Yangery BESS

Traffic Impact Assessment

Yangery BESS Development Pty Ltd

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Document control record

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Executive Summary

This Traffic Impact Assessment (TIA) has been prepared for South Energy Pty Ltd on behalf of Yangery BESS Development Pty Ltd (the Proponent) to support the Planning Permit application for the development of the proposed 120 MW / 480 MWh Yangery Battery Energy Storage System (BESS) in Yangery, Victoria.

The development is proposed to have two site access points, a primary access on Tower Hill Road and a secondary access on Conns Lane. Vehicles are generally expected to travel via either Southern Cross Road or Caramut Road to Tower Hill Road. Access routes, and any upgrades required, will be confirmed at a later stage.

During the operation and maintenance phase the traffic generation of the Project is expected to be up to six vehicles per day a few days a month. It is not expected to notably impact the capacity or safety of Tower Hill Road, or the surrounding road network.

During construction activities, vehicle movements will be higher than during normal operations and maintenance activities, however, the temporary traffic flow on the key access roads is expected to be manageable.

A preliminary sight distance assessment indicates that the absolute minimum sight distance requirement for private site accesses (minimum gap sight distance) will be met at both accesses. However, due to the vertical crests to the west and north of the site accesses the desirable safe intersection sight distance and approach sight distance may not be met in both directions at both accesses. It is recommended that comprehensive sight distance checks are undertaken during detailed design to ensure that accesses are located and designed to achieve minimum sight distance requirements and whether mitigation measures would be warranted due to the crests.

Construction vehicles are expected to be able to access the site via Tower Hill Road. Should B-doubles be required to travel from Conns Lane to Tower Hill Road temporary widening of the Conns Lane approach splays at Tower Hill Road may be required. Any temporary traffic management treatments and mitigation works required for construction are to be identified and addressed by way of an approved Construction Traffic Management Plan (CTMP) to the satisfaction of the responsible authority.

A one-off oversize overmass (OSOM) delivery is expected for the transformer delivery. Any temporary works required to accomodate the OSOM delivery vehicle will be assessed following confirmation of the specific vehicle and access route and detailed in an appropriate CTMP, noting that this vehicle is expected to operate under specific permit conditions.

Contents

Figures

Tables

1 Introduction

Aurecon Pty Ltd (Aurecon) has been commissioned by South Energy Pty Ltd on behalf of Yangery BESS Development Pty Ltd (the Proponent) to undertake a Traffic Impact Assessment (TIA) to inform the development of a Battery Energy Storage System (BESS) in Yangery, Victoria called Yangery BESS (herein referred to as 'the Project').

1.1 Purpose

The purpose of this TIA is to provide an assessment of anticipated traffic and transport impacts and parking requirements at the project site, including an assessment of any potential impacts to the surrounding road network.

The scope of the assessment was to:

- undertake a review of existing publicly available information for the project site
- assess traffic movements generated by the Project during construction, operations and maintenance, and decommissioning phases.
- assess the adequacy of proposed access arrangements and impacts to the wider local road network, during the construction, operations and maintenance, and decommissioning phases.
- assess the adequacy of the Project's proposed car parking provision and layout arrangements.

1.2 Assumptions and limitations

The following assumptions and limitations apply to this report.

- The traffic assessment was undertaken via a desktop review. No site visit was conducted.
- The assessment was based on the supplied site layout drawings:
  - Proposed Site Plan, EHV-YGB-EL-DR-0001, EHV Consulting and Design, Rev D, 05/01/2026
  - Proposed Overall Site Plan, EHV-YGB-EL-DR-0002, EHV Consulting and Design, Rev D, 05/01/2026
  - Proposed Construction Site Plan, EHV-YGB-EL-DR-0011, EHV Consulting and Design, Rev D, 05/01/2026
- Relevant standards and guidelines relied upon are noted and referenced as necessary throughout this report.
- All information regarding traffic volumes/movements has been either supplied or confirmed by the Proponent, except as noted within the report.

2 The Project

2.1 Project description

The Project proposes a Battery Energy Storage System (BESS) with a nominal installed capacity of 120 MW / 480 MWh.

The Project works include:

- BESS unit, inverters and transformers
- Construction of internal access roads and access (and egress) points
- Underground cabling (33kV) to provide a connection between the battery modules and inverters and on-site substation
- On-site substation including transformer to step up from 33kV to the connection voltage
- Underground or overhead cabling (66kV) to connect the onsite substation to the adjoining Koroit zone substation (confirmed by South Energy as part of distribution network at a voltage of 66kV)
- An operations and maintenance facility
- Water storage (including firefighting water supply tanks and fire water runoff containment)
- Fencing around the perimeter of the BESS facility
- Car parking
- Business identification signage at site entry

The Project works may require the realignment of the water course within the southern half of the Project Area. It is understood that this may be an option to be assessed at this stage, but may not be required as part of this Project.

The Project may also include acoustic and visual mitigation measures, as required.

2.2 The Project area

The Project area is located in Yangery, in south-western Victoria, approximately 6 km east of Koroit and 9 km northwest of Warrnambool. The Project area sits within Warrnambool City Council, with Moyne Shire Council directly adjacent to the north and west. The Project area is adjacent to the Koroit zone substation, which is owned and operated by Powercor.

The Project area is privately owned, agricultural land which is void of native vegetation. It is intersected by a degraded and eroded drainage line that adjoins one isolated waterbody in the southern paddock.

Primary vehicle access to the site is proposed from Tower Hill Road, which runs east to west along the northern site boundary. Secondary vehicle access is proposed from Conns Lane, which runs north to south along the western site boundary.

The location of the BESS infrastructure will be determined through detailed design, once a BESS supplier has been selected and will be in accordance with commitments made in the planning application. The Project area and indicative layout is shown in Figure 2-1 below.

