TRAFFIC IMPACT ASSESSMENT

NORTHERN COAL SERVICES
NORTHERN COAL LOGISTICS PROJECT

PREPARED FOR: NORTHERN COAL SERVICES PTY LTD

APRIL 2014

REF: 12/011

TRAFFIC IMPACT ASSESSMENT – COAL LOGISTICS PROJECT
NORTHERN COAL SERVICES PTY LTD

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QUALITY ASSURANCE

This document has been prepared, checked and released in accordance with the Quality Control Standards established by Intersect Traffic Pty Ltd.

Issue	Date	Description	By
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Date 10th April 2014

EXECUTIVE SUMMARY

Intersect Traffic Pty Ltd (Intersect) has been engaged by Centennial Coal's Northern Coal Services Pty Ltd (Northern Coal Services) to undertake a traffic impact assessment for its Northern Coal Logistics Project (the Project). Specifically the project seeks to;

1. Re-develop and upgrade the existing coal preparation and handling infrastructure at the Newstan Colliery Surface Site to enable continued utilisation for the receipt, handling and processing of up to 8 Mtpa of ROM coal from the Newstan Colliery (up to 4.5 Mtpa), Awaba Colliery (up to 0.88 Mtpa) and Mandalong Mine (up to 6 Mtpa);
2. Continue to utilise the existing coal handling infrastructure at the Cooranbong Entry Site to enable the receipt, handling and processing of up to 6 Mtpa of ROM coal from Mandalong Mine;
3. Increase the volume of coal transported from the Cooranbong Entry Site to Newstan Colliery Surface Site, via truck using existing private haul roads, from 4 Mtpa to up to 6 Mtpa;
4. Increase the volume of coal transported from the Cooranbong Entry Site to Eraring Power Station, using an existing dedicated overland conveyor, from 4 Mtpa to up to 6 Mtpa;
5. Increase the volume of coal transported from the Newstan Colliery Surface Site to Eraring Power Station, via truck using existing private haul roads, from 2 Mtpa to up to 4.5 Mtpa;
6. Increase the volume of coal transported from the Newstan Colliery Surface Site rail loading facilities by train to the Port of Newcastle and/or Port Kembla (for export) and/or to Vales Point Power Station from 3 Mtpa to up to 8 Mtpa;
7. Continue to transport up to 0.5 Mtpa of middlings by truck via private haul roads from Newstan Colliery Surface Site to Cooranbong Entry Site for subsequent supply to the Eraring Power Station via a dedicated overland conveyor;
8. Continue to transport up to 0.88 Mtpa of material (including coal and stone from construction activities undertaken as part of the Newstan Colliery Extension of Mining Project) by truck via private haul roads from the Awaba Colliery Surface Site to the reject emplacement areas at the Newstan Colliery Surface Site;
9. Transport reject material from the Newstan Colliery Surface Site to the Newstan Colliery Northern Reject Emplacement Area (NREA), the Newstan Colliery Southern Reject Emplacement Area (SREA) and/or Hawkmount Quarry via existing private haul roads;
10. Increase the volume of water discharged via licensed discharge points at the Newstan Colliery Surface Site and Cooranbong Entry Site;
11. Provide employment for up to 120 full-time personnel;
12. Provide a life of operation of 30 years from the granting of development consent; and
13. Operate 24 hours per day, seven days per week.

From a traffic impact perspective it is considered that the main impact to the local and State road network will be from additional employee traffic to the Newstan Colliery Surface Site associated with the operation of the coal handling and processing infrastructure, as well as construction traffic associated with the redevelopment of the Newstan Colliery Surface Site. All coal transport activity associated with the Project will occur on the existing rail lines to the Port of Newcastle, Port Kembla and/or Vales Point Power Station, as well as existing privately owned infrastructure e.g. haul roads, conveyors. Therefore the transportation of coal will not have any impact on the local and State road networks in the vicinity of the Project Application Area.

However there is some concern as to the impact rail traffic will have on two existing rail level crossings in Newcastle on the rail route to the Port of Newcastle. Motorist using these rail crossings experience significant delays and queuing during peak traffic periods. Therefore this report has also made comment on the impact the Project will have on these level crossings (Glebe Road, Adamstown and Clyde Street, Hamilton North).

This traffic and transport assessment has determined the following;

- The local road network likely to be impacted on by the Project includes Miller Road, Macquarie Road, Fassifern Road and the Miller Road / Macquarie Road / Fassifern Road intersections in Fassifern as additional employee traffic access the Newstan Colliery Surface Site. Construction traffic associated with the Project may also impact on Newport Road, Gradwells Road and their intersection in Dora Creek as construction employees utilise the Cooranbong Entry Site to access the construction site at the Newstan Colliery Surface Site.
- Miller Road and Gradwells Road are two lane two way rural roads with a likely two way capacity of up to 920 vehicles per hour (vph) if a Level of Service (LOS) C is considered satisfactory. Macquarie Road, Fassifern Road and Newport Road are typical two lane two way urban roads with a likely two way capacity of up to 1,800 vph again if a LOS C is considered satisfactory.
- Traffic data collected on the local road network indicates that all roads expected to be impacted on by the Project have spare mid-block two way capacity to cater for additional traffic from the Project.
- The peak traffic generation periods associated with the proposal are likely to occur during shift changes in the morning and afternoon periods.
- Traffic counts at the existing Newstan Colliery Surface Site access intersection has determined that the peak hour traffic generation associated with the current operations on the site are approximately 91 vph in the night to day shift changeover and 131 vph in the day to afternoon shift changeover. Total Newstan Colliery employees at the time of the traffic counts numbered 195. It is also thought the difference in traffic generation between the AM and PM peak is associated with the operation of the Fassifern Administration Offices at the site. For this assessment it was assumed the morning peak was more representative of the existing traffic generation associated with the Newstan Colliery mining operations.
- Additional traffic generated by the Project will result from an increase in employees on existing employee numbers (shift numbers) of in the order of 120 new employees or up to 45 new employees per shift. Whilst overall employee numbers will remain below previous Newstan approval levels the employee increase will increase existing traffic volumes on the local road network by up to 91 vph in the AM peak and PM peaks.
- For a period of time the Newstan Extension of Mining Project could also increase traffic volumes on the road network by up to 142 vph in the AM peak and PM peaks prior to the relocation of the mine workforce to the existing Awaba Colliery Surface Site.
- The net increase in traffic on the local road network, even prior to the Newstan Colliery mine entrance being relocated to the Awaba Colliery Surface Site, will not cause the two way mid-block capacity of the local road network in the vicinity of the Newstan Colliery Surface Site to be reached therefore subject to satisfactory intersection operation the Project will not adversely impact on the local road network.
- Sidra modeling of the Newstan Colliery Surface Site access intersection and the Miller Road / Macquarie Road / Fassifern Road intersection has determined that these intersections will continue to operate satisfactorily on operation of both the Newstan Extension of Mining Project and the Northern Coal Logistics Project as well as with at least ten years background traffic growth.
- By observation it is considered that the existing road network servicing the Newstan Colliery is of a suitable standard to cater for the increase in traffic associated with the Northern Coal Logistics Project and the Newstan Extension of Mining Project.
- There is sufficient on-site car parking within the Newstan Colliery Surface Site to cater for the long term parking demand generated by both the Newstan Extension of Mining Project and the Northern Coal Logistics Project. There are also sufficient areas within the site that could be used as temporary overflow car parking to cater for the additional demand such that the operation of both Projects will not result in any parking demand within the local road network adjacent to the Newstan Colliery Surface Site.
- The peak traffic generation associated with construction works at the Newstan Colliery Surface Site is expected to be 170 vph.

- A two way mid-block capacity check and additional Sidra modeling has shown that the local road network around the Newstan Colliery Surface Site has sufficient spare capacity to cater for the construction traffic generated by the Northern Coal Logistics Project even with both the Northern Coal Logistics Project and the Newstan Extension of Mining Project operational. Therefore construction traffic associated with the Northern Coal Logistics Project will not adversely impact on the local road network.
- Should Northern Coal Services chose to utilise the Cooranbong Entry Site to assemble construction employees and access the new construction site within the Newstan Colliery Surface Site via the private haul roads, it has been determined through a two way mid-block capacity check and additional Sidra modeling that the local road network around the Cooranbong Entry Site has sufficient spare capacity to cater for this construction employee traffic.
- The Project is unlikely to increase demand for alternate transport modes and there would be no nexus or need for the provision of additional services or facilities associated with these transport modes as a result of this proposal.
- The project will not increase the number of loaded trains travelling from the Newstan Colliery Surface Site to the Port of Newcastle and/or Port Kembla (for export) and/or Vales Point Power Station, with a maximum of 8 trains per day for which Newstan Colliery already has approval. Therefore the proposal does not seek to increase the number of approved train movements from Newstan Colliery.
- As there are a number of users of the rail line between Newstan Colliery Surface Site and the port of Newcastle and as other projects are likely to increase rail traffic on the subject rail line it is considered that any problems perceived as significant with the operation of the railway level crossings within Newcastle may require a regional solution such as closure of the level crossings (rerouting of traffic) or provision of an alternate freight rail line (Hexham to Toronto). Any regional solution needs to be considered at a more strategic planning level than for individual projects.

Based on this traffic impact assessment it is recommended that the Northern Coal Logistics Project can be supported without any requirement for upgrading of the external road network. Additional traffic generated by the Project will not adversely impact on the efficiency and safety of the local road network around the Project Application Area.

ABBREVIATIONS

AADT – Average Annual Daily Traffic

ASD – Approach Sight Distance

AUR – Auxiliary Right Turn lane

AUL – Auxiliary Left Turn lane

BAR – Basic Right Turn treatment

BAL – Basic Left Turn treatment

CLP – Coal Logistics Project

CHR – Channelised Right Turn lane

CHL – Channelised Left Turn lane

DCP – Development Control Plan

EPL - Environment Protection Licence

Intersect – Intersect Traffic Pty Ltd.

LGA – Local Government Area

LOS – Level of Service

LMCC – Lake Macquarie City Council

NCC – Newcastle City Council

NEM – Newstan Extension of Mining Project

NREA - Newstan Colliery Northern Reject Emplacement Area

NSW – New South Wales

Mtpa – Million tonnes per annum

RMS – NSW Roads and Maritime Services

ROM – Run-of-mine

SISD – Safe Intersection Sight Distance

SREA - Newstan Colliery Southern Reject Emplacement Area

vph – vehicles per hour

vtph – vehicle trips per hour

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1. INTRODUCTION

Intersect Traffic Pty Ltd (Intersect) has been engaged by Centennial Coal's Northern Coal Services Pty Ltd (Northern Coal Services) to undertake a traffic impact assessment for its Northern Coal Logistics Project (the Project). Specifically the Project seeks to;

1. Re-develop and upgrade the existing coal preparation and handling infrastructure at the Newstan Colliery Surface Site to enable continued utilisation for the receipt, handling and processing of up to 8 million tonnes per annum (Mtpa) ROM coal from the Newstan Colliery (up to 4.5 Mtpa), the Awaba Colliery (up to 0.88 Mtpa) and Mandalong Mine (up to 6 Mtpa);
2. Continue to utilise the existing coal handling infrastructure at the Cooranbong Entry Site to enable the receipt, handling and processing of up to 6 Mtpa of ROM coal from Mandalong Mine;
3. Increase the volume of coal transported from the Cooranbong Entry Site to Newstan Colliery Surface Site, via truck using existing private haul roads, from 4 Mtpa to up to 6 Mtpa;
4. Increase the volume of coal transported from the Cooranbong Entry Site to Eraring Power Station, using the existing dedicated overland conveyor, from 4 Mtpa to up to 6 Mtpa;
5. Increase the volume of coal transported from the Newstan Colliery Surface Site to Eraring Power Station, via truck using existing private haul roads, from 2 Mtpa to up to 4.5 Mtpa;
6. Increase the volume of coal transported from the Newstan Colliery Surface Site rail loading facilities by train to the Port of Newcastle and/or Port Kembla (for export) or Vales Point Power Station from 3 Mtpa to up to 8 Mtpa;
7. Continue to transport up to 0.5 Mtpa of middlings by truck via private haul roads from Newstan Colliery Surface Site to Cooranbong Entry Site for subsequent supply to the Eraring Power Station via a dedicated overland conveyor;
8. Continue to transport up to 0.88 Mtpa of material (including coal and stone from construction activities undertaken as part of the Newstan Colliery Extension of Mining Project) by truck via private haul roads from the Awaba Colliery Surface Site to the reject emplacement areas at the Newstan Colliery Surface Site;
9. Transport reject material from the Newstan Colliery Surface Site to the Newstan Colliery Northern Reject Emplacement Area (NREA), the Newstan Colliery Southern Reject Emplacement Area (SREA) and/or Hawkmount Quarry via existing private haul roads;
10. Increase the volume of water discharged via licenced discharge points at the Newstan Colliery Surface Site and Cooranbong Entry Site;
11. Provide employment for up to 120 full-time personnel;
12. Provide a life of operation of 30 years from the granting of development consent; and
13. Operate 24 hours per day, seven days per week.

The purpose of this document is to undertake an assessment of the likely traffic and transport impacts of the Project, and to provide advice to the client in regard to any likely road upgrade works and costs relating to addressing and/or mitigating these impacts. The document is also required to support a development application to the NSW Department of Planning and Infrastructure for the Project.

From a traffic impact perspective it is considered that the main impact to the local and State road network will be from additional employee traffic to the Newstan Colliery Surface Site associated with operation of the coal handling and preparation infrastructure, as well as construction traffic associated with the redevelopment of the Newstan Colliery Surface Site. All coal transport activity associated with the Project will occur on the existing rail lines to the Port of Newcastle, Port Kembla and/or Vales Point Power Station, as well as existing privately owned infrastructure (e.g. haul roads and conveyors), and will not have any impact on the local and State road network in the vicinity of the Project Application Area.

However there is some concern as to the impact rail traffic will have on two existing rail level crossings in Newcastle on the rail route to the Port of Newcastle. Motorist using these rail crossings experience significant delays and queuing during peak traffic periods. Therefore this report has also commented on the impact the Project will have on these level crossings (Glebe Road, Adamstown and Clyde Street, Hamilton North).

Rail Crossing Newstan Colliery

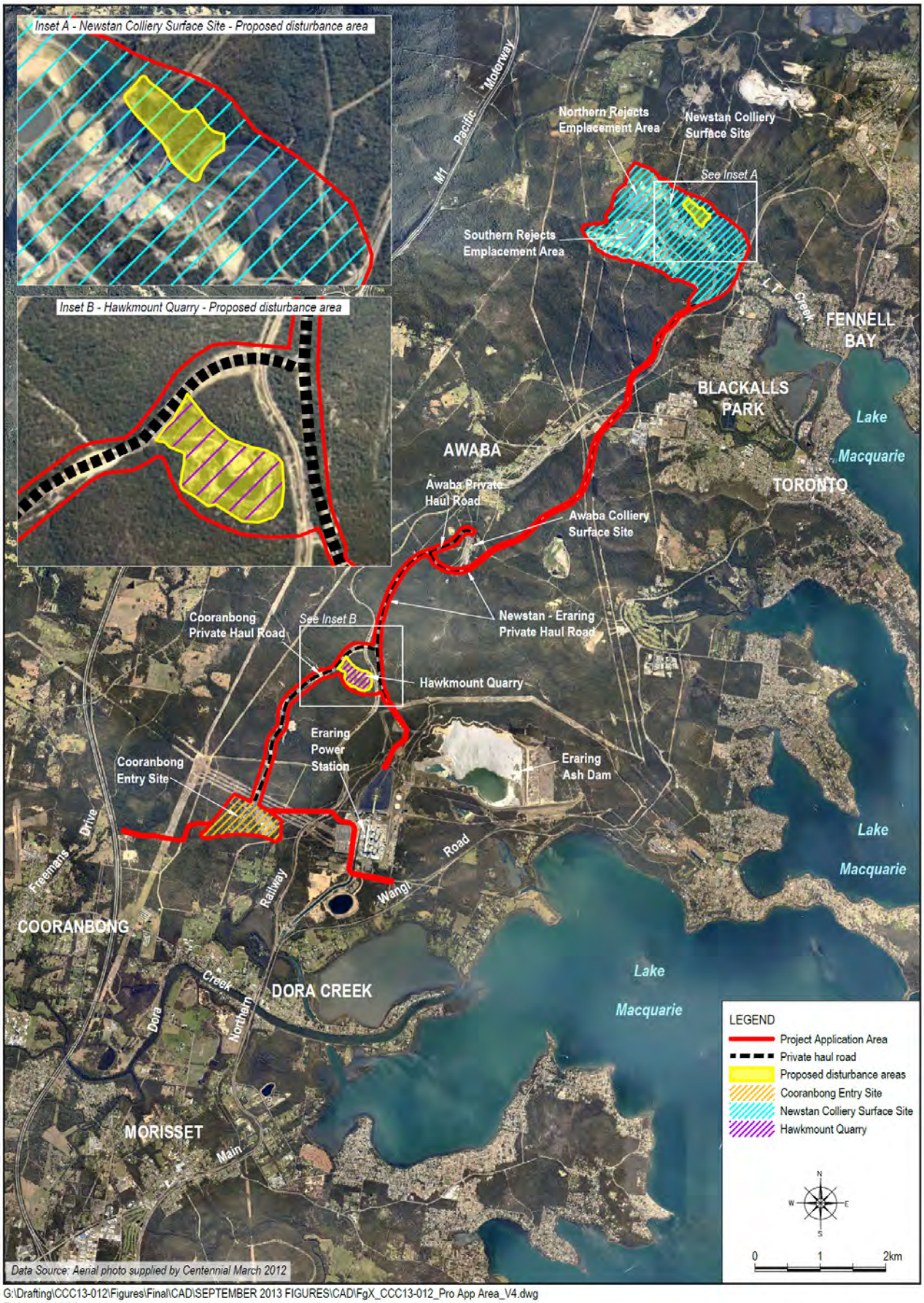
2. SITE LOCATION

Newstan Colliery Surface Site is located on the outskirts of Fassifern approximately 4 km north of the township of Toronto on the western side of Lake Macquarie and within the Lake Macquarie Local Government Area (LGA). It is approximately 25 km south of Newcastle and 140 km north of Sydney.

The Cooranbong Entry Site is located approximately 130 km north of Sydney and 2 km north of the Dora Creek township on the western side of Lake Macquarie and within the Lake Macquarie LGA. Newstan Colliery Surface Site and the Cooranbong Entry Site are connected directly via the Newstan – Eraring Private Haul Road, which is approximately 13 km long and owned by Eraring Energy, and the Cooranbong Private Haul Road, which is approximately 3.4 km long and owned by Centennial Mandalong. These private haul roads provide the main transportation route for coal haulage vehicles between the two sites.

In addition, the Project proposes the continued use of the private haul road linking Awaba Colliery to the Newstan-Eraring Private Haul Road to transport up to 0.88 Mtpa of material (as currently approved), including coal and stone from construction activities at Awaba Colliery Surface Site as part of the Newstan Extension of Mining Project, to the Newstan Colliery Surface Site.

