

Appendix Q

Traffic and Transport Assessment Addendum



McPhillamys Gold Project

Traffic and Transport Assessment Addendum

Prepared for
LFB Resources NL

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Commonly Used Acronyms

Abbreviation	Description
AADT	Average Annual Daily Traffic
AUL(s)	Auxiliary Left Turn Lane (short)
AUR	Auxiliary Right Turn Lane
BAL	Basic Left Turn Lane
BAR	Basic Right Turn Lane
CHR	Channelised Right Turn Lane
CHR(s)	Channelised Right Turn Lane (short)
DPIE	Department of Planning, Industry and Environment
EARs	Environmental Assessment Requirements
EIS	Environmental Impact Statement
HV	Heavy Vehicle
LV	Light Vehicle
RSA	Road Safety Audit
SISD	Safe Intersection Site Distance
TfNSW	Transport for NSW (formally Roads and Maritime Services)
WAD	Works Authorisation Deed

Executive Summary

This Addendum report has been prepared to assess the potential traffic and transport impacts associated with a revised site access from the Mid Western Highway for the McPhillamys Gold Project.

There has been no change to the proposed project related traffic types and volumes from those presented in the EIA TTA. There have also been no changes to the indicative shift times presented in the EIS and therefore no change is expected in impacts on the local and regional road network to those described in the EIS TTA.

A new concept design drawing for the revised site access has been developed to address regulator and the community submissions relating to the original site access as outlined in the EIS TTA. The revised site access was developed in consultation with TfNSW and Blayney Shire Council. The concept design exceeds minimum requirements and includes a number of mitigation measures in order to provide a safe traffic environment for both development and existing Highway traffic.

This Addendum report also provides a supplementary assessment of the use of Dungeon Road as a preliminary construction site access prior to the construction of the revised site access. This supplementary assessment demonstrates that, subject to the implementation of a number of additional mitigation measures, the existing Mid-Western Highway/Dungeon Rd intersection can safely accommodate the peak development traffic projected up until construction of the revised site access is completed by the end of month 6.

These additional mitigation measures have been developed during a site meeting and direct consultation with TfNSW and Blayney Shire Council.

1 Introduction

1.1 Background

LFB Resources NL is seeking State significant development consent under Division 4.7 of Part 4 of the NSW Environmental Planning and Assessment Act 1979 (EP&A Act) to develop and operate a greenfield open cut gold mine, associated mine infrastructure and a water supply pipeline in Central West NSW. The project application area is illustrated at a regional scale in **Figure 1**. LFB Resources NL is a 100% owned subsidiary of Regis Resources Limited (herein referred to as Regis).

As shown in **Figure 1**, the McPhillamys Gold Project (the project) is comprised of two key components; the mine site where the ore will be extracted, processed and gold produced for distribution to the market (the mine development), and an associated water pipeline which will enable the supply of water from approximately 90 km away near Lithgow to the mine site (the pipeline development). The mine development is around 8 km north-east of Blayney, within the Blayney and Cabonne local government areas (LGAs).

Up to 8.5 Million tonnes per annum (Mtpa) of ore will be extracted from the McPhillamys gold deposit over a total project life of 15 years. The mine development will include a conventional carbon-in-leach processing facility, waste rock emplacement, an engineered tailings storage facility (TSF) and associated mine infrastructure including workshops, administration buildings, roads, water management infrastructure, laydown and hardstand areas, and soil stockpiles.

In accordance with the requirements of the EP&A Act, the NSW Environmental Planning & Assessment Regulation 2000 (EP&A Regulation) and the Secretary's Environmental Assessment Requirements (SEARs) for the project, an Environmental Impact Statement (EIS) was prepared to assess the potential environmental, economic and social impacts of the project. The development application and accompanying EIS was submitted to the NSW Department of Planning, Industry and Environment (DPIE) and subsequently publicly exhibited. During this exhibition period Regis received submissions from government agencies, the community, businesses and other organisations regarding varying aspects of the project.

In response to issues raised in submissions received, as well as a result of further detailed mine planning and design, Regis has made a number of refinements to the project. Accordingly, an Amendment Report has been prepared by EMM Consulting Pty Ltd (EMM 2020a) to outline the changes to the project that have been made since the public exhibition of the EIS and to assess the potential impacts of the amended project, compared to those that were presented in the EIS. This report forms part of the Amendment Report and presents an assessment of the traffic and transport impacts of the amended project.

Further, this Addendum report assesses the potential traffic and transport impacts associated with the mine development component of the McPhillamys Gold Project. References to 'the project' throughout this report are therefore referring to the mine development only. The potential traffic and transport impacts associated with the pipeline development component are addressed in the Amendment Report (EMM 2020a).

1.2 Project Overview

A summary of the key amendments to the project since the exhibition of the EIS are summarised below and described in detail in Chapter 2 of the Amendment Report (EMM 2020a):

- **Site access** – a new location for the site access intersection off the Mid Western Highway is proposed, approximately 1 km east of the original location assessed in the EIS, in response to feedback from Transport for NSW (TfNSW, former Roads and Maritime Services) and the community. A new alignment is subsequently proposed for the site access road to the mine administration and infrastructure area.

- **Mine and waste rock emplacement schedule** – revision of the mine schedule and the subsequent construction sequence of the waste rock emplacement has been undertaken, in particular consideration of predicted noise levels in Kings Plains. This achieved a reduction in predicted noise levels at nearby residences while extending the construction timeframe for the southern amenity bund.
- **Pit amenity bund** – the size of the pit amenity bund has been reduced as a result of optimisation of the open cut pit design and the improved location of exit ramps for haul trucks.
- **Tailings Storage Facility (TSF)** – amendments to the design include changes to the embankment design and construction timing, the TSF footprint, and the TSF post closure landform.
- **Water management system** – the secondary water management facility (WMF) has been removed from the water management system resulting in an avoidance of impacts to a potential item of historic heritage (MGP 23 - Hallwood Farm Complex (Hallwood)). The size of the WMFs has also been revised to achieve a reduced likelihood of discharge from the storages within the operational water management system as part of a revised nil discharge design.
- **Mine administration and infrastructure area** – the layout of this area has been revised and optimised.
- **Mine development project area** – a very small change has been made to the mine development project area along the eastern boundary (an additional 1 ha, or 0.04% change), to accommodate the required clean water management system. The change takes the project area from 2,513 hectares (ha) to 2,514 ha.

No amendments have been made to other key aspects of the project as presented in the EIS for which approval is sought, such as the proposed mining method, operating hours, annual ore extraction rate of up to 8.5 Mtpa, approximate annual ore processing rate of up to 7 Mtpa, employee numbers, and rehabilitation methods and outcomes.

The amended mine development project layout, compared to that assessed in the EIS, is shown in **Figure 2**.