Figure 2-1 **Proposed site layout (EHV-YGB-EL-DR-0002, EHV Consulting and Design, Rev D, 05/01/2026)**

3 Existing conditions

3.1 Land use

The Project area is located in currently vacant land within Farming Zone (FZ). The adjacent substation and other adjacent land are also zoned FZ, under the Warrnambool Planning Scheme.

The site is affected by the Design and Development Overlay – Schedule 16 (Warrnambool Regional Airport – Building Height Above 7.5 metres (RL 79.0 metres AHD)) (DDO16) and the site is within a designated bushfire prone area.

3.2 Road network

The Project area road network is shown in Figure 3-1 and the over-size over-mass vehicle network (vehicles up to 3.5 m wide, 4.6 m high, 25 m long, 49.5 tonnes) is shown in Figure 3-2. The site is surrounded by two key roads. The key roads are described in the following sections.

Access from further away is expected to be via the Princes Highway then either Caramut Road to Tower Hill Road, straight to Conns Lane, or Southern Cross Road to Tower Hill Road. The largest vehicle Caramut Road and Southern Cross Road are pre-approved for is a prime mover towing dolly and low loader up to 5 m wide, 5 m high, 30 m long, 77 tonnes. There are no restricted vehicles on these roads or on Tower Hill Road or Conns Lane. All of the 23 m low loader and platform trailer reference vehicle combinations are pre-approved on the Princes Highway.

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Legend

- Locality
- Road network
- LGA
- Project Area
- Development footprint

Basemap: ESRI
Data source:
Aurecon (2026)
DEWLP (2026)

Date: 20/01/2026 Version: 3

Figure 3-1 **Surrounding road map**

ADVERTISED PLAN

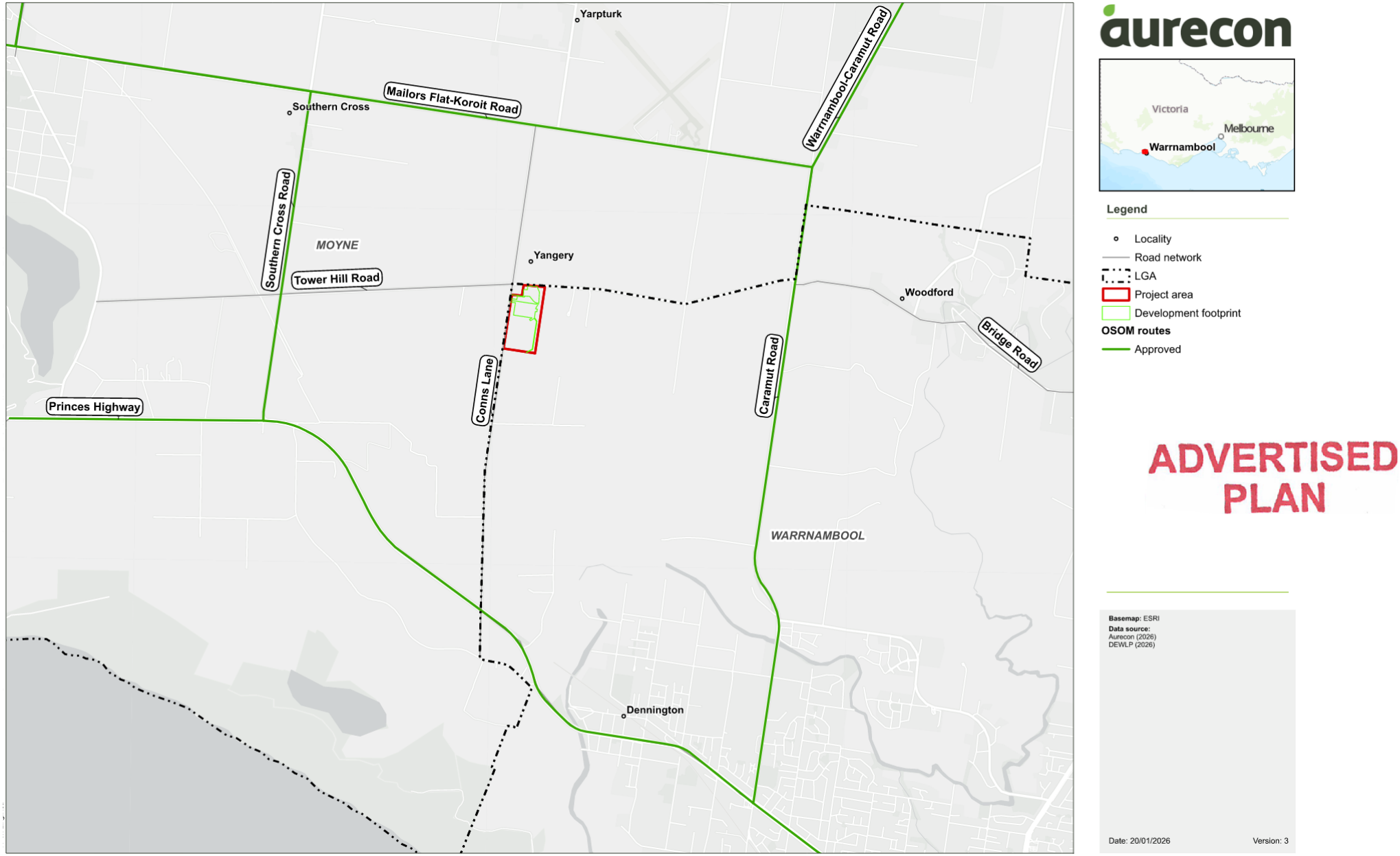

Figure 3-2 **OSOM approved routes**

3.2.1 Tower Hill Road

Tower Hill Road (shown in Figure 3-3) is a two-lane, two-way undivided collector road managed by Moyne Shire Council and Warrnambool City Council. It connects into Caramut Road in the east and Lane View Road in the west. The road comprises a 6 m wide carriageway set within a 20 m road reserve (varies and approximate). There are no shoulders present along the road, and verges consist of grass and gravel.

Tower Hill Road has an unposted (default) speed limit of 100 km/h. It is an approved B-Double and Higher Mass Limit (HML) vehicle route. There are no provisions for active transport along the road.

