Appendix E – Traffic Impact Assessment

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Bringing ideas to life

Wooreen Battery Energy Storage System

Traffic Impact Assessment

EnergyAustralia

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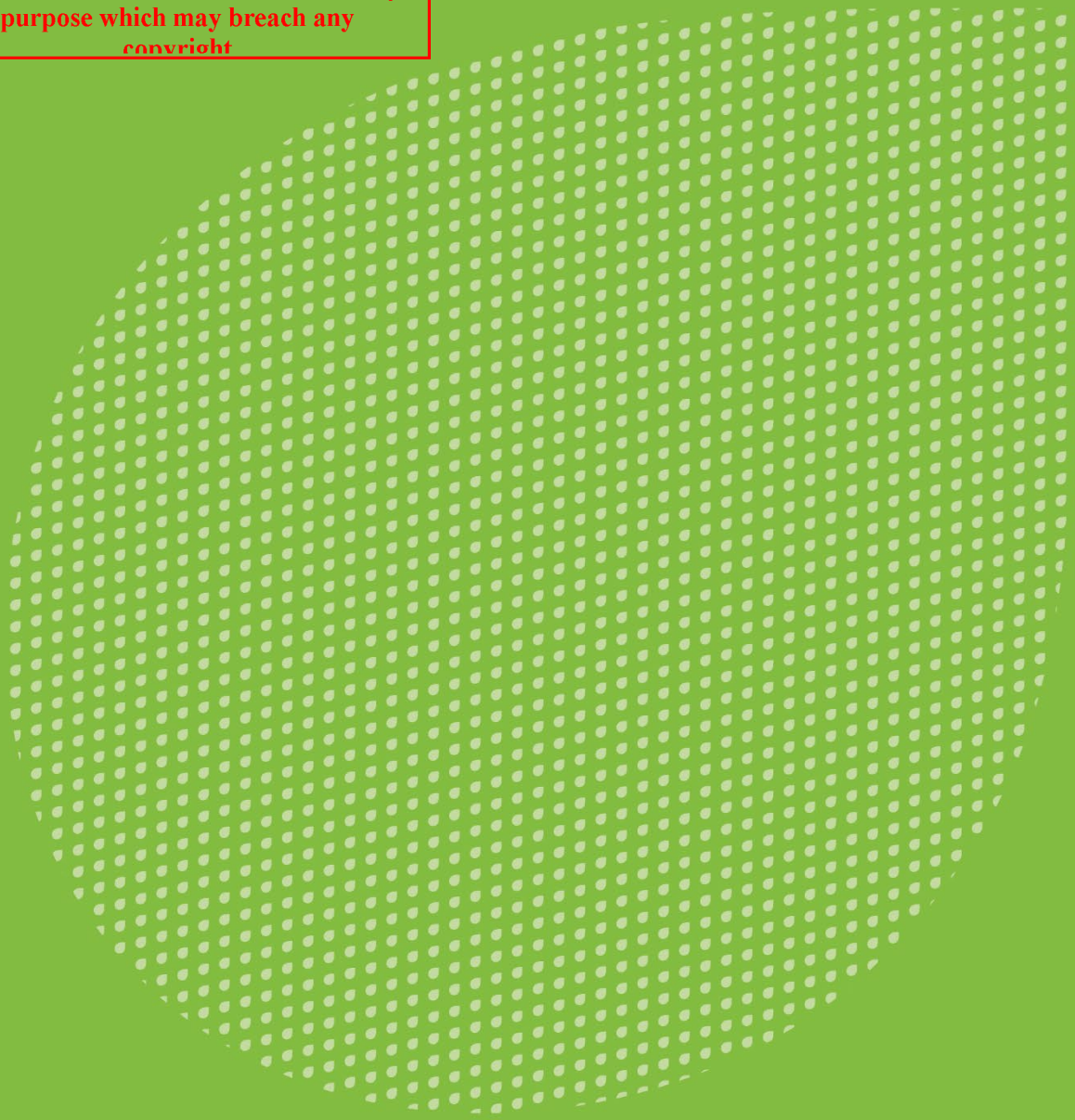

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Executive Summary

Aurecon was commissioned by EngergyAustralia to undertake a Traffic Impact Assessment (TIA) to inform the design and planning approvals for the proposed Wooreen Battery Energy Storage System (WESS) at their existing Jeeralang Power Station site near Morwell in the Latrobe Valley, eastern Victoria.

The summary of the analysis is as follows:

- Two port options (Port of Melbourne and Port of Hastings) are feasible with several convenient heavy vehicle approved access routes exist for access to the proposed WESS facility from Morwell;
- The proposed two parking bays will be able to accommodate the 2 maintenance and operation staff related to the WESS site that visit infrequently. If staffing requirements change from what has been assumed in this TIA, then parking requirements may need to be revised;
- Construction phase vehicles are expected to be able to appropriately access the site via the existing access point for the Jeeralang Power Station noting:
  - 19 metre semi-trailers and/or B-double trucks cannot turn concurrently at the intersection of Monash Way and Bonds Lane with the existing intersection layout. Traffic management will be required to control turning movements such that they do not occur concurrently;
  - 19 metre semi-trailers and/or B-double trucks cannot turn concurrently at the existing Jeeralang Power Station access. Traffic management should be provided as appropriate to control turning movements into and out of the site such that they do not occur concurrently;
  - The largest delivery vehicle (prime mover with multiple axle low platform trailer) is expected to appropriately access the site via Monash Way and Bonds Lane, with these movements to be addressed by way of an approved Construction Traffic Management Plan (CTMP) or Traffic Management Plan (TMP) to be prepared by the construction contractor;
  - It is recommended that height clearances are confirmed along the relevant access routes, noting that the example transformer delivery vehicle is expected to have a minimum vertical height clearance in excess of 5 metres.

  Notwithstanding the above, any required traffic management treatments and mitigation works are to be identified and addressed by way of an approved CTMP or TMP which is the responsibility of the Proponent but to be prepared by the construction contractor. These should be prepared in consultation with the road management authorities;
- The WESS proposal is expected to comply with access requirements of the CFA. A BMP and / or EMP are commended to be completed in consultation with the CFA during the Project's detailed design;
- The proposed Project is estimated to generate the following vehicle movements during the peak construction period. This will be confirmed based on a construction program when a construction contractor is engaged:
  - 130 light vehicle one-way movements per day (260 vehicle movements per day);
  - 30 heavy vehicle one-way movements per day (total 60 vehicle movements per day).
- Construction traffic is expected to have minimal impact to traffic flow on Monash Way and Tramway Road and the LoS is anticipated to remain above the minimum desired LoS C;
- Construction phase vehicle movements are expected to be accommodated at the Monash Way / Bonds Lane intersection and the Jeeralang Power Station access. However, traffic management will need to be provided to enable concurrent turning movements of heavy vehicles at both locations;
- Operation and maintenance vehicle movements could not be expected to notably impact the capacity or safety of these roads and the surrounding road network.

1 Introduction

1.1 Background

EnergyAustralia (EA) is considering its future portfolio in Victoria given evolving consumer requirements, diversity in distributed energy resources, and the need for more flexible capacity given increasing use of renewables in the National Electricity Market (NEM). One component of the portfolio diversification is developing new Wooreen Battery Energy Storage Systems (WESS).

EA has committed to building a BESS with a rating up to 1400MWh, providing electricity back into the grid at 350MW for a maximum of 4hours, which will be one of the largest operational batteries in Victoria. EA's gas-fired Jeeralang Power Station, located in the Latrobe Valley, has been selected as the preferred location for the new WESS development. This was based on the planned Yallourn Power Station's closure in mid-2028, land availability and optimal connection to the grid.

Aurecon Australia Pty Ltd (Aurecon) has been engaged by EA to prepare a Traffic Impact Assessment of / to inform the construction and operation of Stage 2 of the WESS development (proposal).

1.2 Scope and Purpose of this assessment

This report sets out an assessment of the anticipated traffic and transport implications and parking requirements of the Project, including consideration of the following:

- Traffic movements generated by the Project during construction, commissioning, operation and maintenance phases
- Adequacy of proposed access arrangements and impacts to the wider local road network, including construction, operation, and maintenance phases
- Requirements for car parking at the site

Over the course of preparing this assessment, a desktop review of the subject site and its environs has been completed, and all relevant traffic data collected and analysed.

Relevant standards and guidelines relied on have been referenced as necessary throughout this report.

2 Existing Conditions

2.1 Site Context

This section provides a description of the Project area, locality, and the broader geographical context of the proposal.

The proposed location for the Project is within the municipality of City of Latrobe, as shown below in Figure 1.

The Project will be located at:

- Part of Jeeralang A and B Gas Power Plant (SPI: 2F~A\PP2749) 30 Bonds Lane, Hazelwood North 3840. Certificate of Title Volume 11919 Folio 204). Owned by EnergyAustralia Pty Ltd
- Part of Monash Way Plantation (SPI: 2E~A\PP2749) Monash Way, Hazelwood North 3840. Certificate of Title Volume 11740 Folio 187). Owned by Department of Treasury and Finance Victoria

The project land (inclusive of both sites) is located approximately 4.5km south of central Morwell and 4km north of Churchill. The smaller regional community of Hazelwood North is located approximately 4.5km to the east of the proposed site.

