



28 June 2016

Peter Marriott  
Generation Project Development Manager  
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Our ref: 31/33610  
252619  
Your ref:

Dear Peter,

**Stockyard Hill Wind Farm  
Traffic assessment for external overhead power line installation**

**1 Introduction**

In April 2016 GHD prepared a traffic assessment for the proposed Stockyard Hill Wind Farm. That assessment is outlined in a separate report (GHD doc ref 248810). Subsequently, Stockyard Hill Wind Farm Pty Ltd (SHWFPL) has asked GHD to prepare an assessment to cover the construction of the external overhead power lines in response to a request for further information by the Department of Environment, Land, Water and Planning. Construction traffic will access the site at a number of locations on the arterial road network and the impacts of this traffic on the relevant roads needs to be quantified.

This letter sets out the traffic assessment for the installation of external overhead power lines and covers the following scope:

- Traffic volume at each proposed access point on the road network
- Site distance at each access
- Other apparent road safety issues at each access
- Condition of the road surface in the vicinity of each access

Due to time and budgetary constraints the accesses have not been visited. The assessment has therefore been carried out using Google Streetview imagery.

**2 Access locations**

Six access are spread out over five locations in total. These are shown on the maps in the appendix. A brief description of each access is given below.

1. North side of Hamilton Highway, east of Middletons Road (drawing 16)
2. Intersection of Rokewood-Skipton Road and Mount Bute Road (drawing 17)
3. North side of Glenelg Highway between Park Lane and Funston Road (drawing 18)
4. South side of Glenelg Highway between Park Lane and Funston Road (drawing 18)
5. East side of Skipton Road, just south of Dunnets Road (drawing 19)

6. Old Geelong Road<sup>1</sup> and Dunnets Road (drawing 20)

### 3 Construction materials

SHWFPL has provided estimates of the amount of material needed for construction. This is shown in Table 1.

**Table 1 Construction material volumes (total for all accesses)**

Material/component	Quantity	Type of truck used
Overhead cable	13 spindles	OD trailer
Tower sections	214 sections	Semi-trailer
Tower footing concrete	4,782 t	Concrete agitator
Tower footing steel	239 t	Semi-trailer
Temporary access track gravel	11,545 t	Rigid truck

### 4 Traffic volumes

#### 4.1 Existing volumes

Traffic data has been sourced from the Victorian Government's open data website where available. This is shown in Table 2.

**Table 2 Existing traffic volumes (two-way)**

Location	Daily volume (vpd)	Hourly volume (vph) <sup>2</sup>
Hamilton Highway, 9.4 km west of access	1,890	~190
Rokewood-Skipton Road, 25 km east of access	740	~75
Glenelg Highway, 6.6 km east of access	1,260	~125
Skipton Road, 3.2 km south of access	890	~90
Dunnets Road	n/a	n/a
Old Geelong Road	n/a	n/a

<sup>1</sup> Old Geelong Road is a currently-unused road reserve which runs approximately parallel to Stockyard Hill Road

<sup>2</sup> Assumed to be 10% of daily volume

## 4.2 Construction volumes

Each access is expected to carry an equal number of vehicles (i.e. one access will generally not be used more than another). The total construction period at each access is expected to be in the order of three months, and the volume of traffic is expected to be uniform throughout that period. Based on the construction volume data shown in Table 1, the number of construction vehicles expected to use each access is shown in Table 3.

**Table 3 Projected traffic volumes at each access (deliveries)**

Vehicle type	Total deliveries	Daily deliveries <sup>3</sup>	Hourly deliveries <sup>4</sup>
OD trailer	3	<1	<1
Semi-trailer	17	<1	<1
Concrete agitator	67	1.1	<1
Rigid truck	193	3.2	<1
Total	280	<5	<1

The above analysis indicates that the projected volume at each access is expected to be very low, at less than five deliveries per day and less than one per hour. (The reason that the total hourly volume is not more than its components is because we are dealing with fractions of vehicles on average. The totals given are therefore the very upper limit of what could be expected.)

Each delivery will consist of two trips (one there, one back). The totals therefore need to be multiplied by two to obtain the total number of one-way trips added to each road section. This is shown in Table 4.

**Table 4 Projected traffic volumes at each access (trips)**

Vehicle type	Total trips	Daily trips	Hourly trips
OD trailer	6	<1	<1
Semi-trailer	34	<1	<1
Concrete agitator	134	2.2	<1
Rigid truck	386	6.4	<1
Total	560	<10	~1

In addition to the above construction vehicles, workers in light vehicles will also access each site every day. It is expected that up to four people (assumed to travel in separate vehicles) will access the sites

<sup>3</sup> Based on a five-day working week

<sup>4</sup> Based on a 10-hour working day

each day. They would arrive and leave within the peak hours, rather than be spread evenly throughout the day like construction vehicles. Therefore, an additional four trips are expected in the peak hours.

Hence it is expected that approximately five trips per hour on average will be added to the road network at each access during peak periods, and one trip per hour on average during the rest of the day.

## 5 Road safety concerns

This element of the assessment has been carried out by using Google Streetview imagery at each access.

### 5.1 Sight distance

There are four sight distance requirements that should be met at intersections and ideally at property accesses. These are:

- Stopping sight distance (SSD);
- Safe intersection sight distance (SISD);
- Approach sight distance (ASD); and
- Minimum gap sight distance (MGSD).

Of these measures, only SSD and SISD can be assessed, as ASD and MGSD are measured from the side road or access, and Streetview imagery is not available at those locations.