Moyne Shire Council provided traffic survey data (collected 23 August 2024 to 13 September 2024) taken 1.2 km east of Conns Lane, which recorded the Average Annual Daily Traffic (AADT) for Tower Hill Road as 1,082 vehicles, consisting of 10% heavy vehicles.

Figure 3-3 Tower Hill Road east of the site, looking west

3.2.2 Conns Lane

Conns Lane is a rural access road set within a 20 m road reserve (varies and approximate) managed by Moyne Shire Council that runs north south between Mailors Flat-Koroit Road to the north and Princes Highway to the south. Adjacent to and north of the site it comprises a single sealed 4 m wide lane with unsealed shoulders either side facilitating two-way movements. South of the site, Conns Lane has been widened to a 6.2 m wide seal for approximately 2.6 km north from the Princes Highway.

Within the vicinity of the site, Conns Lane has a downhill grade falling away from a crest approximately 50 m south of Tower Hill Road.

Conns Lane has an unposted (default) speed limit of 100 km/h. It is not pre-approved for any heavy vehicle classes (other than general heavy vehicles up to semi-trailer trucks) and there are no provisions for active transport along the road.

The pavement is in good condition near the site (see example in Figure 3-4). North of Tower Hill Road the pavement condition is poor in places (see example in Figure 3-5).

Moyne Shire Council provided recent traffic survey data (collected 23 August 2024 to 13 September 2024) taken 400 m south of Tower Hill Road, which recorded the AADT for Conns Lane as 209 vehicles, with 10% heavy vehicles.

It is noted that the existing 4 m wide section of Conns Lane is in accordance with the Infrastructure Design Manual rural access and rural collector road width for traffic volumes of 51-150 vehicles per day, which is less than the surveyed traffic volume of 209 vehicles per day. The specified minimum seal width for rural access and rural collector roads with more than 150 vehicles per day is 6.2 m.

Figure 3-4 Conns Lane south of the site, looking north

Figure 3-5 Conns Lane north of Tower Hill Road, looking south

3.3 Public transport network

There is no regular public transport service stops in the vicinity of the site. Moyne Shire Council has advised there is a Public Transport Victoria school bus route along Conns Lane between Princes Highway and Tower Hill Road.

3.4 Active transport network

Give the rural nature of the location, there is currently no formal pedestrian or cyclist infrastructure in the vicinity of the site.

3.5 Crash history

Victorian Road Crash Data for the most recent available five-year period (to 31 March 2025) was reviewed for the likely access roads in the vicinity of the site. Six crashes were recorded within approximately 3.5 km radius of the site. Only one crash was recorded at the Tower Hill Road / Conns Lane intersection. These are shown in Figure 3-3 and summarised in Table 3-1.

One crash involved a heavy vehicles (head on crash on Caramut Road, serious injury). One crash involved a motorcycle (Caramut Road near Tower Hill Road, other injury). The fatal crash (at the Southern Cross Road / Tower Hill Road intersection) involved a cyclist. No trends were identified.

Table 3-1 Crashes on primary access routes to site

Figure Number	Date	Location & driving distance from site	Severity	Type	Vulnerable road users or heavy vehicles
1	May 23, 2022	Caramut Rd / Tower Hill Rd intersection ~3 km	Serious injury	Collision with vehicle, right near (at intersection)	
2	Jun 9, 2024	Caramut Rd near Tower Hill Rd ~3 km	Other injury	Collision with vehicle, U turn	Motorcycle
3	Jan 29, 2021	Caramut Rd south of Tower Hill Rd ~5.2 km	Serious injury	Collision with vehicle, head on (not overtaking)	Heavy vehicle
4	Mar 18, 2025	Conns Ln / Tower Hill Rd intersection ~200 m	Serious injury	Collision with vehicle, cross traffic at intersection	
5	Feb 10, 2023	Southern Cross Rd / Tower Hill Rd intersection ~2.5 km	Fatal	Collision with vehicle, cross traffic at intersection	Cyclist
6	Jan 21, 2022	Southern Cross Rd / Tower Hill Rd intersection ~2.5 km	Serious injury	Collision with vehicle, cross traffic at intersection	

