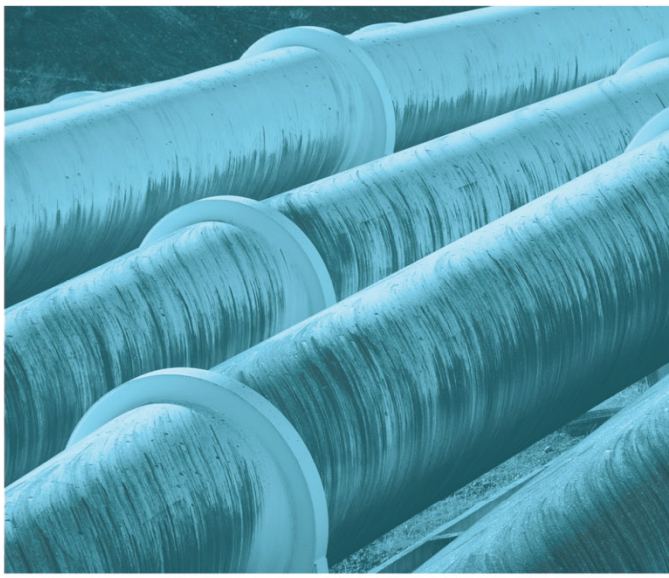



Clarence Colliery

Modification to DA 504-00 Statement of Environmental Effects

Prepared for Centennial Coal
April 2019



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Clarence Colliery

Modification to DA 504-00 Statement of Environmental Effects

Report Number

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Client

Centennial Coal Pty Ltd

Date

4 April 2019

Version

v1 Final

Prepared by



Lia Zwolinski
Environmental Scientist
4 April 2019

Approved by



Phil Towler
Associate Director
4 April 2019

This report has been prepared in accordance with the brief provided by the client and has relied upon the information collected at the time and under the conditions specified in the report. All findings, conclusions or recommendations contained in the report are based on the aforementioned circumstances. The report is for the use of the client and no responsibility will be taken for its use by other parties. The client may, at its discretion, use the report to inform regulators and the public.

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Executive Summary

Clarence Colliery is an underground coal mining operation utilising bord and pillar mining and partial extraction techniques. It is in the Western Coalfield of New South Wales (NSW), approximately 10 kilometres (km) east of Lithgow in the Lithgow local government area (LGA).

Clarence Colliery operates under DA 504-00 which was granted in 2005 by the NSW Department of Infrastructure, Planning and Natural Resources (now the NSW Department of Planning and Environment). Clarence Colliery is managed by Centennial Coal Company Limited (Centennial Coal).

Centennial Coal is seeking to modify Condition 7 Schedule 2 of DA 504-00 pursuant to Section 4.55(2) of the *NSW Environmental Planning and Assessment Act 1979* (EP&A Act) to allow for:

- increase total allowable coal haulage off-site by road from 200,000 tonnes (t) to 300,000 t for a limited period of time up to 31 December 2020; and
- increase total allowable coal haulage off-site to the west by road from 100,000 t to 200,000 t for a limited period of time up to 31 December 2020.

The proposed increase of total coal haulage by road will increase the total number of trucks which transport coal from Clarence Colliery from 25 trucks per day (ie 50 truck movements) to 40 trucks per day (ie 80 truck movements).

Springvale Mine is experiencing shortfalls in the amount of coal, of the required specification, that it is contracted to supply to Mount Piper Power Station (MPPS), with the volume of coal held in on-site stockpiles declining. The proposed modification will allow Centennial Coal to provide an alternative source of coal of suitable quality to MPPS to supplement the decline in supply from Springvale Mine. If left unmitigated, on-site stockpiles at MPPS will continue to decline with potential impacts to the efficient operation of MPPS and the supply of electricity to NSW.

Coal haulage to the west by road to MPPS includes the use of Clarence Colliery Road, Chifley Road, the Darling Causeway, Station Street, Great Western Highway, Castlereagh Highway, Wallerawang Power Station Haul Road and Mount Piper Power Station Haul Road.

No change to the coal haulage by road to the east is proposed as part of this modification. This will remain at a maximum rate of 200,000 t per calendar year. There will be no change to currently approved extraction limits, coal handling and preparation or dispatch via rail as part of the proposed modification.

This statement of environmental effects (SEE) and supporting technical assessments examine the potential impacts from the proposed modification. The NSW Department of Planning and Environment (DPE) and key stakeholders have been consulted. The purpose of this consultation has been to notify them of the proposed modification and to assist to identify all of the relevant issues to be assessed.

The proposed modification will not result in significant biophysical, social or economic impacts and any residual impacts can be appropriately managed in accordance with Clarence Colliery's existing approved environmental management system.

The proposed modification of DA 504-00 is of minimal environmental impact and will remain substantially the same development as the development authorised by the consent as last modified under Section 75W of the EP&A Act. As such it is considered the modification can be approved pursuant to Section 4.55(2) of the EP&A Act.

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1 Introduction

1.1 Overview

Clarence Colliery is an underground coal mining operation within the Western Coalfield of New South Wales (NSW) approximately 10 kilometres (km) east of Lithgow in the Lithgow local government area (LGA) (refer to Figure 1.1).

Clarence Colliery has been in operation since the 1980s and is currently owned by Centennial Coal Company Limited and SK Networks Resources Australia Pty Ltd as participants in the Clarence Colliery Joint Venture. Centennial Coal Company Limited (Centennial Coal) has been appointed as the management entity for the Clarence Colliery Joint Venture.

Centennial Coal is seeking to modify development consent DA 504-00 pursuant to Section 4.55(2) of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) to:

- increase total allowable coal haulage off-site by road from 200,000 tonnes (t) to 300,000 t for a limited period of time up to 31 December 2020; and
- increase total allowable coal haulage off-site to the west by road from 100,000 t to 200,000 t for a limited period of time up to 31 December 2020.

The proposed increase of total coal haulage by road will increase the total number of trucks which transport coal from Clarence Colliery from 25 trucks per day (ie 50 truck movements) to 40 trucks per day (ie 80 truck movements).

As part of the proposed modification, truck movements between the intersection of Station Street and Harley Avenue, in Mount Victoria, and the Wallerawang Power Station Haul Road (ie haulage to the west) will remain within assessed and approved limits (ie 25 trucks per day or 50 truck movements). The increased tonnage along the western haul route will be achieved through an increase to the number of days per year that truck movements will occur (ie from approximately 125 days per year to 250 days per year).

Therefore, the increase in daily truck movements that requires assessment is limited to the existing haulage route between Clarence Colliery and the intersection of Station Street and Harley Avenue via Darling Causeway (refer to Figure 1.2).

No change to the coal haulage by road to the east is proposed as part of this modification. This will remain at a maximum rate of 200,000 t per calendar year.

Springvale Mine is experiencing shortfalls in the amount of coal, of the required specification, that it is contracted to supply to Mount Piper Power Station (MPPS), with the volume of coal held in on-site stockpiles declining. The proposed modification will allow Centennial Coal to provide an alternative source of coal of suitable quality to MPPS to supplement the decline in supply from Springvale Mine. If left unmitigated, on-site stockpiles at MPPS will continue to decline with potential impacts to the efficient operation of MPPS and the supply of electricity to NSW.

This statement of environmental effects (SEE) assesses the impacts associated with the proposed modification and proposes mitigation measures where required to minimise potential impacts.

1.2 Proponent

Centennial Coal operates the Clarence Colliery and is the proponent for the modification.

The relevant address is:

Centennial Coal Company Limited
Level 18
1 Market Street
Sydney NSW 2000

1.3 Background

Clarence Colliery is an underground mining operation utilising bord and pillar mining and partial extraction techniques. It targets the Katoomba Seam of the Illawarra Coal Measures and is approved to extract 3 million tonnes per annum (Mtpa) of run-of-mine (ROM) coal for supply to both domestic and export markets.

Clarence Colliery operates under three separate development consents:

- an interim development consent issued in 1976 by Blaxland Shire Council (now Lithgow City Council) for the construction of surface facilities;
- development consent issued in 1994 by Lithgow City Council for the extension of underground coal mining, surface reject emplacement areas and water management and ancillary structures; and
- development consent issued in 2005 (DA 504-00) by the NSW Department of Infrastructure, Planning and Natural Resources (now the NSW Department of Planning and Environment) to expand site operations into Mining Lease (ML) 1583.

Condition 7 Schedule 2 of DA 504-00 permits Clarence Colliery to transport up to 200,000 t of coal by road per calendar year in total, with a maximum of 100,000 t per calendar year transported to the west, via the Darling Causeway and Great Western Highway haulage route.

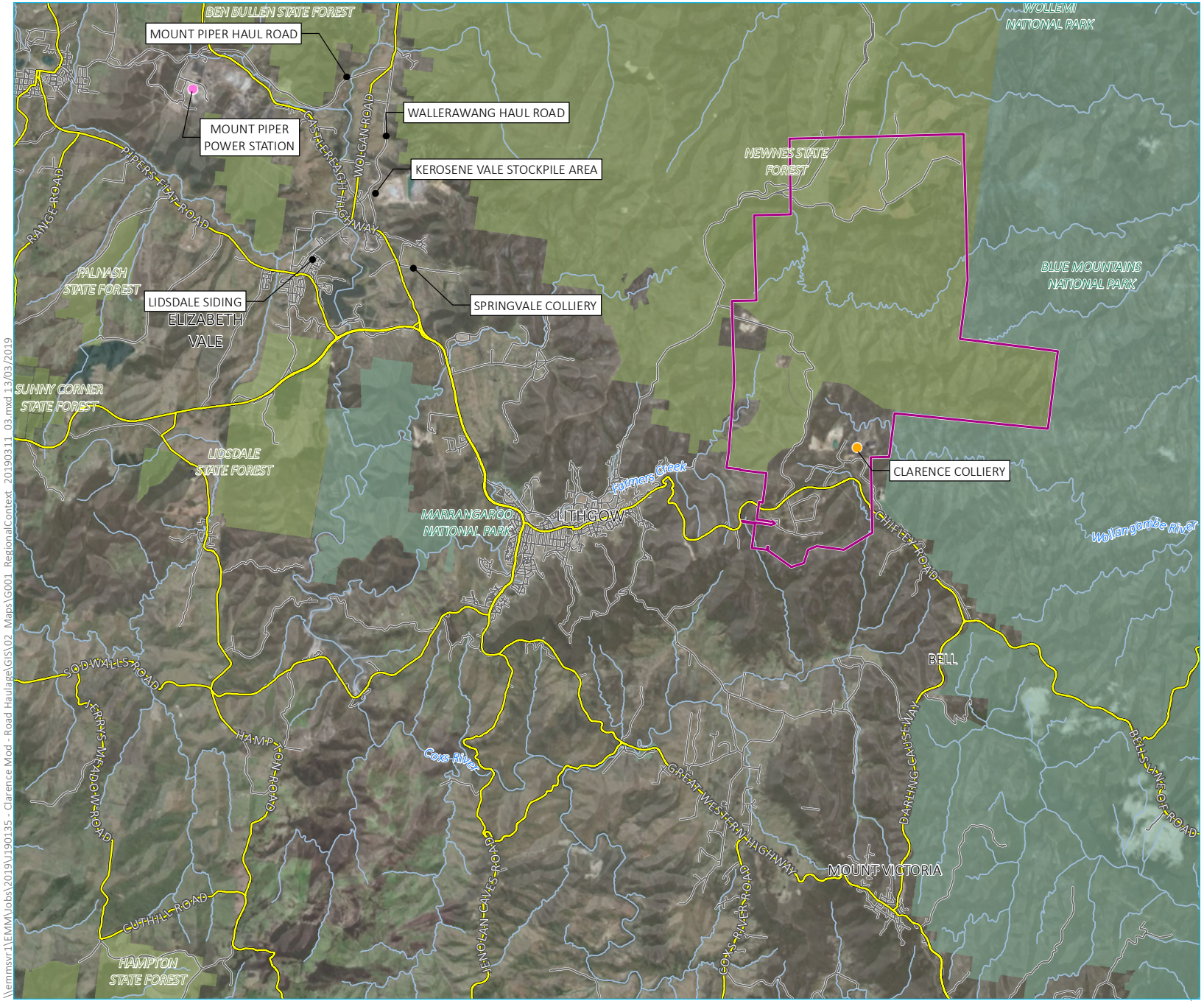
The approved haulage routes from Clarence Colliery are highlighted on Figure 1.2. All trucks hauling coal from Clarence Colliery turn left from Clarence Colliery Road onto Chifley Road regardless of whether their ultimate destination is to the east or to the west.