The site includes the Jeeralang gas turbine power station. The local area is predominantly used for energy generation and distribution with Hazelwood Terminal Station directly adjacent the proposal site, Loy Yang Power Station to the east and the now decommissioned Hazelwood Power Station to the west.

Beyond energy related uses, the broader area can be characterised as farmland with regional townships including Morwell, Traralgon and Moe to the north west and north east, and Churchill south of the Project Land.

Bonds Lane runs directly adjacent the site connecting Monash Way to the west and Tramway Road to the east and includes two existing vehicle access points located toward the north western corner of the site, and an unused gate into the site adjacent to the Tramway Road intersection.

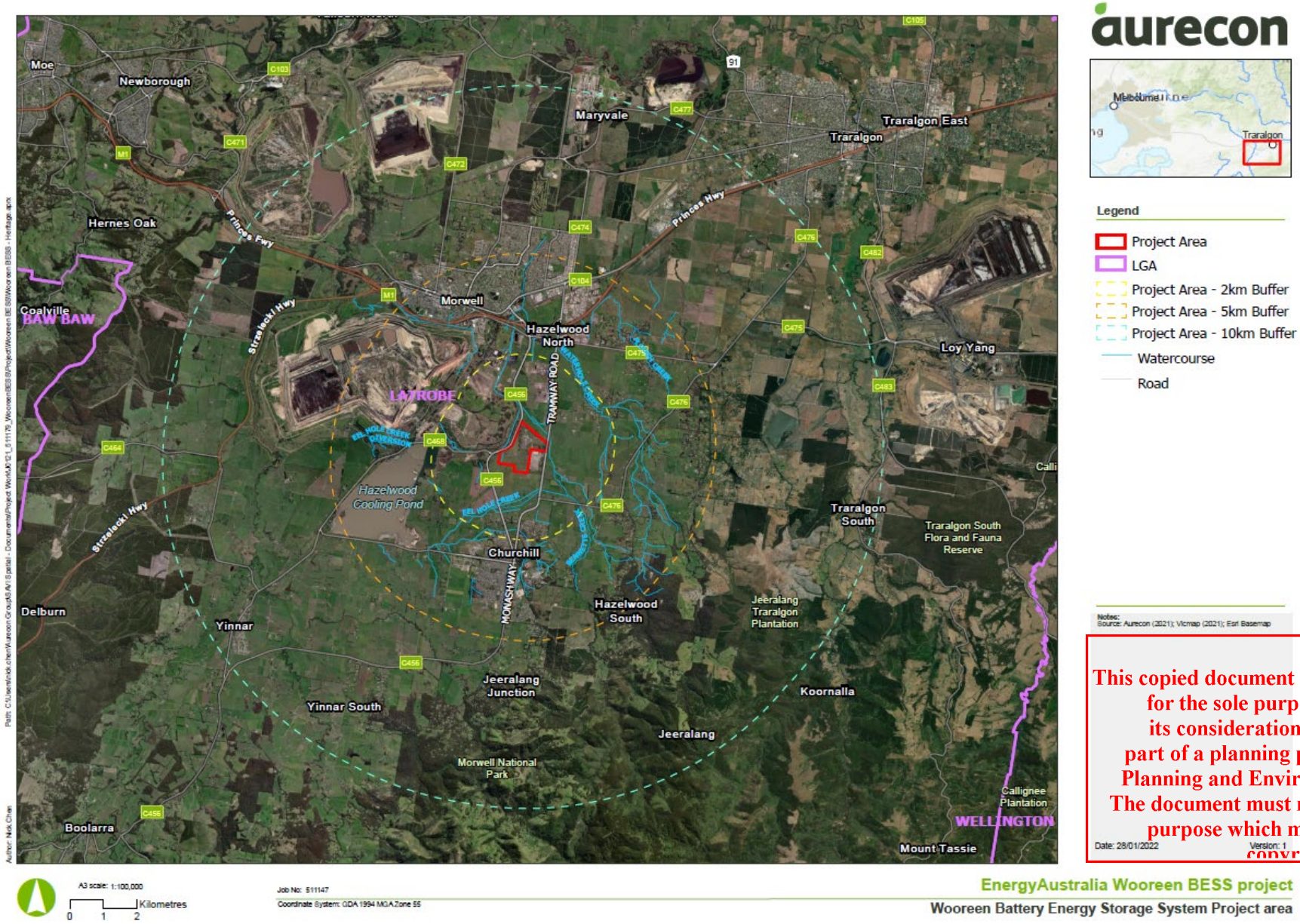

Figure 1 WESS Project Site and Local Context

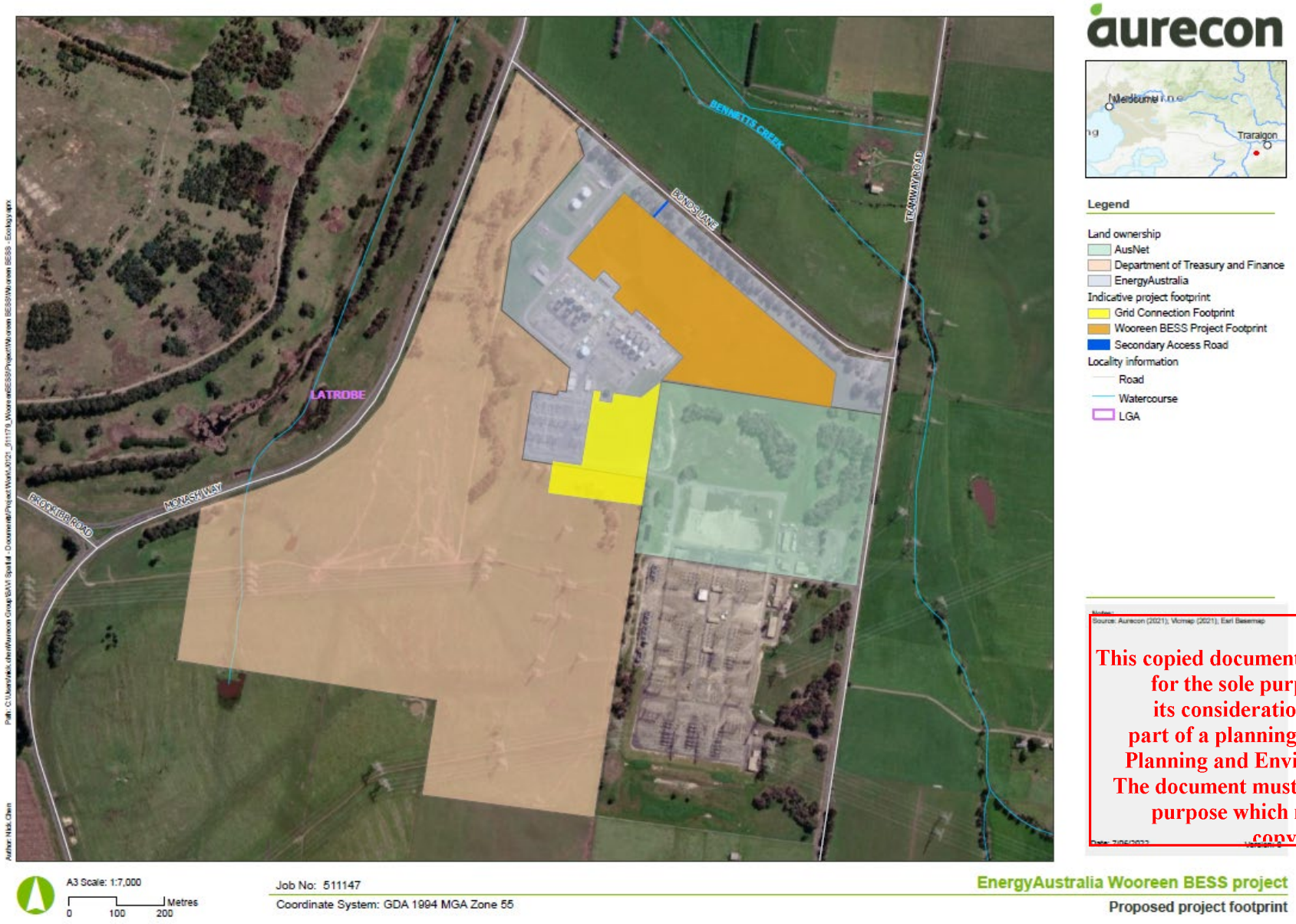

Figure 2 WESS Project Land and Indicative Footprint

2.2 Transport Network

2.2.1 Road Network

1.1.1.1 Monash Way

Monash Way is an arterial road generally aligned north-west to south-east and is located to the west of the proposal site. It comprises a single seven-metre-wide two-lane two-way sealed carriageway with two metre paved shoulders and is generally set within a 20 m road reserve (in the vicinity of the site and approximate). There is no provision for bicycles or pedestrians along this section of Monash way.

Monash Way provides a connection between Morwell to the north and townships to the south such as Churchill and Boolarra. It also provides connections to the Jeeralang Power Station, and the now decommissioned Energy Brix (Morwell) and Hazelwood power stations.

