



CRUDINE RIDGE WIND FARM

TRAFFIC MANAGEMENT PLAN

FOR

CWP RENEWABLES



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DOCUMENT CONTROL SHEET

Issue History

Report File Name	Prepared by	Reviewed by	Issued by	Date	Issued to
P3065 001R Crudine Ridge Wind Farm Traffic Management Plan	G. Yin / C. Wills	M. Thompson	M. Thompson	8/6/17	Mark Branson, CWP Renewables
P3065 002R Crudine Ridge Wind Farm Traffic Management Plan	C. Holobrodskyj/ C. Wills/ G. Yin/ C. Luk/ M Davidson	M. Thompson	M. Thompson	8/8/17	Mark Branson, CWP Renewables
P3065 003R Crudine Ridge Wind Farm Traffic Management Plan	C. Holobrodskyj/ A. Choudhury	T. Wheatley	T. Wheatley	5/9/17	Mark Branson, CWP Renewables
P3065 004R Crudine Ridge Wind Farm Traffic Management Plan	C. Holobrodskyj	M. Thompson	M. Thompson	3/11/17	Mark Branson, CWP Renewables
P3065 005R Crudine Ridge Wind Farm Traffic Management Plan	S. Daizli	M. Thompson	M. Thompson	10/11/17	Mark Branson, CWP Renewables
P3065 006R Crudine Ridge Wind Farm Traffic Management Plan	M. Hearne	M. Thompson	M. Thompson	28/11/17	Mark Branson, CWP Renewables
P3065 007R Crudine Ridge Wind Farm Traffic Management Plan	M. Thompson	T. Wheatley	M. Thompson	14/12/17	Mark Branson, CWP Renewables
190628_CRWF_TMP_Final_MOD1PMTc	P. Millar / T. Wheatley	T. Wheatley	T. Wheatley	28/6/19	Patric Millar CWP Renewables
190628_CRWF_TMP_Final_MOD1PM5	P. Millar / T. Wheatley	T. Wheatley	T. Wheatley	08/08/2019	Patric Millar CWP Renewables

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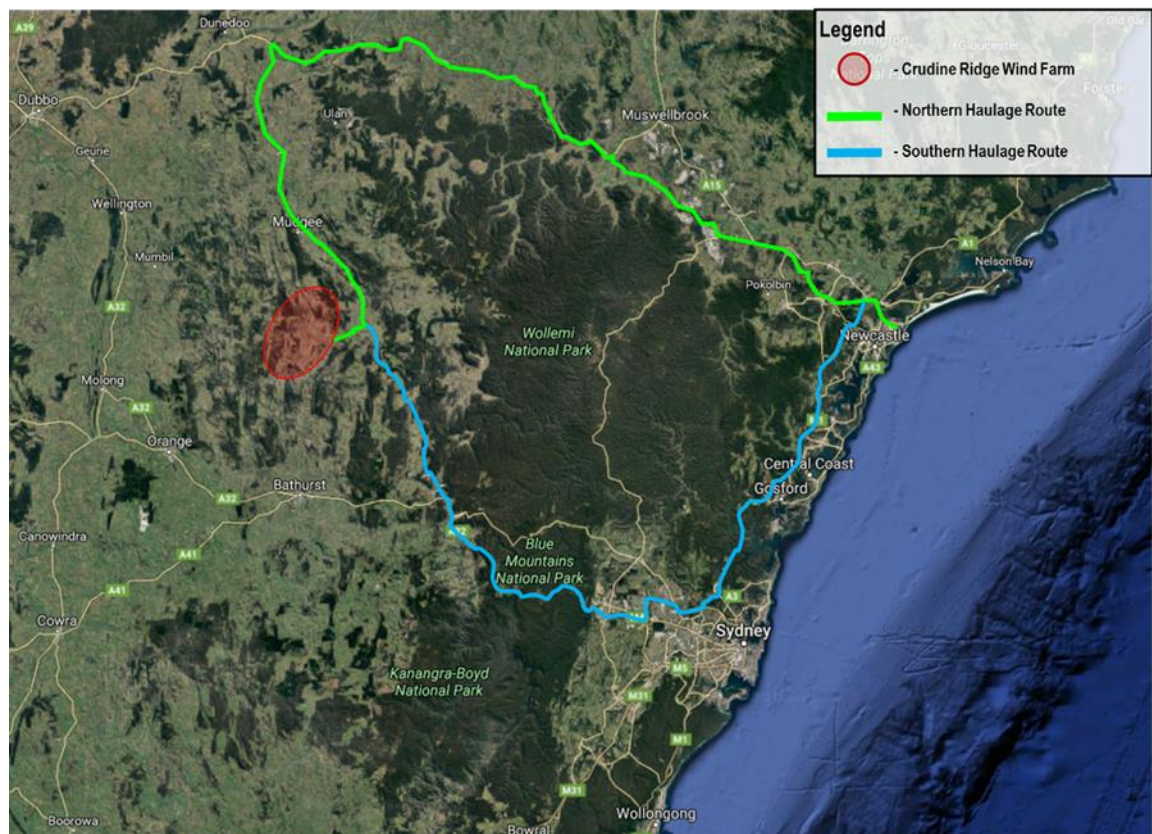
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1. INTRODUCTION

1.1 BACKGROUND

CWP Renewables Pty. Ltd, on behalf of Crudine Ridge Wind Farm Pty Ltd. has commissioned Bitzios Consulting to develop a Traffic Management Plan (TMP) relating to the construction of the Crudine Ridge Wind Farm (the Project).

The Crudine Ridge Wind Farm is situated 45 kilometres south of Mudgee and 45 kilometres north of Bathurst, New South Wales (NSW) and is located in the Bathurst and Mid-Western Regional Council (MWRC) areas. The location of the site is shown in Figure 1.1.



Source: Google Earth

Figure 1.1: Site Location

The TMP addresses the haulage of wind turbine blades from Newcastle Port to the Project site near Pyramul in central-western New South Wales, as well as standard heavy vehicle (SHV) movements required during Project construction. The TMP is prepared in accordance with the Development Consent issued by the NSW Planning Assessment Commission in May 10, 2016 as modified by the Independent Planning Commission on 21 June 2019. Specifically the conditions 28 to 34 of Schedule 3 provide the Project Requirements related to transport.

Prior to construction an Engineering Procurement and Construction (EPC) contractor will be appointed to deliver the construction phase of the Project. The EPC is responsible for all transport and traffic management required for construction of the Project. The EPC will engage a specialist haulage sub-contractor to prepare a Transport Management Plan when applying for permits to transport over-dimensional equipment, which will include specific Traffic Control Plans.

Specific measures for traffic management, including final route identification, timing of transport, switching and detours, escort and pilot vehicles, and variable message signage, will be implemented as required by the roads authority when permits are issued.

The EPC Contractor will engage with Council in relation to the Aarons Pass Road and Bombandi Road upgrades and traffic management required under the Development Consent. Draft Traffic Control Plans are provided in this TMP, however it is noted that more detailed TMP and TCPs will be completed by the appointed EPC Contractor in consultation with Mid-Western Regional Council (MWRC), so as to address the final agreed road design.

1.2 PREVIOUS REPORTS UNDERTAKEN

Prior to completion of this TMP a number of reports detailing various route assessments have been compiled. A list outlining a brief overview of each report can be seen below.

1.2.1 Aarons Pass Road – Passing Bay Assessment by CWP Renewables

The EPC Contractor in consultation with MWRC assessed potential locations of passing bays along the Aarons Pass Road haulage route in accordance with the requirements of MOD Appendix 6, as identified on the proposed layout drawings in Appendix C. The assessment identified a number of potential passing bays with minimum dimensions of 15 metres by 3 metres. This assessment took in to account driveway access and natural / wider sections along the route, blade sweep path avoidance minimising vegetation clearing and minimising levelling.

The determination of final passing bay numbers and configurations will be agreed with MWRC as part of the development of the Aarons Pass Road & Bombandi Road Specific TMP.

1.2.2 Preferred Project Report: Transport Assessment by Samsa Consulting

This report assesses transportation issues associated with the haulage of wind farm components and equipment. The report identifies a preferred transportation mode and haulage routes to the site access points. The report concludes that the proposed Crudine Ridge Wind Farm project would not create any significant adverse impacts with respect to transport. It recommends the implementation of a Construction Traffic Management Plan (CTMP) to be prepared prior to construction and the use of a specialised transport contractor.

1.2.3 Crudine Ridge Wind Farm: Route Survey and Upgrade Assessment by Downer.

This report details a heavy haulage route survey conducted by Downer along the northern haulage route and the recommended upgrades as a result of the survey. The report concludes the Hill End, Windeyer and Pyramul Road routes are unsuitable for a heavy haulage route. Instead, the report gives three alternative routes with further variations for each alternative that would be suitable for heavy vehicle haulage. The report also concludes that the Aarons Pass Road does not meet specifications and would require upgrading to unsealed gravel paving in conjunction with the creation of passing bays and clearing of vegetation as outlined in CWP's Passing Bay Assessment report. Further to these upgrades the report recommends balancing truck movements via the southern and northern site entrances. A preliminary cost estimation is provided at the end for the total amount of upgrades required.

1.2.4 Blade Trial Run: Crudine Ridge Windfarm: Ex Mooney Mooney by Rex J Andrews

This report documents the observations made by the team from Rex J Andrews and gives advice on a dry run that was completed along the proposed southern haulage route, travelling via the Blue Mountains to Crudine Ridge. The observations in the report were current as of 8 June 2017.

The report concludes that the proposed haulage route would allow for transportation of the loads if the following items were considered:

- A light pole is relocated at Mt Victoria rail bridge;
- New works along the carriageway in Mt Victoria Village are passable given there is no centre barrier installed;

- Victoria Pass would have to be blocked at the top and bottom gantries to enable transportation around tight corners. The movement is expected to take approximately 10 minutes;
- The Great Western Highway at River Lett Hill needs to be closed to eastbound traffic for approximately 6 minutes to enable to haulage vehicles to manoeuvre around tight corners.
- The rail crossing at Ben Bullen will require works due to conflict between the blades overhanging and a rail signal; and
- A sign post on the corner at Aarons Pass will need to be removed.

1.2.5 Crudine Ridge Wind Farm: Aarons Pass Road – Route Survey by iCubed

iCubed undertook swept path analysis of Aarons Pass Road for the proposed haulage vehicles and produced a set of preliminary drawings. The drawings detail proposed upgrades and alterations to be made to the route to enable transport. These include:

- removal of vegetation;
- earthworks to alter vertical alignment; and
- installation / extension of culverts.

The drawings also give comments on potential passing bay opportunities and locations where the transport is expected to encroach on surrounding land.

1.2.6 Crudine Ridge Wind Farm: Modification to SSD 6697 December 2019

iCubed undertook further design during the preparation of the development Modification. This further refined the previous swept path analysis of Aarons Pass Road for the proposed haulage vehicles. An updated set of preliminary drawings was produced and is contained in Appendix C.

The drawings detail proposed upgrades and alterations to be made to Aarons Pass Road to enable transport of Oversize Over Mass (OSOM) traffic. These include:

- Refinement of the vegetation removal required as per Biodiversity Management Plan (BMP);
- Updating the earthworks required to obtain vertical and horizontal alignment; and
- Location of existing and proposed culverts.

The drawings identify the locations of proposed passing bay and locations where the transport is expected to encroach on surrounding land.

1.3 CONDITIONS OF APPROVAL

Conditional development consent was provided for the Project in May 2016 by the Planning Assessment Commission. Schedule 3, conditions 28-34 relate specifically to transport matters, with condition 33 requiring the development of a TMP. Conditions 32 and 33 are outlined in Table 1.1.

Table 1.1: Conditions of Approval – Section 3, Conditions 32 and 33

CoA	Requirement	Section where this addressed
28	Prior to the commencement of construction (other than pre-construction minor works or the construction of the external overhead transmission line), the Applicant shall:	
	(a) undertake the road upgrades and other traffic management measures (including the construction of passing bays) identified in Appendix 6 to the satisfaction of MWRC;	Section 5.3.2
	(b) upgrade the existing intersection between Aarons Pass Road and the Castlereagh Highway to the satisfaction of the RMS, unless the RMS determines these upgrades are unnecessary; and	Section 2.3 N16 Section 3.3 S19 Section 5.2
	(c) construct the new intersection between Aarons Pass Road and the northern site access road to the satisfaction of MWRC. The intersection design must include: <ul style="list-style-type: none"> a widened shoulder prior to the intersection to assist turning vehicles; and/or a widened intersection to facilitate the flow of entering traffic off the road; and/or placing site entrance gates back from the road so that they do not create a hold point for entering vehicles prior to their egress from Aarons Pass Road. 	Section 1.5.6
	The Applicant may commence construction of the external overhead transmission line (as identified in Appendix 2), prior to completion of the Aarons Pass Road upgrades set out in this condition, provided that all heavy and over-dimensional vehicles associated with the construction of this transmission line: <ul style="list-style-type: none"> (a) access the site from Bombandi Road; and (b) do not use Aarons Pass Road before it has been upgraded in accordance with this condition. 	Section 5.1
29	Prior to the commencement of construction of the external transmission line (see the figures in Appendix 2), the Applicant shall:	
	(a) undertake the road upgrades and other traffic management measures identified in Appendix 6 to the satisfaction of MWRC; and	Section 6.3
	(b) upgrade the existing intersection between Bombandi Road and the Castlereagh Highway to the satisfaction of the RMS, unless the RMS determines these upgrades are unnecessary.	Section 6.3
30	The Applicant shall:	
	(a) prepare a pre-dilapidation survey of the transport route prior to the commencement of any construction or decommissioning works other than pre-construction minor works;	Section 5.1.1 Aarons Pass Road Section 6.1.1 Bombandi Road

CoA	Requirement	Section where this addressed
	(b) prepare a post-dilapidation survey of the transport route within 1 month of the completion of construction or decommissioning works other than pre-construction minor works, or other timing as may be agreed by the applicable roads authority; and	Section 5.1.1 Aarons Pass Road Section 6.1.1 Bombandi Road
	(c) rehabilitate and/or make good any project-related damage identified in the post-dilapidation survey within 2 months of the completion of survey, or other timing as may be agreed by the relevant roads authority, to the satisfaction of the relevant roads authority.	Section 5.1.1 Aarons Pass Road Section 6.1.1 Bombandi Road
	If the construction and/or decommissioning of the development is to be staged, the obligations in this condition apply to each stage of construction and/or decommissioning. If there is a dispute about the scope of any remedial works or the implementation of the works, then either party may refer the matter to the Secretary for resolution.	Noted
32	The Applicant shall ensure that all:	
	(a) Over-dimensional vehicle access to and from the site is via the northern route using Castlereagh Highway and Aarons Pass Road;	Section 2
	(b) Over-dimensional vehicle access through Mudgee is via: <ul style="list-style-type: none"> Route 1 (using Castlereagh Highway, Market Street, Duoro Street and Horatio Street), for vehicles up to 50 metres length; or Route 2 (using Castlereagh Highway, Market Street, Cox Street, Short Street, Lawson Street, Mortimer Street, Burrundulla Avenue and Horatio Street), for vehicles more than 50 metres length; 	Section 2
	(c) Other heavy vehicle access to and from the site is via: <ul style="list-style-type: none"> The northern route using Castlereagh Highway and Aarons Pass Road; or The southern route using Hill End Road and the Ilford-Sofala Road or Sofala Road; or The minor access routes using Bombandi Road and/or Crudine Road, Unless the Secretary authority approves otherwise.	Sections 2, 3, 4, and 5
	Notes: <i>The Applicant is required to obtain relevant permits under the Heavy Vehicle National Law (NSW) for the use of over-dimensional vehicles on the road network.</i>	
33	Prior to carrying out further work on the upgrades on Aarons Pass Road after the date of approval of Modification 1 or the commencement of the Bombandi Road upgrades, whichever occurs first, the Applicant must prepare a revised Traffic Management Plan for the development to the satisfaction of the Secretary. This plan must be prepared in consultation with RMS and the Councils, and include:	
	(a) Details of all transport routes and traffic types to be used for the development-related traffic;	Sections 2 and 3

CoA	Requirement	Section where this addressed
	(b) A protocol for undertaking dilapidation surveys to assess the: <ul style="list-style-type: none"> Existing condition of the transport route/s prior to construction or decommissioning works; and Condition of the transport route/s following construction or decommissioning works; 	Sections 5 and 6
	(c) A protocol for the repair of any roads identified in the dilapidation surveys to have been damaged during construction or decommissioning works;	Sections 4 and 5
	(d) Details of the measures that would be implemented to minimise traffic safety issues and disruption to local users of the transport route/s during any road upgrades and construction or decommissioning works, including: <ul style="list-style-type: none"> Temporary traffic controls, including detours and signage; Notifying the local community about project related traffic impacts; Minimising potential for conflict with school buses and rail services, including avoiding heavy vehicle transport through Mudgee between the hours of 7 am and 10am and 2 pm and 4:30 pm Monday to Friday, as far as practicable; Undertaking monitoring and maintenance on Aarons Pass Road; Responding to any emergency repair or maintenance requirements; and A traffic management system for managing over-dimensional vehicles; and 	TCP in Appendix A Community Notification Sections 2.3, 3.3, 5.3 and 6.3 School buses Section 2.1 and Section 2.4
	(e) A driver's code of conduct that addresses; <ul style="list-style-type: none"> Travelling speeds; Procedures to ensure that drivers adhere to the designated transport routes; and Procedures to ensure that drivers implement safe driving practices, particularly if using local roads through Mudgee. If the construction and/or decommissioning of the development is to be staged, the obligations in this condition apply to each stage of construction and/or decommissioning. 	Appendix B

Condition 32 of the Development Consent requires that over-dimensional vehicle access to and from the site is via the northern route using Castlereagh Highway and Aarons Pass Road, unless the applicable roads authority approves otherwise. The condition also states that the Applicant is required to obtain relevant permits under the Heavy Vehicle National Law (NSW) for the use of over-dimensional vehicles on the road network.

In early 2017, the proponent engaged with Roads and Maritime Services (RMS) to evaluate the feasibility and potential impacts of an alternative southern transport route in order to reduce traffic pressure on townships along the northern route, including Gulgong and Mudgee. Extensive consultation was undertaken during this assessment to ensure that the route was feasible, including meetings and information exchange with the following entities:

- Mid-Western Regional Council

- Roads and Maritime Services
- Development Assessments team
- Special Permits Unit
- Great Western Highway design team
- Golden Highway design team
- Northconnex (Ward Group construction team)
- M2 Hills Motorway
- Country Regional Network / John Holland Rail Group

At the request of the Special Permits Unit, an unloaded dry run was undertaken under police escort in June 2017, to confirm that the route could be safely used to transport over-dimensional equipment from Newcastle to the site entrance. The dry run was successfully completed and the Special Permits Unit subsequently provided endorsement for use of the route for the Project, subject to an adequate TMP and standard permitting procedures. A draft version of this TMP was provided to RMS Land Use Assessment Team for review in September 2017. RMS subsequently accepted the use of the southern and northern routes, subject to the terms of the special permits.

The approval of the Traffic Management Plan by the Secretary on 15 December 2017 constitutes Secretary's Approval of the Southern Access Route that was previously approved by the RMS. This aligns it to the Conditions of Consent for SSD 6697 MOD 1.

Sections 2 and 3 of this plan identify the planned management measures for haulage that will be adopted on the northern and southern routes during construction of the Project.

1.4 OBJECTIVES

The purpose of this TMP is to define the traffic management initiatives that will be deployed during construction of the Project to minimise disruption to, and ensure the safety of, the wide range of stakeholders potentially affected by the Project works.

The development of this TMP is in accordance with the overarching Schedule 3: Environmental Conditions, of the Development Consent. Prior to the commencement of construction, the EPC will engage a specialist sub-contractor to prepare an Over-size Over-mass Transport Management Plan when applying for permits to transport over-dimensional equipment. The EPC Contractor will also be engaged with Council in relation to the Council road upgrades and traffic management required under the Development Consent. Specific measures for traffic management, including final route identification, timing of transport, switching and detours, escort and pilot vehicles, and variable message signage, will be implemented as required by the roads authority when permits are issued.

1.5 SCOPE

The scope of this project is broken down into the specific traffic management plans detailed below.

1.5.1 Northern Haulage Route TMP

The scope of the Northern Haulage Route TMP includes:

- Reviewing material from contractors (relating to traffic and transport for the TMP)
- Reviewing material from consultants (relating to traffic, transport and previous haulage route assessment)
- Preparation of a road corridor TMP report for the Northern Haulage Route, which includes reference to the standard TCPs that are to be implemented as part of the haulage of wind turbine components.

1.5.2 Southern Haulage Route TMP

The scope of the Southern Haulage Route TMP includes:

- Reviewing material from contractors (relating to traffic and transport for the TMP)

- Reviewing material from consultants (relating to traffic, transport and previous haulage route assessments)
- Preparation of a road corridor TMP report for the Southern Haulage Route, which includes reference to the standard TCPs that are to be implemented as part of the haulage of wind turbine components.

1.5.3 Aarons Pass Road TMP (Schedule 3 Item 28)

The scope of the Aarons Pass Road TMP includes:

- Reviewing material from contractors (relating to traffic and transport for the TMP); and
- Preparation of a TMP report for Aarons Pass Road and Castlereagh Highway intersection, which includes reference to the standard TCPs that are to be implemented as part of the haulage operations of wind turbine components that do not require a custom TCP to be prepared.

A draft TMP report for Aarons Pass Road haulage corridor, including reference to the standard TCPs has been included in the contents of this report. A finalised TMP with updated TCPs will be completed at a later stage by the appointed EPC Contractor in consultation with Mid-Western Regional Council, so as to address the final road design.

1.5.4 Bombandi Road TMP (Schedule 3 Item 29)

The scope for the Bombandi Road TMP includes:

- Reviewing material from contractors (relating to traffic and transport for the TMP); and
- Preparation of a TMP report for Bombandi Road and Castlereagh Highway intersection, which includes reference to the standard TCPs that are to be implemented as part of the haulage operations of transformer, switch room and transmission tower components.

A draft TMP report for Bombandi Road haulage corridor, including reference to the standard TCPs has been included in the contents of this report. A finalised TMP with updated TCPs will to be completed at a later stage by the appointed EPC Contractor in consultation with Mid-Western Regional Council, so as to address the final road design.

1.5.5 Traffic Control Plans (TCP) for the Southern and Northern Haulage Routes

The scope for the traffic control plans include:

- Traffic control plans for the following oversized vehicles haulage routes from Newcastle Port to Aaron Pass Road:
- Northern Route – Newcastle Port to Aarons Pass Road via Golden Highway and Mudgee; and
- Southern Route - Newcastle Port to Aarons Pass Road via Sydney and Blue Mountains.

The TCPs address OSOM movements however it is likely that when haulage contractors are engaged the TCPs will require adjustment, which would be undertaken in consultation with RMS.

1.5.6 Northern Entrance Access from Aarons Pass Road

An approved access point to the Project site for SHV, OS/OM and light vehicles enters from Aarons Pass Road to create the main entrance to the site. The final design and alignment of this access has been determined following consultation with Mid Western Regional Council. The northern entrance will be used for construction activities commencing in the northern area of the site.

1.5.7 Southern Entrance Access from Hill End Road

A second approved access point to the Project site for SHV and light vehicles enters from Hill End Road to create a southern entrance to the site. The location and alignment of this access has been determined following consultation with Bathurst Regional Council. The southern entrance will be used for construction activities commencing in the southern area of the site as permitted under the Development Consent.

Only light vehicles may traverse Sallys Flat Road and only then with the express permission of the EPC Project Manager. A register of all vehicles using Sallys Flat Road will be maintained. Heavy vehicles are approved to use the Hill End Road, Ilford-Sofala Road or Sofala Road.

The EPC Contractor has identified the potential for the operation of an existing quarry opposite the southern entry to the south of Hill End Road. Subsequently, a TMP relating to the southern entrance from Hill End

Road is not included in the scope of this plan as it will be prepared in consultation with Bathurst Regional Council, once the anticipated quarry movements are known.

Any heavy vehicle movements along Sallys Flat Road associated with the establishment and operation of the proposed southern quarry is outside the scope of SSD 6698 MOD1. It is covered in a separate Development Consent which was granted by Bathurst Regional Council.

1.6 CONSULTATION

Throughout the preparation of the draft Traffic Management Plan (TMP) for Crudine Ridge Wind Farm consultation was undertaken with the following organisations:

- Roads and Maritime Services (RMS);
- Mid-Western Regional Council (MWRC); and
- Bathurst Regional Council (BRC).

Table 1.2 outlines the comments received during consultation and the changes or response made regarding each comment.

Table 1.2: Consultation comments

Organisation	Comment	Response
RMS	The TMP submitted only appears to address heavy vehicle haulage movements and not other traffic generation such as construction staff, concrete, etc.	Section 4 includes anticipated light vehicle movements. Section 2.1.2, 3.1.2 and 5.4.2 address the standard heavy vehicle movements on state and council roads.
	The TMP needs to include all traffic generation, that is, light vehicles, buses (eg for staff), construction vehicles eg concrete materials, etc), to identify, understand and mitigate the cumulative traffic impacts of the development.	Section 4 includes anticipated light vehicle movements. Section 2.1.2, 3.1.2 and 5.4.2 address the standard heavy vehicle movements on state and council roads.
RMS	The intersection of Aarons Pass Rd and the Castlereagh Highway has sight deficiencies, hence why VMS were required at this intersection during construction (see attached) Detail from the email attachment: During the construction period, trailer mounted Variable Message Signs (VMS) shall be placed on the Castlereagh Highway displaying "Trucks Turning Ahead" warning motorists of turning construction vehicles at the following locations: Approximately 250 metres south and north of the intersection of Castlereagh Highway and Aarons Pass Road. VMS shall only be operational during actual construction days. The final location of the VMS will require the approval of Roads and Maritime prior to their positioning and display adjacent to the highway.	See section 2.3, 3.3 and TCP N16.
RMS	Can you confirm upgrades to the level crossing on Castlereagh Highway at Ben Bullen are restricted to rail infrastructure only?	Affirmative. There are minor adjustments required to the rail signals in order to allow the blade

Organisation	Comment	Response
		trailers to pass through the rail crossing. There are no anticipated changes for the roadway itself. Refer to Section 3.3 S.18
	Section 4.3.2 refers to waiting bays along the haulage route. Dimension are also provided for the waiting bays (15m x 3m). Can you advise where these will be located, in particular, are any proposed on classified roads (Castlereagh Highway, Hill End Rd)? Further, can you advise how the 15m waiting/passing bays has been arrived at? Given general access vehicles are up to 19m long and Castlereagh Highway is open to 26m B-doubles.	This section has been reviewed and waiting bays are not considered to be required on this section of the route due to the existing infrastructure on the highway (i.e. overtaking lanes and channelized turning bays on the major intersections). The dimensions referred to in RMS' comments are were indicated originally in the early Project traffic assessment for passing bays on Aarons Pass Road (A Council Road). Traffic management including passing bay locations and dimensions are being discussed with Mid-Western Regional Council to ensure they are fit for purpose. Refer to Section 4.3.2
	Section 6.3.1 – warrants for BAR/BAL intersection. What warrants are you referring to?	We agree that the language in this section was confusing. We do not consider that an intersection upgrade is required (i.e. warranted) due to the very low daily vehicle movements and no OSOM movements whatsoever. Vehicle movements have been further broken down in Appendix D. Refer to Section 6.3.1
RMS	Section 6.3.1 – there needs to be a projected breakdown of vehicle types, volumes and origin/destination to justify not upgrading Bombandi/Castlereagh Highway intersection. To help, I've attached a breakdown of traffic submitted for the Silverton Wind Farm – please note that in this case, all traffic was coming and going to/from the one direction, so there wasn't a need to break down origin/destination for the intersections.	Appendix D provides an updated breakdown of vehicle movements including the anticipated direction of travel (North/South) for the Bombandi Rd intersection. There will be no OSOM vehicles using this intersection, just light and standard heavy vehicles (See Section 6.3.1).
	The appendices include TCPs for Bombandi/Castlereagh Highway intersection and Aarons Pass/Castlereagh Highway. Are these to manage roadworks or traffic during OSOM movements?	The TCPs are provided to address OSOM movements, as indicated in Section 1.5.1 and 1.5.2. It is likely that when a haulage contractor is engaged that the TCPs will require adjustment in consultation with RMS Special Permits group.