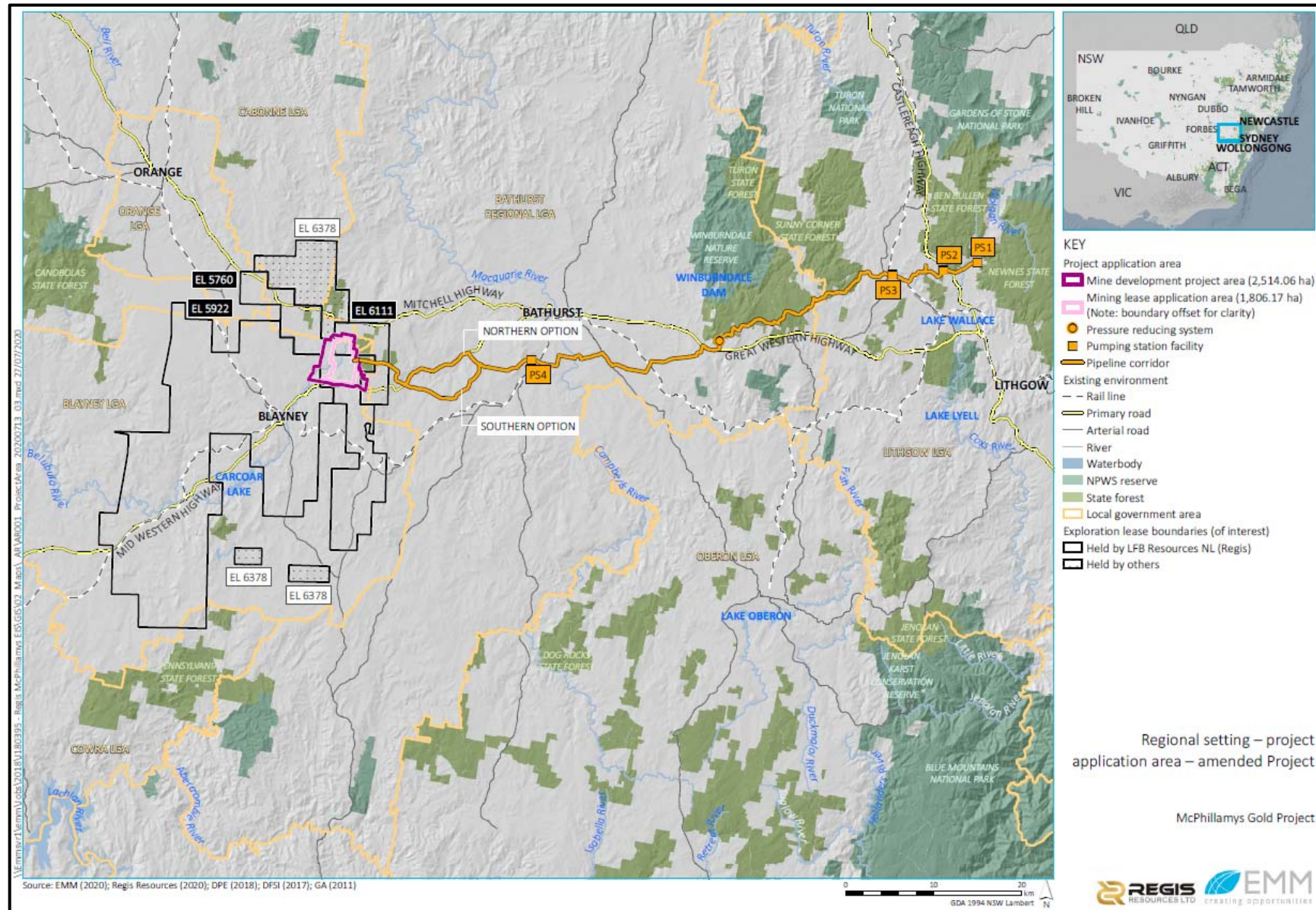


Figure 1 – Locality Plan

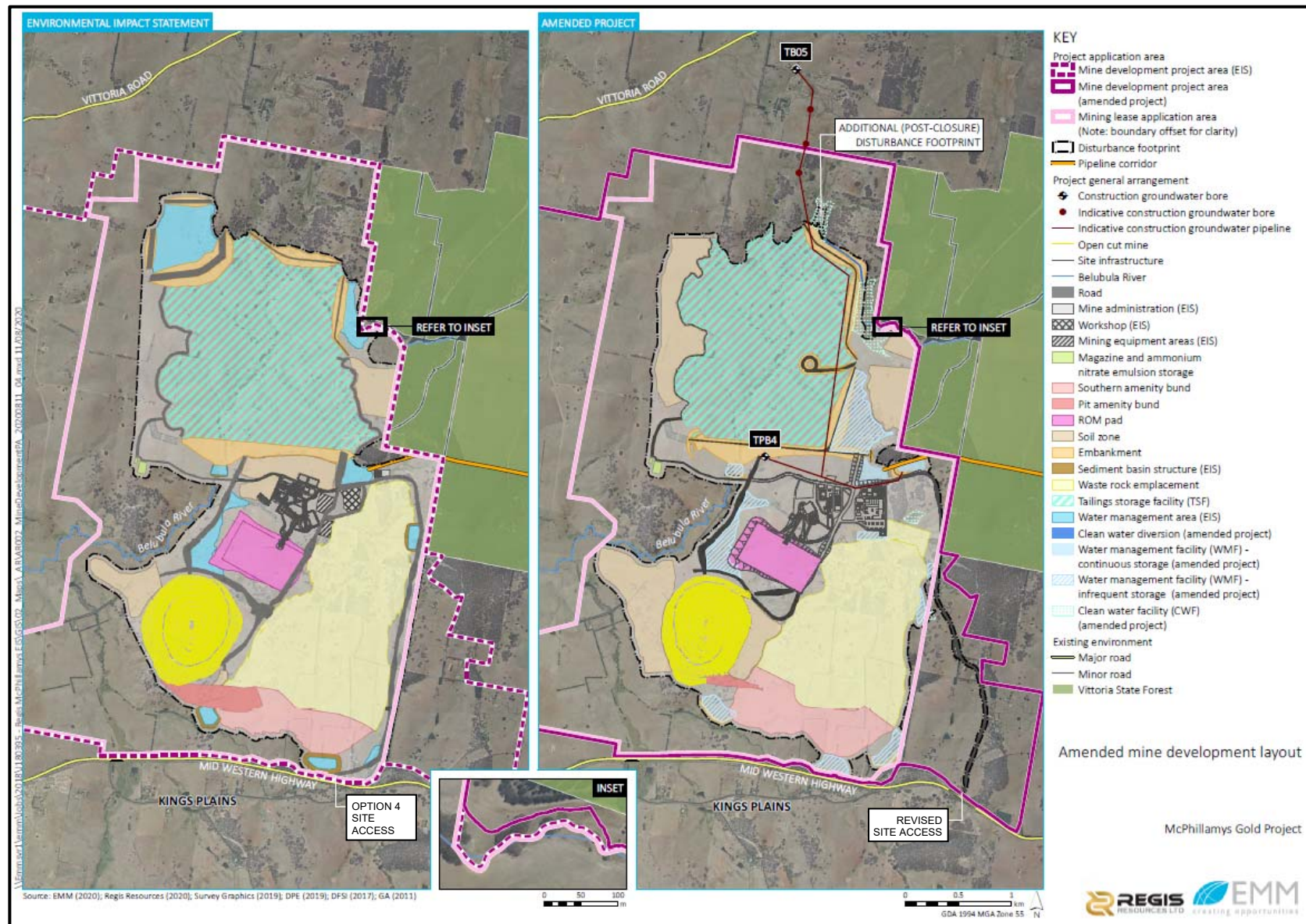


Figure 2 – Original and Amended Mine Development Layouts

1.3 Purpose of this report

This Addendum report has been prepared to assess the potential traffic and transport impacts of the amended project. The assessment considers and outlines the differences in impacts compared to the original project as presented in the EIS. In this way, it serves as an update to the McPhillamys Gold Project Traffic and Transport Assessment (TTA) (Appendix Q of the McPhillamys Gold Project EIS) (herein referred to as the EIA TTA).

The assessment namely assesses the traffic and transport impacts associated with the revised site access. It also provides a supplementary assessment of the use of Dungeon Road as a preliminary site access prior to the construction of the revised site access within the first six months of the project.

1.4 Submissions on the EIS

A number of issues relevant to traffic and transport were raised in submissions received on the EIS. These issues have also been considered in this revised assessment. Detailed responses to all the submissions received are provided in the Submissions Report prepared for the project (EMM 2020b), which has been prepared in conjunction with the Amendment Report (EMM 2020a). A summary of the key issues relevant to this assessment are provided in **Table 1**, together with where each matter has been addressed within this report.

Table 1 - Key comments received in submissions relating to traffic and transport, and how they have been addressed

Issue	Where addressed
Construction access - TfNSW raised concerns regarding the use of Dungeon Road during construction.	Sections 3.1, 4.2, & 4.3.
TfNSW specified requirements for the new site access intersection design.	Section 3.2.

2 Project Related Traffic

There has been no change to the proposed project related traffic types and volumes. There have also been no changes to the indicative shift times presented in the EIS TTA and therefore no change is expected in impacts on the local and regional road network to those described in the EIS TTA. Nevertheless, a summary of development traffic as described in the EIS TTA is provided below.

2.1 Construction Traffic

Construction phase of the Project is defined from the start of construction works and mine development activities until the completion of the processing plant mid Year 2 (Months 12 to 18). Quantities of expected development traffic for the entire Project were presented in Appendix 3 of the EIS TTA. A summary of months relevant to this TTA Addendum are presented in **Table 2**. Peak development traffic occurs during months 10 and 11. It is noted that total movements per day from the EIS TTA Appendix 3 and **Table 2** below are one way movements i.e. both the inward and outward movements are included in each vehicle movement quantity. Inwards only movements are therefore calculated by halving the figures reported in the table.

Table 2 - Daily vehicle movements

	Month 1	Month 2	Month 3	Month 4	Month 6	Months 10 & 11
Employee LVs and Minibuses	209	257	263	260	300	402
Light Vehicle Visitors/Deliveries	10	25	30	20	20	20
Heavy Vehicle Deliveries	5	20	20	10	10	10
Total Daily Vehicle Movements	224	302	313	290	330	432

The first six months of construction of the mine development will be carried out during standard construction hours as per the Interim Construction Noise Guideline (ICNG) (DECC 2009):

- Monday to Friday - 7:00am to 6:00pm
- Saturday – 8:00am to 1:00pm
- No work on Sundays or public holidays.

After six months, construction and mine development activities will be carried out 24 hours per day, 7 days per week in 12 hour shifts changing over at around 7am and 6pm for the remainder of the construction phase.

Approximately 80% of the construction workforce traffic will originate from the west (Blayney) and approximately 20% will originate from the east (Bathurst). 30% of Construction Deliveries are expected from the west (Blayney and Orange) and the remaining 70% from the east (Bathurst).

2.2 Operational Traffic

While some operational staff will commence working onsite from month 1, full scale mining and processing operations will commence in month 7 and month 16 respectively. Mining operations will initially be undertaken over a 12 hour daytime shift (between 6:30am and 6:30pm), progressing to 24 hours per day. Processing operations will be 24 hours per day with two 12 hour shifts changing over at 6:30am and 6:30pm respectively).

The anticipated breakdown of direction of origin for operational traffic is identical to those stated above for construction traffic.

3 Revised site access to the Mine Project Area

As outlined in the EIS TTA, the existing access to the mine project area is via Dungeon Road. As the mine project area fronts the Mid Western Highway, it is desirable for the mine to have its own dedicated access directly from the Highway. This will eliminate the need for Project related traffic to detour to the mine project area via Council local roads and will limit the numbers of additional traffic on these roads.

The location of the site access off the Mid Western Highway has been amended to address issues raised in submissions from the local community, Blayney Shire Council and TfNSW. The EIS presented and assessed a proposed new access intersection to be constructed approximately 190 m west of the Walkom Road (east) intersection. The new location for the intersection of the access road with the Mid Western Highway is approximately 1 km east of the location presented in the EIS, as shown in **Figure 2**. Subsequently, a new alignment is required for the site access road to connect to the mine administration and infrastructure area, as also shown in **Figure 2**. Construction of the intersection and site access road are anticipated to be completed within the first six months of the project.

The design principles of the site access intersection have not changed from that presented in the EIS TTA. The revised site access concept design is attached as **Appendix 1** and includes a short Auxiliary Left Turn Lane (AUL(s)) and Channelised Right Turn Lane (CHR) on the Mid Western Highway and has been designed with dimensional capacity to cater for the turning movements of a 25m B-Double. The proposed intersection has been designed to cater for the worst-case scenario of peak background traffic and project-related traffic.

An existing property access is located 50m to the west of the proposed new access (refer **Plate 3**). Rather than use this existing access the proposed new intersection is located further east in order to provide separation from a curve on the Highway to the west.

Safe Intersection Sight Distance (SISD) is greater than 350m to the east and exceeds the minimum 262m for a 100km/hr speed zone to the west. Bitumen seal and line marking on the Mid Western Highway are considered to be in good condition at the proposed location (refer **Plate 1** to **Plate 2**).

The intersection configuration shortens an eastbound overtaking lane located immediately to the east but allows development traffic to commence accelerating up to speed with the provision of an eastbound acceleration lane.

It has been identified that an existing westbound acceleration lane to the east of the site does not comply with minimum length requirements. As this overtaking lane would be further shortened by the introduction of the CHR it has been agreed with TfNSW that this overtaking lane be removed.



Plate 1 - Mid Western Highway – view east from the revised site access



Plate 2 – Mid Western Highway – view west from the revised site access



Plate 3 – View North from the Mid Western Highway in the vicinity of the revised site access

An additional property access is located opposite the intersection. To improve safety of turning movements at this property access the following features have been incorporated in the revised site access concept design:

- The CHR painted median west of the revised site access has been lengthened to cater for a 19m articulated vehicle to stop and turn right safely into the property clear of the eastbound travel lane; and
- A school bus stops to service this property both in the morning and afternoon. Therefore, a 3m shoulder widening is provided to enable the school bus to pull off and stop clear of westbound traffic. Eastbound buses will be able to use the AUL to decelerate and pull off onto the old Highway alignment on the northern side of the Highway. Refer to **Section 5.1.4** for further discussion regarding school buses.

