



Permit No. 20092820 & 20092821

Berrybank Wind Farm

Transport Evidence

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Client // Berrybank Development Pty Ltd
Instructed by // Herbert Smith Freehills
Reference // V137900
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Report Date // 08/11/17

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Issue: Final 08/11/17

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GTA Consultants Office: VIC

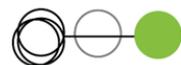


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1. Introduction

1.1 Background

A planning permit amendment is being sought for the approved Berrybank Wind Farm, Permit No. 20092820 (Corangamite Shire) and Permit No. 20092821 (Golden Plains Shire).

The amendments being sought seek a reduction in the number of endorsed wind turbines from 95 to 79.

The proposed amendments will also result in an increase in the overall maximum height of the wind turbines from 131m to 180m. The proposed increase to the maximum tip height also results in an increase in the maximum over-dimensional (OD) truck length required to transport the blades from 56.61m to 68.80m. No changes are proposed to the approved vehicle access routes noting that clear zones at intersections have been increased to accommodate the larger OD vehicles. An additional access point is proposed via Berrybank-Wallinduc Road and will permit light/heavy but not over dimensional vehicle access.

The aforementioned details were submitted by the Applicant within an updated Traffic Management Plan (TMP) along with a covering letter, prepared by AECOM/URS. I understand that AECOM have acquired URS, thus for the purposes of my assessment I refer solely to AECOM as the author of relevant traffic plans and impact assessments. I was not involved in the preparation of the TMPs for the Berrybank Wind Farm prior to my engagement to provide expert traffic evidence for this Panel Hearing.

A Panel has been convened to consider the amendment to the Planning Permit(s). Golden Plains Shire provided a submission to the panel, dated 18 September 2017, in which the following was noted:

“Council wishes to ensure that any approved changes address the potential for additional impacts on matters including native vegetation and council assets such as road infrastructure”

A number of third parties have made submissions to the Panel, however, these submissions did not relate to traffic matters. No submission has been made at this time by VicRoads, noting that item no.12 of the outcomes of the Directions Hearing held on 23 October 2017 states that any correspondence received will be tabled at the Hearing along with a verbal submission (if applicable).

My evidence has been prepared to provide a peer review of the amended TMP prepared by AECOM and specifically the traffic impact of the amended application in comparison to the permitted use and the associated endorsed TMP dated 5 August 2013.

1.2 References

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

- 'Traffic Impact Assessment – Berrybank Wind Farm', prepared by AECOM, dated 25 May 2009
- 'Berrybank Wind Farm Traffic Management Plan', prepared by URS, dated 5 August 2013
- 'Berrybank Wind Farm Planning Permit Assessment Report', prepared by ERM, dated May 2017

- 'Berrybank Wind Farm Traffic Management Plan', prepared by AECOM, dated 23 March 2017
- 'Berrybank Wind Energy Facility Golden Plains Planning Scheme Corangamite Planning Scheme - Panel Report', dated May 2010
- Planning Permit No. 20092820
- Planning Permit No. 20092821
- 'Policy and Planning Guidelines for Development of Wind Energy Facilities in Victoria', (DELWP, January 2016)
- Golden Plains Shire Council submission dated 18 September 2017
- Third party submissions
- 'Ryan Corner Wind Farm Traffic Management Plan' prepared by URS dated 23 December 2011
- 'Hawkesdale Wind Farm Traffic Management Plan' prepared by URS dated 23 December 2011
- 'Ryan Corner Wind Farm Traffic Management Plan' prepared by URS dated 24 March 2017
- 'Hawkesdale Wind Farm Traffic Management Plan' prepared by URS dated 24 March 2017
- Other information as nominated.

2. Traffic Impact Analysis

2.1 Traffic Generation

2.1.1 Methodology

The TMP's prepared provide an assessment of the peak construction activity within the peak month of the 15-month construction program.

