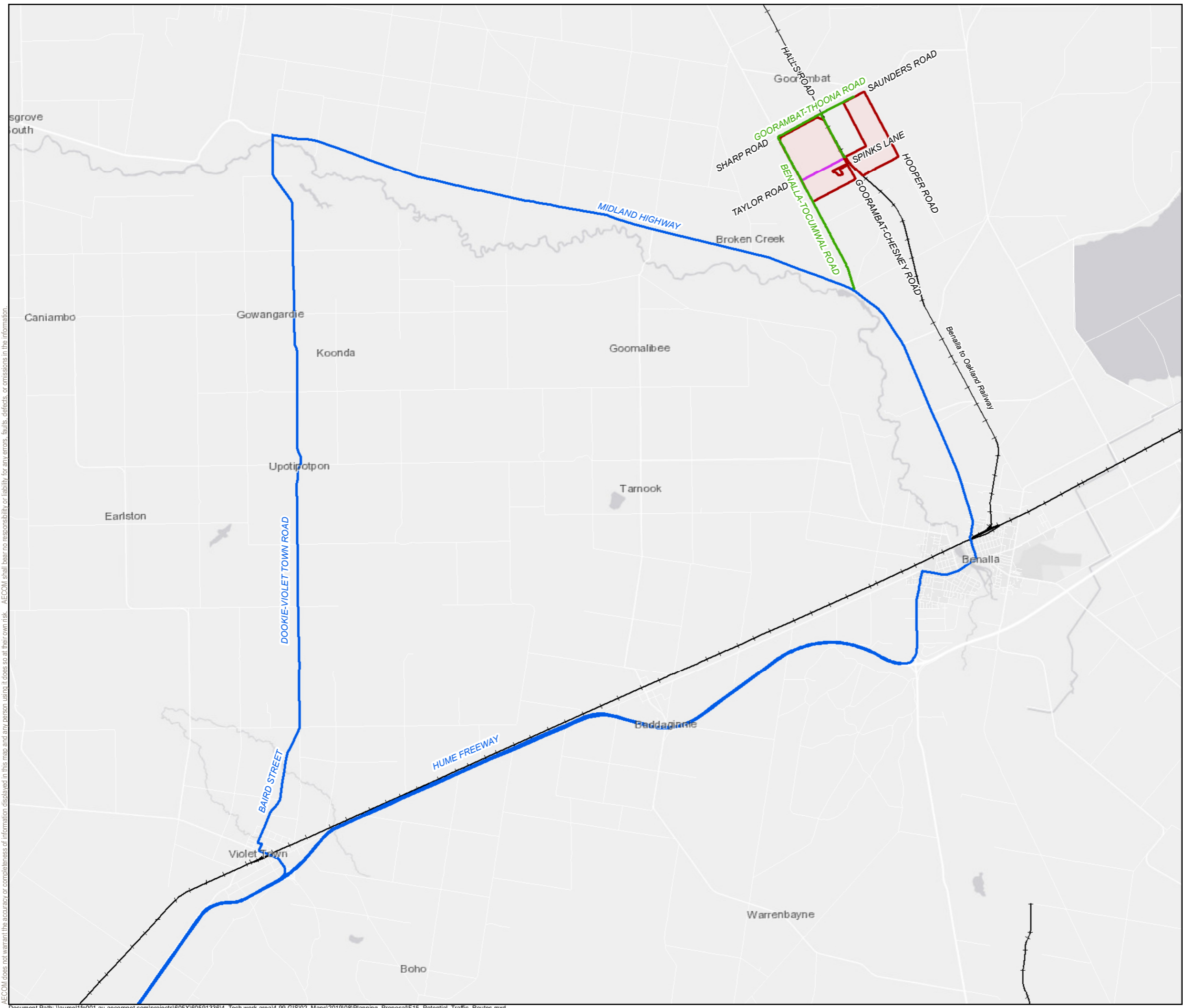
Permits can be applied for through NHVR which must seek consent from all road managers involved in a proposed permit route. Councils will generally allow the gazetted pre-approved local road network to be used by various types of heavy vehicles. Pre-approved local routes for each type of vehicle are outlined by VicRoads which maintains a list of the B-Double and higher mass limited (HML) network in Victoria.

In addition, a permit delivered by the Department of Transport (DoT) will be required for heavy vehicles such as over-dimensional vehicles crossing or travelling across train tracks. A permit is required when an over-dimensional vehicle crossing the railway line is greater than 4.9 metres in height, 3.0 metres wide or 26.0 metres in length. Given that access to the site on Spinks Lane requires passage a level-crossing, discussions with DoT are recommended.



**Legend**

- ▭ Site Investigation Area
- B-Double Approved Roads
- Local Roads
- Unused Government Road
- +— Railway



Data Sources:  
 Locality, Railway, Drainage Line, Streets Features © VICMAP - 2018  
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**Goorambat East Solar Farm**

**POTENTIAL PROJECT TRAFFIC ROUTES**

PROJECT #: 60591336  
 CREATED BY: JB  
 LAST MODIFIED: brierej; 16/08/2019  
 VERSION: 1

**Figure 15**

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## **4.1.5 Personnel and construction vehicle access**

### **4.1.5.1 Personnel vehicle access**

Workers will travel to the site either from the local area (Benalla and surrounds) or from Melbourne. Car parking will be provided on site in designated car parking areas during the various stages of construction. In addition, shuttle buses may be used by contractors to commute workers to and from the site, particularly during the peak of construction activities.