Signage for the intersection will consist of a give way sign and sight board opposite the intersection and truck advanced warning signage with fog activated wig wags 300m in advance of the intersection in both directions along the Mid Western Highway.

Discussions with TfNSW regarding the final layout of the revised site access concept design are ongoing and it is possible that further minor amendments to the intersection design and location will be required prior to proceeding to detailed design of the intersection. This may also require refinements to the internal road layout.

Once the revised site access intersection and internal road network is complete all remaining existing access points including Dungeon Road will be closed to all vehicles, except in the case of emergencies.

3.1 Internal Road Network

Due to the amended location of the proposed site access intersection, a new alignment is proposed for the internal site access road to service the mine administration and infrastructure area. A comparison of the change to the internal road network is shown in **Figure 2**. Initially the first kilometre from the Mid Western Highway to a gate house will be sealed with bitumen while the remainder will be constructed as an all-weather unsealed road to enable access at all times.

4 Preliminary construction access - Dungeon Road

Once the project is approved it will take some months to construct and commission the new site access. Consistent with the EIS TTA, construction traffic will initially access the mine development project area via the existing Dungeon Road access. It is estimated that construction and commissioning of the new site intersection will take approximately four or up to six months to complete. Once the new site access is complete the Dungeon Road access could be closed in due course; however, access via locked gates would be maintained via Dungeon Road for emergency vehicles, environmental monitoring, mine inspections or in the event of an unplanned blockage of the new site access. Dungeon Road would become a no-through road during construction activities.

The configuration of the Mid Western Highway and Dungeon Road intersection consists of a Basic Left (BAL) turn lane and a Short Channelised Right (CHR(s)) turn lane. This configuration meets minimum turn lane requirements as described in **Section 5.1.1**. SIDRA analysis on the intersection has also been undertaken at the intersection resulting in a high level of service (refer to **Section 5.2.1**).

As described in **Section 2**, assuming construction of the amended site access is delayed to month six, the maximum development vehicle movements expected to use Dungeon Road will be 196 LV and 5 HV inwards movements per day. The direction of origin east/west split for Dungeon Road will be the same as for construction and operational movements to/from the amended site access.

Consultation and an onsite meeting with Transport for NSW (TfNSW) indicate that subject to the outcomes of a Road Safety Audit (RSA) and the implementation of suitable mitigation measures, the use of Dungeon Road until the new site access is complete will be considered.

It is anticipated that the revised site access will be completed by the end of month six at which time all project traffic will cease using Dungeon Road. As described in **Section 2**, peak development traffic movements do not occur until months 10 and 11. Therefore, Dungeon Road will not be subject to peak traffic volumes. In addition, the Proponent intends to seal Dungeon Road from the Mid Western Highway intersection, 550m north past two neighbouring dwellings in order to reduce potential dust impacts caused by project traffic.

As described in **Section 2**, the first six months of construction of the mine development will be carried out during standard construction hours as per the Interim Construction Noise Guideline (ICNG)(DECC 2009). Therefore, the vast majority of traffic movements will access the site during daylight hours.

An independent RSA was conducted of the existing Dungeon Road intersection during June 2020. Findings from the RSA report are discussed in **Section 5.2.2** and the report is attached as **Appendix 2**.

Once satisfied with the revised site access concept design, TfNSW will commence the Works Authorisation Deed (WAD) process as soon as possible, thereby minimising delays and enabling construction of the revised site access intersection to commence as soon as project approval is granted.

It is noted that the Blayney Shire Council supports the use of Dungeon Road as an access the mine project area until the preferred access is constructed subject to the following conditions:

- Undertake the closure of Dungeon Road from 550m North of the intersection with the Mid Western Highway to the boundary between the Local Government Areas of Blayney and Cabonne;
- Upgrade a minimum 550m of Dungeon Road from the intersection with the Mid Western Highway to the Mine Project Area boundary to Council's Rural Collector standard, in accordance with Council's Guidelines for Engineering Works (8m seal on 10m formation – Table 2.3.4.1 Standard Road Widths);
- Seal Dungeon Road an extended distance (potentially 1,000m) north of the Mid-Western Highway intersection to reduce dust impacts on the properties at the Southern end of Dungeon Road;

- Prioritise the construction of the new main site access to the Mine Project Area, at the preferred location on the Mid-Western Highway to minimise traffic noise and dust impacts on existing residents on Dungeon Road; and
- Proponent to Purchase the remaining portion of Dungeon Road (being from the Mine Project Area boundary at Ch.550m) to the Local Government Area boundary between Blayney and Cabonne.

Regis intends to comply with all of the above Blayney Shire Council conditions with the exception of sealing Dungeon Road to an extended distance past 550m. As there are no further dwellings north of chainage 550m and due to the fact that Dungeon road will become a dead end after four months and rarely used there is limited benefit to sealing an extended distance up to the mine project area. Rather than sealing Dungeon Road north of the dwellings a water cart can be used to control dust on this section of Dungeon Road as needed until such time that the road is closed.

5 Assessment and Recommendations

5.1 Assessment of revised site access

The following subsections review the anticipated impacts of the revised site access. Discussions relevant to the recommendations for impact mitigation or other controls are also included, where appropriate.

5.1.1 Warrants for Intersection Turn Treatments

As there is no change to the proposed development traffic, the turn treatment warrants remain unchanged from the EIS TTA. As a minimum the new access will require a Basic Left (BAL) turn lane and a Short Channelised Right (CHR(s)) turn lane on the Mid Western Highway.

Feedback and consultation with TfNSW regarding the revised site access concept design has resulted in adoption of a full CHR and an AUL(s) turn lane. This outcome exceeds the minimum requirements and will assist with safer turning movements at the intersection, particularly during inclement weather conditions.

5.1.2 SIDRA Analysis

At the request of TfNSW the intersection of the Mid Western Hwy and Dungeon Road was analysed using SIDRA (refer **Section 5.2.1**), an intersection performance simulation software package. As a check, SIDRA analysis of the revised site access intersection during overall Project peak traffic (months 10 & 11) was undertaken.

SIDRA simulates the performance of an intersection based upon the traffic volumes of each turning movement, approach speed limits and geometric properties of the intersection. The performance of the intersection is summarised by four performance indicators:

- Level of Service (LoS);
- Degree of Saturation (DoS);
- Queue length; and
- Average delay per vehicle.

LoS is a qualitative measure describing operational conditions within a traffic stream and considers service measures such as speed and travel time, freedom to manoeuvre, traffic interruptions, safety, comfort and convenience. There are six levels of service, designated A (best – free flow) to F (worst – breakdown in flow).

DoS is defined as the ratio of demand flow to capacity. As it approaches 1, extensive delays and queues would be expected. For a satisfactory situation, the DoS should be less than the nominated practical degree of saturation, usually 0.9.

Queue length is the number of vehicles waiting at the hold line and is usually quoted as the 95th percentile back of the queue, which is the value below which 95% of all observed queue lengths fall.

Delay is the difference between interrupted and uninterrupted travel times through the intersection and is measured in seconds per vehicle. The delays include queued vehicles decelerating and accelerating to and/or from the stop, as well as delays experienced by all vehicles negotiating the intersection. At sign controlled intersections the average delay for the worst movement is reported.

It is noted that all scenarios returned LoS A which is the most desirable outcome with traffic flowing freely and with minimal delays for turning traffic (refer Table 3). Detailed SIDRA outputs for the revised site access are provided in **Appendix 3**.

Table 3 – SIDRA Analysis Revised Site Access Results

Scenario	DoS	Delays (Sec)	LoS	Queue (m)
Revised site access - Months 10 & 11.	0.102	6.1	A	0.9

5.1.3 Crash History

A check of crash data on the NSW Government Centre for Road Safety Interactive Crashes website in the vicinity of the revised site access revealed no new crashes have been reported in the vicinity of the revised site access that were not already reported in the EIS TTA.

As reported in the EIS TTA there was one crash reported near the revised site access in 2015 (Crash ID 1062249). It was a rear end crash during daylight hours that resulted in moderate injuries. Refer to **Appendix 4** for further details of this crash from the website.

The low number of crashes reported at this location demonstrate that there are no repetitive or reoccurring accident patterns that require further investigation.

5.1.4 Bus Services

As stated in the EIS TTA, school buses operate along the Mid Western Highway during morning and afternoon school times (7:30am to 9:00am and 3:30pm to 4:45pm). The school buses stop to pick up and drop off passengers at informal locations along the Highway including the property access opposite the revised site access.

Regarding this property access, a westbound 3m sealed shoulder is shown on the revised site access concept design (**Appendix 1**) before and after the property access to allow the school bus to pull over clear of traffic. When travelling eastbound the school bus will be able to pull over safely on the northern side of the Highway by slowing down within the AUL and pulling over onto the old Mid Western Highway roadway well clear of traffic.

School pickup and drop off times do not coincide with mine shift/end times, therefore turning traffic at the intersection will be minimal. The design of the revised site access intersection will in fact improve safety outcomes for school buses at this location.

5.1.5 Pedestrian and Cyclist Activity

No pedestrians or cyclists were observed during inspections of the Mid Western Highway in the vicinity of the revised site access. Given the rural environment, pedestrian and cyclist activity is considered to be rare in the vicinity of the mine project area. There are currently no dedicated on-road cycleways or off-road shared paths (for cyclists and pedestrians) in the vicinity of the revised site access. There will be limited pedestrian activity associated with school bus pick up and drop off, however as stated above these times fall outside mine shift start/end times.

The concept design of the proposed revised site access maintains the existing 1m wide sealed shoulder on both sides of the Mid Western Highway and it is therefore considered that the Project will not adversely impact upon the passage of pedestrians and cyclists.

5.2 Supplementary assessment of preliminary construction access - Dungeon Rd

This section provides a supplementary assessment of Dungeon Rd in addition to the assessment contained in the EIS TTA in response to TfNSW submission on the EIS TTA and subsequent ongoing consultation with TfNSW and Blayney Council.

5.2.1 SIDRA Analysis

As noted above, at the request of TfNSW the intersection of the Mid Western Hwy and Dungeon Road was analysed using SIDRA,

It is anticipated that the revised site access will be completed in approximately four and up to six months at which time all project traffic will cease using Dungeon Road. Accordingly, modelling was undertaken for peak morning traffic during month four and month six between 5:30am to 6:30am when the majority of employees are arriving to site. The performance of the Mid Western Hwy and Dungeon Road intersection for the peak turning traffic scenarios is summarised in **Table 4**.