Organisation	Comment	Response
	Section 4 estimates 27 light vehicles movements per day, on average, will be generated during construction. This seems very low, considering similar projects are generating up to 100 light vehicle movements per day. Can you explain why this proposal will generate significantly less vehicle movements? Again, the attached extract from Silverton Wind Farm may be useful.	There is high variability in the daily vehicle movements across the project schedule. The movements are expected to peak at 107 vehicles per day (VPD) as stated. However the average is 27 VPD. Full details of the vehicle movements are provided in Appendix D for clarity. It is also noted that Silverton Wind Farm is a ~200MW facility whereas Crudine Ridge Wind Farm will be a ~135 MW facility (i.e. approximately two thirds the size) so fewer vehicle movements are required. Refer to Section 4 and Appendix D.
MWRC	Although no modifications or Traffic Control are identified as required at the intersection with Douro and Horatio Streets, please be aware that Mudgee Public and Mudgee high school are located at this intersection. The movement hour restrictions should mitigate any conflict with students here, but I think it is worthy of consideration in the pedestrian section.	See sections 2.1.4 and 2.4.1
	Clarification of routes - ...just checking that you have no plans to use the previously discussed route in Mudgee via Short Street, Lawson Street and Burrendulla Ave – I assume the use of the southern Haulage Route for the long vehicles supersedes this route through Mudgee.	Given that the Southern Route is approved for use by RMS, it is not anticipated that there will be a need to use the Second route through Mudgee. The route is still approved and could be adopted if needed due to roadworks or other constraints, but consultation would occur with MWRC prior to use and prepare Traffic Control Plans for your review.
MWRC	There (are) conflicting statements in the TMP about the Aarons Pass Road and Bombandi Road. Section 4 of the TMP provides details of Aarons Pass Road TMP, however item 1.5.3 states that the Aarons Pass Road TMP is not covered in the scope of this plan and will be developed later in consultation with Council. Are we to expect a second TMP specifically for Aarons Pass because Section 4 doesn't address our concerns, particularly around managing the interface with local traffic. This may be covered in the communication plan or driver code of conduct but they are not appended to this document. (Similar to above) Section 5 and 1.5.4 for Bombandi Road.	A specific TMP and TCPs are to be completed at a later stage by the appointed EPC Contractor in consultation with Mid-Western Regional Council, so as to address the final road design and appropriate management of construction and local traffic during both the upgrade of Aarons Pass and Bombandi Roads as well as continued traffic management until construction completion.
BRC	In general we have no issue with use of Hill End Road to access the site	Noted

Organisation	Comment	Response
	Happy to liaise with contractor once they are engaged once types of vehicles and volumes etc are known.	

2. NORTHERN HAULAGE ROUTE - TMP

2.1 EXISTING CONDITIONS

The northern haulage route is an approximate 420-kilometre journey from the Port of Newcastle at Mayfield to the Project Site near Pyramul. It travels in a north-west direction from Newcastle before heading south along the Castlereagh Highway, through Mudgee to Aarons Pass, from just east of the township of Dunedoo. The route utilises major roads and highways travelling from Newcastle through Jerrys Plains, Denman, Sandy Hollow, Merriwa, Birriwa, Gulgong, and Mudgee to Aarons Pass.

An alternative heavy vehicle route exists along New England Highway, Thomas Mitchell Drive and Denman Road, which would avoid the Golden Highway route through Jerrys Plains, particularly when upgrades to the Golden Highway are being undertaken. Use of the alternative route will be subject to consultation with RMS Special Permits Unit and identified in the Over Size or Over Mass (OSOM) Transport Management Plan prepared when applying for permits.

The northern haulage route will be used for transport of wind turbine towers, nacelles and standard loads.

2.1.1 Roads on Northern Haulage Route

The following roads are to be utilised between Newcastle and Aarons Pass:

- Selwyn Street;
- George Street;
- Industrial Drive;
- Pacific Highway (Maitland Road);
- John Renshaw Drive;
- Hunter Expressway;
- New England Highway, west of Branxton;
- Golden Highway (Mitchell Line of Road);
- Golden Highway (Putty Road), east of Jerrys Plains Road;
- Golden Highway (From Jerrys Plains Road to Castlereagh Highway);
- Castlereagh Highway;
- Birriwa Rail crossing;
- Castlereagh Highway (Fisher Street and Medley Street);
- Castlereagh Highway, north of Mudgee;
- Castlereagh Highway (Market Street), Mudgee
- Castlereagh Highway (Douro Street), Mudgee
- Castlereagh Highway (Horatio Street), Mudgee
- Castlereagh Highway, south of Mudgee; and
- Aarons Pass Road

A map of the northern haulage route is shown below in Figure 2.1. Note that the alternative OSOM route via Thomas Mitchell Drive and Denman Road will be considered for use in consultation with RMS Special Permits Unit.

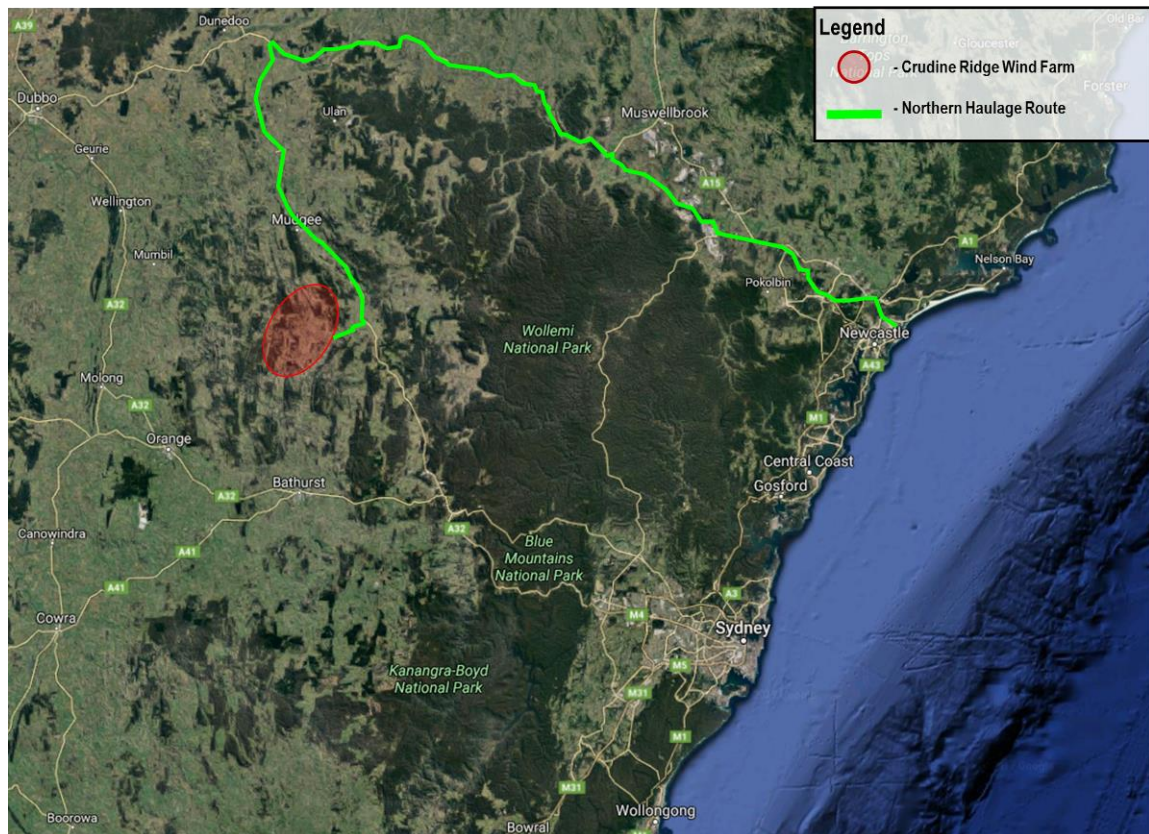


Figure 2.1: Northern Haulage Route

2.1.2 Expected Haulage Vehicles

Vehicles traversing the northern haulage route are to be of an approximate length of 32 metres consisting of truck and trailer. These vehicles are to carry wind turbine components (other than turbine blades) from Newcastle to site on Aarons Pass Road. Vehicles transporting wind turbine blades are not expected to use the northern route. Drivers are required to follow the Driver's Code of Conduct. This is included in Appendix B. The route will also be used by Standard Heavy Vehicles hauling materials to the site. Where practicable and approved by the relevant council, gravel and water to be used during construction is expected to be provided on-site, reducing the anticipated standard heavy vehicle movements on the state and council road network. All drivers will be required to follow the Driver's Code of Conduct, included in Appendix B.

2.1.3 Escort Vehicles

Each separate OSOM vehicle traversing the northern haulage route will be accompanied by escorts and pilot vehicles as per the road authority requirements. It is expected that escort police vehicles will carry out the required TCPs at nominated sites.

2.1.4 Key Intersections/Sections

This section details key intersections or sections of road along the northern haulage route, including those that require further traffic management, See Table 2.1 for a summary.

Table 2.1: Summary of the Key Intersection / Sections (Northern Haulage Route)

ID	Intersection
NS1	Selwyn Street to George Street to Industrial Drive, Mayfield East
NS2	Industrial Drive and Pacific Highway (Maitland Road), Mayfield
NS3	M1 Pacific Motorway and John Renshaw Road Roundabout, Beresfield
N4	Hunter Expressway and John Renshaw Drive Roundabout, Buchanan
N5	New England Highway at Golden Highway, Whittingham
N6	Golden Highway (Mitchell Line of Road) and Golden Highway (Putty Road), Mount Thorley
N7	Golden Highway Turnoff at Mount Thorley, Golden Highway (Putty Road) onto Golden Highway (Jerrys Plains Road)
N8	Golden Highway, Dual Bends at Jerrys Plains
N9	Golden Highway and Golden Highway (Denman Road), Denman
N10	Golden Highway, Right Bend at Denman
N11	Golden Highway onto Castlereagh Highway, Dunedoo
N12	Castlereagh Highway (Fisher Street and Medley Street), Gulgong
N13	Castlereagh Highway (Market Street / Douro Street), Mudgee
N14	Castlereagh Highway (Douro Street / Horatio Street), Mudgee
N15	Castlereagh Highway (Horatio Street / Church Street) Roundabout, Mudgee
NS19	Castlereagh Highway and Aarons Pass Road, Aarons Pass

NS1. Selwyn Street to George Street to Industrial Drive, Mayfield East

Sign posted Speed Limit:

- Selwyn Street – 50km/h;
- George Street – 50km/h; and
- Industrial Drive – 80km/h.

Specific Road Alignment Issues / Description: N/A.

A double right turn is required at this pair of intersections, as shown in Figure 2.2. The first intersection (George Street and Selwyn Street) has no obstructions and is expected to accommodate the manoeuvre by using part of the opposite side of the road. However, the location of the traffic lights at the intersection with Industrial Drive may cause problems during the right turn manoeuvre. Trucks are expected to travel on the opposite side of the road, over the median and back onto the left side. The traffic signal located on the central median may require temporary removal or relocation. Traffic management and/or police presence will be utilised as trucks perform the movement if required by RMS Special Permits.



Source: Google Maps

Figure 2.2: Vehicles Use Both Sides of the Road at Selwyn Street / George St / Industrial Drive Intersections

NS2. Industrial Drive and Pacific Highway (Maitland Road), Mayfield

Sign posted Speed Limit:

- Industrial Drive – 80km/h; and
- Pacific Highway (Maitland Road) – 80km/h.

Specific Road Alignment Issues / Description: N/A.

Traffic management is required to assist the wind turbine blades travel through the intersection of Industrial Drive and the Pacific Highway (Maitland Road) at Mayfield. The right hand turn to the Pacific Highway does not have sufficient width to accommodate the turning oversized vehicles. Oversized vehicles will be required to travel on the opposite side of the road on both Industrial Drive and Maitland Road on approach and exit of the intersection as shown in Figure 2.3.



Source: Google Maps

Figure 2.3: Vehicles Use Both Sides of the Road at Industrial Drive / Pacific Highway (Maitland Road) Intersection

N3. M1 Pacific Motorway and John Renshaw Drive Roundabout, Beresfield

Sign posted Speed Limit:

- M1 Pacific Motorway – 60km/h;
- John Renshaw Drive – 60km/h; and
- Weakleys Drive – 60km/h.

Specific Road Alignment Issues / Description: N/A.

Both the approach and exit of the roundabout are dual carriageways and will assist oversize vehicle movements through the roundabout. Oversize trucks may be required to mount the kerb section of the roundabout, as shown in **Figure 2.4**.

As a result, reflective signage (standing at 800 millimetres high) located upon the roundabout may require temporary removal or relocation further back onto the roundabout to accommodate oversize vehicles. No traffic management should be required for this intersection.



Source: Google Maps

Figure 2.4: Vehicles Mount Roundabout at John Renshaw Drive / M1 Pacific Motorway Intersection

N4. Hunter Expressway and John Renshaw Drive Roundabout, Buchanan

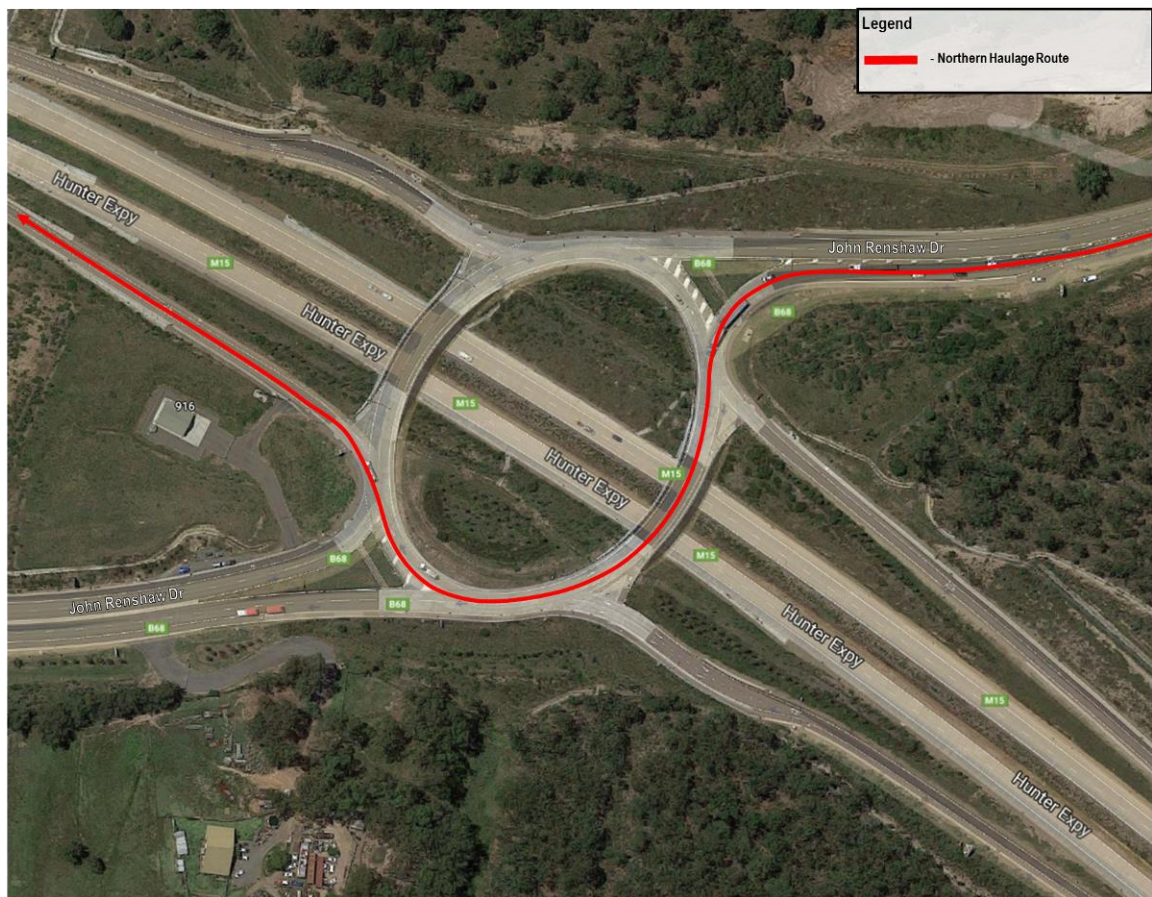
Sign posted Speed Limit:

- Hunter Expressway – 110km/h; and
- John Renshaw Drive – 60km/h (reduced from 100km/h, 200 metres east of the intersection).

Specific Road Alignment Issues / Description: Steep gradient preceding intersection.

Approach, exit, and travel lanes of the Hunter Expressway / John Renshaw Drive Roundabout are dual carriageway which will assist oversize vehicle movements through the intersection, shown in Figure 2.5.

It is expected that trucks, up to 32 metres in length, can manoeuvre around the roundabout without traffic management. Trucks are expected to use both travel lanes to perform the manoeuvre.



Source: Google Maps

Figure 2.5: Northern Haulage Route Through the Hunter Expressway / John Renshaw Drive Roundabout

N5. New England Highway at Golden Highway (Mitchell Line of Road), Whittingham

Signposted Speed Limit:

- New England Highway – 100km/h; and
- Golden Highway (Mitchell Line of Road) – 100km/h.

Specific Road Alignment Issues / Description: N/A.

Trucks may be required to use part of the through-travel lane on the New England Highway, to perform the left turn, as shown in Figure 2.6. Small median islands to facilitate bicycle traffic been installed since the previous route assessment by Downer. Trucks are expected to travel over these islands, requiring the removable reflective sign located on one of the islands to be removed during manoeuvres. Given the width of the road section on the New England Highway at the intersection with the Golden Highway, no further modification will be required to accommodate left turn manoeuvres. Currently there is indication from RMS that upgrade works at the intersection are to occur in 2018. Ongoing engagement with RMS will be undertaken to manage potential impacts to roadworks during haulage. An alternative heavy haulage route is available via New England Highway, Thomas Mitchell Drive, and Denman Road, subject to approval from RMS. The alternative route would avoid intersections N5 – N9.



Source: Google Maps

Figure 2.6: Northern Haulage Route Through the New England Highway / Golden Highway (Mitchell Line of Road) Intersection

N6. Golden Highway (Mitchell Line of Road) and Golden Highway (Putty Road), Mount Thorley

Sign posted Speed Limit:

- Golden Highway (Mitchell Line of Road) – 100km/h; and
- Putty Road (Golden Highway) – 100km/h.

Specific Road Alignment Issues / Description: N/A.

Traffic management is not expected to be required at the intersection of the Golden Highway and Putty Road near Mount Thorley to assist truck movements.

To perform the left turn shown in Figure 2.7, trucks are expected to partially use the opposite side of the road on the Golden Highway (Mitchell Line of Road) and the Golden Highway (Putty Road) to perform the left turn.

A removable give way sign is currently in place on the median on Golden Highway and will be required to be removed during truck movements.



Source: Google Maps

Figure 2.7: Vehicles Use Both Sides of the Road at Golden Highway (Mitchell Line of Rd) / Golden Highway (Putty Road) Intersection

N7. Golden Highway Turnoff at Mount Thorley, Golden Highway (Putty Road) onto Golden Highway (Mount Thorley Road)

Sign posted Speed Limit:

- Golden Highway (Putty Road) – 100km/h; and
- Golden Highway (Mount Thorley Road) – 80km/h.

Specific Road Alignment Issues / Description: N/A.

Traffic management is not expected to be required for the right turn onto Mount Thorley Road from Putty Road (Golden Hwy). Trucks may be required to utilise the through lane on Putty Road to perform the right turn with removal of a give way sign on Putty Road and roadside signage on the corner island. The route from Putty Road onto Mount Thorley Road/Golden Highway is shown in Figure 2.8.



Source: Google Maps

Figure 2.8: Northern Haulage Route onto Golden Highway (Mount Thorley Road) from Golden Highway (Putty Road)

N8. Golden Highway (Pagan Street), Jerrys Plain and Golden Highway (Lonsdale Street), Jerrys Plain

Sign posted Speed Limit:

- Golden Highway (Pagan Street / Lonsdale Street) – 60km/h (reduced from 80km/h 900 metres south of intersection).

Specific Road Alignment Issues / Description: N/A

Two bends on the Golden Highway through Jerrys Plains will require traffic management to assist the oversized heavy vehicles manoeuvre through these corners. Southbound traffic along Golden Highway (Pringle Street) to the north-west of the site, will need to be stopped for a period of time as the trucks will required both sides of the road to travel through this section. This is shown in Figure 2.9.

Additional traffic management is required to slow and/or stop vehicles at Arrowfield Hill and Ogilvie's Hill to assist the trucks movement through the steep sections of the road at these locations.



Source: Google Maps

Figure 2.9: Vehicles Use Both Sides of the Road at Jerrys Plains on Golden Highway

N9. Golden Highway and Golden Highway (Denman Road), Denman

Sign posted Speed Limit:

- Golden Highway – 100km/h; and
- Golden Highway (Denman Road) – 100km/h.

Specific Road Alignment Issues / Description: N/A.

Oversize vehicles may be required to utilise part of the opposing traffic lanes on Golden Highway and Golden Highway (Denman Road) to perform the left turn manoeuvre and will require traffic management to assist manoeuvres. The haulage route through the intersection is shown in Figure 2.10.



Source: Google Maps

Figure 2.10: Haulage Vehicles Utilising Both Sides of the Road at Golden Highway / Golden Highway (Denman Road) Intersection, Denman

N10. Golden Highway (Crinoline Street) and Golden Highway (Palace Street), Denman

Sign posted Speed Limit:

- Golden Highway (Crinoline Street) – 60km/h; and
- Golden Highway (Palace Street) – 60km/h.

Specific Road Alignment Issues / Description: N/A.

This intersection has been upgraded to include a larger radius right turn since the survey conducted by Downer was undertaken. As a result, it is not expected that traffic management will be required at this location. An approximation of the new alignment is shown in Figure 2.11.



Source: Google Maps

Figure 2.11: Northern Haulage Route through Approximate New Alignment of Golden Highway at Crinoline Street, Denman

N11. Golden Highway onto Castlereagh Highway, Dunedoo

Sign posted Speed Limit:

- Golden Highway – 100km/h; and
 - Castlereagh Highway (Palace Street) – 100km/h.
- Specific Road Alignment Issues / Description: N/A.

Traffic management is required to assist the oversized vehicles manoeuvring through the intersection of the Golden Highway onto Castlereagh Highway near Dunedoo. The left hand turn will require part of the eastbound lane on Golden highway and the northbound lane on Castlereagh Highway. This is shown in Figure 2.12.



Source: Google Maps

Figure 2.12: Vehicles Use Both Sides of the Road at Golden Highway / Castlereagh Highway Intersection

N12. Castlereagh Highway (Fisher Street and Medley Street), Gulgong

Sign posted Speed Limit:

- Castlereagh Highway (Fisher Street / Medley Street) – 50km/h
Specific Road Alignment Issues / Description: N/A.

This intersection is not sufficiently wide to accommodate oversize vehicle manoeuvres and will require minor modification to allow the right turn movement. Removal or conversion, to removable signposts, of the two signposts on the inside of the turn will be required. A temporary hardstand may also be required on the inside corner to facilitate trailers tracking over the kerb. Temporary relocation of the steel safety barrier is unlikely to be required for the expected OSOM movements through this intersection. The movement through the intersection is shown in Figure 2.13.



Source: Google Maps

Figure 2.13: Vehicles Travel Over Inside Corner at Castlereagh Highway (Fisher Street / Medley Street) Intersection, Gulgong

N13. Castlereagh Highway (Market Street / Douro Street), Mudgee (Vehicles under 50 metres in length only)

Sign posted Speed Limit:

- Castlereagh Highway (Market Street / Douro Street) – 50km/h.
Specific Road Alignment Issues / Description: N/A.

A roundabout and leading median islands have been installed since the previous route assessment by Downer. This intersection remains constricted and will require oversized vehicles to travel over the roundabout and median islands on both Castlereagh Highway/Market Street and Douro Street to perform the right turn, as shown in Figure 2.14. In addition, two sets of signage will require removal or conversion to removable signposting. Traffic management and parking control will be required to assist truck movements through this intersection.



Source: Google Maps

Figure 2.14: Vehicles Travel over Medians at Castlereagh Highway (Market Street / Douro Street) Intersection, Mudgee

N14. Castlereagh Highway (Douro Street / Horatio Street), Mudgee (Vehicles under 50 metres in length only)

Sign posted Speed Limit:

- Castlereagh Highway (Douro Street and Horatio Street) – 50km/h.
Specific Road Alignment Issues / Description: N/A.

To perform the left turn manoeuvre from Douro Street to Horatio Street, oversized vehicles are expected to use the through lane on Douro Street and part of the opposite side of the road on Horatio Street, as shown in Figure 2.15. Parking will need to be controlled along the southern side of Horatio Street adjacent to the intersection. Otherwise, no modifications to the intersection are required.



Source: Google Maps

Figure 2.15: Northern Haulage Route through Castlereagh Highway (Douro Street / Horatio Street), Mudgee

N14(a). Castlereagh Highway (Douro Street / Horatio Street), Mudgee

Mudgee High School is located at this intersection and Mudgee Public School is located 350 metres north of the intersection. Given movement times avoiding heavy vehicle transport through Mudgee between the hours of 7 am and 10am and 2 pm and 4:30 pm Monday to Friday, as far as practicable restrict the potential for conflict with children no traffic control is required. However, further consideration of potential issues is outlined in section 2.4.1.

N15. Castlereagh Highway (Horatio Street / Church Street) Roundabout, Mudgee (Vehicles under 50 metres in length only)

Signposted Speed Limit:

- Castlereagh Highway (Horatio Street / Church Street) – 50km/h.

Specific Road Alignment Issues / Description: N/A.

The entry and exit lanes to the Church Street roundabout are sufficiently wide to accommodate oversize vehicles travelling through. Trucks will be required to utilise both entry lanes to manoeuvre around the roundabout, as shown in Figure 2.16. The roundabout is a mountable type and will be mounted if necessary. No road traffic management is required for this intersection.



