

Traffic Impact Assessment

Rockwood Quarry Winchester Lane Extension of Development Consent Table Top, NSW Report 26 June 2018 Revision D

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1. Executive Summary

This report provides an assessment of the traffic impacts to support a development application for AP Delaney to continue the Rockwood Quarry operations on the existing site of Lots 2 and 3, 208 Winchester Lane, Table Top.

This report investigates the traffic impacts of vehicle movements for the existing and increased quarry production at the key intersection of Gerogery Road and Winchester Lane.

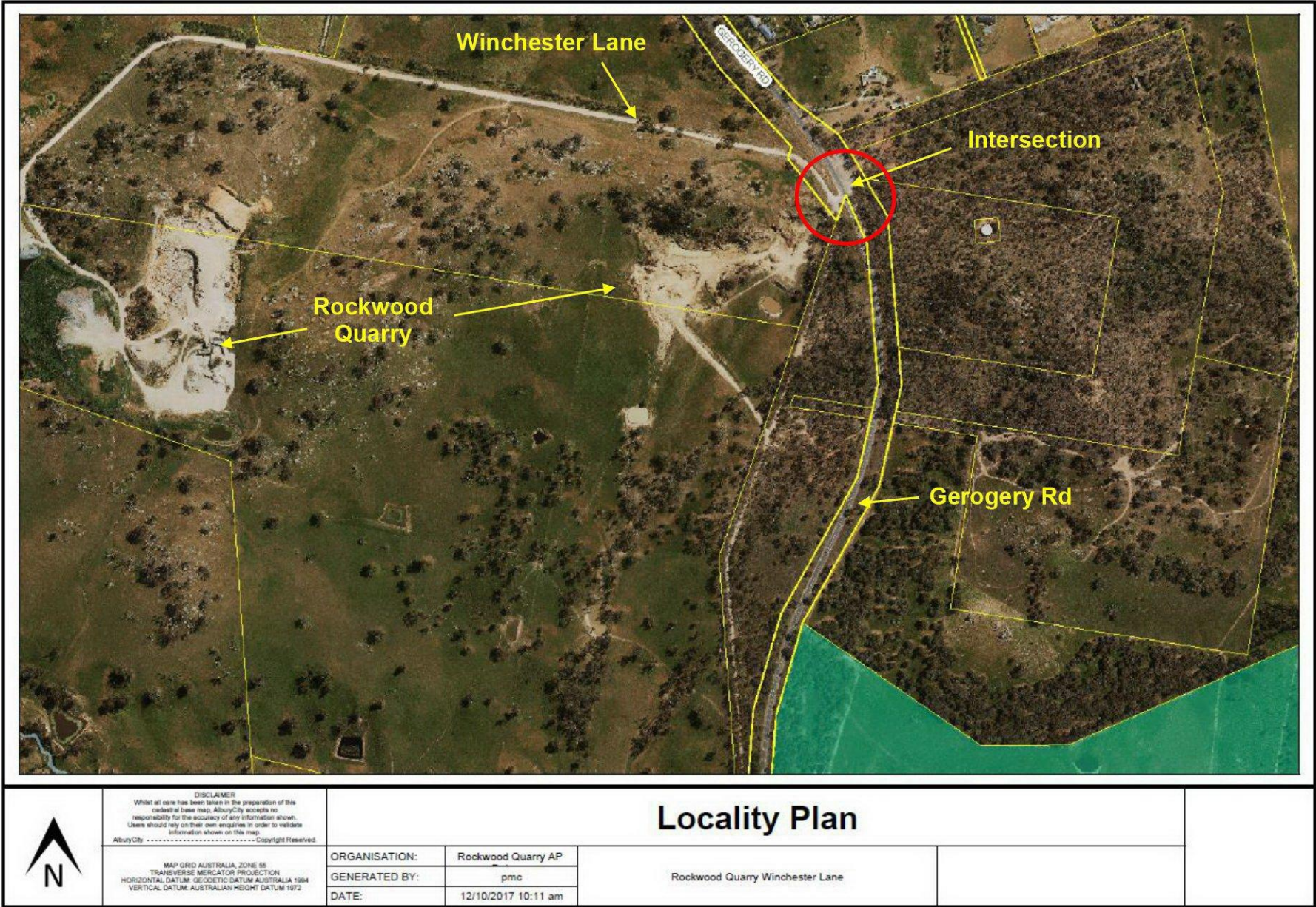
It is concluded that the existing intersection of Gerogery Road and Winchester Lane operates well within capacity at a Level-of-Service of A in both the AM and PM peak periods at current traffic flows and will continue to operate within capacity at a Level-of-Service of A at 2038 with the addition of forecast and generated quarry traffic. Additionally, it is concluded that the minimal potential increase in traffic flow (AM +2vph and +6vpd) generated by the increase in quarry production will have no adverse effect on safety at the intersection.

SISD criteria for 100km/h design speed is not met on the south bound approach to the intersection of Gerogery Road and Winchester Lane. However, the existing cutting embankment on the western side of Gerogery Road can be excavated to achieve an inter-visible SISD of over 250m for Gerogery Road and that a cost sharing arrangement for the construction works between Albury City Council and AP Delaney be investigated. Furthermore, if the speed limit between the Gerogery Road/Hub road roundabout and Himalaya Drive was reduced to 80km/h a SISD for a design speed of 80km/h could be achieved without any excavation works to the existing cutting embankment.

It is concluded that the measured SISD of 250m for the north bound approach is acceptable and within practical limits. Additionally, because the existing quarry activities and other vehicle movements have not caused any reported traffic incidents or crashes at or near the intersection of Gerogery Road and Winchester Lane in the past five years a design speed of 100km/h be adopted for all sight distance calculations.

It is determined that the proposed continuation of quarry activities will continue to have a minimal impact on the existing road network subject to the recommended mitigating works.

1.1 Locality Plan



1.2 Site Characteristics

Address	208 Winchester Lane, Table Top NSW
Road Hierarchy	Gerogery Road classified as a local road under the management of Albury City Council. Winchester Lane is classified as an access road and is under the management of the property owners who have access.
Proposed Use	Continued use as a Quarry
Access	Intersection of Gerogery Road and Winchester Lane
Existing Traffic volumes and Speed Environment	Gerogery Road June 2018 Average daily traffic 1,235vpd Posted speed limit 100km/h Weekly peak hour AM 127vph and PM 132vph Refer Section 3 Table for detailed summary Winchester Lane 2018 Average daily traffic potential 56vpd No speed limit posted assume 60km/h safe speed. Weekly peak hour potential AM 7vph and PM 9vph
Traffic Generation	Information obtained from quarry operators AP Delaney and Albury Wodonga Clay Target Gun Club. Increase in quarry production gives potential increase of 6vpd No change for Albury Wodonga Clay Target Gun Club traffic average 10vpd.

1.3 Recommendations

- Albury City Council concurs with the renewal of the Rockwood Quarry development approval and the increase in the quarry production from 75,000 to 100,000 cubic metres per annum;
- The small trees and branches on the road verge to be removed to provide clear sight line are a pre-existing situation that is the responsibility of the road authority;
- Albury City Council concurs with the removal of the existing western cutting embankment to obtain the north bound SISD and that a cost sharing arrangement for the construction works between Albury City Council and AP Delaney be investigated;
- Albury City Council concurs that the measured SISD of 250m for the north bound approach is acceptable and within practical limits. Additionally, because the existing quarry activities and other vehicle movements have not caused any reported traffic incidents or crashes at or near the intersection of Gerogery Road and Winchester Lane in the past five years a design speed of 100km/h be adopted for all sight distance calculations;
- Albury City Council carry out repair works to the existing bitumen apron in Winchester Lane.

2. Introduction

A development application seeking a renewal of approval for AP Delaney to continue the Rockwood Quarry operations on the existing site of Lots 2 and 3, 208 Winchester Lane is being prepared for submission to Albury City Council.

In support of the development application Peter Meredith Consulting has been engaged to prepare a report assessing the traffic impacts for the continuation of the quarry activities on the existing road network. The Traffic Impact Assessment Report (TIAR) will also investigate the traffic impacts of providing the continuation of access to the existing quarry site via the intersection of Gerogery Road and Winchester Lane.

The assessment uses existing traffic count data obtained from Albury City council, on-site observations, traffic generating development figures, and future traffic growth predictions.

2.1 Documentation

The documentation and information provided for this assessment includes:

- Letter to Albury City Council form AP Delaney 9 August 2017.
- Letter from RMS to Department of Planning and Environment 29 August 20107.
- Condition 20.3 Assessment of Material Removed From Site. Certified assessment of the tonnage of material removed from the site and the quantity of material stockpile upon the site from 2008 to 2016. Table provided AP Delaney. *Refer to Appendix A for details.*
- Vehicle (truck and trailer combination) generation calculations from the quarry site for annual production of 75,000 and 100,000 cubic metres provided by AP Delaney. *Refer to Appendix A for details.*
- Preliminary designs for embankment removal works on the western side of Gerogery Road on the south bound approach to the intersection of Gerogery Road and Winchester Lane provided by AP Delaney. *Refer to Appendix D for details.*

2.2 References

References used in the preparation of this assessment include the following:

- *Roads and Maritime Services (RMS) Guide to Traffic Generating Developments, Version 2.2 October 2002 for traffic generation predictions and Technical Direction TDT 2013/04a Updated Traffic Surveys.*
- *Austroads Guide to Traffic Management Part 12: Traffic Impacts of Development*
- *Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections.*
- *RMS supplement to Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections.*
- *Austroads Guide to Road Design Part 6: Roadside Design, Safety and Barriers.*
- *Signalised and Unsignalised Intersection Design and Research Aid (SIDRA). SIDRA Intersections 7.0 Plus software.*

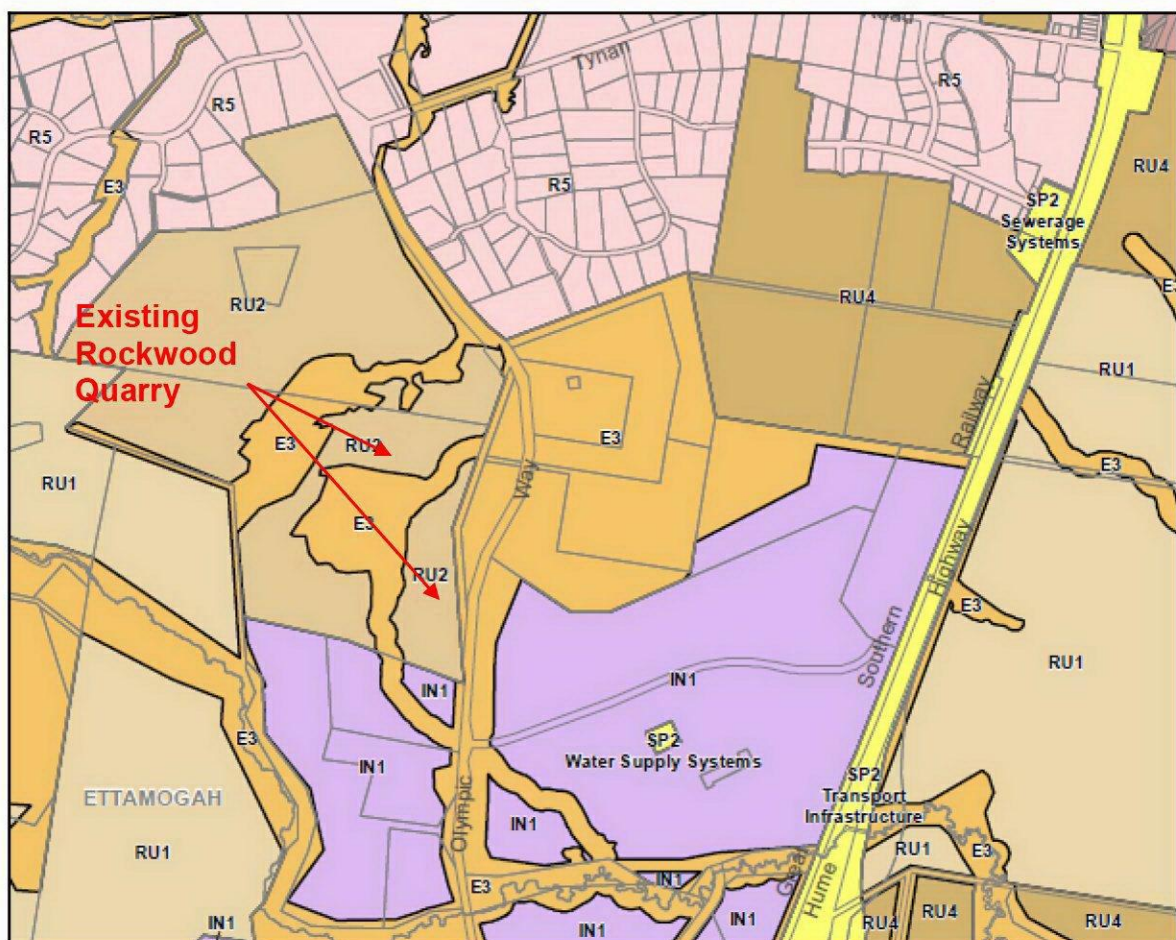
3. Existing Conditions

The existing Rockwood Quarry site located at 208 Winchester Lane. The site is accessed from Gerogery Road at the top of Nine Mile Hill.