Detailed SIDRA outputs for the intersections are provided in **Appendix 3**.

Table 4 – SIDRA Analysis Results Summary

Scenario	DoS	Delays (Sec)	LoS	Queue (m)
Dungeon Rd Month four	0.083	4.4	A	0.5
Dungeon Rd Month six	0.098	5.0	A	0.8

5.2.2 Road Safety Audit of Dungeon Road

A Road Safety Audit (RSA) was conducted at the existing Dungeon Road and Mid Western Highway intersection. A copy of the RSA is provided as **Appendix 2**. The RSA resulted in two Corrective Action Requests (CARs).

5.2.2.1 CAR 001: CHR(s)

The auditors identified that the CHR(s) auxiliary right turn lane is particularly short. This does present some risks to vehicles negotiating the intersection however these risks can be mitigated by the following:

- As stated in the EIS TTA it is estimated that 80% of the construction workforce traffic will originate from the west (Blayney). Therefore, only a small percentage of traffic will be using the CHR(s) to turn right into Dungeon Road;

- The EIS TTA also outlines that 70% of HV deliveries are expected from the east (Bathurst). 70% of the maximum 20 HV daily delivery movements (10 inward movements) results in a very small number (less than one per hour) of potential long HVs waiting to turn right at the short CHR(s);
- Construction traffic peak hour falls well before peak hour traffic on the Mid Western Highway (8-9am). Therefore, peak development turning traffic and peak Highway through traffic do not coincide;
- SIDRA analysis of the intersection has been completed and predicts a high level of service (refer **Section 5.2.1**). Therefore, queue lengths of vehicles waiting to turn at the intersection will be minimal thereby reducing the risk of rear end collisions or an overrun of the intersection; and
- If deemed acceptable by TfNSW, a temporary local speed reduction to 80km/hr in the vicinity of the Dungeon Road intersection could be imposed for the construction period of the revised site access.

5.2.2.2 CAR 002: Inclement Weather

Following discussion and consultation with TfNSW, a suite of mitigation measures are proposed to mitigate the risks from inclement weather. These are described in **Section 5.3**. It should also be noted that Dungeon Road is proposed as the temporary site access and will be used only until the transition to 24/7 operations, which therefore reduces potential risks to traffic outside of daylight hours.

5.2.3 Sealing of Dungeon Road

In response to Blayney Council's submission on the EIS (refer **Section 4**), Regis will seal the portion of Dungeon Road that will remain open to the public. This will reduce potential dust impacts on the neighbouring properties while Dungeon Road is used as the preliminary site access and will have long term benefits for the residences utilising Dungeon Road. Regis will also implement dust mitigation measures on the unsealed portion of Dungeon Road within the mine project area.

5.3 Management measures to address local climate conditions

As described in the EIS TTA, the local area, including Dungeon Road and the revised site access intersection site, can receive heavy fog, particularly early in the morning when shift changeover times occur. Noting 24 hour operations are not proposed until after six months once the revised site intersection is commissioned.

Installation of fog activated flashing yellow lights (also known as wigwags) above truck warning signs on the Mid Western Highway, in advance of the intersections is still proposed. Refer to **Figure 3** for an example of the proposed sign arrangement. The fog activated signs will be initially installed at Dungeon Road. The signs will then be permanently relocated to the revised site access once it is complete.



Figure 3 - Fog Activated Flashing Sign

Additional inclement weather mitigation measures proposed for the revised site access and Dungeon Road intersection include:

- Installation of Raised Reflective Pavement Markers (RRPMs);
- Operational restrictions limiting HV movements which cross the road centreline when visibility is less than the safe intersection sight distance. An infrared visibility sensor may be used to measure visibility at the intersection; and
- For Dungeon Road only, operational restrictions such as limiting all HV movements to daylight hours.

The proposed axillary turn lane treatments that exceed minimum requirements for the proposed revised site access will also mitigate the chance of rear end vehicular accidents as a result of vehicles waiting to turn into the mine project area in times of reduced visibility.

6 Conclusions

This Addendum report has been prepared to assess the potential traffic and transport impacts associated with the revised site access. The revised site access has been designed in consultation with TfNSW and Blayney Shire Council and addresses these agencies' and the community's concerns relating to the original site access as outlined in the EIS TTA.

There has been no change to the proposed project related traffic types and volumes. There have also been no changes to the indicative shift times presented in the EIS and therefore no change is expected in impacts on the local and regional road network to those described in the EIS TTA.

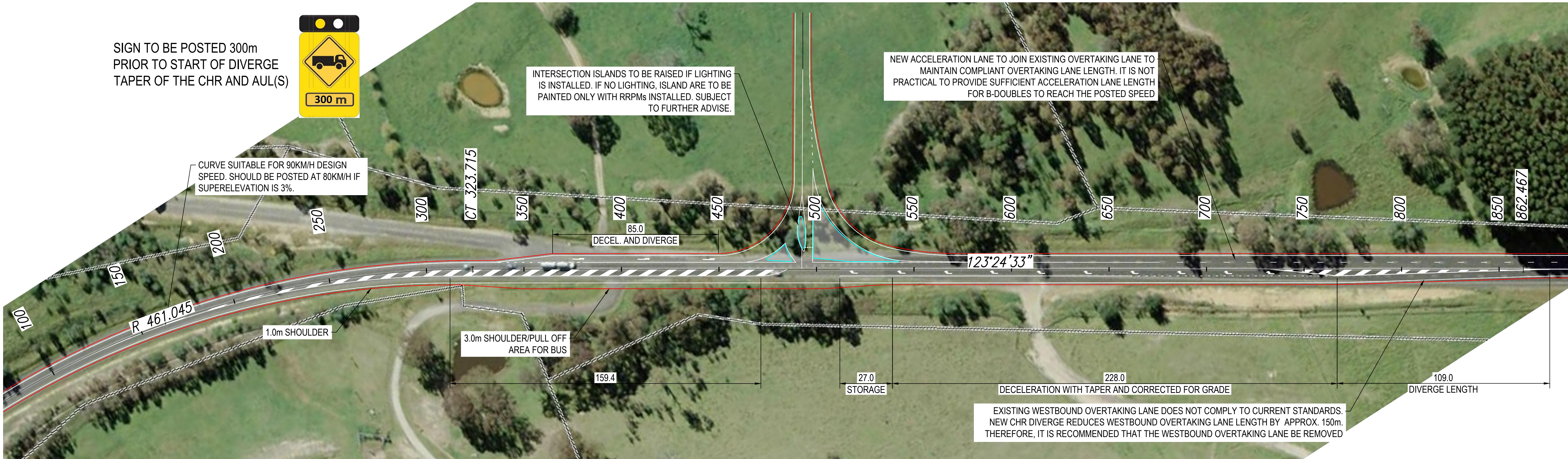
This Addendum report has also provided a supplementary assessment of the use of Dungeon Road as a preliminary construction site access prior to the construction of the revised site access. This supplementary assessment demonstrates that the existing Mid-Western Highway/Dungeon Rd intersection can accommodate the peak project traffic projected up until construction of the revised site access is completed by the end of month 6.

Additional mitigation measures have been developed in consultation with TfNSW and Blayney Shire Council to enable the continued use of Dungeon Road to access the site until the revised site access intersection has been completed.

7 References

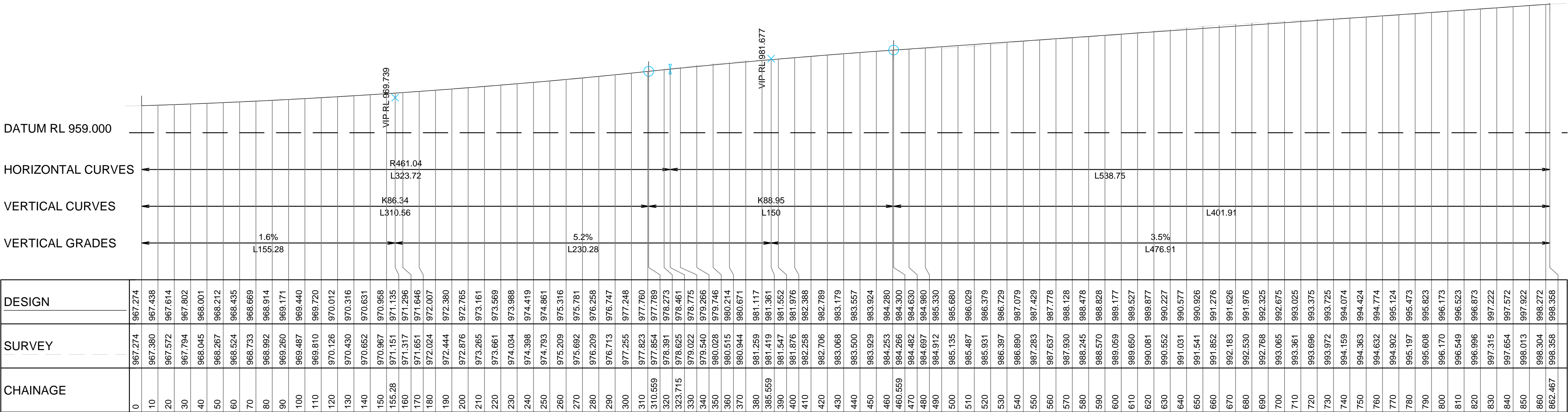
- Austroads (2010), 'Guide to Road Design – Part 3: Geometric Design'.
- Austroads (2017), 'Guide to Road Design – Part 4: Intersections and Crossings General'.
- Austroads (2019) 'Guide to Traffic Management - Part 12: Traffic Impacts of Development'.
- EMM (2019) 'McPhillamys Gold Project Environmental Impact Statement'.
- RTA (2002) 'Guide to Traffic Generating Developments'.
- RMS (2017) 'Roads and Maritime Austroads Guide Supplement'.
- RTA Publication (Feb 2010), 'Delineation Guidelines – Section 6: Transverse Markings'.