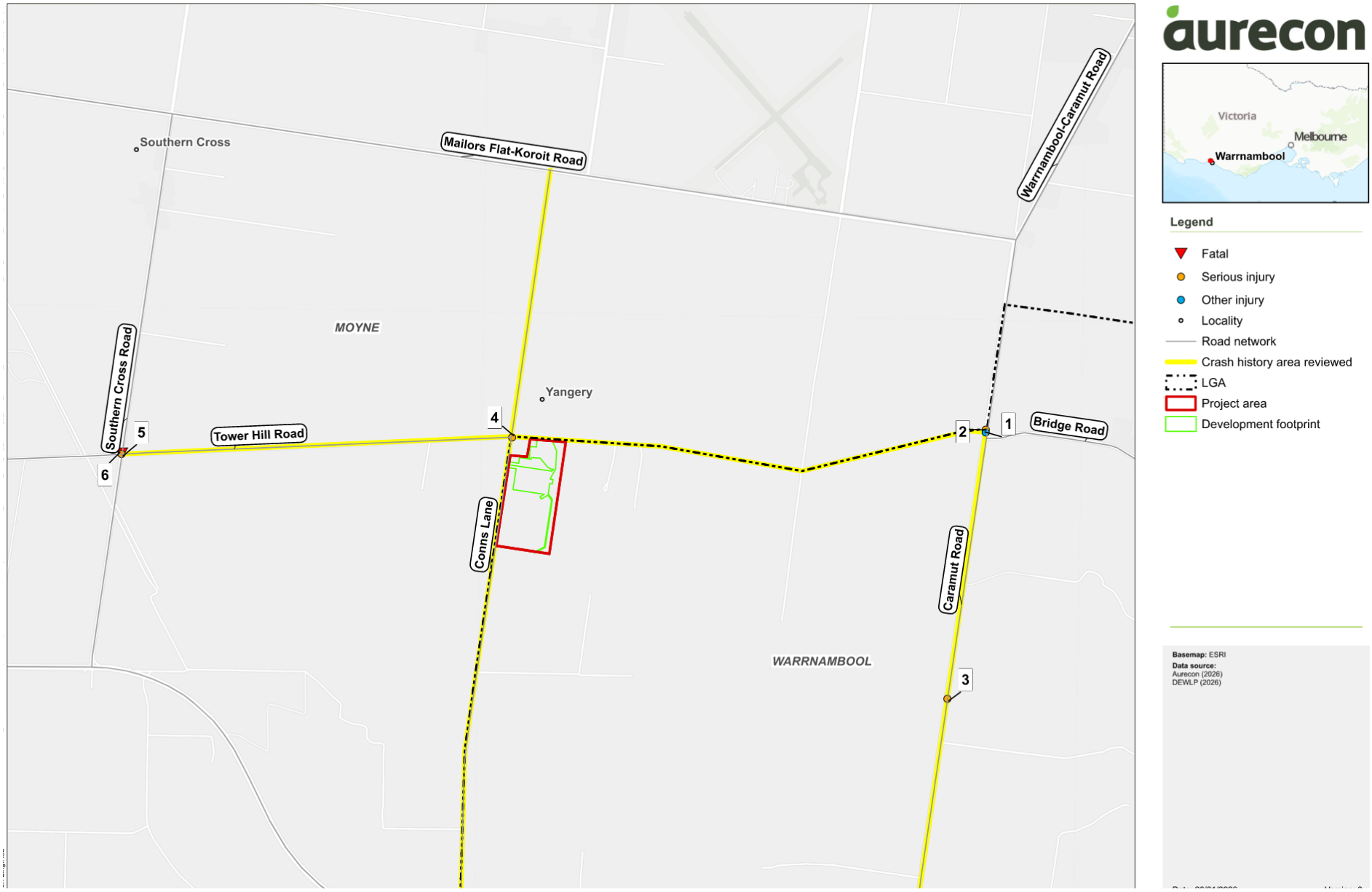

Figure 3-6 **Crashes in vicinity of site**

4 Development proposal

The proposed site layout includes two separate BESS areas plus a future BESS expansion. Each BESS area will be fenced and have at least two access points.

4.1 Site access

Access to the Project site (for all phases of the project) will be via two new accesses.

- Access 1: Tower Hill Road approximately 170 m east of Conns Lane – main construction and operations access (entry and exit).
- Access 2: Conns Lane approximately 180 m south of Tower Hill Road – secondary emergency access and additional construction vehicle exit.

The Tower Hill Road site access will lead directly to the northernmost BESS area, with access to the southernmost BESS area and future BESS expansion available through the northernmost BESS area. The Conns Lane access will lead direction to all three BESS areas. The internal access roads will all be at least 6 m wide.

4.2 Construction phase

The construction phase is expected to last 15 to 18 months, starting in January 2027. The construction phase is typically broken into stages based on the type of works, with different construction vehicle types and volumes in each stage.

4.2.1 Construction vehicle types

The vehicle types that could be expected to access site during construction are summarised below in Table 4-1.

Table 4-1 Anticipated construction vehicle types

Load Type	Vehicle Type
Construction workers	Light vehicle (LV)
Mobile plant	Low loader
Site office, site equipment containers, high voltage equipment, fuel	Semi-trailer
Concrete	Concrete agitator
Potable water	Heavy rigid water truck
Gravel	Truck and dog
Miscellaneous equipment and supplies	Heavy rigid vehicle
Main transformer	Platform trailer combination (see below)
BESS equipment	GML B-Double

The delivery of the transformer is expected to occur via a prime mover truck with a multiple axle low loader or platform ‘gooseneck’ trailer. The largest vehicle currently pre-approved for Caramut Road and Southern Cross Road can weigh up to 77 tonnes. Therefore, it would have a carrying capacity of 50-55 tonnes (assuming the vehicles weighs approximately 20 tonnes). Depending on the specific transformer and delivery vehicle, specific additional assessment for a OSOM permit may only be required for Tower Hill Road or Conns Lane (depending on the route chosen, refer to Section 5.2 for further discussion).

Notwithstanding the above, construction vehicle types will be confirmed following appointment of a construction contractor (following planning permit issuing). At the post approval stage, specific traffic management measures will be identified as required, and detailed in an appropriate Traffic Management Plan (TMP).

4.2.2 Vehicle origins and access routes

Construction delivery vehicles

Although to be confirmed once a contractor has been appointed, it is expected that the delivery of imported plant, equipment and materials will mostly originate from major population centres, quarries, and ports. Based on this assumption, heavy vehicles are expected to arrive from the following locations:

- Warrnambool
- McKinnon and Warrnambool quarries (as identified by the proponent for locally sourced aggregate, lime, sand, and other materials)
- Selected ports (Port of Portland, Port of Geelong, or Port of Melbourne) for the delivery of imported materials (such as the transformer)

For each port option, there are heavy vehicle approved access routes for delivery of plant, equipment, and materials (depending on their origin and vehicle size). The transformer delivery vehicle access route will depend on the characteristics of the confirmed vehicle and consultation with the relevant authorities including the National Heavy Vehicle Regulator (NHVR), Regional Roads Victoria, and DTP.

Specific access routes will be confirmed following selection of a preferred BESS supplier and construction contractor and detailed in an appropriate CTMP/TMP.

Construction workers

Based on information from other similar projects, approximately 50 full time construction workers each day could be expected during the peak of construction activities. Construction worker vehicle movements will depend on where workers live or are housed.

For the purposes of this assessment, it is assumed that approximately (based on the populations of these towns):

- 85 % will travel to/from Warrnambool
- 5% to/from Koroit, and
- 10 % to/from Port Fairy

Construction worker origins and access routes will be confirmed following selection of a construction contractor and detailed in an appropriate TMP. Light vehicles will utilise local and regional roads to access the site, with a preference to use major and arterial roads.