3.1 Land Use

The existing quarry site has an approximate area of 190 hectares and is currently zoned RU2 Rural Landscape under the Albury Local Environmental Plan 2010 and this zoning allows for quarry and extraction activities.

The surrounding land use is established large lot rural residential development to the north and general industrial to the south. The site is also bordered by Environmental Management land.



Source: Albury City Council LEP

3.2 Road Network

Gerogery Road (Old Olympic Way)

Gerogery Road forms the eastern boundary of the site. It runs north from Wagga Road to the township of Gerogery. It provides access for local traffic from farms, large lot rural residential and the Nexus industrial complex. Gerogery Road is classified as a local road and is under the management of Albury City Council. Gerogery Road is also an RMS heavy vehicle incident management bypass route for the Hume Highway.

Adjacent to the intersection Gerogery Road consists of the following characteristics:

- An undivided two-way road with a sealed carriageway width of 8.6m;
- Two traffic lanes of 3.5m and gravel shoulder at 2.1m on the east side and 2.6 on the west side shoulder;
- Formed table drains and grass verges;
- Line marked centre and edge lines with guide post delineation and guard rail protection on the western side of the north bound traffic lane;
- 'Truck' entering symbolic warning signage on both approaches to intersection of Gerogery Road and Winchester Lane.



Photo 1: Gerogery Road looking south bound from Winchester Lane.



Photo 2: Gerogery Road looking north bound from Winchester Lane.



Photo 3: Gerogery Road on top of Nine Mile Hill looking south bound with Winchester Lane access on the right



Photo 4: Gerogery Road on top of Nine Mile Hill looking west at Winchester Lane access

Winchester Lane

Winchester Lane forms the northern boundary of the quarry site. Winchester Lane connects to Gerogery Road as a T-junction intersection and allows two-way access from Gerogery Road. Winchester Lane is classified as a property access road and provides access to the Rockwood Quarry and the Albury Wodonga Clay Target Gun Club and is under the management of the property owners who have access.

Winchester Lane consists of the following characteristics:

- An undivided two-way 6m wide gravel access road;
- Table drains; and
- Give-way signs at the entrance to the quarry site.



Photo 5: Winchester Lane approaching Gerogery Road.



Photo 6: Winchester Lane west bound from Gerogery Road.

3.3 Speed Environment

Gerogery Road has a posted speed limits of 80km/h between Wagga Road and the roundabout at Hub Road and 100km/h north of the roundabout. Winchester Lane is subject to speed limit restrictions but the safe operating speed is 60km/h.

3.4 Existing Traffic

3.4.1 Gerogery Road

During June 2018 Albury City Council conducted classifier traffic counts on Gerogery Road between Hub Road/Winchester Lane and Tynan Road/Winchester Lane. The results of the traffic

counts are shown in tables in Appendix B. A summary of the June 2018 ADT, AM and PM weekday peak hour traffic volumes (vph) for Gerogery Road are shown below in the Table 1.

Table 1: ADT, AM and PM Peak hour traffic volumes for Gerogery Road June 2018

June 2018 Location/Direction	ADT weekday	AM	PM	85 th % speed Km/h
Gerogery Road between Hub Road and Winchester Lane (Classifier set up approximately 200m south of Winchester Lane)				
Gerogery Road north bound Lane (Uphill travel lane)	660	33 (11 to 12am)	85 (4 to 5pm)	91.1 (uphill)
Gerogery Road south bound Lane (Downhill travel lane)	575	82 (8 to 9am)	46 (2 to 3pm)	108.7 (downhill)
Gerogery Road between Tynan Road and Winchester Lane (Classifier set up approximately 180m north of Winchester Lane)				
Gerogery Road north bound Lane (Downhill travel lane)	643	35 (11 to 12am)	88 (4 to 5pm)	99.3 (downhill)
Gerogery Road south bound Lane (Uphill travel lane)	654	94 (8 to 9am)	47 (2 to 3pm)	99.5 (uphill)

3.4.2 Winchester Lane

Traffic volumes on Winchester Lane are generated from the AP Delaney Quarry and the Albury Wodonga Clay Target Gun Club (AWCTGC). The following information has been provided by both organisations to assist with the determination of the potential AM and PM peak traffic flows on Winchester Lane.

AP Delaney Quarry

The majority of all traffic accessing the quarry site will enter north bound turning left into Winchester Lane from Gerogery Road and exit south bound by turning right from Winchester Lane into Gerogery Road. Traffic generated by the quarry has south bound origin/destination generators and it's rare that vehicles need to be heading north bound. *Advice from AP Delaney based on existing traffic flows.*

The existing hours of operation for cartage from the quarry when trucks are carting material to construction sites is from 7.30am to 3.00pm.

Table 2 below shows a summary of the actual average AM and PM peak hour truck volumes on Winchester Lane taken from the Assessment of Material Removed from Site table in Appendix A1.

Table 2: AM and PM peak hour traffic truck volumes for Winchester Lane

Year	Total Tonnage Removed Per annum (Actual)	Truck Movements per day (*Note)	Movements per AM/PM (*Note)
2008	55,352	5.4	(0.68) = 1/1
2009	71,738	7.0	(0.88) = 1/1
2010	60,772	5.9	(0.74) = 1/1
2011	45,509	4.4	(0.45) = 1/1
2012	36,751	3.6	(0.45) = 1/1
2013	48,921	4.8	(0.60) = 1/1
2014	36,440	3.5	(0.44) = 1/1
2015	43,122	4.2	(0.53) = 1/1
2016	46,401	4.5	(0.56) = 1/1

**Note: Refer to Appendix A2 for details of the calculation formula for truck movements per tonne of material per day. Truck = truck and trailer combination @ 33 tonne per truck operating 312 days per annum 8 hours per day.*

Between 2008 and 2016 the actual average AM (8.00-9.00) peak hour truck movements coinciding with the peak hour on Gerogery Road = **1 truck entering and exiting Winchester Lane** and PM (5.00-6.00) peak hour truck movements coinciding with the peak hour on Gerogery Road = **0 trucks** (quarry operations close at 3.00pm).

The existing development approval for the quarry allows for the maximum annual production of 75,000 cubic metres. This equates to $75,000 \times 2.2 = 165,000$ tonnes. Truck movements = $165,000 / 33 \text{ truck load} / 312 \text{ days} = 16 \text{ loads} / 8 \text{ hours} = 2 \text{ per hour}$. **The potential AM peak hour movements = 2 trucks and PM = 0 trucks. Weekday average daily traffic 16 trucks x 2 trips = 32**

Quarry operations (excavation and crushing) generally occur during down-time periods of construction and make up approximately 25% of the overall quarry activities. Crushing operations involve 3 operators arriving and departing in one vehicle. **There is potential for 1 light vehicle arriving in the AM peak and exiting during the PM peak. Weekday average daily traffic 1 vehicle x 2 trips = 2**

In addition, there is some minor quarry activity at the front of the site where access is north bound via Winchester Lane and left onto a gravel access track. Egress is via the access track at the base of the Nine Mile Hill. Traffic activity is less than one truck per week and the tonnage removed is included in the Table 2 above and therefore include in the overall site traffic generation.

Albury Wodonga Clay Target Club (AWCTC)

Club President Mr Shane Pinner has provided the following information in relation to traffic movements at Albury Wodonga Clay Target Club on Winchester Lane:

- Opening hours of the range are 10am to 5pm EST and 10am to 7pm daylight saving EST;
- Club events are conducted every second Sunday with approximately 80-100 participants and committee members taking part. Competitors normally arrive at 9.30am for a 10.00am or 11.00am start and depart between 4.30 and 4.30pm. It is estimate that there would be an average of 2 people per vehicle equating to approximately 40-50 vehicles entering and exiting Winchester Lane during the weekend AM and PM;
- Practice at the range normally occurs during weekday afternoons, particularly during daylight savings. Numbers practicing can range from one-on-one coaching to 15-20 people practicing (10 vehicles). Participants arrive after work hours (between 3.00 and 5.00pm) and leave after practice between (5.00-7.00pm). **Potentially there could be 5 vehicles exiting Winchester Lane onto Gerogery Road during the PM (5.00-6.00) peak period. Weekday average daily traffic 10 vehicles x 2 trips = 20;**
- School sporting groups also visit the range and arrive by bus at 1.30pm and leave by 3.00-3.30pm. **Weekday average daily traffic 1 vehicle x 2 trips = 2;**
- Estimated 80/20 split of vehicles with 80% entering Winchester Lane north bound turning left and 20% south bound turning right into Winchester Lane from Gerogery Road. The reverse would occur when exiting.

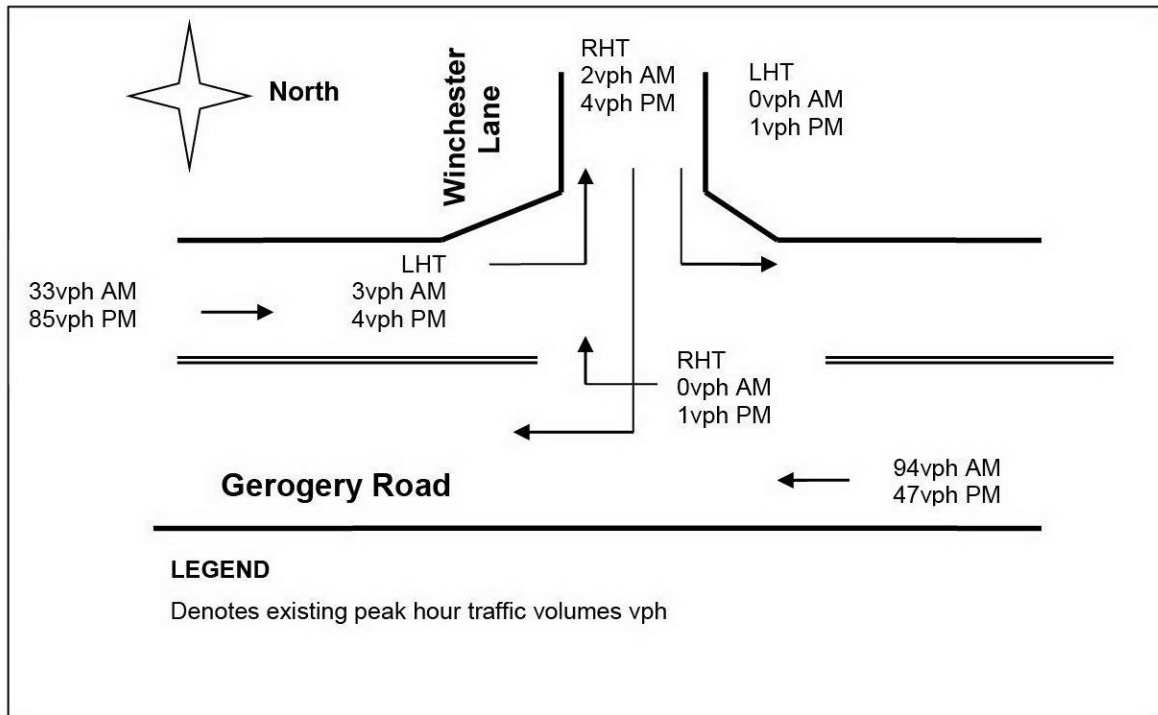
A summary of the estimated existing average daily traffic (ADT) and the direction peak hour traffic volumes (vph) for Winchester Lane are listed below in Table 3.

Table 3: Estimated existing average daily traffic (ADT) and directional AM & PM peak hour traffic volume for Winchester Lane (2018)

Location / Direction	ADT 5-day week	AM peak 8.00-9.00	PM peak 5.00-6.00
Winchester Lane North bound left-turn-in	56 Worst case scenario	2 trucks + 1 car = 3vph	4vph (cars)
Winchester Lane South bound right-turn-in		0 vph	1 vph (car)
Winchester Lane South bound right-turn-out		2 vph (trucks)	4 vph (cars)
Winchester Lane North bound left-turn-out		0 vph	1vph (car)

A summary of the existing estimated turning movements for the Gerogery Road and Winchester Lane intersection are shown in Figure 1.

Figure 1: Existing and estimated AM and PM peak traffic flows at the intersection of the Gerogery Road and Winchester Lane (2018)



The intersection was modelled to determine the level-of-service (LOS) using the intersection analysis program SIDRA Intersection 7.0. Full results for the site are included in Appendix C1 and C2, however the key outcomes may be summarised as follows:

- Gerogery Road and Winchester Lane operate well within capacity in both the AM and PM peak periods with a LOS A for all movements. Minimal delays are experienced, with the worst being on the south bound right-turn into Winchester Lane (average 5.6 seconds AM and 5.7 seconds PM).

3.5 Crash Data

AP Delaney has operated the Rockwood Quarry for over 45 years without any traffic incidents/crashes or injury resulting from traffic movements from the quarry site. The Albury City Council Road Safety Officer advises that the RMS crash data base also confirms that there have been no crashes at or near the intersection of Gerogery Road and Winchester Lane in the past five years.

3.6 Public Transport

Gerogery Road is a designated school bus route and buses operated during the morning and afternoon traffic peaks.

3.7 Cyclists

Gerogery Road is used mostly during the morning and afternoon by recreational cyclists. There are no on or off-road bicycle lanes on Gerogery Road.

4. Proposed Development

AP Delaney is seeking renewal of development approval to continue existing quarry operations at the existing Rockwood Quarry site located at Lots 2 and 3, 208 Winchester Lane, Table Top.