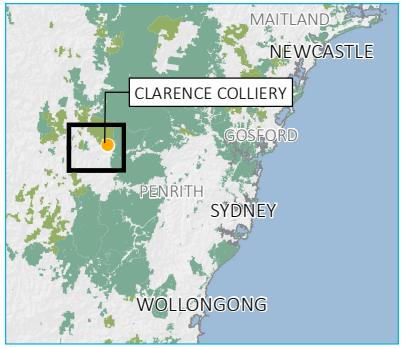
As per Condition 7B Schedule 2 of DA 504-00, trucking of coal to the west occurs only between 7:00 am and 10:00 pm Monday to Saturday and between 8:00 am and 10:00 pm on Sundays and public holidays.

1.4 Objectives

This SEE has been prepared to support an application to modify DA 504-00 pursuant to Section 4.55(2) of the EP&A Act as described in Chapter 4.

There will need to be a temporary (to up to 31 December 2020) increase to the total number of trucks permitted to transport coal from Clarence Colliery from 25 trucks per day (ie 50 truck movements) to 40 trucks per day (ie 80 truck movements) to achieve the proposed increase in total coal haulage by road. As noted in Section 1.1, the increase in daily truck movements that requires assessment is limited to the existing haulage route between Clarence Colliery and the intersection of Station Street and Harley Avenue via Darling Causeway (refer to Figure 1.2).





KEY

- Clarence Colliery holding boundary
- Clarence Colliery surface facilities
- Mount Piper Power Station
- Main road
- LocalRoad
- Watercourse
- NPWS reserve
- State forest

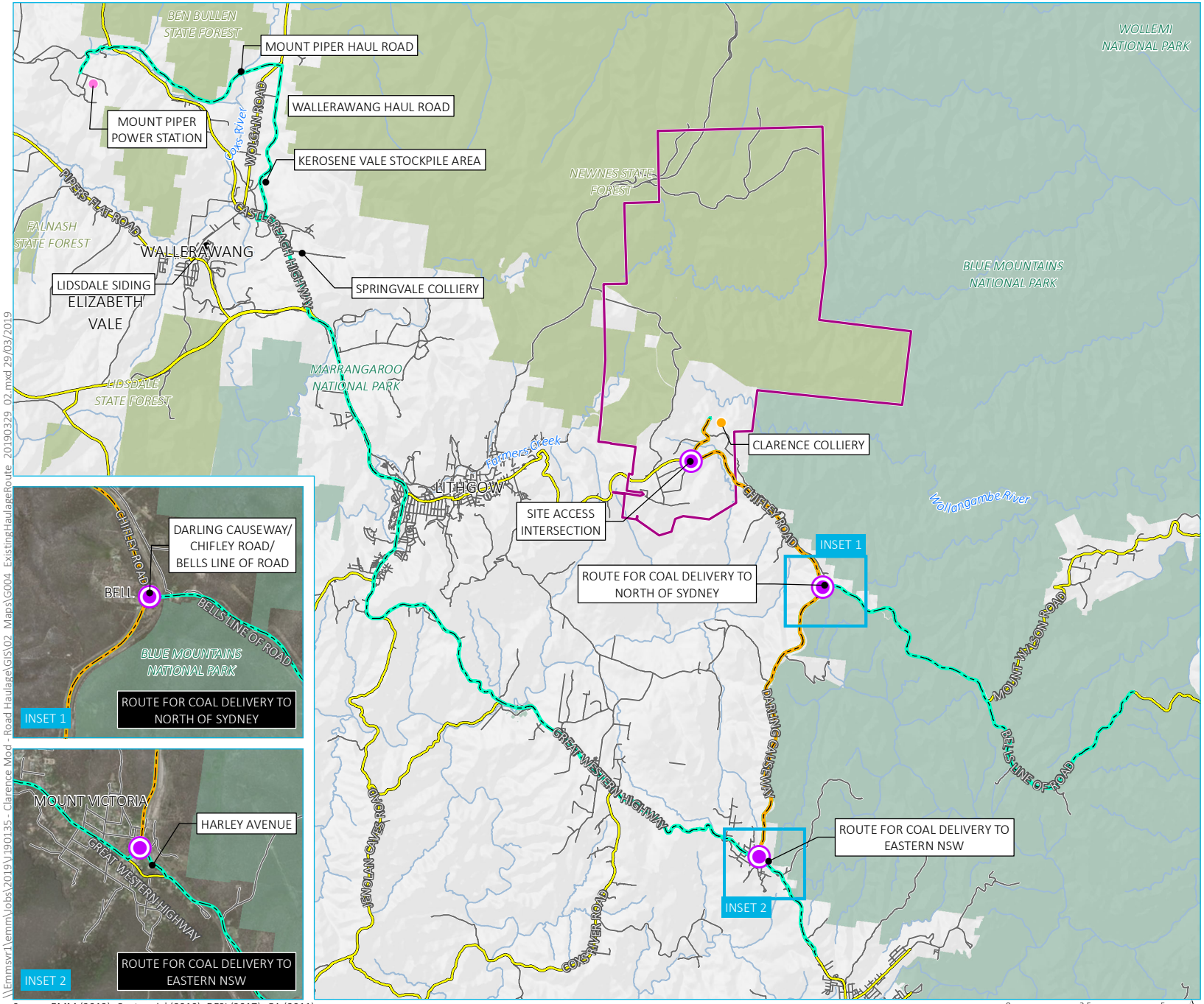
Source: EMM (2019); Centennial (2019); DFSI (2017); GA (2011)

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Regional context

Clarence Colliery
Statement of environmental effects
Figure 1.1

EMM
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KEY

- Clarence Colliery holding boundary
- Clarence Colliery surface facilities
- Mount Piper Power Station
- Assessed intersection
- Assessed haulage route
- Existing haulage route
- Main road
- LocalRoad
- Named watercourse
- NPWS reserve
- State forest

Source: EMM (2019); Centennial (2019); DFSI (2017); GA (2011)

0 2.5 5 km

GDA 1994 MGA Zone 56

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Existing haulage routes and assessed intersections

Clarence Colliery
Statement of environmental effects
Figure 1.2

EMM
creating opportunities

1.5 Justification

Springvale Mine is the primary coal supplier to MPPS, a coal-fired power station approximately 25 km north-west of Lithgow. The MPPS has a rated capacity of 1,400 megawatts (MW) and supplies approximately 15% of NSW electricity needs.

Springvale Coal Pty Limited (Springvale Coal) is contracted to supply coal of a specific quality to MPPS. Historically, this has been achieved by washing ROM coal to reduce the ash content. Following the commencement of mining of the southern longwall blocks at Springvale Mine in July 2018, the quality of ROM coal has declined. This has resulted in lower washed coal yields and, subsequently, Springvale Mine is experiencing shortfalls in the contracted amount of coal that is required to be supplied to MPPS.

If this shortfall is not addressed, on-site stockpiles at MPPS will decline further, resulting in a peak shortfall of approximately 560 kilotonnes (kt) by June 2019. A sustained shortfall to stockpiled coal reserves at MPPS will put power generation at risk.

Based on available stockpiles at MPPS and current production levels at Springvale Mine, it is anticipated that an additional 30 kt/month to 62 kt/month is required to maintain current MPPS power generation. No other mines have approval to transport coal by road direct to MPPS and MPPS does not currently have a rail unloading facility. Subsequently, Centennial Coal is investigating viable alternatives to provide coal to MPPS from its existing operations in the Western Coalfields.

The proposed modification to temporarily increase the volume of coal transport from Clarence Colliery to MPPS via road is considered a viable alternative for the following reasons:

- it does not require an increase to currently approved extraction limits at Clarence Colliery (currently 3 Mtpa);
- it does not require any significant changes to currently approved operations at Clarence Colliery's surface facilities or MPPS;
- with the exception of additional truck movements, no additional plant, equipment or supporting infrastructure is required to support the transport of coal from Clarence Colliery to MPPS by road;
- truck movements between the intersection of Station Street and Harley Avenue, in Mount Victoria, and the Wallerawang Power Station Haul Road (ie haulage to the west) will remain within assessed and approved limits (ie 25 trucks per day or 50 truck movements); and
- the proposed additional truck movements will not have a significant impact on the safety or serviceability of the existing haulage route.

Some of the coal produced at Clarence Colliery is used to meet existing contractual obligations. The coal proposed to be supplied to MPPS from Clarence Colliery is usually sold on the 'spot' market (ie it is not committed to a particular site and/or customer). However, if contracted coal is displaced as a result of Clarence Colliery supplying coal to MPPS, an alternative coal supply of the required specifications will be sourced from another mine to meet existing contractual obligations.

The temporary increase (up to 31 December 2020) will allow time to apply for the necessary approvals and/or install the infrastructure required to provide an alternative source of coal (for example from another mine) or an alternative transport method (rail).

1.6 Report structure

EMM Consulting Pty Limited (EMM) has been engaged by Centennial Coal to prepare this SEE and to assess the potential impact of the proposed modification to DA 504-00. This SEE has been prepared in consideration of Section 4.15(1) of the EP&A Act and Clause 115 of the NSW *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation).

This SEE provides a description of the existing environment, existing operations at Clarence Colliery and the proposed modification, provides the legislative context for the proposed modification and a summary of stakeholder consultation. It includes an environmental assessment of the potential impacts associated with the proposed modification and outlines associated mitigation measures (where required). This SEE is supported by a traffic impact assessment (TIA) (refer to Appendix A) and road traffic noise assessment (refer to Appendix B).

2 Site description

2.1 Site location

Clarence Colliery is in the Western Coalfield of NSW, approximately 10 km east of Lithgow in the Lithgow LGA (refer to Figure 1.1). It is bordered by the Blue Mountains National Park to the east and Newnes State Forest to the north and west. The residential areas of Newnes Junction and Clarence Village are 900 metres (m) south-east and 1.5 km south-west of Clarence Colliery, respectively (refer to Figure 2.1).

A number of extractive industries are in close proximity, including the Hanson Quarry to the west and the disused Rocla Quarry to the south-east (refer to Figure 2.1). The proposed Newnes Kaolin Project is also to the south-east (refer to Figure 2.1).

Clarence Colliery is within the Hawkesbury-Nepean Catchment and drains to the Wollangambe River, which in turn drains to the Colo River.

2.2 Clarence Colliery surface facilities

The surface facilities at Clarence Colliery are on Crown and free-hold land north of Chifley Road (a continuation of Bells Line of Road) and the Main Western Rail Line (refer to Figure 2.2). A spur rail line also connects the surface facilities to the Main Western Rail Line (refer to Figure 2.2). Road access to Clarence Colliery is directly from Clarence Colliery Road.

2.3 Environmental setting

2.3.1 Climate

The Lithgow (Cooerwull) Bureau of Meteorology (BOM) weather Station is 9.5 km south-west of Clarence Colliery. Clarence Colliery experiences a temperate climate, as classified by the Koppen climate classification system. This consists of warm summers and cold winters. At this station, the average rainfall is 784 millimetres (mm) per year (from 1878–2018) with an annual low of 470.4 mm (in 1940) and annual high of 1,206.3 mm (in 1956).The average annual temperature is 18.6°C (from 2006–2018) with an annual low of 17.6°C (in 2011) and an annual high of 19.5°C (in 2017 and 2018).