4.3 Operations phase

BESS facilities operate 24/7 and are monitored remotely in real-time and do not require dedicated staff to always be on-site. Staff will access the site periodically for inspections and maintenance activities. There will be two to three full time operational staff for rolling maintenance and troubleshooting activities. It is anticipated that two staff will be on site at any one time. Vehicles during the operations phase are expected to be mostly light vehicles (e.g. passenger cars, utility vans). Occasional heavy vehicles will likely be required during the operational period for major maintenance.

Operations staff vehicle origins and access routes will depend on where staff live, which is expected to be highly varied. Staff access route to the site in the vicinity of the site are expected to be the same as construction worker access routes.

The indicative site plan shows three parking spaces. The final number and location of parking spaces for the operations phase will be determined through detailed design.

4.4 Decommissioning

The Project is expected to be decommissioned 40 years post opening, with a replenishment after 20 years. Following decommissioning, the land will be rehabilitated. This will include the removal of all above ground non-operational equipment and rehabilitation of disturbed areas, in consultation with the landholder.

5 Car parking and access assessment

5.1 Car parking

5.1.1 Statutory requirements

Requirements for the provision of car parking are set out in Clause 52.06 of the Warrnambool Planning Scheme.

The scheme does not provide guidance on parking rates for BESS facilities (utility installation land use). In such circumstances, the scheme notes that car parking spaces must be provided to the satisfaction of the responsible authority.

5.1.2 Parking demand assessment

During the operations phase there is expected to be limited operational vehicles, with two to three operational staff visiting for rolling maintenance and troubleshooting activities. There are three parking spaces shown on the indicative layout plan. This satisfies the expected demand during the operations phase.

5.1.3 Parking layout

Design of the parking layout will be undertaken during detailed design and provided to the satisfaction of the Responsible Authority.

5.2 Access and route assessment

As noted in Section 4.1, primary access to the site for both construction and operation is proposed via a new entry/exit access on Tower Hill Road. A secondary access is proposed on Conns Lane as an additional construction vehicle exit and for emergency access. The preferred port for the transformer is not yet known. Regardless, it is expected that OSOM vehicles will approach the site via the Princes Highway.

The preferred access route for B-doubles and larger construction vehicles from the Princes Highway to the primary site access on Tower Hill Road is either Caramut Road or Southern Cross Road, as these roads are part of Victoria's gazetted B-double network and Conns Lane is not. It is noted that Tower Hill Road is not a pre-approved OSOM route or pre-approved for any low loader or platform trailer combinations and therefore, any structures or other obstacles along this route would need to be assessed as part of the NHVR permit/approvals process.

The Project will not have a permanent impact on traffic volumes, with temporary construction volumes approximating up to 112 additional vehicle movements per day during the peak construction period (expected to be around 16 weeks long within the 15 to 18-month construction period).

Alternatively, Conns Lane may be accessed directly from the Princes Highway south of the site. Conns Lane is not pre-approved for any heavy vehicle combinations (above general traffic which includes semi-trailer trucks). Therefore, any structures or other obstacles along this route would need to be assessed as part of the NHVR permit/approvals process. It is also noted that Conns Lane is only 4 m wide from approximately 40 m south of Tower Hill Road to approximately 900 m south of the site, at which point it widens to 6.2 m wide.

The site access routes will be discussed and confirmed with the appropriate Road Authorities. Construction access routes and any upgrades will be investigated and detailed in the CTMP. Specific OSOM delivery vehicle access routes will be confirmed following selection of a preferred BESS supplier and construction contractor and detailed in an appropriate CTMP/TMP.

5.2.1 Sight distance

The site access points are private accesses rather than intersections. Requirements for sight distance at property entrances is set out in *Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections (AGRD4A)* Section 3.4. The minimum requirement for non-domestic accesses is as per *AS 2890.1*, which provides distances for minimum gap sight distance (MGSD) with a desirable 5 s gap and minimum stopping sight distance (SSD) based on a 2 s reaction time.

Additionally under AGRD4A sight distances at accesses should aim to comply with the sight distance requirements for intersections if possible, namely safe intersection sight distance (SISD), minimum gap sight distance (MGSD) and approach sight distance (ASD), noting that it is not always possible due to constraints and therefore not mandatory.

Preliminary MGSD, SISD, and ASD checks were undertaken as a desktop assessment at the proposed site access points in accordance with the requirements in AGRD4A. It is noted there are vertical crests to the west of the site access on Tower Hill Road and to the north of the site access on Conns Lane limiting the available site distance to approximately 330 m and 190 m respectively (not taking the different driver and object measurement heights into consideration). The available site distance to the east of the Tower Hill Road access and south of the Conns Lan access are in excess of 500 m. As no survey is available at the time of this assessment, the location of crests and the grades of Tower Hill Road and Conns Lane have been estimated from Google Earth for the purposes of these preliminary sight distance checks. The sight distance is required to be reassessed in detailed design once all required information is available or a site visit undertaken.

MGSD

A preliminary check for the AS 2890.1 sight distance requirements for a 5 s gap was undertaken as a desktop assessment at the proposed site access points on Tower Hill Road and Conns Lane using publicly available information for a 100 km/h speed limit. This assessment found that both proposed access locations are likely to meet or exceed the minimum requirements.

- The minimum desirable MGSD is 140 m.
- Preliminary assessment indicates that the MGSD is met in both directions at both access points.

SISD

SISD is the minimum sight distance that should be provided on the major road at any intersection. While not mandatory it is desirable at property accesses (such as the site accesses), as set out in AGRD4A. The SISD input parameters were 100 km/h, reaction time 2 seconds, grade of road estimated from Google Earth.