The Quarry operation consists of the following elements:

- The Quarry operated by AP Delaney is not a commercial quarry (not open to general public). Rock is quarried and crushed on-site for use in construction projects by AP Delaney;
- Operating hours will remain at 7.30 am to 3.00 pm;
- Existing access to the Quarry site remains from Winchester Lane via Gerogery Road. The majority of unloaded truck ingress movement is north-bound left turn into Winchester Lane via Gerogery Road and loaded egress movement south-bound right turn onto Gerogery Road. Truck and trailer combinations carrying 33 tonne when fully loaded are used to remove material from the site;
- The existing development approval for the quarry allows for the maximum annual production of 75,000 cubic metres and the renewal of development approval is seeking to raise the possible maximum production to 100,000 cubic metres.

5. Future Traffic Growth and Analysis

5.1 Existing Traffic Growth

A standard 2% per annum traffic growth has been applied to the existing volumes on Gerogery Road to allow for the increase in background traffic volumes arising from general increases across the network. There is no expected percentage increase in background traffic volumes arising from general increases across the network on Winchester Lane from AWCTGC traffic.

5.2 Traffic Generation by Proposed Development

The renewal of development approval is seeking to raise the possible maximum production to 100,000 cubic metres. Historically maximum production allowable at the quarry has not been met but for the purpose of traffic calculations it has been assumed that full production of 100,000 cubic metres could occur by 2038 but this will be subject to demand. *Refer to Appendix A for table of certified assessment of the tonnage of material removed from the site and the quantity of material stockpile upon the site from 2008 to 2016.*

Traffic generation levels for the increase in quarry production are established using the truck movements per tonne of material per day rates suggested by AP Delaney. *Refer to Appendix A2 for details of the calculation formula.*

Truck movements

Cubic metres production p.a x 2.2 = tonnes p.a

Truck = truck and trailer combination @ 33 tonne per truck operating 312 days per annum 8 hours per day.

By applying the above rates to a production of 100,000 cubic metres of quarry rock per annum the quarry activity could potentially generate:

- $100,000 \times 2.2 = 220,000$ tonnes p.a
- Daily truck trips = $220,000 / 33 \text{ truck load} / 312 \text{ days} = \mathbf{21.4 \text{ loads per day (increase of 5.4vph)}}$
- Weekday average peak hour vehicle trips = $21.4 / 8 \text{ hours} = 2.7 \text{ say } \mathbf{3vph \text{ (increase of 1vph)}}$

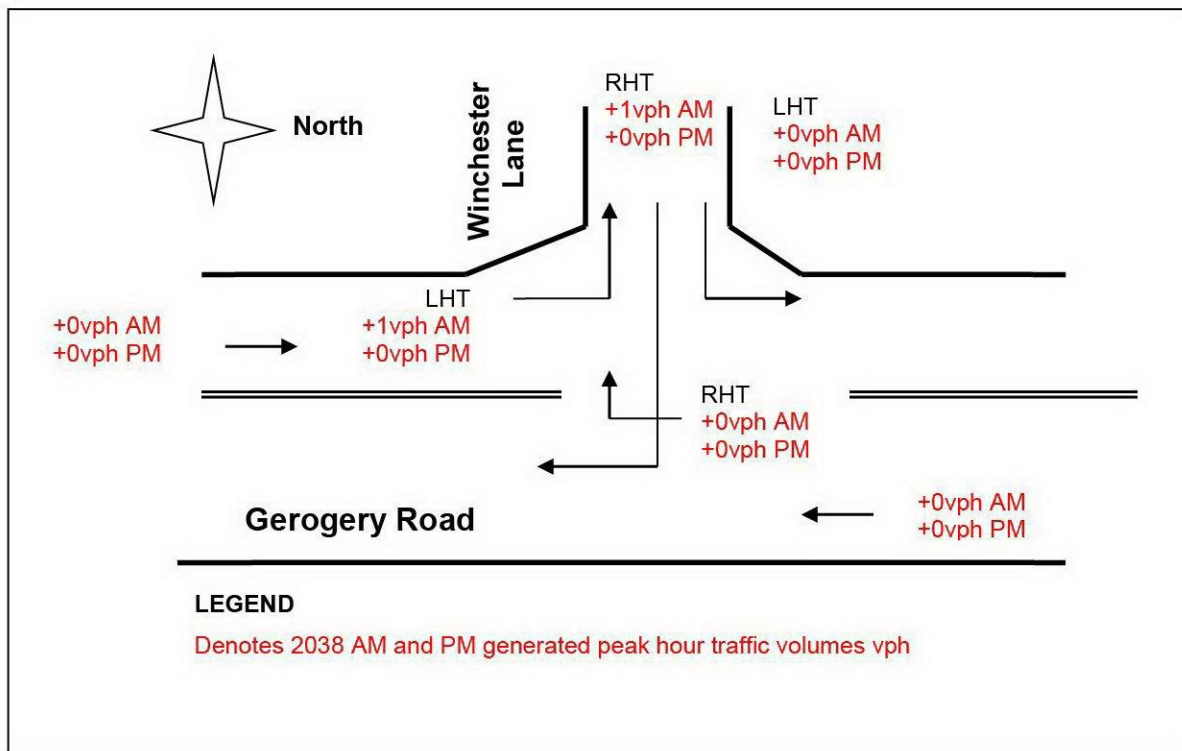
5.3 Traffic Distribution and Analysis

Traffic generated by the quarry development will be distributed throughout the network depending on origin/destination and route choices. This can be estimated by assessing likely origins and destinations based on existing traffic flows. It is assumed the majority of all quarry traffic accessing the quarry site will enter north bound turning left into Winchester Lane from Gerogery Road and exit south bound by turning right from Winchester Lane into Gerogery Road. Traffic generated by the quarry has south bound origin/destination generators and it's rare that vehicles need to be heading north bound. *Advice from AP Delaney based on existing traffic flows.*

These assumptions have been used to determine the additional traffic likely to be generated at the key intersection of Gerogery Road and Winchester Lane

A summary of the additional turning movements for the intersection of Gerogery Road and Winchester Lane are shown in Figure 2 below.

Figure 2: Future 2038 AM and PM peak traffic flows at the intersection of the Gerogery Road and Winchester Lane



6. Impacts & Mitigating Works

The impacts of the renewal of the Rockwood Quarry development approval and the possible increase in maximum production from 75,000 to 100,000 cubic metres on through-traffic on Gerogery Road are primarily related to the low speed turning manoeuvres at the T-junction intersection of Gerogery Road and Winchester Lane.

The impacts are quantified below and appropriate mitigating works are recommended, if required.

6.1 Intersection Performance Gerogery Road and Winchester Lane

A SIDRA analysis of the operation of the existing T-Junction intersection of Gerogery Road and Winchester Lane was undertaken for the forecast and generated future quarry traffic flows for both AM and PM up to year 2037. The analysis determines the future capacity and operational level-of-service (LOS) of the intersection movements. *Refer to Table 4 below for the Austroads definitions of level-of-service.*

Table 4: Level-of-service for capacity and operational analysis for all types of road facilities

Level of service A	A condition of free-flow in which individual drivers are virtually unaffected by the presence of others in the traffic stream. Freedom to select desired speeds and to manoeuvre within the traffic stream is extremely high, and the general level of comfort and convenience provided is excellent.
Level of service B	In the zone of stable flow where drivers still have reasonable freedom to select their desired speed and to manoeuvre within the traffic stream. The general level of comfort and convenience is a little less than with level of service A.
Level of service C	Also in the zone of stable flow, but most drivers are restricted to some extent in their freedom to select their desired speed and to manoeuvre within the traffic stream. The general level of comfort and convenience declines noticeably at this level.
Level of service D	Close to the limit of stable flow and approaching unstable flow. All drivers are severely restricted in their freedom to select their desired speed and to manoeuvre within the traffic stream. The general level of comfort and convenience is poor, and small increases in traffic flow will generally cause operational problems.
Level of service E	Traffic volumes are at or close to capacity, and there is virtually no freedom to select desired speeds or to manoeuvre within the traffic stream. Flow is unstable and minor disturbances within the traffic stream will cause breakdown.
Level of service F	In the zone of forced flow, where the amount of traffic approaching the point under consideration exceeds that which can pass it. Flow breakdown occurs, and queuing and delays result.

SIDRA Movement Summary results for the intersection of Gerogery Road and Winchester Lane are included in Appendix C3 and C4, however the key outcomes may be summarised as follows:

- Gerogery Road and Winchester Lane intersection continues to operate well within capacity at a Level of Service of A in both the AM and PM peak periods at 2038. Minimal delays are experienced; with the worst being still Gerogery Road south bound right-turn into Winchester Lane (average 5.6 seconds AM and 5.9 seconds PM)

6.2 Sight Distance

6.2.1 Design Speed

The existing posted speed limit for Gerogery Road at the intersection of Winchester Lane is 100km/h.

The operational speed or 85th percentile speed for Gregory Road on both the north and south bound approaches to the intersection of Gerogery Road and Winchester Lane has been determined using traffic classifiers. Results indicate that the 85th percentile speed for Gregory Road for both the uphill north and south bound approaches to the intersection of Gerogery Road and Winchester Lane are **91.1 km/h** and **99.5 km/h** respectively. The results of the speed statistics are shown in tables in Appendix B and a summary shown in Table 1. AGRD Part 3 Geometric Design Section 3.5 Determining Desired Speed suggests the following:

...the desired speed may be measured directly as the 85th percentile speed on long straights or large radius horizontal curves where there has been sufficient length for drivers to maintain a constant speed to suit the surrounding terrain.

The above 85th percentile speed results indicate it would be appropriate to adopt a 100km/h design speed for calculations of sight distance for the Safe Intersection Sight Distance and the Minimum Gap Sight Distance requirements for the existing intersection of Gerogery Road and Winchester Lane.

6.2.2 Safe Intersection Sight Distance

The Safe Intersection Sight Distance (SISD) is the minimum sight distance which should be provided on the major road at any intersection. The minimum SISD as set out in the *AGRD Part 4A: Section 3 Sight Distance, Table 3.2* for design speeds of 100km/h are shown below:

- **100km/h design speed:** Calculated SISD of 262m for a reaction time of 2.5 seconds (trucks) with the SISD reduced to **251m** with a 11m reduction for an average 4% uphill grade in accordance with Table 3.4: Grade corrections to ASD and SISD (cars);

Gerogery Road North Bound Approach SISD

An inter-visible SISD of **251m** for Gerogery Road on the north bound approach to the intersection of Gerogery Road and Winchester Lane was measured in accordance with *AGRD Part 4A: Section 3 Sight Distance, Figure 3.2 with a 5m offset.*

The results indicate that the measured SISD of 251m for the north bound approach is considered to be within acceptable practical limits and meets the *AGRD Part 4A* requirements of SISD for a design speed of 100km/h. In addition, the sight lines at the intersection of north bound traffic have not been maintained and sucker trees (15 less than 100mm diameter) and small trees (8 up to 200mm diameter) and low branches (3 lots) that have been allowed to grow uncontrolled on the road verge are restricting SISD sight lines. The smaller sucker trees and branches are a pre-existing condition and their removal by Albury City Council, the responsible road authority would provide clear sight lines. *Refer Photo 1.*

Note: Observations and measurements indicate that a SISD of 287m for a design speed of 110km/h would be very difficult to achieve because of the topography and a large number of trees on the western road verge (environmental zone) blocks sight lines. Extensive earthworks to remove a small knoll and tree removal on the road verge would be required to achieve SISD of 287m for a 110km/h design speed. *Refer Photo 7 below.*



Photo 7: Gerogery Road north bound at 287m from Winchester Lane

Gerogery Road South Bound Approach SISD

An inter-visible SISD of **180m** for Gerogery Road on the south bound approach to the intersection of Gerogery Road and Winchester Lane was measured in accordance with *AGRD Part 4A: Section 3 Sight Distance, Figure 3.2 with a 5m offset*.

The results indicate that the measured 180m SISD for a design speeds of 100km/h on the south bound approach does not meet AGRD Part 4A requirements.

However, preliminary designs prepared by AP Delaney indicate that the existing cutting embankment on the western side of Gerogery Road can be excavated to achieve an inter-visible SISD of over 250m for Gerogery Road on the south bound approach to the intersection of Gerogery Road and Winchester Lane. *Refer to Appendix D for details of the preliminary designs of sight improvements.*

The intersection of Gerogery Road and Winchester Lane has an historical deficiency in the SISD on the on the south bound approach. There is evidence of old survey/construction set out pegs along the existing cutting embankment that would indicate that improvements to the SISD were investigated by previous road authorities (RMS, Hume Shire Council or Greater Hume Council). Both Gerogery Road and Winchester Lane are classified as local roads and the intersection connection to Winchester Lane is currently used by AP Delaney and Albury Wodonga Clay Target Club.

Even though AP Delaney are seeking a renewal of approval to continue the Rockwood Quarry operations, it would be appropriate for any construction works to improve the SISD on the south bound approach to the intersection been done on a cost sharing basis suitably arranged between Albury City Council and AP Delaney.