2.3.2 Geology, soils and hydrology

Clarence Colliery targets the Katoomba Seam of the Illawarra Coal Measures in the Western Coalfield. The overburden lithology at Clarence Colliery is characterised by competent interbedded sandstones, shales and fine to medium grained massive sandstones tending to basal conglomerates (GHD 2013a).

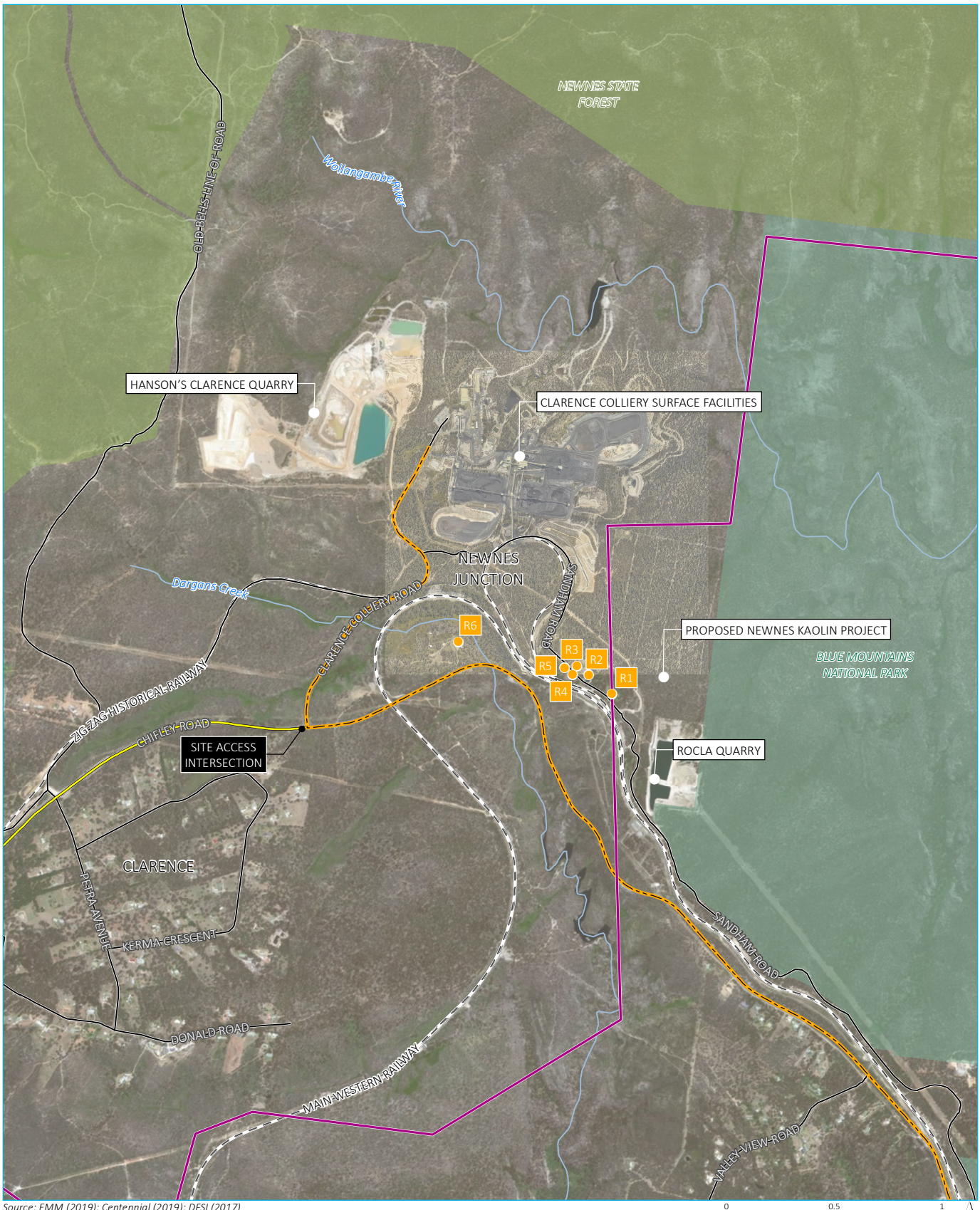
The soil landscape can be categorised as either the Newnes Plateau or the Medlow Bath soil landscape (GHD 2013a). The Newnes Plateau soil landscape consists of shallow sands and lithosols (GHD 2013a). The Medlow Bath soil landscape consists of moderately deep earthy sands and yellow earths (GHD 2013a).

Clarence Colliery is in the Hawkesbury Nepean Catchment.

2.4 Land use and zoning

The land within Clarence Colliery's holding boundary is zoned RU3 (Forestry) and E3 (Environmental Management) under the Lithgow Local Environmental Plan 2014 (Lithgow LEP). Land uses surrounding Clarence Colliery include extractive industries, rural residential dwellings, conservation and forestry.

There are six sensitive receivers within 1 km of Clarence Colliery's surface facilities (refer to Figure 2.1). As noted in Section 2.1, the residential areas of Newnes Junction and Clarence Village are approximately 900 m south-east and 1.5 km south-west of Clarence Colliery, respectively (refer to Figure 2.1).



Source: EMM (2019); Centennial (2019); DFSI (2017)

0 0.5 1 km

GDA 1994 MGA Zone 56

N

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KEY

- Clarence Colliery holding boundary
- Sensitive receiver
- Assessed haulage route
- Rail line
- Main road
- Local road
- Watercourse
- NPWS reserve
- State forest

Local context

Clarence Colliery
Statement of environmental effects
Figure 2.1

EMM creating opportunities



Source: EMM (2019); Centennial (2019); DFSI (2017); GA (2011)

0 250 500 m

GDA 1994 MGA Zone 56

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KEY

- Clarence Colliery holding boundary
- Clarence Colliery surface facilities
- Assessed haulage route
- Rail line
- Main road
- Local road
- Watercourse/drainage line
- Waterbody

Existing surface facilities

Clarence Colliery
Statement of environmental effects
Figure 2.2

EMM
creating opportunities

3 Existing operations

3.1 Overview

Clarence Colliery has approval to extract 3 Mtpa ROM coal for supply to both domestic and export markets. Coal is extracted from the Katoomba Seam of the Illawarra Coal Measures using bord and pillar and partial extraction methods. ROM coal is beneficiated (washed) on-site prior to despatch. Clarence Colliery is approved to operate 24 hours per day, seven days per week and currently employs up to 300 full-time equivalent (FTE) personnel.

Clarence Colliery holds multiple mining leases issued under the NSW *Mining Act 1992*. The bulk of the underground mining operations and Clarence Colliery's surface facilities occur within Consolidated Coal Lease (CCL) 705, while underground mining activities also occur within ML 1353, ML 1354 and ML 1583. A small proportion of the existing surface facilities are within ML 1721.

3.2 Coal handling, preparation and dispatch

Coal from the underground operations is brought to the surface via the main ROM conveyor and is then run through a rotary breaker and crusher to reduce the size of the coal to 50 mm or less after which it is conveyed to the ROM stockpile. The ROM stockpile has capacity to store approximately 300,000 t of ROM coal.

From the ROM stockpile, two underground coal reclaim systems direct coal either to the rail load out (for direct transfer by rail to Port Kembla or Newcastle where it is shipped to international markets) or to the coal preparation plant for beneficiation (ie washing) (refer to Figure 2.2). Beneficiated coal can also be transported by rail to Port Kembla or Newcastle.

Clarence Colliery has approval to transport up to 3 Mtpa of coal via rail, which can take place 24 hours per day, seven days per week. As described below, some coal is dispatched by road.

Only washed and sized coal is transported by road trucks to domestic markets.

3.3 Existing coal haulage by road

As per Condition 7 Schedule 2 of DA 504-00, Clarence Colliery is permitted to transport up to 200,000 t of coal by road per calendar year in total, with a maximum of 100,000 t per calendar year transported to the west, via the Darling Causeway and Great Western Highway haulage route.

The existing haulage route to the east consists of (refer to Figure 1.2):

- trucks turn left from Clarence Colliery Road onto Chifley Road;
- trucks continue east to where Chifley Road intersects with Darling Causeway – from the intersection of Chifley Road and Darling Causeway, there are two options:
    - the majority of trucks turn right onto Darling Causeway and travel south towards Mount Victoria until turning left from Station Street onto Harley Avenue and left again onto the Great Western Highway (for delivery of coal to eastern NSW); or
    - a small proportion of trucks continue to destinations north of Sydney via Bells Line of Road.

The existing haulage route to the west (for delivery to the Kerosene Vale Stockpile Site near Lidsdale and the MPPS) consists of (refer to Figure 1.2):

- trucks turn left from Clarence Colliery Road onto Chifley Road;
- trucks continue east to where Chifley Road intersects with Darling Causeway;
- trucks turn right onto Darling Causeway and travel south towards Mount Victoria until turning right from Station Street onto the Great Western Highway towards Lithgow; and
- trucks continue towards the Castlereagh Highway, before turning left onto the Wallerawang Power Station Haul Road or left onto the MPPS Haul Road.

The TIA previously prepared by GHD (2013b) as part of the environmental assessment for an earlier modification to DA 504-00 considered impacts associated with 25 trucks per day (ie 50 truck movements) travelling along the western haul route (refer to Figure 1.2). This assessment assumed that the average load per truck would be 32 t and that trucks would travel along the western haul route for 125 days per year to transport a total of 100,000 t per year.

4 Proposed modification

4.1 Product coal haulage

Centennial Coal is seeking to modify Condition 7 Schedule 2 of DA 504-00 pursuant to Section 4.55(2) of the EP&A Act to:

- increase total coal haulage off-site by road from 200,000 t to 300,000 t for a limited period of time up to 31 December 2020; and
- increase total coal haulage off-site to the west by road from 100,000 t to 200,000 t for a limited period of time up to 31 December 2020.

Condition 7 Schedule 2 of DA 504-00 states:

> The applicant may transport up to 200,000 tonnes of coal by road per calendar year in total, with a maximum of 100,000 tonnes per calendar year transported to the west, via the Darling Causeway and Great Western Highway haulage route shown in EA Mod 3.

To achieve the proposed increase in total coal haulage by road there will need to be an increase to the total number of trucks permitted to transport coal from Clarence Colliery from 25 trucks per day (ie 50 truck movements) to 40 trucks per day (ie 80 truck movements). This would be achieved by modifying Condition 7 Schedule 2 of DA 504-00 to:

> The applicant may transport up to 300,000 tonnes of coal by road per calendar year in total, with a maximum of 200,000 tonnes per calendar year transported to the west, via the Darling Causeway and Great Western Highway haulage route shown in EA Mod 3 [or this modification].

As noted in Section 1.1, daily truck movements between the intersection of Station Street and Harley Avenue, in Mount Victoria, and the Wallerawang Power Station Haul Road (ie haulage to the west) will remain within the assessed and approved limits (ie 25 trucks per day or 50 truck movements). The increased tonnage along the western haul route will be achieved through an increase to the number of days per year that truck movements will occur (ie from approximately 125 days per year to 250 days per year).

No change to total coal haulage off-site to the east by road is proposed as part of this modification. This will remain at a maximum rate of 200,000 t per calendar year. Further, there will be no change to currently approved extraction limits, coal handling and preparation or dispatch via rail as part of the proposed modification.