Source: Google Maps

Figure 2.16: Haulage Route through Castlereagh Highway (Horatio Street / Church Street) Roundabout, Mudgee

N16. Castlereagh Highway and Aarons Pass Road, Aarons Pass (Vehicles over 50 metres in length)

Signposted Speed Limit:

- Castlereagh Highway – 100km/h; and
- Aarons Pass Road – 100km/h.

Specific Road Alignment Issues / Description: Intersection located atop Crest.

The intersection has recently been upgraded and is sufficiently wide to accommodate oversized vehicles. It can be expected for trucks to begin turning from the through lane on Castlereagh Highway and use part of the opposite side of the road on Aarons Pass Road to perform the right turn, as shown in Figure 2.17.

Being located at the top of crest, sight distance is limited for traffic in both directions. Therefore, traffic management will be required for this intersection.



Source: Google Maps

Figure 2.17: Haulage Route through Castlereagh Highway / Aarons Pass Road Intersection, Aarons Pass

2.2 TRAFFIC COMPOSITION

The RMS have a number of permanent and mobile vehicle counting stations throughout New South Wales with data available displaying the average volume of vehicles passing a certain point in each direction per hour. This data assists in understanding the traffic volumes and traffic composition the convoy of vehicles is likely to encounter at the times they are proposed to be travelling from Newcastle to Crudine Ridge. The following traffic counting stations are and/or have been present on the Northern Haulage Route:

- New England Highway, 400 metres east of Woodlands Close, Tarro – Data from 2006 to 2016;
- M15 Hunter Expressway, 830 metres east of Sawyers Gully Road, Sawyers Gully – Data from 2015 to 2017;
- Golden Highway, 1.65 kilometres West of New Freugh Lane, Singleton Military Area – Data from 2008 and 2010;
- Golden Highway, 790 metres north of Mount Thorley Road, Mount Thorley – Data from 2007
- Golden Highway, 2.35 kilometres East of Edderton Road, Jerrys Plains – Data from 2006-2012;
- Golden Highway, 40 metres north of Kenilworth Street, Denman – Data from 2008 to 2017;
- Golden Highway, 1.2 kilometres west of Giants Creek Road, Sandy Hollow – Data from 2015 to 2017;
- Golden Highway, 3.25 kilometres east of Cosier Road, Leadville – Data from 2006, 2008 and 2009;

- Castlereagh Highway, 1.73 kilometres south of Golden Highway, Dunedoo – Data for 2009;
- Castlereagh Highway, 790 metres west of Old Mill Road, Gulgong – Data for 2009;
- Castlereagh Highway, 110 metres south of Abbatoirs Road, Menah – Data for 2009;
- Market Street, 100 metres east of Courst Street Mudgee – Data from 2009; and
- Castlereagh Highway, 1.47 kilometres north of Cudegegong Road, Cudegegong – Data for 2009.

2.2.1 Daily Traffic Profile and Vehicle Composition

A typical daily traffic profile consists of clear peaks in the AM and PM, a trough through the middle part of the day and significant drop off through the night. A daily traffic profile for the New England Highway at Tarro, approximately 15.5 kilometres north-west of Newcastle Port, is shown below in Figure 2.18.

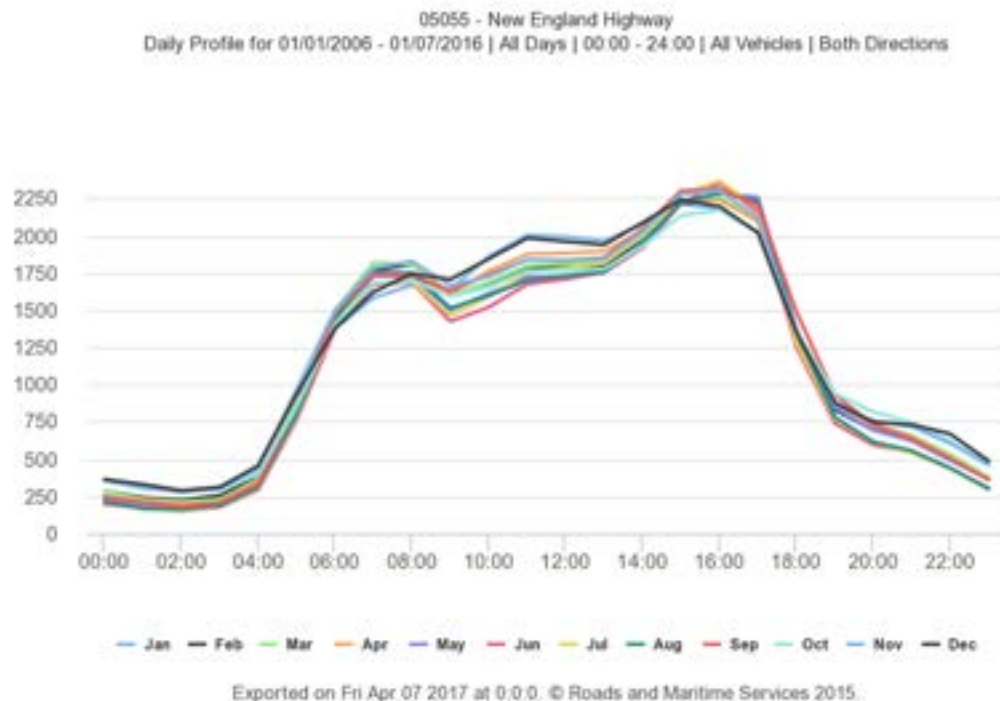


Figure 2.18: Daily Traffic Profile on New England Highway, Tarro

The proposed timeline for moving the wind turbine components impacts number of vehicles exposed to the OSOM and pilot vehicles, and the potential impact the heavy vehicles on the travel times and delays experienced of other road users. The timeline and approximate number of vehicles exposed to the haulage at critical stages are shown in Table 2.2.

Table 2.2: Haulage Schedule

Time	Location	Existing Operating Vehicle Volume	Heavy Vehicles (%)
3:00am	Mayfield Port	N/A	N/A
3:10am	Selwyn Street onto Industrial Drive	~80	N/A
3:20am	Industrial Drive onto Maitland Road	~ 450	N/A
4:00am	John Renshaw Drive onto Hunter Expressway	~ 230	9%
5:00am	New England Highway onto Golden Highway	N/A	N/A
6:00am	Golden Highway	~ 125	11%
6:10am	Golden Highway/Singleton Road	N/A	N/A
6:20am	Golden Highway/Singleton Road (Mt Thorley)	~ 120	13%
7:30am	Golden Highway/Denman Road	~180	N/A
10:30am	Golden Highway/Castlereagh Highway	~50	20%
10:30am	Castlereagh Highway	~50	20%
11:30am	Castlereagh Highway Gulgong	~85	14%
12:30pm	Castlereagh Highway Mudgee	~550	N/A
1:30pm	Castlereagh Highway/Aarons Pass Road	~150	N/A
2:30pm	Crudine Ridge Wind Farm	N/A	N/A

2.3 DESCRIPTION OF TRAFFIC MANAGEMENT MEASURES

The following intersections/sections of haulage route have been identified to require traffic management or traffic control:

NS1. Selwyn Street / George Street / Industrial Drive, Mayfield

Traffic management includes temporary road closures on all approaches to the intersection. Traffic is to be held at sufficient distance from the operation site until OSOM and accompanying vehicles are cleared of the intersection. Tail vehicles (and/or police escort vehicles) are to ensure following traffic do not encroach on the OSOM vehicle.

Detours are not be required at this location as closures are not expected to be extensive. However, Emergency Services should be advised of potential delays as a result of OSOM vehicle movements through the area.

Variable Message Signs (VMS) will be used where required by the roads authority to inform motorists of potential delays at the intersections of Industrial Drive and George Street.

If required, a Road Occupancy Licence (ROL) will be secured from RMS for the closure of and haulage operations through the intersection.

NS2. Industrial Drive and Pacific Highway (Maitland Road), Mayfield

Temporary road closures on all approaches to the intersection are to be applied. Traffic is to be held at sufficient distance from the operation site until convoys are cleared of the intersection. Tail escort vehicles will ensure following traffic do not encroach on the convoy. If required by RMS Special Permits, traffic lights will be turned to flashing yellow during the closure periods. Due to the high-speed environment at the intersection, temporary advance warning signs will be adopted if required by RMS Special Permits unit. Regular road operation will be reinstated after the convoy has cleared the operation area. A suitable detour route does not exist at this location.

Where required under the roads authority's permit, VMS will be used to inform motorists of potential delays and identify alternative routes.

If required, a Road Occupancy Licence will be obtained from RMS for the closure of and haulage operations through the intersection.

N8. Golden Highway, Dual bends at Jerrys Plains

Temporary road closures on north and south highway approaches to the section are to be applied. Southbound traffic is to be held approximately 100 metres north of the northern bend while convoys traverse through both bends at Jerrys Plains. Due to the high speed environment and vehicles slowing from 80km/h to 50km/h 900 metres prior to the intersection, traffic approaching from the north will require temporary advance warning signs. Tail vehicles are to ensure following traffic do not encroach on the OSOM vehicle. Regular road operation will be reinstated after the convoy has cleared the operation area.

If required, a Road Occupancy Licence will be obtained from RMS for the closure of this section of highway.

N11. Golden Highway / Castlereagh Highway

Temporary road closures on all approaches to the intersection are to be applied. Eastbound traffic on Golden Highway and northbound traffic on Castlereagh Highway will be required to be held back minimum 100 metres from the intersection to allow for safe truck movements. Due to the high speed environment at the intersection, temporary advance warning signs will be required. Regular road operation will be reinstated after the convoy has cleared the operation area.

If required, a Road Occupancy Licence will be obtained from RMS for the closure of this section of State Highway.

N12. Castlereagh Highway (Fisher Street / Medley Street), Gulgong

Traffic on all approaches and from the service station will be required to be temporarily held back minimum 50 metres from the intersection to allow for truck movements.

Detours are available at this location, shown in Figure 2.19, but will not be necessary as temporary closures are not expected to be extensive.



Figure 2.19: Potential Detour for closure of Medley Street / Castlereagh Highway (Fisher Street) Intersection

If required, a Road Occupancy Licence will be obtained from RMS for the closure of this section of regional highway.

N13. Castlereagh Highway (Market Street / Duoro Street), Mudgee

Temporary road closures on all approaches to the intersection are to be applied. Traffic is to be held back approximately 50 metres to allow truck movements through the intersection. Detours are available at this location, as shown in Figure 2.20, but will not be necessary as temporary closure of the intersection is not expected to be extensive. Traffic can be diverted to alternative parallel streets to access Castlereagh Highway and other areas of Mudgee as shown in Figure 2.20. Pedestrian traffic will also be required to be managed during operation times.



Figure 2.20: Detour Route for Closure of Market Street / Duoro Street Intersection

If required, a Road Occupancy Licence will be obtained from RMS for the closure of this section of State Highway.

N15. Castlereagh Highway (Horatio / Church Street), Mudgee

At this intersection, trucks will perform the manoeuvre around the roundabout without extensive traffic management. Traffic control restricting vehicles entering the roundabout will be required to assist truck movements. Pedestrian traffic will also require to be controlled at this intersection.

N16. Castlereagh Highway / Aarons Pass Road

Due to the intersection of Aarons Pass Road and Castlereagh Highway alignment being located on a ridge, traffic control will be required to maintain road user safety and assist truck movements off the highway. The traffic control will consist of reduced speeds in proximity to the intersection, warning signs to indicate trucks turning and trailer mounted Variable Message Signs located approximately 250 metres north and south of the intersection on Castlereagh Highway displaying "Trucks Turning Ahead". Police escorts will be required to hold vehicles temporarily whilst the larger trucks undertake the turn.

If required, a Road Occupancy Licence will be obtained from RMS for the closure of this section of state highway.

2.3.1 Traffic Control Plans

A Traffic Control Plan (TCP) has been prepared for operations at each of the locations in Section 2.3 in accordance with the *RMS Traffic Control at Work Sites* (2010) Manual. The proposed TCPs presented within Appendix A have been based on the following Standard TCPs:

- TCP 57; and
- TCP 159

Police escort units are to carry out the TCPs at the nominated sites.

TCPs have been modified where necessary to suit specific conditions. Signage should only be displayed when the need exists (i.e. during operating hours) and removed or covered when the truck activity has ceased (i.e. operating hours).

The additional sign T2-25 will be introduced to highlight truck access ahead and to advise drivers of distance to entry.

Given the expected heavy vehicle traffic volumes, additional traffic control measures are not required. Should traffic volumes increase significantly, from those presented within this TMP, a revised TMP and associated TCP will be required.

A Communication Plan will be prepared by the proponent to allow communication of traffic volumes to/from the site with key stakeholders as the project progresses.

The proposed TCPs have been reviewed and approved by M. Thompson (Prepare a Work Zone Traffic Management Plan Card No. 0045298760) Final TCPs will be subject to the permit approvals process with RMS Special Permits Unit.

2.3.2 Parking Facilities

Suitable rest areas have been identified at locations based on the approximate haulage schedule provided by Rex J Andrews. Rest areas have been selected based on ease of access and egress and impact to traffic. The rest areas are as follows:

- New England Highway and Golden Highway, wide shoulder area opposite Singleton East Rest Area; and
- Location to be confirmed at Castlereagh Highway

Additional traffic control vehicles are to be parked near operation sites, but at a sufficient distance to allow haulage movements and effective control of traffic.

If required by RMS further rest areas / stopping bays will be provided along the transport route, the locations of which will be decided in consultation with RMS.

2.4 ASSESSMENT OF MITIGATION MEASURES

2.4.1 Pedestrians and Cyclists

Pedestrians have been identified to be affected at the following key intersections/sections of the northern haulage route as a result of traffic management and/or controls.

- NS1 Selwyn Street / George Street/ Industrial Drive - pedestrians

The haulage route through the intersection will affect east-west pedestrian movements, temporarily closing the pedestrian crossing. Due to the timing of transport and the lack of footpath connectivity on the eastern side of Industrial Drive, the impact on pedestrians will be insignificant.

- NS 2 Industrial Drive / Pacific Highway (Maitland Road) - Cyclists

The haulage route affects southbound cyclists on Maitland Road at the left turn slip lane onto Industrial Drive. The road shoulder/cycle lane will be required to be closed with regular traffic during operation times. No other infrastructure is available to provide a detour. Due to the timing of transport, the impact on cyclists will be insignificant.

- N5 New England Highway / Golden Highway (Mitchell Line of Road), Whittingham - cyclists

The haulage route traverses over the road shoulder and a cycle refuge island, affecting northbound cycle traffic. The road shoulder will be required to be temporarily closed with regular traffic during operations at this intersection. Cycling traffic is not expected to be high at the time at this location and therefore traffic management will have an insignificant impact on cyclists.

- N13 Castlereagh Highway (Market Street / Duoro Street) Mudgee - pedestrians

The haulage route traverses over two pedestrian refuges at the intersection and close to the south-western corner. Pedestrian access to the intersection will be affected. With parallel streets located nearby, alternative routes are available for pedestrians and therefore will not be significantly impacted.

- N14 (a) Castlereagh Highway (Horatio Street / Church Street), Mudgee - pedestrians

The haulage route passes adjacent to Mudgee Public School and Mudgee High School. The restricted movement hours avoiding heavy vehicle transport through Mudgee between the hours of 7 am and 10am and 2 pm and 4:30 pm Monday to Friday, as far as practicable should mitigate potential conflict. However, drivers should be made aware of the potential for increased school-aged pedestrians along this section of the route outside of the approved transport hours given the proximity of the recreation park, skateboard park and pedestrian travel routes. In the event that there is an increased number of school-aged pedestrians are present during haulage along this section the haulage transport vehicles will be halted and not proceed until there is no potential for conflict. The EPC Contractor will ensure appropriate notifications are provided in driver and subcontractor inductions and Driver's Code of Conduct.

- N15 Castlereagh Highway (Horatio Street / Church Street), Mudgee - pedestrians

To maintain sufficient clearance, pedestrian access to the intersection will be affected. Pedestrians are required to seek alternative crossing opportunities.

2.4.2 Traffic

Traffic management for OSOM vehicles will be done at the time of passing through the intersection/section as per the road authority permit conditions. Potential traffic management measures are identified below.

NS1. Selwyn Street / George Street / Industrial Drive, Mayfield

Initial loads travelling in early AM off-peak periods will have little impact on traffic at the intersection.

Advanced road closure warnings will be deployed at Elizabeth Street to the south and Ingall Street to the north to divert traffic, or as otherwise directed by RMS. This will minimise the number of vehicles impacted at the Selwyn Street intersection during haulage operations.

NS2. Industrial Drive and Pacific Highway (Maitland Road), Mayfield

Traffic management measures at this intersection will have little impact on vehicles due to timing of transport. It should be noted the intersection is located on two major roads (a state highway and arterial road) with an estimated vehicle volume of 450 veh/hour during early AM periods.

N8. Dual bends at Jerrys Plains

Local and highway traffic will be affected at this location, but is not expected to be severe. Jerrys Plains is an existing slow point along the highway and any delays caused through this section will not be overly significant.

N11. Golden Highway / Castlereagh Highway

Traffic management measures at this location is not expected to be significant, as traffic volumes in the area is indicated to be approximately 50 vehicles per hour. Vehicles will be slowed to 80km/h for a 300 metre section at the intersection.

N12. Castlereagh Highway (Fisher Street / Medley Street), Gulgong

Measures at this location will affect any traffic approaching Gulgong from the south or travelling south as no suitable alternative routes are available for highway traffic. Guntawang Street and Adams Lead Road to the south will be suitable for light vehicles to avoid the intersection, however, the escorting vehicles will assist with traffic temporary management before consideration of more permanent traffic diversions are to be implemented. As this location is on the only approved heavy vehicle route through Gulgong, heavy vehicle traffic will be affected.

N13. Castlereagh Highway (Market Street / Duoro Street), Mudgee

This location is on the only approved heavy vehicle route through Mudgee. As a result, traffic management measures at this location could impact heavy vehicles travelling through Mudgee via Castlereagh Highway (Duoro Street and Horatio Street). Traffic volumes at this location are not expected to be significant, however, alternative routes will be available for highway light vehicles and local traffic.

N15. Castlereagh Highway (Horatio Street / Church Street), Mudgee

At this intersection, trucks will perform the manoeuvre around the roundabout without extensive traffic management. Traffic control restricting vehicles entering the roundabout will be required to assist truck movements. Pedestrian traffic will also be required to be controlled at this intersection.

NS19. Castlereagh Highway / Aarons Pass Road

Vehicular volumes are expected to be approximately 150 vehicles per hour, and therefore any traffic management measures at this location will not adversely impact traffic on Castlereagh Highway.

2.5 ADDITIONAL TRAFFIC MANAGEMENT MEASURES

The TMP and associated TCP's have considered the opposing highway, local and rural movements at each relevant location along the Northern Haulage Route with historical traffic volume data obtained from the *RMS Traffic Volume Viewer*. Should traffic volumes significantly increase a revised TMP and associated TCP's will be required.

Additional traffic management measures, to ease the potential impacts on traffic movement when the TCP's are operational, include:

- Providing optional detour routes where detour routes are available and practical; and
- Utilising variable message signs in the lead up to the traffic management taking place to provide warning and allow for motorists and companies to make alternative arrangements for travelling through affected areas; and
- Advising Emergency Services of haulage operations and potential delays.

3. SOUTHERN HAULAGE ROUTE -TMP

3.1 EXISTING CONDITIONS

The southern haulage route is an approximate 395 kilometre journey from Newcastle Port to the Project Site. It travels in a north-west direction from Newcastle before heading south on the M1 Pacific Motorway towards Sydney from Beresfield. At the end of the M1, the route traverses Pennant Hills Road and travels west on the M2 Motorway, M7 Motorway, M4 Motorway and Great Western Highway to Lithgow before heading north-west to Aarons Pass on the Castlereagh Highway.

The southern haulage route is to be used for transport of wind turbine blades, hubs and standard loads.

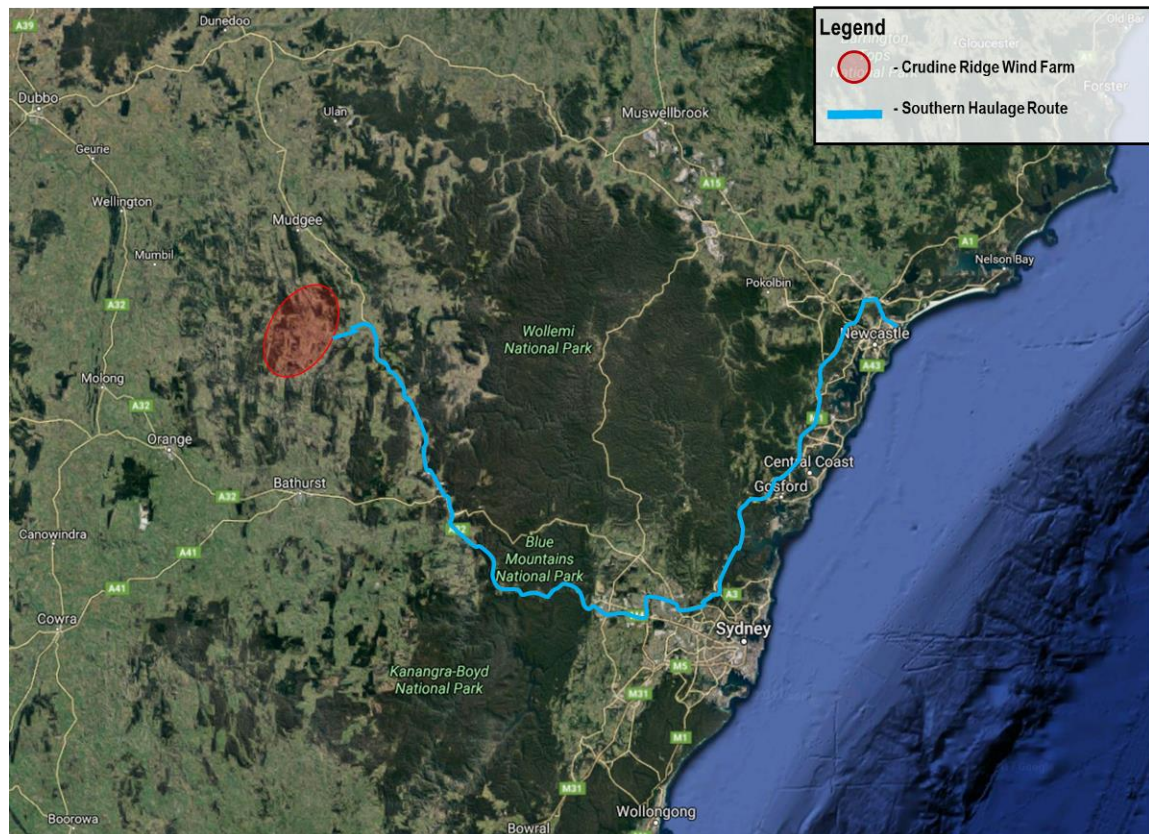
The approval of the Southern Haulage route originally rested with the “applicable roads authority” which was the RMS. The approval of Traffic Management Plan by the Secretary on 15 December 2017 constituted RMS approval. Following the Modification to SSD 6697 Secretary’s agreement of the Southern Access Route is required. The approval of Traffic Management Plan by the Secretary on 15 December 2017 constitutes Secretary’s agreement and aligns with the Conditions of Consent for SSD 6697 MOD 1.

3.1.1 Roads on Southern Route

The following roads are to be used as part of the southern route Via Sydney and Blue Mountains:

- Selwyn Street
- George Street
- Industrial Drive
- Maitland Road
- John Renshaw Road
- M1/Pacific Highway
- Pennant Hills Road
- M2 Motorway
- M7 Motorway
- M4 Motorway
- Great Western Highway
- Castlereagh Highway
- Aarons Pass Road

A map of the southern haulage route is shown below in Figure 3.1.



Source: Google Maps

Figure 3.1: Southern Haulage Route

3.1.2 Expected Haulage Vehicles

Vehicles traversing the southern route are to be up to an approximate length of 75 metres, including truck, trailer and blade overhang. These vehicles are to carry wind turbine blades and components from Newcastle to the Project site. Vehicles transporting hubs and Standard Heavy Vehicles are expected to be of approximately 25 metres and 19 metres length respectively. Drivers are required to follow the Driver's Code of Conduct, included in Appendix B. Where practical and approved by the relevant council, aggregate, gravel and water to be used during construction is expected to be provided on-site, reducing the anticipated standard heavy vehicle movements on the state and council road network.

3.1.3 Escort Vehicles

Each separate OSOM vehicle traversing the southern haulage route will be accompanied escort vehicles as per the OSOM permit.

3.1.4 Key Intersections/Sections

This section details key intersections or sections of road along the southern haulage route, including those that require further traffic management, See Table 3.1 for a summary.

Table 3.1: Summary of the Key Intersection / Sections (Southern Haulage Route)

ID	Intersection
NS1	Selwyn Street to George Street to Industrial Drive, Mayfield East
NS2	Industrial Drive and Pacific Highway (Maitland Road), Mayfield
NS3	M1 Pacific Motorway and John Renshaw Road Roundabout, Beresfield
S4	M1 Pacific Motorway and Pennant Hills Road, Wahroonga and Normanhurst
S5	M2 Motorway and Pennant Hills Road, West Pennant Hills and Carlingford
S6	The Great Western Highway over rail line, Mt Victoria
S7	The Great Western Highway through Mt Victoria Village
S8	Left Hairpin on Great Western Highway down Victoria Pass, Mt Victoria
S9	The Great Western Highway Viaduct Crossing, Mt Victoria
S10	The Great Western Highway Eastern Speed Camera Gantry, Mt Victoria (TCP Only)
S11	The Great Western Highway Western Speed Camera Gantry, Mt Victoria (TCP Only)
S12	Intersection of Great Western Highway and Darling Causeway, Mt Victoria (TCP Only)
S13	Intersection of Bells Line of Road and Darling Causeway, Bell (TCP Only)
S14	Intersection of Hartley Vale Road and Browns Gap Road, Hartley Vale (TCP Only)
S15	First Left Hairpin on The Great Western Highway at River Lett Hill
S16	Second Left Hairpin on The Great Western Highway at River Lett Hill
S17	West Speed Camera Gantry, River Lett Hill (TCP Only)
S18	Castlereagh Highway Rail Crossing, Ben Bullen
NS19	Castlereagh Highway and Aarons Pass Road, Aarons Pass

NS1. Selwyn Street / George Street / Industrial Drive, Mayfield

Both northern and southern routes share this intersection at the beginning of the routes from Mayfield Port. Details involving the traffic management for this intersection can be found in Section 2.1.4.

NS2. Industrial Drive and Pacific Highway (Maitland Road), Mayfield

Both northern and southern routes share this intersection at the beginning of the routes from Mayfield Port. Details involving the traffic management for this intersection can be found in Section 2.1.4.