6.2.3 Minimum Gap Sight Distance

Minimum Gap Sight Distance (MGSD) is based on distances corresponding to the critical acceptance gap that drivers are prepared to accept when undertaking a crossing or turning manoeuvres at intersections. The MGSD as set out in the *AGRD Part 4A: Section 3 Sight Distance*, Table 3.6 for 85th Percentile speeds of 100km/h are shown below:

- **100km/h 85th Percentile speed:** Calculated MGSD of 139m for a critical gap acceptance time $^*(ta)$ of 5 seconds for all movements of two lane /two-way traffic with the approaching vehicle required to slow if necessary;

Note: A critical gap acceptance time $^(ta)$ of 5 seconds for all movements of two lane /two-way traffic requiring the approaching vehicle to slow has been selected because Gerogery Road is classified as a local rural road and it is reasonable to expect drivers on this type of road to slow down or adjust their speed when they approach another vehicle turning from or entering the main road.

A critical gap acceptance time $^*(ta)$ of 14-40 seconds is generally used where there is to be no interference or slowing down of a vehicle approaching another vehicle turning from or entering the main road and is normally used on types of roads such as major Highways, Freeways or Motorways.

Gerogery Road North Bound Approach MGSD

A MGSD of **160m** for Gerogery Road on the north bound approach to the intersection of Gerogery Road and Winchester Lane was measured in accordance with the possible conflict movements as shown in *AGRD Part 4A: Section 3 Sight Distance*, Figures 3.4, 3.5 and 3.6.

The results indicate that the measured MGSD of 160m for the north bound approached is considered to be acceptable and meets the AGRD Part 4A requirements of MGSD for a speed of 100km/h.

In addition, small sucker trees and low branches that have been allowed to grow uncontrolled on the road verge are restricting MGSD sight lines.

Gerogery Road South Bound Approach MGSD

A MGSD of **170m** for Gerogery Road on the south bound approach to the intersection of Gerogery Road and Winchester Lane was measured in accordance with the possible conflict movements as shown in *AGRD Part 4A: Section 3 Sight Distance*, Figures 3.4, 3.5 and 3.6.

The results indicate that the measured MGSD of 170m for the south bound approached is considered to be acceptable and meets the AGRD Part 4A requirements of MGSD for a speed of 100km/h.

6.3 Speed Limits

The speed limit on Gerogery Road between the Gerogery Road/Hub Road roundabout and Wagga Road was recently reduce from 100km/h to 80km/h. The speed limit was reduced to improve traffic safety along this section of Gerogery Road and to reduce the approach speed at the new roundabout.

Similar traffic safety benefits could also be achieved by reducing the speed limit to 80km/h on the section of Gerogery Road between the Hub Road roundabout and Himalaya Drive. The traffic safety issues identified for this section of Gerogery Road are listed below:

- School bus zone with shelter on Gerogery Road adjacent to the Himalaya Drive T-junction. Morning and afternoon pick-up and drop-off. Parent parking and children close to edge of road;
- School bus zone with shelter on the south east side of Gerogery Road at Tynan Road T-junction. Morning and afternoon pick-up and drop-off. Parent parking and children close to edge of road;
- Property entrance on eastern side of Gerogery Road close to top of crest of Nine Mile Hill has restricted sight distance of north bound traffic;
- The intersection of Gerogery Road and Winchester Lane has restricted sight distance of south bound traffic. The reduction in speed limit to 80km/h would allow the required SISD 181m to be achieved. This would also eliminate the need to remove the cutting embankment to achieve a SISD for 100km/h;
- Recreational and service access to reserve on east side of Gerogery Road has restricted sight distance for both north and south bound traffic;
- Property access on west side of Gerogery Road near southern end of Nine Mile Hill has restricted sight distance;
- Straight section of Gerogery Road with a high speed downhill approach to Gerogery Road/Hub Road roundabout. A reduction in speed limit would improve motorist's ability to identify the roundabout hazard.

6.4 Winchester Lane Bitumen Apron

The existing bitumen apron in Winchester Lane connecting to Gerogery Road is severely pot holed and damaged with loose gravel covering most of the apron. Vehicles (particularly cars) entering onto Gerogery Road are losing traction in the loose gravel and losing critical manoeuvring time when turning onto Gerogery Road. The loose gravel should be swept off the bitumen and the pot holes filled to improve the safety of the intersection. *Refer to Photos 1, 2 and 5.*

7. Conclusions and Recommendations

It is concluded that:

- The existing intersection of Gerogery Road and Winchester Lane operates well within capacity at a Level-of-Service of A in both the AM and PM peak periods at 2016 traffic flows and will continue to operate within capacity at a Level-of-Service of A at 2037 with the addition of forecast and generated maximum production quarry traffic. It is determined that the continued operation of the Rockwood Quarry will have a minimal impact on the existing road network;
- The existing T-junction intersection of Gerogery Road and Winchester Lane will adequately cater for the existing and the very minor increase (AM +2vph and +6vpd) in quarry generated turning traffic;
- SISD criteria for a design speed of 100km/h for the north bound approach is within acceptable practical limits;
- SISD criteria for 100km/h design speed is not met on the south bound approach to the intersection of Gerogery Road and Winchester Lane, however the existing cutting embankment on the western side of Gerogery Road can be excavated to achieve an inter-visible SISD of over 250m for Gerogery Road;
- MGSD criteria for speeds of 100km/h are met for both the north and south bound approaches to the intersection of Gerogery Road and Winchester Lane;
- The removal of small trees and branches will enable the provision of clear sight lines for the SISD and MGSD on the north bound approach to the intersection of Gerogery Road and Winchester Lane;
- Repairs to the bitumen apron in Winchester Lane will improve traffic safety;
- If the speed limit between the Gerogery Road/Hub Road roundabout and Himalaya Drive was reduced to 80km/h traffic safety would be improved and a SISD for a design speed of 80km/h could be achieved without any excavation works to the existing cutting embankment.
- It is concluded that the minimal potential increase in traffic flow (AM +2vph and +6vpd) generated by the increase in quarry production will have no effect on safety at the intersection.

It is recommended that:

- Albury City Council concurs with the renewal of the Rockwood Quarry development approval and the increase in the quarry production from 75,000 to 100,000 cubic metres per annum;
- The small trees and branches on the road verge to be removed to provide clear sight line are a pre-existing situation that is the responsibility of the road authority;
- Albury City Council investigate the traffic safety benefits of reducing of the speed limit to 80km/h on Gerogery Road between the Gerogery Road/Hub Road roundabout and Himalaya Drive and if warranted Council make application to the RMS to reduce the speed limit;
- If the speed limit can't be reduced to 80km/h then Albury City Council concurs with the removal of the existing western cutting embankment to obtain the north bound SISD and that a cost sharing arrangement for the construction works between Albury City Council and AP Delaney be investigated;
- Albury City Council concurs that the measured SISD of 250m for the north bound approach is acceptable and within practical limits. Additionally, because the existing quarry activities and other vehicle movements have not caused any reported traffic incidents or crashes at or near the intersection of Gerogery Road and Winchester Lane in the past five years a design speed of 100km/h be adopted for all sight distance calculations;
- Albury City Council carry out repair works to the existing bitumen apron in Winchester Lane.

Appendix A

- A1: Condition 20.3 Assessment of Material Removed From Site. Certified assessment of the tonnage of material removed from the site and the quantity of material stockpile upon the site from 2008 to 2016;
- A2: Vehicle (truck and trailer combination) generation calculations from the quarry site for annual production of 75,000 and 100,000 cubic metres.

A1: Condition 20.3 Assessment of Material Removed From Site

CONDITION 20.3 - ASSESSMENT OF MATERIAL REMOVED FROM SITE						
<i>A certified assessment of the tonnage of material removed from the site and the quantity of material stockpiled upon the site. Quantities are measured in tonnes.</i>						
2008	FCR	Recycled FCR	Beaching	Buckshot	Topsoil	TOTAL
PRODUCTN	22,612	23,643	740	8,330	27	55,352
STOCKPILE	5,000	500	1,000	500	Nil	7,000
2009						
PRODUCTN	54,770	9,960	954	5,705	Nil	71,738
STOCKPILE	8,000	300	1,500	350	Nil	10,150
2010						
PRODUCTN	40,114	13,874	1,477	5,307	Nil	60,772
STOCKPILE	2,500	500	1,000	250	Nil	4,250
2011						
PRODUCTN	30,878	9,672	868	4,091	Nil	45,509
STOCKPILE	2,000	750	750	500	Nil	5,750
2012						
PRODUCTN	23,468	5,152	2,123	6,008	Nil	36,751
STOCKPILE	750	5,000	250	1,500	Nil	7,500
2013						-
PRODUCTN	37,203	5,240	732	5,746		48,921
STOCKPILE						-
2014						-
PRODUCTN	25,052	6,095	907	4,386		36,440
STOCKPILE						-
2015						-
PRODUCTN	23,593	14,404	1,168	3,957		43,122
STOCKPILE						-
2016						-
PRODUCTN	31,338	8,636	1,130	5,297	Nil	46,401
STOCKPILE						-
						-
						-

A2: Vehicle (truck and trailer combination) generation calculations from the quarry site for annual production of 75,000 and 100,000 cubic metres.

15/09/2017

ROCKWOOD QUARRY



TRAFFIC:

THEORETICAL TRAFFIC:

MAXIMUM ALLOWED ANNUAL PRODUCTION: 75,000 M³

$75,000 \text{ M}^3 \times 2.2 \text{ TONNES / M}^3 = 165,000 \text{ TONNES P.A.}$

$165,000 \text{ T} / 33 \text{ TONNES / TRUCK LOAD}$

$= 5,000 \text{ TRUCK LOADS PER ANNUM}$

@ 6 DAYS / WEEK $\times$ 52 WEEKS = 312 DAYS

$\therefore$ AVE TRAFFIC: $5000 / 312 \text{ DAYS}$
 $= 16.0 \text{ LOADS / DAY}$
 $= 2.0 \text{ LOADS / HR.}$

IF CAPACITY IS RAISED TO 100,000 M³

SUMS BECOME:

$100,000 \times 2.2 = 220,000$

$220,000 / 33 = 6,666$

$6666 / 312 = 21 \text{ LOADS / DAY}$

$= 2.7 \text{ LOADS / HR.}$

Appendix B

Gerogery Road Traffic Data (2018):

B1: Gerogery Road between Hub Road and Winchester Lane north bound direction
Virtual weekly count

B2: Gerogery Road between Hub Road and Winchester Lane south bound direction
Virtual weekly count

B3: Gerogery Road between Hub Road and Winchester Lane north bound direction
speed Statistics

B4: Gerogery Road between Hub Road and Winchester Lane south bound direction
speed Statistics

B5: Gerogery Road between Tynan Road and Winchester Lane north bound direction
Virtual weekly count

B6: Gerogery Road between Tynan Road and Winchester Lane south bound direction
Virtual weekly count

B7: Gerogery Road between Tynan Road and Winchester Lane north bound direction
speed Statistics

B8: Gerogery Road between Tynan Road and Winchester Lane south bound direction
speed Statistics

B1: Gerogery Road between Hub Road and Winchester Lane north bound direction Virtual weekly count

MetroCount Traffic Executive
Weekly Vehicle Counts (Virtual Week)

VirtWeeklyVehicle-48 -- English (ENA)

Datasets:

Site: [129518] Gerogery Road - Hub Road to Winchester Lane
 Direction: 7 - North bound A>B, South bound B>A. Lane: 0
 Survey Duration: 9:14 Thursday, 24 May 2018 => 16:47 Wednesday, 6 June 2018
 Zone:
 File: Gerogery Road - Hub Road to Winchester lane (next to Winchester) June18.ec0 (Plus)
 Identifier: Y8536TKM MC56-L5 [MC55] (c)Microcom 19Oct04
 Algorithm: Factory default (v3.21 - 15315)
 Data type: Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time: 9:00 Tuesday, 29 May 2018 => 14:00 Tuesday, 5 June 2018
 Included classes: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10
 Speed range: 10 - 160 km/h.
 Direction: North (bound)
 Separation: All - (Headway)
 Name: Default Profile
 Scheme: Vehicle classification (AustRoads94)
 Units: Metric (meter, kilometer, m/s, km/h, kg, tonne)
 In profile: Vehicles = 4542 / 8810 (51.56%)

Weekly Vehicle Counts (Virtual Week)

VirtWeeklyVehicle-48

Site: 129518.0.0NS
 Description: Gerogery Road - Hub Road to Winchester Lane
 Filter time: 9:00 Tuesday, 29 May 2018 => 14:00 Tuesday, 5 June 2018
 Scheme: Vehicle classification (AustRoads94)
 Filter: CIs(1 2 3 4 5 6 7 8 9 10) Dir(N) Sp(10,160) Headway(>0)