Monash Way has a 100 km/hr posted speed limit and carries in the order of 10,000 vehicles per day including 7% Heavy Vehicles (HV)[1].

1.1.1.2 Tramway Road

Tramway Road is an arterial road aligned north to south and is located to the east of the proposal site. It comprises of a single seven-metre-wide two-lane two-way sealed carriageway with one metre wide gravel shoulders. There is no provision for pedestrians or cyclists along this section of Tramway Road.

Tramway Road provides a connection between the eastern side of Morwell in the north and Churchill in the south. In Churchill, Tramway Road intersects with Monash Way.

Tramway Road has a 100 kilometre per hour posted speed limit and carries in the order of 4,800 vehicles per day with 12% HV[1].

1.1.1.3 Bonds Lane

Bonds Lane is a local road aligned north-west to south-east along the northern boundary of the site and connects Monash Way to Tramway Road. It comprises a single seven metre wide two-lane two-way sealed carriageway with no shoulders. There is no provision for pedestrians or cyclists along Bonds Lane.

There is no publicly available traffic data for Bonds Lane. However, given that this road connects Monash Way to Tramway Road, which are both aligned in the same direction, it is unlikely that there would be any significant traffic volumes along this road as it is expected to carry local traffic only (generated by the existing Jeeralang Power Station).

1.1.1.4 Public Transport Network

There are currently no active public transport stops along Monash Way, Tramway Road or Bonds Lane in the vicinity of the site. However, the Bus Route 2 from Morwell to Churchill runs along Tramway Road east of the site (blue route in Figure 3).

[1] VicRoads Open Data Traffic Volume Data.

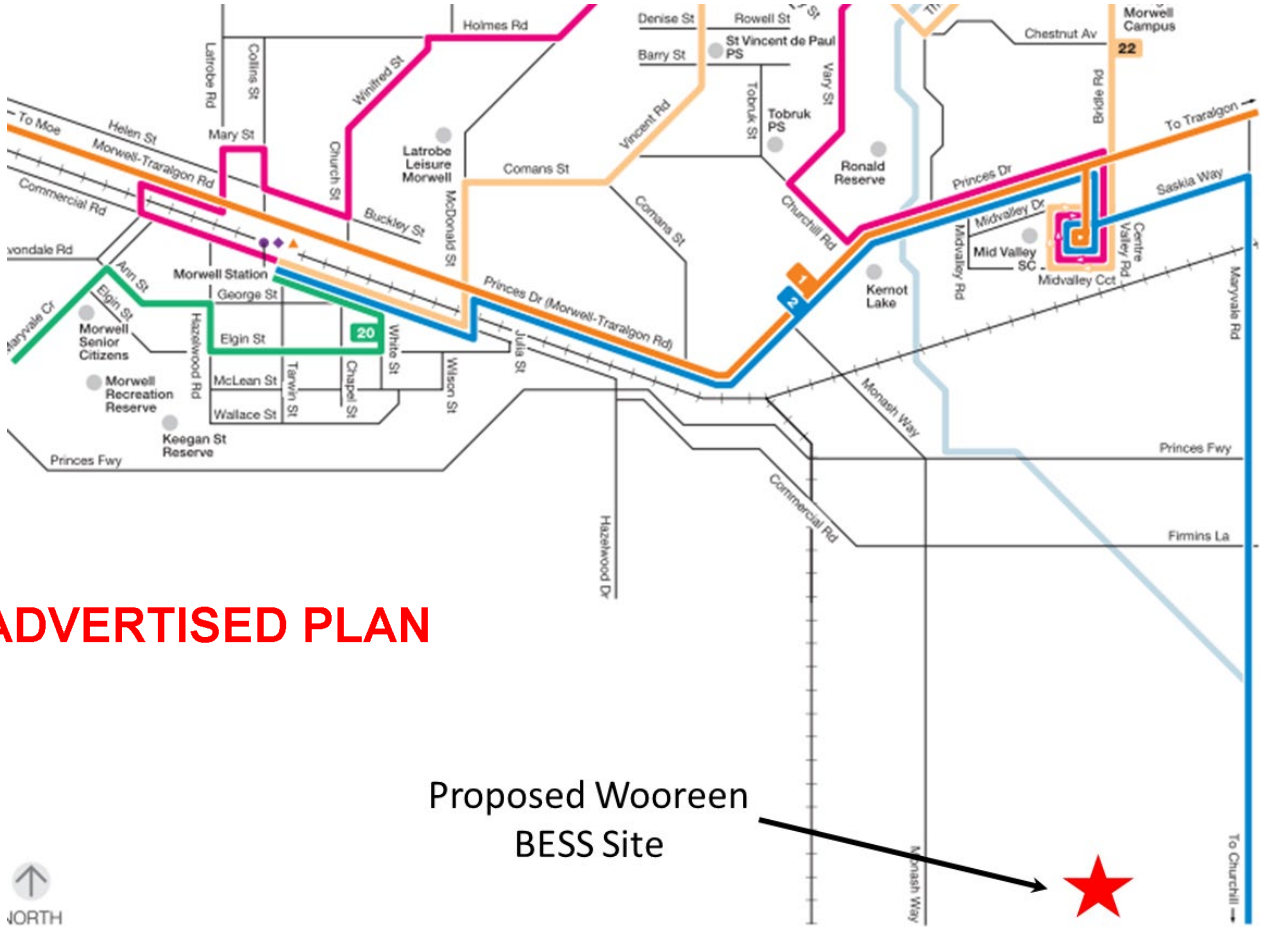

Figure 3 Morwell Public Transport Network (source: Public Transport Victoria, 2019)

2.3 Traffic Volumes

2.3.1 Monash Way

Existing traffic data for Monash Way and Tramway Road has been collated from VicRoads open data traffic volumes (2020) and summarised in Table 1.

Table 1 Monash Way – Existing Traffic Volumes

Location	Direction	AM peak	PM peak	Daily
Monash Way (btwn Commercial Rd & Brodribb Rd)	Northbound	490 vph	470 vph	4,800 vpd (10% HV)
	Southbound	360 vph	520 vph	5,200 vpd (7% HV)
Tramway Road (btwn Churchill-Traralgon Rd & Ly Yang – Morwell Rd)	Northbound	260 vph	260 vph	2,600 vpd (15% HV)
	Southbound	220 vph	220 vph	2,200 vpd (16% HV)

* vph (vehicles per hour), vpd (vehicles per day), HV (heavy vehicles), data rounded to nearest 10 vehicles.

Peak volumes are assumed to be 10% of the daily traffic, in line with average rural daily traffic patterns.

2.4 Crash History

In order to assess any road safety issues around the site, the last available five year period (between the start of 2015 and the end of 2019)[2] of crash history has been analysed. The crash type and severity breakdowns and locations are illustrated in Figures 4 and 5 respectively.

It is shown there have been 12 crashes recorded near the proposal site. One accident resulted in a fatality and five of these resulted in serious injuries. Collisions with other vehicles were the most common type of crash in this period, with five occurrences, two of which resulted in serious injuries. There were two vehicle roll overs in this time period, one of which was a motorcycle and resulted in a fatality. The fatality occurred on Fourth Road on private land in the Carter Holt Harvey site. It is thereby concluded that there is not an existing safety concern on roads providing access to the site.

Of these crashes, one 'other injury' crash was located at the Monash Way / Bonds Lane intersection, which will be impacted by the proposed construction routes.

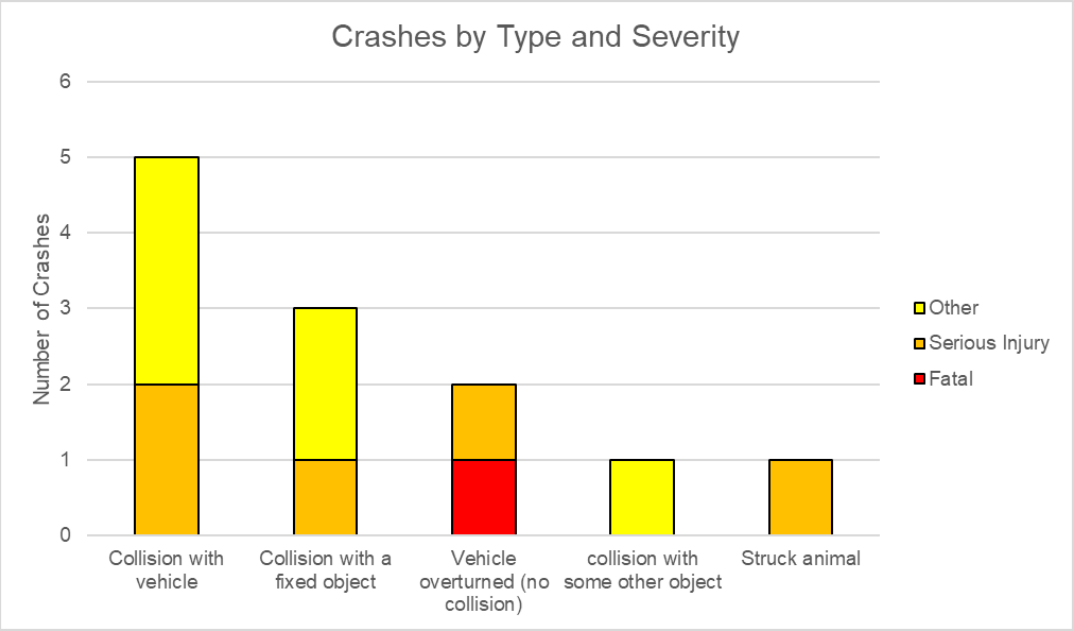

Figure 4 Crashes between 2015-2019 (inclusive) within crash investigation area

[2] Department of Transport Crash Stats - Data Extract (accessed June 2021)