The Project Application Area is shown below in ***Figure 1.***



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GSS ENVIRONMENTAL
Environmental, Land and Project Management Consultants

Project Application Area

Figure 1 – Coal Logistics Project Application Area

3. DEVELOPMENT PROPOSAL

The Project involves the following;

1. Re-develop and upgrade the existing coal preparation and handling infrastructure at the Newstan Colliery Surface Site to enable continued utilisation for the receipt, handling and processing of up to 8 million tonnes per annum (Mtpa) ROM coal from the Newstan Colliery (up to 4.5 Mtpa), the Awaba Colliery (up to 0.88 Mtpa) and Mandalong Mine (up to 6 Mtpa);
2. Continue to utilise the existing coal handling infrastructure at the Cooranbong Entry Site to enable the receipt, handling and processing of up to 6 Mtpa of ROM coal from Mandalong Mine;
3. Increase the volume of coal transported from the Cooranbong Entry Site to Newstan Colliery Surface Site, via truck using existing private haul roads, from 4 Mtpa to up to 6 Mtpa;
4. Increase the volume of coal transported from the Cooranbong Entry Site to Eraring Power Station, using the existing dedicated overland conveyor, from 4 Mtpa to up to 6 Mtpa;
5. Increase the volume of coal transported from the Newstan Colliery Surface Site to Eraring Power Station, via truck using existing private haul roads, from 2 Mtpa to up to 4.5 Mtpa;
6. Increase the volume of coal transported from the Newstan Colliery Surface Site rail loading facilities by train to the Port of Newcastle and/or Port Kembla (for export) and/or Vales Point Power Station from 3 Mtpa to up to 8 Mtpa;
7. Continue to transport up to 0.5 Mtpa of middlings by truck via private haul roads from Newstan Colliery Surface Site to Cooranbong Entry Site for subsequent supply to the Eraring Power Station via a dedicated overland conveyor;
8. Continue to transport up to 0.88 Mtpa of material (including coal and stone from construction activities undertaken as part of the Newstan Colliery Extension of Mining Project) by truck via private haul roads from the Awaba Colliery Surface Site to the reject emplacement areas at the Newstan Colliery Surface Site;
9. Transport reject material from the Newstan Colliery Surface Site to the Newstan Colliery Northern Reject Emplacement Area (NREA), the Newstan Colliery Southern Reject Emplacement Area (SREA) and/or Hawkmount Quarry via existing private haul roads;
10. Increase the volume of water discharged via licenced discharge points at the Newstan Colliery Surface Site and Cooranbong Entry Site;
11. Provide employment for up to 120 full-time personnel;
12. Provide a life of operation of 30 years from the granting of development consent; and Operate 24 hours per day, seven days per week.

In regard to traffic movements on the external road network the Project will result in additional traffic being generated by additional employee traffic to the Newstan Colliery Surface Site associated with operation of the coal handling and preparation infrastructure as well as construction traffic associated with the redevelopment of the Newstan Colliery Surface Site (see ***Appendix C***). All other traffic movements, including coal transportation, will be on privately owned infrastructure (e.g. haul roads and conveyors) and the existing rail lines to the Port of Newcastle, Port Kembla and/or Vales Point Power Station.

The Project will result in an additional 120 employees (total) who will be based at the Newstan Colliery Surface Site. This is equivalent to up to 45 new employees per shift operating at the Newstan Colliery Surface Site. Currently approximately 14 employees work at the Cooranbong Entry Site with up to 4 employees per shift. Whilst these employees will be additional employees to current employee levels overall employee numbers will remain below the 320 employees for which Newstan Colliery already has approval. There will be no change to the operational workforce numbers (14 full-time personnel) based at the Cooranbong Entry Site as a result of the Project.

The additional employees at the Newstan Colliery Surface Site will be distributed over each of the current shifts, although new employee numbers will be at a peak during the day and afternoon shifts. Newstan Colliery Surface Site operates on a 3 shift basis as follows;

Day Shift - 6.30 am to 2.30 pm
Afternoon Shift - 2.30 pm to 10.30 pm; and

Night Shift - 9.30 pm to 7.00 am.

Northern Coal Services employees operating at the Cooranbong Entry Site operate on a 2 shift basis as follows;

Day Shift - 6:00 am – 6:00 pm
Night Shift - 6:00 pm – 6:00 am

Additionally, and separate to this Project, Centennial Newstan is progressing the Newstan Extension of Mining Project proposal. Although the Newstan Extension of Mining Project will be the subject of a separate development application, it proposes the continued utilisation of the Newstan Colliery Surface Site by the mine workforce until such time that upgrades to the Awaba Colliery Surface Site have been completed. The Newstan Extension of Mining Project is seeking approval for up to 420 full time personnel with up to an additional 50 contractors during longwall moves. As such, this assessment has taken into consideration both the traffic volumes generated by the Northern Coal Logistics Project and the Newstan Extension of Mining Project to ensure a worst case scenario in regard to additional traffic generation is being assessed. The existing and proposed Newstan Colliery mining operations are on a 5 shift basis as follows:

Monday – Thursday

Day Shift – 6.30 am to 4.00 pm
Afternoon Shift - 2.30 pm to 12.00 am; and
Night Shift - 10:30 pm to 8.00 am.

Friday – Sunday

Day Shift - 6 am to 6 pm
Night Shift - 6 pm to 6 am

Therefore the peak traffic generating periods for the two projects are likely to occur between 5.30 am and 8 am and between 2 pm and 6.30 pm corresponding to the main shift changeovers. These periods are also likely to coincide with relatively busy periods on the local road network.

The proposed redevelopment of the Newstan Colliery Surface Site (see ***Appendix C***) will result in a construction traffic impact on the local road network that also needs to be considered in this assessment.

It is noted that the project will not increase the approved number of loaded trains travelling from the Newstan Colliery Surface Site to the Port of Newcastle and/or Port Kembla (for export) and/or Vales Points Power Station. Newstan Colliery currently has approval for the operation of a total of 8 trains per day.

Overall it is considered that from both a long term and short term traffic impact perspective the links of the road network that will need to be assessed for this development include;

1. Miller Road (Fassifern),
2. Macquarie Road / Fassifern Road (Fassifern);
3. Existing Newstan Colliery Surface Site access intersection (outskirts of Fassifern);
4. Miller Road / Macquarie Road / Fassifern Road intersection (Fassifern);
5. Glebe Road, Adamstown level rail crossing (Newcastle);
6. Clyde Street, Hamilton North level rail crossing (Newcastle).
7. Newport Road & Gradwells Road, (Dora Creek) (as the Project requires some employees to be located at the Cooranbong Entry Site).
8. Newport Road / Gradwells Road intersection (Dora Creek)

The road network around the Newstan Colliery Surface Site and the Cooranbong Entry Site expected to be impacted on by this proposal is shown below in ***Figures 2 & 3.***

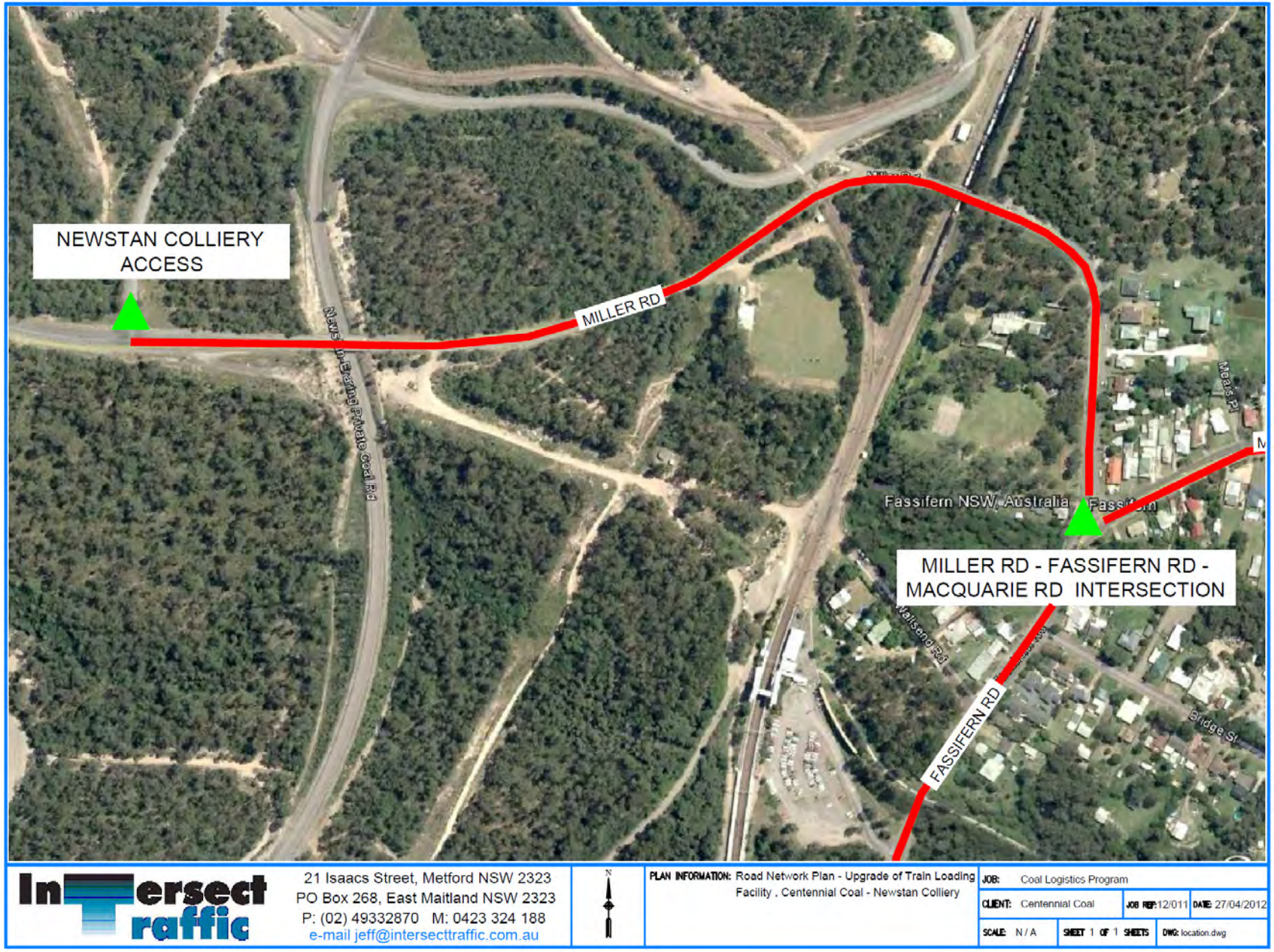


Figure 2 – Local road network – Newstan Colliery Surface Site

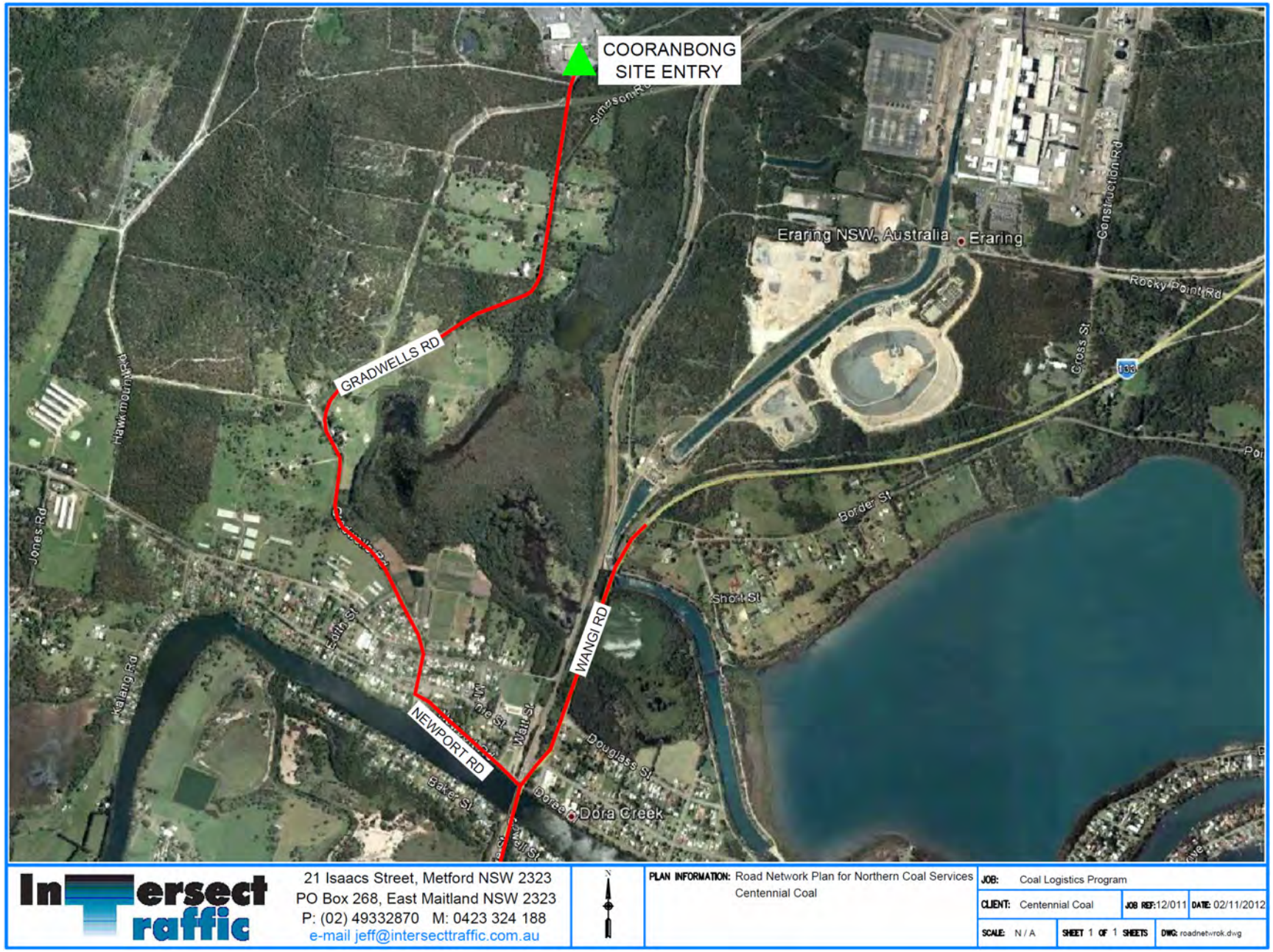


Figure 3 – Local road network – Cooranbong Entry Site

4. EXISTING ROAD NETWORK

4.1 Miller Road

Miller Road (previously known as Fassifern Road) is a local collector road that connects Fassifern to the Wakefield area. Whilst the section of road in Fassifern is of urban construction standards the majority of the road is a two lane two way rural road.

As a local road it is under the care and control of Lake Macquarie City Council. Typically Miller Road is a two lane two way sealed rural road with laneway widths of between 3 and 3.5 metres. The current speed zoning on Miller Road in the vicinity of the Newstan Colliery Surface Site is 80 km/h and at the time of inspection it was found to be in fair to good condition.

Photograph 1 – Miller Road.

4.2 Macquarie Road / Fassifern Road

Macquarie Road / Fassifern Road is also a local collector road that connects Fassifern to both the Toronto and Fennell Bay area's thereby providing a link to the sub-arterial road network (Awaba Road and Main Road). This road is typically a two lane two way urban road with kerb and gutter and piped longitudinal drainage.

As a local road it is under the care and control of Lake Macquarie City Council. Typically Macquarie Road / Fassifern Road have widths of between 12 and 13 metres. The current speed zoning in the vicinity of Miller Road is 60 km/h though a variable school speed zone exists around the Miller Road intersection. At the time of inspection it was found to be in good condition.

Photograph 2 – Macquarie Road / Fassifern Road

4.3 Miller Road / Macquarie Road / Fassifern Road Intersection

Miller Road intersects with Macquarie Road near the Fassifern Railway Station. The intersection is currently constructed as an urban stop sign controlled T-intersection with no protected turn bays but wide enough to allow through vehicles on Macquarie Road to pass vehicles propped to turn right into Miller Road. From observation sight distances at the intersection are good and considered suitable to comply with Austroads Guide to Road Design (2009) requirements.

Photograph 3 – Miller Road / Macquarie Road intersection

4.4 Gradwells Road

Gradwells Road is a local access road that runs north from Newport Road, Dora Creek. It provides access to properties along its length including the Cooranbong Entry Site. This road is typically a two lane two way rural road with unsealed shoulders and grassed table drains.

As a local road it is under the care and control of Lake Macquarie City Council. Typically Gradwells Road has a width of 7 metres and the current speed zoning is 80 km/h. At the time of inspection it was found to be in good condition.

Photograph 4 – Gradwells Road

4.5 Newport Road

Newport Road is a local collector road that runs in an east west direction connecting Cooranbong (Freeman's Drive) and Dora Creek (Wangi Road). The road has both rural and urban road construction standards along its length though typically at the Gradwells Road intersection it has sealed shoulders and grass table drains.

As a local road it is under the care and control of Lake Macquarie City Council. Typically Newport Road has a width of 7 metres and the current speed zoning is 50 km/h in the vicinity of Gradwells Road. At the time of inspection it was found to be in good condition.

Photograph 5 – Newport Road

4.6 Newport Road / Gradwells Road intersection

The Newport Road / Gradwells Road intersection is constructed as an urban give way controlled cross intersection. Due to relatively low traffic volumes on the road network even during peak periods the intersection has been observed as operating with uninterrupted flow conditions with little if any delay being experienced. There is no accident history at the intersection and again by observation sight distances at the intersection are good and considered suitable to comply with Austroads Guide to Road Design (2009) requirements.

Photograph 6 – Newport Road / Gradwells Road intersection, Dora Creek

4.7 Glebe Road, Adamstown level rail crossing

The main Sydney – Newcastle rail line crosses Glebe Road at Adamstown with an at-grade level crossing with boom gates being provided at this location. Glebe Road is a classified State road (MR188) and is under the care and control of the NSW Roads and Maritime Services (RMS). Under a functional road hierarchy Glebe Road would be considered either as a sub-arterial or major collector road. The rail line is operated by RailCorp NSW who would control timetabling of all train services.

This rail crossing has recently been upgraded to the highest level of protection that is possible for a level crossing including a central median and pedestrian safety fence. Collision risk at this railway level crossing is considered to be low.

Photograph 7 – Glebe Road, Adamstown level rail crossing

4.8 Clyde Street, Hamilton North level rail crossing

The main Sydney – Newcastle rail line crosses Clyde Street at Hamilton North and an at-grade level crossing with boom gates is provided at this location. Clyde Street is a local road and is under the care and control of Newcastle City Council (NCC). Under a functional road hierarchy Clyde Street would be considered a collector road. The rail line is operated by RailCorp NSW who controls timetabling of all train services.

This rail crossing has recently been upgraded to the highest level of protection that is possible for a level crossing including a central median and pedestrian safety fence. Collision risk at this railway level crossing is considered to be low.