	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Averages	
								1 - 5	1 - 7
Hour									
0000-0100	1.0	0.0	2.0	0.0	1.0	1.0	3.0	0.8	1.1
0100-0200	0.0	0.0	1.0	0.0	1.0	3.0	2.0	0.4	1.0
0200-0300	0.0	4.0	0.0	0.0	0.0	0.0	2.0	0.8	0.9
0300-0400	0.0	0.0	0.0	1.0	1.0	1.0	1.0	0.4	0.6
0400-0500	0.0	0.0	2.0	1.0	0.0	0.0	0.0	0.6	0.4
0500-0600	5.0	3.0	2.0	4.0	4.0	2.0	3.0	3.6	3.3
0600-0700	19.0	20.0	16.0	20.0	17.0	8.0	7.0	18.4	15.3
0700-0800	25.0	31.0	28.0	20.0	23.0	11.0	6.0	25.4	20.6
0800-0900	30.0	34.0	39.0<	39.0	24.0	14.0	14.0	33.2	27.7
0900-1000	31.0	31.0	24.0	40.0<	30.0	37.0	23.0	31.2	30.9
1000-1100	41.0<	37.5	36.0	31.0	34.0	49.0	37.0	36.2	37.9
1100-1200	39.0	43.5<	27.0	33.0	36.0<	57.0<	56.0<	37.0<	41.9<
1200-1300	39.0	42.5	36.0	48.0	38.0	60.0<	50.0	41.0	44.5
1300-1400	39.0	47.5	54.0	33.0	43.0	57.0	48.0	44.0	46.1
1400-1500	43.0	36.0	48.0	48.0	56.0	44.0	48.0	46.2	46.1
1500-1600	60.0	64.0	77.0	64.0	59.0	43.0	50.0	64.8	59.6
1600-1700	90.0<	76.0<	95.0<	82.0<	82.0<	48.0	54.0<	85.0<	75.3<
1700-1800	78.0	72.0	87.0	78.0	71.0	36.0	38.0	77.2	65.7
1800-1900	42.0	46.0	52.0	50.0	40.0	26.0	19.0	46.0	39.3
1900-2000	22.0	37.0	18.0	27.0	26.0	16.0	16.0	26.0	23.1
2000-2100	13.0	17.0	22.0	25.0	15.0	19.0	9.0	18.4	17.1
2100-2200	11.0	12.0	12.0	14.0	23.0	8.0	3.0	14.4	11.9
2200-2300	4.0	9.0	5.0	6.0	8.0	9.0	1.0	6.4	6.0
2300-2400	2.0	3.0	7.0	2.0	3.0	9.0	1.0	3.4	3.9
Totals									
0700-1900	557.0	561.0	603.0	566.0	536.0	482.0	443.0	567.1	535.5
0600-2200	622.0	647.0	671.0	652.0	617.0	533.0	478.0	644.3	603.0
0600-0000	628.0	659.0	683.0	660.0	628.0	551.0	480.0	654.1	612.8
0000-0000	634.0	666.0	690.0	666.0	635.0	558.0	491.0	660.7	620.1
AM Peak	1000	1100	0800	0900	1100	1100	1100		
	41.0	43.5	39.0	40.0	36.0	57.0	56.0		
PM Peak	1600	1600	1600	1600	1600	1200	1600		
	90.0	76.0	95.0	82.0	82.0	60.0	54.0		
* - No data.									

B2: Gerogery Road between Hub Road and Winchester Lane south bound direction Virtual weekly count

MetroCount Traffic Executive
Weekly Vehicle Counts (Virtual Week)

VirtWeeklyVehicle-49 -- English (ENA)

Datasets:

Site: [129518] Gerogery Road - Hub Road to Winchester Lane
Direction: 7 - North bound A>B, South bound B>A. Lane: 0
Survey Duration: 9:14 Thursday, 24 May 2018 => 16:47 Wednesday, 6 June 2018
Zone:
File: Gerogery Road - Hub Road to Winchester lane (next to Winchester) June18.ec0 (Plus)
Identifier: Y8536TKM MC56-L5 [MC55] (c)Microcom 19Oct04
Algorithm: Factory default (v3.21 - 15315)
Data type: Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time: 9:00 Tuesday, 29 May 2018 => 14:00 Tuesday, 5 June 2018
Included classes: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10
Speed range: 10 - 160 km/h.
Direction: South (bound)
Separation: All - (Headway)
Name: Default Profile
Scheme: Vehicle classification (AustRoads94)
Units: Metric (meter, kilometer, m/s, km/h, kg, tonne)
In profile: Vehicles = 4114 / 8810 (46.70%)

Weekly Vehicle Counts (Virtual Week)

VirtWeeklyVehicle-49

Site: 129518.0.ONS
Description: Gerogery Road - Hub Road to Winchester Lane
Filter time: 9:00 Tuesday, 29 May 2018 => 14:00 Tuesday, 5 June 2018
Scheme: Vehicle classification (AustRoads94)
Filter: Cls(1 2 3 4 5 6 7 8 9 10) Dir(S) Sp(10,160) Headway(>0)

	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Averages	
								1 - 5	1 - 7
Hour									
0000-0100	0.0	1.0	0.0	1.0	1.0	1.0	2.0	0.6	0.9
0100-0200	1.0	0.0	0.0	0.0	0.0	1.0	2.0	0.2	0.6
0200-0300	3.0	4.0	0.0	1.0	0.0	2.0	2.0	1.6	1.7
0300-0400	0.0	1.0	1.0	3.0	2.0	0.0	0.0	1.4	1.0
0400-0500	3.0	3.0	0.0	3.0	1.0	2.0	1.0	2.0	1.9
0500-0600	11.0	13.0	0.0	15.0	18.0	7.0	3.0	11.4	9.6
0600-0700	42.0	43.0	1.0	45.0	45.0	19.0	11.0	35.2	29.4
0700-0800	71.0	74.0	0.0	72.0	62.0	24.0	13.0	55.8	45.1
0800-0900	110.0<	96.0<	2.0	103.0<	97.0<	48.0	35.0	81.6<	70.1<
0900-1000	56.0	54.0	2.0<	47.0	53.0	66.0<	43.0<	44.3	46.9
1000-1100	41.0	42.5	1.0	54.0	40.0	58.0	39.0	36.8	39.8
1100-1200	35.0	39.5	1.0	55.0	28.0	56.0	36.0	33.0	36.3
1200-1300	30.0	39.0<	15.0	28.0	35.0	46.0<	47.0<	31.0	34.9
1300-1400	35.0	37.5	22.0	29.0	36.0	45.0	39.0	32.8	35.1
1400-1500	42.0	38.0	46.0	51.0<	52.0<	34.0	46.0	45.8<	44.1<
1500-1600	54.0	6.0	40.0	46.0	47.0	34.0	36.0	38.6	37.6
1600-1700	54.0<	0.0	56.0<	48.0	42.0	35.0	42.0	40.0	39.6
1700-1800	40.0	2.0	55.0	44.0	42.0	42.0	38.0	36.6	37.6
1800-1900	22.0	1.0	25.0	20.0	22.0	26.0	19.0	18.0	19.3
1900-2000	12.0	2.0	16.0	19.0	16.0	14.0	19.0	13.0	14.0
2000-2100	8.0	0.0	6.0	12.0	8.0	4.0	5.0	6.8	6.1
2100-2200	7.0	1.0	3.0	9.0	6.0	5.0	2.0	5.2	4.7
2200-2300	1.0	1.0	1.0	3.0	2.0	4.0	1.0	1.6	1.9
2300-2400	1.0	0.0	3.0	0.0	5.0	6.0	0.0	1.8	2.1
Totals									
0700-1900	590.0	429.5	265.0	597.0	556.0	514.0	433.0	494.4	486.3
0600-2200	659.0	475.5	291.0	682.0	631.0	556.0	470.0	554.6	540.6
0600-0000	661.0	476.5	295.0	685.0	638.0	566.0	471.0	558.0	544.6
0000-0000	679.0	498.5	296.0	708.0	660.0	579.0	481.0	575.2	560.2
AM Peak	0800	0800	0900	0800	0800	0900	0900		
	110.0	96.0	2.0	103.0	97.0	66.0	43.0		
PM Peak	1600	1200	1600	1400	1400	1200	1200		
	54.0	39.0	56.0	51.0	52.0	46.0	47.0		
* - No data.									

B3: Gerogery Road between Hub Road and Winchester Lane north bound direction speed Statistics

MetroCount Traffic Executive Speed Statistics

SpeedStat-50 -- English (ENA)

Datasets:

Site: [129518] Gerogery Road - Hub Road to Winchester Lane
Direction: 7 - North bound A>B, South bound B>A. Lane: 0
Survey Duration: 9:14 Thursday, 24 May 2018 => 16:47 Wednesday, 6 June 2018
Zone:
File: Gerogery Road - Hub Road to Winchester lane (next to Winchester) June18.ec0 (Plus)
Identifier: Y8536TKM MC56-L5 [MC55] (c)Microcom 19Oct04
Algorithm: Factory default (v3.21 - 15315)
Data type: Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time: 9:00 Tuesday, 29 May 2018 => 14:00 Tuesday, 5 June 2018
Included classes: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10
Speed range: 10 - 160 km/h.
Direction: North (bound)
Separation: All - (Headway)
Name: Default Profile
Scheme: Vehicle classification (AustRoads94)
Units: Metric (meter, kilometer, m/s, km/h, kg, tonne)
In profile: Vehicles = 4542 / 8810 (51.56%)

Speed Statistics

SpeedStat-50

Site: 129518.0.0NS
Description: Gerogery Road - Hub Road to Winchester Lane
Filter time: 9:00 Tuesday, 29 May 2018 => 14:00 Tuesday, 5 June 2018
Scheme: Vehicle classification (AustRoads94)
Filter: Cls(1 2 3 4 5 6 7 8 9 10) Dir(N) Sp(10,160) Headway(>0)

Vehicles = 4542

Posted speed limit = 60 km/h, Exceeding = 4149 (91.35%), Mean Exceeding = 82.26 km/h

Maximum = 121.5 km/h, Minimum = 15.3 km/h, Mean = 78.8 km/h

85% Speed = 91.1 km/h, 95% Speed = 96.1 km/h, Median = 81.0 km/h

20 km/h Pace = 73 - 93, Number in Pace = 3012 (66.31%)

Variance = 209.93, Standard Deviation = 14.49 km/h

Speed Bins (Partial days)

Speed	Bin	Below	Above	Energy	vMult	n * vMult
0 - 10	0 0.0%	0 0.0%	4542 100.0%	0.00	0.00	0.00
10 - 20	11 0.2%	11 0.2%	4531 99.8%	0.00	0.00	0.00
20 - 30	12 0.3%	23 0.5%	4519 99.5%	0.00	0.00	0.00
30 - 40	182 4.0%	205 4.5%	4337 95.5%	0.00	0.00	0.00
40 - 50	73 1.6%	278 6.1%	4264 93.9%	0.00	0.00	0.00
50 - 60	115 2.5%	393 8.7%	4149 91.3%	0.00	0.00	0.00
60 - 70	398 8.8%	791 17.4%	3751 82.6%	0.00	0.00	0.00
70 - 80	1245 27.4%	2036 44.8%	2506 55.2%	0.00	0.00	0.00
80 - 90	1657 36.5%	3693 81.3%	849 18.7%	0.00	0.00	0.00
90 - 100	779 17.2%	4472 98.5%	70 1.5%	0.00	0.00	0.00
100 - 110	64 1.4%	4536 99.9%	6 0.1%	0.00	0.00	0.00
110 - 120	5 0.1%	4541 100.0%	1 0.0%	0.00	0.00	0.00
120 - 130	1 0.0%	4542 100.0%	0 0.0%	0.00	0.00	0.00
130 - 140	0 0.0%	4542 100.0%	0 0.0%	0.00	0.00	0.00
140 - 150	0 0.0%	4542 100.0%	0 0.0%	0.00	0.00	0.00
150 - 160	0 0.0%	4542 100.0%	0 0.0%	0.00	0.00	0.00
160 - 170	0 0.0%	4542 100.0%	0 0.0%	0.00	0.00	0.00
170 - 180	0 0.0%	4542 100.0%	0 0.0%	0.00	0.00	0.00
180 - 190	0 0.0%	4542 100.0%	0 0.0%	0.00	0.00	0.00
190 - 200	0 0.0%	4542 100.0%	0 0.0%	0.00	0.00	0.00

Total Speed Rating = 0.00

Total Moving Energy (Estimated) = 0.00

Speed limit fields (Partial days)

Limit	Below	Above
0 60 (PSL)	393 8.7%	4149 91.3%

B4: Gerogery Road between Hub Road and Winchester Lane south bound direction speed Statistics

SpeedStat-51 -- English (ENA)

MetroCount Traffic Executive Speed Statistics

SpeedStat-51 -- English (ENA)

Datasets:

Site: [129518] Gerogery Road - Hub Road to Winchester Lane
Direction: 7 - North bound A>B, South bound B>A. Lane: 0
Survey Duration: 9:14 Thursday, 24 May 2018 => 16:47 Wednesday, 6 June 2018
Zone:
File: Gerogery Road - Hub Road to Winchester lane (next to Winchester) June18.ec0 (Plus)
Identifier: Y8536TKM MC56-L5 [MC55] (c)Microcom 19Oct04
Algorithm: Factory default (v3.21 - 15315)
Data type: Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time: 9:00 Tuesday, 29 May 2018 => 14:00 Tuesday, 5 June 2018
Included classes: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10
Speed range: 10 - 160 km/h.
Direction: South (bound)
Separation: All - (Headway)
Name: Default Profile
Scheme: Vehicle classification (AustRoads94)
Units: Metric (meter, kilometer, m/s, km/h, kg, tonne)
In profile: Vehicles = 4114 / 8810 (46.70%)

SpeedStat-51 Page 2

Speed Statistics

SpeedStat-51

Site: 129518.0.ONS
Description: Gerogery Road - Hub Road to Winchester Lane
Filter time: 9:00 Tuesday, 29 May 2018 => 14:00 Tuesday, 5 June 2018
Scheme: Vehicle classification (AustRoads94)
Filter: Cls(1 2 3 4 5 6 7 8 9 10) Dir(S) Sp(10,160) Headway(>0)

Vehicles = 4114

Posted speed limit = 60 km/h, Exceeding = 4009 (97.45%), Mean Exceeding = 96.88 km/h