NS3. M1 Pacific Motorway and John Renshaw Road Roundabout, Beresfield

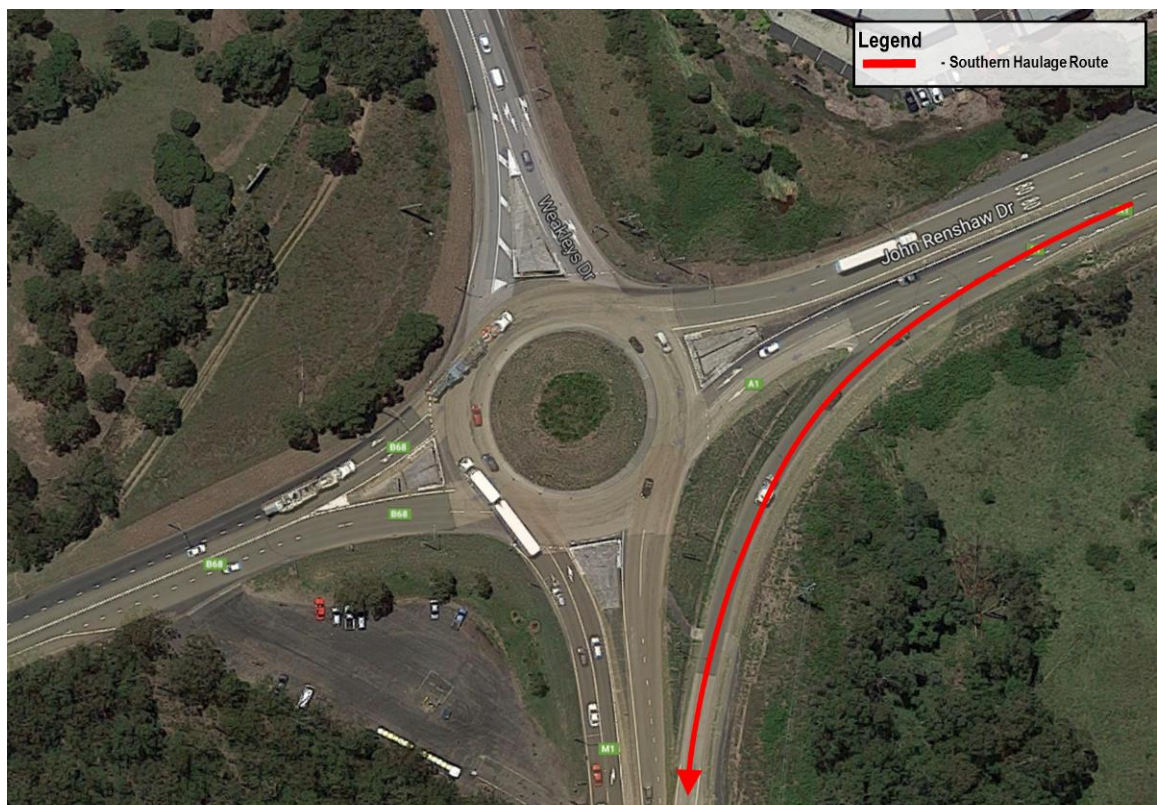
Signposted Speed Limit:

- M1 Pacific Motorway – 60km/h;
- John Renshaw Drive – 60km/h; and
- Weakleys Drive – 60km/h.

Specific Road Alignment Issues / Description: N/A.

Both northern and southern routes share this intersection at the beginning of the routes from Mayfield Port. In the case of the southern route, vehicles will turn left from John Renshaw Drive onto the M1 Pacific Motorway as shown in Figure 3.2.

Currently there is indication from RMS that the roundabout may be upgraded in the near future. After consultation, it was found that the proposed changes are not expected to impact the transport and the vehicles will be able to pass through this section with no modification to the existing infrastructure. Traffic management is not expected to be required at this intersection.



Source: Google Maps

Figure 3.2: Left Turn at M1 Pacific Motorway and John Renshaw Roundabout, Beresfield

S4. M1 Pacific Motorway and Pennant Hills Road, Wahroonga and Normanhurst

Signposted Speed Limit:

- M1 Pacific Motorway – 60km/h (reduced from 80km/h, 450 metres east of the intersection); and
- Pennant Hills Road – 70km/h.

Specific Road Alignment Issues / Description: N/A.

Traffic management is required to assist the wind turbine blades to travel through the intersection of Pennant Hills Road and the M1 Pacific Motorway exit. The left hand turn to Pennant Hills Road is too tight to accommodate large vehicles and blades within the southbound lanes. The prime mover will require to cross to the incorrect side of Pennant Hills Road for approximately 50 metres, against the normal traffic direction, in order to make the manoeuvre. The trailer and blade will remain on the correct side of the road. The route is shown in red in Figure 3.3.



Source: Google Maps

Figure 3.3: Vehicles Use Both Sides of the Road M1 Pacific Motorway / Pennant Hills Road Intersection

S5. M2 Motorway and Pennant Hills Road, West Pennant Hills and Carlingford

Signposted Speed Limit:

- Pennant Hills Road – 60km/h (reduced from 70km/h due to roadworks, 700 metres north of the intersection); and
- M2 Motorway – 80km/h.

Specific Road Alignment Issues / Description: N/A.

Traffic management is required to assist the wind turbine blades to travel through the intersection of Pennant Hills Road and the M2 Motorway. The right hand turn to M2 Motorway on-ramp will require the truck to use all southbound approach lanes to complete the turn safely. The trailer and blade will remain on the correct side of the road. The route is shown in red in Figure 3.4.



Source: Google Maps

Figure 3.4: Vehicles Use all southbound approach lanes at M2 Motorway / Pennant Hills Road Intersection

S6. The Great Western Highway over Blue Mountains rail line, Mt Victoria

Signposted Speed Limit:

- Great Western Highway – 60km/h.

Specific Road Alignment Issues / Description: Narrow bridge over railway tracks.

Traffic management is required to assist the wind turbine blades to travel through the right turn immediately after the rail crossing bridge at Mt Victoria. Both truck and trailer will require to use both sides of the road to perform the manoeuvre and avoid existing power poles on the southern side of the bridge abutment. The power pole immediately after the bridge on the left hand side will require temporary removal or relocation. The route through this section is shown below in Figure 3.5.



Source: Google Maps

Figure 3.5: Vehicles Use Both Sides of the Road near Fairy Bower Road on Great Western Highway

S7. The Great Western Highway through Mt Victoria Village

Signposted Speed Limit:

- Great Western Highway – 60km/h.

Specific Road Alignment Issues / Description: N/A.

Traffic management is required to assist the wind turbine blades travel through the right turn in Mt Victoria Village near Mount Piddington Road. Both truck and trailer will require to use both sides of the road to perform the manoeuvre. The route through this section is shown below in Figure 3.6.



Source: Google Maps

Figure 3.6: Vehicles Use Both Sides of the Road near Mount Piddington Road on Great Western Highway

S8. Left Hairpin on Great Western Highway down Victoria Pass, Mt Victoria

Signposted Speed Limit:

- Great Western Highway – 60km/h

Specific Road Alignment Issues / Description: Steep gradient.

Traffic management will be required for turbine blade loads to assist the truck to manoeuvre around the first turn whilst descending Victoria Pass. The left hairpin is sufficiently wide to allow both truck and trailer to remain on the correct side of the road, however, the tail of the turbine blade (protruding from the rear of the trailer) will overhang onto the opposite side of the road, as shown below in Figure 3.7. A broader traffic management treatment will be used to include other locations along Victoria Pass unless otherwise directed by RMS Special Permits.



Source: Google Maps

Figure 3.7: Vehicle Overhang at Mt Victoria on Great Western Highway

S9. The Great Western Highway Viaduct Crossing, Mt Victoria

Signposted Speed Limit:

- Great Western Highway – 60km/h

Specific Road Alignment Issues / Description: Steep gradient.

Both truck and trailer will require to use both sides of the road to manoeuvre around the right hand turn approximately halfway down Victoria Pass, as shown in Figure 3.8, and will require traffic management for turbine blade loads. A broad traffic management treatment will be used for all of Victoria Pass unless otherwise directed by RMS Special Permits. To allow for the turbine blade overhanging the trailer tail, two sets of signposts on the southern side of the bridge will require temporary relocation or lowering.



Source: Google Maps

Figure 3.8: Use Both Sides of the Road at Mt Victoria on Great Western Highway

S15 First Left Hair Pin Great Western Highway at River Lett Hill

Sign posted Speed Limit

- Great Western Highway – 100km/h

Specific Road Alignment Issues / Description: Vehicle overhang, steep gradient

Both truck and trailer can manoeuvre through the first left turn with sufficient clearance and no modifications are required. However, the blade overhang at the tail of the trailer will encroach on the opposite traffic lanes, as shown in Figure 3.9, and therefore traffic management will be required. It should be noted traffic management will only be required for turbine blade loads.



Source: Google Maps

Figure 3.9: Vehicle Overhang on Great Western Highway at First Hairpin, River Lett Hill

S16 Second Left Hair Pin Great Western Highway at River Lett Hill

Sign posted Speed Limit

- Great Western Highway – 100km/h

Specific Road Alignment Issues / Description: Vehicle overhang, steep gradient.

Both truck and trailer can manoeuvre through the second left turn with sufficient clearance and no modifications are required. However, the blade overhang at the tail of the trailer will encroach on the opposite traffic lanes, as shown in Figure 3.10, and therefore traffic management will be required. It should be noted traffic management will only be required for turbine blade loads.

A broad traffic management treatment will be applied to accommodate OSOM vehicle movements through both hairpins along this section of the Great Western Highway unless otherwise directed by RMS Special Permits.



Source: Google Maps

Figure 3.10: Vehicle Overhang on Great Western Highway at Second Hairpin, River Lett Hill

S17. Castlereagh Highway Rail Crossing, Ben Bullen

Sign posted Speed Limit:

- Castlereagh Highway – 100km/h

Specific Road Alignment Issues / Description: N/A.

To manoeuvre through two successive sharp turns, both truck and trailer will require to use both sides of the roadway as shown in Figure 3.11. Traffic management is required to assist the truck in performing the manoeuvre, stopping traffic on both north and south approaches to Ben Bullen. It should be noted traffic management will only be required for turbine blade loads.

Rail warning signals will be replaced with tilting rail signals, to allow for the turbine blade overhang at the tail of the trailer. The proponent has been in consultation with Country Regional Network to address the requirements for this manoeuvre.



Source: Google Maps

Figure 3.11: Vehicles Use Both Sides of the Road at Ben Bullen on Castlereagh Highway

S18. Castlereagh Highway and Aarons Pass Road, Aarons Pass

Sign posted Speed Limit:

- Castlereagh Highway – 100km/h; and
- Aarons Pass Road – 100km/h.

Specific Road Alignment Issues / Description: Intersection atop crest.

Traffic management will be required for the left turn into Aarons Pass Road from Castlereagh Highway. The roadway on Castlereagh Highway is sufficiently wide to accommodate truck and trailer movements, however, the overhang due to the wind turbine will require closure of opposing traffic lanes. Southbound traffic on Castlereagh Highway will be required to be stopped to allow the truck movements.

The prime mover will require to use the opposite side of Aarons Pass Road to manoeuvre around the turn, shown below in Figure 3.12. A signpost inside the left turn will need to be made movable or relocated.



Source: Google Maps

Figure 3.12: Potential Vehicle Overhang at Castlereagh Highway / Aarons Pass Road Intersection

3.1.5 Required Upgrade Works

Upgrade works are required at the rail line level crossing near Ben Bullen. The swing of the blade as the truck manoeuvres through the intersection is likely to be make contact with existing rail warning devices, signage and light posts. The proponent has been in consultation with John Holland Rail on behalf of Country Regional Network to design and install a tilting rail signal to facilitate this manoeuvre.

3.2 TRAFFIC COMPOSITION

The RMS have a large number of permanent and mobile vehicle counting stations throughout New South Wales with data available displaying the average volume of vehicles passing a certain point in each direction per hour. This data assists in understanding the traffic volumes and traffic composition the convoy of vehicles is likely to encounter at the times they are to be travelling from Newcastle to the Project Site. A selection of relevant traffic counting stations on the Southern Haulage Route include:

- New England Highway, 400 metres east of Woodlands Close, Tarro – Data from 2006 to 2016;
- M1 Pacific Motorway, 240 metres north of Curtin Avenue, North Wahroonga – Data from 2009 to 2017;
- Pennant Hills Road, 30 metres east of Beecroft Road, Pennant Hills – Data from 2015 to 2017;
- M4 Western Motorway, 190 metres north of Loftus Street, Regentville – Data from 2006 to 2016
- Great Western Highway, 260 metres west of Victoria Street, Mount Victoria – Data from 2015 to 2017;
- Great Western Highway, 330 metres west of walker Street, Hartley – Data from 2015 to 2017;
- Castlereagh Highway, 870 metres north of Gemalong Close, Marrangaroo – Data from 2009;
- Castlereagh Highway, 820 metres north of Boulder Road, Portland – Data from 2009; and
- Castlereagh Highway, 1.76 kilometres north of Bylong Valley Way, Ilford– Data for 2009.

3.2.1 Daily Traffic Profile and Vehicle Composition

A typical daily traffic profile consists of clear peaks in the AM and PM, a trough through the middle part of the day and significant drop off through the night. A daily traffic profile for the M1 Pacific Motorway at North Wahroonga, approximately 3.4 kilometres north of Pennant Hills Road, is shown below in Figure 3.13.

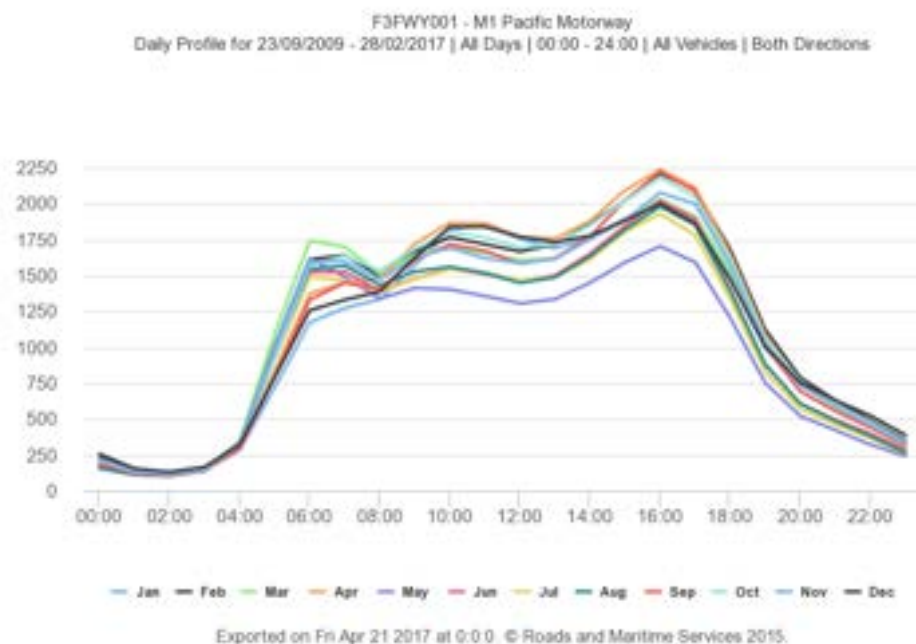


Figure 3.13: Daily Traffic Profile on M1 Pacific Motorway, North Wahroonga

The proposed timeline for moving the wind turbine blades has been designed to minimise the potential impacts to vehicles exposed to the convoy, including heavy vehicles, to reduce delays experienced by other road users. The timeline and approximate number of vehicles exposed to the haulage at critical stages are shown in Table 3.2.

Table 3.2: Haulage Schedule

Time	Location	Existing Operating Vehicle Volume	Heavy Vehicles (%)
11:00pm	Mayfield Port	N/A	N/A
11:15pm	Selwyn Street onto Industrial Drive	~ 300	N/A
11:30pm	Industrial Drive onto Maitland Road	~ 307	N/A
11:45pm	John Renshaw Drive onto M1 Pacific Motorway	~ 250 (on southern section of M1)	38%
1:30am	Pennant Hills Road	~ 175	43%
1:45am	M2 Motorway	N/A	N/A
2:30am	M4 Motorway	~ 230 (Mulgoa Rd)	N/A
4:00am	Great Western Highway through Mt Victoria village	~100	45%
4:30am	Great Western Highway over River Lett Hill	~100	48%
5:00am	Castlereagh Highway	~85	12%
7:00am	Castlereagh Highway over rail crossing at Ben Bullen	~80	N/A
8:30am	Aarons Pass Road	~50	26%
9:30am	Crudine Ridge Wind Farm	N/A	N/A
11:00pm	Mayfield Port	N/A	N/A
11:15pm	Selwyn Street onto Industrial Drive	~ 300	N/A

3.3 DESCRIPTION OF TRAFFIC MANAGEMENT MEASURES

The following intersections/sections of haulage route have been identified to require traffic management or traffic control. Relevant TCP's for each intersection and/or section of roadway are shown in **Appendix A**:

NS1. Selwyn Street / George Street / Industrial Drive, Mayfield

This section of the route is the same as the northern haulage route. Refer to section 2.3 for further details.

NS2. Industrial Drive and Pacific Highway (Maitland Road), Mayfield

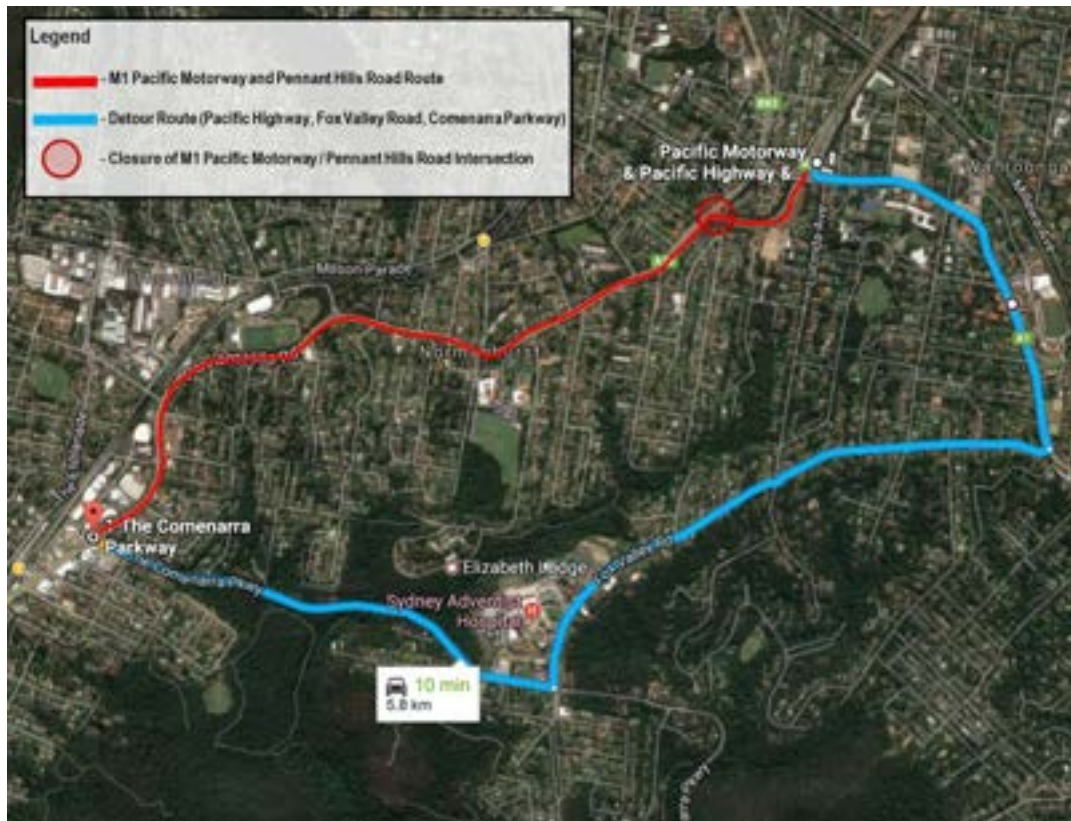
This section of the route is the same as the northern haulage route. Refer to section 2.3 for further details.

S4. M1 Pacific Motorway and Pennant Hills Road, Wahroonga and Normanhurst

Temporary road closures on all approaches to the intersection are to be applied. Traffic is to be held at sufficient distance from the operation site until loads are cleared of the intersection. Tail escort police vehicles are to ensure following traffic do not encroach on the OSOM vehicles. If required by RMS Special Permits, traffic lights will be turned to flashing yellow during the closure periods. Due to the high-speed environment at the intersection, temporary advance warning signs are required. This manoeuvre would be performed in the early hours of the morning when traffic volumes are lowest, after 1:30am. Regular road operation will be reinstated after the convoy has cleared the operation area.

A possible temporary detour route exists for vehicles impacted by the road closure, if deemed necessary by RMS Special Permits Unit. Vehicles would be directed off the M1 Pacific Motorway onto the Pacific Highway before using Fox Valley Way and the Comenarra Parkway to access Pennant Hills Road in the southbound travel direction and vice versa for northbound travel. This detour adds approximately 3 minutes to the travel time between the M1 Pacific Motorway / Pacific Highway intersection and the Pennant Hills / Comenarra

Parkway intersection. This route is not be suitable for all vehicle types. The detour route is shown in Figure 3.14.



Source: Google Maps

Figure 3.14: Detour Route for Closure of M1 Pacific Motorway / Pennant Hills Road Intersection

If deemed necessary by RMS, VMS will be adopted to inform motorists on Pennant Hills Road and M1 Pacific Motorway of the potential delays at the juncture of M1 Pacific Motorway and Pennant Hills Road.

S5. M2 Motorway and Pennant Hills Road, West Pennant Hills and Carlingford

Temporary road closures will apply to through and right turn movements from Pennant Hills Road and right turn movements from the M2 Motorway. Southbound traffic on Pennant Hills Road held at sufficient distance from the operation site until convoys are cleared of the intersection, with other approaches held at the stop lines of the intersection. Tail escort police vehicles are to ensure following traffic do not encroach on the convoy. If required by RMS Special Permits, traffic lights will be turned to flashing yellow during the closure periods. Due to the high-speed environment at the intersection, temporary advance warning signs are required. Regular road operation will be reinstated after the convoy has cleared the operation area. A suitable detour route does not exist at this location.

Pedestrian traffic will also be required to be managed during operation times.

S6. The Great Western Highway over Blue Mountains rail line, Mt Victoria

Temporary road closures will apply to traffic in both directions on the Great Western Highway with traffic held back a minimum of 200 metres from the corner to allow for safe truck movements. Due to the speed environment and winding nature of the Great Western Highway, temporary advance warning signs will be required. Regular road operation will be reinstated after the convoy has cleared the operation area. A suitable detour route does not exist at this location.

Traffic control of the intersection of the Great Western Highway with Fairy Bower Road is also required during movement of trucks through this section. Movements from Fairy Bower Road to the Great Western Highway will be paused.

S7. The Great Western Highway through Mt Victoria Village

Temporary road closures will apply to traffic in both directions on the Great Western Highway with traffic held back a minimum of 200 metres from the corner to allow for safe truck movements. Due to the speed environment and winding nature of the Great Western Highway, temporary advance warning signs will be required. Regular road operation will be reinstated after the convoy has cleared the operation area. A suitable detour route does not exist at this location.

Traffic control of the intersections of the Great Western Highway with Harley Avenue, Mount Piddington Road, Hooper Street and Station Street will be required during movements of trucks through this section. Movements from these roads to the Great Western Highway will be disallowed.

Traffic on approaches from Mount Piddington Road will be required to be held back minimum 25 metres from the intersection to allow truck movements and swing of the turbine blade,

Pedestrian traffic will also be required to be managed during operation times.

S8 Left Hair Pin and S9 Viaduct Crossing, Great Western Highway Victoria Pass

To address traffic management requirements at both the left hairpin (designated S8) and the right turn immediately after the viaduct crossing (designated S9) along Victoria Pass, a broad traffic management treatment will be applied.

Temporary road closures for both directions of traffic will apply at the top and bottom of Victoria Pass at the overhead speed camera gantry locations, as shown in Figure 3.15, closing the entirety of Victoria Pass for approximately 10 minutes to allow for OSOM vehicle movements along the 2.2 kilometres of the Great Western Highway. This manoeuvre will be undertaken in the early hours of the morning, around 4:00am, to minimise potential impacts on other road users.



Source: Google Maps

Figure 3.15: Temporary Road Closure of Victoria Pass

As a result, advanced warning signage is to be used to alert drivers of the timing of the temporary road closures and to expect possible delays. Portable VMS will be suitable for this purpose and will be adopted if required by RMS Special Permits. Emergency Services are to be advised of the temporary road closures and timing.

A detour is not necessary for this temporary closure, but the use of alternative routes will be identified using the VMS.

Messages displayed and placement of portable VMS are to comply with Austroads Guide to Traffic Management Part 10, RMS Supplement Document RMS/Pub.11.024 and RMS Technical Direction 2010/07. The implementation of VMS are subject to approval by RMS Western Region Office or Transport Management Centre (Sydney Region).

Where deemed appropriate by RMS Special Permits and the haulage contractor, two loads will descend the pass during one closure to minimise impacts to motorists. Regular road operation will be reinstated after the OSOM vehicles have cleared Victoria Pass.

If required, a Road Occupancy Licence (ROL) will be secured from RMS for the closure of and haulage operations through the intersection.

S10, and S11, Left Hairpin turns, Great Western Highway, River Lett Hill

To address traffic management requirements at both left hairpins (designated S10 and 11) at River Lett Hill, a broad traffic management treatment will be applied.

A temporary road closure for the east bound direction of traffic will apply at the speed camera gantry location near the top of River Lett Hill, as shown in Figure 3.16. The closure will span approximately 6 minutes to allow for OSOM vehicle movements along approximately 2.0 kilometres of the Great Western Highway. Police escort vehicles will operate the closure unless otherwise directed by RMS Special Permits.



Source: Google Maps

Figure 3.16: Closure of Great Western Highway at River Lett Hill

As a result, advanced warning signage is to be used to alert drivers of the timing of the temporary road closures and to expect possible delays. Portable VMS will be used if required by RMS Special Permits. Messages displayed and placement of portable VMS are to comply with Austroads Guide to Traffic Management Part 10, RMS Supplement Document RMS/Pub.11.024 and RMS Technical Direction 2010/07. The implementation of VMS are subject to approval by RMS Western Region Office.

A detour is not necessary for this temporary closure, however, Emergency Services are to be advised of the temporary road closures and timing.

Regular road operations will be reinstated after the OSOM vehicles have cleared the section.

If required, a Road Occupancy Licence (ROL) will be secured from RMS for the closure of and haulage operations through the intersection.

S18. Castlereagh Highway Rail Crossing, Ben Bullen

Temporary road closures will apply to traffic in both directions on the Castlereagh Highway approaching the rail level crossing at Ben Bullen. Traffic will be required to be held back a minimum of 200 metres from the corner to allow for safe truck movements. Due to the speed environment of the approaches to the level crossing, temporary advance warning signs will be required. Regular road operation will be reinstated after loads have cleared the operation area. A suitable detour route does not exist at this location.

Liaison with John Holland Rail on behalf of Country Regional Network has been undertaken, to design the tilting rail signals to be used to enable the manoeuvre through the level crossing, and the procedures to ensure safety of rail and road users is maintained. Upgrades are expected to be restricted to rail infrastructure only.

If required, a Road Occupancy Licence (ROL) will be secured from RMS for the closure of and haulage operations through the intersection.