Haulage of coal by truck along the Wallerawang Power Station Haul Road and MPPS Haul Road will be consistent with approved operations under the Western Coal Services Project (SSD-5579), which restricts truck movements along the Wallerawang and MPPS haul roads to the day period only, prior to longwall extraction at the Angus Place Colliery. Under SSD-5579, the day period is defined as the period from 7 am-6 pm Monday to Saturday and 8 am-6 pm on Sundays and public holidays. These hours will not change during the period of proposed haulage increase as no longwall extraction at the Angus Place Colliery will occur prior to 31 December 2020.

4.2 Consideration of alternatives

Centennial Coal has been investigating viable alternatives to provide coal to MPPS from its existing operations in the Western Coalfields. Concurrently to the proposed modification, Centennial Coal is seeking to modify development consent DA 08_0223 for the Lidsdale Coal Loader Project. This modification is the subject of a separate SEE, which will seek approval for Lidsdale Siding to be used to transport coal to the Western Coal

Services Project. This coal will further supplement the shortfall of coal supplied to MPPS that has occurred as a result of the decline in coal quality at Springvale Mine.

The proposed modification to DA 08_0223 also has potential to provide an alternative source of coal of suitable quality to MPPS to supplement the decline in supply from Springvale Mine; however, it requires additional plant, equipment and infrastructure to be constructed at Lidsdale Siding. It would also need to be approved.

With the exception of additional truck movements on the local and regional road network, the proposed modification that is the subject of this SEE can be carried out without any additional plant, equipment or supporting infrastructure and will help to maintain current operations at MPPS.

Other alternatives have also been considered by Centennial Coal, including:

- trucking of coal from Airly Mine, approximately 25 km north of MPPS, which was not considered a viable alternative due to the community impacts associated with the haulage route between Airly Mine and MPPS; and
- recommencement of mining at Angus Place Colliery (placed into a period of care and maintenance on 28 March 2018), which could not occur in the timeframe required for supplementary supply of coal to MPPS.

4.3 'Do nothing' scenario

If Centennial Coal does not provide an alternative source of coal of suitable quality to MPPS to supplement the decline in supply from Springvale Mine, on-site stockpiles at MPPS will continue to decline with potential impacts to the efficient operation of MPPS and the supply of electricity to NSW.

The 'do nothing' scenario will put ongoing power generation at MPPS at risk.

5 Legislation and policy

5.1 Lithgow Local Environmental Plan 2014

As noted in Section 2.4, the subject land is zoned RU3 (Forestry) and E3 (Environmental Management) under the Lithgow LEP.

The Lithgow LEP states that the objectives of land zoned RU3 (Forestry) are:

- to enable development for forestry purposes; and
- to enable other development that is compatible with forestry land uses.

The Lithgow LEP states that the objectives of land zoned E3 (Environmental Management) are:

- to protect, manage and restore areas with special ecological, scientific, cultural or aesthetic values;
- to provide for a limited range of development that does not have an adverse effect on those values;
- to facilitate the management of environmentally sensitive lands and riparian areas;
- to protect and conserve the vegetation and escarpment landscape surrounding Lithgow; and
- to maintain or improve the water quality of receiving water catchments.

State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007 (Mining SEPP) aims to provide for the proper management and development of mineral, petroleum and extractive material resources for the social and economic welfare of NSW.

Sub-clause 7(1)(a) of the Mining SEPP states that development for the purpose of underground mining may be carried out on any land with development consent. In relation to any inconsistency between the Mining SEPP and an LEP, sub-clause 5(3) provides that the Mining SEPP prevails to the extent of the inconsistency.

On this basis, any provision in the Lithgow LEP that would otherwise operate to prohibit the proposed modification has no effect. The proposed modification is permissible with development consent.

5.2 NSW State legislation

5.2.1 Environmental Planning and Assessment Act 1979

i Section 4.55(2) modification

Centennial Coal is seeking to modify DA 504-00 pursuant to Section 4.55(2) of the EP&A Act. Development consent may be modified under Section 4.55 of the EP&A Act provided that the development as modified will be substantially the same development as the development for which consent was originally granted. Compliance of the proposed modification with the requirements of Section 4.55(2) is provided in Table 5.1.

Table 5.1 Comparison with Section 4.55(2) requirements

Section 4.55(2) requirements	Comment
(a) it is satisfied that the development to which the consent as modified relates is substantially the same development as the development for which consent was originally granted and before that consent as originally granted was modified (if at all), and	The proposed modification is substantially the same development for which consent was originally granted – being an underground coal mine. As noted in Table 5.4, the proposed modification can be considered substantially the same development as the development authorised by the consent as last modified under Section 75W of the EP&A Act. The proposed modification is seeking to increase coal haulage off-site by road from 200,000 t to 300,000 t and also increase coal haulage off-site to the west from 100,000 t to 200,000 t. The proposed modification will only operate for a limited period of time up to 31 December 2020 and will allow Centennial Coal to provide an alternative source of coal of suitable quality to MPPS to supplement the decline in supply of suitable coal from Springvale Mine. With the exception of additional truck movements, no additional plant, equipment or supporting infrastructure is required to support the proposed modification.
(b) it has consulted with the relevant Minister, public authority or approval body (within the meaning of Division 4.8) in respect of a condition imposed as a requirement of a concurrence to the consent or in accordance with the general terms of an approval proposed to be granted by the approval body and that Minister, authority or body has not, within 21 days after being consulted, objected to the modification of that consent, and	Centennial Coal has consulted with DPE as part of the preparation of this SEE. DPE confirmed that the appropriate approval pathway for the modification is by way of Section 4.55(2) of the EP&A Act. Further information about consultation is provided in Chapter 6
(c) it has notified the application in accordance with: i) the regulations, if the regulations so require, or ii) a development control plan, if the consent authority is a council that has made a development control plan that requires the notification or advertising of applications for modification of a development consent, and	Clause 118 of the EP&A Regulation relates to the notification period associated with 4.55(2) modifications. Notice of the application must be published in a local newspaper by DPE. DPE must also cause notice of the proposed modification to be given to each person who made a submission in relation to the original development application. This SEE will be placed on public exhibition for a minimum of 14 days.
(d) it has considered any submissions made concerning the proposed modification within the period prescribed by the regulations or provided by the development control plan, as the case may be.	Any submissions made concerning the proposed modification will be reviewed by DPE and forwarded to Centennial Mandalong to consider and respond to (via a response to submissions (RTS) report).

ii Matters for consideration

In accordance with Section 4.55(2) of the EP&A Act, when determining a modification of development consent, the consent authority must take into consideration the matters referred in Section 4.15(1) of the EP&A Act. The Section 4.15(1) matters of consideration, and where they are addressed in this SEE, are provided in Table 5.2.

Table 5.2 EP&A Act Section 4.15(1) matters for consideration

Section 4.15(1) matters for consideration	Where addressed
(a) the provisions of:	
i. any environmental planning instrument, and	Relevant planning instruments are addressed in Section 5.1.
ii. any proposed instrument that is or has been the subject of public consultation under this Act and that has been notified to the consent authority (unless the Planning Secretary has notified the consent authority that the making of the proposed instrument has been deferred definitely or has not been approved), and	There are no proposed instruments relevant to the modification.
iii. any development control plan, and	There are no development control plans relevant to the modification.
iv. any planning agreement that has been entered into under Section 7.4, or any draft planning agreement that a developer has offered to enter into under Section 7.4, and	There are no planning agreements relevant to the modification.
v. the regulations (to the extent that they prescribe matters for the purposes of this paragraph) that apply to the land to which the development application relates,	The requirements of the EP&A Regulation are addressed in Table 5.3.
(b) the likely impacts of that development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality,	This SEE describes the likely impacts of the proposed modification, including environmental impacts on both the natural and built environments, and social and economic impacts in the local area and region.
(c) the suitability of the site for the development,	Existing land use, zoning and characteristics at Clarence Colliery are described in Chapter 2. No changes to existing infrastructure or the extent of the Clarence Colliery holding boundary are required as part of the proposed modification.
(d) any submissions made in accordance with this Act or the regulations,	This SEE will be placed on public exhibition for a minimum of 14 days by DPE and submissions will be sought from local and State government agencies and the community. Submissions received by DPE will be reviewed and forwarded to Centennial Mandalong to consider and respond to (via a RTS report). Following receipt of the RTS report, DPE will prepare its assessment report considering this SEE, submissions received during the exhibition process and the RTS report.
(e) the public interest.	To assist the consent authority in determining whether the proposed modification is in the public interest, this SEE provides a justification for the project, taking into consideration its potential environmental impacts and the suitability of the subject land. DPE will also consider the submissions received during the public exhibition of the SEE.

5.2.2 Environmental Planning and Assessment Regulation 2000

Clause 115 of the EP&A Regulation states the information that is required in an application for a modification under Section 4.55(2) of the EP&A Act. Where the required information is provided is summarised in Table 5.3.

Table 5.3 EP&A Regulation Clause 115 information requirements

Clause 115 information requirement	Where addressed
(a) the name and address of application	Section 1.2
(b) a description of the development to be carried out under the consent (as previously modified)	Chapter 3
(c) the address, and formal particulars of title, of the land on which the development is to be carried out,	Section 2.1
(d) a description of the proposed modification to the development consent,	Chapter 4
(e) a statement that indicates either: i. that the modification is merely intended to correct a minor error, misdescription or miscalculation, or ii. that the modification is intended to have some other effect, as specified in the statement,	Section 4.1
(f) a description of the expected impacts of the modification,	Chapter 7
(g) an undertaking to the effect that the development (as to be modified) will remain substantially the same as the development that was originally approved,	Chapter 7
(g1) in the case of an application that is accompanied by a biodiversity development assessment report, the reasonable steps taken to obtain the like-for-like biodiversity credits required to be retired under the report to offset the residual impacts on biodiversity values if different biodiversity credits are proposed to be used as offsets in accordance with the variation rules under the Biodiversity Conservation Act 2016,	Not applicable as the proposed modification will have no impacts to biodiversity and a biodiversity development assessment report is not required.
(h) if the applicant is not the owner of the land, a statement signed by the owner of the land to the effect that the owner consents to the making of the application (except where the application for the consent the subject of the modification was made, or could have been made, without the consent of the owner),	The proponent and landholder are related entities so landholder consent is not required for the modification application to be made.
(i) a statement as to whether the application is being made to the Court (under Section 4.55) or to the consent authority (under Section 4.56)	The proposed modification application is not being made to the NSW Land and Environment Court.
and, if the consent authority so requires, must be in the form approved by that authority.	Not applicable.

5.2.3 Other relevant NSW State legislation

An outline of other relevant NSW State legislation and planning instruments is provided in Table 5.4.

Table 5.4 Other relevant NSW State legislation

NSW legislation	Comments
NSW Environmental Planning and Assessment (Savings, Transitional and other Provisions) Regulation 2017	Pursuant to Schedule 2 Part 3BA (6)(b) of the NSW Environmental Planning and Assessment (Savings, Transitional and other provisions) Regulation 2017, the proposed modification can be considered substantially the same development as the development authorised by the consent as last modified under Section 75W of the EP&A Act. DA 504-00 was last modified in 2014 under Mod 3. This included the introduction of Clause 7: > The applicant may transport up to 200,000 tonnes of coal by road per calendar year in total, with a maximum of 100,000 tonnes per calendar year transported to the west, via the Darling Causeway and Great Western Highway haulage route shown in EA Mod 3.
NSW *Protection of the Environment Operations Act 1997* (POEO Act)	Clarence Colliery is a 'premise based scheduled activity' under Schedule 1 (10 Coal Works) and (28 Mining for Coal) of the POEO Act. Clarence Colliery operates under Environment Protection Licence (EPL) 726, which is administered by the NSW Environment Protection Authority (EPA) under Sections 43(b) and 48 of the POEO Act. No changes to EPL 726 are proposed as part of this modification. The modification outlined in Chapter 4 will operate under EPL 726.
NSW *Biodiversity Conservation Act 2016* (BC Act)	The proposed modification is expected to have a negligible or no impact on protected animals and plants, such that it is expected that the modification is not likely to impact on matters listed under the BC Act.
NSW *Waste Avoidance and Resource Recovery Act* 2001	The proposed modification will not increase waste production at Clarence Colliery. Waste will continue to be managed in accordance with the existing Environmental Management Strategy (Centennial Coal 2012).
NSW *Work Health and Safety (Mines and Petroleum Sites) Act 2013*	The NSW *Work Health and Safety (Mines and Petroleum Sites) Act 2013* aims to assist in securing and promoting the health, safety and welfare of people at work at coal operations. Clarence Colliery hold all necessary approvals under the Act and operations at Clarence Colliery will continue to be regulated under the provisions of the Act.
Mining SEPP	Under Part 2 of the Mining SEPP, mining may be carried out with consent on land that is the subject of a ML under the NSW *Mining Act 1992*. Therefore, the proposed modification is permitted with consent.
State Environmental Planning Policy No 33 – Hazardous and Offensive Development (SEPP 33)	The modification will not include hazardous activities such as the storage, handling or transport of dangerous goods. Therefore, the modification is not considered to be a potentially hazardous and/or offensive development.