Maximum = 157.7 km/h, Minimum = 18.9 km/h, Mean = 95.7 km/h

85% Speed = 108.7 km/h, 95% Speed = 115.2 km/h, Median = 97.2 km/h

20 km/h Pace = 90 - 110, Number in Pace = 2411 (58.60%)

Variance = 215.82, Standard Deviation = 14.69 km/h

Speed Bins (Partial days)

Speed	Bin	Below	Above	Energy	vMult	n * vMult
0 - 10	0 0.0%	0 0.0%	4114 100.0%	0.00	0.00	0.00
10 - 20	1 0.0%	1 0.0%	4113 100.0%	0.00	0.00	0.00
20 - 30	1 0.0%	2 0.0%	4112 100.0%	0.00	0.00	0.00
30 - 40	4 0.1%	6 0.1%	4108 99.9%	0.00	0.00	0.00
40 - 50	49 1.2%	55 1.3%	4059 98.7%	0.00	0.00	0.00
50 - 60	50 1.2%	105 2.6%	4009 97.4%	0.00	0.00	0.00
60 - 70	95 2.3%	200 4.9%	3914 95.1%	0.00	0.00	0.00
70 - 80	329 8.0%	529 12.9%	3585 87.1%	0.00	0.00	0.00
80 - 90	678 16.5%	1207 29.3%	2907 70.7%	0.00	0.00	0.00
90 - 100	1167 28.4%	2374 57.7%	1740 42.3%	0.00	0.00	0.00
100 - 110	1220 29.7%	3594 87.4%	520 12.6%	0.00	0.00	0.00
110 - 120	427 10.4%	4021 97.7%	93 2.3%	0.00	0.00	0.00
120 - 130	66 1.6%	4087 99.3%	27 0.7%	0.00	0.00	0.00
130 - 140	17 0.4%	4104 99.6%	10 0.2%	0.00	0.00	0.00
140 - 150	7 0.2%	4111 99.8%	3 0.1%	0.00	0.00	0.00
150 - 160	3 0.1%	4114 100.0%	0 0.0%	0.00	0.00	0.00
160 - 170	0 0.0%	4114 100.0%	0 0.0%	0.00	0.00	0.00
170 - 180	0 0.0%	4114 100.0%	0 0.0%	0.00	0.00	0.00
180 - 190	0 0.0%	4114 100.0%	0 0.0%	0.00	0.00	0.00
190 - 200	0 0.0%	4114 100.0%	0 0.0%	0.00	0.00	0.00

Total Speed Rating = 0.00

Total Moving Energy (Estimated) = 0.00

Speed limit fields (Partial days)

Limit	Below	Above
0 60 (PSL)	105 2.6%	4009 97.4%

B5: Gerogery Road between Tynan Road and Winchester Lane north bound direction Virtual weekly count

MetroCount Traffic Executive
Weekly Vehicle Counts (Virtual Week)

VirtWeeklyVehicle-368 -- English (ENA)

Datasets:

Site: [229518] Gerogery Road - Winchester Lane to Tynan Road
Attribute: Ettamogah
Direction: 7 - South bound A>B, North bound B>A. Lane: 0
Survey Duration: 9:18 Thursday, 24 May 2018 => 16:53 Wednesday, 6 June 2018,
Zone:
File: Gerogery Road - Winchester Lane to Tynan Road (next to Winchester) June18.ec0 (Plus)
Identifier: NR50QDFM MC5900-X13 (c)MetroCount 09Nov16
Algorithm: Factory default axle (v5.02)
Data type: Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time: 9:00 Tuesday, 29 May 2018 => 14:00 Tuesday, 5 June 2018 (7.20833)
Included classes: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Speed range: 10 - 160 km/h.
Direction: North (bound), P = North, Lane = 0-16
Separation: Headway > 0 sec, Span 0 - 100 metre
Name: Default Profile
Scheme: Vehicle classification (ARX)
Units: Metric (metre, kilometre, m/s, km/h, kg, tonne)
In profile: Vehicles = 4431 / 9051 (48.96%)

Weekly Vehicle Counts (Virtual Week)

VirtWeeklyVehicle-368

Site: 229518.0.1NS
Description: Gerogery Road - Winchester Lane to Tynan Road
Filter time: 9:00 Tuesday, 29 May 2018 => 14:00 Tuesday, 5 June 2018
Scheme: Vehicle classification (ARX)
Filter: Cls(1-12) Dir(N) Sp(10,160) Headway(>0) Span(0 - 100) Lane(0-16)

	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Averages	
								1 - 5	1 - 7
Hour									
0000-0100	1.0	0.0	2.0	0.0	1.0	1.0	3.0	0.8	1.1
0100-0200	0.0	0.0	1.0	0.0	1.0	3.0	2.0	0.4	1.0
0200-0300	2.0	2.0	0.0	0.0	0.0	0.0	2.0	0.8	0.9
0300-0400	0.0	0.0	0.0	0.0	1.0	1.0	2.0	0.2	0.6
0400-0500	0.0	0.0	3.0	1.0	0.0	0.0	0.0	0.8	0.6
0500-0600	6.0	5.0	2.0	4.0	7.0	2.0	3.0	4.8	4.1
0600-0700	19.0	16.0	19.0	17.0	19.0	9.0	7.0	18.0	15.1
0700-0800	21.0	28.0	25.0	22.0	19.0	8.0	6.0	23.0	18.4
0800-0900	21.0	31.0	42.0	35.0	23.0	5.0	14.0	30.4	24.4
0900-1000	29.0	26.0	27.0	40.0	31.0	33.0	25.0	29.8	29.6
1000-1100	33.0	36.5	34.0	33.0	33.0	43.0	37.0	34.3	35.8
1100-1200	35.0	38.5	28.0	34.0	36.0	58.0	58.0	35.0	40.8
1200-1300	33.0	37.0	31.0	46.0	35.0	58.0	50.0	36.5	40.9
1300-1400	37.0	44.0	48.0	31.0	42.0	60.0	47.0	41.0	44.1
1400-1500	38.0	34.0	41.0	46.0	52.0	45.0	50.0	42.2	43.7
1500-1600	58.0	63.0	70.0	61.0	64.0	42.0	50.0	63.2	58.3
1600-1700	90.0	81.0	97.0	85.0	86.0	50.0	56.0	87.8	77.9
1700-1800	78.0	76.0	89.0	77.0	69.0	36.0	37.0	77.8	66.0
1800-1900	43.0	46.0	52.0	49.0	40.0	25.0	19.0	46.0	39.1
1900-2000	22.0	38.0	18.0	27.0	27.0	16.0	16.0	26.4	23.4
2000-2100	13.0	17.0	22.0	24.0	15.0	19.0	9.0	18.2	17.0
2100-2200	12.0	12.0	13.0	14.0	24.0	8.0	3.0	15.0	12.3
2200-2300	4.0	9.0	5.0	7.0	9.0	10.0	1.0	6.8	6.4
2300-2400	2.0	3.0	7.0	2.0	5.0	9.0	1.0	3.8	4.1
Totals									
0700-1900	516.0	541.0	584.0	559.0	530.0	463.0	449.0	547.1	519.0
0600-2200	582.0	624.0	656.0	641.0	615.0	515.0	484.0	624.7	586.8
0600-0000	588.0	636.0	668.0	650.0	629.0	534.0	486.0	635.3	597.4
0000-0000	597.0	643.0	676.0	655.0	639.0	541.0	498.0	643.1	605.7
AM Peak	1100	1100	0800	0900	1100	1100	1100		
	35.0	38.5	42.0	40.0	36.0	58.0	58.0		
PM Peak	1600	1600	1600	1600	1600	1300	1600		
	90.0	81.0	97.0	85.0	86.0	60.0	56.0		
* - No data.									

B6: Gerogery Road between Tynan Road and Winchester Lane south bound direction Virtual weekly count

MetroCount Traffic Executive
Weekly Vehicle Counts (Virtual Week)

VirtWeeklyVehicle-370 -- English (ENA)

Datasets:

Site: [229518] Gerogery Road - Winchester Lane to Tynan Road
Attribute: Ettamogah
Direction: 7 - South bound A>B, North bound B>A. **Lane:** 0
Survey Duration: 9:18 Thursday, 24 May 2018 => 16:53 Wednesday, 6 June 2018,
Zone:
File: Gerogery Road - Winchester Lane to Tynan Road (next to Winchester) June18.ec0 (Plus)
Identifier: NR50QDFM MC5900-X13 (c)MetroCount 09Nov16
Algorithm: Factory default axle (v5.02)
Data type: Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time: 9:00 Tuesday, 29 May 2018 => 14:00 Tuesday, 5 June 2018 (7.20833)
Included classes: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Speed range: 10 - 160 km/h.
Direction: South (bound), P = North, Lane = 0-16
Separation: Headway > 0 sec, Span 0 - 100 metre
Name: Default Profile
Scheme: Vehicle classification (ARX)
Units: Metric (metre, kilometre, m/s, km/h, kg, tonne)
In profile: Vehicles = 4500 / 9051 (49.72%)

Weekly Vehicle Counts (Virtual Week)

VirtWeeklyVehicle-370

Site: 229518.0.1NS
Description: Gerogery Road - Winchester Lane to Tynan Road
Filter time: 9:00 Tuesday, 29 May 2018 => 14:00 Tuesday, 5 June 2018
Scheme: Vehicle classification (ARX)
Filter: Cls(1-12) Dir(S) Sp(10,160) Headway(>0) Span(0 - 100) Lane(0-16)

	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Averages	
								1 - 5	1 - 7
Hour									
0000-0100	0.0	1.0	0.0	1.0	1.0	1.0	2.0	0.6	0.9
0100-0200	1.0	0.0	1.0	0.0	0.0	1.0	2.0	0.4	0.7
0200-0300	4.0	2.0	0.0	1.0	0.0	2.0	2.0	1.4	1.6
0300-0400	0.0	1.0	3.0	3.0	2.0	0.0	0.0	1.8	1.3
0400-0500	3.0	3.0	4.0	3.0	1.0	2.0	1.0	2.8	2.4
0500-0600	11.0	13.0	19.0	15.0	20.0	7.0	3.0	15.6	12.6
0600-0700	41.0	44.0	43.0	45.0	44.0	20.0	11.0	43.4	35.4
0700-0800	70.0	72.0	68.0	74.0	63.0	23.0	13.0	69.4	54.7
0800-0900	97.0	91.0	85.0	100.0	96.0	49.0	35.0	93.8	79.0
0900-1000	51.0	52.0	61.0	45.0	51.0	66.0	43.0	52.0	52.6
1000-1100	36.0	38.0	46.0	57.0	35.0	51.0	39.0	41.7	42.5
1100-1200	30.0	37.5	45.0	52.0	26.0	51.0	38.0	38.0	39.6
1200-1300	23.0	35.5	36.0	23.0	32.0	42.0	47.0	30.8	34.3
1300-1400	33.0	33.0	28.0	26.0	33.0	36.0	41.0	31.0	32.9
1400-1500	36.0	37.0	47.0	45.0	51.0	34.0	44.0	43.2	42.0
1500-1600	47.0	41.0	48.0	43.0	45.0	37.0	37.0	44.8	42.6
1600-1700	51.0	41.0	57.0	45.0	41.0	34.0	42.0	47.0	44.4
1700-1800	38.0	45.0	43.0	43.0	39.0	44.0	38.0	41.6	41.4
1800-1900	23.0	19.0	24.0	19.0	21.0	23.0	17.0	21.2	20.9
1900-2000	12.0	20.0	16.0	19.0	16.0	14.0	19.0	16.6	16.6
2000-2100	7.0	4.0	6.0	8.0	7.0	4.0	5.0	6.4	5.9
2100-2200	7.0	4.0	3.0	9.0	6.0	5.0	2.0	5.8	5.1
2200-2300	1.0	1.0	2.0	4.0	4.0	4.0	1.0	2.4	2.4
2300-2400	1.0	0.0	3.0	0.0	6.0	6.0	0.0	2.0	2.3
Totals									
0700-1900	535.0	542.0	588.0	572.0	533.0	490.0	434.0	554.5	526.9
0600-2200	602.0	614.0	656.0	653.0	606.0	533.0	471.0	626.7	589.9
0600-0000	604.0	615.0	661.0	657.0	616.0	543.0	472.0	631.1	594.6
0000-0000	623.0	635.0	688.0	680.0	640.0	556.0	482.0	653.7	614.0
AM Peak	0800	0800	0800	0800	0800	0900	0900		
	97.0	91.0	85.0	100.0	96.0	66.0	43.0		
PM Peak	1600	1700	1600	1600	1400	1700	1200		
	51.0	45.0	57.0	45.0	51.0	44.0	47.0		

* - No data.