S19. Castlereagh Highway / Aarons Pass Road

Due to the intersection of Aarons Pass Road and Castlereagh Highway located on a ridge, traffic control will be required to maintain road user safety and assist truck movements off the highway. Temporary road closures on all approaches to the intersection will be applied and trailer mounted Variable Message Signs located approximately 250 metres north and south of the intersection on Castlereagh Highway displaying "Trucks Turning Ahead". Traffic is to be held at sufficient distance from the operation site until loads are cleared of the intersection. Tail escort police vehicles are to ensure following traffic do not encroach on the OSOM vehicles. A suitable detour route does not exist at this location.

If required, a Road Occupancy Licence (ROL) will be secured from RMS for the closure of and haulage operations through the intersection.

3.3.1 Traffic Control Plans

A traffic control Plan (TCP) has been prepared for operations at each of the locations above in accordance with the *RMS Traffic Control at Work Sites* (2010). The TCPs presented within **Appendix A** have been based on the following Standard TCPs:

- TCP 47;
- TCP 57; and
- TCP 195.

Police escort units are to assist in the execution of the TCPs at the nominated sites.

TCPs have been modified where necessary to suit specific conditions. Signage should only be displayed when the need exists (i.e. during construction/operating hours) and removed or covered when the truck activity has ceased (i.e. outside of construction/operating hours).

The additional sign T2-25 will be introduced to highlight truck access ahead and to advise drivers of distance to entry.

Given the expected heavy vehicle traffic volumes, additional traffic control measures are not/will be required. Should traffic volumes increase significantly from those presented within this TMP, a revised TMP and associated TCP will be required.

A Communication Plan will be prepared between the proponent and RMS to allow confirmation and monitoring traffic volumes to/from site as the project progresses.

The TCPs have been reviewed and approved by M. Thompson (Prepare a Work Zone Traffic Management Plan Card No. 0045298760). Final TCPs will be subject to the permit approvals process with RMS Special Permits Unit.

3.3.2 Parking Facilities

Generally, no dedicated parking will be provided along the haulage route. Traffic control vehicles are to be parked near operation sites, but at a sufficient distance to allow haulage movements and effective control of traffic.

Suitable rest areas have been identified at locations based on the approximate haulage schedule provided by Rex J Andrews. Rest areas will be selected based on feedback from RMS during permit applications.

If required by RMS further rest areas / stopping bays will be provided along the transport route, the locations of which will be decided in consultation with RMS.

3.4 ASSESSMENT OF MITIGATION MEASURES

3.4.1 Pedestrians and Cyclists

Pedestrians have been identified to be potentially impacted at the following key intersections of the southern haulage route as a result of traffic management and/or controls:

- M2 Motorway / Pennant Hills Road.

The haulage route through the intersection will affect north-south moving pedestrian movements on the western side of the intersection and east-west pedestrian movements on the northern side of the intersection, due to the temporary closure of the pedestrian crossing. As the closure of the intersection is proposed to take place at approximately 1:45 a.m. the impact on pedestrians is expected to be very low.

Cyclists are expected to be impacted by all intersection and road closures on the Southern Haulage Route, as other vehicles will be. On road cyclists (including those using the shoulder or on road cycle lanes) are to be controlled with on-road traffic by all traffic management and TCP's implemented. Due to the timing of the movement of the vehicles and roads utilised within the haulage route, there is not expected to be any significant impact to cyclists.

3.4.2 Traffic

All traffic management measures will be active for a brief period of time, approximately 1-2 minutes, with an expected maximum of approximately 15 minutes (Victoria Pass only). One to two loads per day approximately 20 minutes apart (and escort vehicles) are expected to travel the southern route per day.

NS1. Selwyn Street / George Street / Industrial Drive, Mayfield

Initial loads travelling in early AM off-peak periods will have little impact on traffic at the intersection.

Advanced road closure warnings will be deployed at Elizabeth Street to the south and Ingall Street to the north to divert traffic, or as otherwise directed by RMS. This will minimise the number of vehicles impacted at the Selwyn Street intersection during haulage operations.

NS2. Industrial Drive and Pacific Highway (Maitland Road), Mayfield

Traffic management measures at this intersection will have little impact on vehicles due to timing of transport. It should be noted the intersection is located on two major roads (a state highway and arterial road) with an estimated vehicle volume of 450 veh/hour during early AM periods.

S6 – S7. The Great Western Highway through Mt Victoria Village

Traffic management measures at various points through Mt Victoria will impact local and highway traffic as the access to the Great Western Highway from adjoining roads are closed in addition to the highway. Traffic volumes in the area are estimated to be approximately 100 in total in the early morning off peak period and as such delays incurred are not expected to be significant. The Great Western Highway does possess a high proportion of heavy vehicles through Mt Victoria in the early morning off peak of approximately 45%. Travel times for these vehicles may be affected.

S8 – S9. The Great Western Highway through Victoria Pass

Traffic management measures at Victoria Pass will have an impact on traffic with an approximate highway closure duration of 10 minutes per load.

Traffic volumes in the area are estimated to be approximately 100 vehicles per hour in total in the early morning off peak period. The Great Western Highway does possess a high proportion of heavy vehicles through Mt Victoria in the early morning off peak of approximately 45%. Travel times for these vehicles may be affected.

If required by RMS Special Permits, VMS will be used leading up to and during the closure of Victoria Pass to ensure motorists and heavy vehicle companies whom may be impacted are notified of potential delays in advance and can make alternative arrangements or routes.

S11 – S16. The Great Western Highway through River Lett Hill

Traffic management measures along this section of the Great Western highway will have little impact on highway traffic as eastbound traffic will be stopped.

Traffic volumes in the area are estimated to be approximately 100 vehicles per hour in total in the early morning off peak period. This section of the Great Western Highway possesses a high proportion of heavy vehicles through Hartley in the early morning off peak of approximately 48%. Travel times for these vehicles may be affected.

If required by RMS Special Permits, VMS will be used leading up to and during the closure of River Lett Hill to ensure impacted motorists and heavy vehicle are notified of potential delays in advance and can make alternative arrangements or routes.

S18. Castlereagh Highway Rail Crossing, Ben Bullen

Traffic management at this location will impact highway traffic on the Castlereagh Highway, local traffic on Quarry Road. Limited traffic volumes occupy this road with bi-directional volumes of approximately 80 vehicles at the proposed time of crossing at 5:00am. Rail services are to be given priority at the level crossing. As such the traffic management at the Ben Bullen level crossing is expected to have minimal impact on traffic.

Liaison with John Holland Rail on behalf of Country Regional Network has been undertaken, to design the tilting rail signals to be used to enable the manoeuvre through the level crossing, and the procedures to ensure safety of rail and road users is maintained. Authorisation for this installation will be required from Country Regional Network prior to works being undertaken.

S19. Castlereagh Highway / Aarons Pass Road

Vehicular volumes are expected to be approximately 150 vehicles per hour on the Castlereagh Highway at Aarons Pass Road. The intersection closure at this location is therefore not expected to have adverse impacts on traffic movements on the Castlereagh Highway.

3.5 ADDITIONAL TRAFFIC MANAGEMENT MEASURES

The TMP and associated TCP's have considered the opposing highway, local and rural movements at each relevant location along the Southern Haulage Route with historical traffic volume data obtained from the *RMS Traffic Volume Viewer*. Should traffic volumes increase by 10% a revised TMP and associated TCP's will be required. The review would consider the effectiveness and efficiency of the TMP and TCPs in light of increased traffic volumes along the Southern Haulage Route.

Additional traffic management measures, to ease the potential impacts on traffic movement when the TCP's are operational, include:

- Providing optional detour routes where detour routes are available and practical. The selection of detour routes would be done in conjunction with the RMS, Department of Planning Industry and Environment (DPIE) and relevant roads authority; and

- Utilising variable message signs in the lead up to the traffic management taking place to provide warning and allow for motorists and companies to make alternative arrangements for travelling through affected areas.

4. TRAFFIC GENERATION – LIGHT VEHICLES

Roadworks and traffic generated during the construction and operational phases are not expected to considerably impact the road network surrounding the site. Any delays caused by staging of construction and haulage vehicles are expected to be brief and infrequent.

The project will generate light vehicle traffic to support construction work including the following:

- early works investigation including surveys, Geotech, testing, etc.;
- transportation of construction workers to and from site;
- pilot vehicles and escorts (for heavy haulage vehicles); and
- delivery of smaller components eg cabling.

Light vehicle numbers are expected to peak with a maximum of 107 per day, averaging 27 vehicles per day, during the construction phase. A high variability of daily vehicle movements is expected during the project. A copy of the expected vehicle movements can be found in Appendix D.

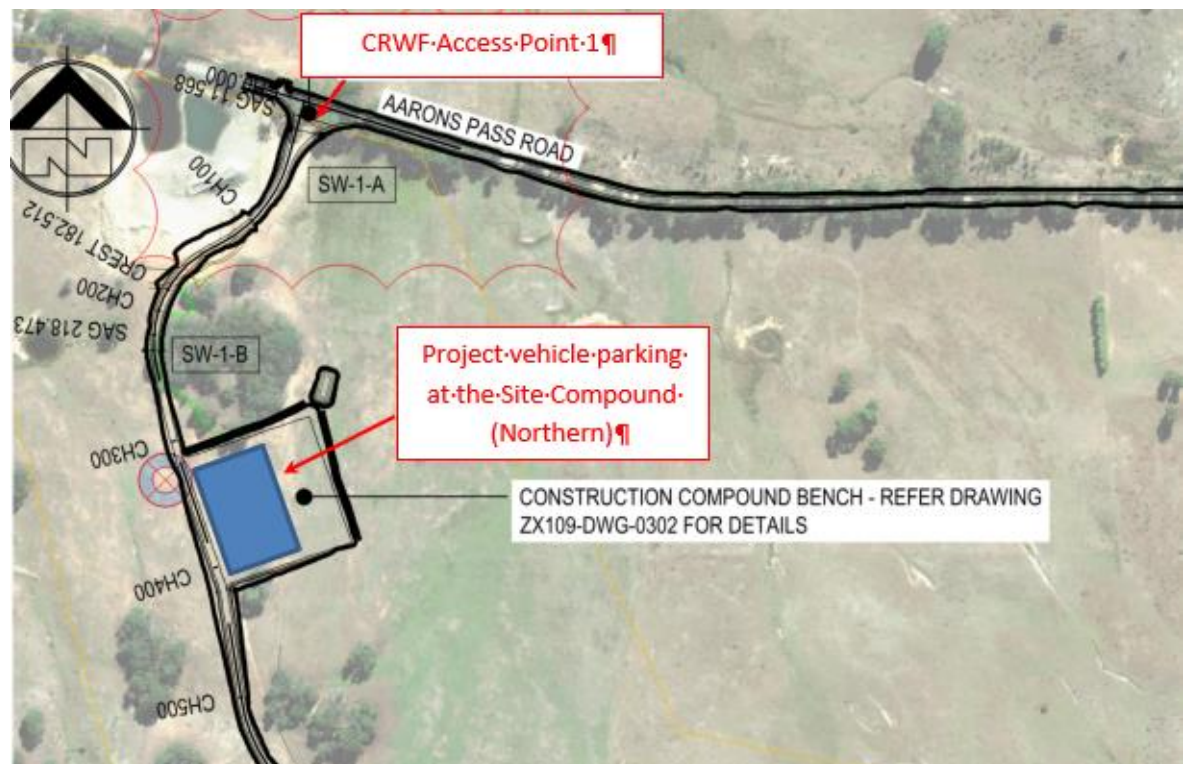
Given the low number of light vehicles accessing site it is not expected that a bus or shuttle service will be required. To reduce the number of light vehicles operating at any one-time staff will be encouraged to car pool to and from and in and around site.

4.1 PARKING FACILITIES

Parking facilities will be supplied on-site, for both northern and southern access points to the site, for all light vehicles. It will consist of a gravel or road base area located away from active works areas along Bombardi Road and Aarons Pass Road, at locations to allow construction traffic and regular traffic to maintain sufficient roadway width for travel.

No vehicles are to be parked on Castlereagh Highway without approval from RMS or private property without owner's consent. Parking for Crudine Ridge Wind Farm will be located within the site and shall be designed in accordance with AS2890.1.

Parking shall be on formed laydown and hardstand areas within the development corridor and the batching / crushing plant. See Figure 4.1 and Figure 4.2 below.



Source: Google Earth

Figure 4.1: Parking Locations – Northern Site Entrance



Source: Google Earth

Figure 4.2: Parking Locations – Southern Site Entrance

4.2 ORIGIN OF TRAVEL

Majority of the light vehicles travelling to site, approximately 80%, are expected to travel via Castlereagh Highway from outside the local road network. The remaining light vehicles are expected to travel from within the local road network and consist mainly of local residents working on the wind farm project.

4.3 ASSESSMENT OF MITIGATION MEASURES

4.3.1 Pedestrians and Cyclists

There are no pedestrian or cyclist measures to consider for access to site. No pedestrian or cycling facility expected to be affected by traffic control/management measures. Any on-road cyclists will be directed with regular traffic.

4.3.2 Traffic

Local Traffic

Bombandi Road and Aarons Pass Road both provide access to a small number of rural properties and as such are not expected to carry high daily traffic volumes. Further, vehicles are to arrive in stages minimising the impact on local traffic, with any delays expected to be brief and infrequent. Some limited light vehicle traffic may occur along Sallys Flat Road. Any light vehicles using Sallys Flat Road will only do so with the express permission of the EPC Project Manager. A register of all vehicles using Sallys Flat Road will be maintained.

Limited access to Crudine Road has been approved. This will consist of traffic associated with the construction of the western section of the transmission line. The provisions of the Traffic Control Plan for Bombandi Road will apply to Crudine Road.

Expected construction traffic along Crudine Road will include (but not limited to):

- Trucks;
- Excavators;

- Water carts;
- Pole deliveries and
- Cement agitators

Construction vehicle volumes are expected to peak at ten (10) light vehicles, and one (1) semi-trailer per day during the construction phase of the transmission line.

It is proposed these vehicles are to arrive in stages and only when works require these vehicles to be in attendance at site.

Highway Traffic

Traffic volumes along Castlereagh Highway during construction activities are expected to be low and therefore queuing of highway vehicles is likely to be minimal. Waiting bays are not expected to be required because of the existing overtaking lanes and channelised right/left turn bays along the route and the major intersections.

4.3.3 Additional Traffic Management Measures

The TMP and associated TCP's have considered the opposing highway, local and rural movements at each relevant location with historical traffic volume data obtained from the *RMS Traffic Volume Viewer*. Should traffic volumes significantly increase, a revised TMP and associated TCP's will be required.

5. AARONS PASS ROAD TMP

5.1.1 Development Consent - Schedule 3 Item 28

The Development Consent includes the following requirements in condition 28 of schedule 3, in relation to Aarons Pass Road:

Prior to the commencement of construction (other than pre-construction minor works or the construction of the external overhead transmission line), the Applicant shall:

- a) Undertake the road upgrades and other traffic management measures (including the construction of passing bays) identified in Appendix 6 to the satisfaction of MWRC;
- b) Upgrade the existing intersection between Aarons Pass Road and Castlereagh Highway to the satisfaction of RMS, unless the RMS determines these upgrades are unnecessary; and
- c) Construct the new intersection between Aarons Pass Road and the northern site access to the satisfaction of MRWC. The intersection design must include:
 - *A widened shoulder prior to the intersection to assist turning vehicles; and/or*
 - *A widened intersection to facilitate the flow of entering traffic off the road; and/or*
 - *Placing site entrance gates back from the road so that they do not create a hold point for entering vehicles prior to their egress from Aarons Pass Road.*

The Applicant may commence construction of the external overhead transmission line (as identified in Appendix 2), prior to completion of the Aarons Pass Road upgrades set out in this condition, provided that all heavy and over-dimensional vehicles associated with the construction of this transmission line:

- (a) access the site from Bombandi Road; and
- (b) do not use Aarons Pass Road before it has been upgraded in accordance with this condition.

The items identified in Appendix 6 of the Development Consent identify the required works to upgrade Aarons Pass Road based on anticipated over-dimensional vehicle dimensions, vertical curve and radius capability at the time. Subsequent to the granting of the Development Consent, the proponent and EPC Contractor have been closely working with MWRC to ensure that the proposed works can satisfy Council's expectations for road safety, quality and maintenance needs.

The proponent undertook additional survey and design to inform consultation with Council to develop an agreed design and upgrade schedule. The detailed design incorporates the requirements of Appendix 6 of the Development Consent. The EPC Contractor will undertake the roadworks required along Aarons Pass Road, and the designs have been developed in accordance with the Austroads Standards and MWRC specifications. The detailed design plans, developed in consultation with MWRC and are consistent with the design requirements specified in Appendix 6 of the Development Consent.

The road would be made fit for purpose prior to the commencement of construction except for pre-construction activities or construction of the external overhead powerline provided that all heavy and over-dimensional vehicles associated with the construction of the transmission line:

- (a) access the site from Bombandi Road; and
- (b) do not use Aarons Pass Road before it has been upgraded.

A pre-dilapidation report will be prepared at the completion of the initial road works, and a post-dilapidation report at the end of the construction period. The road would be maintained during the construction period, and rehabilitated to the state of the pre-dilapidation report at completion of construction, at the Proponents expense and complete the repair works within 2 months of the completion of survey, or other timing as may be agreed by the relevant roads authority

Completion of road realignment and corner works will be undertaken prior to the commencement of construction and delivery of over-dimensional equipment to site

5.2 EXISTING CONDITIONS

Aarons Pass Road is a rural unsealed road running primarily east-west, connecting with Castlereagh Highway (east) and Pyramul Road / Sally's Flat Road / Prices Lane (west). The road surface of Aarons Pass Road on the approach to the intersections with Castlereagh Highway and Pyramul Road is sealed for approximately 90 metres. It provides access to properties in the Aarons Pass and Carcalgong areas. The road alignment is mostly composed of curves and turns with undulations, primarily following the ridgeline. Road sections vary between one and two car widths.

Aarons Pass Road is the access road between the Castlereagh Highway and the northern site entrance to the Crudine Ridge Wind Farm for the northern and southern haulage route. The entrance to the site is just under 20 kilometres along Aarons Pass Road west of the Castlereagh Highway. A maximum gradient of approximately 15% (~1:6) is expected along the route approximately 8.2 kilometres west of Castlereagh Highway. The minimum horizontal radius is 60m and minimum vertical radius is 400m. Approximately 38 gateways/driveways have been identified along the haulage route.

Aarons Pass Road requires upgrades to support over-dimensional vehicles including improvements to the capacity, width and capability along the route. The section of road included in the haulage route is shown in Figure 5.1.



Source: Google Maps

Figure 5.1: Section of Haulage on Aarons Pass Road

Detailed design of the Aarons Pass Road upgrades has been undertaken in consultation with MRWC. A cadastral survey of the road alignment and neighbouring property boundaries was undertaken in late 2016 to facilitate the initial 2D swept path analysis and design for the route, based on Council specifications and the loaded dimensions and capabilities of the vehicles for the preferred turbines. Subsequent topographical and detailed ecological surveys undertaken in 2018 have enabled the progression of the proposed upgrade to a detailed 3D overlay to refine the alignment alterations and vegetation removal, as demonstrated in Appendix C. The final design will be undertaken in close coordination with MWRC.

5.3 DESCRIPTION OF TRAFFIC MANAGEMENT MEASURES

5.3.1 Construction

Construction is to be undertaken by EPC Contractor and traffic management measures will be developed by the EPC Contractor to ensure they meet the requirements for road safety in the Council Area.

Traffic controllers will be used due to sight line constraints, and advanced temporary signage will be adopted to advise drivers of roadwork conditions ahead. The proposed traffic management measures have been developed by the EPC Contractor and MWRC in development of the Aarons Pass Road and Bombandi Road TMP.

5.3.2 Haulage

Passing bays will be established at locations to be agreed between the proponent, contractors and MWRC. The passing bays identified in Appendix C will be utilised during the haulage campaign. A Communication Plan will be established between the haulage contractors and the EPC Contractor for any maintenance or emergency repairs undertaken during haulage for the Project.

Advanced signage on Castlereagh Highway will also be implemented as part of traffic management relating to northern and southern haulage routes.

5.3.3 Traffic Control Plans

Traffic Control Plans (TCP) relating to haulage vehicle movements at the intersection of Castlereagh Highway and Aarons Pass Road are provided in Appendix A with the Haulage Route TCPs. The additional sign T2-25 will be introduced to highlight truck access ahead and to advise drivers of distance to entry.

TCPs relating to haulage movements along Aarons Pass Road are to be completed at a later date by the EPC Contractor / Mid-Western Regional Council, subject to the confirmation of the scope and schedule for the road upgrades.

TCPs relating to the upgrade works of Aarons Pass Road, including construction, are to be addressed in the EPC Contractor's Construction Traffic Management Plan.

Given the expected HV traffic volumes, additional traffic control measures are not/will be required. Should traffic volumes increase significantly, from those presented within this TMP, a revised TMP and associated TCP will be required.

A Communication Plan has been by the proponent and presented to MWRC to allow confirmation and monitoring of traffic volumes to/from site as the project progresses.

The TCP has been reviewed and approved by M.Thompson (Prepare a Work Zone Traffic Management Plan Card No. 0045298760).

5.3.4 Parking Facilities

Parking for Crudine Ridge Wind Farm will be located within the site and shall be designed in accordance with AS2890.1. Passing bays along Aarons Pass Road and waiting bays on Aarons Pass Road near the Castlereagh Highway will be designed in consultation with MWRC, to allow safe passing of vehicles during OSOM haulage operations. .

No vehicles are to park on private property, outside of the designated development corridor, without owner's consent. No vehicles are to be parked on Castlereagh Highway without approval from RMS.

5.4 ASSESSMENT OF MITIGATION MEASURES

5.4.1 Pedestrians and Cyclists

It is not expected any cyclists or pedestrians utilise Aarons Pass Road as currently no infrastructure is provided to entice active transport. As such, any traffic management measures are not expected to impact pedestrians or cycle traffic. Any on-road cyclists will be directed with regular traffic.

5.4.2 Generated Traffic

Roadworks proposed and traffic generated during the construction and operational phases are not expected to considerably impact the movement of existing traffic along Aarons Pass Road. With approximately 15 rural properties gaining access from Aarons Pass Road along the haulage route to the Project site, Aarons Pass road is not expected to carry high daily traffic volumes. Further, construction vehicles and haulage vehicles are to arrive in stages, and therefore any delays incurred are expected to be brief and infrequent.

Construction vehicles will be travelling to Aarons Pass Road to transport plant, construction vehicles and materials. These vehicles will arrive in stages and only when proposed works require these vehicles to be in attendance at site. The vehicles will include:

- Trucks;
- Tipper trucks;
- Graders/scrapers;
- Excavators;
- Water trucks
- Rollers; and
- Asphalt laying machines.

MWRC have separately approved several quarry developments within the Project area. This should allow for the majority of aggregate, gravel and water required during construction to be sourced on or near to the site. Thus reducing the anticipated standard heavy vehicle movements on Aarons Pass Road. During the construction phase of the project, a peak vehicular volume of approximately 207 vehicles per day is expected along Aarons Pass Road, including delivery vehicles and construction vehicles (both light and heavy).

Passing bay locations will be established at locations determined in coordination with MWRC as shown in Appendix C. This will ensure road safety, minimise delays incurred by local traffic and maximise passing opportunities of heavy vehicles.

Haulage

The volume of heavy vehicles using Aarons Pass Road as part of the haulage of the wind turbine structure, including blades and tower components, is estimated at over 370 over a period of months. This includes trucks transporting wind turbine blades and tower component.

Staging of loads is planned to ensure no build up or queueing of vehicles is to occur on Aarons Pass Road or Castlereagh Highway. Vehicles transporting wind turbine blades are to wait on Aarons Pass Road, near the Castlereagh Highway, until the road is clear of other heavy vehicles. A waiting/passing bay for over-dimensional vehicles will be established at a location to be confirmed with MWRC, to ensure traffic can be adequately staged along the road.

Vehicles are assumed to travel to the site on Aarons Pass Road and return to exit back onto Castlereagh Highway using Aarons Pass Road (i.e. two trips per blade/truck, 1 in/1 out) as Pyramul Road has been deemed unsuitable in previous route assessments (Downer Route Assessment). Unloaded vehicles returning from the site will be collapsed to return as standard heavy vehicles where possible.

5.5 ADDITIONAL TRAFFIC MANAGEMENT MEASURES

The TMP and associated TCP's have considered the opposing highway, local and rural movements at each relevant location along the Southern Haulage Route with historical traffic volume data obtained from the RMS

Traffic Volume Viewer. Should traffic volumes significantly increase, a revised TMP and associated TCP's will be required.

Dust Management would be achieved through:

- Adoption of maximum speed limit for vehicles on all unsealed surfaces
- Use of water sprays and/or water carts to dampen stockpiles, work areas, haul routes and exposed soils
- Water carts will operate in the morning before the start of shift along Aarons Pass Road prior to the arrival of staff and again at the end of shift prior to the departure of staff from the site. Additionally, water carts will be present at the work front during construction activities on Aarons Pass Road which will be able to available to water sections of Aarons Pass Road.
- During component deliveries a water cart will be available to water Aarons Pass Road depending on prevailing weather conditions.
- During periods of high winds works may be stood down to prevent dust generation.
-
- Managing roads and access points to prevent tracking of material onto sealed roads. Before driving on a sealed road all vehicles will come to a complete stop to allow for accumulated dust to drop off the vehicle. This will minimise tracking of loose material onto the sealed road surface.
- Regular equipment maintenance to ensure exhaust emissions comply with statutory requirements
- Monitoring of meteorological conditions to limit the potential for impacts on downwind receivers
- Ensuring loads are covered to minimise dust generation where possible (Note: loads must be covered on public roads)
- Active stockpile management
- Visual dust monitoring will be undertaken daily during construction and more frequently during periods of high winds

6. BOMBANDI ROAD TMP

6.1 CONSTRUCTION

6.1.1 Development Consent - Schedule 3 Item 29

The Development Consent specifies upgrades required to be undertaken on Bombandi Road in Schedule 3 condition 29:

Prior to the commencement of construction on the external transmission line (see figures in Appendix 2 of MOD), the Applicant shall:

- *Undertake the road upgrades and other traffic management measures identified in Appendix 6 (MOD) to the satisfaction of MWRC; and*
- *Upgrade the existing intersection between Bombandi Road and the Castlereagh Highway to the satisfaction of the RMS, unless the RMS determines these upgrades are unnecessary.*

The items identified in Appendix 6 are the required works to upgrade Bombandi Road to ensure it is suitable for the construction of the transmission line. The items are as follows:

1. *Installation of five (5) heavy duty grids with end assemblies and gates at the locations of the existing grids;*
2. *Installation of two (2) culverts at approximately 200 metres and 500 metres from the Castlereagh Highway;*
3. *Maintenance of the used section of Bombandi Road for the duration of the Lease;*
4. *Establish a new access ("Eldon Court Laneway to Switching Station") point from Bombandi Road approximately 80 metres west from the Eldon Court driveway and which is approximately 1.5 kilometres west from the Castlereagh Highway.*

Subsequent to the Development Consent, the proponent has been closely engaged with the MWRC Works Department to ensure that the works can satisfy Council's expectations for road safety, quality and maintenance needs. Additional survey will be undertaken and specifications provided to MWRC to develop an agreed design and upgrade schedule, to address the items in Appendix 6 of the Development Consent.