5.3 Commonwealth legislation

5.3.1 Environmental Protection and Biodiversity Conservation Act 1999

The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is administered by the Commonwealth Department of the Environment and Energy (DoEE). It provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places defined as 'matters of national environmental significance' (MNES). If significant impacts are considered likely,

and the action is deemed to be a ‘controlled action’, then the proponent may need to provide further information about the proposal to DoEE.

The proposed modification is unlikely to have a significant impact on any MNES listed under the EPBC Act and consequently has not been referred to DoEE.

6 Stakeholder consultation

6.1.1 NSW Department of Planning and Environment

Centennial Coal wrote to DPE on 21 March 2019 to introduce the proposed modification and seek initial advice with regard to the assessment pathway and scope of this SEE. The department responded on 25 March 2019 to confirm the assessment scope and nominated an application under Section 4.55(2) of the EP&A Act as the appropriate approval pathway. A copy of this correspondence is provided in Appendix C. Feedback provided by DPE and how it has been addressed is summarised in Table 6.1.

Table 6.1 Feedback from DPE and how it has been addressed

Matter raised	Response
DPE confirms that the appropriate approval pathway for the modification application would be by way of Section 4.55(2) of the EP&A Act.	The modification application will be made under Section 4.55(2).
DPE endorses the issues identified in the letter dated 21 March 2019 to be addressed in the SEE.	The technical assessments proposed within Centennial Coal's letter to DPE (dated 21 March 2019) are appended to this SEE and the findings summarised in Chapter 7.
DPE requested that the SEE include consideration of the social and economic impacts of the proposed modification.	An assessment of social impacts has been undertaken utilising DPE's social impact assessment scoping tool and generally in accordance with the *Social Impact Assessment Guideline: For State Significant Mining, Petroleum Production and Extractive Industry Development* (DPE 2017). This assessment is included in Section 7.4 of this SEE. In addition, an assessment of the potential annual economic effects is presented in Section 7.4.
DPE requested that as part of the preparation of the SEE, Centennial Coal consult with NSW Roads and Maritime Services (RMS), relevant Council's and the mine's Community Consultative Committee (CCC).	A summary of the engagement undertaken with the identified stakeholders is provided in the following sections and a copy of correspondence is provided in Appendix C.

6.1.2 Lithgow City Council

Representatives from Lithgow City Council (LCC) attended a site visit with Centennial Coal to the Springvale Water Treatment Plant at the Mount Piper Power Station on 20 March 2019. As part of this visit, Centennial Coal notified attendees of their intent to modify DA 504-00 to allow for a temporary increase in the total volume of coal that can be transported off-site by truck from the Clarence Colliery. No concerns were raised regarding the proposed modification.

In addition, a letter was sent to LCC on 25 March 2019 providing further information about the proposed modification and the key technical assessments (traffic and road traffic noise). The letter included a figure identifying the existing approved haulage routes that will continue to be utilised as part of the proposed modification. A copy of this correspondence is provided in Appendix C. No feedback on the proposed modification was received.

6.1.3 Blue Mountains City Council

A letter was sent to Blue Mountains City Council (BMCC) on 25 March 2019 introducing the proposed modification and the key technical assessments. The letter included a figure identifying the existing approved haulage routes

that will continue to be utilised as part of the proposed modification. A copy of this correspondence is provided in Appendix C. No feedback on the proposed modification was received.

6.1.4 NSW Roads and Maritime Services

A letter was sent to RMS on 25 March 2019 introducing the proposed modification and the key technical assessments. The letter included a figure identifying the existing approved haulage routes that will continue to be utilised as part of the proposed modification. A copy of this correspondence is provided in Appendix C. No feedback on the proposed modification was received.

6.1.5 Clarence Colliery Community Consultative Committee

The Clarence Colliery CCC comprises representatives from the local community and LCC. It is independently chaired. The CCC meets quarterly and provides a forum for open discussion between Centennial Coal, the community, LCC and other stakeholders on issues directly relating to Clarence Colliery's operation, environmental performance and community relations. The proposed modification was discussed at the CCC meeting on 21 March 2019. Minutes from CCC meetings are available on the Centennial Coal website. No concerns were raised regarding the proposed modification.

6.1.6 Local community

On 25 March 2019, a letter was distributed to residents close to the Wallerawang and Mount Piper private haul roads. The letter advised residents that coal haulage operations on these haul roads will be recommencing in the week commencing 25 March 2019. It was noted that the transport of coal from Clarence Colliery to MPPS via these haul roads will be restricted to day time hours only (ie 7 am–6 pm Monday to Saturday and 8 am¬6 pm Sundays and public holidays).

7 Environmental assessment and management

7.1 Introduction

This section assesses the potential environmental, social and economic impacts from the proposed modification. Consultation with DPE confirmed the technical assessment requirements for this SEE, which included consideration of the following:

- traffic;
- road traffic noise; and
- socio-economics.

Where relevant, technical reports have been prepared and appended (refer to Appendix A and Appendix B). An assessment of the other potential environmental impacts aspects from the proposed modification is provided in Table 7.6.

7.2 Traffic

7.2.1 Introduction

A TIA was prepared by EMM (refer to Appendix A). The assessment:

- identified the surrounding road network potentially affected by the modification;
- identified the existing daily and peak hourly traffic volumes using the rod network, including intersection capacity assessments;
- identified the accident history record and any road safety issues for these roads;
- identified any site parking, pedestrian and cyclist access issues and public transport accessibility requirements for the modification;
- identified additional future daily and peak hourly traffic movements generated by the proposed modification; and
- assessed the future effects of this traffic on traffic capacity and safety of the road network and intersections and any need for mitigation measures to address these impacts.

As noted in Section 1.1, the TIA completed by GHD (2013a) as part of a previous modification to DA 504-00 considered impacts associated with 25 truck movements per day (ie 50 truck movements) travelling along the western haul route (refer to Figure 1.2). This assessment assumed that the average load per truck would be 32 t and that trucks would travel along the western haul route 125 days per year to transport a total of 100,000 t per year.

As part of the proposed modification, the daily truck movements between the intersection of Station Street/Harley Avenue in Mount Victoria and the Wallerawang Power Station Haul Road will remain within the

assessed and approved limits (ie 25 trucks per day or 50 truck movements). The increased tonnage along the western haul route will be achieved through an increase to the number of days per year that truck movements will occur (ie from approximately 125 days per year to 250 days per year).

Impacts from increased vehicle movements on road and intersection capacities have been assessed for during peak hours and on a daily basis.

7.2.2 Existing environment

i Roads

The following roads and their current traffic volumes are described in the TIA:

- Clarence Colliery Road – the main access road connecting to the surface facilities;
- Chifley Road – a 20 km-long two-way two-lane sealed road running from Lithgow to Bell. Chifley Road is currently being improved by RMS to improve existing road conditions;
- Darling Causeway – a 10 km-long road running from Bell to Mount Victoria;
- Harley Avenue – an urban road with one travel lane and an additional parking lane in each direction, located in Mount Victoria connecting Station Street and the Great Western Highway; and
- Great Western Highway – linking Lithgow and the west of Sydney.

ii Intersections

The following intersections are described in the TIA (refer to Figure 1.2):

- site access intersection (Clarence Colliery Road/Chifley Road) – a T-junction;
- Darling Causeway/Chifley Road/Bells Line of Road intersection – a T-junction with two split (auxiliary turning lanes); and
- Station Street/Harley Avenue intersection – a T-junction.

7.2.3 Assessment criteria

A site inspection and intersection traffic surveys were performed in December 2018 and February 2019.

The existing and future performance of the intersections noted above have been analysed using the SIDRA intersection model. The model results were compared to the RMS intersection level of service (LOS) standards. This indicates the operational performance of the intersection based on the average delay per vehicle.

7.2.4 Impact assessment

i Overview

The TIA assessed the morning and afternoon peak hour intersection and daily road traffic flow impacts of the proposed modification.

ii Daily traffic volumes

To achieve the proposed increase in total coal haulage by road, there will need to be an increase to the maximum daily number of trucks required to transport coal from Clarence Colliery on the days when both the eastern and western routes are operating, from 25 trucks per day (ie 50 truck movements) to 40 trucks per day (ie 80 truck movements). On these days, the maximum hourly number of trucks dispatched may increase from about six loads per hour currently to about eight loads per hour, for the duration of the proposed modification.

The differences between existing traffic (as surveyed), existing traffic (typical maximum) and the proposed (typical maximum) daily and peak hourly truck loads generated by Clarence Colliery are provided in Table 7.1.

Table 7.1 Existing and proposed daily truck loads

Timing	Existing (as surveyed)[1]	Existing (typical maximum)	Proposed (typical maximum)
Daily truck loads despatched either to the east or west	12	25	40
Typical morning or afternoon peak period hourly truck loads	2	6	8

Notes: [1] On each of the intersection traffic survey days there were only 12 truckloads dispatched from Clarence Colliery and typically only 2 truckloads per hour during the morning and afternoon peak hours.

As shown in Table 7.1, the proposed modification may result in approximately two additional peak hourly truck loads (ie four additional peak hourly truck movements) at each of the assessed intersections (refer to Figure 1.2) in comparison to existing typical maximum hourly operations.

Existing daily traffic volumes for the local road network have been determined from the morning and afternoon peak hours intersection traffic survey data. A summary of existing daily traffic volumes and predicted maximum additional daily heavy vehicle movements along the western haulage route is provided in Table 7.2.

Table 7.2 Existing and predicted daily traffic volumes

Road	Existing daily traffic as surveyed (all vehicles)	Future additional daily traffic (average–maximum truck movements)	Percentage increase
Clarence Colliery Road (north of Chifley Road)	675	30–56	+4.4–8.3%
Chifley Road (west of site access intersection)	2,355	0	0
Chifley Road (east of site access intersection)	2,090	30–56	+1.4–2.7%
Chifley Road (west of Darling Causeway)	1,950	30–56	+1.5–2.9%
Darling Causeway (south of Chifley Road)	810	30–56	+3.7–6.9%
Station Street (north of Harley Avenue)	1,125	30–56	+2.7–5.0%
Station Street (south of Harley Avenue)	605	0	0

Note: 1. The 2019 existing daily traffic volume is based on 10 x the hourly volumes from the intersection traffic surveys.