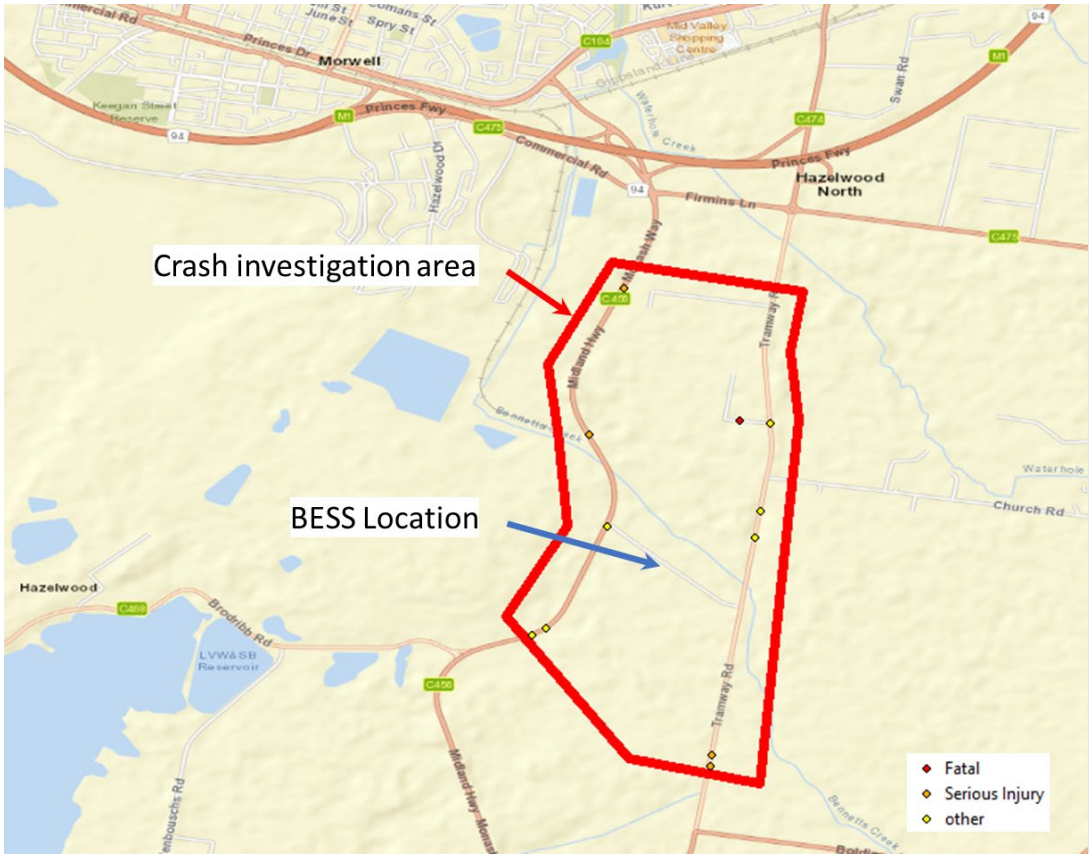

Figure 5 Location of crashes

3 WESS Proposal

3.1 Development Proposal

The WESS primarily relates to the construction of battery storage enclosures (battery cells that are situated in enclosures). The WESS will be rated up to 1400MWh providing electricity back into the grid at 350MW for a maximum of 4 hours. The following contains an indicative list and quantities of the elements required to enable the WESS to function:

- Approx. 280 BESS enclosures (or equivalent) equating to 1400MWh of lithium batteries with low voltage inverters and 33kV to low voltage transformers
- A 220/33 kV substation including two 220kV/33kV transformers, 220 kV isolators and auxiliary services such as two 33 kV zig-zag transformers
- One 220kV overhead powerline proposed to connect the BESS transformers to the switchyard
- One control room likely located adjacent to the BESS enclosures
- Four 33kV switchrooms likely located adjacent to the BESS enclosures
- Provision of an office, an operation and maintenance shed/room, and two car parking spaces for maintenance staff
- Multiple noise walls approx. 6m in height
- Secondary access from Bonds Lane into the WESS facility
- Installation of fire detection equipment
- Perimeter road encompassing WESS footprint and internal roads for access
- Retention pond and/or water storage tank
- Replace internal fencing and install CCTV
- Temporary construction laydown areas

It is understood that part of the AusNet site may be used for construction laydown under clause 62.02 of the Planning Scheme but will not form part of the Project Land for Permanent Works. For both construction and operation, the existing Jeeralang Power Station access will be used to access the site. An additional secondary access will be provided directly into the WESS site which will also provide access to the WESS site. Figure 6 illustrates the proposed site layout and access points.

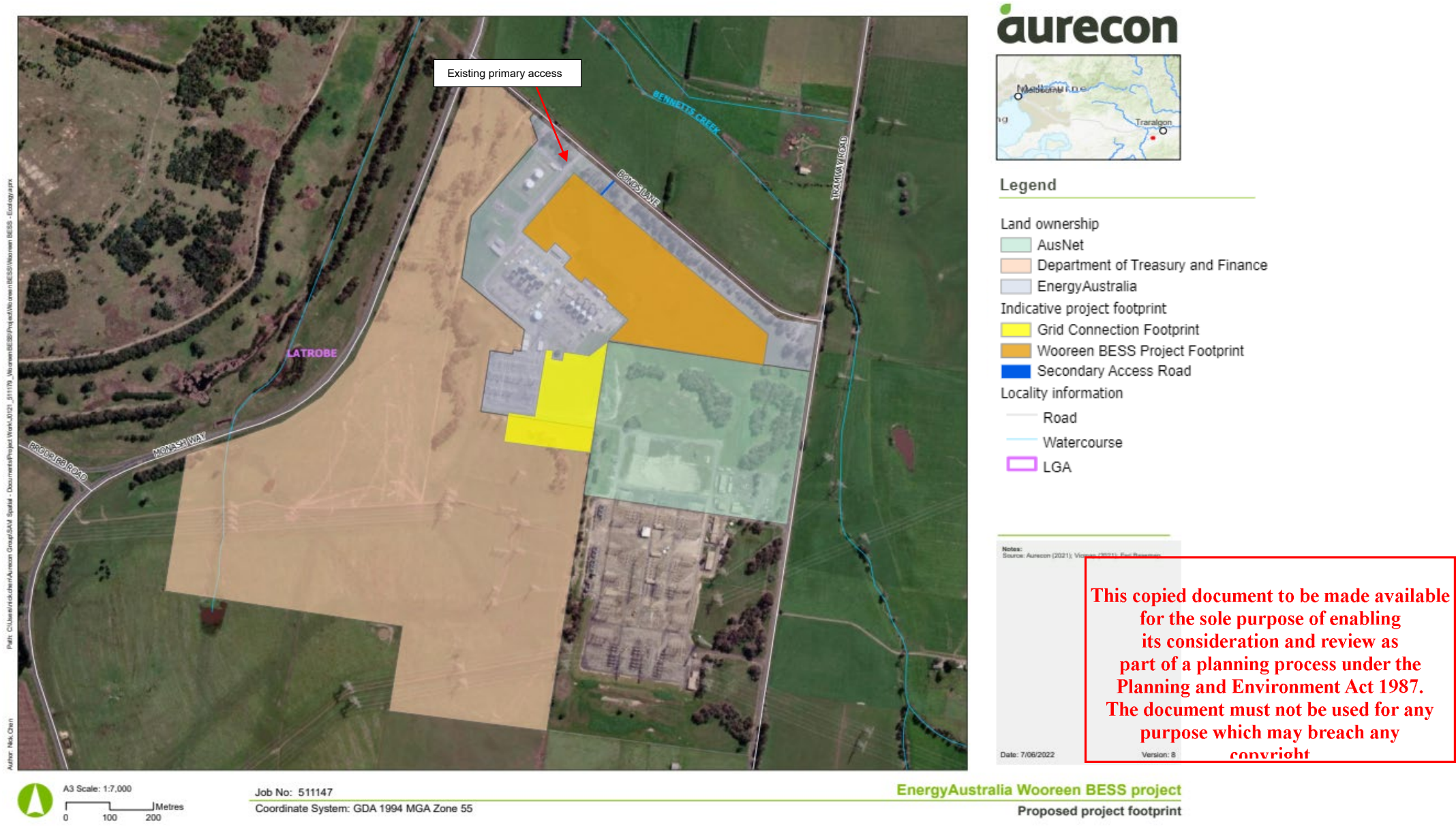

Figure 6 WESS Project Area and Local Context

The proposed facility is expected to be remotely operated and normally not permanently staffed, requiring infrequent inspections and maintenance activities by staff.