- Tower Hill Road
  - The minimum SISD for trucks is in the order of 310 m to the east of the access and 350 m to the west of the access and the minimum SISD for cars is in the order of 250 m to the east of the access and 270 m to the west of the access.
  - Preliminary assessment indicates that the SISD to the east is met however, the SISD to the west is met for cars but not met for trucks due to the vertical crest (approximately 330 m available, not taking the different driver and object measurement heights into consideration).
  - At a speed limit of 80 km/h, SISD for trucks to the west is in the order of 320 m. This is available.
- Conns Lane
  - The minimum SISD for trucks is in the order of 350 m to the north of the access and 270 m to the south of the accesses and the minimum SISD for cars is in the order of 270 m to the north and 230 m to the south.
  - Preliminary assessment indicates that the SISD to the south is met however, the SISD to the north is unlikely to be met due to the vertical crest (with approximately 190 m available, not taking the different driver and object measurement heights into consideration).

- At a speed limit of 80 km/h, the SISD for trucks to the north is in the order of 240 m and for cars is in the order of 190 m. This is not available for trucks but is for cars.

ASD

ASD is the minimum level of sight distance available on road approaches at intersections to ensure that drivers are aware of the presence of an intersection. It is not mandatory at property accesses (such as the site accesses) but is desirable. The ASD input parameters were 100 km/h, reaction time 2 seconds, grade of road estimated from Google Earth.

- Tower Hill Road
  - The ASD for trucks is in the order of 200 m to the east and 220 m to the west and the ASD for cars is in the order of 170 m to the east and 180 m to the west.
  - Preliminary assessment indicates that the ASD is met for both cars and trucks in both directions.
- Conns Lane
  - The ASD for trucks is in the order of 220 m to the north and 170 m to the south and the ASD for cars is in the order of 180 m to the north and 150 m to the south.
  - Preliminary assessment indicates that the ASD for cars is met. It also indicates that the ASD for trucks to the south. However, ASD to the north is not met due to the vertical crest and downhill grade of Conns Lane (with approximately 190 m available at Access 1, not taking the different driver and object measurement heights into consideration).
  - At a speed of 80 km/h, the ASD for trucks to the north is in the order of 150 m. This is available.

Summary

Both site access points are expected to meet MGSD sight distance requirements, which are the absolute minimum requirement for the private site accesses. However, the desirable SISD and the ASD are constrained to the east of the Tower Hill Road access and the north of the Conns Lane access due to crests.

Sight distance could be improved by several means if considered necessary as part of further investigation. Means to improve visibility could include relocating the site accesses further from the crest, reducing the speed limit in the vicinity of the site (either temporarily during construction only or permanently), advanced warning signs (concealed driveway signs). It is recommended that comprehensive sight distances checks are undertaken during detailed design once all required information is available, and mitigation measures considered if necessary.

5.2.2 Swept path assessment

As noted in Section 4, the heavy vehicles that are expected to service the site during construction are up to 25 metre B-double trucks. In addition to these trucks, a transformer delivery vehicle will also access the site once during construction for the delivery of the transformer. These are expected to primarily access the site via the primary access on Tower Hill Road, with some exiting the site via the Conns Lane access. The origin and destination of these vehicles is currently unknow.

A preliminary swept path assessment was undertaken at the Tower Hill Road / Conns Lane intersection for a B-double (largest regular construction vehicle). The swept paths are shown in Figure 5-1 and Figure 5-2.

Swept paths have not yet been undertaken at the site accesses as they have not yet been designed. This is expected to be undertaken during detailed design to confirm suitability of the accesses.

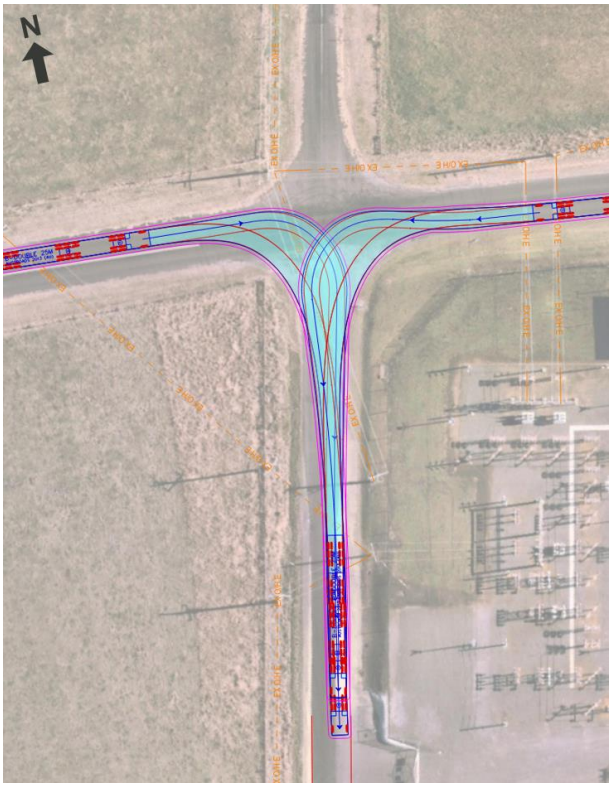

Figure 5-1 Tower Hill Road / Conns Lane - B-Double Left/Right Turn into Conns Lane

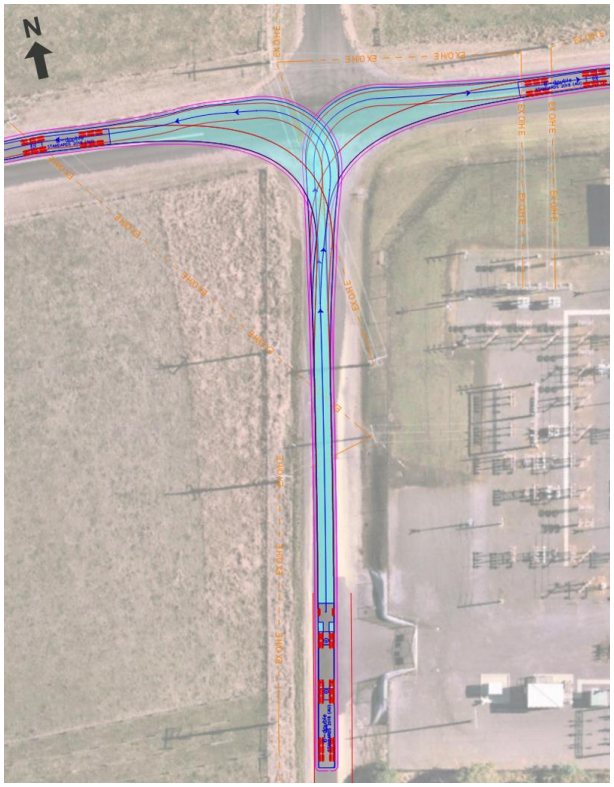

Figure 5-2 Tower Hill Road / Conns Lane - B-Double Left/Right Turn out of Conns Lane