As a result of the proposed modification, the daily traffic volume increases at the assessed locations will be generally less than 10% and the existing daily traffic movements and traffic conditions along these routes will be effectively unchanged with a negligible impact on the locality road network.

iii Traffic safety

Road safety was assessed using the most recent five-year reported accident history (2013–2018) for personal injuries (casualty incidents). There is generally good or acceptable intersection visibility at all the assessed intersections along the existing haulage route. A total of 13 personal injury traffic accidents occurred within the assessed area over the 5-year period. This represents a low annual average accident rate of 2.6 accidents per year. The future additional daily truck movements from the proposed modification should have no adverse traffic safety impacts on these roads.

iv Intersection performance

The SIDRA intersection analysis results for the intersections considered as part of the TIA are shown in Table 7.3.

Table 7.3 Summary of existing and predicted intersection operations

Intersection	Peak hour	Existing baseline traffic			With project-related traffic		
		LOS	DOS	DEL	LOS	DOS	DEL
Site access intersection	Morning peak hour (8:00 am–9:00 am)	A	0.055	8.8	A	0.058	8.9
	Afternoon peak hour (3:15 pm–4:15 pm)	A	0.087	8.5	A	0.090	8.5
Chifley Road/Bells Line of Road/Darling Causeway	Morning peak hour (7:45 am–8:45 am)	A	0.043	9.6	A	0.043	9.7
	Afternoon peak hour (3:45 pm–4:45 pm)	A	0.054	9.5	A	0.054	9.6
Station Street/Harley Avenue	Morning peak hour (8:15 am–9:15 am)	A	0.031	5.8	A	0.032	5.8
	Afternoon peak hour (2:30 pm–3:30 pm)	A	0.034	5.9	A	0.036	5.9

Note: LOS – level of service, DOS – degree of saturation, DEL – vehicle delay (seconds).

The site access intersection is currently operating at a very low degree of saturation (0.055–0.087). The proposed modification will result in a small increase to the site access intersection degree of saturation (0.058–0.090). There will be negligible additional traffic delays at the site access intersection from the additional traffic as a result of the proposed modification. The site access intersection will remain at LOS A for all the morning and afternoon peak traffic scenarios. The site access intersection has capacity to grow in terms of future traffic volumes.

The other two assessed intersections will not experience any significant traffic delay or degree of saturation impacts as a result of the proposed modification. Both intersections will remain at LOS A for all the morning and afternoon peak traffic scenarios.

a Car parking

No additional car parking areas at Clarence Colliery's surface facilities are required as part of the proposed modification.

7.2.5 Management and mitigation

Due to the negligible traffic impact associated with the proposed modification, no additional traffic management or mitigation measures for the local and regional road network have been proposed.

7.2.6 Conclusion

The proposed modification will not significantly impact traffic flow or safety of the surrounding road network or existing haulage routes.

The proposed modification will result in generally low proportional traffic increases or additional intersection traffic delays at the three intersections assessed as part of the TIA.

7.3 Road traffic noise

7.3.1 Introduction

A road traffic noise assessment was completed by EMM (refer to Appendix B). This assessed noise impacts associated with the traffic noise level of the proposed modification, with a focus on the assessed haulage route along Chifley Road and the Darling Causeway. The assessment considered the:

- the road traffic noise assessment completed by SLR (2013) as part of the environmental assessment for a previous modification to DA 504-00; and
- the *Road Noise Policy* (RNP) (DECCW 2011).

7.3.2 Existing environment

The previous road traffic noise assessment (SLR 2013) predicted the traffic noise level for Chifley Road to be 52.7 to 60.6 $L_{Aeq, (15\ hour)}$, based upon an annual average daily traffic (AADT) volume of 2,220 vehicles with 4% heavy vehicles. The predicted traffic volume for the Darling Causeway was 65.4 to 66.7 $L_{Aeq, (15\ hour)}$, based up on an AADT volume of 880 vehicles per day with 9% heavy vehicles.

7.3.3 Assessment criteria

The road traffic noise assessment was based on the predicted traffic volumes and the traffic generation resulting from the proposed modification (refer to Section 7.2):

- Chifley Road - daily traffic volume of 1,926 vehicles with 10.7% heavy vehicles; and
- Darling Causeway – daily traffic volume of 784 vehicles with 15.5% heavy vehicles.

The assessment criteria are provided in the RNP. The proposed modification is considered to be 'Project type 3' as the additional traffic has the potential to impact existing residences on existing freeways/arterial/sub-arterial roads.

The assessment criteria (dB(A)) for day and night periods are:

- day (7 am–10 pm): $L_{Aeq, (15\ hour)}$ 60 (external); and
- night (10 pm–7 am): $L_{Aeq, (9\ hour)}$ 55 (external).

The RNP dictates that traffic generation from a site should be addressed as a "build versus no build" situation to ensure that the overall traffic noise impact is acceptably addressed. Therefore, the road traffic noise assessment considered the total maximum number of truck movements from Clarence Colliery, up to 40 trucks (ie 80 truck movements) along the assessed haulage route, rather than just the additional truck movements. This is to ensure that progressive increases in traffic volume from a site do not exceed a no-build traffic noise level by more than 2 dB(A).

7.3.4 Impact assessment

The proposed modification will result in a traffic noise level increase on the no build scenario of 0.9 dB(A) on Chifley Road and 1.7 dB(A) on the Darling Causeway (refer to Table 7.4).

Table 7.4 Comparison of traffic noise generated by proposed additional road haulage

Road segment	Traffic volume (without Clarence Colliery)	Heavy vehicles (%)	Traffic volume with proposed increase	Heavy vehicles (%)	Increase in traffic noise level, dB(A)
Chifley Road (east of Clarence Colliery Access Road)	1,926	10.7%	2,006	14%	0.9
Darling Causeway (south of Bells Line of Road)	784	15.5%	864	23%	1.7

Road traffic noise levels resulting from the proposed modification will not exceed the 2 dB(A) increase criterion and will therefore satisfy the requirements of the RNP.

7.3.5 Management and mitigation

Due to the negligible impacts associated with road traffic noise as a result of the proposed modification, no additional mitigation measures have been proposed.

7.3.6 Conclusion

The total traffic noise generated by the proposed increase to 40 trucks per day along the assessed haulage route will not exceed the RNP's 2 dB(A) criterion for the increase in road traffic noise. This will generally be imperceptible.

Further, the small increase in traffic noise will only occur over a limited period (ie up to 31 December 2020).

7.4 Socio-economics

7.4.1 Overview

An assessment of social impacts has been undertaken utilising DPE's social impact assessment scoping tool and generally in accordance with the *Social Impact Assessment Guideline: For State Significant Mining, Petroleum Production and Extractive Industry Development* (DPE 2017). This meets the social impact assessment requirements detailed in correspondence from DPE (21 March 2019). The potential economic impacts associated with the proposed modification have also been considered.

The assessment of social impacts focused on the following potential impacts associated with the proposed modification:

- road traffic noise;
- traffic and road safety;
- air quality; and

- economic.

As noted in Chapter 6, the proposed modification was presented to the Clarence Colliery CCC on 21 March 2019. No issues regarding the proposed modification were raised at the CCC meeting. A letter was distributed to residents close to the Wallerawang and Mount Piper private haul roads on 25 March 2019, which advised residents that coal haulage operations on these haul roads will be recommencing in the week commencing 25 March 2019.

7.4.2 Assessment criteria

A social impact risk assessment rating was also applied to the potential socio-economic impact of road traffic noise, road safety and air quality utilising the social impact risk assessment matrix displayed in Table 7.5

Table 7.5 Social impact risk assessment matrix

			Consequence level				
			1	2	3	4	5
			Minimal	Minor	Moderate	Major	Catastrophic
Likelihood level	A	Almost certain	A1	A2	A3	A4	A5
	B	Likely	B1	B2	B3	B4	B5
	C	Possible	C1	C2	C3	C4	C5
	D	Unlikely	D1	D2	D3	D4	D5
	E	Rare	E1	E2	E3	E4	E5

Social risk rating

Low | Moderate | High | Extreme

7.4.3 Impact assessment

i Traffic and road safety

As described in Section 7.2.4, it is unlikely that the proposed modification will adversely impact traffic safety on the assessed intersections or haulage route.

The daily traffic volume increases as a result of the proposed modification on the assessed haulage route (refer to Figure 1.2) will be generally less than 10% and the existing daily traffic movements and traffic conditions along the route will be effectively unchanged.

The proposed modification will result in a small increase to the site access intersection DOS. There will be negligible additional traffic delays at the site access intersection as a result of the proposed modification. The other two assessed intersections will not experience any significant traffic delay or DOS impacts as a result of the proposed modification.

Due to the negligible traffic impact associated with the proposed modification, no additional traffic management or mitigation measures for the local and regional road network have been proposed.

The social impact risk assessment rating of road safety was determined to be C2 (moderate).

ii Road traffic noise

As described in Section 7.3.4, the total road traffic noise generated by the proposed modification will not exceed the RNP's 2 dB(A) criterion (refer to Section 7.3.3) for the increase in road traffic noise. This will generally be imperceptible.

The social impact risk assessment rating of road traffic noise was determined to be C1 (low).

iii Air quality

As described in Table 7.6, the proposed modification will result in a small amount of additional greenhouse gas (GHG) emissions resulting from the transport of 100,000 t of coal by truck rather than rail. It is unlikely that the proposed modification will result in additional particulate matter, such as coal dust, emissions as loads are covered.

Air quality and GHG emission impacts will continue to be managed in accordance with Centennial Coal's *Western Region Air Quality and Greenhouse Gas Management Plan* (AQGHGMP) (Centennial Coal 2018b).

The social impact risk assessment rating of air quality was determined to be C1 (low).

iv Economic

The following assessment of economic benefits is based on operating hours, round trip times and payload assumptions.

The proposed modification is likely to have a positive impact on haulage contractors operating out of Clarence Colliery. In total, two contractors will receive sustained employment over the 12-month duration of the proposed modification. The annual income for each contractor is estimated to be $71,950[1], resulting in a total economic benefit of approximately $216,000 (NPV)[2]. This would directly benefit the contractor and their households, who would likely spend their income in the surrounding local and regional economies in which they reside creating further economic activity.

v Other social impacts

This SEE considers the potential biophysical, social and economic impacts of the proposed modification. Existing mitigation and management measures will continue to be implemented to address any additional impacts associated with the proposed modification. Amenity impacts for the disturbance to biodiversity, Aboriginal heritage, historic heritage and visual amenity (refer to Table 7.6) as a result of the proposed modification are considered to be negligible.

7.4.4 Mitigation measures

Due to the low socio-economic impact associated with the proposed modification, no additional management or mitigation measures are proposed.

[1] Job Outlook (2019) reports weekly earnings (2015) for the employment category 'truck drivers' at $1,300 per week (ie $67,600 annually). This was escalated (compound) by the National Wage Price Index (ABS 2019), being 1.9%, 2.1% and 2.3% for 2016, 2017 and 2018 respectively.

[2] At 7% discount rate.

7.4.5 Conclusion

The proposed modification is likely to have a positive social and economic impact in the Lithgow LGA and surrounds.

Increased contractor employment will result in minor economic benefits relating to the additional contractor's household consumption and investment activities in the surrounding local and regional economies in which they reside.

The proposed modification will result in generally low proportional traffic increases or additional intersection traffic delays at the site access intersection, which may impact the amenity of other vehicles utilising the site access intersection. This impact will be temporary and unlikely to have a lasting impact on the amenity of the location.

The proposed modification will also provide indirect social and economic benefits through increased job security for MPPS employees and subsequent benefits to the local and regional economy through income and expenditure and more widely in NSW in assisting to secure the current electricity supply.

7.5 Other potential environmental impacts

An assessment of other potential environmental impacts as a result of the proposed modification is provided in Table 7.6.

Environmental management, including monitoring and reporting requirements, will continue to be managed in accordance with Clarence Colliery's *Environmental Management Strategy* (Centennial Coal 2012).