Photograph 8 – Clyde Street, Hamilton North level rail crossing


Newstan Colliery Surface Site

5. TRAFFIC VOLUMES AND NETWORK CAPACITY

Intersect carried out manual traffic counts during AM and PM traffic periods coinciding with the likely change of shifts at the existing Newstan Colliery Surface Site access entrance and the Miller Road / Macquarie Road / Fassifern Road intersections as part of this assessment. Whilst these counts were mainly carried out to determine existing traffic generation from the Newstan Colliery Surface Site and determine current traffic distribution patterns from this traffic, they are also useful data for assessing likely mid block traffic conditions of the roads.

Similarly a manual traffic count was carried out on the Newport Road / Gradwells Road intersection to determine existing peak hour traffic volumes on these roads. The count sheets for all these manual traffic counts are provided in ***Appendix A***.

It should be noted the intersection counts were carried out during the likely peak periods for traffic generated by the Newstan Colliery Surface Site and may not in fact represent the peak traffic volume on the road network. This data is however relevant to the assessment as it represents the network traffic volume at the time of greatest impact from the Project. The mid-block traffic data extracted from these counts are shown in ***Table 1.***

Table 1 – Existing Traffic Volume Data

Road	Section	AM peak period	AM peak (vph)	PM peak period	PM peak (vph)
Miller Road	west of Newstan entrance	6.30 am to 7.30 am	103	2 pm to 3 pm	141
Miller Road	east of Newstan entrance	6.30 am to 7.30 am	146	2 pm to 3 pm	191
Macquarie Road		6.45 am to 7.45 am	290	2 pm to 3 pm	329
Fassifern Road		6.45 am to 7.45 am	283	2 pm to 3 pm	364
Gradwells Road	North of Newport Road	7.30 am to 8.30 am	51	4 pm to 5 pm	51
Newport Road	East of Gradwells Road	7.30 am to 8.30 am	387	4 pm to 5 pm	369

The capacity of roads is generally governed by the capacity of intersections however Table 4.5 of the RMS' Guide to Traffic Generating Developments gives some guidance on the mid block capacity and expected levels of service on rural roads. This table is reproduced below. It is noted that the table provides for speed limits of 100 km/h but does indicate that capacity volumes for a design speed of 80 km/hr represent between 85 % and 95 % of the figures quoted.

Table 4.5
peak hour flow on two-lane rural roads (veh/hr)
(Design speed of 100km/hr)

Terrain	Level of Service	Percent of Heavy Vehicles			
		0	5	10	15
Level	B	630	590	560	530
	C	1030	970	920	870
	D	1630	1550	1480	1410
	E	2630	2500	2390	2290
Rolling	B	500	420	360	310
	C	920	760	650	570
	D	1370	1140	970	700
	E	2420	2000	1720	1510
Mountainous	B	340	230	180	150
	C	600	410	320	260
	D	1050	680	500	400
	E	2160	1400	1040	820

The data for Table 4.5 assumes the following criteria:

- *terrain level* with 20% no overtaking.
- *rolling* with 40% no overtaking.
- *mountainous* with 60% no overtaking.
- 3.7 m traffic lane width with side clearances of at least 2m.
- 60/40 directional split of traffic.

Therefore assuming an 80 km/hr design speed, 10% heavy vehicles and rolling terrain the likely level of service (LOS) thresholds on the rural road network being assessed would be as shown in ***Table 2*** below.

Table 2 – Likely LOS thresholds – local road network

Level of Service (LOS)	Traffic volume (vph)
A	0
B	340
C	615
D	920
E	1630

Miller Road and Gradwells Road with current peak traffic volumes less than 340 vph (191 vph and 51 vph respectively) would be operating with a mid-block LOS A and have significant capacity to cater for additional traffic. Assuming a LOS C being acceptable the likely mid-block capacity of Miller Road and Gradwells Road would be in the order of 920 vph.

Similarly the RMS' Guide to Traffic Generating Developments also provides guidance on urban road LOS within Tables 4.3 and 4.4 reproduced below. Assuming a LOS C being desirable for urban roads in this area it can be seen that the desirable capacity of a two lane two way urban road would be 1,800 vph. As both Macquarie Road and Fassifern Road are operating with peak mid-block traffic volumes well less than this (329 vph and 364 vph respectively) it can be concluded both roads also have significant capacity to cater for additional traffic while the current LOS being experienced by motorists is likely to be LOS A or B. Newport Road with an existing peak hour traffic volume of 387 vph also has significant spare capacity with the current LOS being experienced by motorists likely to be LOS A.

Table 4.3
Typical mid-block capacities for urban roads with interrupted flow

Type of Road	One-Way Mid-block Lane Capacity (pcu/hr)	
Median or inner lane:	Divided Road	1,000
	Undivided Road	900
Outer or kerb lane:	With Adjacent Parking Lane	900
	Clearway Conditions	900
	Occasional Parked Cars	600
4 lane undivided:	Occasional Parked Cars	1,500
	Clearway Conditions	1,800
4 lane divided:	Clearway Conditions	1,900

Table 4.4
Urban road peak hour flows per direction

Level of Service	One Lane (veh/hr)	Two Lanes (veh/hr)
A	200	900
B	380	1400
C	600	1800
D	900	2200
E	1400	2800

6. TRAFFIC GENERATION AND DISTRIBUTION

Intersect carried out traffic counts at the Newstan Colliery Surface Site entrance during the two major shift changes at the Colliery at that time being 6.30 am for the commencement of the morning shift and 2.30 pm for the commencement of the afternoon shift. These counts were carried out during October 2011 when mining employee numbers at Newstan Colliery were approximately 195 persons and shift numbers in the day and afternoon shifts totalled approximately 55 persons and 35 persons respectively.

Assumptions have been made in the traffic and transport assessment to adequately cover a number of possible development scenarios and site conditions associated with the Northern Coal Logistics Project and the Newstan Extension of Mining Project (proposed as part of a separate development application). These assumptions ensure a worst case scenario in regard to additional traffic generation is being assessed. These assumptions are;

1. It is noted that the Fassifern administration office staff also utilise the Newstan Colliery entrance to access their building. However it is likely that in terms of the counts undertaken by Intersect due to the starting times for administration staff being later than the day shift, the administration staff traffic would only impact on the PM count. An adjustment to delete the Fassifern administration traffic from the PM count has been carried out in the Traffic Assessment for the Newstan Extension of Mining Project.
2. The Newstan Colliery Surface Site is operating at maximum capacity of workforce employees prior to the relocation of the Newstan Colliery mine workforce to the Awaba Colliery Surface Site as proposed under the Newstan Extension of Mining Project.
3. The Newstan Extension of Mining Project increases manning numbers to 420 employees plus 50 contractors during longwall shifts. This increases shift numbers in the day and afternoon shifts to a maximum of 150 persons and 80 persons respectively i.e. increases of 95 persons and 45 persons respectively.
4. This Project will also increase employee numbers at the Newstan Colliery Surface Site by 120 persons or approximately 45 persons in the main shifts however overall employee numbers will remain below the 320 employees for which Newstan Colliery already has approval.

6.1 Heavy Vehicle Traffic Generation

The Project will generate heavy vehicle traffic through the transportation of product coal, reject material and other material between Cooranbong Entry Site, Newstan Colliery Surface Site (including the NREA and SREA), Eraring Power Station, Hawkmount Quarry and the Awaba Colliery Surface Site. Importantly, all road haulage will be undertaken on the private haul routes linking these facilities and will cumulatively generate, on average, 32 heavy vehicle movements per hour (16 return trips per hour). The low number of heavy vehicle movements is due primarily to the large capacity of the haulage trucks and the ability to backload.

6.2 Operational Traffic Generation

The manual traffic counts identified that the peak traffic generation volumes to and from the Newstan Colliery Surface Site at the time of the counts and associated with the operation of the Newstan Colliery mining operations was 91 vph associated with shift employees at the morning and afternoon shift change of around 90 employees.

Based on this information the additional traffic generated above existing traffic volumes in the AM and PM peaks at shift changeovers by the Northern Coal Logistics Project at the Newstan Colliery Surface Site has the potential to be;

- 90 persons (2 x 45 person shifts) x 91 vtph / 90 persons = 91 vtph

Currently, approximately 14 employees are based at the Cooranbong Entry Site located off Gradwells Road, Dora Creek. Of the 120 people proposed to be employed by the Project, approximately 14 employees will continue to be positioned at the Cooranbong Entry Site with up to 4 employees per shift. There will be no change to future operational numbers accessing or leaving the Cooranbong Entry Site as a result of the Project.

The Newstan Extension of Mining Project, is likely to increase shift numbers at the Newstan Colliery Surface Site for a period of time (until upgrades to the Awaba Colliery Surface Site are completed and the workforce is relocated) to up to 95 persons per day shift and 45 persons per afternoon shift. As such, the Newstan Extension of Mining Project also has the potential to generate the following additional peak AM and PM traffic on the local road network for a period of time;

- 140 persons x 91 vtph/ 90 persons = 142 vtph.

Therefore the total additional peak AM and PM traffic generated by both the Northern Coal Logistics Project and the Newstan Extension of Mining Project is as follows;

- 91 vtph + 142 vtph = **233 vtph**.

6.3 Traffic Distribution

The manual traffic counts identified that the trip distribution to and from the Newstan Colliery Surface Site is as follows;

- In the AM and PM peaks on average 20% of traffic has an origin / destination to the west and 80% of traffic has an origin destination to the east.
- Based on shift numbers for the Northern Coal Logistics Project inbound and outbound trips would be 50% each due to equal shift numbers.
- Based on shift numbers in the AM peak inbound trips for the Newstan Extension of Mining Project would make up 68% of trips while in the PM peak this would be mirrored such that 68% of trips would be outbound.

Based on this data and results from the manual traffic counts the additional traffic from both the Northern Coal Logistics Project and the Newstan Extension of Mining Project can be distributed on the local road network as shown in ***Figure 4*** below.

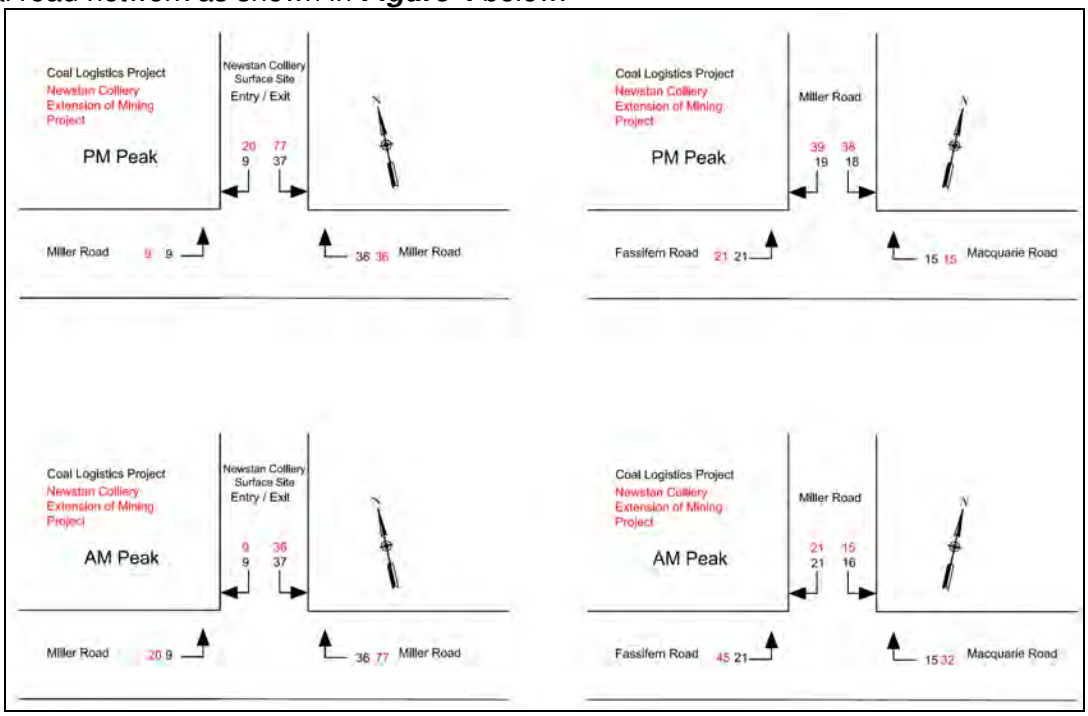


Figure 4 – Project Traffic Distribution

7. TRAFFIC AND TRANSPORT IMPACTS

7.1 Road Network

7.1.1 Miller Road

The traffic counts carried out by Intersect (2011) indicate that the maximum existing traffic volume on Miller Road during the likely peak traffic periods for both the Northern Coal Logistics Project and the Newstan Extension of Mining Project during the period when the workforce is operating at the Newstan Colliery Surface Site is 191 vph (see ***Section 5***). This assessment has determined that Miller Road has a two way mid block capacity of up to 920 vph if it is assumed a LOS C is satisfactory. After distributing the additional development traffic onto the local road network the Northern Coal Logistics Project and the Newstan Extension of Mining Project combined have the potential to generate a maximum of an additional 186 vph onto Miller Road between Newstan Colliery and Fassifern Road (see ***Figure 4***).

The resultant peak traffic volumes on this section of Miller Road will therefore be in the order of 377 vph during the peak traffic periods and a satisfactory LOS B or better (***Table 2***) will be experienced by motorists on this section of Miller Road.

It is concluded that Miller Road has sufficient spare mid-block capacity to cater for both the Northern Coal Logistics Project and the Newstan Extension of Mining Project.

7.1.2 Fassifern Road / Macquarie Road

The traffic counts carried out by Intersect (2011) indicate that the maximum existing traffic volume on Fassifern Road and Macquarie Road during the likely peak traffic periods is 364 vph (see ***Section 5***). This assessment has determined that Fassifern Road / Macquarie Road as an urban two way two lane road has a likely two way mid-block capacity of up to 1,800 vph if it is assumed a LOS C is satisfactory. After distributing the additional development traffic onto the local road network the Northern Coal Logistics Project and the Newstan Extension of Mining Project combined have the potential to generate an additional 108 vph onto Fassifern Road / Macquarie Road in the PM peak (see ***Figure 4***).

The resultant traffic volumes on Fassifern Road / Macquarie Road will be in the order 472 vph during the peak traffic periods therefore a satisfactory level of service LOS B will be experienced by all motorists on Fassifern Road / Macquarie Road. It is concluded that Fassifern Road / Macquarie Road has sufficient spare mid-block capacity to cater for both the Northern Coal Logistics Project and the Newstan Extension of Mining Project.

7.1.3 Newport Road

The traffic counts carried out by Intersect (2012) indicate that the maximum existing traffic volume on Newport Road during the likely peak traffic periods is 387 vph (see ***Section 5***). This assessment has determined that Newport Road as an urban two way two lane road has a likely two way mid-block capacity of up to 1,800 vph if it is assumed a LOS C is satisfactory. The Northern Coal Logistics Project will not increase traffic on Newport Road during operations therefore traffic volumes will remain at current levels.

The resultant traffic volumes on Newport Road will therefore remain in the order 387 vph during the peak periods therefore a good level of service LOS A will be experienced by all motorists on Newport Road. It is concluded that Newport Road will not be adversely impacted by the operation of the Project.

7.1.4 Gradwells Road

The traffic counts carried out by Intersect (2012) indicate that the maximum existing traffic volume on Gradwells Road during the likely peak traffic periods is 51 vph (see ***Section 5***). This assessment has determined that Gradwells Road as a rural two way two lane road has a likely two way mid-block capacity of up to 920 vph if it is assumed a LOS C is satisfactory (**Table 2**). The

Project will not increase traffic on Gradwells Road during operations therefore traffic volumes will remain at current levels.

The resultant traffic volumes on Gradwells Road will therefore remain in the order 51 vph during the peak periods therefore a good level of service LOS A (**Table 2**) will be experienced by all motorists on Gradwells Road.

It is concluded that Gradwells Road will not be adversely impacted by the operation of the Project.

7.2 Intersection Capacities

Intersection capacities have been assessed using the Sidra 5 intersection modelling software using the level of service (delay) model adopted by the RMS. Average delay is used to determine the level of service (LOS) based on the following table sourced from the RMS' *Guide to Traffic Generating Developments.*

Table 4.2
Level of service criteria for intersections

Level of Service	Average Delay per Vehicle (secs/veh)	Traffic Signals, Roundabout	Give Way & Stop Signs
A	< 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays & spare capacity	Acceptable delays & spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity & accident study required
E	57 to 70	At capacity; at signals, incidents will cause excessive delays Roundabouts require other control mode	At capacity, requires other control mode

For assessment purposes a LOS D or higher is considered satisfactory intersection operation within an urban situation.

7.2.1 Newstan Colliery Surface Site Access Entrance

The Newstan Colliery Surface Site access entrance was modelled using the Sidra 5 intersection modelling software for the following scenarios;

- 2014 traffic volumes including traffic generated by the Newstan Extension of Mining Project and the Northern Coal Logistics Project calculated by using the 2011 traffic counts carried out by Intersect Traffic and a background traffic growth of 1 % per annum.
- 2024 predicted traffic volumes including both the Northern Coal Logistics Project and the Newstan Extension of Mining Project. This has been carried out in case relocation of the Newstan Colliery entrance to the Awaba Colliery Surface Site is found to be uneconomical. Note 2024 traffic volumes have been predicted by adopting a 1 % per annum background traffic growth rate on Miller Road which is considered suitable as very little new development is occurring in the area. It is reasonable to assume that should the intersection modelling show satisfactory performance with both Projects operational from the Newstan Colliery Surface Site in 2024 then satisfactory intersection performance would also occur in 2024 if the Newstan Colliery mine workforce relocation to the Awaba Colliery Surface Site had already occurred.

The results of this modelling are shown in the following tables.

Table 3 – Sidra Movement Summary Table – Newstan Colliery Entrance – 2014 AM Peak – CLP + NME

MOVEMENT SUMMARY

Site: Newstan Colliery entrance 2014 AM Peak - NME + CLP

Newstan Colliery Entrance (Give-Way control)
AM Peak (6.30 am - 7.30 am)
with NME and CLP traffic
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
East: Miller Road											
5	T	58	10.0	0.032	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
6	R	146	10.0	0.095	9.0	LOS A	0.5	3.4	0.24	0.62	47.9
Approach		204	10.0	0.095	6.4	NA	0.5	3.4	0.17	0.44	50.8
North: Newstan Colliery entrance											
7	L	107	10.0	0.114	8.8	LOS A	0.4	2.8	0.13	0.63	48.4
9	R	37	10.0	0.064	11.6	LOS A	0.2	1.9	0.43	0.71	45.8
Approach		144	10.0	0.114	9.5	LOS A	0.4	2.8	0.21	0.65	47.7
West: Miller Road											
10	L	34	10.0	0.020	8.6	LOS A	0.0	0.0	0.00	0.67	49.0
11	T	24	10.0	0.013	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		58	10.0	0.020	5.0	NA	0.0	0.0	0.00	0.39	53.0
All Vehicles		406	10.0	0.114	7.3	NA	0.5	3.4	0.16	0.51	50.0

Level of Service (LOS) Method: Delay (RTA NSW).
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 used.