3.2 Construction and Commissioning Phase

3.2.1 Vehicle Types

The following vehicle types are anticipated to deliver materials and equipment during the construction phase as summarised in Table 2.

Table 2 Anticipated Construction Phase Vehicle Types

Load Type	Vehicle Type	Design Vehicle
Site Buildings & Plant	Low loader / float (standard)	19 m semi-trailer
Staff / Visitor	Passenger vehicle (4x4, car, etc)	99th percentile car (B99 car)
Civil Material Import / Export (bulk earthworks)	Truck & Quad Dog or B-double truck	19 m Truck & Quad Dog or 25 m / 26 m B-double Truck
Concrete & Steel	Semi-trailer and Concrete Truck	19 m semi-trailer and ≈ 8.8 m Medium Rigid Vehicle (MRV)
Batteries, inverters, transformers, conduits & cable	Semi-trailer	19 m Semi-trailer
Crane	Mobile 50-100t crane	≤ 12.5 m Heavy Rigid Vehicle (HRV) [1]
220kV Transformer	Prime mover & custom multiple axle low platform trailer	*N/A - Refer discussion below*

[1] Approximate equivalent as mobile cranes of this type have all wheel steering / multiple wheel steering with relatively smaller turning circles.

The majority of vehicles expected to service the site during construction include a vehicle size up to and including 19 m semi-trailer trucks and truck and quad dog combination trucks.

A smaller number of bulk earthworks vehicles may include 25 m/26 m B-double trucks while the delivery of the 220 kV transformer will include a prime mover truck with a multiple axle low platform 'gooseneck' trailer (or similar). An example of a 105 t transformer delivery vehicle is illustrated in Figure 7 below (total length in the order of 30 m).

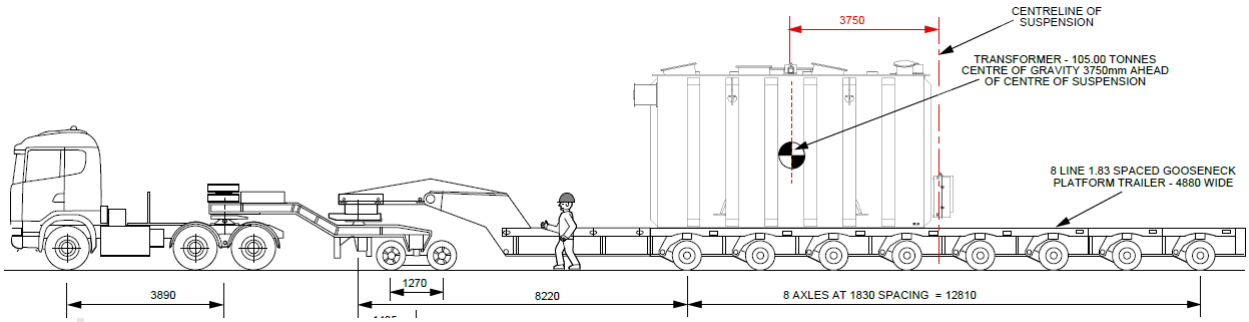

Figure 7 Example 105t Transformer Delivery Vehicle

Multiple axle low platform trailers of this type include independent hydraulic wheel height control to navigate longitudinal crests and dips and all wheel steering or multiple wheel electronic steering which provides higher degrees of turning control and relatively small turning circles (comparative to its 30 m length).

An excerpt of this example vehicle's full lock (45°) turning circle is illustrated below in Figure 8.

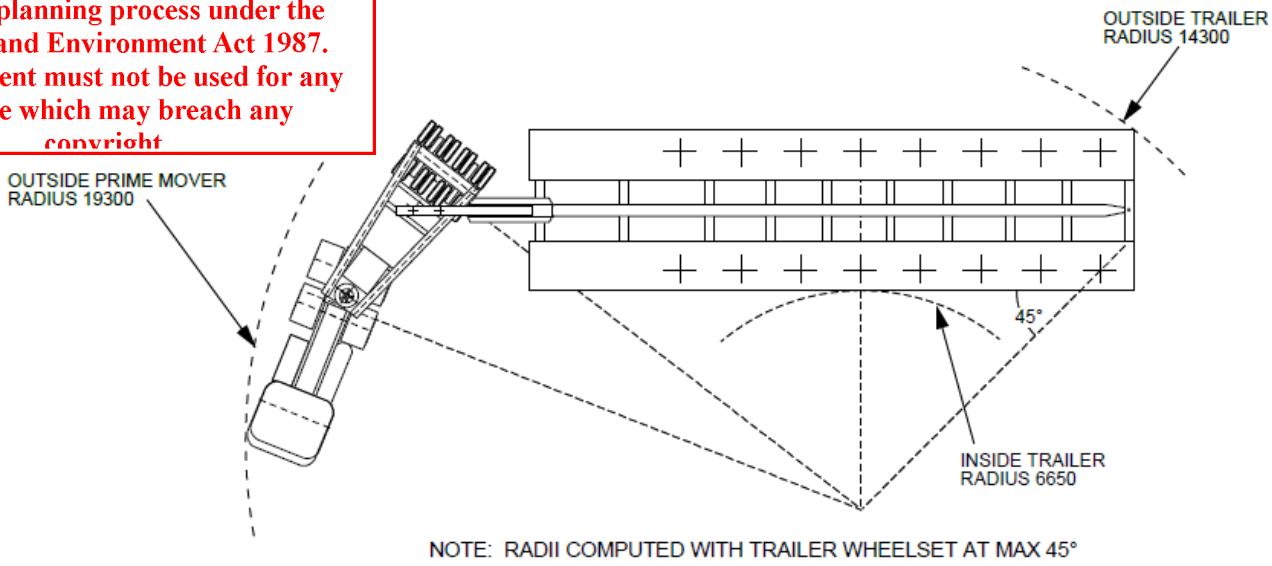

Figure 8 Example 105t Transformer Delivery Vehicle – Turning Circle

Notwithstanding the above, construction vehicle types will be confirmed following appointment of the delivery contractor prior to construction). At this stage, specific traffic management measures will be identified for each vehicle as necessary and detailed in an appropriate Construction Traffic Management Plan (CTMP) or Traffic Management Plan (TMP).

This is especially the case for OD / OSOM (Over Dimension / Over Size Over Mass) vehicles such as the transformer delivery vehicle example above.

3.2.2 Access Routes

It is expected that delivery of imported plant, equipment and materials will occur at one of two potential port of origins: Port of Melbourne (140 km from site) or the Port of Hastings (Western Port Bay) (105 km from site).

Non-imported plant, equipment and materials are expected to be sourced from various areas throughout Victoria and locally in Morwell and its surrounds.

For each point option, there are convenient heavy vehicle approved access routes for delivery of plant, equipment, and materials (depending on their origin and vehicle size), including but not limited to:

- From Port of Melbourne:
  - Webb Dock Drive → Todd Road → Cook Street → West Gate Freeway → W3 → West Gate Freeway → Citylink → West Gate Freeway → Citylink → South Eastern Freeway → Monash Freeway → South Eastern Freeway → Monash Freeway → South Eastern Artl → Monash Freeway → South Eastern Artl → Monash Freeway → South Eastern Artl → Monash Freeway → Hallam Bypass → Monash Freeway → Hallam Bypass → Monash Freeway → Princes Freeway → Monash Way → Bonds Road to the subject site
- From Port of Hastings:
  - Bayview Road → Barclay Cres → Marine Parade → Frankston-Flinders Road → Western Port Highway → Dandenong-Hastings Road → Western Port Highway → Dandenong-Hastings Road → Cranbourne-Frankston Road → Princes Highway → Western Port Highway → Princes Highway → Western Port Highway → Dandenong-Hastings Road → Princes Highway → South Gippsland Freeway → Princes Highway → Princes Freeway → Monash Way → Bonds Road to the subject site

Following appointment of a construction team, specific access routes would then be confirmed and adopted for the construction phase and detailed in an appropriate CTMP or TMP.

3.2.3 Workers Access Routes

Based on information provided for similar projects, it is understood approximately 130 full time construction workers could be expected during the construction of the facility. Regarding staff vehicle movements, this will depend on where workers live (and/or are housed from Melbourne or further afield) which is expected to be highly varied.

While not yet confirmed, it is likely that a large proportion of construction workers will comprise local staff from, or be housed in, Morwell in the north, Moe in the northwest and Traralgon in the northeast.

On this basis, the majority construction workers are expected to access the site via Monash Way or Tramway Road (from the north) and then via Bonds Lane.

3.2.4 Site Access

It is assumed that the existing primary Jeeralang Power Station access will be used for traffic movements during the construction phase.

3.3 Operations and Maintenance

WESS facilities are usually monitored remotely in real-time and do not require dedicated staff to be on site at all times. Staff are however required to access the site periodically for inspections and maintenance activities.

Based on information provided for similar projects it understood that up to two staff could typically be expected to be on-site at any time. Vehicle movements are expected to include light vehicles (passenger cars, utility vans / trucks).