Appendix 1: Revised Site Access Concept Design



MID WESTERN HWY - NEW SITE ACCESS INTERSECTION CONCEPT LAYOUT PLAN

1:1000



MC00 - LONGITUDINAL SECTION

A1 HORZ SCALE 1:1500
A1 VERT SCALE 1:750

REV	DATE	REVISION DETAILS	APPROVED	DRAWN	PROJECT	CLIENT
				D. TELFORD-O'DONNELL	MID WESTERN HIGHWAY - NEW SITE ACCESS - MCPHILLAMYS	REGIS RESOURCES LTD
				DESIGNED		constructive solutions
				D. TELFORD-O'DONNELL		providing total solutions
				CHECKED	DRAWING TITLE	CONCEPT DESIGN
				D. SEYMOUR	CONCEPT LAYOUT PLAN	CSPL PROJECT No. 201907
				APPROVED		DRAWING NUMBER 201907-001
				D. SEYMOUR		SIZE A1
C	14/08/20	CONCEPT DESIGN ISSUE REVISED	DS			REV C
B	22/06/20	CONCEPT DESIGN ISSUE REVISED	DS			
A	7/03/19	CONCEPT DESIGN ISSUE	DS			

Appendix 2: Dungeon Road RSA



RISK, SAFETY AND
BUSINESS ADVISORY
CONSULTANCY



constructive
solutions

Road Safety Audit Report

McPhillamys Gold Project – Mid Western Highway and Dungeon Road Intersection

June 2020

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Project Details

Name of Client: Constructive Solutions Pty Ltd
Name of Project: McPhillamys Gold Project
QRMCM Project Manager: Ben Rossiter
Document Author: Ben Rossiter
Name of Document: Road Safety Audit Report: McPhillamys Gold Project – Mid Western Highway and Dungeon Road Intersection

Document History and Status

Revision	Issued to	Date	Reviewed by	Approved by
A	Internal	14/06/2020	Steve O'Rourke	
1 (draft)	CSPL	17/06/2020	Mick Bloem	Ben Rossiter
2 (final)	CSPL	19/06/2020	Ben Rossiter	Ben Rossiter

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QRMCM does not warrant the accuracy of any documents that are not in hard copy or non editable electronic format.

Audit Details

Client:	Constructive Solutions Pty Ltd.
Address:	7 Gipps Street Tamworth NSW 2340
Telephone:	02 67621969
Project Manager/ Project Sponsor	Doug Seymour Q Regis Resources Ltd
Designer:	N/A
Project:	McPhillamys Gold Project
Drawings:	
Type of Audit:	Stage 5: Existing Road
Date of Audit:	7 June 2020
Audit Team:	Ben Rossiter Accredited Level 3 Road Safety Auditor in NSW Steve O'Rourke Accredited Level 2 Road Safety Auditor in NSW
Commencement Meeting:	5 June 2020
Completion Meeting:	18 June 2020
Previous Audit:	Nil

Executive Summary

Regis Resources LTD is seeking development consent for the construction and operation of the McPhillamys Gold Project, a greenfield open-cut gold mine and associated water supply pipeline in the Central West region of New South Wales (the "Development"). It is proposed that access during the construction phase will be provided by an existing intersection, whilst the new permanent access intersection is being constructed.

Constructive Solutions Pty Ltd (CSPL) have been engaged to complete a Traffic and Transport Assessment for the Development and as part of the assessment, Transport for NSW (TfNSW) has requested the completion of a road safety audit (RSA) of the Mid Western Highway and Dungeon Road intersection. As a result, QRMC has been commissioned by CSPL to undertake a RSA to assess the existing intersection which is proposed to be used for access during the construction phase.

The audit consisted of an independent Stage 5 existing road RSA. The purpose of this audit is to report on the potential safety deficiencies and areas of risk associated with the use of this intersection as a temporary access.

The audit consisted of a site inspection in both day and night conditions on the 6th and 7th of June 2020. The safety issues identified have been scheduled in Table 1 in Section 5 of the report with 2 Corrective Action Requests (CARs) raised. The safety issues identified fall within the following safety categories:

- Intersections;
- Auxiliary Lanes;
- Lighting; and
- Road Pavement.

The comments listed under the heading 'General Observations' are observations noted whilst carrying out the audit and do not necessarily relate to safety issues. This list is not comprehensive, it is simply a record of some of the additional observations made by the auditors and has been provided purely as an item for additional information for the Client. Some of these issues may have already been addressed by the Client.

The risk ratings provided in this audit are the assessment of the auditor. Ultimately, it is the Client's responsibility to determine the response to risk for each road safety risk identified.

This report does not provide recommendations with regards to addressing the corrective actions identified from this audit.

The Corrective Action Request (CAR) forms in 'Appendix A: Corrective Action Requests' have been provided for the use of the Client. The purpose of the form is to formalise the process of attending to the specific safety risk raised, whether it be the "do nothing" action or what action was taken to address the risk, and then the form can be signed off. CARs have been provided for all audit findings irrespective of the risk rating of the issue raised.

1. Introduction

1.1 Project Description

LFB Resources NL is seeking development consent for the construction and operation of the McPhillamys Gold Project, a greenfield open-cut gold mine and associated water supply pipeline in the Central West region of New South Wales. CSPL have been engaged to undertake a traffic and transport assessment to support the development application.

The traffic and transport assessment has recommended that access be obtained via a new site access road and intersection with the Mid Western Highway. The existing site access, via Dungeon Road from the Mid Western Highway, is proposed to be used for the construction phase until the permanent access is available for use. As part of the traffic and transport assessment, TfNSW requires the completion of a Stage 5 RSA of the Mid Western Highway and Dungeon Road intersection. The location of the intersection is shown in Figure 1.

The intersection will be utilised for up to six months as the sole access to the development area. Standard construction hours are proposed which include:

- Monday to Friday – 7:00am to 6:00pm.
- Saturday – 8:00am to 1:00pm.
- No work on Sundays or public holidays.

It is anticipated that 80% of light vehicle traffic will originate from the west (Blayney and Orange) and 20% will originate from the east (Bathurst) whilst 30% of heavy vehicle traffic will originate from the west (Blayney and Orange) and 70% from the east (Bathurst).

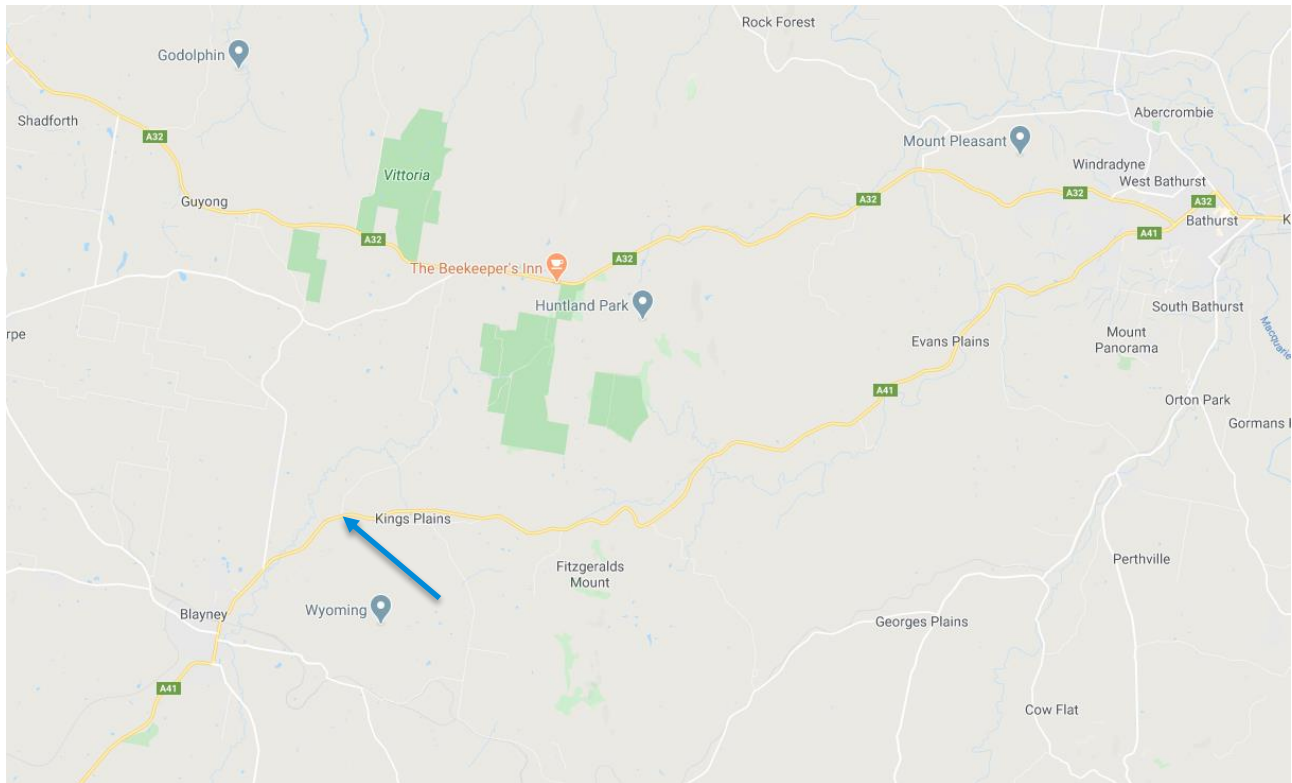


Figure 1: Location of Intersection (source Google Maps June 2020)

Existing auxiliary lanes include a basic left (BAL) and a short channelised right lane (CHR(s)) from the Mid Western Highway into Dungeon Road.

1.2 Current Status of the Audited Road(s)

The Mid Western Highway is a classified road referred to as State Highway 6 (SH6) and provides a link from the Great Western Highway at Bathurst to the east to the Cobb Highway at Hay to the west. It is a significant transport route linking regional centres including Bathurst, Blayney, Cowra, and Hay. The Mid Western Highway is identified as approved for 25m B-double heavy vehicles route from the TfNSW online interactive Restricted Access Vehicle Maps

Dungeon Road is a local road that provides access to numerous rural properties and the Project Area. It is approximately 9.3km long and joins the Mid Western Highway in the south and Vittoria Road to the north. With the exception of the mouth of the intersection, the road is unsealed and typically 4m to 6m in width.

2. Audit Scope and Objectives

The audit consisted of an independent existing road RSA for the Mid Western Highway and Dungeon Road intersection which will be subject to increased traffic volumes as a result of the McPhillamys Gold Project during the construction phase.

The purpose of this audit is to identify the defects and deficiencies of the current Mid Western Highway and Dungeon Road intersection from a safety perspective of all road users.

This report does not provide recommendations with regards to addressing the corrective actions identified from this audit.

3. Information Provided by the Client

Information provided by CSPL in relation to the Development included:

- McPhillamys Gold Project – Traffic and Transport Assessment (20/08/19).