In determining the traffic volumes, the following key parameters are noted:

- 15-month construction program
- 11-hour (7am-6pm) working weekday
- 24 working days per month.

The 2013 and 2017 TMP adopt the same parameters for their analysis and are considered appropriate.

2.1.2 Anticipated Change in Traffic Generation

I have compared the traffic volumes from the 2013 approved TMP with that assessed within the 2017 TMP.

Table 2.1 has been prepared to provide a comparison of the traffic volumes, with a more detailed assessment provided within Appendix A.

Table 2.1: Comparison of Peak Monthly Traffic Volumes (one-way)

Vehicle Class	2013 TMP (veh / month)	2017 TMP (veh / month)	Difference (veh / month)	Difference (%)
Over-Dimensional	103	67	-36	-35%
Heavy Vehicles	1,589	518	-1,071	-67%
Light Vehicles (i.e. cars, utes)	7,267	2,134	-5,133	-71%
TOTAL	8,959	2,719	-6,240	-70%

As shown within Table 2.1, the 2017 TMP anticipates that there will be 6,240 fewer vehicle arrivals which corresponds to 70% fewer vehicles per month relative to the endorsed 2013 TMP. Given the significant discrepancy in traffic volumes and absence of commentary regarding the rationale for these changes within the 2017 TMP my office sought clarification from AECOM as the author of the TMP.

I have been instructed that the change in traffic volumes was attributable to different assumptions concerning the duration of the construction timetable and the intensity of construction activity that would occur during the most intensive month of construction (which is the period that is used for the purposes of assessing the traffic impact). More specifically, it is understood that the construction activities will be distributed more evenly across the construction timetable than had previously been assumed, such that the peak level of activity is anticipated to be less than that originally modelled in the 2013 TMP.

In my opinion the 2013 and 2017 TMPs establish a range within which to assess potential impacts (with the 2013 TMP establishing a conservative upper limit). For the purposes of this assessment I've adopted the 2013 upper limit (which I note had been endorsed by the responsible authority under the 2013 TMP).

2.1.3 Over Dimensional Vehicles

Over dimensional deliveries for the site are broken into two categories, namely:

- tower sections; and
- blades/nacelles.

Based on discussions with AECOM it is my understanding that the 2013 TMP is based upon four tower sections per 131m high turbine. I am instructed that the proposed 180m turbines will comprise 5 sections per turbine.

There is a total of four blade/nacelle deliveries (one nacelle and three blades) for each turbine which remains constant irrespective of the height of the turbine.

Having regard to this Table 2.2 provides a first principles assessment of the anticipated total OD traffic generation for the approved development and the amended development proposal over the duration of the construction period.

Table 2.2: Comparison of Anticipated Over Dimensional Vehicle Traffic Volumes

Development	Number of Turbines	Tower Sections per Turbine	Blade / Nacelle Deliveries per Tower	Peak One-Way Vehicle Movements Generated		
				Tower Section	Blade/Nacelle	Total
Approved Development	95 turbines	4	4	380	380	760
Amended Development Height	79 turbines	5	4	395	316	711

Based on the above assumptions, the proposed amendment being sought is anticipated to result in a reduction in the number of over dimensional vehicle deliveries across the 15-month construction period from 760 to 711 deliveries which equates to a 6% decrease in the number of over dimensional trips.

It is my view therefore that the proposed amendment is likely to result in a minor decrease in the total number of OD vehicles compared to those anticipated in the endorsed 2013 TMP.

2.1.4 Heavy Vehicles

The proposed amendment will both increase and decrease certain types of heavy vehicle volumes. The amendment requires 16 fewer tower foundations with the roads to these foundations also not required as a result, which is expected to decrease some heavy vehicle volumes. On the other hand, bigger wind turbines now require larger and stronger foundation, which is expected to increase some heavy vehicle volumes.