Table 4 – Sidra Movement Summary Table – Newstan Colliery Entrance – 2024 AM Peak - CLP + NME

MOVEMENT SUMMARY

Site: Newstan Colliery entrance 2024 AM Peak

Newstan Colliery Entrance (Give-Way control)
2024 AM Peak (6.30 am - 7.30 am)

Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
East: Miller Road											
5	T	64	10.0	0.035	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
6	R	146	10.0	0.095	9.0	LOS A	0.5	3.4	0.24	0.62	47.9
Approach		210	10.0	0.095	6.2	NA	0.5	3.4	0.17	0.43	51.0
North: Newstan Colliery entrance											
7	L	107	10.0	0.114	8.8	LOS A	0.4	2.8	0.14	0.63	48.3
9	R	37	10.0	0.065	11.7	LOS A	0.2	1.9	0.44	0.71	45.7
Approach		144	10.0	0.114	9.5	LOS A	0.4	2.8	0.22	0.65	47.6
West: Miller Road											
10	L	34	10.0	0.020	8.6	LOS A	0.0	0.0	0.00	0.67	49.0
11	T	27	10.0	0.015	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		61	10.0	0.020	4.8	NA	0.0	0.0	0.00	0.37	53.3
All Vehicles		415	10.0	0.114	7.2	NA	0.5	3.4	0.16	0.50	50.1

Level of Service (LOS) Method: Delay (RTA NSW).
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 used.

Table 5 – Sidra Movement Summary Table – Newstan Colliery Entrance – 2014 PM Peak – CLP + NME

MOVEMENT SUMMARY

Site: Newstan Colliery entrance 2014 PM Peak - NME + CLP

Newstan Colliery Entrance (Give-Way control)
2014 PM Peak (2 pm - 3 pm)
with NME & CLP traffic
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Average Speed
							Vehicles	Distance			
		veh/h	%	v/c	sec		veh	m		per veh	km/h
East: Miller Road											
5	T	38	10.0	0.021	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
6	R	129	10.0	0.089	9.2	LOS A	0.4	3.2	0.30	0.63	47.6
Approach		167	10.0	0.089	7.1	NA	0.4	3.2	0.24	0.48	50.0
North: Newstan Colliery entrance											
7	L	139	10.0	0.150	9.0	LOS A	0.5	4.0	0.21	0.63	48.0
9	R	45	10.0	0.079	11.7	LOS A	0.3	2.3	0.44	0.72	45.7
Approach		184	10.0	0.150	9.7	LOS A	0.5	4.0	0.26	0.65	47.4
West: Miller Road											
10	L	51	10.0	0.029	8.6	LOS A	0.0	0.0	0.00	0.67	49.0
11	T	57	10.0	0.031	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		108	10.0	0.031	4.0	NA	0.0	0.0	0.00	0.32	54.2
All Vehicles		459	10.0	0.150	7.4	NA	0.5	4.0	0.19	0.51	49.8

Level of Service (LOS) Method: Delay (RTA NSW).
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 used.

Table 6 – Sidra Movement Summary Table – Newstan Colliery Entrance – 2024 PM Peak – CLP + NME

MOVEMENT SUMMARY

Site: Newstan Colliery entrance 2024 PM Peak

Newstan Colliery Entrance (Give-Way control)
2024 PM Peak (2 pm - 3 pm)

Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Average Speed
							Vehicles	Distance			
		veh/h	%	v/c	sec		veh	m		per veh	km/h
East: Miller Road											
5	T	42	10.0	0.023	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
6	R	129	10.0	0.090	9.2	LOS A	0.4	3.2	0.31	0.63	47.6
Approach		171	10.0	0.090	7.0	NA	0.4	3.2	0.23	0.47	50.1
North: Newstan Colliery entrance											
7	L	139	10.0	0.150	9.1	LOS A	0.5	4.0	0.21	0.63	48.0
9	R	45	10.0	0.080	11.9	LOS A	0.3	2.3	0.45	0.72	45.5
Approach		184	10.0	0.150	9.8	LOS A	0.5	4.0	0.27	0.65	47.4
West: Miller Road											
10	L	51	10.0	0.029	8.6	LOS A	0.0	0.0	0.00	0.67	49.0
11	T	63	10.0	0.034	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		114	10.0	0.034	3.8	NA	0.0	0.0	0.00	0.30	54.5
All Vehicles		469	10.0	0.150	7.3	NA	0.5	4.0	0.19	0.50	50.0

Level of Service (LOS) Method: Delay (RTA NSW).
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 used.

The Sidra modelling shows that upon commencement of both the Newstan Extension of Mining Project and the Northern Coal Logistics Project motorists will experience little if any delays (LOS A) as well as little or no queuing in both the AM and PM peak traffic periods at the Newstan Colliery Surface Site access entrance. It also shows that the access intersection continues to operate with satisfactory Levels of Service (LOS) for all traffic movements through to 2024 with both Projects operational from the Newstan Colliery Surface Site.

It is concluded that the existing Newstan Colliery Surface Site access entrance off Miller Road, Fassifern has sufficient spare capacity to cater for both the Northern Coal Logistics Project and the Newstan Extension of Mining Project and will not require any upgrading.

7.2.2 Miller Road / Macquarie Road / Fassifern Road intersection

The Miller Road / Fassifern Road / Macquarie Road intersection was modelled using the Sidra 5 intersection modelling software for traffic volumes for the following scenarios;

- 2014 traffic volumes including traffic generated by the Newstan Extension of Mining Project and the Northern Coal Logistics Project calculated by using the 2011 traffic counts carried out by Intersect Traffic and a background traffic growth of 1 % per annum.
- 2024 predicted traffic volumes including both the Northern Coal Logistics Project and the Newstan Extension of Mining Project. This has been carried out in case relocation of the Newstan Colliery entrance to the Awaba Colliery Surface Site is found to be uneconomical. Note 2024 traffic volumes have been predicted by adopting a 1 % per annum background traffic growth rate on Miller Road, Fassifern Road and Macquarie Road which is considered suitable as very little new development is occurring in the area. It is reasonable to assume that should the intersection modelling show satisfactory performance with both Projects operational from the Newstan Colliery Surface Site in 2024 then satisfactory intersection performance would also occur in 2024 if the Newstan Colliery mine workforce relocation to the Awaba Colliery Surface Site had already occurred.

The results of this modelling are shown in the following tables.

Table 7 – Sidra Movement Summary Table – Miller Road / Macquarie Road / Fassifern Road Intersection – 2014 AM Peak – CLP + NME

MOVEMENT SUMMARY

Site: Miller Road / Macquarie Rd / Fassifern Rd 2014 AM Peak - NME + CLP

Miller Road / Macquarie Rd / Fassifern Rd (Give-Way control)
2014 AM peak (6.45 am - 7.45 am)
with NME & CLP traffic
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Average Speed
							Vehicles	Distance			
		veh/h	%	v/c	sec		veh	m		per veh	km/h
East: Macquarie Road											
5	T	82	10.0	0.110	1.1	LOS A	0.6	4.6	0.39	0.00	51.9
6	R	85	10.0	0.110	9.8	LOS A	0.6	4.6	0.39	0.77	48.1
Approach		167	10.0	0.110	5.5	NA	0.6	4.6	0.39	0.39	49.9
North: Miller Road											
7	L	60	10.0	0.066	9.7	LOS A	0.2	1.8	0.32	0.65	47.6
9	R	82	10.0	0.178	14.2	LOS A	0.7	5.3	0.56	0.84	43.4
Approach		142	10.0	0.178	12.3	LOS A	0.7	5.3	0.46	0.76	45.0
West: Fassifern Road											
10	L	101	10.0	0.136	8.6	LOS A	0.0	0.0	0.00	0.86	49.0
11	T	142	10.0	0.136	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		243	10.0	0.136	3.6	NA	0.0	0.0	0.00	0.36	54.9
All Vehicles		552	10.0	0.178	6.4	NA	0.7	5.3	0.24	0.47	50.5

Level of Service (LOS) Method: Delay (RTA NSW).
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 used.

Table 8 – Sidra Movement Summary Table – Miller Road / Macquarie Road / Fassifern Road intersection – 2024 AM Peak – CLP + NME.

MOVEMENT SUMMARY

Site: Miller Road / Macquarie Rd / Fassifern Rd 2024 AM Peak

Miller Road / Macquarie Rd / Fassifern Rd (Give-Way control)
2024 AM peak (6.45 am - 7.45 am)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Average Speed
							Vehicles	Distance			
		veh/h	%	v/c	sec		veh	m		per veh	km/h
East: Macquarie Road											
5	T	88	10.0	0.122	1.3	LOS A	0.7	5.2	0.41	0.00	51.4
6	R	94	10.0	0.122	9.9	LOS A	0.7	5.2	0.41	0.77	48.1
Approach		182	10.0	0.122	5.7	NA	0.7	5.2	0.41	0.40	49.7
North: Miller Road											
7	L	66	10.0	0.074	9.8	LOS A	0.3	2.0	0.34	0.66	47.5
9	R	90	10.0	0.208	15.1	LOS B	0.8	6.2	0.58	0.87	42.6
Approach		156	10.0	0.208	12.9	LOS A	0.8	6.2	0.48	0.78	44.6
West: Fassifern Road											
10	L	111	10.0	0.149	8.6	LOS A	0.0	0.0	0.00	0.86	49.0
11	T	156	10.0	0.149	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		267	10.0	0.149	3.6	NA	0.0	0.0	0.00	0.36	54.9
All Vehicles		605	10.0	0.208	6.6	NA	0.8	6.2	0.25	0.48	50.3

Level of Service (LOS) Method: Delay (RTA NSW).
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 used.

Table 9 – Sidra Movement Summary Table – Miller Road / Macquarie Road / Fassifern Road intersection – 2014 PM Peak – CLP + NME

MOVEMENT SUMMARY

Site: Miller Road / Macquarie Rd / Fassifern Rd PM Peak - 2014 NME + CLP

Miller Road / Macquarie Rd / Fassifern Rd (Give-Way control)
2014 PM peak (2 pm - 3 pm)
with NME + CLP
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Average Speed
							Vehicles	Distance			
		veh/h	%	v/c	sec		veh	m		per veh	km/h
East: Macquarie Road											
5	T	98	10.0	0.150	1.3	LOS A	0.8	6.4	0.42	0.00	51.2
6	R	123	10.0	0.150	10.0	LOS A	0.8	6.4	0.42	0.77	48.0
Approach		221	10.0	0.150	6.1	NA	0.8	6.4	0.42	0.43	49.4
North: Miller Road											
7	L	80	10.0	0.090	9.8	LOS A	0.3	2.5	0.34	0.67	47.5
9	R	82	10.0	0.203	15.8	LOS B	0.8	6.0	0.60	0.88	42.0
Approach		162	10.0	0.203	12.9	LOS A	0.8	6.0	0.47	0.78	44.6
West: Fassifern Road											
10	L	100	10.0	0.144	8.6	LOS A	0.0	0.0	0.00	0.88	49.0
11	T	158	10.0	0.144	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		258	10.0	0.144	3.3	NA	0.0	0.0	0.00	0.34	55.2
All Vehicles		641	10.0	0.203	6.7	NA	0.8	6.4	0.26	0.48	50.1

Level of Service (LOS) Method: Delay (RTA NSW).
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 used.

Table 10 – Sidra Movement Summary Table – Miller Road / Macquarie Road / Fassifern Road – 2024 PM Peak – CLP + NME.

MOVEMENT SUMMARY

Site: Miller Road / Macquarie Rd / Fassifern Rd 2024 PM Peak

Miller Road / Macquarie Rd / Fassifern Rd (Give-Way control)
2024 PM peak (2 pm - 3 pm)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Average Speed
							Vehicles	Distance			
		veh/h	%	v/c	sec		veh	m		per veh	km/h
East: Macquarie Road											
5	T	108	10.0	0.168	1.5	LOS A	1.0	7.4	0.45	0.00	50.7
6	R	135	10.0	0.168	10.2	LOS A	1.0	7.4	0.45	0.78	47.9
Approach		243	10.0	0.168	6.3	NA	1.0	7.4	0.45	0.43	49.1
North: Miller Road											
7	L	88	10.0	0.101	10.0	LOS A	0.4	2.8	0.36	0.68	47.4
9	R	90	10.0	0.243	17.4	LOS B	1.0	7.5	0.64	0.91	40.8
Approach		178	10.0	0.243	13.7	LOS A	1.0	7.5	0.50	0.79	43.8
West: Fassifern Road											
10	L	110	10.0	0.158	8.6	LOS A	0.0	0.0	0.00	0.88	49.0
11	T	174	10.0	0.158	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		284	10.0	0.158	3.3	NA	0.0	0.0	0.00	0.34	55.2
All Vehicles		705	10.0	0.243	7.0	NA	1.0	7.5	0.28	0.49	49.8

Level of Service (LOS) Method: Delay (RTA NSW).
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 used.

The Sidra modelling shows that upon commencement of both the Newstan Extension of Mining Project and the Northern Coal Logistics Project motorists will experience little if any delays (LOS A) as well as little or no queuing in both the AM and PM peak traffic periods at the Miller Road / Macquarie Road / Fassifern Road intersection. It also shows that the intersection continues to operate with satisfactory Levels of Service (LOS) for all traffic movements through to 2024 with both Projects operational from the Newstan Colliery Surface Site.

It is concluded that the existing Miller Road / Macquarie Road / Fassifern Road intersection has sufficient spare capacity to cater for both the Northern Coal Logistics Project and the Newstan Extension of Mining Project and will not require any upgrading

7.2.3 Newport Road / Gradwells Road intersection.

This intersection currently operates with major road flows of 387 vph (Newport Road) and minor road flows of 51 vph (Gradwells Road). These flows are blow the thresholds provided in the following table taken from Austroads *Guide to Traffic Management – Part 6 – Intersections, Interchanges & Crossings (2009)* for which the guide states a detailed analysis to demonstrate adequate capacity is available is unlikely to be necessary as uninterrupted flow conditions would prevail.

Major road type[1]	Major road flow (vph)[2]	Minor road flow (vph)[3]
Two-lane	400	250
	500	200
	650	100
Four-lane	1000	100
	1500	50
	2000	25

Notes:

1. Major road is through road (i.e. has priority).
2. Major road flow includes all major road traffic with priority over minor road traffic.
3. Minor road design volumes include through and turning volumes.

Therefore it is concluded that as the intersection currently operates with uninterrupted flow conditions and as the Project does not generate additional operational traffic on this intersection the Project will not adversely impact on the operation of the Newport Road / Gradwells Road intersection.

7.2.4 Glebe Road, Adamstown and Clyde Street, Hamilton North level railway crossings.

These two railway level crossings in Newcastle lie on the rail haulage path for coal trains from the Newstan Colliery Surface Site to the Port of Newcastle for export to overseas markets. During peak road network periods in the morning and particularly in the evening traffic is subjected to long delays and queuing at these rail crossings. The location of these crossings is shown in ***Figure 5*** below.

To determine the current delays and queuing at the railway crossings Intersect Traffic collected closure and approximate vehicle queuing data during peak periods on Thursday 22nd March 2012 and during non-peak periods on Thursday 3rd May 2012. A summary of the collected data is provided below in ***Table 11*** while the individual data sheets are provided within ***Appendix B***.

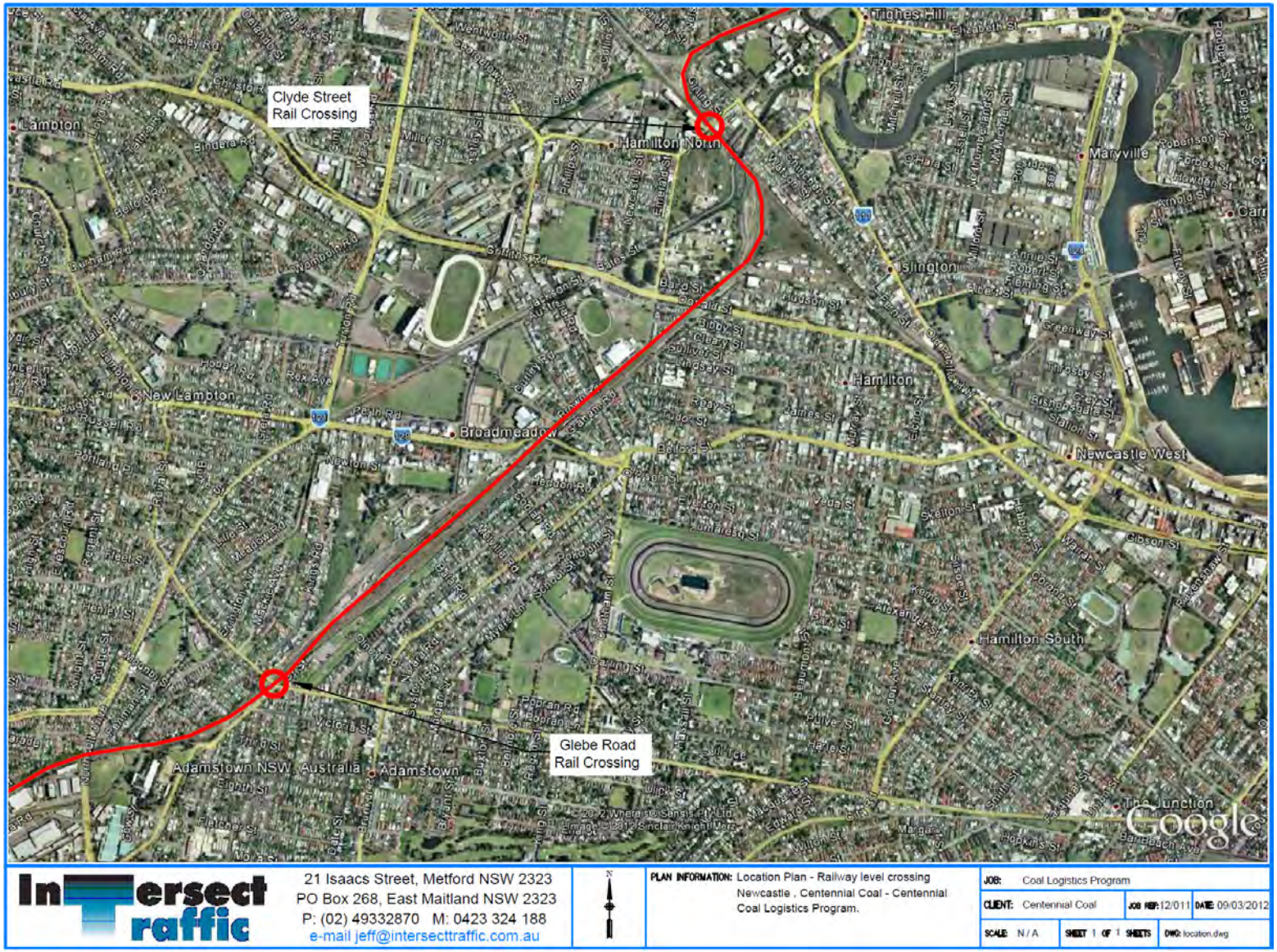


Figure 5 – Railway Level Crossing Locations – Newcastle

Table 11 – Summary of Results – Railway Level Crossing Surveys.