4. Road Safety Audit Program

4.1 Commencement Meeting

The commencement meeting was held on 5 June 2020 and included Ben Rossiter, the Lead Auditor, and Doug Seymour, the Client's Project Manager.

Issues discussed included:

- Relevant details of the Development;
- The intended use of the intersection; and
- The prevalence of fog.

The objective of this RSA is to identify any potential road safety issues/deficiencies associated with the Mid Western Highway and the Dungeon Road intersection that may need to be investigated and rectified prior to its use as the temporary access for the construction of the McPhillamys Gold Project.

4.2 Site Inspection

The night time inspection was undertaken at 7:30pm on the 6 June 2020 and the day time inspection was undertaken at 8:30am on the 7 June 2020. Conditions were fine. Fog was not observed however there was a heavy frost with night time temperatures less than zero.

4.3 Completion Meeting

The completion meeting was held on 18 June 2020 and included Doug Seymour, Project Manager and Ben Rossiter lead auditor and with the findings discussed prior to finalising the audit report.

5. Road Safety Audit

5.1 Audit Findings


The audit findings have been documented in Table 1 which includes the following information:

- Specific details of the nature of the audit findings;
- A risk rating of high, medium or low (refer 'Appendix B: Risk Assessment Tools'); and
- A reference to a Corrective Action Request (CAR) form (refer 'Appendix A: Corrective Action Requests').

The CAR forms will facilitate proper close out of each of the potential road safety deficiencies as these require follow up action from the Client Project Manager/project sponsor as well as formal close out of each CAR.

Road Safety Audit Report: McPhillamys Gold Project

Table 1: Audit Findings

CAR No.	Audit Findings	Plan ref. (stage 3 audits)	Photos
Dungeon Road / Mid Western Highway Intersection			
001	<p>Intersections / Auxiliary Lanes</p> <p>The existing channelised right turn lane is estimated to offer 35m of combined storage and deceleration. Given the speed environment, the length of the storage and deceleration is considered insufficient. There is a risk that the existing deficiencies could result in a rear end collision or an overrun of the intersection that may result in a serious injury to the occupants of the vehicles. This issue will likely be exacerbated during peak hour traffic and shift start times during the construction phase of the Development.</p> <p>It is understood that TfNSW no longer allow CHR (Short) intersections to be constructed within a 100km/h speed zone such as this.</p> <p>There is currently limited advance warning signage for west bound traffic. This consists of a small "Dungeon Road" rural road name sign (G3-5), but there is no side road junction signage (W2-4), nor any indication of a distance to the intersection ahead.</p> <p>Impact: Major Likelihood: Possible Risk Rating: High (iv)</p>	Not applicable	
002	<p>Lighting / Road Pavement</p> <p>Although not observed at the time of the audit, inclement weather including fog, snow and ice are considered probable in this location. Fog has the potential to limit visibility. Whilst not uncommon in this climate it would exacerbate the existing risks associated with the increase in turning traffic at this intersection. There is a risk that the fog hazard could result in a vehicle on vehicle collision due to the lack of visibility resulting in a serious injury to the occupants of the vehicles.</p> <p>Snow and ice have the potential to affect traction. A lack of traction has the potential to result in a loss of control which could result in numerous incidents at this intersection. Cumulative impacts may result when considered with CAR 001.</p> <p>Impact: Major Likelihood: Possible Risk Rating: High (iv)</p>	Not applicable	

6. General Observations

The following general observations have been included with respect to the Development:

- Transverse linemarking associated with the Give Way sign (R1-2) is faded and covered in loose aggregate.
- The duplicated Give Way (signage (R1-2) lacks prominence given their size and position adjacent to pavement.
- A timber (non-frangible) power pole is situated on the north western side of the intersection approximately 10m offset from the edge line. This may be within the clear zone requirements for the Mid Western Highway.

7. Formal Statement

We, the undersigned, declare that we have reviewed the material listed in this report and identified the potential safety and operational deficiencies.

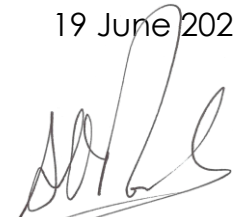
It should be noted that while every effort has been made to identify potential safety hazards, no guarantee could be made that every deficiency has been identified.

It is recommended that audit findings be investigated with satisfactory corrective actions identified and implemented.



Name: Ben Rossiter
Position: Road Safety Auditor Level 3
Auditor ID: RSA-02-464

Date: 19 June 2020



Name: Steve O'Rourke
Position: Road Safety Auditor Level 2
Auditor ID: RSA-02-0311


Date: 19 June 2020

8. References

Austroads 2009, 'Guide to Road Safety – Part 6: Road Safety Audit'

RTA 2011, '*Road Safety Audit Practices Information Sheet – Road Safety Categories*',
August 2011 RTA/Pub 11.348

Appendix A: Corrective Action Requests

Project Name: Mid Western Highway and Dungeon Road Intersection			
Ref No.	Corrective Action Response (CAR)	Priority for action (To be completed by Project Manager)	Residual risk (if any)
1	<p>The existing channelised right turn lane is estimated to offer 35m of combined storage and deceleration. Given the speed environment, the length of the storage and deceleration is considered insufficient. There is a risk that the existing deficiencies could result in a rear end collision or an overrun of the intersection that may result in a serious injury to the occupants of the vehicles. This issue will likely be exacerbated during peak hour traffic and shift start times during the construction phase of the Development.</p> <p>It is understood that TfNSW no longer allow CHR (Short) intersections to be constructed within a 100km/h speed zone such as this.</p> <p>There is currently limited advance warning signage for west bound traffic. This consists of a small "Dungeon Road" rural road name sign (G3-5), but there is no side road junction signage (W2-4), nor any indication of a distance to the intersection ahead.</p>		High
2	<p>Although not observed at the time of the audit, inclement weather including fog, snow and ice are considered probable in this location. Fog has the potential to limit visibility. Whilst not uncommon in this climate it would exacerbate the existing risks associated with the increase in turning traffic at this intersection. There is a risk that the fog hazard could result in a vehicle on vehicle collision due to the lack of visibility resulting in a serious injury to the occupants of the vehicles.</p>		High
Project Manager / Sponsor Name: Ben Rossiter		Signature: 	
Concurring Client Name:		Signature:	

Appendix B: Risk Assessment Tools

Measures of Effectiveness of Existing Controls

The following table can be used to assess the effectiveness of existing risk controls, which should then be taken into account when determining the Consequence, Likelihood and therefore the level of Residual Risk.

Level	Communication and documentation	General effectiveness
5. Excellent	Risk treatments and procedures are implemented, with communication and monitoring on a regular basis to determine their level of effectiveness in 'managing' the risk.	Is effective in reducing the risk under all conditions.
4. Good	Risk treatments and procedures are well documented and implemented, but with some room for improvement. Good communication and understanding of treatments with some degree of monitoring.	Is effective in reducing the risk under most conditions.
3. Fair	Risk treatments and procedures documented, but not well implemented, with minimal monitoring to ensure compliance or to determine their level of relevance.	Is effective in reducing the risk under ideal conditions.
2. Marginal	Risk treatments and procedures are informal, not well communicated and are implemented in an inconsistent manner.	Is partially effective in reducing the risk.
1. Poor or non-existent	Risk treatments and procedures are non-existent or ineffective; not communicated, sparsely implemented and of little value.	Makes little impact in reducing the risk.

Measures of Consequence (or Impact)

Consequence should be assessed before Likelihood: ISO 31000 section 5.4.3 *Risk analysis* indicates that the Consequence be determined and then the Likelihood that this Consequence would occur (in that order).

Level	Examples					
	Financial (Revenue & Costs)	Property	Provision of Service	Reputation	Environment	Road Safety
Insignificant	<ul style="list-style-type: none"> Low financial loss (e.g. < 1% of revenue or budget). 	<ul style="list-style-type: none"> Negligible damage to or loss of assets. 	<ul style="list-style-type: none"> Short-term, localised interruption to service / performance. 	<ul style="list-style-type: none"> Issue of no public concern. Isolated communications expressing concern. Non-compliance identified internally and rectified. 	<ul style="list-style-type: none"> Minor breach of environmental policy / procedures. Negligible impact on the environment. 	<ul style="list-style-type: none"> Some low speed single vehicle collisions. Pedestrian walks into object (no head injury). Vehicle reverses into post.
Minor	<ul style="list-style-type: none"> Minor financial loss (e.g. 1% to 2% of revenue or budget). 	<ul style="list-style-type: none"> Minor loss / damage. Some repairs may be required. 	<ul style="list-style-type: none"> Minor, temporary disruption to services; Minor inconvenience to client(s). 	<ul style="list-style-type: none"> Local public concern. May cause some complaints (justified or unjustified). Regulatory non-compliances identified by external auditor. 	<ul style="list-style-type: none"> Minor localised impact; one-off situation easily remedied. 	<ul style="list-style-type: none"> Some low speed vehicle collisions. Cyclist falls from bicycle at low speed. Rear end collision
Moderate	<ul style="list-style-type: none"> High financial loss (e.g. 2% to 5% of revenue or budget). 	<ul style="list-style-type: none"> Moderate to high damage requiring specialist/contractor equipment to repair or replace. 	<ul style="list-style-type: none"> Some serious disruption to services; some contravention of legal/contractual obligations. 	<ul style="list-style-type: none"> Regional public concern. Significant complaints. Some adverse publicity. Brought to the attention of regulator. Local media coverage. 	<ul style="list-style-type: none"> Moderate impact on the environment; no long term or irreversible damage. May incur cautionary notice or infringement notice. 	<ul style="list-style-type: none"> Medium or slow speed vehicle/vehicle collision. Cyclist falls from bicycle at moderate speed. Rear end collision and pushed into object.
Major	<ul style="list-style-type: none"> Major financial loss (e.g. 5% to 10% of revenue or budget). 	<ul style="list-style-type: none"> Significant / permanent damage to assets and / or infrastructure. 	<ul style="list-style-type: none"> Major, long-term disruption to services. Serious breach of a legal / contractual obligation. 	<ul style="list-style-type: none"> Significant public concern. Adverse publicity in national media. Embarrassment to the organisation. Damage to credibility and confidence in the organisation. Inquiry by regulator. State or regional media coverage. 	<ul style="list-style-type: none"> Severe impact requiring remedial action and review of processes to prevent reoccurrence. Penalties and / or direction or compliance order incurred. 	<ul style="list-style-type: none"> High or medium speed vehicle/vehicle collision. High or medium speed collision with a fixed roadside object. Pedestrian / cyclist struck (minor injuries).
Catastrophic	<ul style="list-style-type: none"> Huge financial loss (e.g. >10% of revenue or budget). 	<ul style="list-style-type: none"> Widespread, substantial / permanent damage to assets and/or infrastructure. 	<ul style="list-style-type: none"> Long term/ irreversible impact on ability to deliver client services. Viability of the organisation in its current form is questionable. 	<ul style="list-style-type: none"> Major public concern. Widespread, ongoing national and possibly international media attention. Severe embarrassment to the organisation. Loss of credibility and confidence in the organisation. Adverse findings and/or penalties by regulator. 	<ul style="list-style-type: none"> Long-term, large-scale damage to habitat or environment. Serious / repeated breach of legislation / licence conditions. Cancellation of licence and / or prosecution. 	<ul style="list-style-type: none"> High-speed multiple vehicle crash resulting in fatality. Pedestrian / cyclist struck (fatality). Significant number of casualties.