3.3.1 Access Routes

Operation and maintenance staff access, much like construction staff, will also depend on where staff live which is expected to be highly varied. It is however likely that staff will be from local areas which would likely include Morwell in the north, Moe in the northwest and Traralgon in the northeast.

Staff access routes to the proposed WESS facility will therefore be via Monash Way or Tramway Road (from the north) and then via Bonds Lane.

3.3.2 Site Access

The existing primary Jeeralang Power Station access will be used for traffic movements during both the maintenance and operational phases, with a secondary access located to the east of the existing primary access for emergency vehicle access.

4 Car Parking and Access Assessment

4.1 Car Parking

4.1.1 Statutory Requirements

Statutory requirements for the provision of car parking (under the operation and maintenance phase) are set out in Clause 52.06 of the Latrobe Planning Scheme, with parking rates specified in Table 1 to Clause 52.06-5.

The scheme does not specifically incorporate a recommended parking rate for a WESS facility (utility installation land use). In such circumstances, the scheme notes:

In instances where a use is noted specific in Table 1 to Clause 52.06-5 or another provision within the planning scheme, car parking spaces are usually provided to the satisfaction of the responsible authority.

4.1.2 Parking Demand Assessment

Based on the existing carpark outside the administration building, parking capacity at the site is 39 bays including one accessible bay. It is noted that this carpark services the power station. As part of the WESS site development, it is proposed that and additional two parking bays are provided to service the WESS site.

It is understood that up to two staff could be expected to be on-site at any time during normal operation for inspection and maintenance. Therefore, the additional two parking spots would be sufficient to cater for these visits for staff. If staffing requirements change from what has been assumed in this TIA, then parking requirements may need to be revised.

4.1.3 Parking Layout

It is recommended that car parking spaces are provided in accordance with dimensional requirements set out in Clause 52.06-9 of the Latrobe Planning Scheme (i.e. minimum 2.6m wide x 4.9m long accessed from a 6.4m wide aisle).

4.1.4 Temporary Construction Worker Parking

Ensuring that construction workers do not park in the existing JPS car park, temporary vehicle parking will be required to service the construction site. The capacity and location of this will be confirmed and addressed appropriately by way of an approved CTMP or TMP to be completed by the construction contractor prior to construction.

4.2 Access

As noted previously, all construction and subsequent employee and maintenance vehicle access to the site is proposed via Bonds Lane, at the existing primary Jeeralang Power Station access. A second emergency vehicle access to meet CFA requirements is provided approximately 200m further east on Bonds Lane, as shown on Figure 6.

4.2.1 Sight Distance

A desktop sight distance assessment has been undertaken of the existing primary Jeeralang Power Station access based on a 100 km/hr posted speed limit in accordance with the various sight distance requirements of Austroads' *Guide to Road Design* (Part 4A).

This desktop assessment indicates that available sight distance at the site access exceeds the minimum requirements set out in the Austroads Guide. Similarly, sight distances at both the Monash Way and Tramway Road intersections also exceed the Austroads requirements.

4.2.2 Existing Jeeralang Power Station Access

1.1.1.5 Swept Path Assessment

As noted in section 3.2.1, the majority of vehicles expected to service the site during construction include a 19 metre semi-trailer and truck and dog combination trucks. Larger 25 metre / 26 metre B-double trucks and the 33 kV transformer delivery vehicle will also service the site however, much less frequently.

To this end, concept swept paths have been assessed for the existing primary Jeeralang Power Station access and the intersection of Monash Way and Bonds Lane.

The assessed swept paths include:

- Figure 9: 9 metre semi-trailer Jeeralang Power Station ingress
- Figure 10: 19 metre semi-trailer Jeeralang Power Station egress
- Figure 11: 19 metre semi-trailer Monash Way left on to Bonds Lane
- Figure 12: 19 metre semi-trailer Bonds Lane right on to Monash Way