Location	Period	Commuter LOS	Coal/Container LOS	No. Times Closed	No. Commuter Closure Times	No. Container/ Coal Closure Times	Av. Commuter Closure (hh:mm:ss)	Av. Container/ Coal Closure (hh:mm:ss)	Av. Queue Commuter (1) (vehicles)	Av. Queue Commuter (2) (vehicles)	Av. Queue length Container/ Coal (1) (vehicles)	Av. Queue length Container/ Coal (2) (vehicles)
Clyde Street	7am to 9am	C	F	16	11	5	0:00:56	0:03:45	9	8	34	18
	9am to 12pm	C	F	16	13	3	0:00:48	0:03:50	6	5	17	20
	12pm to 2pm	C	F	12	10	2	0:00:52	0:02:41	9	6	29	21
	2pm to 4pm	C	F	14	12	2	0:00:52	0:03:50	9	9	29	23
	3.30pm to 5.30pm	C	F	13	8	5	0:00:45	0:03:21	11	14	46	48
			Totals	**71**	**54**	**17**						
Glebe Street	7am to 9am	F	F	14	9	5	0:02:51	0:03:27	33	37	26	31
	9am to 12pm	F	F	15	11	4	0:02:27	0:04:16	48	47	80	80
	12pm to 2pm	F	F	10	7	3	0:02:20	0:04:54	43	47	93	108
	2pm to 4pm	F	F	10	8	2	0:03:02	0:04:36	53	53	72	74
	3.30pm to 5.30pm	F	F	11	10	1	0:02:44	0:05:11	51	58	101	126
			Totals	**60**	**45**	**15**						

Note :- LOS values based on RMS criteria for average delay (seconds) (*Table 4.2 of Guide to Traffic Generating Developments*) in ***Section 7.2***.

The main conclusions to be drawn from the collected data are as follows;

- Coal and container (freight) trains cause long delays and queuing at the Glebe Road, Adamstown and the Clyde Street, Hamilton North railway crossings.
- Container and coal trains have a greater impact on motorist delay and queue length than commuter trains due to their length and slower speed of travel through the gates.
- Commuter trains cause more crossing closures than container and coal trains
- The afternoon peak traffic period (3.30 pm to 5.30 pm) is when delays and queuing are greatest however only 1 coal train passes through the rail gates during this period. The additional delay is caused by the additional commuter trains using the rail line during this period.

The Northern Coal Logistics Project will not result in train movements from Newstan Colliery exceeding the current approval for 8 trains per day. It is likely that the proposed Wallarah No. 2 Coal Project at Bushell's Ridge on the Central Coast (currently seeking approval) will result in an additional 2 or 3 coal trains with up to 6 movements per day (i.e. 3 north bound movements and 3 south bound movements) on the rail line to the Port of Newcastle. Other future coal mining projects could in the future also increase coal train traffic on this rail line.

There is no doubt these additional trains will cause additional queuing and delay for motorists at the Glebe Road, Adamstown and Clyde Street, Hamilton North railway level crossings, however the Northern Coal Logistics Project does not propose to increase train movements in excess of its current approval. Therefore it is argued whilst other projects would have an impact on the operation of the local road network around the Adamstown and Hamilton North railway gates this Project will not.

As there are a number of users of the rail line and as other projects are likely to increase rail traffic on the subject rail line it is considered that any problems perceived as significant with the operation of the railway level crossings may require a regional solution such as closure of the level crossings (rerouting of traffic) or provision of an alternate freight rail line (Hexham to Toronto). Any regional solution needs to be considered at a more strategic planning level than for individual projects.

Centennial is seeking to utilise existing available paths on the network to transport coal to either Port Kembla, Port of Newcastle and/or Vales Point Power Station. Train path availability is priority driven where commuter trains take first priority, followed by general freight. The system is "take or pay", which means that it is difficult to predict in advance which paths will be utilised for the Project.

Timetabling of the trains on the rail line is controlled by RailCorp NSW, Australian Rail Track Corporation and Hunter Valley Coal Chain. As such Northern Coal Services has no control over the timetabling of the coal trains.

7.3 Internal Coal Transport

The Project will generate internal heavy vehicle traffic through the transportation of coal, reject material and other material between the Cooranbong Entry Site, Newstan Colliery Surface Site (including the NREA and SREA), Eraring Power Station, Hawkmount Quarry and the Awaba Colliery Surface Site. Importantly, all road haulage will be undertaken on the private haul routes linking these facilities and will cumulatively generate, on average, 32 heavy vehicle movements per hour (16 return trips per hour). The low number of heavy vehicle movements is due primarily to the large capacity of the haulage trucks and the ability to backload. Furthermore, the transportation of coal from the Cooranbong Entry Site to Eraring Power Station will continue to be undertaken via a dedicated overland conveyor.

On this basis, the transportation of coal and other material between the Project's surface sites and the Eraring Power Station will not impact on the external public road network.

7.4 Materials Delivery

Material deliveries for the Project will occur throughout the life of the Project. Materials to be delivered may include fuels, supplies or materials from off-site to be used during rehabilitation of the reject emplacement areas. Deliveries would generally occur between 7.00 am and 6.00 pm via either the public road network or the private haul roads for internal deliveries. It is unlikely that more than 1 delivery on the public road network would occur during peak traffic periods.

7.5 Road Safety

The road network impacted on by this Project is from observation considered to be suitable to carry the additional traffic volumes resulting from both the Northern Coal Logistics Project and the Newstan Extension of Mining Project at the Newstan Colliery Surface Site.

Miller Road for the majority of its length is considered a good standard local rural road, particularly between Newstan Colliery and Fassifern Road / Macquarie Road while both Fassifern Road and Macquarie Road are considered high standard urban collector roads.

Newport Road and Gradwells Road are both considered of suitable standard for current traffic volumes and as no additional traffic will result from the Project there will be no impact on Road safety in this area as a result of the Project.

The Newstan Colliery Surface Site access intersection has been constructed as a high standard type AUR/AUL rural intersection. Austroads *Guide to Road Design Part 4A – Unsignalised intersections and signalised intersections Table 3.2* recommends for an 80 km/h speed zoning that the safe intersection sight distance should be at least 175 metres but ideally 185 metres. From observation sight distances in both directions exceeded 200 metres therefore it is considered that the sight distances at this intersection complies with at least Austroads minimum standards.

The Miller Road / Macquarie Road / Fassifern Road intersection is also considered by observation to be a satisfactory standard urban intersection. Austroads *Guide to Road Design Part 4A – Unsignalised intersections and signalised intersections Table 3.2* recommends for a 60 km/h speed zoning that the safe intersection sight distance (SISD) should be at least 115 metres but ideally 125 metres. Table 3.1 Austroads *Guide to Road Design Part 4A – Unsignalised intersections and signalised intersections* also recommends that the approach sight distance (ASD) for a 60 km/h speed zone should be at least 65 metres though preferably 75 metres. From observation sight distances on all legs of this intersection exceeded 200 metres therefore even given some grade corrections required to account for approach grades it is considered that the sight distances at this intersection complies with at least Austroads minimum standards.

There are a number of variable speed limit school zones on the local road network impacted by this proposal which provide suitable road regulation subject to satisfactory enforcement to ensure the additional traffic generated by the development does not impact on road safety at these locations. Materials deliveries can be controlled via the Construction Traffic Management Plan to ensure these are made outside the school control hours such that it will be only the employee light vehicle traffic that could coincide with the school hour zones.

Overall it is concluded that the road networks around the Newstan Colliery Surface Site and the Cooranbong Entry Site are of a suitable standard to safely cater for the increase in traffic volumes likely to occur as a result of both the Newstan Extension of Mining Project and the Northern Coal Logistics Project.

7.6 On-site Car Parking

This assessment has identified that the likely peak hour traffic volume generated by the Newstan Extension of Mining Project and the Northern Coal Logistics Project is of the order of 324 vehicles per hour at the morning and afternoon change of shifts. If the reasonable assumption is made that the new shift workers arrive before the finishing shift workers leave then the peak on-site parking demand is at most likely to mirror the peak hour traffic generation. On this basis it is considered the maximum parking demand at the Newstan Colliery Surface Site likely in the near future would be in the order of 324 vehicles.

It is estimated that current on-site parking provision at Newstan Colliery Surface Site is in the order of 300 vehicle spaces which is slightly less than the expected future demand. However the potential exists as a result of the Newstan Extension of Mining Project that the Newstan mining workforce will relocate to the Awaba Colliery Surface Site once surface facilities are constructed and/or upgraded which will mean the long term on-site parking demand at the Newstan Colliery Surface Site will be only in the order of 100 on-site car parks. There is sufficient existing on-site parking provided to cater for this long term demand.

In terms of the larger short term parking demand prior to the relocation of the Newstan mining workforce it is noted that there are a number of overflow parking areas available on the site that

could be used as temporary short term parking during construction or prior to the relocation of the workforce to the Awaba Colliery Surface Site to provide the required on site car parking.

Additionally, consideration is also being given within the Project to construction traffic utilising the Cooranbong Entry Site car parking facilities and accessing the Newstan Colliery Surface Site by bus via the existing private haul roads.

In either instance, the proposal will not result in any on-road parking occurring in the vicinity of the Newstan Colliery Surface Site or the Cooranbong Entry Site therefore will not impact on the safety and efficiency of the public road network. In this instance on-site parking becomes an internal traffic management issue for Centennial Coal.

7.7 Construction Traffic

The Northern Coal Logistics Project involves the redevelopment of the coal processing and handling facilities at the Newstan Colliery Surface Site which will generate additional traffic associated with construction. Construction traffic generally has peaks at the start and end of the job associated with site establishment and site disestablishment as well as daily peaks associated with construction employees arriving and leaving the site. This represents the most frequent peak construction traffic periods throughout the construction works.

Site establishment and disestablishment involves traffic associated with floating larger construction equipment to and from the site (i.e. dozers, excavators, rollers etc) and provision/removal of temporary infrastructure such as sheds, containers and compounds. Delivery of materials can also occur during site establishment and then throughout the project.

Construction traffic only has a short term impact on the road network and in most cases can be easily managed through the provision of construction traffic management plans which would form part of the overall environmental management plan for the construction works. Construction traffic management plans detail the strategies that are to be adopted to minimise the impacts of the construction works on the local road network and ensure suitable safe conditions occur during the construction period. They can include such measures as;

1. Temporary signage and line marking;
2. Regulated construction and delivery times and periods;
3. Provision of suitably qualified traffic marshals;
4. Oversize delivery loads.
5. Dust and noise mitigation measures;
6. Temporary works e.g. shoulder sealing, construction accesses etc.

It would be expected that any approval of the Northern Coal Logistics Project would include a requirement to prepare and submit a suitable Construction Traffic Management Plan prior to commencement of construction works. At this stage of the approval process however an assessment needs to be made as to whether the impacts of the construction traffic can be managed through a suitable construction traffic management plan or whether upgrading of the local road network needs to occur before construction begins. To do this, construction traffic first needs to be quantified and then its impact on the local road network assessed.

The re-development works will be undertaken progressively throughout the life of the Project as required to meet operational efficiencies and/or to ensure relevant environmental criteria are met. All construction work will be carried out during standard construction hours i.e. 7 a.m. to 6 p.m. weekdays and 8 a.m. to 1 p.m. on weekends. This construction traffic is likely to utilise the local road network identified in ***Figures 2 & 3*** to access the site i.e. Fassifern Road, Macquarie Road and Miller Road, Fassifern to the Newstan Colliery Surface Site as well as Newport Road and Gradwells Road, Dora Creek to the Cooranbong Entry Site.

At the peak of construction works it is likely that a maximum of 195 construction staff could be on-site at any one time. If a car occupancy rate of 1.2 is adopted to accommodate the scenario of

some carpooling the likely construction employee traffic volumes on the external road network associated with travelling to and from the site would be in the order of 162 vtph.

Materials likely to be delivered to site during these works would include road base, structural steel, mechanical equipment and readymix concrete. Of these it is considered the delivery of readymix concrete to the site would generate the highest peak hour traffic volume during major concrete pours however is unlikely to exceed the peak of 162 vtph generated by the construction employee traffic.

Some deliveries could occur within the first or last hours of work during the day and thus would need to be added to the employee traffic to obtain the peak hour construction traffic volumes. On this basis a combined peak hour construction traffic volume (employees + deliveries) of up to 170 vtph could occur in the morning and evening peak periods. It is noted then that the likely peak hour traffic volume for the construction traffic associated with the redevelopment of the Newstan Colliery Surface Site i.e. 170 vtph is almost double the additional traffic generated by the actual operation of the Northern Coal Logistics Project.

Northern Coal Services are considering utilising the Cooranbong Entry Site to assemble construction works and transport them to the Newstan Colliery Surface Site via the private haul roads to reduce the impact of this traffic on the Fassifern road network. For completeness this assessment will review the following two scenarios;

- All construction traffic access via the Newstan Colliery Surface Site access intersection assuming both the Northern Coal Logistics Project and the Newstan Extension of Mining Project are operational from the Newstan Colliery Surface Site.
- All construction employee traffic access via the Cooranbong Entry Site i.e. 162 vtph and subsequently travel to the Newstan Colliery Surface Site via the private haul road network.

7.7.1 Construction traffic access via Newstan Colliery Surface Site access.

To assess the impact of this traffic on the local road network the Newstan Colliery Surface Site access intersection and the Miller Road / Macquarie Road / Fassifern Road intersections were modelled using the Sidra intersection modelling program for the scenario of the Project construction traffic and operational traffic plus Newstan Extension of Mining Project operational traffic, as this would be the worst case scenario likely during the construction period. Note for construction traffic it was assumed that as a continuous shift was in existence the split between inbound and outbound trips is 50:50. It was also assumed the majority of construction traffic had an origin / destination that took them through the Miller Road / Fassifern Road / Miller Road intersection. The results of this modelling for both the AM and PM peaks are shown in the following tables.

Table 12 – Sidra Movement Summary Table – Newstan Colliery Surface Site Access Entrance – 2014 AM Peak – CLP Construction Traffic + CLP + NME

MOVEMENT SUMMARY

Site: Newstan Colliery entrance 2014 AM Peak - NME + CLP Construction

Newstan Colliery Entrance (Give-Way control)
2014 AM Peak
NME + CLP Construction
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
East: Miller Road											
5	T	57	10.0	0.031	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
6	R	231	10.0	0.156	9.2	LOS A	0.8	5.9	0.30	0.63	47.6
Approach		288	10.0	0.156	7.3	NA	0.8	5.9	0.24	0.50	49.7
North: Newstan Colliery entrance											
7	L	195	10.0	0.208	8.8	LOS A	0.7	5.6	0.14	0.63	48.3
9	R	37	10.0	0.074	12.9	LOS A	0.3	2.1	0.50	0.76	44.6
Approach		232	10.0	0.208	9.5	LOS A	0.7	5.6	0.20	0.65	47.7
West: Miller Road											

10	L	34	10.0	0.020	8.6	LOS A	0.0	0.0	0.00	0.67	49.0
11	T	23	10.0	0.013	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		57	10.0	0.020	5.1	NA	0.0	0.0	0.00	0.40	52.9
All Vehicles		577	10.0	0.208	8.0	NA	0.8	5.9	0.20	0.55	49.1

Level of Service (LOS) Method: Delay (RTA NSW).
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 used.

Table 13 – Sidra Movement Summary Table – Newstan Colliery Surface Site Access Entrance – 2014 PM Peak – CLP Construction Traffic + CLP + NME

MOVEMENT SUMMARY

Site: Newstan Colliery entrance 2014 PM Peak - NME + CLP Construction

Newstan Colliery Entrance (Give-Way control)
2014 PM Peak
NME + CLP Construction
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
East: Miller Road											
5	T	38	10.0	0.021	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
6	R	214	10.0	0.154	9.4	LOS A	0.8	5.7	0.36	0.65	47.4
Approach		252	10.0	0.154	8.0	NA	0.8	5.7	0.31	0.55	48.9
North: Newstan Colliery entrance											
7	L	225	10.0	0.242	9.1	LOS A	0.9	7.0	0.22	0.63	48.0
9	R	45	10.0	0.091	13.1	LOS A	0.3	2.6	0.51	0.77	44.4
Approach		270	10.0	0.242	9.8	LOS A	0.9	7.0	0.27	0.65	47.3
West: Miller Road											
10	L	51	10.0	0.029	8.6	LOS A	0.0	0.0	0.00	0.67	49.0
11	T	57	10.0	0.031	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		108	10.0	0.031	4.0	NA	0.0	0.0	0.00	0.32	54.2
All Vehicles		630	10.0	0.242	8.1	NA	0.9	7.0	0.24	0.55	49.0

Level of Service (LOS) Method: Delay (RTA NSW).
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 used.

Table 14 – Sidra Movement Summary Table – Miller Road / Fassifern Road / Macquarie Road intersection – 2014 AM Peak – CLP Construction Traffic + CLP + NME

MOVEMENT SUMMARY

Site: Miller Road / Macquarie Rd / Fassifern Rd 2014 AM Peak - NME + CLP Construction

Miller Road / Macquarie Rd / Fassifern Rd (Give-Way control)
2014 AM peak
NME + CLP Construction
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
East: Macquarie Road											
5	T	82	10.0	0.144	1.5	LOS A	0.8	6.1	0.45	0.00	50.7
6	R	121	10.0	0.144	10.2	LOS A	0.8	6.1	0.45	0.77	47.8
Approach		203	10.0	0.144	6.7	NA	0.8	6.1	0.45	0.46	49.0
North: Miller Road											
7	L	97	10.0	0.110	9.9	LOS A	0.4	3.1	0.35	0.68	47.4
9	R	132	10.0	0.322	17.1	LOS B	1.5	11.5	0.63	0.93	41.0
Approach		229	10.0	0.322	14.0	LOS A	1.5	11.5	0.51	0.82	43.5
West: Fassifern Road											
10	L	151	10.0	0.165	8.6	LOS A	0.0	0.0	0.00	0.82	49.0
11	T	142	10.0	0.165	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		293	10.0	0.165	4.4	NA	0.0	0.0	0.00	0.42	53.8
All Vehicles		725	10.0	0.322	8.1	NA	1.5	11.5	0.29	0.56	48.8

Level of Service (LOS) Method: Delay (RTA NSW).
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 used.

Table 15 – Sidra Movement Summary Table – Miller Road / Fassifern Road / Macquarie Road intersection – 2014 PM Peak – CLP Construction Traffic + CLP + NME.