Measures of Likelihood

Level	Definition	History	Anecdotal Examples
Almost certain	Will occur in most conditions	Experienced at this site (or similar sites) regularly	Most people are strongly aware of the risk occurring on several occasions
Likely	Will probably occur in most conditions	Experienced at this site (or similar sites) approximately annually	Several people have recollections of a similar event occurring several times over the years
Possible	Should happen at some time	Experienced at this site (or similar sites) occasionally	Several people have recollections of a similar event occurring, but are not really sure where or when, and on more than one occasion
Unlikely	Could happen at some time	Experienced across the industry from time to time	Never heard of it, but it sounds like something that we know has happened elsewhere before
Rare	May only occur in exceptional circumstances	Experienced across the industry irregularly/at some time in historical memory	Nobody has ever heard of it happening

Residual Risk Assessment Matrix

Likelihood	Consequence				
	NEGATIVE CONSEQUENCES				
	Insignificant	Minor	Moderate	Major	Significant
Almost certain	- M (ii)	- H (ii)	- E (i)	- E (iv)	- E (v)
Likely	- M (i)	- H (i)	- H (ii)	- E (ii)	- E (iv)
Possible	- L (iv)	- M (ii)	- H (i)	- H (iv)	- E (iii)
Unlikely	- L (ii)	- L (iv)	- M (iii)	- H (iii)	- H (iv)
Rare	- L (i)	- L (iii)	- M (ii)	- M (iii)	- H (iii)

Recommended Management Response

	L (i – iv)	M (i – iii)	H (i – iv)	E (i – v)
Risk Level:	Low	Moderate	High	Extreme
Refer to:	Supervisor	Manager	Executive Management	Board
Refer within:	1 month	1 month	1 week	1 day
Actions:	Routine procedures	Routine procedures	Specific treatment	Specific treatment
Monitoring:	Quarterly	Quarterly	Monthly	Weekly

Appendix 3: SIDRA Outputs

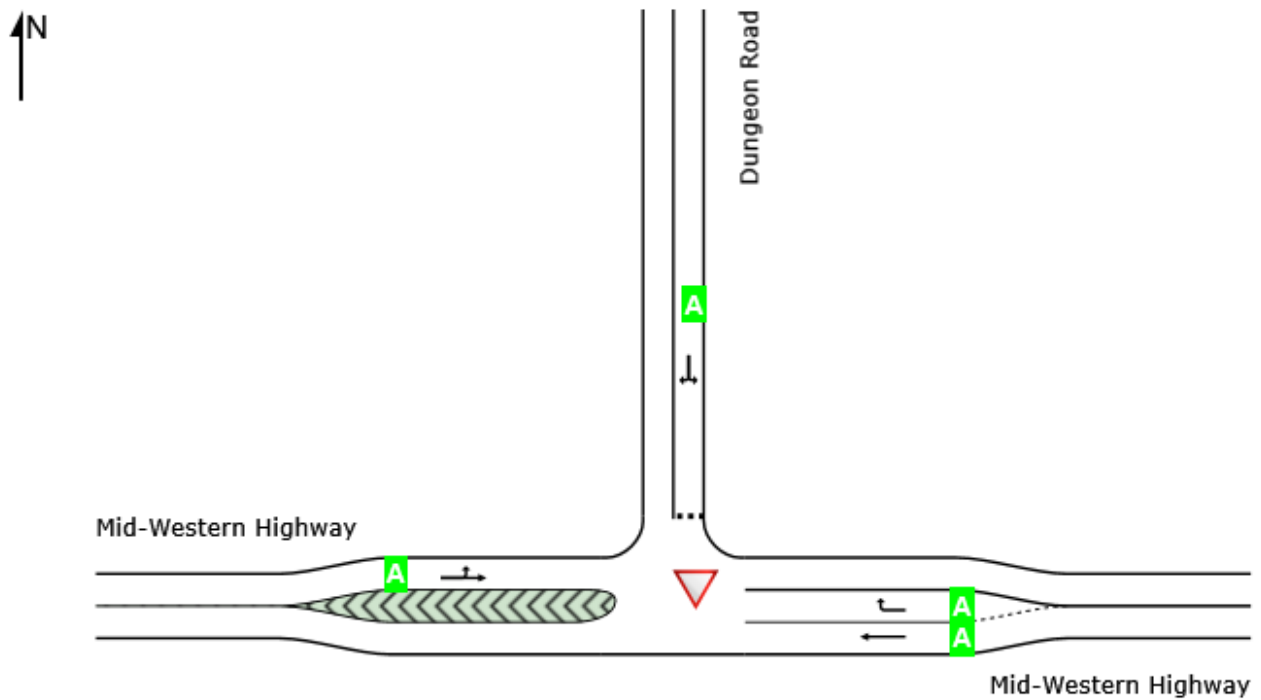
LANE LEVEL OF SERVICE

Lane Level of Service

▽ Site: 101 [Mid-Western HWY and Dungeon Road - Month 4 - 0530 to 0630 (Site Folder: General)]

New Site
Site Category: Existing Design
Give-Way (Two-Way)

	Approaches			Intersection
	East	North	West	
LOS	NA	A	NA	NA



Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Lane LOS values are based on average delay per lane.

Minor Road Approach LOS values are based on average delay for all lanes.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.

Delay Model: SIDRA Standard (Geometric Delay is included).

MOVEMENT SUMMARY

▼ Site: 101 [Mid-Western HWY and Dungeon Road - Month 4 - 0530 to 0630 (Site Folder: General)]

New Site

Site Category: Existing Design

Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %				[Veh. veh	Dist] m				
East: Mid-Western Highway														
5	T1	44	19.0	46	19.0	0.027	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	100.0
6	R2	21	16.0	22	16.0	0.015	8.4	LOS A	0.1	0.5	0.27	0.61	0.27	67.5
Approach		65	18.0	68	18.0	0.027	2.7	NA	0.1	0.5	0.09	0.20	0.09	86.5
North: Dungeon Road														
7	L2	1	50.0	1	50.0	0.004	9.4	LOS A	0.0	0.1	0.22	0.62	0.22	58.6
9	R2	2	50.0	2	50.0	0.004	10.2	LOS A	0.0	0.1	0.22	0.62	0.22	57.7
Approach		3	50.0	3	50.0	0.004	9.9	LOS A	0.0	0.1	0.22	0.62	0.22	58.0
West: Mid-Western Highway														
10	L2	84	16.0	88	16.0	0.083	8.3	LOS A	0.0	0.0	0.00	0.42	0.00	72.8
11	T1	51	19.0	54	19.0	0.083	0.0	LOS A	0.0	0.0	0.00	0.42	0.00	88.0
Approach		135	17.1	142	17.1	0.083	5.1	NA	0.0	0.0	0.00	0.42	0.00	77.9
All Vehicles		203	17.9	214	17.9	0.083	4.4	NA	0.1	0.5	0.03	0.35	0.03	80.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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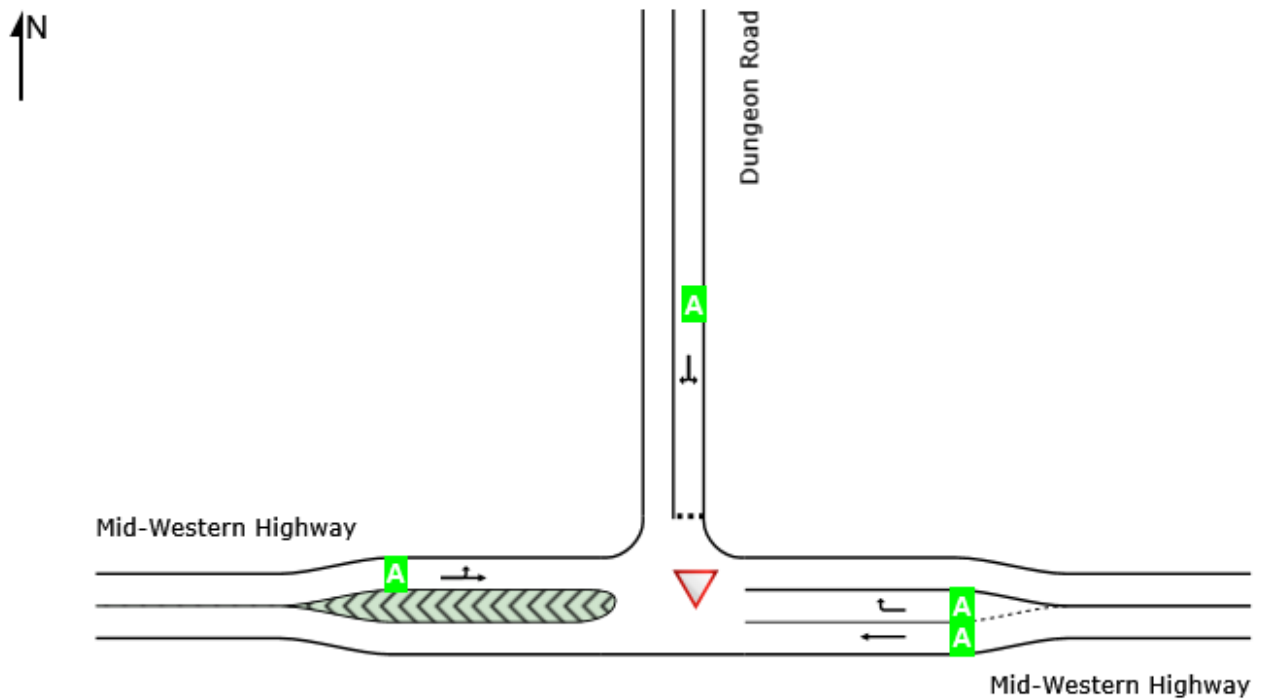
LANE LEVEL OF SERVICE

Lane Level of Service

 **Site: 101 [Mid-Western HWY and Dungeon Road - Month 6 - 0530 to 0630 (Site Folder: General)]**

New Site
Site Category: Existing Design
Give-Way (Two-Way)

	Approaches			Intersection
	East	North	West	
LOS	NA	A	NA	NA



Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Lane LOS values are based on average delay per lane.