Table 7.6 Other potential environmental impacts

Environmental aspect	Assessment
Air quality	The proposed modification does not include any demolition or construction of surface facilities at Clarence Colliery, which may require the use of GHG emission generating equipment. The proposed modification does not include an increase to currently approved extraction limits at Clarence Colliery of 3 Mtpa. Air quality impacts will continue to be managed in accordance with Centennial Coal's AQGHGMP (Centennial Coal 2018b). This provides air quality criteria consistent with the *National Environment Protection (Ambient Air Quality) Measure* (NEPM) (DoE 2016) and *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW* (EPA 2005). Management measures relevant to the generation of dust and exhaust emissions are provided in Section 3.1.1 of the AQGHGMP (Centennial Coal 2018b).
GHG	There will be a small amount of additional incremental GHG emissions resulting from the transporting of 100,000 t of coal by truck rather than rail. However, the increase in GHG emissions resulting from the modification will not measurably increase the total Australian emissions. The proposed modification does not include any demolition or construction of surface facilities at Clarence Colliery, which may require the use of GHG emission generating equipment. The proposed modification does not include an increase to currently approved extraction limits at Clarence Colliery of 3 Mtpa. GHG emission impacts will continue to be managed in accordance with Centennial Coal's AQGHGMP (Centennial Coal 2018b). As noted in the AQGHGMP, the Centennial Coal has set its "Vision 2020" as part of Centennial Coal's Sustainability Strategy, the platform to tangibly deliver the Company Vision and Values. A Vision 2020 target is to reduce company GHG emissions by 25% by 2020. An action plan and roadmap are in place to deliver this goal.

Table 7.6 Other potential environmental impacts

Environmental aspect	Assessment
	Management measures relevant to the generation of GHG emissions are provided in Section 3.1.2 of the AQGHGMP (Centennial Coal 2018b).
Biodiversity	The proposed modification does not include any vegetation clearance. Protected plants and animals or matters listed under the BC Act will not be impacted as a result of the proposed modification. A biodiversity development assessment report or biodiversity integrity report are not required. Due to the negligible impacts associated with the proposed modification, no mitigation measures have been proposed.
Aboriginal heritage	The proposed modification does not include any ground surface disturbance and heavy vehicles will continue to use existing haulage routes. Aboriginal heritage at Clarence Colliery will continue to be managed in accordance with Centennial Coal's *Western Region Aboriginal Cultural Heritage Management Plan* (Centennial Coal 2017), which provides a consistent approach to consultation between Centennial Coal and local Aboriginal communities regarding Aboriginal cultural heritage matters. It also provides consistent minimum standards and processes for Aboriginal cultural heritage identification, monitoring and management.
Historic heritage	The proposed modification does not include any ground surface disturbance and heavy vehicles will continue to use existing haulage routes. Historic heritage at Clarence Colliery will continue to be managed in accordance with Centennial Coal's *Western Region Historic Heritage Management Plan* (Centennial Coal 2018c), which provides a consistent approach to the identification, recording and management of historic heritage protected under the NSW *Heritage Act 1977*.
Surface water	The proposed modification does not include any ground surface disturbance and heavy vehicles will continue to use existing haulage routes. Unsealed roads at Clarence Colliery are heavily compacted and have a low susceptibility to erosion. Surface water will continue to be managed in accordance with Clarence Colliery's *Water Management Plan* (WMP) (Centennial Coal 2015a). This provides background on existing water management issues, identifies potential impacts from existing and future operations, develops assessment criteria for identification of exceedances and provides protocol for when exceedances occur.
Groundwater	The proposed modification does not include any change to existing underground mining operations or groundwater extraction rates at Clarence Colliery. Groundwater at Clarence Colliery will continue to be managed in accordance with Clarence Colliery's WMP (2015).
Soils	The proposed modification does not include any ground surface disturbance or vegetation clearance and heavy vehicles will continue to use existing haulage routes. Unsealed roads at Clarence Colliery are heavily compacted and have a low susceptibility to erosion. Soils at Clarence Colliery will continue to be managed in accordance with Clarence Colliery's *Erosion and Sediment Control Plan* (Centennial Coal 2015b), which identifies activities that may cause soil erosion and generate sediment. It describes measures implemented to minimise soil erosion and sedimentation into downstream waters, including the location, function and capacity of sediment control structures.
Waste	The proposed modification will not increase waste production at Clarence Colliery. Waste will continue to be managed in accordance with the existing *Environmental Management Strategy* (Centennial Coal 2012).
Visual and lighting	The proposed modification does not include any change to surface facilities, including the implementation of additional lighting sources. Due to the negligible visual and lighting impact associated with the proposed modification, no additional mitigation measures have been proposed.
Hazards	The proposed modification does not include any surface disturbance. Heavy vehicles will continue to use unsealed roads at Clarence Colliery and existing haulage routes. No additional mitigation measures have been proposed. Refer to Section 7.2.4 regrading road safety.

8 Conclusion

A description of the need and justification for the proposed modification is provided below with regard to biophysical, social and economic factors; the principles of ecologically sustainable development (ESD); and the consistency of the proposed modification with the objects of the EP&A Act.

8.1 Modification impacts

This SEE and supporting technical assessments examine the potential impacts that may result from the proposed modification. The assessment of environmental issues has been multi-disciplinary and involved consultation with DPE and other key stakeholders (including LCC, BMCC, RMS and the CCC).

The proposed modification does not require an increase to currently approved extraction limits at Clarence Colliery (currently 3 Mtpa) or any significant changes to currently approved operations at Clarence Colliery's surface facilities or MPPS.

The proposed modification will not significantly impact traffic flow or safety of the surrounding road network (including existing haulage routes) and will only operate for a limited period of time up to 31 December 2020.

8.2 Modification benefits

The proposed modification is in the public interest as it will help to maintain current operations at MPPS and, with the exception of additional truck movements, it can be carried out without any additional plant, equipment or supporting infrastructure.

The proposed modification will also enable continued efficient operations at MPPS. The supplementary supply of coal to MPPS will provide indirect social and economic benefits through increased job security for MPPS employees and subsequent benefits to the local and regional economy through income and expenditure and more widely in NSW in assisting to secure the current electricity supply. In addition, increased contractor employment will result in minor economic benefits relating to the additional contractor's household consumption and investment activities in the surrounding local and regional economies in which they reside.

The proposed modification is a minor alteration to an approved coal mine operation which represents an orderly and economic use of a resource approved for extraction for use in domestic power generation.

All aspects relating to environmental management will continue in accordance with DA 504-00, EPL 726, the approved management plans and the other elements of the development consent.

8.3 Ecologically sustainable development

Under Section 516A of the EPBC Act, Commonwealth organisations have a statutory requirement to report on their environmental performance and how they accord with, and advance, the principles of ESD.

Australia's *National Strategy for Ecologically Sustainable Development* (AGESDSC 1992), which was prepared by the ESD Steering Committee, defines ESD as "using, conserving and enhancing the community's resources so that ecological processes, on which life depends, are maintained, and the total quality of life, now and in the future, can be increased".

The principles of ESD, for the purposes of the EP&A Act, are provided in Clause 7(4) of Schedule 2 of the EP&A Regulation. The four principles of ESD are:

- precautionary principle – the precautionary principle states that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation;

- inter-generational equity – the principle of inter-generational equity is that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations;

- conservation of biological diversity and maintenance of ecological integrity – the conservation of biological diversity and ecological integrity should be a fundamental consideration in decision-making; and

- improved valuation and pricing of environmental resources – improved valuation, pricing and incentive mechanisms should be promoted.

The overall objectives of ESD are to use, conserve and enhance natural resources. This ensures that ecological processes are maintained facilitating improved quality of life, now and into the future. Centennial Coal is committed to the principles of ESD and understands that biophysical, social and economic objectives are interdependent. Centennial Coal acknowledges that a well-designed and effectively managed operation will avoid significant and/or costly environmental impacts or degradation.

The proposed modification has been designed to reduce impacts to a level which is as low as is reasonably practicable. The additional truck movements will utilise existing haulage routes and no additional management measures are required to mitigate residual impacts.

Consideration has been given to appropriately identifying, avoiding, mitigating and managing environmental risks. This demonstrates environmental due diligence and will provide for ongoing and adaptive monitoring and management of the operation in line with the principles of ESD outlined in the following sections.

8.3.1 Precautionary principle

The SEE has enabled an understanding of the potential impacts of the proposed modification on biophysical, social and economic factors. No additional safeguards are warranted to monitor, mitigate and/or manage the potential impacts.

8.3.2 Inter-generational equity

Centennial Coal undertakes ongoing environmental monitoring with mitigation measures to provide effective environmental management across its existing operations. This management is provided through planning, communication, documentation, review and feedback. These environmental management measures ensure that the health, diversity and productivity of the environment is maintained or enhanced for future generations. The proposed modification is temporary and will not impact future generations.

8.3.3 Conservation of biological diversity and maintenance of ecological integrity

The potential environmental impacts of the proposed modification are detailed in this SEE. The proposed modification is unlikely to cause any impacts to threatened species or Endangered Ecological Communities.

8.3.4 Improved valuation and pricing of environmental resources

Centennial Coal will optimise the valuation and pricing of the coal resource within the holding boundary at Clarence Colliery by continuing to efficiently extract coal resources utilising existing approved infrastructure.

With the exception of additional truck movements, no additional plant, equipment or supporting infrastructure is required to support the transport of coal from Clarence Colliery to MPPS by road.

If Centennial Coal does not provide an alternative source of coal of suitable quality to MPPS to supplement the decline in supply from Springvale Mine, on-site stockpiles at MPPS will continue to decline. The proposed modification will support the ongoing, efficient operation of MPPS and the supply of electricity to NSW.

8.4 Conclusion

The proposed modification has been designed to avoid and minimise adverse biophysical, social and economic impacts, where possible.

The residual impacts have been identified and assessed. The proposed modification is anticipated to result in minimal environmental impacts beyond those previously assessed and approved under DA 504-00.

The proposed modification will support the ongoing, efficient operation of MPPS thereby providing a number of benefits to the local community, region and NSW.

The proposed modification is consistent with the relevant objects of the EP&A Act, including the principles of ESD, and will not change the nature of the development originally approved.

All aspects relating to environmental management will continue in accordance with DA 504-00, the relevant EPL, the various approved plans and other elements of the development consent.

References

AGESDSC 1992, *National Strategy for Ecologically Sustainable Development*. Australian Government Ecologically Sustainable Development Steering Committee.

Centennial Coal 2018a, *Western Region Noise Management Plan.*

Centennial Coal 2018b, *Western Region Air Quality and Greenhouse Gas Management Plan.*

Centennial Coal 2018c, *Western Region Historic Heritage Management Plan.*

Centennial Coal 2017, *Western Region Aboriginal Cultural Heritage Management Plan.*

Centennial Coal 2015a, *Clarence Water Management Plan.*

Centennial Coal 2015b, *Erosion and Sediment Control Plan*.

Centennial Coal 2012, *Clarence Colliery Environmental Management Strategy.*

DPE 2017, *Social Impact Assessment Guideline: For State Significant Mining, Petroleum Production and Extractive Industry Development*, NSW Department of Planning and Environment.

EPA 2005, *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales*. Environmental Protection Authority.

GHD 2013a, *Environmental Assessment for Reject Emplacement Area VI*, prepared for Centennial Coal by GHD Pty Ltd.

GHD 2013b, *Clarence Colliery Road Haulage Section 75W Modification Traffic Impact Assessment*, prepared for Centennial Coal by GHD Pty Ltd.

DECCW 2011, *Road Noise Policy*, NSW Government Department of Environment, Climate Change and Water.

DoE 2016, *National Environment Protection (Ambient Air Quality) Measure*, the Commonwealth Department of the Environment.

Job Outlook 2019, Employment category - 'truck drivers', retrieved 2 April 2019, https://joboutlook.gov.au.