MOVEMENT SUMMARY

Site: Miller Road / Macquarie Rd / Fassifern Rd 2014 PM Peak - NME + CLP Construction

Miller Road / Macquarie Rd / Fassifern Rd (Give-Way control)
2014 PM peak
NME + CLP Construction
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Average Speed
							Vehicles	Distance			
		veh/h	%	v/c	sec		veh	m		per veh	km/h
East: Macquarie Road											
5	T	98	10.0	0.188	1.7	LOS A	1.1	8.2	0.48	0.00	50.1
6	R	160	10.0	0.188	10.4	LOS A	1.1	8.2	0.48	0.78	47.7
Approach		258	10.0	0.188	7.1	NA	1.1	8.2	0.48	0.48	48.6
North: Miller Road											
7	L	116	10.0	0.134	10.1	LOS A	0.5	3.8	0.37	0.69	47.3
9	R	132	10.0	0.371	19.8	LOS B	1.8	13.7	0.69	0.98	39.0
Approach		248	10.0	0.371	15.3	LOS B	1.8	13.7	0.54	0.84	42.5
West: Fassifern Road											
10	L	150	10.0	0.173	8.6	LOS A	0.0	0.0	0.00	0.83	49.0
11	T	158	10.0	0.173	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		308	10.0	0.173	4.2	NA	0.0	0.0	0.00	0.41	54.1
All Vehicles		814	10.0	0.371	8.5	NA	1.8	13.7	0.32	0.56	48.3

Level of Service (LOS) Method: Delay (RTA NSW).
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 used.

The results of this Sidra modelling show that LOS for all traffic movements at both the Newstan Colliery Surface Site access entrance and the Miller Road / Macquarie Road / Fassifern Road intersection would continue to be satisfactory (LOS B) during the redevelopment of the Newstan Colliery Surface Site even with both the Northern Coal Logistics Project and the Newstan Extension of Mining Project operational. This indicates that these intersections have sufficient spare capacity to cater for all the construction traffic associated with the Project.

It is also noted the addition of 170 vph on Millers Road and up to 98 vph on Fassifern Road, as a result of the construction works, will result in two way mid-block traffic volumes on these roads of 547 vph and 570 vph respectively. These are still well below the two way mid-block capacity thresholds for these roads determined in ***Section 5*** i.e. 920 vph for Miller Road and 1,800 vph for Fassifern Road. Therefore the local road network has sufficient spare mid-block capacity to cater for all the construction traffic associated with the Project.

It is concluded therefore that subject to appropriate construction traffic management plans being prepared, construction traffic associated with the Project will not adversely impact on the local road network in the vicinity of the Newstan Colliery Surface Site and no road network upgrading works are required.

7.7.2 Construction employee traffic access via Cooranbong Entry Site .

It is noted that the addition of up to 162 vtph on both Newport Road and Gradwells Road during the redevelopment of the Newstan Colliery Surface Site will result in two way mid-block traffic volumes on these roads of 549 vph and 213 vph respectively. These are still well below the two way mid-block capacity thresholds for these roads determined in ***Section 5*** i.e. 1,800 vph for Newport Road and 920 vph for Gradwells Road. Therefore the local road network around the

Cooranbong Entry Site has sufficient spare mid-block capacity to cater for all the construction employee traffic associated with the Project.

Sidra has again been used to model the operation of the Newport Road / Gradwells Road intersection with all construction employee traffic using the Cooranbong Entry Site for access to the construction works associated with the Project. The results of this modelling are shown in the following tables.

Table 16 – Sidra Movement Summary Table – Newport Road / Gradwells Road intersection – 2014 AM Peak – CLP Construction Traffic

MOVEMENT SUMMARY

Site: Newport Road / Gradwells Road - 2014 AM Peak - CLP Construction

Newport Road / Gradwells Road intersection
2014 AM Peak
+CLP Construction employees
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Gradwells Road south											
1	L	1	5.0	0.006	12.2	LOS A	0.0	0.1	0.46	0.58	44.9
2	T	1	5.0	0.006	11.0	LOS A	0.0	0.1	0.46	0.61	45.7
3	R	1	5.0	0.006	12.5	LOS A	0.0	0.1	0.46	0.74	44.8
Approach		3	5.0	0.006	11.9	LOS A	0.0	0.1	0.46	0.64	45.1
East: Newport Road east											
4	L	1	5.0	0.180	9.0	LOS A	1.1	7.8	0.32	0.59	48.5
5	T	188	5.0	0.180	0.8	LOS A	1.1	7.8	0.32	0.00	53.4
6	R	98	5.0	0.180	9.4	LOS A	1.1	7.8	0.32	0.84	48.5
Approach		287	5.0	0.180	3.8	NA	1.1	7.8	0.32	0.29	51.6
North: Gradwells Road north											
7	L	112	5.0	0.122	9.4	LOS A	0.5	3.4	0.30	0.65	47.6
8	T	1	5.0	0.122	8.0	LOS A	0.5	3.4	0.30	0.66	48.5
9	R	4	5.0	0.122	9.7	LOS A	0.5	3.4	0.30	0.80	47.6
Approach		117	5.0	0.122	9.4	LOS A	0.5	3.4	0.30	0.65	47.7
West: Newport Road west											
10	L	3	5.0	0.088	9.2	LOS A	0.6	4.1	0.34	0.71	49.2
11	T	162	5.0	0.088	0.8	LOS A	0.6	4.1	0.34	0.00	53.8
12	R	1	5.0	0.088	9.2	LOS A	0.6	4.1	0.34	0.98	49.1
Approach		166	5.0	0.088	1.0	NA	0.6	4.1	0.34	0.02	53.7
All Vehicles		573	5.0	0.180	4.2	NA	1.1	7.8	0.32	0.29	51.3

Level of Service (LOS) Method: Delay (RTA NSW).
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 used.

Table 17 – Sidra Movement Summary Table – Newport Road / Gradwells Road intersection – 2014 PM Peak – CLP Construction Traffic

MOVEMENT SUMMARY

Site: Newport Road / Gradwells Road - 2014 PM Peak - CLP Construction

Newport Road / Gradwells Road intersection
2014 PM Peak
+CLP Construction employees
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Gradwells Road south											
1	L	1	5.0	0.005	12.0	LOS A	0.0	0.1	0.43	0.57	45.2
2	T	1	5.0	0.005	10.7	LOS A	0.0	0.1	0.43	0.60	46.0
3	R	1	5.0	0.005	12.2	LOS A	0.0	0.1	0.43	0.74	45.0
Approach		3	5.0	0.005	11.6	LOS A	0.0	0.1	0.43	0.64	45.4
East: Newport Road east											
4	L	1	5.0	0.164	9.0	LOS A	0.9	6.9	0.33	0.57	48.4
5	T	156	5.0	0.164	0.8	LOS A	0.9	6.9	0.33	0.00	53.2
6	R	98	5.0	0.164	9.5	LOS A	0.9	6.9	0.33	0.83	48.4
Approach		255	5.0	0.164	4.2	NA	0.9	6.9	0.33	0.32	51.3
North: Gradwells Road north											
7	L	112	5.0	0.123	9.5	LOS A	0.5	3.4	0.31	0.65	47.6
8	T	1	5.0	0.123	8.1	LOS A	0.5	3.4	0.31	0.66	48.4
9	R	4	5.0	0.123	9.8	LOS A	0.5	3.4	0.31	0.79	47.5
Approach		117	5.0	0.123	9.5	LOS A	0.5	3.4	0.31	0.66	47.6
West: Newport Road west											
10	L	1	5.0	0.094	8.8	LOS A	0.6	4.3	0.31	0.75	49.2
11	T	175	5.0	0.094	0.7	LOS A	0.6	4.3	0.31	0.00	54.4
12	R	1	5.0	0.094	9.1	LOS A	0.6	4.3	0.31	1.00	49.1
Approach		177	5.0	0.094	0.7	NA	0.6	4.3	0.31	0.01	54.3
All Vehicles		552	5.0	0.164	4.2	NA	0.9	6.9	0.32	0.29	51.3

Level of Service (LOS) Method: Delay (RTA NSW).
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 used.

With all traffic movements showing a LOS A and with little or no queuing occurring at the intersection this modelling shows that the Newport Road / Gradwells Road intersection would continue to operate satisfactorily even with all construction employee traffic utilising the Cooranbong Entry Site to access the Newstan Colliery Surface Site redevelopment works.

It is concluded therefore that subject to appropriate construction traffic management plans being prepared for the construction works, all construction employee traffic associated with the Project could utilise the Cooranbong Entry Site for access to the work site without impacting on the local road network in the vicinity of the Cooranbong Entry Site and without requiring road network upgrading works.

7.7.3 Other Construction Traffic.

This project will also accept excess spoil material resulting from the construction of the Mandalong South Surface Site and a new ventilation shaft site (exact location yet to be determined) associated with the proposed Mandalong Southern Extension Project and Newstan Colliery Extension of Mining Project, respectively. This material will be transported to the site from the Cooranbong Entry Site and the Awaba Surface Facilities Site via the private haul road network. However both projects will utilise the public road network to access the Cooranbong Entry Site and the Awaba Surface Facilities site. Construction traffic assessment for each of these projects has been carried out in separate Traffic Assessment Reports. These assessments have determined that the construction traffic generated by these projects will not adversely impact on the local road network as there is sufficient spare capacity within the local road network. The impacts are short term and any negative impact can be managed satisfactorily through the preparation and implementation of Construction Traffic Management Plans for each Project.

7.7.4 Other Operational Traffic

Waste material collated from the sumps and dirty water dams at the Mandalong Mine Access Site (part of the Mandalong Southern Extension Project) will be dried on site prior to being transported to the Cooranbong Entry Site. On average it is estimated that this material will amount to approximately 2 to 3 m^3 per week and therefore will generate only 1 truck load per week (2 movements). Trucks will travel from the Mandalong Mine Access Site via Morisset and Dora Creek to the Cooranbong Entry Site or alternatively via Cooranbong to the Cooranbong Entry Site. It is unlikely that this movement will coincide with peak traffic periods and it is considered insignificant in terms of its impact on the local road network which is currently operating below its technical capacity.

8. ALTERNATE TRANSPORT MODES

The Newstan Colliery Surface Site is not well serviced by public transport. Hunter Valley Buses runs a regular bus route (271) Toronto to Charlestown, Glendale and University along Fassifern Road and Macquarie Road however no bus services run along Miller Road. Therefore, the nearest bus stop is likely to be at least 1.5 km from the main facilities within the site.

Similarly Fassifern Railway Station which is on the main Sydney to Newcastle railway line is approximately 1 km from the site however to walk to the main facilities within the site from the station is likely to be in the order of a 2 km walk.

It was observed during the manual traffic counts at the existing Newstan Colliery Surface Site access intersection that there did not appear be any utilisation of public transport services to access the site.

Also by observation there were no on or off road pedestrian and cycle way facilities in the vicinity of the Newstan Colliery access. This means pedestrians and cyclists accessing the site would need to share the travel lanes on Miller Road. This is not considered a particular safe environment and would discourage the use of these transport modes to access the site. Again it was observed during the manual traffic counts at the existing Newstan Colliery Surface Site access intersection that no pedestrian or cycle traffic was observed in the vicinity of the site indicating current employees did not use these forms of transport to travel to the site.

Therefore it is considered unlikely that the Northern Coal Logistics Project will increase demand for alternate transport modes and there would be no nexus for the provision of additional services or facilities associated with these transport modes as a result of the Project.

Materials Handling – Newstan Colliery Surface Site

9. CONCLUSIONS

This traffic assessment of the Northern Coal Services – Northern Coal Logistics Project has determined the following;

- The local road network likely to be impacted on by the Project includes Miller Road, Macquarie Road, Fassifern Road and the Miller Road / Macquarie Road / Fassifern Road intersections in Fassifern as additional employee traffic access the Newstan Colliery Surface Site. Construction traffic associated with the Project may also impact on Newport Road, Gradwells Road and their intersection in Dora Creek as construction employees utilise the Cooranbong Entry Site to access the construction site at the Newstan Colliery Surface Site.
- Miller Road and Gradwells Road are two lane two way rural roads with a likely two way capacity of up to 920 vehicles per hour (vph) if a Level of Service (LOS) C is considered satisfactory. Macquarie Road, Fassifern Road and Newport Road are typical two lane two way urban roads with a likely two way capacity of up to 1,800 vph again if a LOS C is considered satisfactory.
- Traffic data collected on the local road network indicates that all roads expected to be impacted on by the Project have spare mid-block two way capacity to cater for additional traffic from the Project.
- The peak traffic generation periods associated with the proposal are likely to occur during shift changes in the morning and afternoon periods.
- Traffic counts at the existing Newstan Colliery Surface Site access intersection has determined that the peak hour traffic generation associated with the current operations on the site are approximately 91 vph in the night to day shift changeover and 131 vph in the day to afternoon shift changeover. Total Newstan Colliery employees at the time of the traffic counts numbered 195. It is also thought the difference in traffic generation between the AM and PM peak is associated with the operation of the Fassifern Administration Offices at the site. For this assessment it was assumed the morning peak was more representative of the existing traffic generation associated with the Newstan Colliery mining operations.
- Additional traffic generated by the Project will result from an increase in employees on existing employee numbers (shift numbers) of in the order of 120 new employees or up to 45 new employees per shift. Whilst overall employee numbers will remain below previous Newstan approval levels the employee increase will increase existing traffic volumes on the local road network by up to 91 vph in the AM peak and PM peaks.
- For a period of time the Newstan Extension of Mining Project could also increase traffic volumes on the road network by up to 142 vph in the AM peak and PM peaks prior to the relocation of the mine workforce to the existing Awaba Colliery Surface Site.
- The net increase in traffic on the local road network, even prior to the Newstan Colliery mine entrance being relocated to the Awaba Colliery Surface Site, will not cause the two way mid-block capacity of the local road network in the vicinity of the Newstan Colliery Surface Site to be reached therefore subject to satisfactory intersection operation the Project will not adversely impact on the local road network.
- Sidra modeling of the Newstan Colliery Surface Site access intersection and the Miller Road / Macquarie Road / Fassifern Road intersection has determined that these intersections will continue to operate satisfactorily on operation of both the Newstan Extension of Mining Project and the Northern Coal Logistics Project as well as with at least ten years background traffic growth.
- By observation it is considered that the existing road network servicing the Newstan Colliery is of a suitable standard to cater for the increase in traffic associated with the Northern Coal Logistics Project and the Newstan Extension of Mining Project.
- There is sufficient on-site car parking within the Newstan Colliery Surface Site to cater for the long term parking demand generated by both the Newstan Extension of Mining Project and the Northern Coal Logistics Project. There are also sufficient areas within the site that could be used as temporary overflow car parking to cater for the additional demand such

that the operation of both Projects will not result in any parking demand within the local road network adjacent to the Newstan Colliery Surface Site.

- The peak traffic generation associated with the construction of the new Northern Coal Logistics Project surface facilities within the Newstan Colliery Surface Site is expected to be 170 vph.
- A two way mid-block capacity check and additional Sidra modeling has shown that the local road network around the Newstan Colliery Surface Site has sufficient spare capacity to cater for the construction traffic generated by the Northern Coal Logistics Project even with both the Northern Coal Logistics Project and the Newstan Extension of Mining Project operational. Therefore construction traffic associated with the Northern Coal Logistics Project will not adversely impact on the local road network.
- Should Northern Coal Services chose to utilise the Cooranbong Entry Site to assemble construction employees and access the new construction site within the Newstan Colliery Surface Site, it has been determined through a two way mid-block capacity check and additional Sidra modeling that the local road network around the Cooranbong Entry Site has sufficient spare capacity to cater for this construction employee traffic.
- The Project is unlikely to increase demand for alternate transport modes and there would be no nexus or need for the provision of additional services or facilities associated with these transport modes as a result of this proposal.
- The project will not increase the number of loaded trains travelling from the Newstan Colliery Surface Site to the Port of Newcastle and/or Port Kembla (for export) and/or Vales Point Power Station, with a maximum of 8 trains per day for which Newstan Colliery already has approval. Therefore the proposal does not seek to increase the number of approved train movements from Newstan Colliery Surface Site.
- As there are a number of users on the rail line between Newstan Colliery Surface Site and the Port of Newcastle and as other projects are likely to increase rail traffic on the subject rail line it is considered that any problems perceived as significant with the operation of the railway level crossings within Newcastle may require a regional solution such as closure of the level crossings (rerouting of traffic) or provision of an alternate freight rail line (Hexham to Toronto). Any regional solution needs to be considered at a more strategic planning level than for individual projects.

10. RECOMMENDATIONS

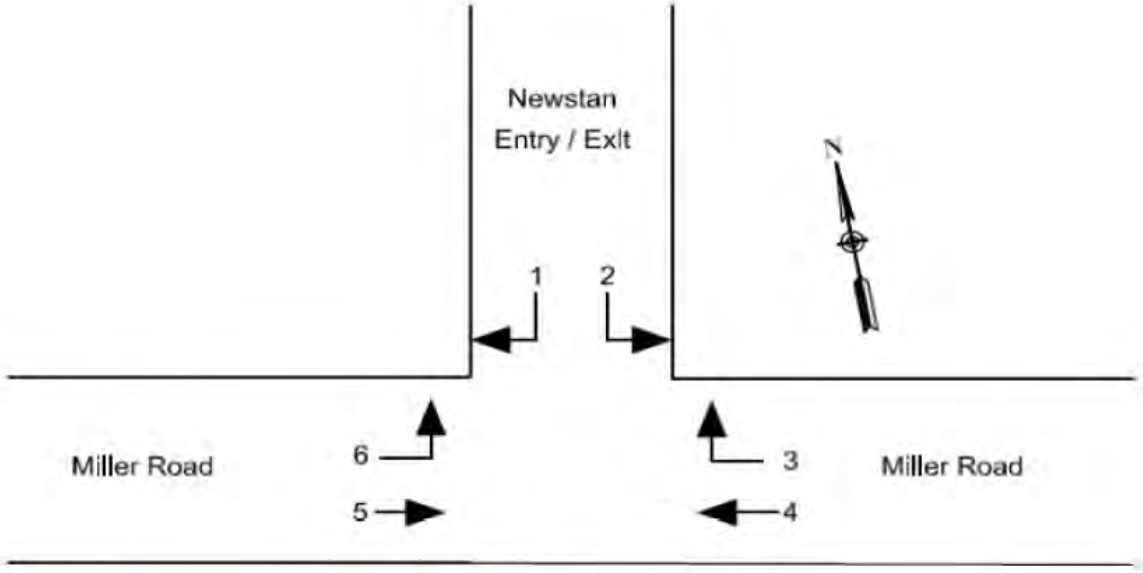
Having carried out this traffic impact assessment for the Northern Coal Services' Northern Coal Logistics Project it is recommended that the proposal can be supported without the requirement for any upgrading of the external road network as it will not adversely impact on the local road network. A Construction Traffic Management Plan should be prepared and approved prior to the commencement of construction activities at the Newstan Colliery Surface Site.