Minor Road Approach LOS values are based on average delay for all lanes.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.

Delay Model: SIDRA Standard (Geometric Delay is included).

MOVEMENT SUMMARY

▼ Site: 101 [Mid-Western HWY and Dungeon Road - Month 6 - 0530 to 0630 (Site Folder: General)]

New Site

Site Category: Existing Design

Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %				[Veh. veh	Dist] m				
East: Mid-Western Highway														
5	T1	44	19.0	46	19.0	0.027	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	100.0
6	R2	25	27.0	26	27.0	0.020	8.8	LOS A	0.1	0.8	0.30	0.62	0.30	63.9
Approach		69	21.9	73	21.9	0.027	3.2	NA	0.1	0.8	0.11	0.22	0.11	83.0
North: Dungeon Road														
7	L2	1	50.0	1	50.0	0.004	9.4	LOS A	0.0	0.1	0.23	0.62	0.23	58.5
9	R2	2	50.0	2	50.0	0.004	10.4	LOS A	0.0	0.1	0.23	0.62	0.23	57.6
Approach		3	50.0	3	50.0	0.004	10.0	LOS A	0.0	0.1	0.23	0.62	0.23	57.9
West: Mid-Western Highway														
10	L2	100	27.0	105	27.0	0.098	8.5	LOS A	0.0	0.0	0.00	0.45	0.00	68.9
11	T1	51	19.0	54	19.0	0.098	0.0	LOS A	0.0	0.0	0.00	0.45	0.00	87.9
Approach		151	24.3	159	24.3	0.098	5.7	NA	0.0	0.0	0.00	0.45	0.00	74.3
All Vehicles		223	23.9	235	23.9	0.098	5.0	NA	0.1	0.8	0.04	0.38	0.04	76.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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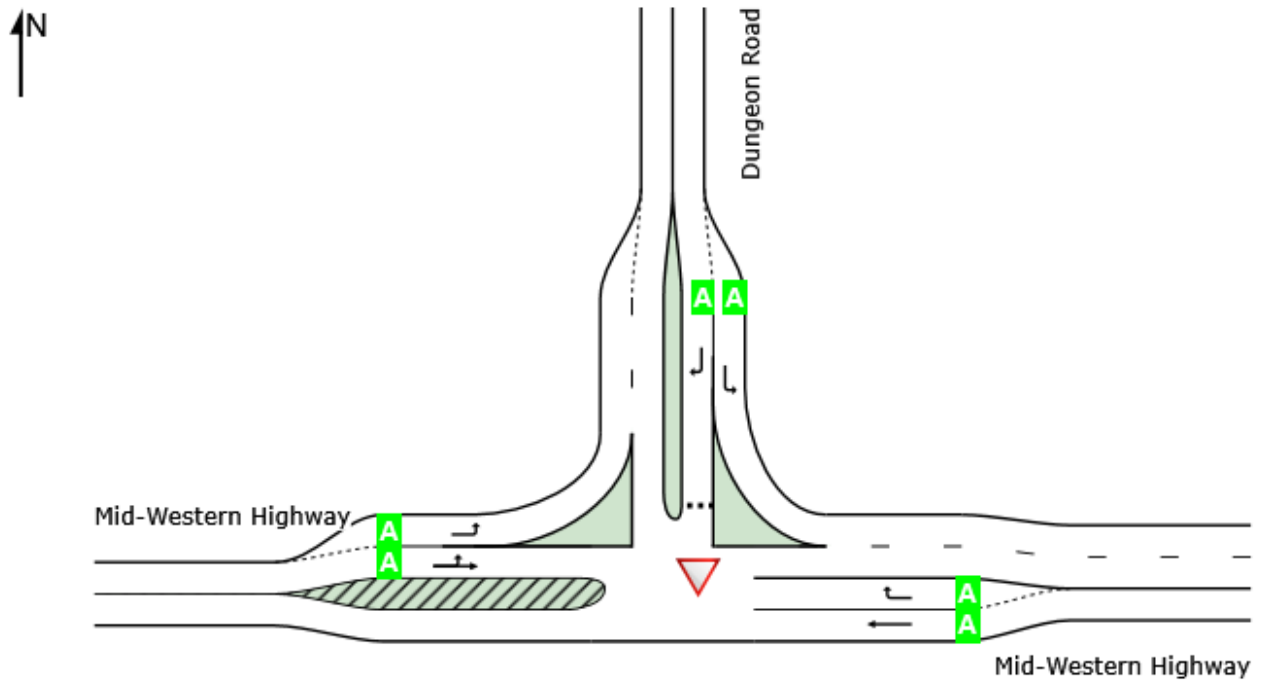
LANE LEVEL OF SERVICE

Lane Level of Service

▽ Site: 101 [Mid-Western HWY and Dungeon Road - Month 10&11 - 0530 to 0630 (Site Folder: General)]

New Site
Site Category: Existing Design
Give-Way (Two-Way)

	Approaches			Intersection
	East	North	West	
LOS	NA	A	NA	NA



Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Lane LOS values are based on average delay per lane.

Minor Road Approach LOS values are based on average delay for all lanes.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.

Delay Model: SIDRA Standard (Geometric Delay is included).

MOVEMENT SUMMARY

Site: 101 [Mid-Western HWY and Dungeon Road - Month 10&11 - 0530 to 0630 (Site Folder: General)]

New Site

Site Category: Existing Design

Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %				[Veh. veh	Dist] m				
East: Mid-Western Highway														
5	T1	44	19.0	46	19.0	0.026	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	100.0
6	R2	35	26.0	37	26.0	0.024	8.8	LOS A	0.1	0.9	0.16	0.60	0.16	65.1
Approach		79	22.1	83	22.1	0.026	3.9	NA	0.1	0.9	0.07	0.27	0.07	80.8
North: Dungeon Road														
7	L2	1	50.0	1	50.0	0.001	9.9	LOS A	0.0	0.0	0.00	0.62	0.00	61.0
9	R2	2	50.0	2	50.0	0.003	11.1	LOS A	0.0	0.1	0.38	0.60	0.38	57.7
Approach		3	50.0	3	50.0	0.003	10.7	LOS A	0.0	0.1	0.26	0.61	0.26	58.7
West: Mid-Western Highway														
10	L2	141	26.0	148	26.0	0.102	9.4	LOS A	0.0	0.0	0.00	0.48	0.00	69.5
11	T1	51	19.0	54	19.0	0.102	0.0	LOS A	0.0	0.0	0.00	0.44	0.00	86.5
Approach		192	24.1	202	24.1	0.102	6.9	NA	0.0	0.0	0.00	0.47	0.00	73.3
All Vehicles		274	23.8	288	23.8	0.102	6.1	NA	0.1	0.9	0.02	0.41	0.02	75.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

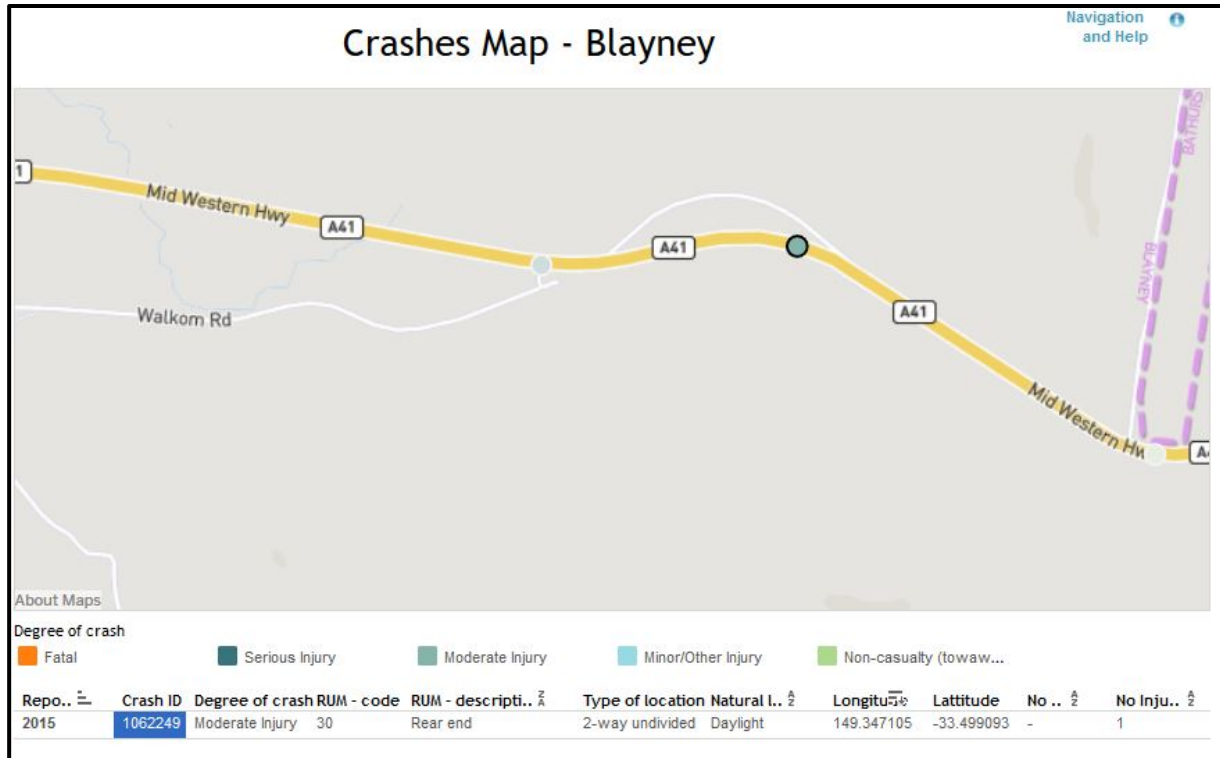
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Appendix 4: Crash History

Crash ID: 1062249 adjacent to the proposed access site



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