Amended TMPs recently prepared for Hawkesdale and Ryan Corner associated with the increase in turbine height from 126.3m to 180m and an associated reduction in the total number of turbines anticipated a 25 – 30% increase in the number of heavy vehicle movements per turbine during the peak month of construction.

Adopting the endorsed 2013 TMP heavy vehicle traffic volume of 1,589 deliveries per month and assuming that the number of heavy vehicle movements per turbine will increase by 25 – 30%, the proposed reduction in the total number of turbines from 95 to 79 is anticipated to result in 1,651 – 1,717 heavy vehicle deliveries per month. This equates to a 4 – 8% increase in heavy vehicle deliveries associated with the amended application compared to the currently endorsed TMP.

In actual terms, this equates to 3 – 5 additional heavy vehicle deliveries per day spread across the five access points to the site.

2.1.5 Light Vehicles

The number of light vehicle movements generally equates to the average number of employees on-site during the peak month with a small number of escort vehicles for OD vehicles.

The 2009 transport impact assessment report, prepared by AECOM, references an average of 70 to 130 workers on-site during most of the construction period with this expected to increase to a maximum of 240 full time equivalent staff at the peak of construction.

No text is provided within the 2013 or 2017 TMP regarding the number of employees. I understand that a single one-way vehicle movement per worker per day is assumed based on discussions between my office and AECOM. Based on this the 2013 TMP assumes approximately 295 full-time staff with the 2017 TMP assuming approximately 85 full-time staff for the peak construction month.

In my experience the 295 employees assumed in the 2013 TMP is higher than would typically be expected with staffing levels more likely consistent with that outlined within the 2017 TMP and 2009 traffic impact assessment prepared for the site. As such, I believe that the endorsed 2013 TMP potentially overstates the number of light vehicle trips. In my opinion, the anticipated number of light vehicle movements is expected to sit somewhere between the volumes stated in the endorsed 2013 TMP and the amended 2017 TMP.

Conservatively assuming that the volume set out in the 2013 TMP is correct and given that the Berrybank site has six access points available for light vehicle access, the amended application is not expected to result in any additional light vehicle movements compared to the approved permit and associated endorsed TMP.

2.1.6 Summary

The following outlines my view of the impact of the proposed amendment on traffic volumes:

- **Over dimensional vehicles** - I anticipate a 6% decrease in the total number of vehicles across the 15-month construction program reducing from 760 deliveries to 711 deliveries.
- **Heavy vehicles** – I anticipate a 4 – 8% increase in the number of heavy vehicle deliveries to the site during the peak construction month which equates to 3 – 5 additional heavy vehicle deliveries per day spread across 5 access points.
- **Light vehicles** – I do not anticipate a significant change in the number of light vehicles associated with the amended application.

2.2 Traffic Impact

I expect that the amended application could be expected to result in a 6% decrease in the number of over dimensional vehicle deliveries to the site and 4 – 8% increase in the number of heavy vehicle deliveries to the site.

On the basis that the increase in heavy vehicles equates to 3 – 5 additional deliveries per day, the proposed amended application is anticipated to have a negligible traffic impact on the surrounding road network compared to the currently endorsed TMP.

It is noted that the additional traffic volume set out above are on the basis that the endorsed 2013 TMP traffic volumes are an accurate representation of the anticipated peak construction

month traffic activity. If the revised 2017 TMP volumes more accurately reflect the anticipated peak construction traffic generation then it follows that the traffic impact of the proposed development will be significantly less than what is currently expected based on the endorsed 2013 TMP.

2.3 Transport Access Routes

The amended 2017 TMP utilises the same access routes as those outlined within the endorsed 2013 TMP. The only exception to this is that the 2017 TMP includes the addition of a sixth vehicle access point, via Berrybank-Wallinduc Road (adjacent to wind turbine no. 6), which is understood to permit access for all vehicles except over-dimensional vehicles.¹

I have reviewed the access routes for the site and it is my view that they are both logical and appropriate. I note that the over-dimensional (OD) and heavy vehicle routes are entirely via the arterial road network, other than Council roads located within the site boundary. Arterial roads represent the most appropriate roads to cater for these vehicles.