JR Garry BE (Civil), Masters of Traffic
Director
Intersect Traffic Pty Ltd

APPENDIX A
MANUAL TRAFFIC COUNTS

Date	12/10/2011
Day	Wednesday
Time	5.30 am - 7.30 am
Weather	Fine
Conducted by:	Brad

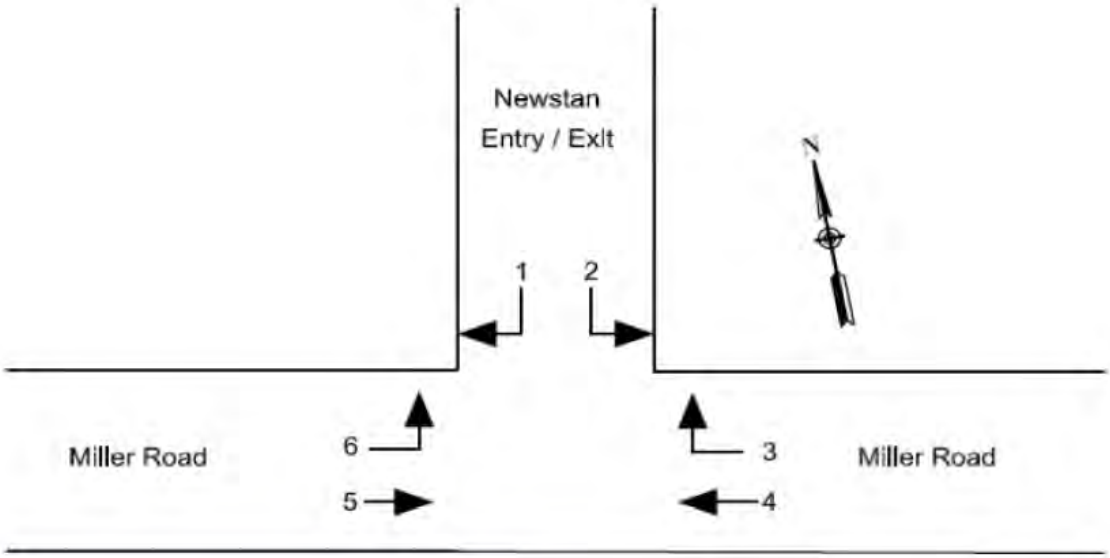
	1	2	3	4	5	6	
5:30 - 5:45	0	0	6	10	2	9	
5:45 - 6:00	0	0	23	10	2	16	
6:00 - 6:15	2	2	22	10	3	10	
6:15 - 6:30	0	0	6	17	1	4	155
6:30 - 6:45	2	4	5	11	4	1	155
6:45 - 7:00	4	10	10	14	6	1	149
7:00 - 7:15	4	9	10	18	6	2	149
7:15 - 7:30	9	11	8	13	7	1	170
	21	36	90	103	31	44	
PEAK	19	34	33	56	23	5	



Road Leg	Peak Volume (vph)
Newstan access	91
Newstan access in	38
Newstan access out	53
Miller Road west	103
Miller Road east	146

Date	12/10/2011
Day	Wednesday
Time	1:30 - 3:30PM
Weather	Fine
Conducted by:	Brad

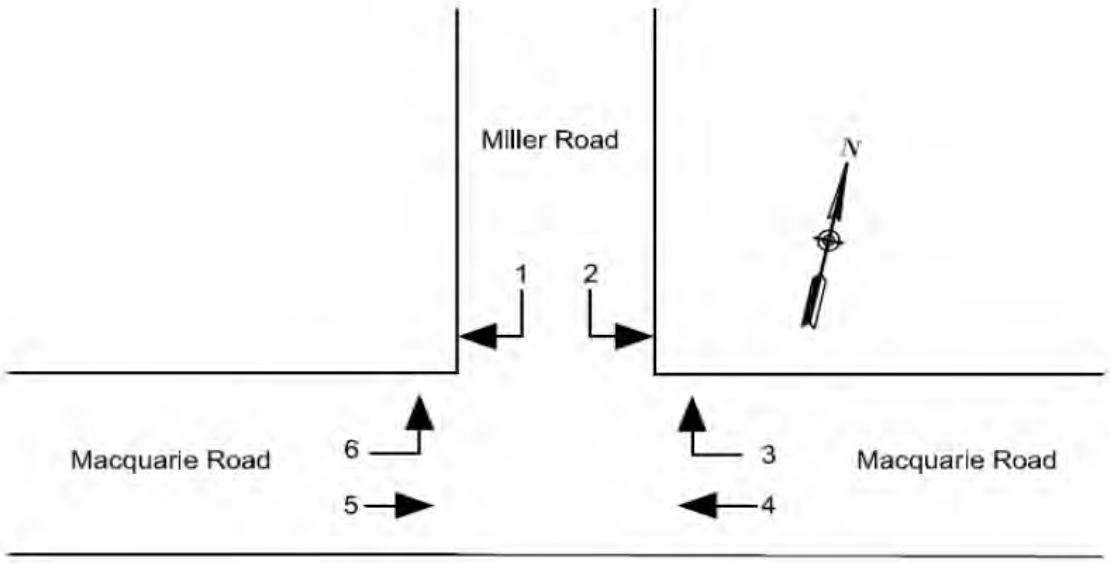
	1	2	3	4	5	6	
1:30 - 1:45	1	3	5	6	11	4	
1:45 - 2:00	0	2	11	11	9	8	
2:00 - 2:15	2	2	27	13	9	18	
2:15 - 2:30	3	1	21	7	13	12	199
2:30 - 2:45	4	6	5	10	18	1	213
2:45 - 3:00	7	16	4	7	15	2	223
3:00 - 3:15	12	18	7	10	14	1	214
3:15 - 3:30	11	20	3	11	16	1	219
	40	68	83	75	105	47	
PEAK	16	25	57	37	55	33	



Road Leg	Peak Volume (vph)
Newstan access	131
Newstan access in	90
Newstan acess out	41
Miller Road west	141
Miller Road east	174

Date	26/10/2011
Day	Wednesday
Time	6:00 - 8:00am
Weather	Fine
Conducted by:	Brad

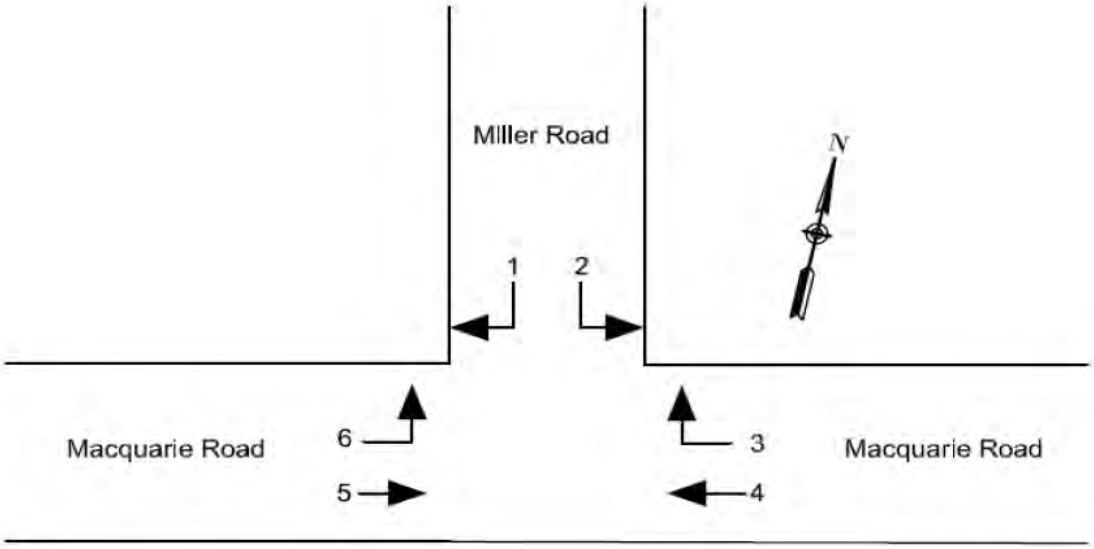
	1	2	3	4	5	6	
6:00 - 6:15	0	2	24	12	29	18	
6:15 - 6:30	2	2	17	15	36	15	
6:30 - 6:45	3	3	11	10	34	3	
6:45 - 7:00	10	3	13	23	37	12	334
7:00 - 7:15	8	2	9	15	38	9	330
7:15 - 7:30	10	13	7	22	34	7	336
7:30 - 7:45	10	10	7	20	30	5	354
7:45 - 8:00	7	11	6	21	31	7	339
	50	46	94	138	269	76	
PEAK	38	28	36	80	139	33	



Road Leg	Peak Volume (vph)
Miller Road	135
Macquarie Road west	290
Macquarie Road east	283

Date	26/10/2011
Day	Wednesday
Time	2 pm - 4 pm
Weather	Fine
Conducted by:	Brad

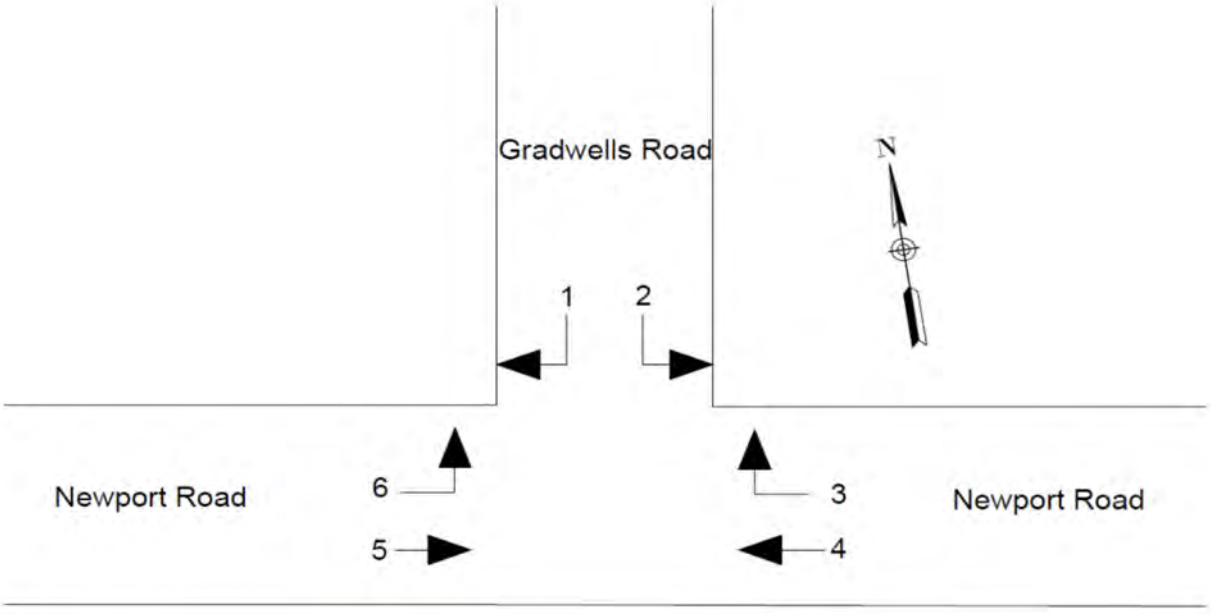
	1	2	3	4	5	6	
2:00 - 2:15	3	3	28	18	31	20	
2:15 - 2:30	4	3	20	14	32	17	
2:30 - 2:45	5	3	23	36	45	10	
2:45 - 3:00	10	13	20	28	47	9	442
3:00 - 3:15	12	10	8	17	30	7	423
3:15 - 3:30	10	9	8	18	27	7	412
3:30 - 3:45	9	11	6	20	29	8	373
3:45 - 4:00	10	9	5	18	33	6	327
	63	61	118	169	274	84	
PEAK	22	22	91	96	155	56	



Road Leg	Peak Volume (vph)
Miller Road	191
Macquarie Road west	329
Macquarie Road east	364

Date	24/08/2012
Day	Friday
Time	6:30 - 8:30am
Weather	Fine
Conducted by: Brad Morgan	

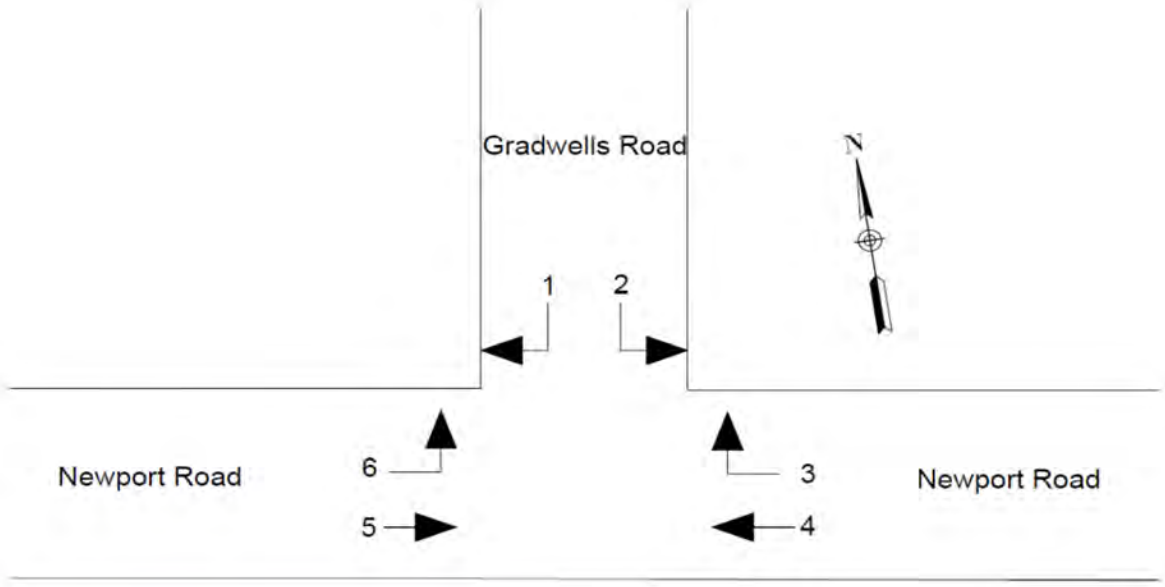
	1	2	3	4	5	6	
6:30 - 6:45	0	2	1	21	31	0	
6:45 - 7:00	2	3	7	32	23	0	
7:00 - 7:15	0	2	3	22	16	1	
7:15 - 7:30	1	3	7	23	18	0	218
7:30 - 7:45	0	10	3	17	30	0	223
7:45 - 8:00	0	4	2	55	33	0	250
8:00 - 8:15	2	6	4	56	49	1	324
8:15 - 8:30	2	9	6	56	47	2	394
	7	39	33	282	247	4	
PEAK	4	29	15	184	159	3	



Road	PVT (vph)
Newport Road East	387
Newport Road West	350
Gradwell's Road	51

Date	24/08/2012
Day	Friday
Time	3:00 - 5:00pm
Weather	Fine
Conducted by:	Brad Morgan

	1	2	3	4	5	6	
3:00 - 3:15	2	4	1	24	31		
3:15 - 3:30	1	2	2	20	29		
3:30 - 3:45	1	2	2	34	33		
3:45 - 4:00	0	3	5	30	30		256
4:00 - 4:15	3	6	4	25	37		269
4:15 - 4:30	1	9	3	38	42		308
4:30 - 4:45	1	6	5	41	51		340
4:45 - 5:00	2	8	3	49	42		376
	11	40	25	261	295	0	
PEAK	7	29	15	153	172	0	



Road	PTV (vph)
Newport Road East	369
Newport Road West	332
Gradwell's Road	51

APPENDIX B
RAILWAY LEVEL CROSSING DATA

FIELD SHEET __LEVEL CROSSING COUNT

STREET: Clyde Street
SUBURB: Hamilton North
Approach 1___ S/W
Approach 2___ N/E
DURATION OF COUNT: From: 7:00 AM To:9:00AM
OBSERVER: Dale Dickey
DAY: Thursday
DATE: 22nd March 2012
WEATHER
Light rain
FINE [ ]
O'CAST [x]

GATES CLOSE	GATES OPEN	TIME	ESTIMATED QUEUE	ESTIMATED QUEUE	Comment
07:00:00					
07:02:45	07:11:00	00:08:15	25	20	Coal/Container
07:22:20	07:23:00	00:00:40	1	1	Commuter
07:27:20	07:28:00	00:00:40	3	5	Commuter
07:28:20	07:30:20	00:02:00	11	10	Towed Train
07:37:00	07:37:50	00:00:50	12	7	Container
07:41:20	07:42:10	00:00:50	7	2	Commuter
07:48:20	07:49:55	00:01:35	19	14	2/Commuter
07:51:10	07:54:10	00:03:00	45	27	Container
07:57:25	07:58:55	00:01:30	23	11	Commuter
08:06:50	08:07:35	00:00:45	10	12	Commuter
08:09:00	08:09:45	00:00:45	4	9	Commuter
08:15:40	08:16:35	00:00:55	6	7	Commuter
08:20:15	08:21:55	00:01:40	16	11	Commuter
08:31:20	08:32:20	00:01:00	4	10	Commuter
08:39:25	08:40:15	00:00:50	9	7	Commuter
08:44:00	08:48:40	00:04:40	76	26	Commuter/Container
		00:29:55			

Note: Queue lengths over 30 vehicles are an estimate only due to site distance constraints in regard to connecting streets

Number times closed	16		
Commuter closure	00:10:20	Averages	00:00:56
Container/Coal closure	00:18:45		00:03:45
Average queue Commuter		9	8
Average queue Container/Coal		34	18

FIELD SHEET __LEVEL CROSSING COUNT

STREET: Clyde Street
SUBURB: Hamilton North
Approach 1___ S/W
Approach 2___ N/E
DURATION OF COUNT: From: 9:00 AM To:12:00 Noon
OBSERVER: Dale
DAY: Thursday
DATE: 3rd May 2012
WEATHER
Light rain
O'CAST [x]

GATES CLOSE HH:MM:SS	GATES OPEN HH:MM:SS	TIME CLOSED	ESTIMATED QUEUE (CAR) APP. 1	ESTIMATED QUEUE (CAR) APP. 2	Comment
09:00:00					
09:07:15	09:08:40	00:01:25	16	7	Commuter + Commuter
09:21:35	09:22:35	00:01:00	11	3	Commuter
09:38:25	09:39:35	00:01:10	7	10	Commuter
09:48:30	09:49:15	00:00:45	4	4	Commuter
09:56:55	09:57:50	00:00:55	5	6	Commuter
10:06:55	10:07:35	00:00:40	6	6	Commuter
10:18:50	10:19:25	00:00:35	2	1	Commuter
10:32:00	10:37:25	00:05:25	20	17	Container (out)
10:39:10	10:39:50	00:00:40	7	4	Commuter
10:50:50	10:53:45	00:02:55	19	25	Container (out)
11:04:45	11:05:30	00:00:45	7	6	Commuter
11:07:55	11:08:35	00:00:40	7	4	Commuter
11:18:10	11:18:50	00:00:40	6	4	Commuter
11:31:25	11:34:35	00:03:10	11	17	Coal (in) + Commuter
11:41:10	11:41:50	00:00:40	5	11	Commuter
11:54:15	11:54:50	00:00:35	1	3	Commuter
		00:22:00			