Figure 9 9 metre semi-trailer Jeeralang Power Station ingress

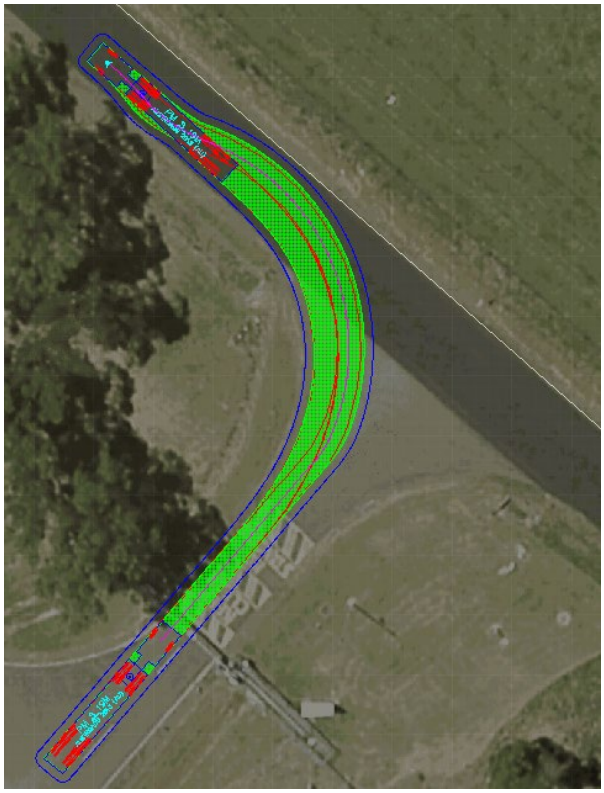

Figure 10 19 metre semi-trailer Jeeralang Power Station egress

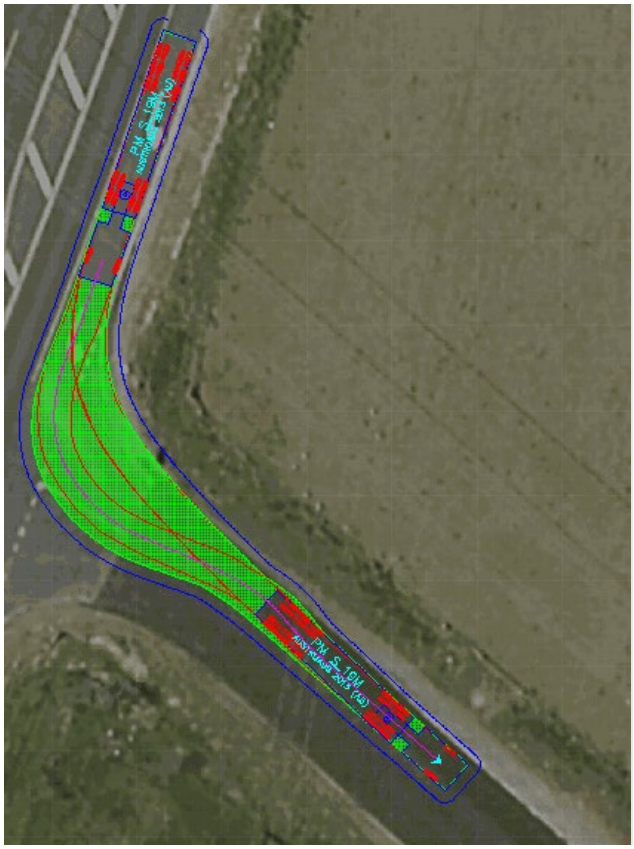

Figure 11 19 metre semi-trailer Monash Way left on to Bonds Lane

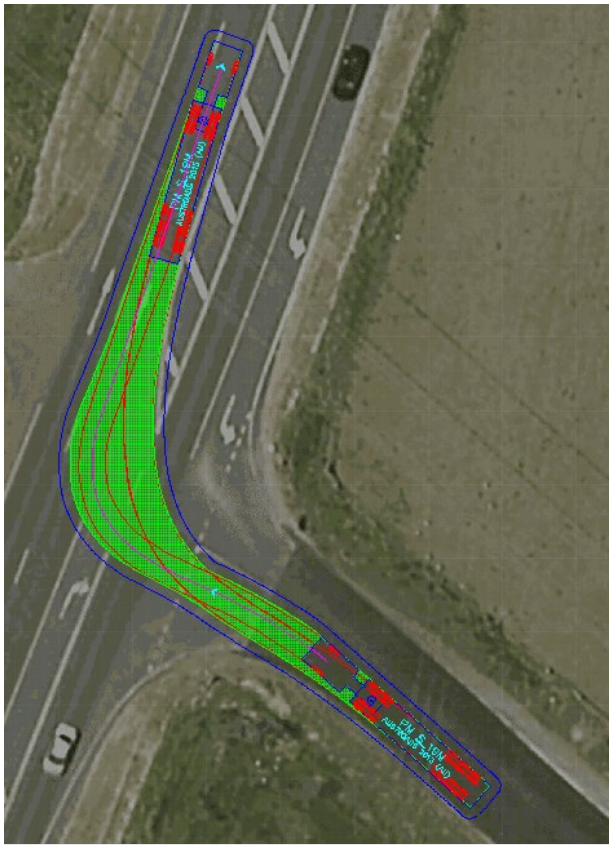

Figure 12 19 metre semi-trailer Bonds Lane right on to Monash Way

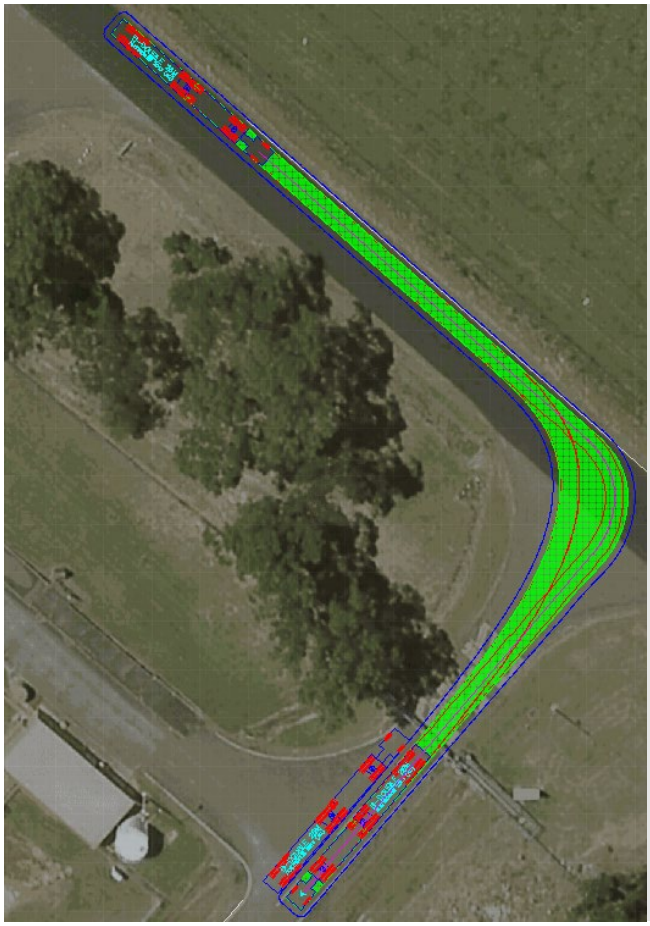

Figure 13 26 metre B-double Jeeralang Power Station ingress

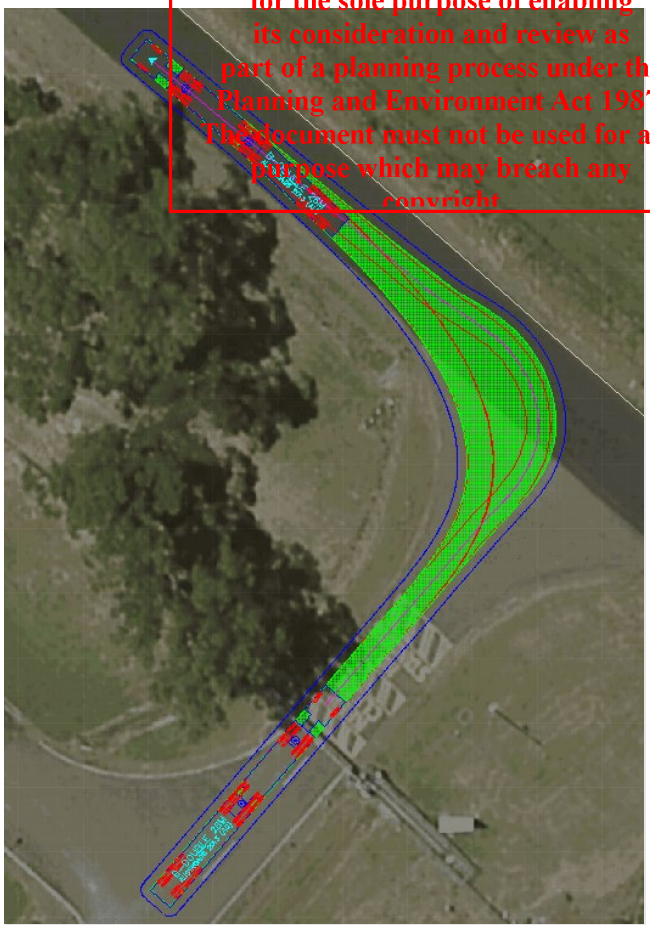

Figure 14 26 metre B-double Jeeralang Power Station egress

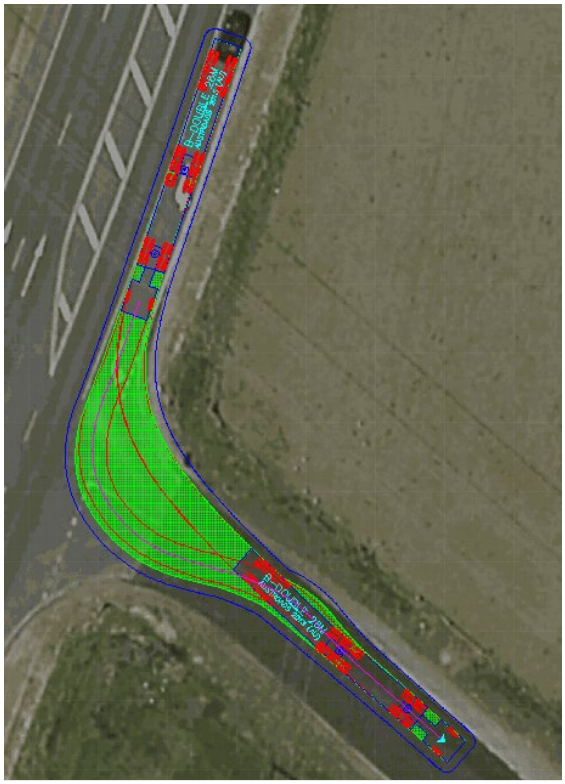

Figure 15 26 metre B-double Monash Way left on to Bonds Lane

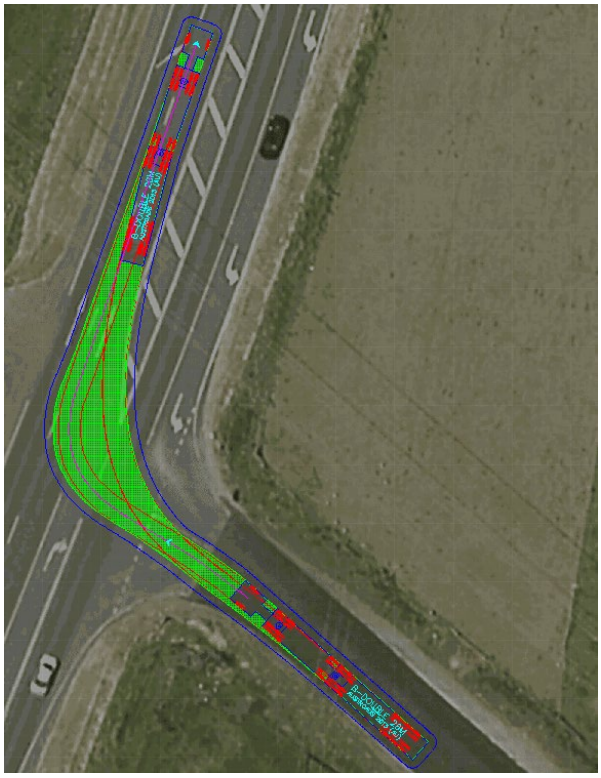

Figure 16 26 metre B double Bonds Lane right on to Monash Way

On the basis of the above, it is noted that the Jeeralang Power Station Access and Monash Way / Bonds Lane intersection is wide enough to cater for both 19 metre semi-trailers and for B-doubles. However, neither

vehicle can turn concurrently with another 19 metre semi-trailer or B-double at either the intersection or existing power station access.

Given the temporary nature of the construction and low probability that these vehicles will meet at these intersections at the same time, traffic management measures would be recommended to ensure that vehicle arrival and departures are staged to manage this. As an example, it is anticipated that the delivery of the transformer will require road closures to facilitate the transporter vehicle's turning movements. However, this will be confirmed and addressed appropriately by way of an approved CTMP or TMP to be completed by the construction contractor prior to construction, especially where OD / OSOM vehicle movements are concerned.

Height Clearance

It is noted that the example 220 kV transformer delivery vehicle is expected to have a minimum vertical clearance requirement in excess of 5 metre (in the order of 5.2 metre subject to confirmation of specific dimensional requirements). It is therefore recommended that when the height clearance requirement is confirmed during the next stage of the project, available height clearances are confirmed along the relevant access routes for transformer delivery.

4.2.3 Bonds Lane Secondary Emergency Vehicle Access

A secondary vehicle access is proposed onto Bonds Lane to the east of the existing vehicle access (Figure 6). This access is intended to be used as an emergency vehicle access to the WESS site.

4.2.4 Internal access

There are currently no internal circulation plans for the proposal available, hence internal circulation once entering off Bonds Lane will need to be considered and assessed once further details of the design are confirmed. Internal access to the identified set down areas within the site will be subject to the alignment and layout of the grid connection.