B7: Gerogery Road between Tynan Road and Winchester Lane north bound direction speed Statistics

MetroCount Traffic Executive
Speed Statistics

SpeedStat-369 -- English (ENA)

Datasets:

Site: [229518] Gerogery Road - Winchester Lane to Tynan Road
Attribute: Ettamogah
Direction: 7 - South bound A>B, North bound B>A. Lane: 0
Survey Duration: 9:18 Thursday, 24 May 2018 => 16:53 Wednesday, 6 June 2018,
Zone:
File: Gerogery Road - Winchester Lane to Tynan Road (next to Winchester) June18.ec0 (Plus)
Identifier: NR50QDFM MC5900-X13 (c)MetroCount 09Nov16
Algorithm: Factory default axle (v5.02)
Data type: Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time: 9:00 Tuesday, 29 May 2018 => 14:00 Tuesday, 5 June 2018 (7.20833)
Included classes: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Speed range: 10 - 160 km/h.
Direction: North (bound), P = North, Lane = 0-16
Separation: Headway > 0 sec, Span 0 - 100 metre
Name: Default Profile
Scheme: Vehicle classification (ARX)
Units: Metric (metre, kilometre, m/s, km/h, kg, tonne)
In profile: Vehicles = 4431 / 9051 (48.96%)

Speed Statistics

SpeedStat-369

Site: 229518.0.1NS
Description: Gerogery Road - Winchester Lane to Tynan Road
Filter time: 9:00 Tuesday, 29 May 2018 => 14:00 Tuesday, 5 June 2018
Scheme: Vehicle classification (ARX)
Filter: CIs(1-12) Dir(N) Sp(10,160) Headway(>0) Span(0 - 100) Lane(0-16)

Vehicles = 4431

Posted speed limit = 100 km/h, Exceeding = 582 (13.13%), Mean Exceeding = 104.42 km/h

Maximum = 131.8 km/h, Minimum = 30.6 km/h, Mean = 88.8 km/h

85% Speed = 99.27 km/h, 95% Speed = 104.49 km/h, Median = 90.36 km/h

20 km/h Pace = 82 - 102, Number in Pace = 3002 (67.75%)

Variance = 128.74, Standard Deviation = 11.35 km/h

Speed Bins (Partial days)

Speed	Bin	Below	Above	Energy	vMult	n * vMult
0 - 10	0 0.000%	0 0.000%	4431 100.0%	0.00	0.00	0.00
10 - 20	0 0.000%	0 0.000%	4431 100.0%	0.00	0.00	0.00
20 - 30	0 0.000%	0 0.000%	4431 100.0%	0.00	0.00	0.00
30 - 40	8 0.181%	8 0.181%	4423 99.82%	0.00	0.00	0.00
40 - 50	14 0.316%	22 0.497%	4409 99.50%	0.00	0.00	0.00
50 - 60	44 0.993%	66 1.490%	4365 98.51%	0.00	0.00	0.00
60 - 70	255 5.755%	321 7.244%	4110 92.76%	0.00	0.00	0.00
70 - 80	542 12.23%	863 19.48%	3568 80.52%	0.00	0.00	0.00
80 - 90	1294 29.20%	2157 48.68%	2274 51.32%	0.00	0.00	0.00
90 - 100	1692 38.19%	3849 86.87%	582 13.13%	0.00	0.00	0.00
100 - 110	526 11.87%	4375 98.74%	56 1.264%	0.00	0.00	0.00
110 - 120	47 1.061%	4422 99.60%	9 0.203%	0.00	0.00	0.00
120 - 130	8 0.181%	4430 99.98%	1 0.023%	0.00	0.00	0.00
130 - 140	1 0.023%	4431 100.0%	0 0.000%	0.00	0.00	0.00
140 - 150	0 0.000%	4431 100.0%	0 0.000%	0.00	0.00	0.00
150 - 160	0 0.000%	4431 100.0%	0 0.000%	0.00	0.00	0.00
160 - 170	0 0.000%	4431 100.0%	0 0.000%	0.00	0.00	0.00
170 - 180	0 0.000%	4431 100.0%	0 0.000%	0.00	0.00	0.00
180 - 190	0 0.000%	4431 100.0%	0 0.000%	0.00	0.00	0.00
190 - 200	0 0.000%	4431 100.0%	0 0.000%	0.00	0.00	0.00

Total Speed Rating = 0.00

Total Moving Energy (Estimated) = 0.00

Speed limit fields (Partial days)

Limit	Below	Above
0 100 (PSL)	3849 86.9%	582 13.1%

B8: Gerogery Road between Tynan Road and Winchester Lane south bound direction speed Statistics

MetroCount Traffic Executive
Speed Statistics

SpeedStat-371 -- English (ENA)

Datasets:

Site: [229518] Gerogery Road - Winchester Lane to Tynan Road
Attribute: Ettamogah
Direction: 7 - South bound A>B, North bound B>A. Lane: 0
Survey Duration: 9:18 Thursday, 24 May 2018 => 16:53 Wednesday, 6 June 2018.
Zone:
File: Gerogery Road - Winchester Lane to Tynan Road (next to Winchester) June18.ec0 (Plus)
Identifier: NR50QDFM MC5900-X13 (c)MetroCount 09Nov16
Algorithm: Factory default axle (v5.02)
Data type: Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time: 9:00 Tuesday, 29 May 2018 => 14:00 Tuesday, 5 June 2018 (7.20833)
Included classes: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Speed range: 10 - 160 km/h.
Direction: South (bound), P = North, Lane = 0-16
Separation: Headway > 0 sec, Span 0 - 100 metre
Name: Default Profile
Scheme: Vehicle classification (ARX)
Units: Metric (metre, kilometre, m/s, km/h, kg, tonne)
In profile: Vehicles = 4500 / 9051 (49.72%)

Speed Statistics

SpeedStat-371

Site: 229518.0.1NS
Description: Gerogery Road - Winchester Lane to Tynan Road
Filter time: 9:00 Tuesday, 29 May 2018 => 14:00 Tuesday, 5 June 2018
Scheme: Vehicle classification (ARX)
Filter: Cls(1-12) Dir(S) Sp(10,160) Headway(>0) Span(0 - 100) Lane(0-16)

Vehicles = 4500
 Posted speed limit = 100 km/h, Exceeding = 593 (13.18%), Mean Exceeding = 103.87 km/h
 Maximum = 125.4 km/h, Minimum = 16.2 km/h, Mean = 88.7 km/h
 85% Speed = 99.45 km/h, 95% Speed = 103.77 km/h, Median = 90.54 km/h
 20 km/h Pace = 82 - 102, Number in Pace = 3111 (69.13%)
 Variance = 138.06, Standard Deviation = 11.75 km/h

Speed Bins (Partial days)

Speed	Bin	Below	Above	Energy	vMult	n * vMult
0 - 10	0 0.000%	0 0.000%	4500 100.0%	0.00	0.00	0.00
10 - 20	4 0.089%	4 0.089%	4496 99.91%	0.00	0.00	0.00
20 - 30	7 0.156%	11 0.244%	4489 99.76%	0.00	0.00	0.00
30 - 40	10 0.222%	21 0.467%	4479 99.53%	0.00	0.00	0.00
40 - 50	14 0.311%	35 0.778%	4465 99.22%	0.00	0.00	0.00
50 - 60	69 1.533%	104 2.311%	4396 97.69%	0.00	0.00	0.00
60 - 70	193 4.289%	297 6.600%	4203 93.40%	0.00	0.00	0.00
70 - 80	554 12.31%	851 18.91%	3649 81.09%	0.00	0.00	0.00
80 - 90	1316 29.24%	2167 48.16%	2333 51.84%	0.00	0.00	0.00
90 - 100	1740 38.67%	3907 86.82%	593 13.18%	0.00	0.00	0.00
100 - 110	552 12.27%	4459 99.09%	41 0.91%	0.00	0.00	0.00
110 - 120	35 0.778%	4494 99.87%	6 0.133%	0.00	0.00	0.00
120 - 130	6 0.133%	4500 100.0%	0 0.000%	0.00	0.00	0.00
130 - 140	0 0.000%	4500 100.0%	0 0.000%	0.00	0.00	0.00
140 - 150	0 0.000%	4500 100.0%	0 0.000%	0.00	0.00	0.00
150 - 160	0 0.000%	4500 100.0%	0 0.000%	0.00	0.00	0.00
160 - 170	0 0.000%	4500 100.0%	0 0.000%	0.00	0.00	0.00
170 - 180	0 0.000%	4500 100.0%	0 0.000%	0.00	0.00	0.00
180 - 190	0 0.000%	4500 100.0%	0 0.000%	0.00	0.00	0.00
190 - 200	0 0.000%	4500 100.0%	0 0.000%	0.00	0.00	0.00

Total Speed Rating = 0.00
 Total Moving Energy (Estimated) = 0.00

Speed limit fields (Partial days)

Limit	Below	Above
0 - 100 (PSL)	3907 86.8%	593 13.2%

Appendix C

SIDRA Movement Summaries:

- C1 Gerogery Road and Winchester Lane AM 2018
- C2 Gerogery Road and Winchester Lane PM 2018
- C3 Gerogery Road and Winchester Lane AM with forecast and generated traffic 2038
- C4 Gerogery Road and Winchester Lane PM with forecast and generated traffic 2038

C1 Gerogery Road and Winchester Lane AM 2018

MOVEMENT SUMMARY

▽ Site: 101 [Gerogery Rd Winchester Lane 2018 AM]

Rockwood Quarry
Giveaway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Gerogery Rd											
1	L2	3	100.0	0.022	5.5	LOS A	0.0	0.0	0.00	0.09	29.9
2	T1	35	5.0	0.022	0.0	LOS A	0.0	0.0	0.00	0.09	59.5
Approach		38	12.9	0.022	0.9	NA	0.0	0.0	0.00	0.09	56.9
North: Gerogery Rd											
8	T1	99	5.0	0.055	0.0	LOS A	0.0	0.0	0.00	0.01	59.9
9	R2	1	0.0	0.055	5.6	LOS A	0.0	0.0	0.00	0.01	30.3
Approach		100	4.9	0.055	0.1	NA	0.0	0.0	0.00	0.01	59.6
West: Winchester Lane											
10	L2	1	0.0	0.004	3.6	LOS A	0.0	0.1	0.15	0.52	51.1
12	R2	2	100.0	0.004	4.3	LOS A	0.0	0.1	0.15	0.52	46.7
Approach		3	66.7	0.004	4.0	LOS A	0.0	0.1	0.15	0.52	48.1
All Vehicles		141	8.5	0.055	0.3	NA	0.0	0.1	0.01	0.04	58.7

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.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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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C2 Gerogery Road and Winchester Lane PM 2018

MOVEMENT SUMMARY

Site: 101 [Gerogery Rd Winchester Lane 2018 PM]

Rockwood Quarry
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Gerogery Rd											
1	L2	4	0.0	0.051	5.5	LOS A	0.0	0.0	0.00	0.03	30.3
2	T1	89	5.0	0.051	0.0	LOS A	0.0	0.0	0.00	0.03	59.7
Approach		94	4.8	0.051	0.3	NA	0.0	0.0	0.00	0.03	58.3
North: Gerogery Rd											
8	T1	49	5.0	0.028	0.0	LOS A	0.0	0.0	0.01	0.01	59.8
9	R2	1	0.0	0.028	5.7	LOS A	0.0	0.0	0.01	0.01	30.3
Approach		51	4.9	0.028	0.1	NA	0.0	0.0	0.01	0.01	59.2
West: Winchester Lane											
10	L2	1	100.0	0.005	4.0	LOS A	0.0	0.1	0.21	0.51	47.9
12	R2	4	5.0	0.005	3.8	LOS A	0.0	0.1	0.21	0.51	50.0
Approach		5	24.0	0.005	3.9	LOS A	0.0	0.1	0.21	0.51	49.6
All Vehicles		149	5.5	0.051	0.3	NA	0.0	0.1	0.01	0.04	58.4

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.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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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C3 Gerogery Road and Winchester Lane AM with forecast and generated traffic 2038

MOVEMENT SUMMARY

▽ Site: 101 [Gerogery Rd Winchester Lane 2038 AM]

Rockwood Quarry
Giveaway / Yield (Two-Way)
Design Life Analysis (Practical Capacity): Results for 20 years

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Gerogery Rd											
1	L2	4	100.0	0.031	5.5	LOS A	0.0	0.0	0.00	0.08	29.9
2	T1	49	5.0	0.031	0.0	LOS A	0.0	0.0	0.00	0.08	59.5
Approach		53	12.6	0.031	0.8	NA	0.0	0.0	0.00	0.08	57.0
North: Gerogery Rd											
8	T1	139	5.0	0.076	0.0	LOS A	0.0	0.0	0.00	0.00	59.9
9	R2	1	0.0	0.076	5.6	LOS A	0.0	0.0	0.00	0.00	30.3
Approach		140	5.0	0.076	0.0	NA	0.0	0.0	0.00	0.00	59.7
West: Winchester Lane											
10	L2	1	0.0	0.005	3.6	LOS A	0.0	0.2	0.20	0.53	50.5
12	R2	3	100.0	0.005	4.8	LOS A	0.0	0.2	0.20	0.53	46.3
Approach		4	75.0	0.005	4.5	LOS A	0.0	0.2	0.20	0.53	47.3
All Vehicles		197	8.5	0.076	0.2	NA	0.0	0.2	0.01	0.04	58.8

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.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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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C4 Gerogery Road and Winchester Lane PM with forecast and generated traffic 2038

MOVEMENT SUMMARY

▽ Site: 101 [Gerogery Rd Winchester Lane 2038 PM]

Rockwood Quarry
 Giveway / Yield (Two-Way)
 Design Life Analysis (Practical Capacity): Results for 20 years