A pre-dilapidation report will be prepared at the completion of the road works, and a post-dilapidation report at the end of the construction period. The road would be maintained during the construction period, and rehabilitated to the state of the pre-dilapidation report at completion of construction, at the Proponents expense and complete the repair works within 2 months of the completion of survey, or other timing as may be agreed by the relevant roads authority.

6.2 EXISTING CONDITIONS

Bombandi Road is a rural unsealed road traversing through two properties south of Aarons Pass. It is a no through road which intersects with Castlereagh Highway to the east. The road section is generally narrow, able to accommodate one vehicle at a time, with the road alignment exhibiting a gentle grade with few curves.

The intersection with Castlereagh Highway is sealed for approximately 50 metres. A gate is located at the eastern property line of Eldon Court.

6.2.1 Traffic Generation

Roadworks proposed, and traffic generated during the construction and operational phases are not expected to considerably impact the movement of existing traffic along Bombandi Road. Minimal traffic movements are expected as no OSOM vehicles or wind turbine components are expected to use Bombandi Road. Bombandi Road will be used only for construction of the transmission line.

A small number of rural properties gaining access from Bombandi Road on the haulage route to the end of the transmission line is not expected to carry high daily traffic volumes. Any delays caused by staging of construction and haulage vehicles are expected to be brief and infrequent.

Construction Stage

A small number of vehicles will be using Bombandi Road to undertake road upgrade measures. The works are to be completed in stages fit for purpose of the road. Details regarding the upgrade of Bombandi Road are subject to investigation and consultation with property owners and MWRC.

Expected construction traffic will include (but not limited to):

- Trucks;
- Excavators;
- Water carts;
- Graders; and
- Rollers

Construction vehicle volumes are expected to peak at ten (10) light vehicles, and one (1) semi-trailer per day during the construction phase of the transmission line .

It is proposed these vehicles are to arrive in stages and only when works require these vehicles to be in attendance at site.

Haulage Stage

Haulage vehicles are expected to deliver plant, transmission line components to the site at the end of Eldon Court Laneway. Expected vehicles include:

- Light vehicles; and
- Heavy vehicles;

Traffic generated is expected to be low, including

- 10 semi-trailers per day over the course of construction, of the transmission line

It is proposed these vehicles are to arrive in stages to minimise impact to traffic along Bombandi Road.

Parking Facilities

Parking will be provided on site on formed laydown and hardstand areas within the development corridor and the batching / crushing plant to allow construction traffic and regular traffic to maintain sufficient roadway width for travel.

No vehicles are to be parked on Castlereagh Highway without approval from RMS or private property without owner's consent.

Staging of vehicles should ensure that minimal queueing should occur on Castlereagh Highway.

6.3 DESCRIPTION OF TRAFFIC MANAGEMENT MEASURES

6.3.1 Construction

Castlereagh Highway Intersection

Traffic utilising Bombandi Road during construction is expected to be minimal, no OSOM vehicles or wind turbine components are expected to utilise Bombandi Road. Speeds are to be reduced from the signposted 100km/h as a part of the TCPs to be developed with MWRC. Given the low vehicle volumes and lack of OSOM movements identified in Appendix D and proposed adoption of reduced sign posted speed limit during the temporary works, Bombandi Road is not expected to experience a change in traffic volume which would require a Basic Right turn (BAR) treatment. An upgrade of the Bombandi Road / Castlereagh intersection is therefore not considered necessary.

TCPs relating to the construction of the transmission line and upgrades to Bombandi Road are to be developed at a later time, subject to investigation and consultation with MWRC and property owners.

Bombandi Road

Traffic Control Plans relating to activities along Bombandi Road are to be completed at a later stage in consultation with MWRC, prior to the commencement of construction if the external transmission line.

Where possible, works are to be undertaken on one side of the road at a time, to maintain one lane width to allow local traffic to pass.

At all sites, general temporary roadworks signage will be utilised for each works stage, with one advanced warning sign at the turn off from Castlereagh Highway applying for all work stages.

Some sites will require traffic controllers due to sight line constraints. TCP's will be required for roadworks undertaken along the road.

Advanced signage indicating truck activities will also be implemented on Castlereagh Highway as part of traffic management relating to northern and southern haulage routes.

6.3.2 Haulage

Traffic management at the intersection of Bombandi Road and Castlereagh Highway will consist of:

- Advanced signage indicating truck activities will be implemented on Castlereagh Highway as part of traffic management relating to northern and southern haulage routes; and
- A Communication Plan will be established between the haulage contractors and MWRC during any road works or maintenance during haulage for the Project.

6.3.3 Traffic Control Plans

A Traffic Control Plan (TCP) relating to upgrades of Bombandi Road, haulage along Bombandi Road and construction of the transmission line is to be developed at a later date by The EPC Contractor / Mid-Western Regional Council.

TCPs relating to haulage vehicle movements at the intersection of Castlereagh Highway and Bombandi Road are not included as part of this TMP.

Signage should only be displayed when the need exists (i.e. during construction/operating hours) and removed or covered when the truck activity has ceased (i.e. outside of construction/operating hours).

Given the expected HV traffic volumes, additional traffic control measures are not/will be required. Should traffic volumes increase significantly, from those presented within this TMP, a revised TMP and associated TCP will be required.

A Communication Plan has been prepared by the proponent and MWRC / RMS to allow confirmation and monitoring of traffic volumes to/from site as the project progresses.

The TCP has been reviewed and approved by M.Thompson (Prepare a Work Zone Traffic Management Plan Card No. 0045298760).

6.4 ASSESSMENT OF MITIGATION MEASURES

6.4.1 Pedestrians and Cyclists

There are no pedestrian or cyclist measures to consider for Bombandi Road. No pedestrian or cycling facilities is expected to be affected by traffic control/management measures. Any on-road cyclists will be directed with regular traffic.

6.4.2 Traffic

Local Traffic

As Bombandi Road is a no through road, only local traffic of the small number of properties will be affected during construction and haulage operations.

Highway Traffic

Southbound traffic on Castlereagh Highway will be affected by trucks turning into Bombandi Road. However, the majority of truck movements are expected to arrive from the south of the intersection and due to low traffic volumes along Castlereagh Highway during haulage operations, minimal impact on traffic is expected.

6.4.3 Dust Management

- Adoption of maximum speed limit for vehicles on all unsealed surfaces
- Use of water sprays and/or water carts to dampen stockpiles, work areas, haul routes and exposed soils
- During component deliveries a water cart will be available to water Bombandi and Crudine Road depending on prevailing weather conditions.
- During periods of high winds works may be stood down to prevent dust generation.
- Managing roads and access points to prevent tracking of material onto sealed roads. Before driving on a sealed road all vehicles will come to a complete stop to allow for accumulated dust to drop off the vehicle. This will minimise tracking of loose material onto the sealed road surface.
- Regular equipment maintenance to ensure exhaust emissions comply with statutory requirements
- Monitoring of meteorological conditions to limit the potential for impacts on downwind receivers
- Ensuring loads are covered to minimise dust generation where possible (Note: loads must be covered on public roads)
- Active stockpile management
- Visual dust monitoring will be undertaken daily during construction and more frequently during periods of high winds
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APPENDIX A

TRAFFIC CONTROL PLANS **Northern Haulage Route**



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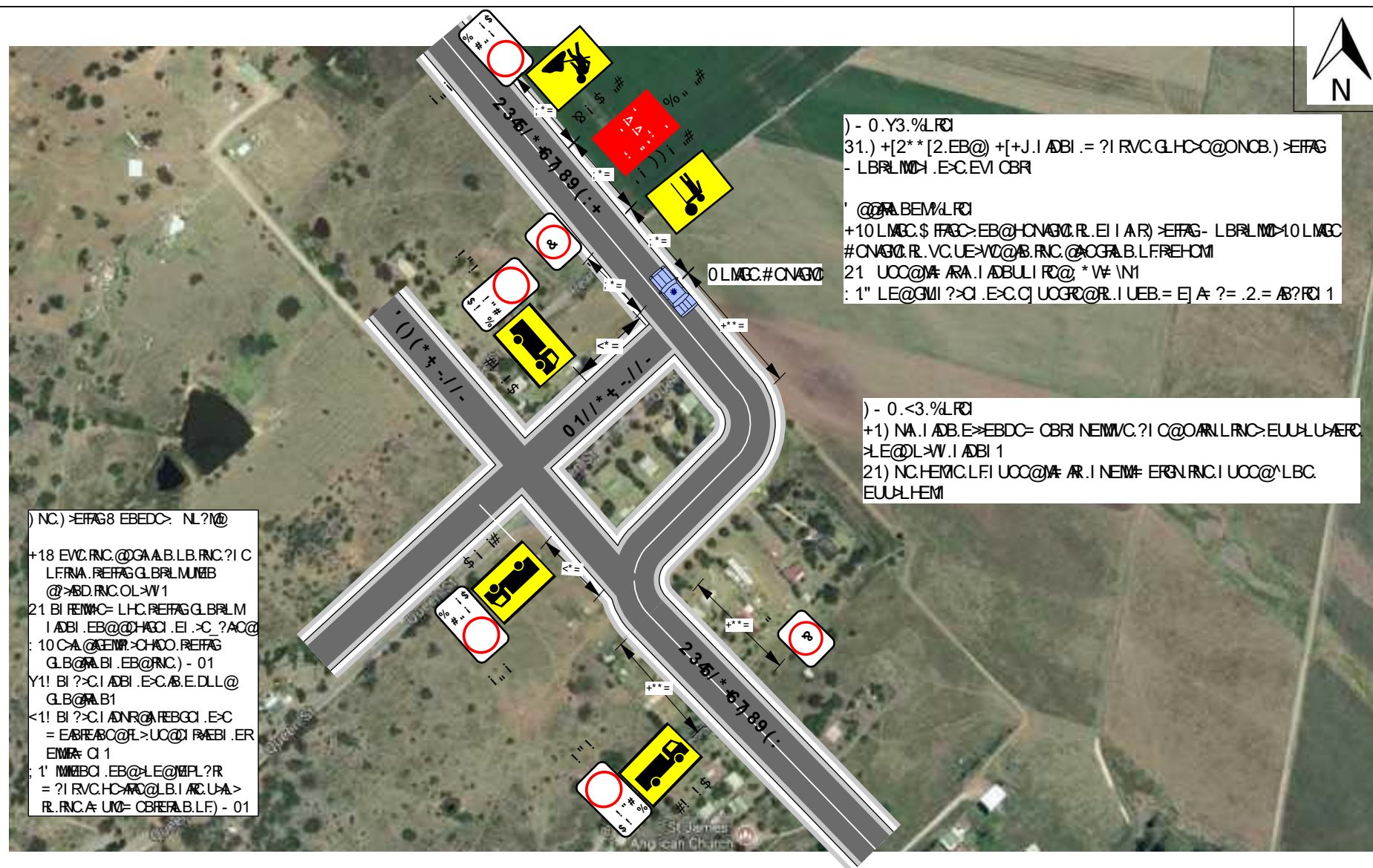
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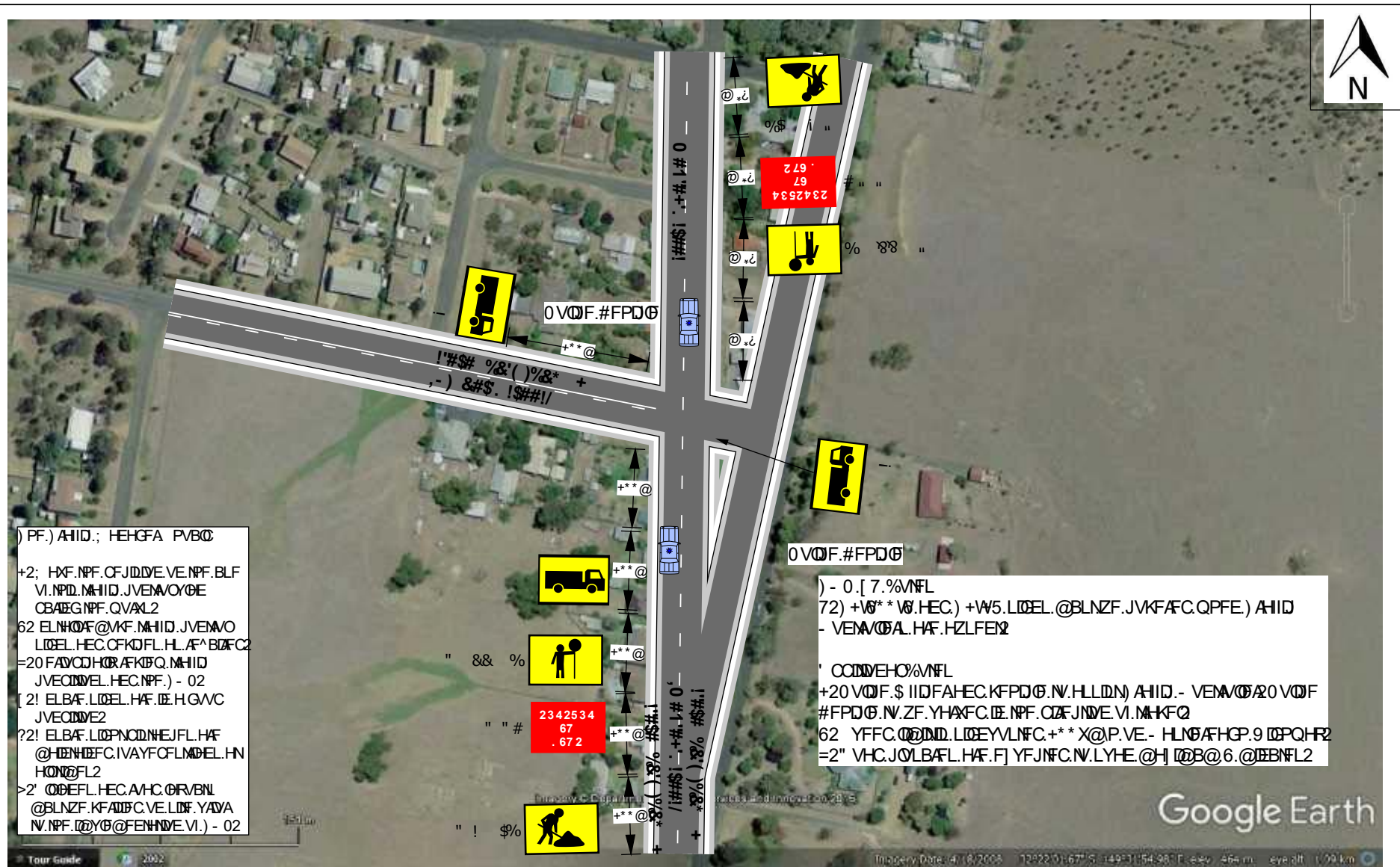
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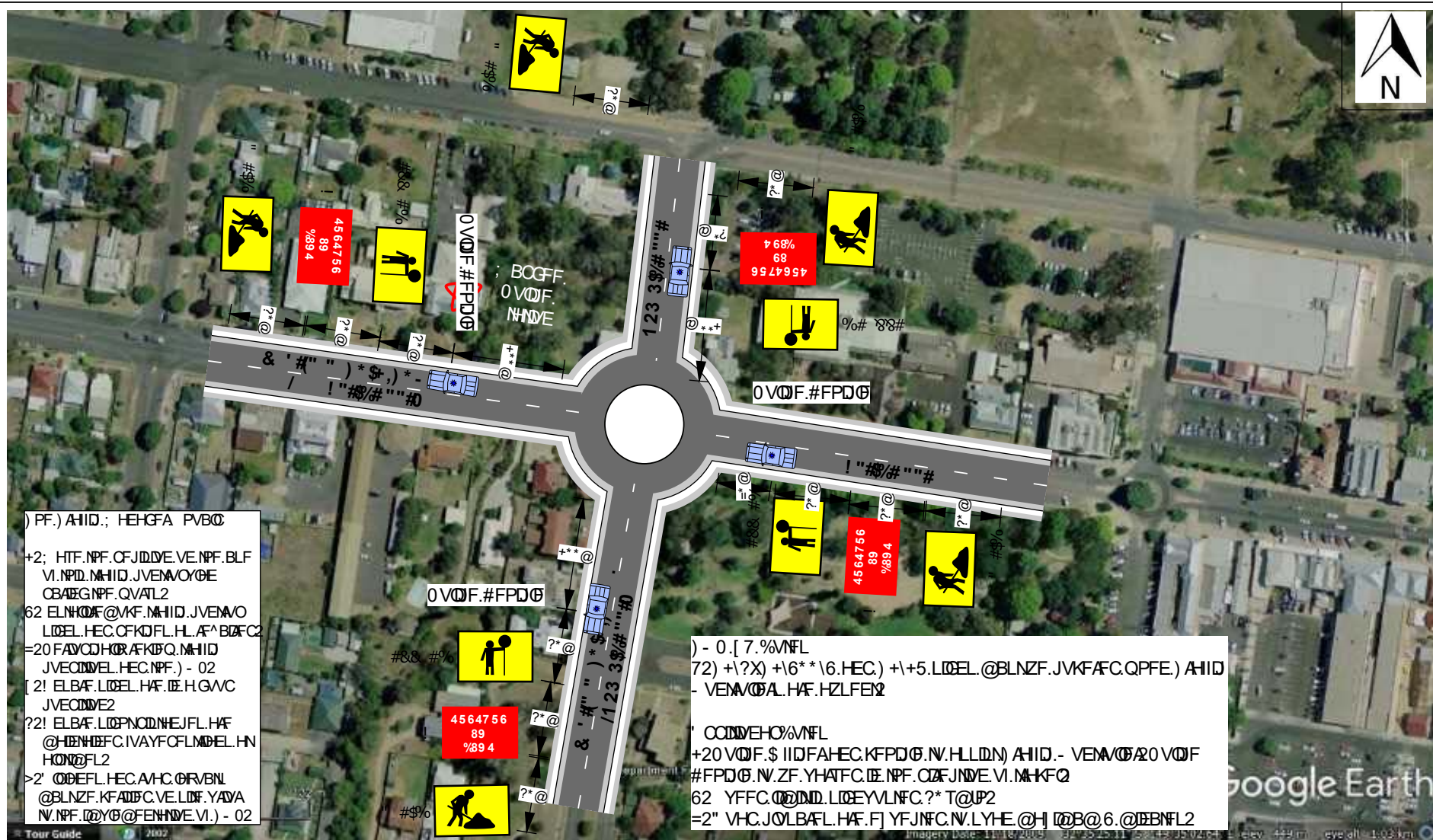
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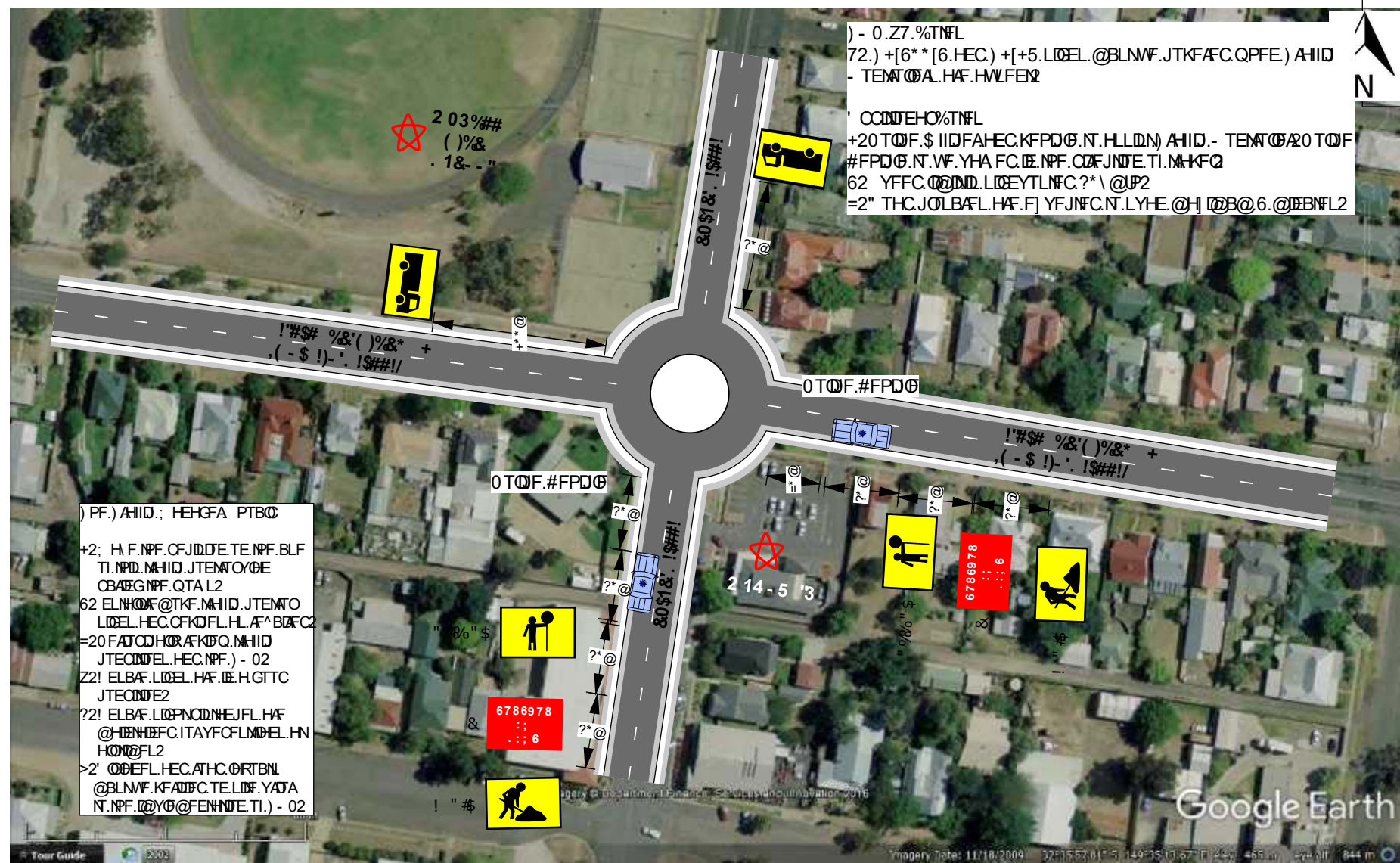
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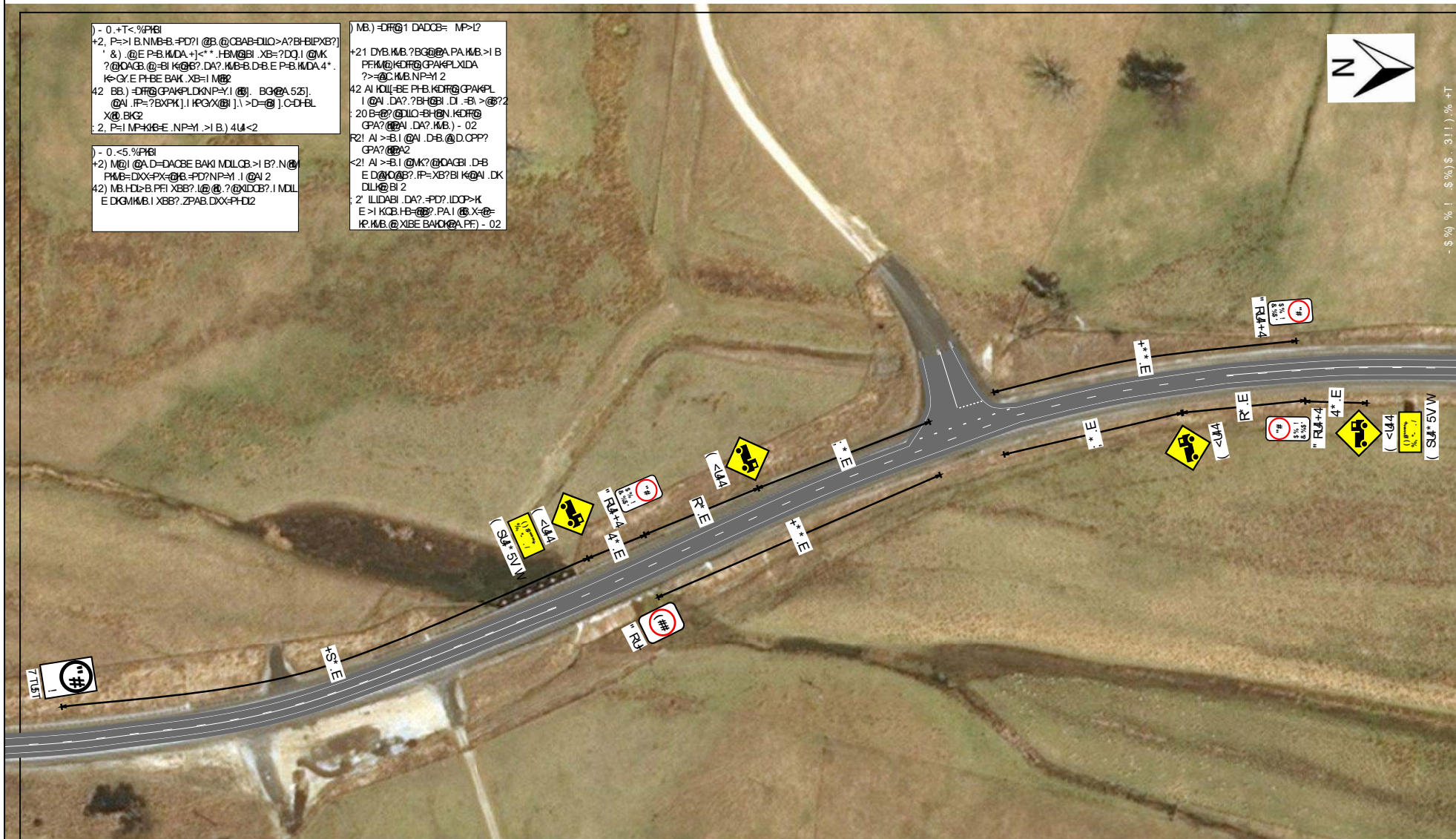
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APPENDIX A