If overspill of car parking is identified, then strategies to limit single vehicle / occupancy use can be reviewed further during the TMP development stage (i.e. strategies include carpooling or additional mini-bus personnel transfers).

### **4.1.5.2 Construction vehicle access**

Construction vehicles are anticipated to mainly access the site from the south via the Hume Freeway, before accessing the site either via either Violet Town or Benalla. This will minimise potential conflicts with pedestrians and cyclists.

Raw material sources have yet to be confirmed and would be confirmed at the TMP stage development given the early planning phase of the project.

Light vehicles may travel in both directions along the Hume Freeway

## **4.2 Traffic impact assessment**

### **4.2.1 Peak traffic generation**

#### **4.2.1.1 Personnel**

During peak construction up to 400 construction personnel could be on-site at one time. It is expected that the number of construction personnel would generally be less than this peak estimate.

Shift times for construction works are expected to be up to seven days per week. Most construction activity would occur during standard construction hours.

The construction vehicle peak trips would generally coincide with worker arrivals and departures, between 6:00am and 7:00 am and 6:00pm to 7:00 pm on a typical weekday. It is anticipated that shifts could be extended during the week-end and construction works could at certain times occur over 24 hours. This would be confirmed at a later stage of the project and will depend on the contractor's methodology.

#### **4.2.1.2 Construction**

As outlined previously in Section 3.3, it is estimated that there will be approximately 36 heavy vehicle movements to and from the site per day on average, to undertake the construction activities and account for deliveries. There will be approximately 90 light vehicles two-ways movements to and from the site per day due to staff.

The program and construction volumes will be confirmed once a contractor is hired for the project and the TMP is produced.

#### **4.2.1.3 Operation**

As outlined previously in Section 3.3, during operation, the site is anticipated to generate traffic movements of approximately 12 vehicles per day, subject to the works that are required.

### **4.2.2 Traffic distribution**

#### **4.2.2.1 Personnel**

For the purposes of this TIA, it is estimated that the construction workers (i.e. private vehicle trips) travelling to and from the site will be split as follows:

- 40 per cent from local areas (Benalla region).
- 60 per cent from Melbourne.

Further details on worker movements will be set out in the TMP that will be prepared for the Project.

#### **4.2.2.2 Construction**

Materials and equipment to construct the solar farm are anticipated to come from Port of Melbourne which is located to the southwest of the site. Therefore, vehicles would ultimately access the site from the Hume Freeway going across through either of the proposed routes (refer to Section 4.1.4).

Construction generated traffic could be split between both routes to reduce the additional traffic, therefore minimising any risk of congestion or road safety issues within the vicinity of the site area.

The actual number and routes of construction vehicles will be confirmed by the nominated contractor at the TMP development stage of the Project, following review and confirmation of quantities, construction timing and location of materials.

#### **4.2.3 Traffic impacts**

It is anticipated that there will be negligible impacts on the local and regional road network used to access the site during construction and operation of the project. Background traffic volumes are low and generally well within the expected carrying capacity of these roads.

The Project would generate approximately 36 heavy and 90 light vehicle movements per day during construction. This is an anticipated average during the construction period. There may be instances where the number of heavy and light vehicle movements is higher or lower than this daily expected average. This is not expected to noticeably change the operability of road network during this period. Considerably lower volumes of light vehicle traffic associated with the operation of the Project would also be expected to result in negligible impact.

The roads proposed to be used to provide site access are generally in suitable conditions. Some upgrades at the currently identified Project site access points would need to be done. These works would be carried out such that Project traffic and local traffic are suitably and safely managed.

A TMP will be prepared prior to the commencement of construction to outline the specific manners in which any residual impacts on the road network will be managed.

## 5.0 Potential mitigation measures

This chapter outlines and considers the potential mitigation measures to be considered further when a TMP is developed for the Project. At the TMP stage, there will be more certainty on the construction timeframes and associated vehicle volumes and routes.

The TMP would be developed in consultation with VicRoads and Benalla Rural City Council.

### 5.1 Goorambat-Chesney Road and Spinks Lane priority intersection

To ensure that construction and local traffic can safely access the site access via Spinks Lane, its width near the intersection should be reviewed during the preparation of the TMP, when greater certainty of the Project construction vehicle requirements are known.

Depending on adopted construction traffic management methods and strategies, the potential widening of the Goorambat-Chesney Road and Spinks Lane priority intersection may be considered to facilitate two-way construction vehicle access (up to B-Doube size).

This should be considered further at the development of the TMP for the Project in consultation with Benalla Rural City Council.

In addition, a permit delivered by the DoT will be required for heavy vehicles such as over-dimensional vehicles crossing or travelling across train tracks. A permit is required when an over-dimensional vehicle crossing the railway line is greater than 4.9 metres in height, 3.0 metres wide or 26.0 metres in length. Given that access to the site on Spinks Lane requires passage a level-crossing, discussions with DoT may be required.