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Gerogery Rd											
1	L2	4	0.0	0.071	5.5	LOS A	0.0	0.0	0.00	0.02	30.3
2	T1	125	5.0	0.071	0.0	LOS A	0.0	0.0	0.00	0.02	59.8
Approach		129	4.8	0.071	0.2	NA	0.0	0.0	0.00	0.02	58.8
North: Gerogery Rd											
8	T1	69	5.0	0.038	0.0	LOS A	0.0	0.1	0.01	0.01	59.9
9	R2	1	0.0	0.038	5.9	LOS A	0.0	0.1	0.01	0.01	30.3
Approach		70	4.9	0.038	0.1	NA	0.0	0.1	0.01	0.01	59.4
West: Winchester Lane											
10	L2	1	100.0	0.005	4.3	LOS A	0.0	0.1	0.26	0.52	47.7
12	R2	4	5.0	0.005	4.0	LOS A	0.0	0.1	0.26	0.52	49.8
Approach		5	24.0	0.005	4.1	LOS A	0.0	0.1	0.26	0.52	49.4
All Vehicles		205	5.4	0.071	0.3	NA	0.0	0.1	0.01	0.03	58.8

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.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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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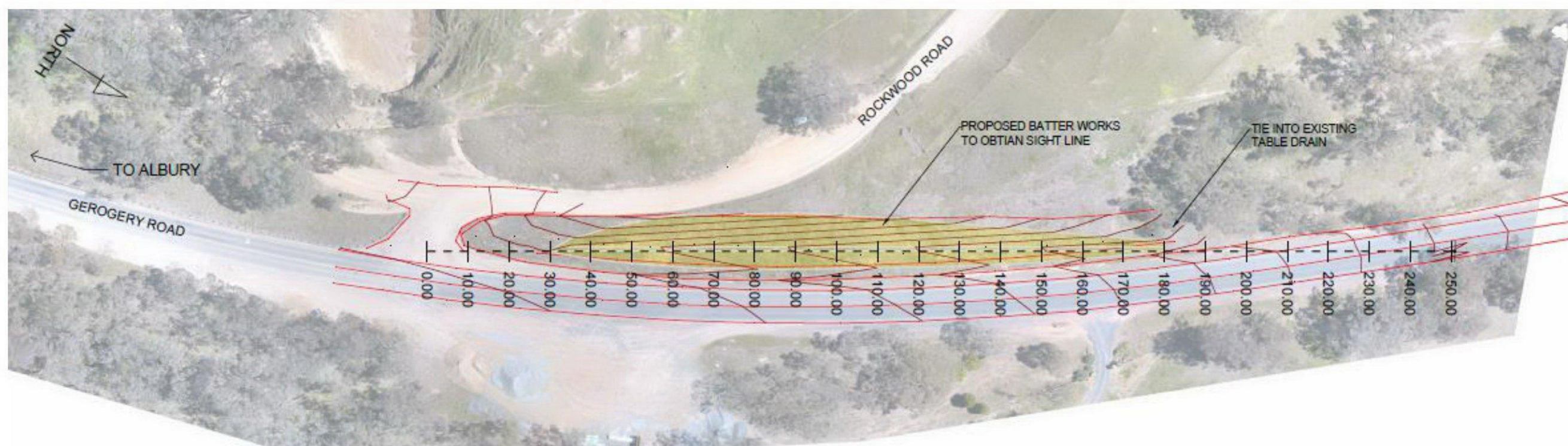
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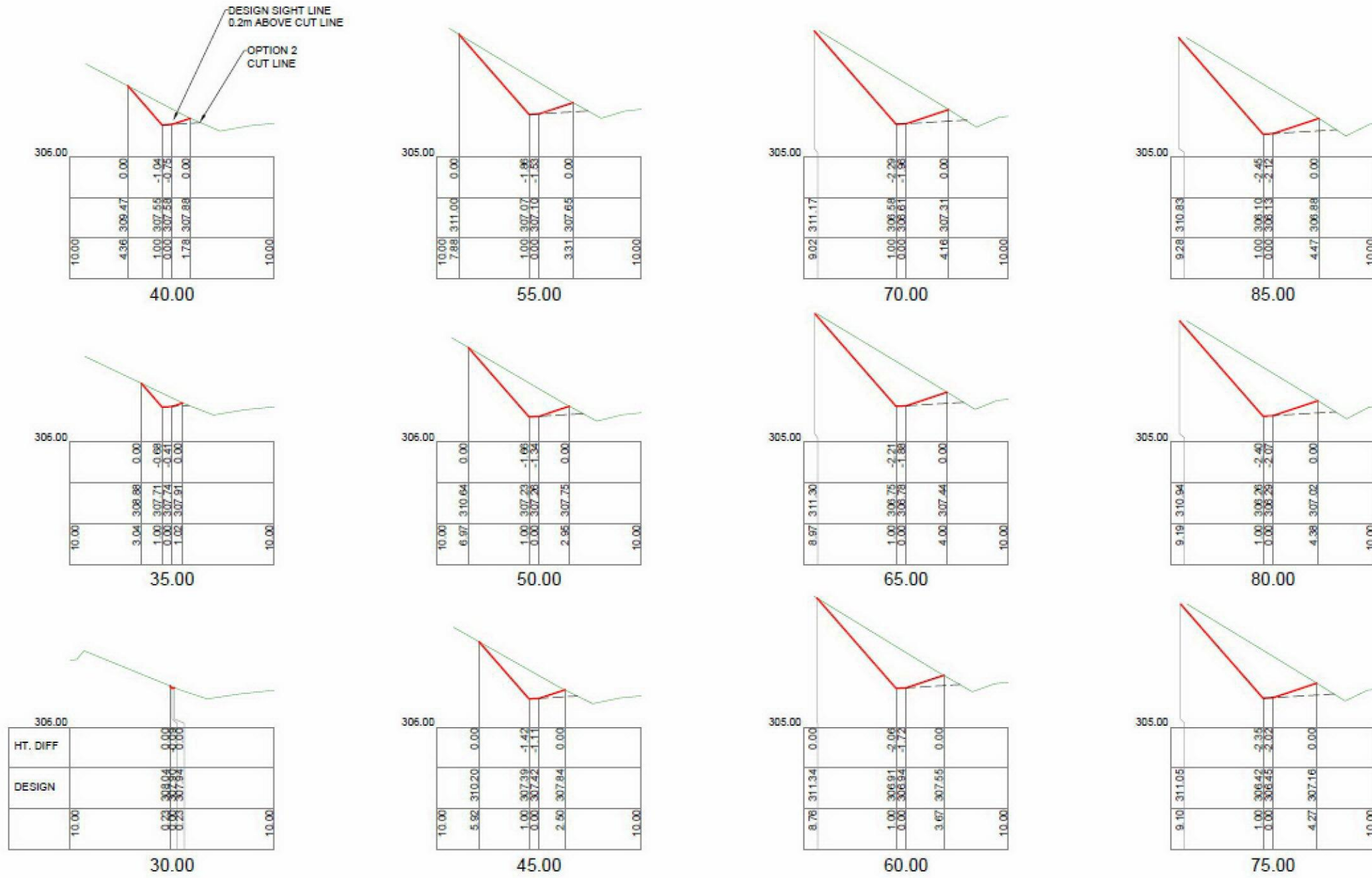
Appendix D

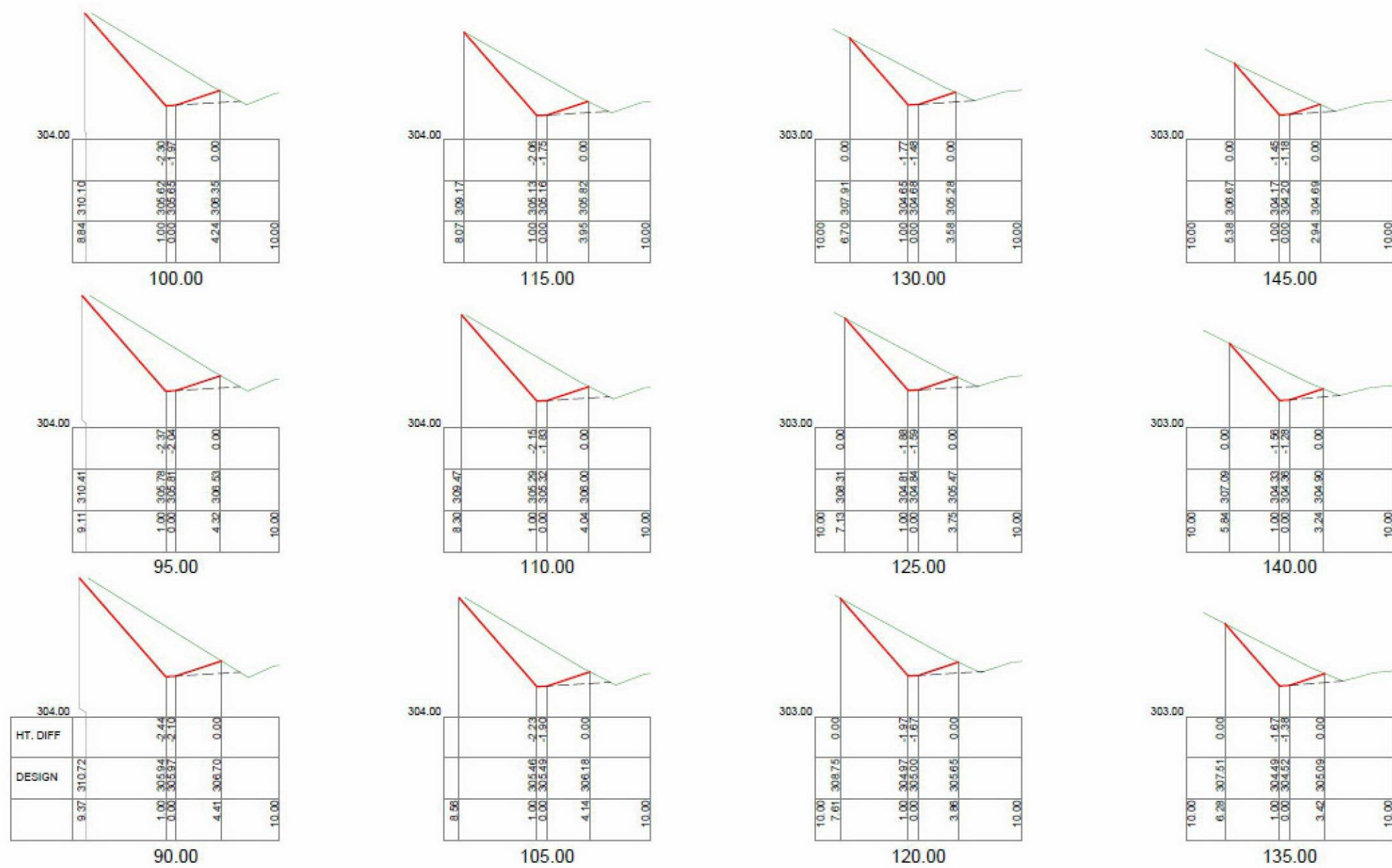
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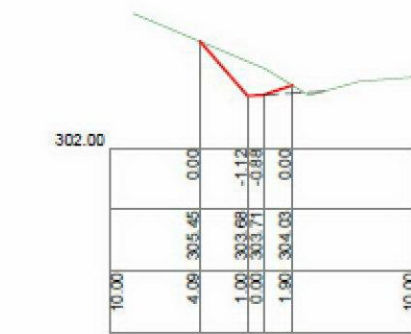
Sheet 1: Plan and Longitudinal Section

Sheets 2 to 4: Cross Sections

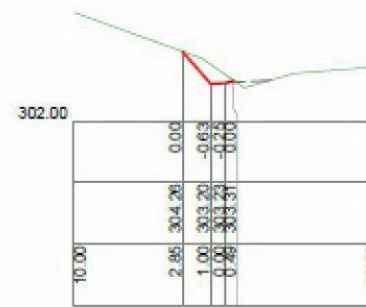




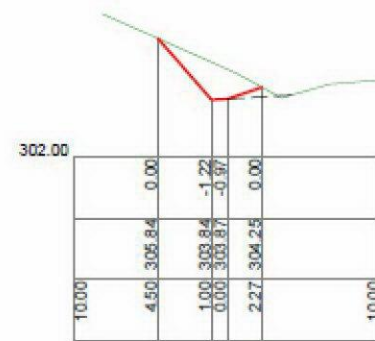




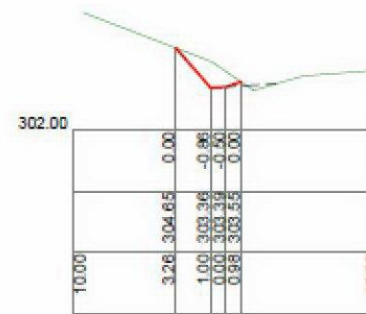
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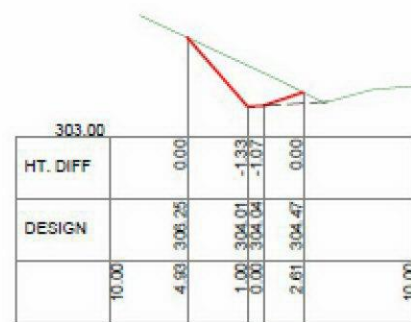
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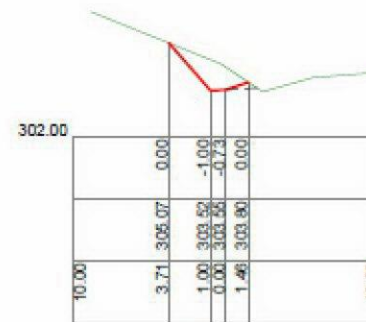
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165.00



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