The amended 2017 TMP has assessed the ability for the larger 68.8m semi-trailer to access the site including the required roadworks to facilitate these truck movements at corners. The road works required to cater for the larger OD vehicle for delivery of blades and tower sections are comparable to the works set out in the endorsed 2013 TMP and are expected to be appropriate.

2.4 Impact on Road Infrastructure

Golden Plan Shire Council has stated in its submission that it wants to ensure that any approved changes address the potential for additional impacts on matters including native vegetation and council assets such as road infrastructure.

Based on the amended application being anticipated to generate less over dimensional deliveries and 3 – 5 additional heavy vehicle deliveries per day equating to a 4 - 8% increase, I do not expect that the change in traffic generation associated with the amendment will have a noticeable impact on the surrounding road network compared to the currently endorsed TMP.

The 2017 TMP sets out the changes to intersection splays to accommodate the larger over dimensional vehicles required to service the site and are considered appropriate.

Furthermore, the 2017 TMP is unchanged in relation to the need for the Applicant to upgrade roads and intersections (Section 3.7), undertake a program of regular inspections (Section 4.4) and undertake a program of rehabilitation at the conclusion of the works (Section 4.6). These arrangements are considered appropriate to ensure that the road network is constructed and maintained to an appropriate standard during construction and handed back to the Responsible Authority at the conclusion of the works in a state consistent with the existing conditions prior to development commencing.

¹ The 2017 AECOM report incorrect refers to the 'turbine 70 access' intersection (refer to pages 42 and 49). I have been instructed by the Applicant that this reference is incorrect and is not included as part of the proposed works.

3. Summary of Opinion & Declaration

3.1 Summary of Opinion

Based on the analysis and discussions presented within this evidence, the following is a summary of my opinion:

- i The 2017 TMP states significantly lower traffic volumes than were originally endorsed as part of the 2013 TMP. To provide a conservative assessment I have adopted that the anticipated traffic volumes documented in the endorsed 2013 TMP for my analysis.
- ii The amended application is anticipated to result in a 6% decrease in the number of over dimensional vehicle deliveries with the actual number of deliveries anticipated to reduce from 760 to 711 over the duration of the construction period.
- iii The amended application is anticipated to result in a 4 – 8% increase in heavy vehicle deliveries to the site which equates to an average of 3 – 5 additional heavy vehicle deliveries per day.
- iv The amended application is expected to have a negligible impact on light vehicle movements to the site which are primarily associated with construction staff.
- v The additional traffic movements associated with the amended application are expected to have a negligible impact on the surrounding road network compared to the currently endorsed 2013 TMP.
- vi The 2017 TMP provides appropriate analysis to determine the amended works required to cater for larger 68.8m over dimensional vehicles as opposed to the 56.6m vehicle originally proposed on the 2013 TMP noting the change in intersection works is relatively minor.
- vii The transport access routes remain unchanged from those endorsed on the 2013 TMP and are considered appropriate.
- viii It is recommended that traffic generation estimates set out in Section 2.4 of the 2017 TMP be reviewed and updated as required to ensure they provide an accurate estimation of the anticipated peak construction traffic generation noting the discrepancy between the volumes stated in the endorsed 2013 TMP the amended 2017 TMP.

3.2 Declaration

I have made all the inquiries that I believe are desirable and appropriate and that no matters of significance that I regard as relevant have, to my knowledge, been withheld from the Panel.



Simon Davies
Director

8/11/17

Appendix A

Traffic Volume Assessment

I have reviewed the traffic volumes presented within the TMP's and have prepared a comparison of the 2013 and 2017 TMP volumes within Table A.1.