### 5.2 Peck Road

Following consultation with VicRoads, Peck Road would not be used for the Project.

In addition, VicRoads advised that consideration should be given to treatments at the intersection of Peck Road and Benalla Tocumwal if this intersection is assessed as presenting a potential safety risk. Further consideration of these treatments will be given at the detailed design stage and during development of the TMP for the project.

### 5.3 Spinks Lane

To ensure that construction and local traffic can safely access the site access via Spinks Lane, the width of this lane near the site access point should be reviewed during the preparation of the TMP, when greater certainty of the Project construction vehicle requirements are known.

Depending on adopted construction traffic management methods and strategies, the potential widening of the Spinks Lane and Goorambat-Chesney Road priority intersection and the proposed site access may be considered to facilitate two-way construction vehicle access (up to B-Double size).

### 5.4 Saunders Road

To ensure that construction and local traffic can safely access the site access via Saunders Road, the width of this road near the site access point should be reviewed during the preparation of the TMP, when greater certainty of the Project construction vehicle requirements and routes to the site are known.

Depending on the adopted construction traffic management methods and strategies, the potential widening of the Saunders Road site access may be considered to facilitate two-way construction vehicle access (up to B-Double size).

## **5.5 Internal access tracks**

Subject to the development of the TMP for the project, it is expected that the Project will provide a network of internal access tracks that surround the site that will be in place to facilitate construction of the site and then ongoing maintenance. This typically consists of a four to five-metre-wide crushed gravel access track.

An indicate access track layout as well as the site access points are shown in Appendix A. This will be confirmed during detailed design. Site access points as well as any measures to manage potential impacts on the road network will be set out in the TMP to be prepared for the project.

## **5.6 Operational stage site access**

During the operational stage of the Project, it is expected that the site access points used during construction as well as the internal access track network would be maintained, to provide for maintenance and operations access.



## 6.0 Conclusion and Traffic Management Plan development

### 6.1 Conclusion

In conclusion this TIA has shown that there is unlikely to be a material impact on the operation or safety of the local road network during the construction or operation of the proposed Goorambat East Solar Farm.

The assessment has highlighted some potential mitigation measures that may be considered to facilitate safe vehicle access to the site, which can be further considered and finalised at the development of the TMP for the project in consultation with key stakeholders.

### 6.2 TMP Development

Following planning approval, a likely condition of the planning permit will be to produce a TMP for the project. The TMP will be developed when a contractor is commissioned and is expected to consider the following key matters relating to traffic management for the project:

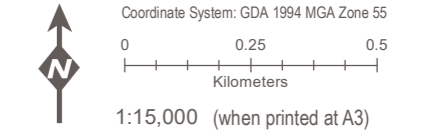
- Key stakeholder inputs and requirements
- Confirmation of proposed construction program and volumes
- Origin of materials and personnel
- Final site access design and traffic management measures (speeds and signage) to facilitate the safe movement of vehicles to and from the site.
- Pre-road condition surveys and maintenance agreements with key stakeholders.
- Control measures including:
  - Roles and responsibilities
  - Training and site inductions
  - Vehicle access
  - Operating and working hours
  - Environmental measures
- Outline monitoring, inspection and auditing of the TMP.

# Appendix A

## Design Response



INDICATIVE SYSTEM INFORMATION	
ITEM	SYSTEM SIZE
Maximum Capacity	Up to 250 MW
Mounting System	Single Axis Tracking
Quantity of Modules	Approximately 500,000 modules
Pitch	5.5 metres to 13 metres
Solar Panel Type	Bifacial 380W
Inverter Units	Approximately 120
Tracker Height	4 metres (maximum)
Row alignment	North-South (tracking east to west)
Tracker Rotation Range	-60 degrees to +60 degrees



**Legend**

- ▭ Site Investigation Area
- ▲ Grid Connection
- ◀ Site Access
- Dwelling (Non-Participating Landowner)
- Dwelling (Participating Landowner)
- Fence
- External Road - 7 metres wide
- Internal Road - 4 metres wide
- ▨ Single Axis Tracking Solar Array
- Existing 220kV Overhead Transmission Lines
- ▭ Operation and Maintenance Facilities
- ⊠ Designated Terminal Substation
- ▭ Large Scattered Trees (15 metre maximum tree protection zone buffer)
- ▭ Small Scattered Trees (15 metre maximum tree protection zone buffer)
- ▭ Large Tree in Patches (15 metre maximum tree protection zone buffer)
- ▭ Remnant Patches (including 15 metre buffer)
- ▭ Native Vegetation Proposed for Removal
- Designated waterways
- Watercourses
- Roads
- Unused Government Road
- Railway
- ▭ Cadastre

Note:  
Design layout is indicative only and the final design layout will be determined during the detailed design phase

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**Goorambat East Solar Farm**

**INDICATIVE DESIGN**

PROJECT #: 60591336  
 CREATED BY: JB  
 LAST MODIFIED: brierej: 16/08/2019  
 VERSION: 1

**Figure 6**

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