Number times closed	16			
Commuter closure	00:10:30		Averages	00:00:48
Container/Coal closure	00:11:30			00:03:50
Average queue Commuter		6	5	
Average queue Container/Coal		17	20	

FIELD SHEET __LEVEL CROSSING COUNT

STREET: Clyde Street
SUBURB: Hamilton North
Approach 1___ S/W
Approach 2___ N/E
DURATION OF COUNT: From: 12 noon To: 2:00 PM
OBSERVER: Dale Dickey
DAY: Thursday
DATE: 22nd March 2012
WEATHER
FINE [ ]
O'CAST [x]

GATES CLOSE HH:MM:SS	GATES OPEN HH:MM:SS	TIME CLOSED	ESTIMATED QUEUE (CAR) APP. 1	ESTIMATED QUEUE (CAR) APP. 2	Comment
12:00:00					
12:04:45	12:05:40	00:00:55	10	5	Commuter
12:07:22	12:08:10	00:00:48	9	9	Commuter
12:22:43	12:23:30	00:00:47	6	6	Commuter
12:41:06	12:42:05	00:00:59	10	7	Commuter
12:43:00	12:43:52	00:00:52	8	4	Commuter
12:44:45	12:46:45	00:02:00	24	17	Container
12:56:55	12:58:58	00:02:03	14	4	2/Commuter
13:06:00	13:06:40	00:00:40	4	2	Commuter
13:23:43	13:24:35	00:00:52	8	5	Commuter
13:43:53	13:44:20	00:00:27	11	6	Commuter
13:46:02	13:49:25	00:03:23	34	24	Coal
13:53:50	13:54:10	00:00:20	5	11	Commuter
TOTAL		00:14:06			

Note: Queue lengths over 30 vehicles are an estimate only due to site distance constraints in regard to connecting streets

Number times closed	12		
Commuter closure	00:08:40	Averages	00:00:52
Container/Coal closure	00:05:23		00:02:41

Average queue Commuter	9	6
Average queue Container/Coal	29	21

FIELD SHEET __LEVEL CROSSING COUNT

STREET: Clyde Street
SUBURB: Hamilton North
Approach 1___ S/W
Approach 2___ N/E
DURATION OF COUNT: From: 2:00 PM To: 4:00 PM
OBSERVER: Dale
DAY: Thursday
DATE: 3rd May 2012
WEATHER
Scattered Cloud
O'CAST [x]

GATES CLOSE HH:MM:SS	GATES OPEN HH:MM:SS	TIME CLOSED	ESTIMATED QUEUE (CAR) APP. 1	ESTIMATED QUEUE (CAR) APP. 2	Comment
14:00:00					
14:04:35	14:05:15	00:00:40	1	7	Commuter
14:13:15	14:13:50	00:00:35	6	7	Commuter
14:16:20	14:17:25	00:01:05	12	18	Commuter
14:24:35	14:25:30	00:00:55	6	6	Commuter
14:30:00	14:33:35	00:03:35	30	31	Coal (out)
14:47:00	14:47:55	00:00:55	9	8	Commuter
14:49:35	14:50:30	00:00:55	12	7	Commuter & Engine
14:52:30	14:55:20	00:02:50	23	19	Engine (Commuter)
15:01:50	15:02:30	00:00:40	12	16	Commuter
15:20:25	15:21:10	00:00:45	11	3	Commuter
15:26:45	15:27:20	00:00:35	9	9	Commuter
15:32:35	15:33:15	00:00:40	12	11	Commuter
15:43:50	15:47:55	00:04:05	51	35	Container (in)
15:57:20	15:58:00	00:00:40	13	9	Commuter
		00:18:55			

Number times closed	14		
Commuter closure	00:11:15	Averages	00:00:56
Container/Coal closure	00:07:40		00:03:50

Average queue Commuter	11	10
Average queue Container/Coal	41	33

FIELD SHEET __LEVEL CROSSING COUNT

STREET: Clyde Street
SUBURB: Hamilton North
Approach 1___ S/W
Approach 2___ N/E
DURATION OF COUNT: From: 3:30PM To: 5:30/PM
OBSERVER: Dale Dickey
DAY: Thursday
DATE: 22nd March 2012
WEATHER
FINE
O'CAST x

GATES CLOSE HH:MM:SS	GATES OPEN HH:MM:SS	TIME CLOSED	ESTIMATED QUEUE (CAR) APP. 1	ESTIMATED QUEUE (CAR) APP. 2	Comment
15:30:00					Queue from previous closure not
15:36:30	15:37:40	00:01:10	63	44	Engine
15:58:50	15:59:32	00:00:42	7	12	Commuter
16:02:00	16:04:00	00:02:00	28	39	Container
16:07:12	16:13:05	00:05:53	60	61	Commuter/Coal/Container
16:19:45	16:20:25	00:00:40	8	17	Commuter
16:23:45	16:24:25	00:00:40	7	11	Commuter
16:29:30	16:30:15	00:00:45	7	5	Commuter
16:47:25	16:48:15	00:00:50	5	22	Commuter
16:49:10	16:49:55	00:00:45	18	11	Commuter
16:50:50	16:55:55	00:05:05	51	71	Coal/Container
17:00:28	17:03:05	00:02:37	37	54	Coal
17:12:45	17:13:40	00:00:55	26	24	Commuter
17:20:45	17:21:25	00:00:40	10	8	Commuter
TOTAL		00:22:42			

Note: Queue lengths over 30 vehicles are an estimate only due to site distance constraints in regard to connecting streets

Number times closed	13		
Commuter closure	00:05:57	Averages	00:00:45
Container/Coal closure	00:16:45		00:03:21

Average queue Commuter	11	14
Average queue Container/Coal	46	48

FIELD SHEET __LEVEL CROSSING COUNT

STREET: Glebe Road
SUBURB: _____
Approach 1___ EAST - GLEBE ROAD
Approach 2___ WEST ST JAMES ROAD
DURATION OF COUNT: From: 7:00 AM To:9:00 AM
OBSERVER: BRAD MORGAN
DAY: THURSDAY
DATE : 22/03/2012
WEATHER
FINE
O'CAST / RAINING

GATES CLOSE HH:MM:SS	GATES OPEN HH:MM:SS	TIME CLOSED	ESTIMATED QUEUE (CAR) APP. 1	ESTIMATED QUEUE (CAR) APP. 2	TYPE OF TRAIN
7:00:00					
07:00:00	07:01:36	00:01:36	32	40	CONTAINER/COAL
07:08:00	07:09:22	00:01:22	16	19	COMMUTER
07:13:00	07:17:13	00:04:13	12	20	CONTAINER/COAL
07:35:00	07:39:18	00:04:18	33	37	COMMUTER
07:41:00	07:45:19	00:04:19	29	32	CONTAINER/COAL
07:46:00	07:48:55	00:02:55	27	26	CONTAINER/COAL
07:53:00	07:54:44	00:01:44	32	30	COMMUTER
07:56:00	07:58:34	00:02:34	37	44	COMMUTER
08:14:00	08:18:53	00:04:53	32	50	COMMUTER
08:26:00	08:29:08	00:03:08	40	41	COMMUTER
08:31:00	08:33:44	00:02:44	32	30	COMMUTER
08:47:00	08:49:04	00:02:04	37	38	COMMUTER
08:50:00	08:54:14	00:04:14	29	34	CONTAINER/COAL
08:55:00	08:57:49	00:02:49	37	48	COMMUTER
TOTAL		00:42:53			

Number times closed	14		
Commuter closure	0:25:36	Averages	00:02:51
Container/Coal closure	0:17:17		00:03:27

Average queue Commuter	33	37
Average queue Container/Coal	26	31

FIELD SHEET __LEVEL CROSSING COUNT					
STREET: Glebe Road				WEATHER	
SUBURB: Adamstown					
Approach 1___ EAST - GLEBE ROAD		DAY: THURSDAY			
Approach 2___ WEST ST JAMES ROAD					
DURATION OF COUNT: From: 9:00 AM To:12 NOON			DATE : 03/05/2012	O'CAST - YES AND RAINING	
OBSERVER: BRAD MORGAN					
GATES CLOSE HH:MM:SS	GATES OPEN HH:MM:SS	TIME CLOSED	ESTIMATED QUEUE (CAR) APP. 1	ESTIMATED QUEUE (CAR) APP. 2	TYPE OF TRAIN
9:01:00 AM	9:04:36 AM	0:03:36	61	56	CONTAINER
9:21:00 PM	9:23:29 PM	0:02:29	44	48	COMMUTER
9:24:00 AM	9:26:35 AM	0:02:35	50	47	COMMUTER
9:39:00 AM	9:40:51 AM	0:01:51	31	34	COMMUTER
9:50:00 AM	9:54:28 AM	0:04:28	90	88	CONTAINER
10:13:00 AM	10:17:15 AM	0:04:50	94	90	CONTAINER
10:21:00 AM	10:24:12 AM	0:03:12	66	50	COMMUTER
10:40:00 AM	10:41:28 AM	0:01:28	25	29	COMMUTER
10:48:00 AM	10:49:32 AM	0:01:32	27	22	COMMUTER
11:01:00 AM	11:04:10 AM	0:03:10	60	65	COMMUTER
11:12:00 AM	11:16:11 AM	0:04:11	76	84	CONTAINER
11:22:00 AM	11:25:07 AM	0:03:07	70	62	COMMUTER
11:39:00 AM	11:40:52 AM	0:01:52	31	33	COMMUTER
11:45:00 PM	11:47:00 PM	0:02:00	43	48	COMMUTER
11:57:00 AM	12:00:44 AM	0:03:44	79	84	COMMUTER
		0:44:05			
Number times closed	15				
Commuter closure	11	0:27:00		Averages	00:02:27
Container/Coal closure	4	0:17:05			00:04:16
Average queue Commuter			48	47	
Average queue Container/Coal			80	80	

FIELD SHEET __LEVEL CROSSING COUNT					
STREET: Glebe Road				WEATHER	
SUBURB: _____					
Approach 1___ EAST - GLEBE ROAD		DAY: THURSDAY			
Approach 2___ WEST ST JAMES ROAD					
DURATION OF COUNT: From: 12 Noon To: 2.00 PM			DATE : 22/03/2012	O'CAST / RAINING	
OBSERVER: BRAD MORGAN					
GATES CLOSE HH:MM:SS	GATES OPEN HH:MM:SS	TIME CLOSED	ESTIMATED QUEUE (CAR) APP. 1	ESTIMATED QUEUE (CAR) APP. 2	TYPE OF TRAIN
12:00:00					
12:01:00 PM	12:03:57 PM	00:02:57	49	54	COMMUTER
12:17:00 PM	12:21:19 PM	00:04:19	68	72	CONTAINER
12:27:00 PM	12:28:21 PM	00:01:21	28	37	COMMUTER
12:42:00 PM	12:44:14 PM	00:02:14	43	41	COMMUTER
12:45:00 PM	12:46:21 PM	00:01:21	31	35	COMMUTER
12:54:00 PM	12:58:52 PM	00:04:52	94	112	COAL / CONTAINER
1:02:00 PM	1:05:12 PM	00:03:12	50	47	COMMUTER
1:18:00 PM	1:20:08 PM	00:02:08	48	59	COMMUTER
1:33:00 PM	1:38:32 PM	00:05:32	116	139	COAL
1:42:00 PM	1:45:10 PM	00:03:10	54	54	COMMUTER
TOTAL		00:31:06			
Number times closed	10				
Commuter closure	00:16:23			Averages	00:02:20
Container/Coal closure	00:14:43				00:04:54
			43	47	
Average queue Commuter			93	108	
Average queue Container/Coal					

FIELD SHEET __LEVEL CROSSING COUNT

STREET: Glebe Road
SUBURB: Adamstown
Approach 1___ EAST - GLEBE ROAD
Approach 2___ WEST ST JAMES ROAD
DURATION OF COUNT: From: 2:00 PM To:4:00PM
OBSERVER: BRAD MORGAN

DAY: THURSDAY
DATE : 03/05/2012

WEATHER
O'CAST - YES

GATES CLOSE HH:MM:SS	GATES OPEN HH:MM:SS	TIME CLOSED	ESTIMATED QUEUE (CAR) APP. 1	ESTIMATED QUEUE (CAR) APP. 2	TYPE OF TRAIN
2:05:00 PM	2:07:54 PM	0:02:54	49	52	COMMUTER
2:16:00 PM	2:20:32 PM	0:04:32	70	69	CONTAINER
2:30:00 PM	2:34:40 PM	0:04:40	73	78	CONTAINER
2:45:00 PM	12:46:24 PM	0:01:24	27	24	COMMUTER
2:53:00 PM	2:54:31 PM	0:01:31	30	37	COMMUTER
3:01:00 PM	3:07:01 PM	0:06:01	109	119	COMMUTER
3:22:00 PM	3:25:26 PM	0:03:26	59	63	COMMUTER
3:39:00 PM	3:41:01 PM	0:02:01	41	39	COMMUTER
3:42:00 PM	3:45:22 PM	0:03:22	48	43	COMMUTER
3:54:00 PM	3:57:36 PM	0:03:36	57	50	COMMUTER
		0:33:27			

Number times closed		10			
Commuter closure	0:24:15			Averages	00:03:02
Container/Coal closure	0:09:12				00:04:36
Average queue Commuter			53	53	
Average queue Container/Coal			72	74	

FIELD SHEET __LEVEL CROSSING COUNT

STREET: Glebe Road
SUBURB: _____
Approach 1___ EAST - GLEBE ROAD
Approach 2___ WEST ST JAMES ROAD
DURATION OF COUNT: From: 3.30 PM To:5.30 PM
OBSERVER: BRAD MORGAN

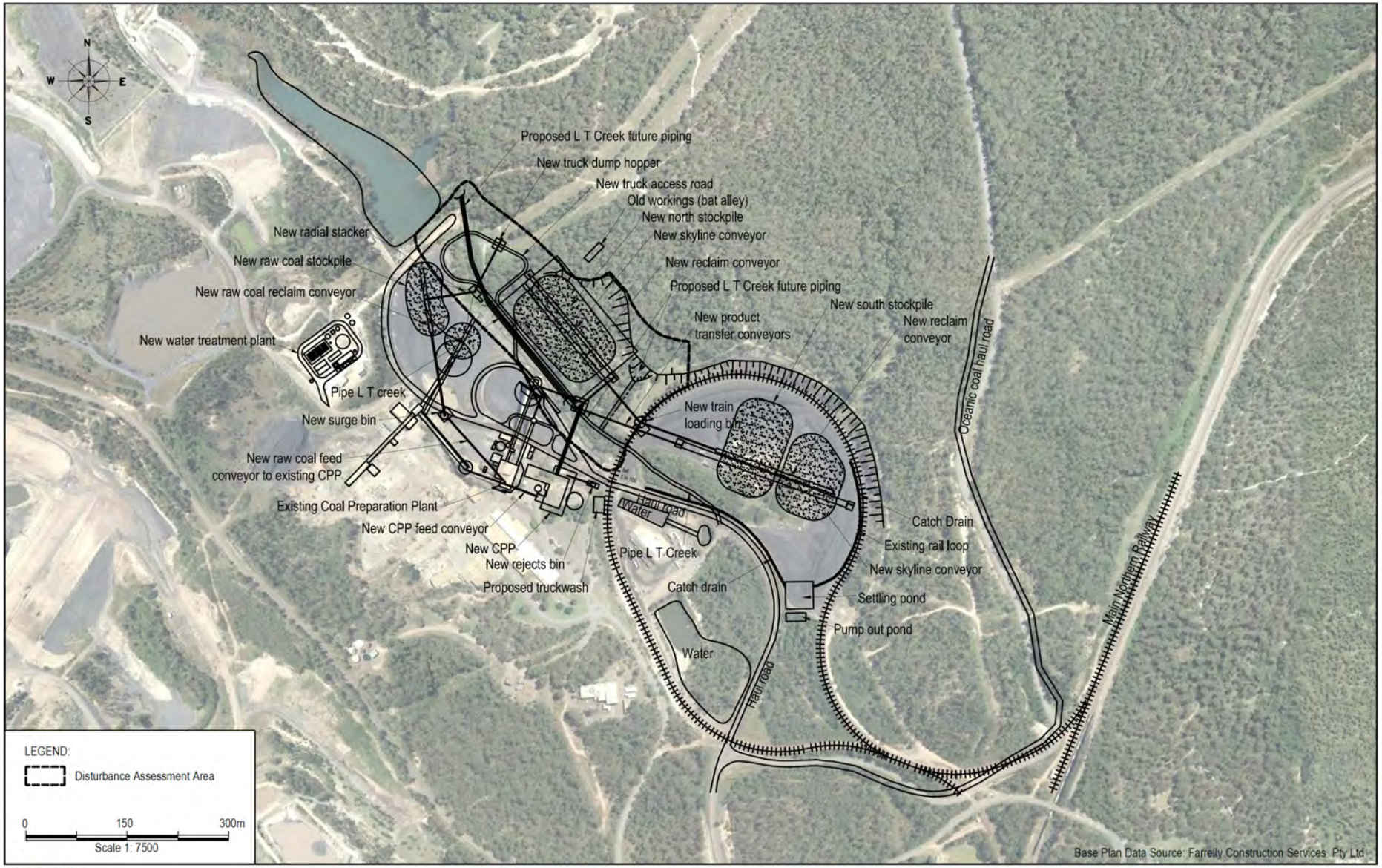
DAY: THURSDAY
DATE : 22/03/2012

WEATHER
O'CAST / RAINING

GATES CLOSE HH:MM:SS	GATES OPEN HH:MM:SS	TIME CLOSED	ESTIMATED QUEUE (CAR) APP. 1	ESTIMATED QUEUE (CAR) APP. 2	TYPE OF TRAIN
15:30:00					
15:36:00	15:37:31	00:01:31	31	37	COMMUTER
15:41:00	15:43:29	00:02:29	48	52	COMMUTER
15:52:00	15:55:11	00:03:11	51	48	COMMUTER
16:17:00	16:19:56	00:02:56	47	59	COMMUTER
16:26:00	16:29:36	00:03:36	44	41	COMMUTER
16:33:00	16:38:11	00:05:11	101	126	COAL / CONTAINER
16:41:00	16:42:34	00:01:34	37	44	COMMUTER
16:52:00	16:54:08	00:02:08	50	55	COMMUTER
16:59:00	17:01:49	00:02:49	59	63	COMMUTER
17:06:00	17:09:31	00:03:31	68	79	COMMUTER
17:29:00	17:32:37	00:03:37	75	97	COMMUTER
TOTAL		00:32:33			

Number times closed	11				
Commuter closure	00:27:22			Averages	00:02:44
Container/Coal closure	00:05:11				00:05:11
Average queue Commuter			51	58	
Average queue Container/Coal			101	126	

APPENDIX C
NEW SURFACE INFRASTRUCTURE PLANS



To be printed A4

GSS ENVIRONMENTAL
Environmental, Land and Project Management Consultants

Northern Coal Logistics Project
Proposed Re-development of Newstan Colliery Surface Site

FIGURE 3