The required sight distance at each location is based on the speed limit of the road. The speed limit on each road is 100 km/h, although it would likely not be possible to travel at this speed on Stockyard Hill Road or Mount Bute Road.

Based on the available imagery, the sight distance assessment is shown in Table 5.

**Table 5 Sight distance assessment**

Access location	Meets SSD?	Meets SISD?
<i>Minimum requirement</i>	<i>241 m</i>	<i>300 m</i>
1. Hamilton Highway	No	No
2. Rokewood/Mt Bute Roads	No	No
3. Glenelg Highway (north)	Yes	Yes
4. Glenelg Highway (south)	Yes	Yes
5. Skipton Road	Yes	Yes

The access on Old Geelong Road has not been assessed, as the road currently does not exist. During construction the road will not be open to the public.

The above analysis indicates that two of the six accesses do not appear to meet sight distance requirements. On Hamilton Highway a crest limits visibility on the east approach. At the intersection of Rokewood and Mount Bute Roads a bend limits visibility on the north approach.

As this assessment has been carried out using Google Streetview imagery it is recommended that an assessment be made on the ground to determine the actual sight distance available at these locations. This would best be dealt with in the traffic management plan, when appropriate mitigation measures would also be decided.

## 5.2 Other road safety concerns

This assessment has involved an examination of the access locations in Google Streetview for any aspect of the road environment which, when combined with a construction access, may pose a threat to the safety of construction vehicles and other road users. It does not include sight distance which has already been covered. The assessment is summarised in Table 6.

**Table 6 Other road safety concerns**

Location	Road safety concerns
1. Hamilton Highway	Overhead power cables across road
2. Rokewood/Mt Bute Roads	<ul style="list-style-type: none"> <li>• Narrow carriageways – may cause access issues for OD vehicles</li> <li>• Poor surface condition on Mount Bute Road</li> </ul>
3. Glenelg Highway (north)	No issues identified
4. Glenelg Highway (south)	No issues identified
5. Skipton Road	No issues identified
6. Old Geelong Road	Assessment not possible, but no issues expected as the road will not be open to the public

The road safety risks identified should be taken in the context of low existing volumes and very low project volumes. Hence it is considered that the overall risk to road safety is low.

## 6 Road surface conditions

This assessment has again been carried out using Google Streetview imagery. The assessment is a visual inspection of the road surface only, which is rated either poor, medium or good. It is anticipated that prior to construction commencing, road surface conditions will be assessed and recorded for the purposes of establishing the level to which the roads must be returned. This will be detailed in the traffic management plan.

The assessment is summarised in Table 7.

**Table 7 Road surface conditions**

<b>Location</b>	<b>Road surface condition</b>
1. Hamilton Highway	Good
2. Rokewood/Mt Bute Roads	Rokewood Road – medium; Mt Bute Road – poor
3. Glenelg Highway north)	Good
4. Glenelg Highway (south)	Good
5. Skipton Road	Good
6. Old Geelong Road	N/a. The road currently does not exist and will be constructed prior to the construction of the power lines

## **7 Mitigation**

This section lists a number of recommendations to mitigate the impacts already identified. The most appropriate time to carry out all surveys and investigations listed here, and to finalise the type of mitigation to be used, is during the development of the traffic management plan.

### **7.1 Traffic generation/volumes**

Given that the maximum volume added to the road at each access is expected to be 5 vph on average during peak periods and 1 vph at other times, it is considered that the impact would be negligible. This would be imperceptible to drivers and would be within the normal day-to-day variation in volumes. No mitigation is required.

### **7.2 Road safety**

#### **7.2.1 Sight distance**

It appears that two of the six accesses do not meet sight distance requirements. It is recommended that sight distances be confirmed on site. If these sight distances are confirmed to be deficient, the following options are available to mitigate the safety issues this creates:

- Reduce the speed limit on the approaches to the access such that the required sight distance is achievable (note that this may not be possible at all locations due to the geometry of the road).
- Survey the road to determine the actual operating speed of the road. This may reduce the required sight distance. This may not be possible on unsealed roads.
- Provide advance warning signage to warn drivers that trucks will be entering (or leaving) the road.
- Provide active traffic management such as traffic controllers.

### **7.2.2 Other road safety concerns**

The clearance to the overhead power lines across Hamilton Highway should be confirmed. If this is not sufficient to allow the passage of the highest truck, it is recommended that the power company be consulted on how to proceed. An alternative access may need to be found.

Where the carriageway is narrow, it may be necessary to widen the road to accommodate the largest vehicles. Otherwise, traffic controllers may be required to hold traffic while the construction vehicle moves onto or off the road.

Road safety issues related to the condition of the road surface are dealt with in the next section.

### **7.3 Road surface conditions**

The condition of the road surface on Mount Bute Road is considered to be poor. Dunnets Road is currently impassable and Old Geelong Road currently does not exist. These roads will need to be constructed and/or sealed prior to use (and the opportunity should be taken to widen them as needed). It is noted that Dunnets Road will be upgraded and sealed as part of the construction of the wind farm.

A system for monitoring the condition of road surfaces will be contained in the traffic management plan. The condition of all roads should be assessed by a specialist prior to, and as close as possible to, construction commencing. Regular checks should be made throughout the construction period to ensure that the road is not deteriorating too much, or beyond a level which would compromise its structural strength. The roads should then be returned to their pre-existing condition after construction is complete.

Yours sincerely



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