Based on the above the following is noted:

- The Tower Hill Road / Conns Lane intersection may require minor temporary widening or clearing to accommodate the swept paths of larger vehicles turning to and from Conns Lane during construction should this be required. Any impacts to signs and other roadside furniture will be confirmed during detailed design.
- The site access used for construction will be designed to accommodate up to and including B-Doubles during construction. Any traffic management required will be detailed in the CTMP/TMP.
- The secondary access crossover (on Conns Lane) will be designed to accommodate the largest fire emergency vehicle, in consultation with the CFA.
- Any widening required for the OSOM delivery vehicle will be assessed following confirmation of the specific vehicle and access route and detailed in an appropriate CTMP/TMP, noting that this vehicle is expected to operate once and under specific permit conditions which may include road closures to all other vehicles.

5.2.3 Height clearance

The transformer delivery vehicle may have a minimum vertical clearance requirement in excess of 5 m, noting that transformers range in size and the transformer and delivery vehicle are unknown at this stage. Larger height loads may impact overhanging vegetation, structures and / or breach clearance zones around power lines. For any vehicles exceeding regulatory height levels, permits will be required to ensure that passage can be managed appropriately.

5.2.4 Emergency vehicle access

As noted in Section 4 there will be two site accesses with 6 m wide internal access roads. The main site access is on Tower Hill Road with a secondary (emergency) access on Conns Lane. All separately fenced BESS areas within the site have at least two access points each.

Internal access to the proposed BESS facility is expected to comply with the access requirements of the CFA *Design Guidelines and Model Requirements, Renewable Energy Facilities, Version 4, August 2023* noting the compliances and/or recommended changes associated with transport specifically. Initial consultation has been undertaken with the CFA on the Project in general. Whilst the design is not yet at a stage where it can be assessed against the specific access requirements the Proponent will ensure these requirements are reflected in the detail design phase of the project in consultation with the CFA.

6 Traffic impact assessment

The following section sets out the expected traffic volumes, and subsequent impacts to the road network during the peak project stage.

6.1 Construction phase

6.1.1 Traffic generation

Construction work is expected to be undertaken six days a week and will generally occur during the following construction hours:

- Monday to Friday 7:00 am – 6:00 pm
- Saturday 8:00 am – 1:00 pm

Based on similar scale BESS projects[1], an indicative assumption of construction worker numbers and heavy vehicles deliveries accessing the site on a typical day during the 16-week peak construction period is:

- 50 workers
- 6 heavy vehicles (deliveries)

Workers (LVs)

To determine the weekday peak hour worst-case LV traffic volumes generated by the project, it is assumed:

- all workers will commute via individual light vehicles (LV)
- workers travel to site between 6:00 am – 7:00 am and from site between 6:00 pm – 7:00 pm (representing the AM and PM project peak hours for workers).

Therefore, the typical peak traffic generation for LVs is:

- 50 travelling to the site in the AM peak hour.
- 50 travelling from the site in the PM peak hour.
- 100 LV movements per day (two-way).

Construction delivery vehicles (HVs)

It is assumed that HV trips will be spread out across the day during construction hours. Approximately 6 HVs delivering materials/components are expected per day across an 11-hour work day, excluding peak road network hours. Therefore, there is expected to be up to two HV movements per hour during the peak construction stage (one 'in' and one 'out', assuming a HV can load/unload in an hour.

Total traffic generation

The total traffic generation for a typical peak construction day and weekday peak hours are summarised in Table 6-1.

Table 6-1 Peak construction phase typical daily traffic generation

Vehicle type	AM Peak (one-way)	PM Peak (one-way)	Daily (two-way)
LV	50	50	100
HV	-	-	12
Total	**50**	**50**	**112**

[1] Bennetts Creek BESS

6.1.2 Traffic distribution

Workers (LVs)

For the purposes of this assessment the assumed worker distribution and access routes to/from each town are as below and shown in Figure 6-1 (noting these are subject to change).

- 85% to/from Warrnambool: Raglan Pde → Caramut Rd → Tower Hill Rd
- 5% to/from Koroit: High St → Lake St → Lake View Rd → Tower Hill Rd
- 10% to/from Port Fairy: Princes Hwy → Southern Cross Rd → Tower Hill Rd

Figure 6-1 **Potential construction worker routes**

Construction delivery vehicles (HVs)

Typical daily construction vehicles are assumed to originate from either Warrnambool (route as per workers) or the Warrnambool Quarry (via Southern Cross Road to Tower Hill Road), with vehicles originating from ports assumed unlikely to be a daily occurrence.

As the split of vehicle types and origins are not currently known for the purposes of this assessment it has been assumed the six heavy vehicles per day are four vehicles from Warrnambool to site and two from the Warrnambool Quarry to site (located approximately 21 km north-west of site).

6.1.3 Traffic impact summary

The peak construction period (worst case) traffic generation and distribution discussed above have been applied to the key roads, resulting in the indicative additional traffic volumes shown in Table 6-2. Actual traffic generation and distribution may vary depending on the final design, construction program, and once a contractor and access routes are confirmed.