4.2.5 CFA Requirements

Internal access to the proposed WESS facility is expected to comply with the access requirements of the CFA Design Guidelines and Model - Requirements Renewable Energy Facilities (2022), noting the following compliances and/or recommended changes. EA will ensure these requirements are reflected in the detail design phase of the project in consultation with the CFA. Access recommendations include:

- Provision of BESS and substations fire service access, which has been provided through a 4 metre perimeter road and internal road network to accommodate CFA vehicles.
- Internal access roads are sealed and comprise 'all-weather construction' and be able to accommodate 15 tonne CFA appliances (vehicles).
- Internal access roads comprise a min. 4 m trafficable width with a clear min. 4 metre vertical clearance.
- Average grades are expected to be less than 1:7 with a max. 1:5 for no more than 50 metre.
- Existing and proposed internal access roads are expected to have dips of no more than 1:8 (sag and summit grades).
- Include two access points for CFA appliances (vehicles) to access the WESS facility, which has been accommodated
- All water sources will be accessible for CFA appliances (vehicles).

Notwithstanding the above, it is recommended that a Bushfire Management Plan (BMP) and/or Emergency Management Plan (EMP) be prepared in consultation with the CFA and other relevant stakeholders.

As discussed, a secondary access is provided to the WESS site from Bonds Lane to the east of the existing power station access. It is proposed that this access is constructed to an appropriate standard to only be

used for emergency access and egress only to meet CFA guidelines requiring two external access points to the site.

5 Traffic Impact Assessment

5.1 Traffic Generation

5.1.1 Construction and Commissioning Phase

Based on traffic generation estimates for a similar projects (Eraring BESS, NSW, Loy Yang BESS, Vic), the construction of the proposed WESS Facility is likely to generate the following traffic movements during *peak* construction activities as summarised below (approximate / in the order of):

- 130 light vehicles one-way ('in' or 'out') vehicle movements per day;
- 30 heavy vehicles (truck) one-way ('in' or 'out') vehicle movements per day.

This equates to in the order of 160 'in' or 'out' vehicle movements over an entire day (i.e. one-way movements), or 320 'in' and 'out' vehicle movements over an entire day (i.e. total two-way movements). This is in addition to existing traffic using the site.

It is noted that during non-peak construction activities, construction related traffic movements are expected to be significantly less.

The construction contractor will be required to develop a construction program based on accurate vehicle volumes and movement which is to be included in a CTMP / TMP during for the construction of the site.

5.1.2 Operational and Maintenance Phase

As noted previously, WESS facilities are usually monitored remotely in real-time and do not require dedicated staff to be on-site. Staff are however required to access the site from time to time for inspections and maintenance activities. Based on information provided for similar projects it is understood that up to two staff could normally be expected to be on-site at any time.

On this basis up to two entry and egress movements per day (two 'in' and two 'out') could be expected to be generated by the proposed WESS facility during normal operation.

5.2 Impact Assessment

The assessment below assumes that the construction of this site does not coincide with the construction of the nearby proposed Morwell Solar Farm. Should there be any overlap in the construction of both sites, it is noted that access to both sections of the solar farm is on Tramway Road, and hence construction traffic will be contained to Tramway Road. This will remain separate to trucks accessing the WESS facility, 100% via Bonds Lane and Monash Way.

The performance measures adopted to assess the mid-block performance of the external road network (Monash Way, Tramway Road and Bonds Lane) is mid-block *Level of Service* (LoS) as defined in the *Highway Capacity Manual* (2016).

- LoS is defined in the Austroads *Guide to Traffic Management* (Part 3) as a quantitative measure for ranking operating conditions, based on factors such as speed, travel time, freedom to manoeuvre, interruptions, comfort and convenience.

  LoS is rated from A (best, free flow conditions) to F (worst, breakdown in vehicle flow, congestion). LoS 'C' is considered a minimum desirable service level for both metropolitan fringe and rural areas.

On the above basis, an assessment of construction phase and maintenance and operation phase related traffic movements is included in the following section below.

5.2.1 Construction Phase

1.1.1.6 Monash Way and Tramway Road

It is assumed that all construction traffic uses Monash Way, given that it provides the most direct access to Princes Freeway from the ports and from Morwell. As such, the assessment in Table 3 similarly assumes all heavy vehicles use Monash Way to access the site whilst staff traffic uses both Tramway Road and Monash Way in an assumed 50/50 split.

Table 3 below sets out a mid-block LoS assessment of Monash Way and tramway Road, conservatively (on the high side) assuming all 'in' movements occur in the AM peak hour and all 'out' movements occur in the PM peak hour.

The LoS assessments below are considered *highly conservative* as construction work movements and construction vehicle and delivery movements are also expected to occur before and after the road network peak hours and are also spread out over the day.

Table 3 Existing and Construction Phase Traffic Assessment

Direction	Existing AM		Construction AM		Existing PM		Construction PM	
	Volume	LOS	Volume	LOS	Volume	LOS	Volume	LOS
Monash Way								
Northbound	490 vph	**B**	490 vph	**B**	470 vph	**B**	565 vph	**B**
Southbound	360 vph	**A**	455 vph	**B**	520 vph	**B**	520 vph	**B**
Tramway Road								
Northbound	260 vph	**A**	260 vph	**A**	260 vph	**A**	325 vph	**A**
Southbound	220 vph	**A**	285 vph	**A**	220 vph	**A**	220 vph	**A**

vph (vehicles per hour (approximate))

Table 3 above indicates that under a conservative assessment, the anticipated peak construction related traffic movements slightly impacts the operational service levels along Monash Way (LoS A changes to LoS B). Notwithstanding, overall Monash Way retains excellent and very good service levels in both directions.

Given both Monash Way and Tramway road operate at a LoS B or LoS A, in the worst case scenarios with the anticipated traffic volumes, it is unlikely that the addition of construction traffic to either or both of these roads will reduce the LoS of the road below desired levels.

1.1.1.7 Bonds Lane

As discussed in section 2.2.1, volumes on Bonds Lane are assumed to be low given the close proximity of the connecting Monash Way and Tramway Road that both converge north of Churchill. It would be expected that this road primarily services existing movements associated with the Jeeralang Power Station. While the expected levels of construction traffic will form a large proportion of additional traffic on Bonds Lane, it is expected that Bonds Lane will be able to accommodate the increase in traffic as resulting traffic volumes on this road will remain relatively low.

5.2.2 Operational and Maintenance Phase

During normal activities during the operation and maintenance phase up to two staff could be expected on-site which is expected to result in two vehicle movements 'in' in the AM and two vehicle movements 'out' in the PM peak periods.

Against existing traffic volumes on the surrounding road network, the development proposal's additional vehicle movements generated under the operation and maintenance phase (four vehicles per day), could not be expected to notably impact on the capacity or safety of the surrounding road network.

Notwithstanding, necessary traffic management treatments will be confirmed and addressed appropriately by way of an approved CTMP or TMP.

6 Summary

On the basis of the above discussions and analysis, the following is summarised:

- Two port options (Port of Melbourne and Port of Hastings) are feasible with several convenient heavy vehicle approved access routes exist for access to the proposed WESS facility from Morwell;
- The proposed two parking bays will be able to accommodate the 2 maintenance and operation staff related to the WESS site that visit infrequently. If staffing requirements change from what has been assumed in this TIA, then parking requirements may need to be revised;
- Construction phase vehicles are expected to be able to appropriately access the site via the existing access point for the Jeeralang Power Station noting:
  - 19 metre semi-trailers and/or B-double trucks cannot turn concurrently at the intersection of Monash Way and Bonds Lane with the existing intersection layout. Traffic management will be required to control turning movements such that they do not occur concurrently;
  - 19 metre semi-trailers and/or B-double trucks cannot turn concurrently at the existing Jeeralang Power Station access. Traffic management should be provided as appropriate to control turning movements into and out of the site such that they do not occur concurrently;
  - The largest delivery vehicle (prime mover with multiple axle low platform trailer) is expected to appropriately access the site via Monash Way and Bonds Lane, with these movements to be addressed by way of an approved CTMP or TMP to be prepared by the construction contractor;
  - It is recommended that height clearances are confirmed along the relevant access routes, noting that the example transformer delivery vehicle is expected to have a minimum vertical height clearance in excess of 5 metres.

  Notwithstanding the above, any required traffic management treatments and mitigation works are to be identified and addressed by way of an approved CTMP or TMP which is the responsibility of the Proponent but to be prepared by the construction contractor. These should be prepared in consultation with the road management authorities;
- The WESS proposal is expected to comply with access requirements of the CFA. A BMP and / or EMP are commended to be completed in consultation with the CFA during the Project's detailed design;
- The proposed Project is estimated to generate the following vehicle movements during the peak construction period. This will be confirmed based on a construction program when a construction contractor is engaged:
  - 130 light vehicle one-way movements per day (260 vehicle movements per day);
  - 30 heavy vehicle one-way movements per day (total 60 vehicle movements per day).
- Construction traffic is expected to have minimal impact to traffic flow on Monash Way and Tramway Road and the LoS is anticipated to remain above the minimum desired LoS C;
- Construction phase vehicle movements are expected to be accommodated at the Monash Way / Bonds Lane intersection and the Jeeralang Power Station access. However, traffic management will need to be provided to enable concurrent turning movements of heavy vehicles at both locations;
- Operation and maintenance vehicle movements could not be expected to notably impact the capacity or safety of these roads and the surrounding road network.

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