TRAFFIC CONTROL PLANS **Southern Haulage Route**



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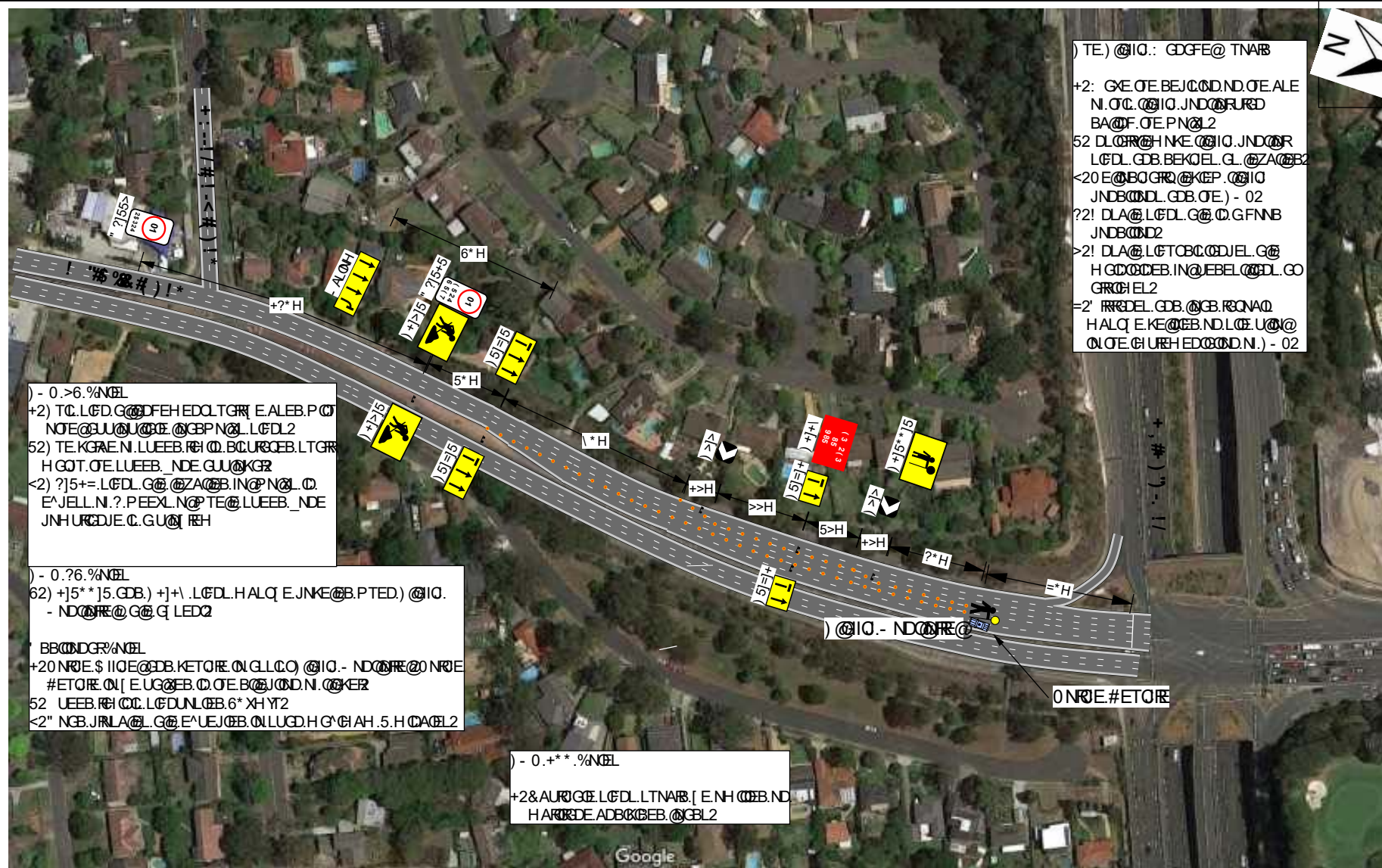
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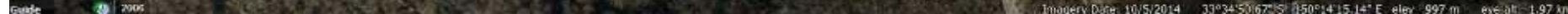
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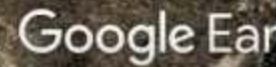
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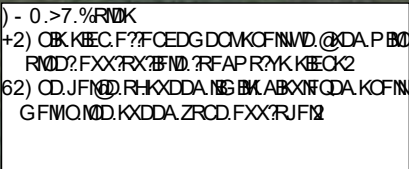


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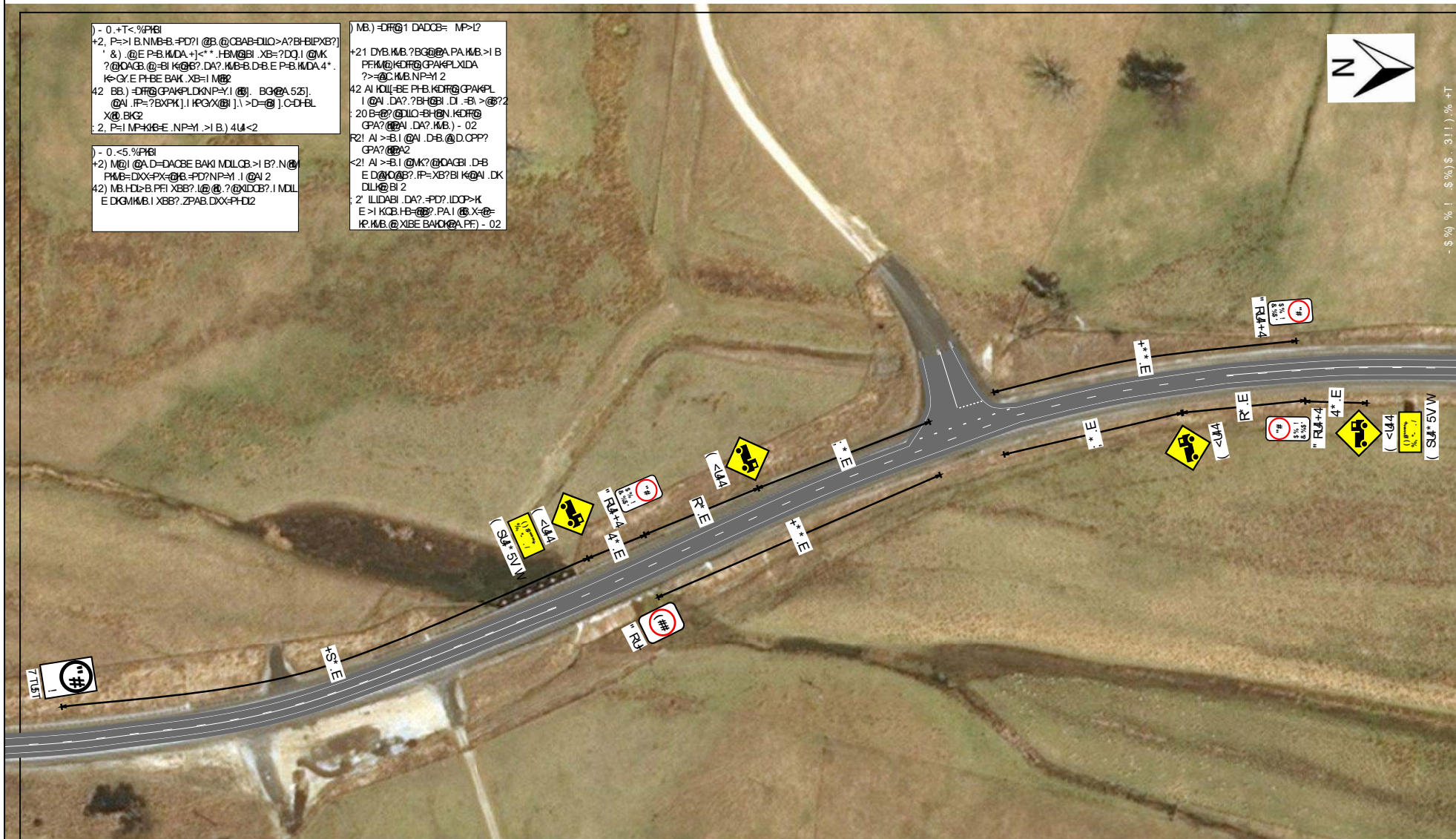
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APPENDIX B

DRIVER'S CODE OF CONDUCT

1. **TRANSPORT CODE OF CONDUCT**

A Transport Code of Conduct will be applied to all traffic and transport construction activities associated with the Project, with emphasis placed on the transport of over-size/over-mass wind turbine components and delivery vehicles during the construction phase. This draft will form the basis for the Transport Code of Conduct to be finalised prior to construction.

1.1 **HAULAGE ROUTES AND TIMING OF TRANSPORT**

All large vehicles associated with the Project will follow the designated haulage routes and main roads near the Project area to minimise impact to local roadways and road users. A map of the primary haulage routes highlighting critical locations will be attached to the Final Transport Code of Conduct. Any School Zones and school bus routes corresponding to the transport routes will be marked on the route maps. Timing of transport will be scheduled to minimise disruption to local traffic or result in safety risks.

1.2 **BEHAVIOURAL REQUIREMENTS**

The operators of all vehicles associated with the Project would maintain a high level of conduct and respect for other road users. All operators will undergo an induction prior to undertaking any transport to site and regular toolbox meetings will be held maintain awareness of required controls.

Details of the traffic and access training and induction will focus on:

- objectives of the TMP;
- performance goals;
- mitigation measures required to be implemented;
- traffic and access monitoring and reporting requirements; and
- incident investigation and response.

Training is to be provided prior to start-up of any traffic and access related management tasks and updated if task, equipment or procedures are expected to, or have changed.

The following requirements would be exercised always:

- obey all the laws and regulations;
- not drive whilst under the influence of alcohol, drugs, nor any medication which may affect their ability to drive;
- be medically fit to drive at all times and must inform site co-ordinators if they have any medical condition which may affect their ability to drive;
- drive in a considerate manner at all times and respect the rights of others to use and share the road space;
- report all vehicle defects to their employer. Serious defects must be corrected immediately or an alternative vehicle supplied;
- report any vehicle accident resulting in injury/or damage to property must be reported to the police;
- report any near misses;
- only drive in the construction hours when conducting Project works (unless permission to conduct Project works has been provided);
- securely fasten and cover loads, as appropriate; and
- keep their vehicle clean and in good mechanical condition to reduce the environmental impact.

The transport contractor is to develop and implement:

- safety initiatives for haulage through residential areas and/or school zones; and
- a maintenance program for the heavy transport vehicles that is consistent with these safety requirements.

1.3 SAFETY INITIATIVES FOR HAULAGE THROUGH RESIDENTIAL AREAS AND/OR SCHOOL ZONES

Safety initiatives for haulage through residential areas and/or school zones will be developed in consultation with RMS, Councils and other community stakeholders and be incorporated in the final Transport Code of Conduct.

1.4 MAINTENANCE REQUIREMENTS

The operators of all vehicles associated with the Project would maintain a high level of maintenance. The following requirements would be exercised at all times:

- ensure their vehicle complies with relevant State legislation in relation to roadworthiness and modifications;
- undergo regular vehicle checks and maintenance; and
- ensure their vehicles have correctly fitted mufflers to minimise noise disturbance.

1.5 SPEED LIMITS

All vehicles associated with the Project are required to travel within the posted speed limits on public roads. In situations where driver's visibility and traffic safety on public roads is affected by weather related conditions such as heavy rainfall or fog, construction vehicles should reduce their speed limit until visibility and traffic safety has improved.

Appropriate speed limits (less than 40 km/h) on site should be implemented, providing for a safe workplace.

Monitoring systems will be implemented to ensure speed limits are complied with at the Project site.

1.6 COMPLAINT RESOLUTION AND DISCIPLINARY PROCEDURE

All traffic related complaints will be managed in accordance with the Project complaints handling procedures described in the Environmental Management Strategy.

Complaints will be investigated and a report prepared on the circumstances of the complaints, risks arising and any non-compliance with project procedures.

Failure to comply with any procedures for safe transport may result in dismissal of specific operator(s) from the project.

1.7 COMMUNITY CONSULTATION FOR PEAK HAULAGE PERIODS

Community consultation in relation to traffic and access will include on-going consultation with relevant stakeholders including, local landholders, emergency services, business owners and school bus companies.

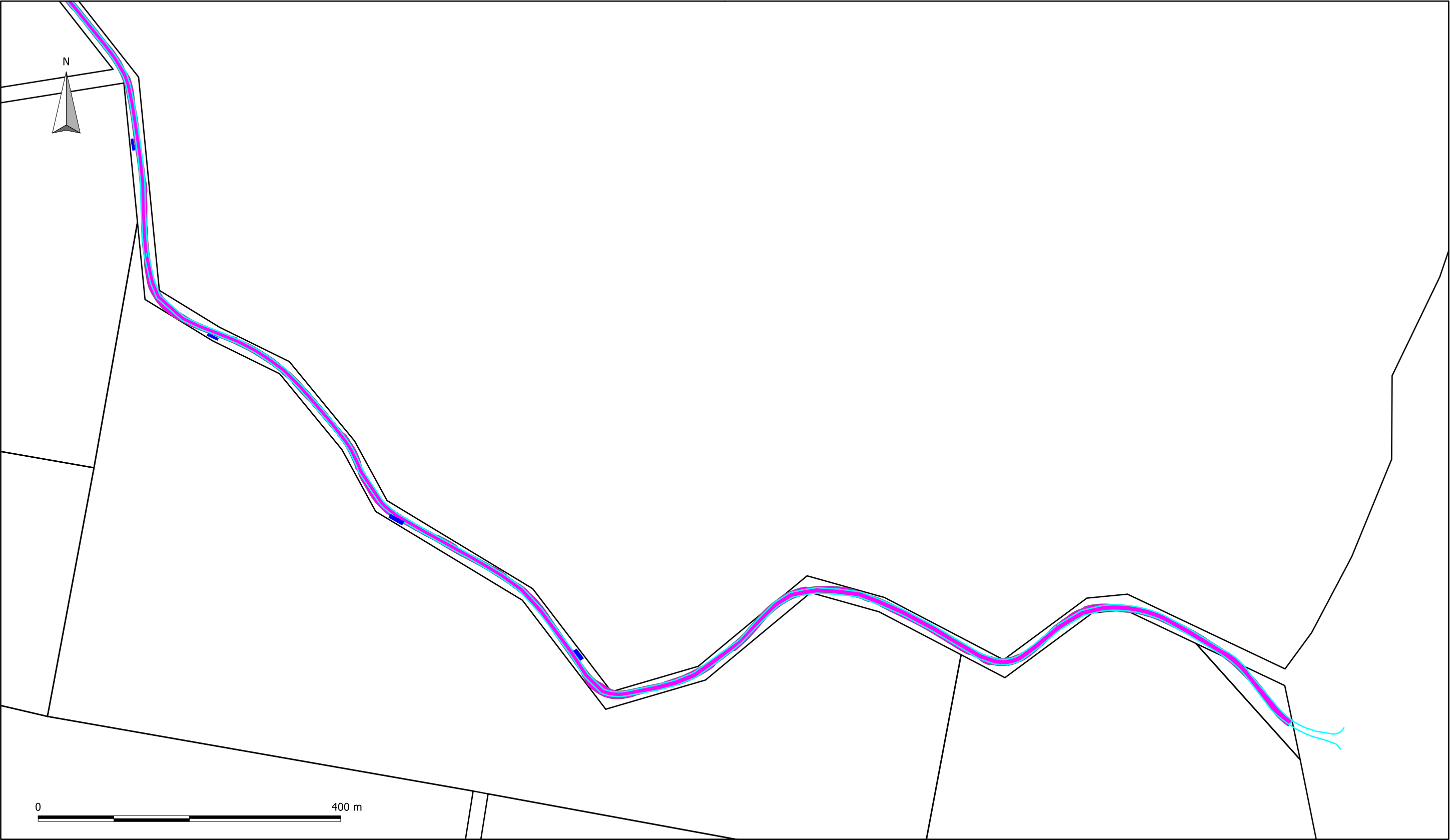
Community engagement is to be undertaken in consultation with the Community Officer.

Liaison activities may include:

- notifications, prior to commencement of any significant works, to local residents, local newspapers, and on the project website; and
- notifications on a case by case basis as construction progresses, including via the project website, shop front, local councils, local residents, newsletters and the Community Consultative Committee.
- a dedicated telephone contacts list to enable any issues or concerns to be rapidly identified and addressed.
- Transport operators are to provide feedback on:
 - any risks or issues arising from the transport; and
 - construction traffic routes and any potential impacts.

APPENDIX C


ASSESSMENT

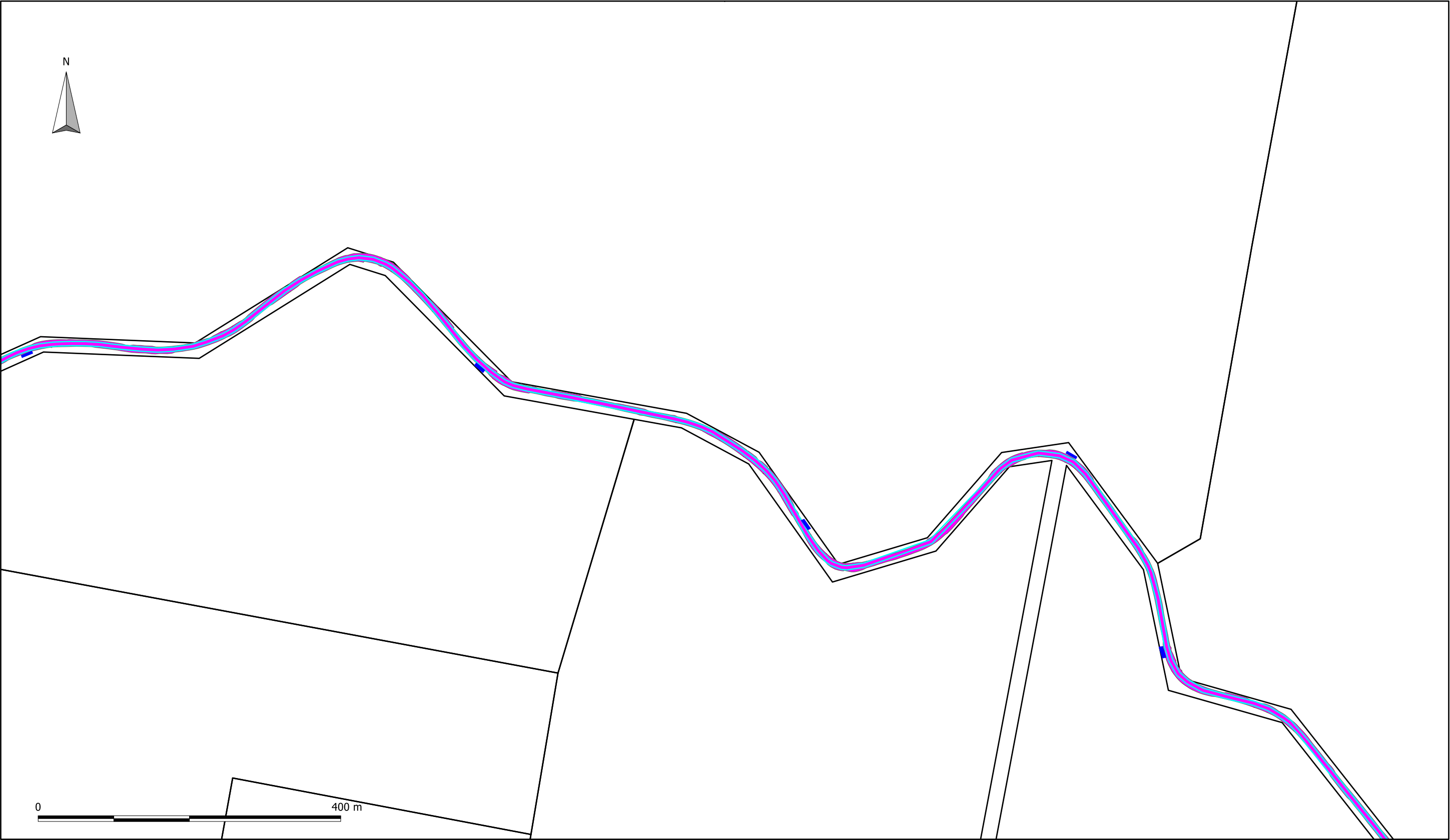


LEGEND



- Passing Bay Option
- Revised Design
- Existing Roadway
- Cadastral Boundaries

*Passing bay locations are consistent with those approved within the Preferred Project Report (CWP 2013). Final passing bay locations are to be determined within the approval under section 138 of the Roads Act in consultation with MWRC. The final passing bay locations are to be constructed within the approved vegetation clearing limits for APR.


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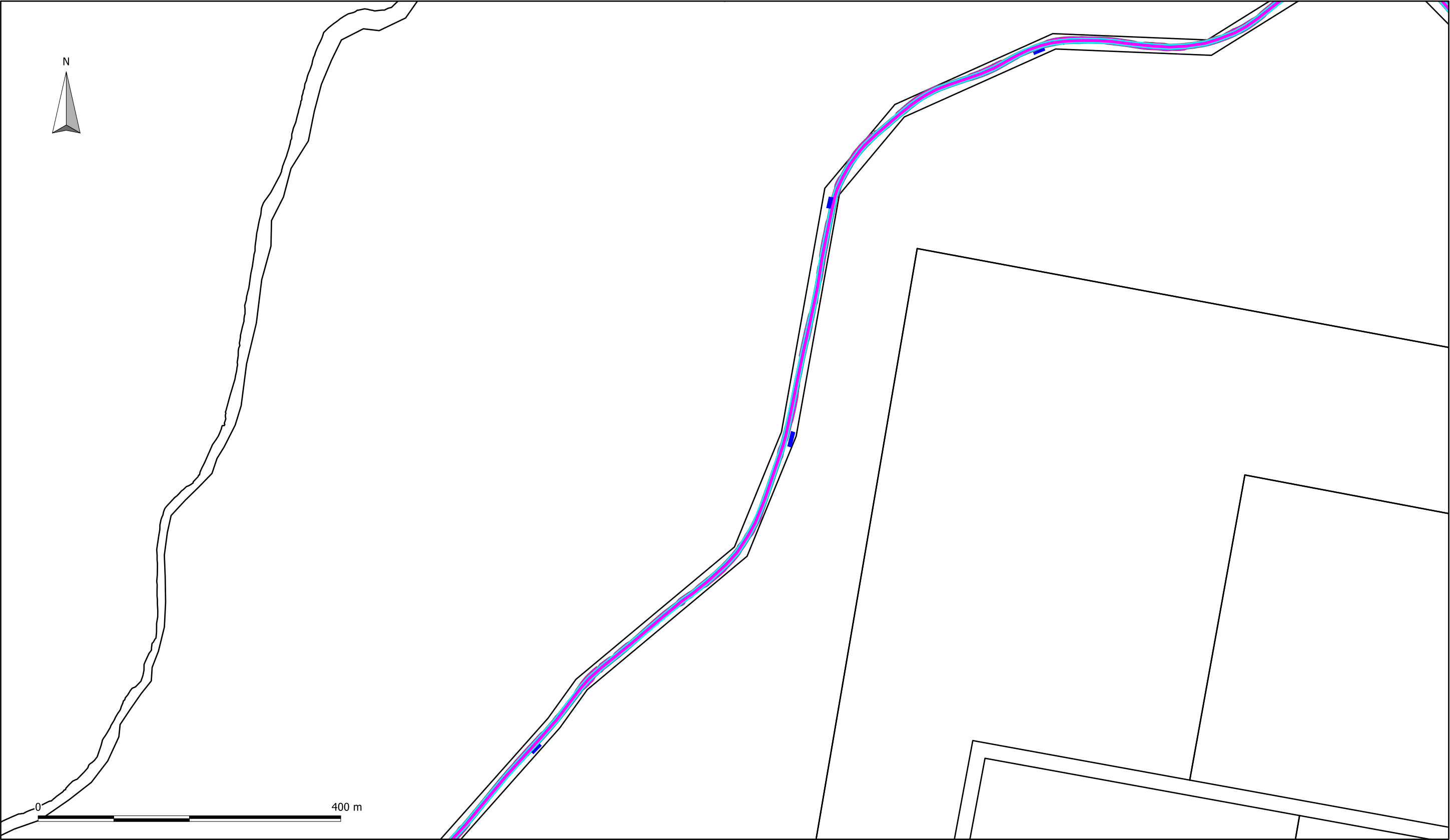


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-  Passing Bay Option  Revised Design
-  Existing Roadway  Cadastral Boundaries

*Passing bay locations are consistent with those approved within the Preferred Project Report (CWP 2013). Final passing bay locations are to be determined within the approval under section 138 of the Roads Act in consultation with MWRC. The final passing bay locations are to be constructed within the approved vegetation clearing limits for APR.


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LEGEND

-  Passing Bay Option
-  Revised Design
-  Existing Roadway
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DRAWN BY	B KRONENBERG	CHECKED BY	M BRANSON	SHEET	3 OF 11	JOB NO	080401	SIZE	A3

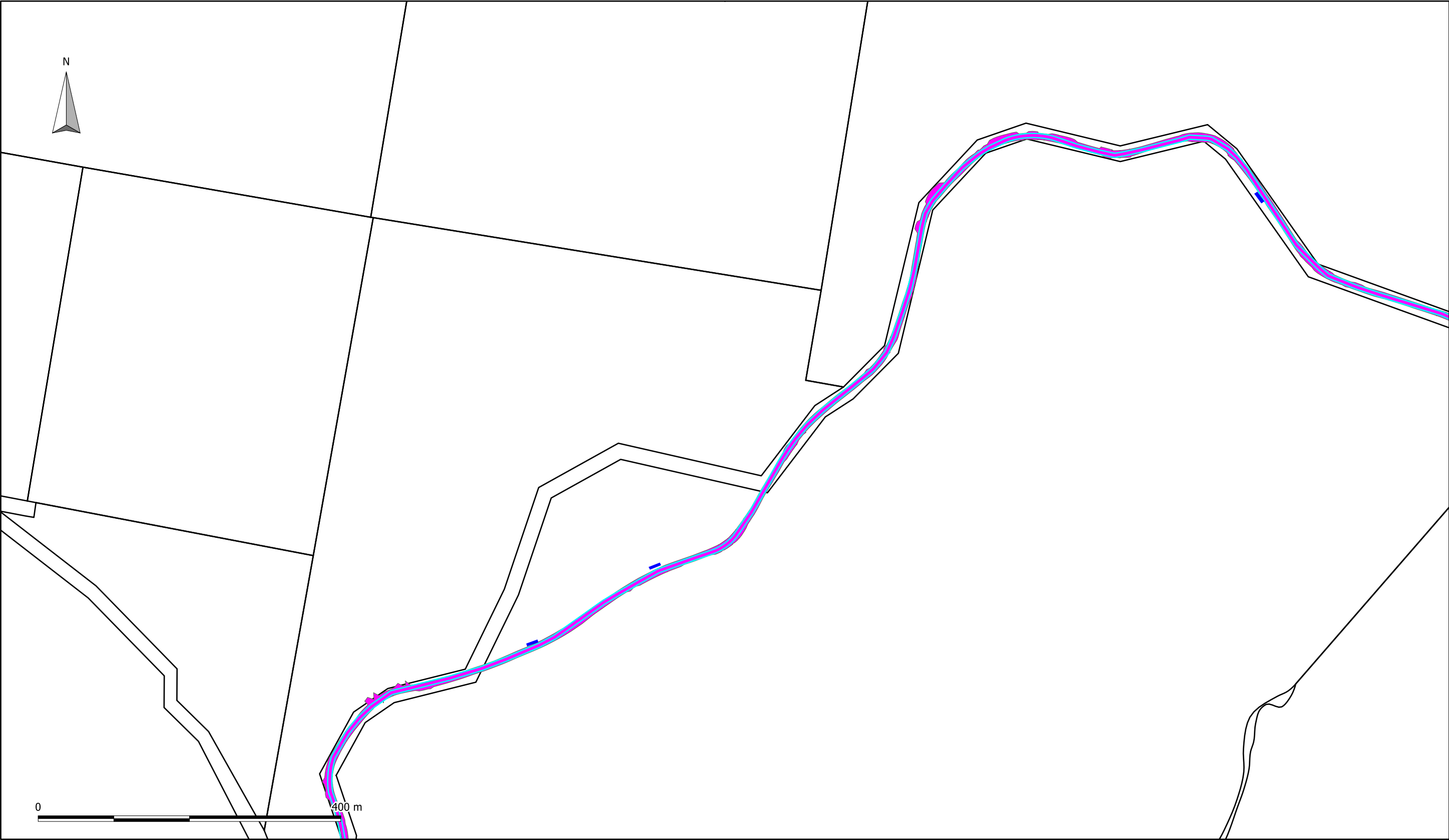


LEGEND

- Passing Bay Option
- Revised Design
- Existing Roadway
- Cadastral Boundaries

*Passing bay locations are consistent with those approved within the Preferred Project Report (CWP 2013). Final passing bay locations are to be determined within the approval under section 138 of the Roads Act in consultation with MWRC. The final passing bay locations are to be constructed within the approved vegetation clearing limits for APR.