Tower Hill Road is a collector road which is currently operating well below capacity and therefore able to accommodate this temporary increase in traffic volume. Additionally, with traffic management during construction the estimated increase in traffic volumes is not expected to notably impact the operation of the surrounding road network. Regardless, it is recommended that the CTMP consider the potential for interaction between construction traffic and school buses, and where necessary identify reasonable traffic controls or mitigation measures.

Table 6-2 Indicative additional traffic volume increase

Road	Peak Hour			Daily		
	LV	HV	Total	LV	HV	Total
Raglan Pde	43	-	**43**	86	8	**94**
Caramut Rd	43	-	**43**	86	8	**94**
Tower Hill Rd (east of Conns Ln)	43	-	**43**	86	8	**94**
Tower Hill Rd (west of Conns Ln)	8	-	**8**	16	4	**20**
High St	3	-	**3**	6	0	**6**
Lake St	3	-	**3**	6	0	**6**
Lake View Rd	3	-	**3**	6	0	**6**
Princes Hwy	5	-	**5**	10	0	**10**
Southern Cross Rd	5	-	**5**	10	4	**14**

Additionally, a CTMP will be prepared and implemented to communicate and manage the routes which workers and heavy vehicles will utilise during construction, to reduce and/or manage any potential impact from construction and operations vehicles on roads which are not suitable for use.

6.2 Operations and maintenance phase

During the operations phase there is expected to be limited operational vehicles, with two to three operational staff visiting for rolling maintenance and troubleshooting activities (up to approximately six vehicle movements per day, per occasion). Therefore, the operational phase traffic is expected to have a negligible impact on the road network.

6.3 Decommissioning phase

Decommissioning is expected to occur 40 years from opening. It is expected that the decommissioning phase will generate less traffic than the construction phase and will therefore have a lesser impact.

Details of the decommissioning process and the associated traffic impacts will be outlined in a Decommissioning Management Plan that will be prepared prior to the commencement of the decommissioning.

7 Summary

On the basis of the above discussion and analysis, the following is summarised for the traffic and transport considerations for the Project.

- Two access points are proposed for the site, a primary access on Tower Hill Road and a secondary access on Conns Lane, via new crossovers. These access points will be used for both construction vehicles and operational vehicles.
- A preliminary sight distance check has been undertaken.
  - Minimum gap sight distance is met at both accesses (which is the absolute minimum requirement for private site accesses).
  - The crests on Tower Hill Road to the west and the crest on Conns Lane to the north constrain available sight distances beyond the minimum required minimum gap sight distance. For a 100 km/h speed limit:
    - safe intersection sight distance is unlikely to be met in these directions at either access (approximately 20 m less than truck minimum available west of Tower Hill Road access but is met for cars and approximately 160 m less than truck minimum available north of Conns Lane access).
    - approach sight distance should be met for the Tower Hill Road access but is unlikely to be met at the Conns Lane access (approximately 30 m less than truck minimum available north of Conns Lane access).
  - For an 80 km/h speed limit:
    - safe intersection sight distance is met at the Tower Hill Road access but is only met for cars at the Conns Lane access (approximately 50 m less than truck minimum available north of Conns Lane access).
    - approach sight distance met for cars and trucks at both accesses.
  - It is recommended that comprehensive sight distances checks are undertaken during detailed design once all required information is available, and mitigation measures for construction and/or operations are considered if required to facilitate reasonable sight distance for the accesses.
- A preliminary swept path assessment has been undertaken.
  - The Tower Hill Road / Conns Lane intersection may require temporary widening or clearing to allow for vehicles up to B-Doubles to turn during construction if this is required.
  - The site access used for construction will be designed to accommodate up to and including B-Doubles on a regular basis during construction. Any traffic management required will be detailed in the CTMP/TMP.
  - The secondary access crossover will be designed to accommodate the largest fire emergency vehicle, in consultation with the CFA.
  - Any additional widening required for the OSOM delivery vehicle will be assessed following confirmation of the specific vehicle and access route and detailed in an appropriate CTMP/TMP, noting that this vehicle is expected to operate under specific permit conditions which may include road closures to all other vehicles.
- During the operational phase staff will only access the site periodically for routine maintenance and inspection activities.
  - The project is expected to generate up to six light vehicle movements per day per visit during this phase. Therefore, the operations phase is not expected to have a noticeable impact on the capacity or safety of the surrounding road network.
  - The car park provision and layout for the operations phase will be determined during detailed design. There is sufficient space on the site to provide parking.

- During the peak construction period (16 weeks duration) the project is estimated to generate the following vehicle movements:
  - 50 ‘in’ light vehicle movements in the AM peak
  - 50 ‘out’ light vehicle movements in the PM peak
  - 6 heavy vehicle trips (12 movements) per day across construction hours, outside the AM and PM road network peak hours.
- Construction phase movements are expected to originate from surrounding towns including:
  - Light vehicle trips to/from Warrnambool , Koroit, and Port Fairy
  - Heavy vehicle trips to/from Warrnambool, Warrnambool Quarry, and Port of Melbourne, Geelong, or Port Fairy.
- The temporary increase in traffic volumes on the key access roads due to the construction phase vehicle movements are expected to be manageable with no material impact on the operation of the local road network given the current low volumes.
- It is recommended that suitable road improvements considered necessary to facilitate construction vehicle access, if any, are investigated and documented as part of a Construction Traffic Management Plan (CTMP) to the satisfaction of the responsible authority. Additionally, the CTMP should be implemented to communicate and manage the routes which workers and heavy vehicles will utilise during construction.
- The transformer delivery vehicle access route will depend on the characteristics of the confirmed vehicle, confirmed port, and consultation with the relevant authorities. The longest potential route expected is from the Port of Melbourne or Port of Geelong to the site. Most of the anticipated route from either port comprises roads with pre-approval for low loader vehicles up to 77 tonnes. However, there are numerous structures along these routes with varying approval conditions or restrictions for platform trailers, depending on the vehicle configuration. Specific access routes will be confirmed following appointment of a construction team and detailed in an appropriate CTMP/TMP.

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