Table A.1: Traffic Volume Comparison

Vehicle Class	2013 TMP (veh / per month)	2017 TMP (veh / per month)	Difference (veh / per month)	Percentage Difference	Activity
Over-Dimensional	59	44	-15	-25%	Delivery of Tower Sections
	44	23	-21	-48%	Delivery of Blades/Nacelles etc.
Heavy Vehicles	408	148	-260	-64%	Gravel for Foundations
	92	34	-58	-63%	Water for Concreting
	59	21	-38	-64%	Cement for Foundations
	26	9	-17	-65%	Steel for Foundations
	353	128	-225	-64%	Water for Foundations
	37	13	-24	-65%	Fuel for Foundation Works
	552	149	-403	-73%	Gravel for Road Construction
	8	1	-7	-88%	Substation Works
	8	2	-6	-75%	Sand for Cabling Works
	8	2	-6	-75%	Cables for Cabling Works
	8	3	-5	-63%	Conduit for Cabling Works
	11	3	-8	-73%	Switchgear works
	8	2	-6	-75%	Steel for Substation Electricals
	11	3	-8	-73%	Switchgear for Substation Electricals
Light Vehicles (cars, utes, etc.)	7,061	2,000	-5061	-72%	Construction Personnel
	206	134	-72	-35%	Escort Vehicles for OD Deliveries
Total	8,959	2,719	-6,240	-70%	Total
Over-Dimensional	103	67	-36	-35%	OD Proportion
Heavy Vehicles	1589	518	-1071	-67%	HV Proportion
Light Vehicles	7,267	2,134	-5,133	-71%	LV Proportion

Appendix B

Simon Davies – Curriculum Vitae



Simon Davies

Director

GTA consultants

transportation planning, design and delivery

Simon has a Bachelor of Environment Engineering Degree with Honours and over 16 years' experience in all facets of traffic and transportation planning, traffic engineering design and special event transport planning.

Simon has overseen the transport management of a number of major events over the past 10 years including the Melbourne Formula 1 Grand Prix, Melbourne World Ironman and the Herald-Sun/Citylink Run for the Kids. He also has extensive experience in traffic and transport planning for a variety of land uses from medium density residential developments through to large scale Master planning and rezoning applications.

Simon regularly presents expert traffic and parking evidence at the Victoria Civil and Administrative Tribunal.

Office

Melbourne

Qualifications

BE (Hons)(Env): Monash University

Memberships and Affiliations

Australian Institute of Traffic Planning and Management (AITPM)
Victorian Planning and Environmental Law Association (VPELA)

Project Experience

Traffic Engineering

Moonee Valley Racing Club Masterplan for Moonee Valley Racing Club
Craigieburn Town Centre for Lend Lease Project Management and Construction
Sanctuary Lakes Shopping Centre, Point Cook for i2C
ALDI Distribution Centre, Dandenong South for APP on behalf of ALDI
Freshwater Place, Southbank for Australand
Brookford Estate, Cranbourne East for Brookford Pty Ltd

Major Event Transport Planning

2000 – 2013 Australian Formula 1 Grand Prix for AGPC
2012/13 World Ironman Melbourne for USM
2006 – 2013 Herald Sun/Citylink Run for the Kids for Herald and Weekly Times
2003 – 2013 Melbourne Moomba Waterfest for Melbourne City Council
2003 – 2012 Melbourne New Years Eve Fireworks for Melbourne City Council
2006 Commonwealth Games for OCGC

Professional Background

1999 – Present: GTA Consultants

Simon commenced his professional career at GTA Consultants as a graduate engineer in 1999 and has subsequently progressed to his current role as a Director of the Melbourne office.

During his time at GTA Consultants, Simon has been involved in all facets of traffic engineering projects including the preparation of parking studies and parking precinct plans, land use planning, access strategies, network modelling and simulation, transit planning, road design and documentation. Simon has a track record of excellence in Major and Special Event Planning, undertaking demand forecasts, strategies, implementation, auditing, liaison, approvals and contract management of many major events.



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