COMPANY			<div>CRWF NOMINEES PTY LTD</div> <div></div>						
TITLE									
AARONS PASS ROAD REVISED DESIGN									
DATE	07 FEB 2019	SCALE	1:5000	DWG NO	CRU309	REV	A	VER	1
DRAWN BY	B KRONENBERG	CHECKED BY	M BRANSON	SHEET	4 OF 11	JOB NO	080401	SIZE	A3

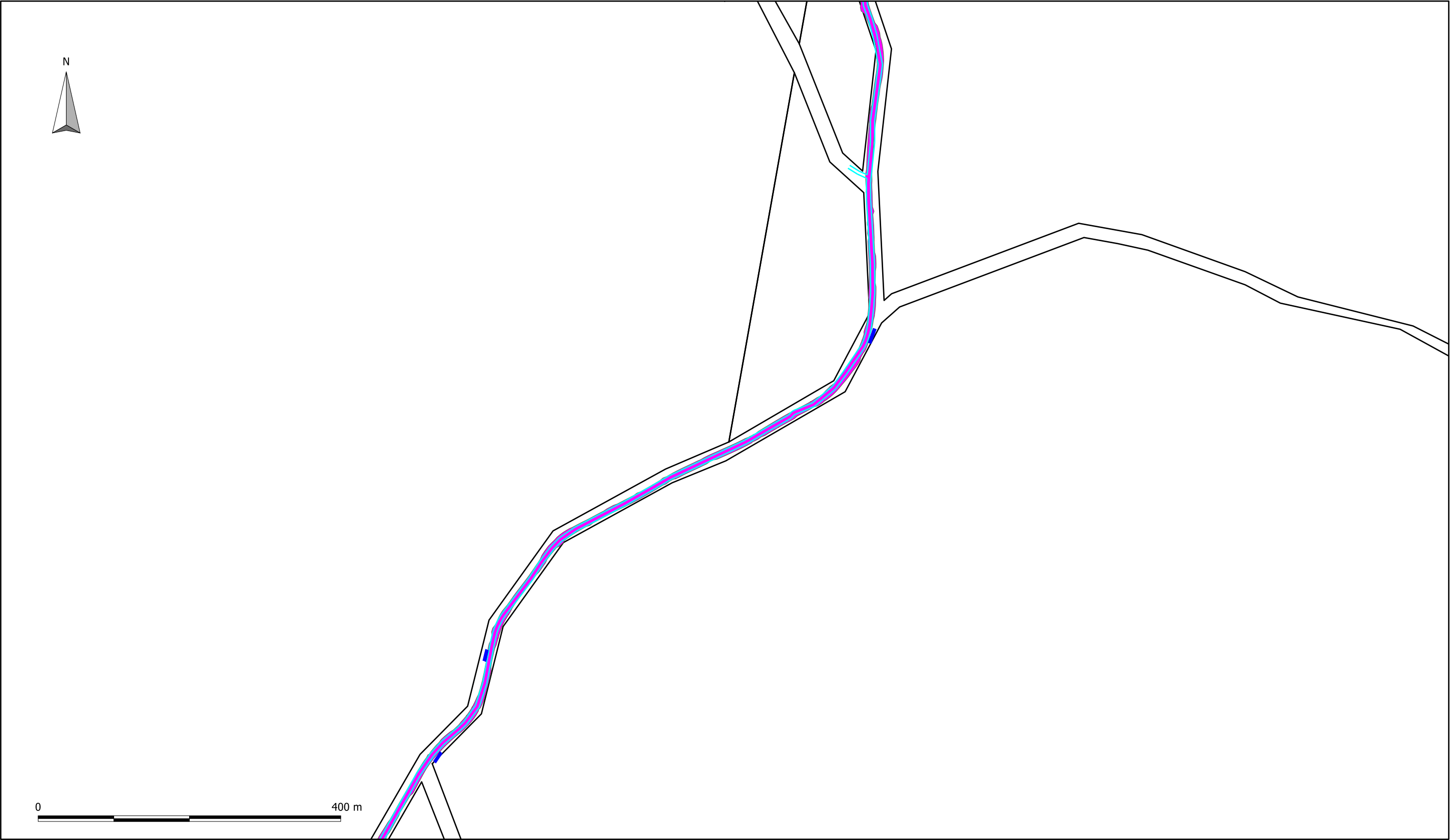


LEGEND





- Passing Bay Option
- Revised Design
- Existing Roadway
- Cadastral Boundaries

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COMPANY					
CRWF NOMINEES PTY LTD					
TITLE					
AARONS PASS ROAD REVISED DESIGN					
DATE		SCALE		DWG NO	
07 FEB 2019		1:5000		CRU309	
DRAWN BY		CHECKED BY		SHEET	
B KRONENBERG		M BRANSON		5 OF 11	
				REV	VER
				A	1
				JOB NO	SIZE
				080401	A3

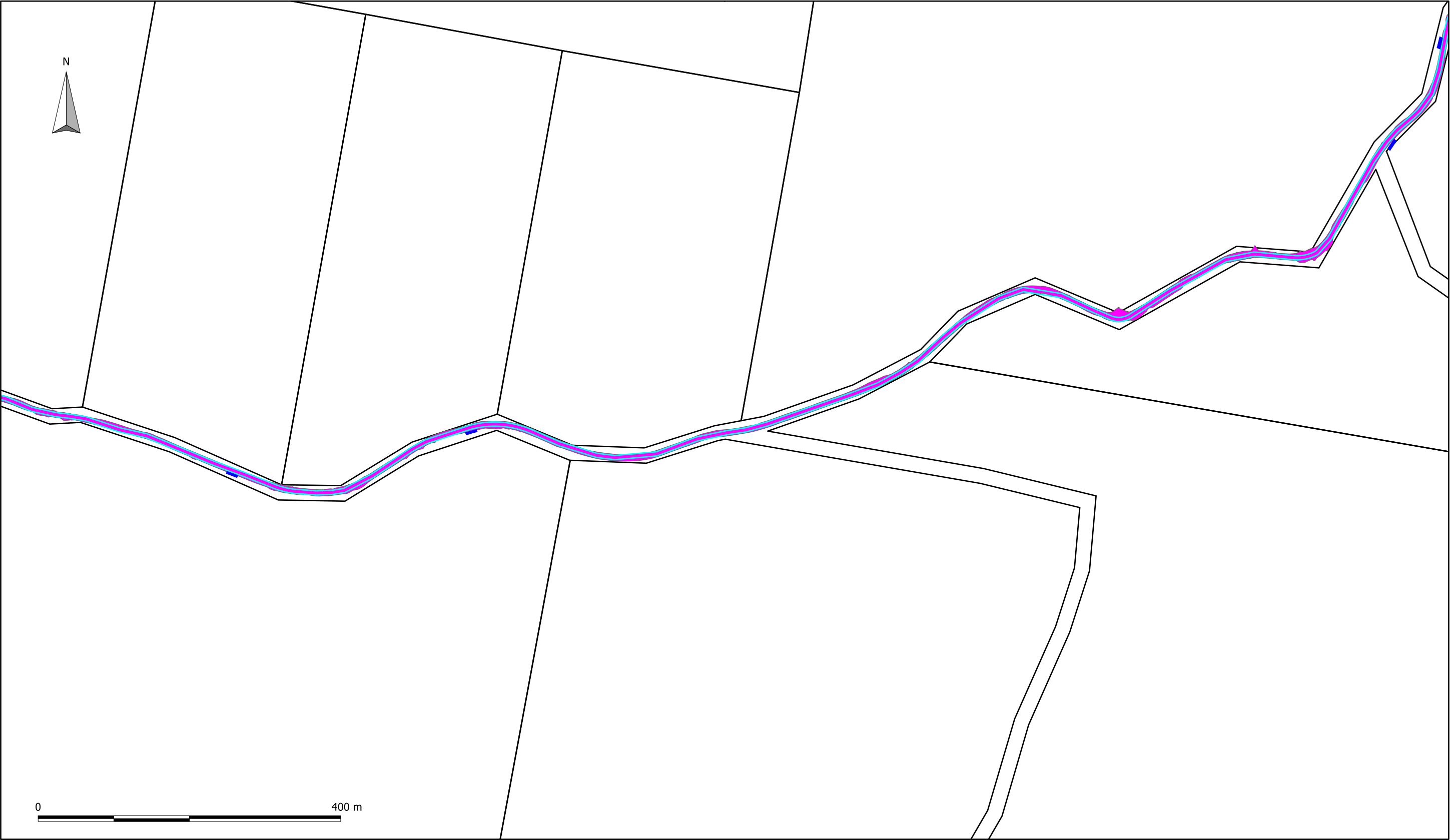


LEGEND

-  Passing Bay Option
-  Revised Design
-  Existing Roadway
-  Cadastral Boundaries

*Passing bay locations are consistent with those approved within the Preferred Project Report (CWP 2013). Final passing bay locations are to be determined within the approval under section 138 of the Roads Act in consultation with MWRC. The final passing bay locations are to be constructed within the approved vegetation clearing limits for APR.


COMPANY				
CRWF NOMINEES PTY LTD				
TITLE				
AARONS PASS ROAD REVISED DESIGN				
DATE	SCALE	DWG NO	REV	VER
07 FEB 2019	1:5000	CRU309	A	1
DRAWN BY	CHECKED BY	SHEET	JOB NO	SIZE
B KRONENBERG	M BRANSON	6 OF 11	080401	A3

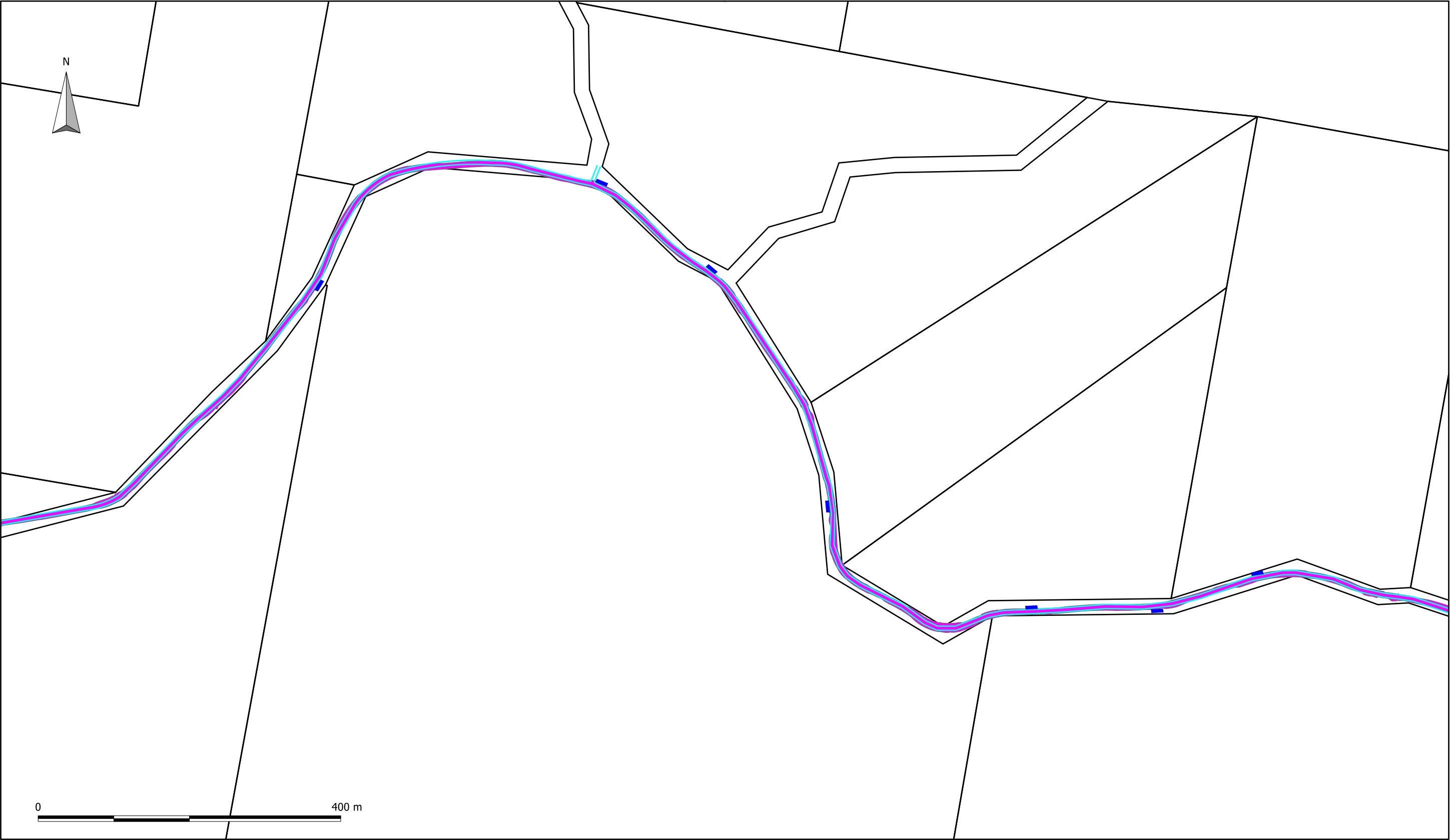


LEGEND





- Passing Bay Option
- Revised Design
- Existing Roadway
- Cadastral Boundaries

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COMPANY			CRWF NOMINEES PTY LTD						
TITLE									
AARONS PASS ROAD REVISED DESIGN									
DATE	07 FEB 2019	SCALE	1:5000	DWG NO	CRU309	REV	A	VER	1
DRAWN BY	B KRONENBERG	CHECKED BY	M BRANSON	SHEET	7 OF 11	JOB NO	080401	SIZE	A3



LEGEND

-  Passing Bay Option
-  Revised Design
-  Existing Roadway
-  Cadastral Boundaries

*Passing bay locations are consistent with those approved within the Preferred Project Report (CWP 2013). Final passing bay locations are to be determined within the approval under section 138 of the Roads Act in consultation with MWRC. The final passing bay locations are to be constructed within the approved vegetation clearing limits for APR.


COMPANY					
CRWF NOMINEES PTY LTD					
TITLE					
AARONS PASS ROAD REVISED DESIGN					
DATE	07 FEB 2019	SCALE	1:5000	DWG NO	CRU309
DRAWN BY	B KRONENBERG	CHECKED BY	M BRANSON	SHEET	8 OF 11
				REV	A
				VER	1
				JOB NO	080401
				SIZE	A3



LEGEND

- Passing Bay Option
- Revised Design
- Existing Roadway
- Cadastral Boundaries

*Passing bay locations are consistent with those approved within the Preferred Project Report (CWP 2013). Final passing bay locations are to be determined within the approval under section 138 of the Roads Act in consultation with MWRC. The final passing bay locations are to be constructed within the approved vegetation clearing limits for APR.


COMPANY				
CRWF NOMINEES PTY LTD				
TITLE				
AARONS PASS ROAD REVISED DESIGN				
DATE	SCALE	DWG NO	REV	VER
07 FEB 2019	1:5000	CRU309	A	1
DRAWN BY	CHECKED BY	SHEET	JOB NO	SIZE
B KRONENBERG	M BRANSON	9 OF 11	080401	A3

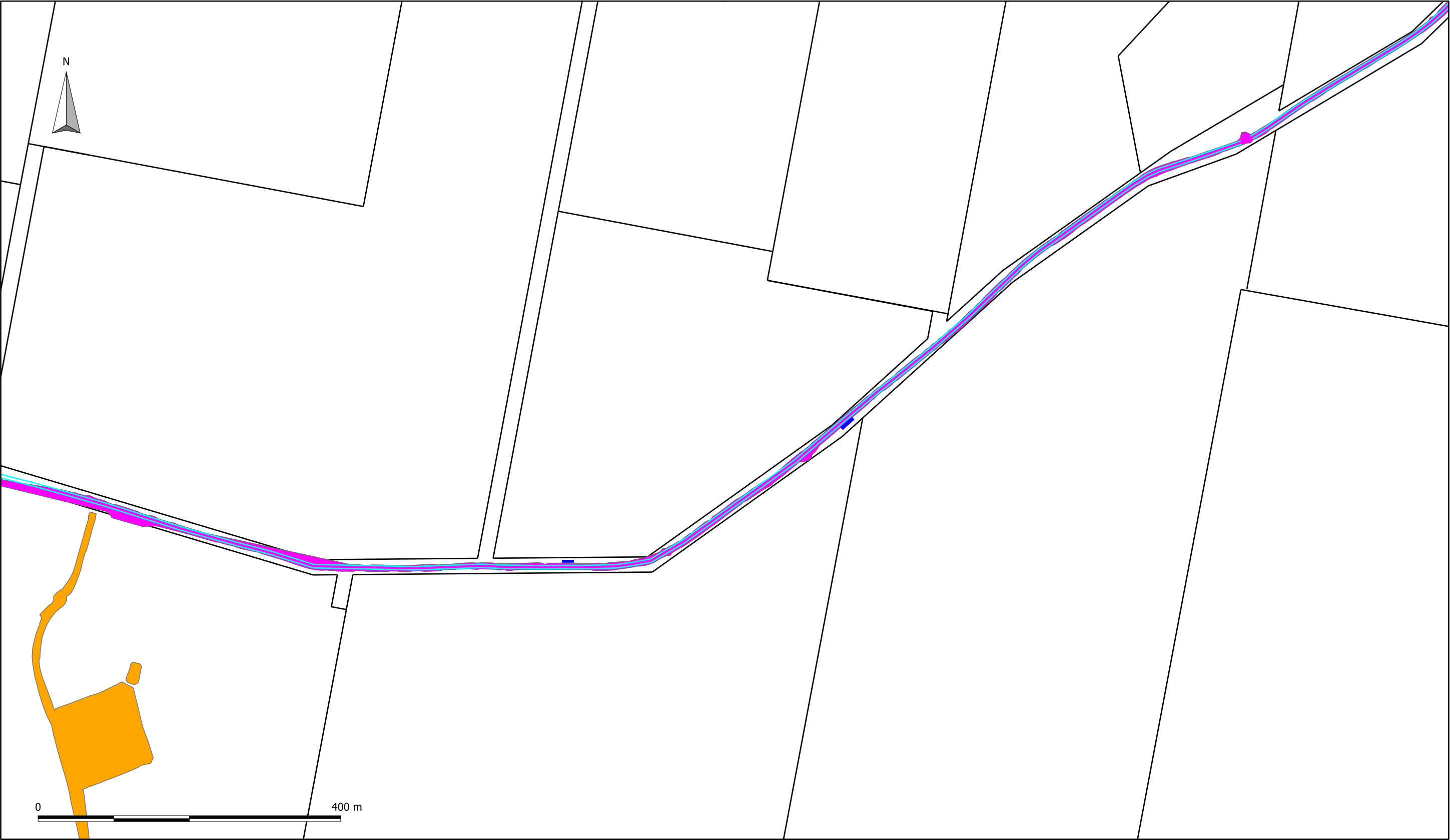


LEGEND






- Passing Bay Option
- Revised Design
- Existing Roadway
- Cadastral Boundaries

*Passing bay locations are consistent with those approved within the Preferred Project Report (CWP 2013). Final passing bay locations are to be determined within the approval under section 138 of the Roads Act in consultation with MWRC. The final passing bay locations are to be constructed within the approved vegetation clearing limits for APR.


COMPANY			<div></div>	
CRWF NOMINEES PTY LTD				
TITLE				
AARONS PASS ROAD REVISED DESIGN				
DATE	SCALE	DWG NO	REV	VER
07 FEB 2019	1:5000	CRU309	A	1
DRAWN BY	CHECKED BY	SHEET	JOB NO	SIZE
B KRONENBERG	M BRANSON	10 OF 11	080401	A3



LEGEND

-  Passing Bay Option
-  Revised Design
-  Existing Roadway
-  Cadastral Boundaries
-  Wind Farm Design

*Passing bay locations are consistent with those approved within the Preferred Project Report (CWP 2013). Final passing bay locations are to be determined within the approval under section 138 of the Roads Act in consultation with MWRC. The final passing bay locations are to be constructed within the approved vegetation clearing limits for APR.

COMPANY				CRWF NOMINEES PTY LTD			
TITLE							
AARONS PASS ROAD REVISED DESIGN							
DATE		SCALE		DWG NO		REV	VER
07 FEB 2019		1:5000		CRU309		A	1
DRAWN BY		CHECKED BY		SHEET		JOB NO	SIZE
B KRONENBERG		M BRANSON		11 OF 11		080401	A3

APPENDIX D

EXPECTED VEHICLE MOVEMENTS

		Early Works Investigation										BOP Infrastructure Construction																WTG Erection & Commision																			
			LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV													
Mudgee to Aaron's Pass Road via Castlereagh Hway RT In LT Out (From North)	Start	Finish	Sep-17		Oct-17		Nov-17		Dec-17		Jan-18		Feb-18		Mar-18		Apr-18		May-18		Jun-18		Jul-18		Aug-18		Sep-18		Oct-18		Nov-18		Dec-18														
Zenviron	1/09/2017	30/11/2018	4		4		4		6		12		12		12		16		16		16		16		12		10		8		8		6														
Project Management - 80% From north, 20% South											2		2		2		2		2		2		2		2		2		2		1		1														
General Deliveries - 50/50											3	1																			3		1														
Mob/Demob - 50/50																																															
Early Works	1/09/2017	9/09/2017																																													
Miscellaneous (Survey, Geotech, Testing, etc....) 50/50			6	2	6	2	4		4																																						
Civil Works - Earthworks, Tracks, Harstands	8/01/2018	31/07/2018																																													
Mob/Demob - 60n/40s											1														1																						
Light Vehicles - 60n/40s								4		12		16		16		16		16		16		16		6		4		3		3		3															
Semi-Water Carts (3 x 4 28,000l loads/day) - from north								4		12		12		12		12		12		12		12		12		6		3		3		3															
Truck & Dogs (12 x 4 loads/day) - 20n/80s											56		56		56		56		56		56		56		8		4																				
Civil Works - WTG Foundations	28/03/2018	13/08/2018																																													
Mob/Demob - north															1												1																				
Light Vehicles allowed for Tower Base Ring Pilots - from north													19		19		16		16		16		16		16		6																				
Heavy Vehicles allowed for Tower Base Ring delivery from - north													3		3		1		1		1		1		1		1																				
Civil Works - Batch Plant	28/03/2018	13/08/2018																																													
Mob/Demob - north												1																1																			
Light Vehicles - 60n/40s													5		5		5		5		5		5		5		5																				
Material Delivery (Based on 1,100t/wtg/every 2 days) 32t to a Truck & Dog - south														17		17		17		17		17		17		17																					
Semi-Water Cart - from north														1		1		1		1		1		1		1																					
Collector Network	22/05/2018	4/09/2018																																													
Mob/Demob - north																		1																													
Cable Delivery - north																2	2	2	2																												
Light Vehicles - 60n/40s																		6		6		6		6		6		6		2		2															
Sand Deliveries Based on 600m per day - south																		4		4		4		4		4		4																			
Internal 33kV	22/05/2018	4/09/2018																																													
Mob/Demob - 80n/20s																			1																												
Deliveries - south																		4		4		4		4		4																					
Light Vehicles - 40n/60s																	8		8		8		8		8																						
WF Substation	22/05/2018	4/09/2018																																													
Mob/Demob - south													1																				1														
Deliveries - south													1		1		1		1		1		1		1																						
Light Vehicles - 40n/60s												6		8		8		8		8		8		6		2		2		2		2															
WTG Erection	5/06/2018	1/11/2018																																													
Mob/Demob allowed for 60 semis to deliver the crane package - south																					2										2																
WTG Component Delivery [OS/OD] - north																					5		5		5		5																				
Pilots and Escorts - south																					12		12		12		12																				
Light Vehicles - 60n/40s																					20		20		20		20		20		10																
Total Anticipated Vehicle Movements/day (Aaron Pass Rd)			10	2	10	2	8	0	14	4	27	72	34	73	60	93	66	94	77	102	107	105	107	103	91	49	65	21	39	5	25	6	16	6													

Early Works Investigation												Substation Construction																			
Sydney to Bombandi Road via Castlereagh Hway LT In RT Out (From South)																															
132kV Transmission Line	4/01/2018	6/07/2018																													
Mob/Demob - 60n/40s												1										1									
Prelim Survey, Testing etc. - 50/50																															
Access - 50/50	4/01/2018	26/02/2018									2	5	2	5																	
Foundations - 50/50	26/02/2018	6/04/2018											2	5	5	5	5	5													
Erection - 50/50	6/04/2018	2/05/2018														4	1	4	1												
Stringing - 80n/20s	2/05/2018	23/06/2018																7	5	7	5										
Mudgee to Bombandi Road via Castlereagh Hway RT In LT Out (From North)																															
132kV Transmission Line	4/01/2018	6/07/2018																													
Mob/Demob - 60n/40s																															
Prelim Survey, Testing etc. - 50/50			4	2	4	2	4		4																						
Access - 50/50	4/01/2018	26/02/2018									2	5	2	5																	
Foundations - 50/50	26/02/2018	6/04/2018											2	5	5	5	5	5													
Erection - 50/50	6/04/2018	2/05/2018														4	0	4	0												
Stringing - 80n/20s	2/05/2018	23/06/2018																7	5	7	5										
Total Anticipated Vehicle Movements/day (Bombandi Rd)			4	2	4	2	4	0	4	0	4	11	8	20	10	10	18	11	22	11	14	10	0	1	0	0	0	0	0	0	0

Average number of vehicles per working day.

Off-Site Quarry

Month	Aarons Pass Rd		Bombandi Rd	
	LV	HV	LV	HV
Sep-17	10	2	4	2
Oct-17	10	2	4	2
Nov-17	8	0	4	0
Dec-17	14	4	4	0
Jan-18	27	72	4	11
Feb-18	34	73	8	20
Mar-18	60	93	10	10
Apr-18	66	94	18	11
May-18	77	102	22	11
Jun-18	107	105	14	10
Jul-18	107	103	0	1
Aug-18	91	49	0	0
Sep-18	65	21	0	0
Oct-18	39	5	0	0
Nov-18	25	6	0	0
Dec-18	16	6	0	0

On-Site Quarry

Month	Aarons Pass Rd		Bombandi Rd	
	LV	HV	LV	HV
Sep-17	10	2	4	2
Oct-17	10	2	4	2
Nov-17	8	0	4	0
Dec-17	14	4	4	0
Jan-18	27	16	4	11
Feb-18	34	17	8	20
Mar-18	60	37	10	10
Apr-18	66	38	18	11
May-18	77	46	22	11
Jun-18	107	49	14	10
Jul-18	107	47	0	1
Aug-18	91	49	0	0
Sep-18	65	21	0	0
Oct-18	39	5	0	0
Nov-18	25	6	0	0
Dec-18	16	6	0	0