SLR 2013, *Road Traffic Noise Impact Assessment*, prepared for Centennial Coal by SLR Consulting Australia Pty Ltd.

Abbreviations

AADT	annual average daily traffic
AQGHGMP	*Air Quality and Greenhouse Gas Management Plan*
BC Act	NSW *Biodiversity Conservation Act 2016*
BMCC	Blue Mountains City Council
BOM	Bureau of Meteorology
CCC	Clarence Colliery Community Consultative Committee
Centennial Coal	Centennial Coal Company Limited
COL	consolidated coal lease
DEL	vehicle delay (seconds)
DoE	NSW Department of the Environment and Energy
DoEE	Commonwealth Department of the Environment and Energy
DOS	degree of saturation
DPE	NSW Department of Planning and Environment
EMM	EMM Consulting Pty Limited
EP&A Act	NSW *Environmental Planning and Assessment Act 1979*
EP&A Regulation	NSW Environmental Planning and Assessment Regulation 2000
EPBC Act	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*
EPA	NSW Environment Protection Authority
EPL	environment protection licence
ESD	ecologically sustainable development
FTE	full-time equivalent
GHG	greenhouse gas
km	kilometres
kt	kilotonnes
LGA	local government area
LCC	Lithgow City Council
Lithgow LEP	Lithgow Local Environmental Plan 2014
LOS	level of service
m	metres

Mining SEPP	State Environmental Planning Policy (Mining, Petroleum and Extractive Industries) 2007
ML	mining lease
MNES	matters of national environmental significance
MPPS	Mount Piper Power Station
Mtpa	million tonnes per annum
MW	megawatts
NEPM	National Environmental Protection (Ambient Air Quality) Measure
NSW	New South Wales
POEO Act	NSW *Protection of the Environment Operations Act 1997*
RMS	NSW Roads and Maritime Services
RNP	Road Noise Policy
ROM	run-of-mine
RTS	response to submission
SEE	statement of environmental effects
SEPP 33	State Environmental Planning Policy No 33 – Hazardous and Offensive Development
Springvale Coal	Springvale Coal Pty Limited
SSD	state significant development
t	tonnes
TIA	traffic impact assessment
WMP	*Water Management Plan*

Appendix A

Traffic impact assessment




Clarence Colliery

Modification to DA 504-00 Traffic impact assessment

Prepared for Centennial Coal Company Limited
April 2019







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Clarence Colliery

Modification to DA 504-00 Traffic impact assessment

Report Number

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Client

Centennial Coal Company Limited

Date

4 April 2019

Version

v1 Final

Prepared by



Tim Brooker
Associate Transport Planner
4 April 2019

Approved by



Phil Towler
Associate Director
4 April 2019

This report has been prepared in accordance with the brief provided by the client and has relied upon the information collected at the time and under the conditions specified in the report. All findings, conclusions or recommendations contained in the report are based on the aforementioned circumstances. The report is for the use of the client and no responsibility will be taken for its use by other parties. The client may, at its discretion, use the report to inform regulators and the public.

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1 Introduction

1.1 Background

Clarence Colliery is an underground coal mining operation within the Western Coalfield of NSW, approximately 10 kilometres (km) east of Lithgow in the Lithgow local government area (LGA). The regional road network connecting Clarence Colliery with Lithgow and other townships is shown in Figure 1.1 and Figure 1.2.

Clarence Colliery has been in operation since the 1980s and is currently owned by Centennial Coal Company Limited and SK Networks Resources Australia Pty Ltd as participants in the Clarence Colliery joint venture. Centennial Coal Company Limited (Centennial Coal) has been appointed as the management entity for the Clarence Colliery joint venture.

Clarence Colliery is bordered by the Blue Mountains National Park to the east and the Newnes State Forest to the north and the west. The residential area of Newnes Junction is approximately 900 metres (m) to the south-east and Clarence village is approximately 1.5 km to the south-west.

The Clarence Colliery pit top area is on Crown and free-hold land to the north of Chifley Road (a continuation of the Bells Line of Road) and the Main Western Rail Line. The pit top area is accessed from Chifley Road via Clarence Colliery Road. A spur rail line connects the pit top area to the Main Western Rail Line.

Clarence Colliery's maximum approved production rate is 3 million tonnes per annum (Mtpa) of run-of-mine (ROM) coal. The majority of product coal (including ROM and beneficiated coal) is transported from Clarence Colliery by rail along the Main Western Rail Line to Port Kembla or Newcastle. Coal transport by rail takes place 24 hours per day, seven days per week.

A small proportion of product coal is transported by road and is limited to a maximum of 200,000 tonnes (t) per year. Up to 100,000 t per year can be sent to the west and the remainder, up to 200,000 t per year, can be sent to the east. All coal is initially transported to the east from the Colliery as far as Bell and then any coal which is transported to the west travels via Mount Victoria towards Lithgow.

The existing haulage route to the east (refer Figure 1.2) consists of:

- trucks turn left from Clarence Colliery Road onto Chifley Road; and
- trucks continue east to where Chifley Road intersects with Darling Causeway – from the intersection of Chifley Road and Darling Causeway, there are two options:
    - the majority of trucks turn right onto Darling Causeway and travel south towards Mount Victoria until turning left from Station Street onto Harley Avenue and left again onto the Great Western Highway (for delivery of coal to eastern NSW); or
    - a small proportion of trucks continue to destinations north of Sydney via Bells Line of Road.

The existing haulage route to the west (refer Figure 1.2) consists of:

- trucks turn left from Clarence Colliery Road onto Chifley Road;
- trucks continue east to where Chifley Road intersects with Darling Causeway; and
- trucks turn right onto Darling Causeway and travel south towards Mount Victoria until turning right from Station Street onto the Great Western Highway towards Lithgow.

Trucks currently deliver coal from Clarence Colliery to the Kerosene Vale Stockpile Site near Lidsdale or directly to Mount Piper Power Station (MPPS) (refer Figure 1.2). Trucks travel along the Castlereagh Highway before turning left onto the Wallerawang Power Station Haul Road and left onto the MPPS Haul Road, both of which are private haul roads with regular heavy vehicle movements associated with product coal haulage (refer Figure 1.2).

As per Condition 7B Schedule 2 of DA 504-00, trucking of coal to the west occurs only between 7:00 am and 10:00 pm Monday to Saturday and between 8:00 am and 10:00 pm on Sundays and public holidays. There are no time limits in place to limit trucking of coal to the east.

1.2 Proposed modification

Centennial Coal is seeking to modify DA 504-00 pursuant to Section 4.55(2) of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) to:

- increase total allowable coal haulage off-site by road from 200,000 t to 300,000 t, on an annual basis, for a limited period of time up to 31 December 2020; and

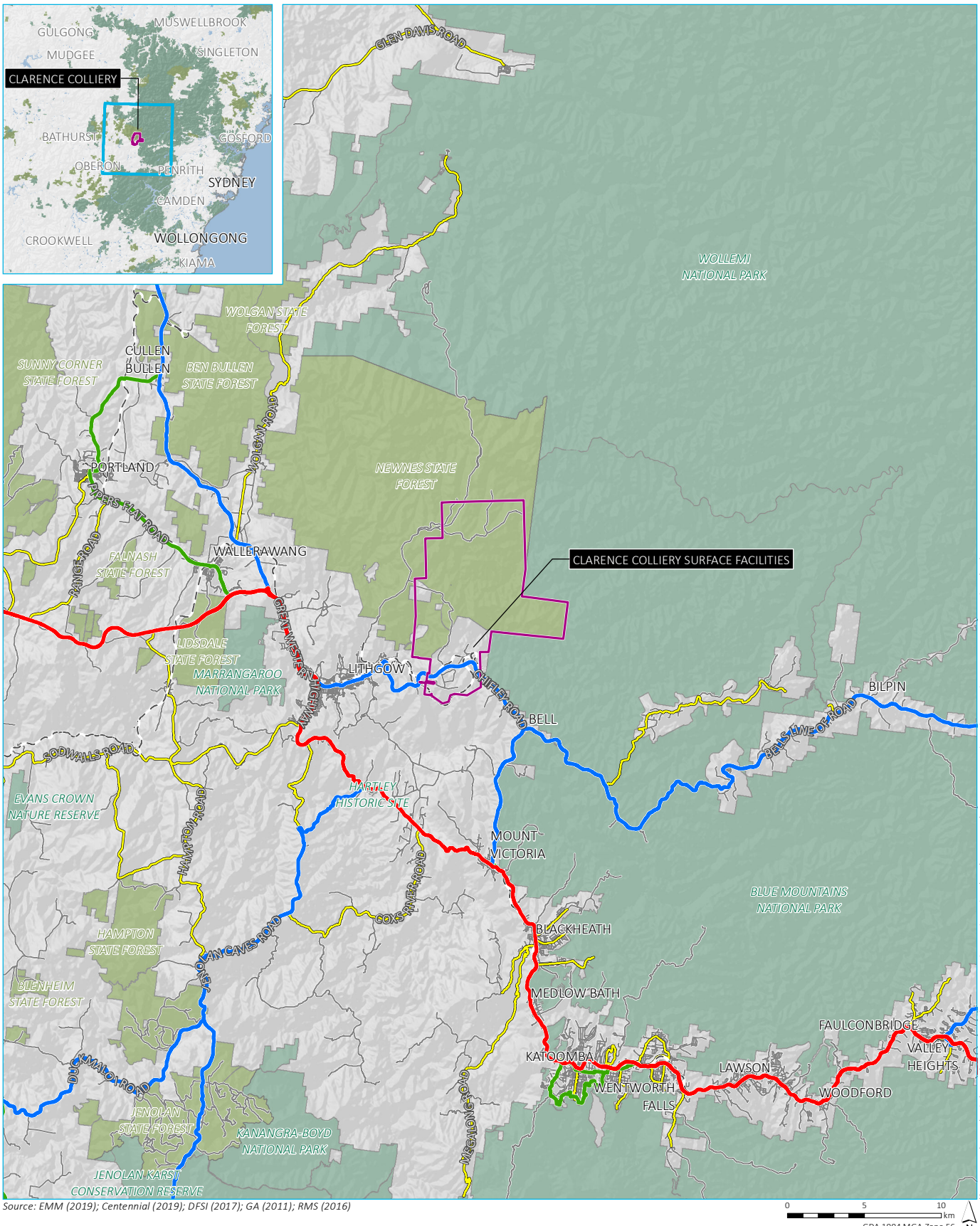
- increase total allowable coal haulage off-site to the west by road from 100,000 t to 200,000 t, on an annual basis, for a limited period of time up to 31 December 2020.

The proposed increase in total coal haulage by road will increase the total number of trucks which transport coal from Clarence Colliery from 25 trucks per day (ie 50 truck movements) to 40 trucks per day (ie 80 truck movements).

As part of the proposed modification, truck movements between the intersection of Station Street and Harley Avenue, in Mount Victoria, and the Wallerawang Power Station Haul Road (ie haulage to the west) will remain within assessed and approved limits (ie 25 trucks per day or 50 truck movements). Haulage of 100,000 t per year can be achieved well within these limits with haulage required to occur on only about 125 days per year.

The increased tonnage along the western haul route will be achieved through an increase to the number of days per year that truck movements will occur (ie from approximately 125 days per year to 250 days per year).

Therefore, the increase in daily truck movements that requires assessment is limited to the existing haulage route between Clarence Colliery and the intersection of Station Street and Harley Avenue via Darling Causeway (refer Figure 1.2).



Source: EMM (2019); Centennial (2019); DFSI (2017); GA (2011); RMS (2016)

0 5 10 km

GDA 1994 MGA Zone 56

N

\\Emmsvr1\emm\Jobs\2019\J190135 - Clarence Mod - Road Haulage\GIS\02_Maps\T001_RegionalRoadNetwork_20190322_02.mxd 22/03/2019

Regional road network

KEY

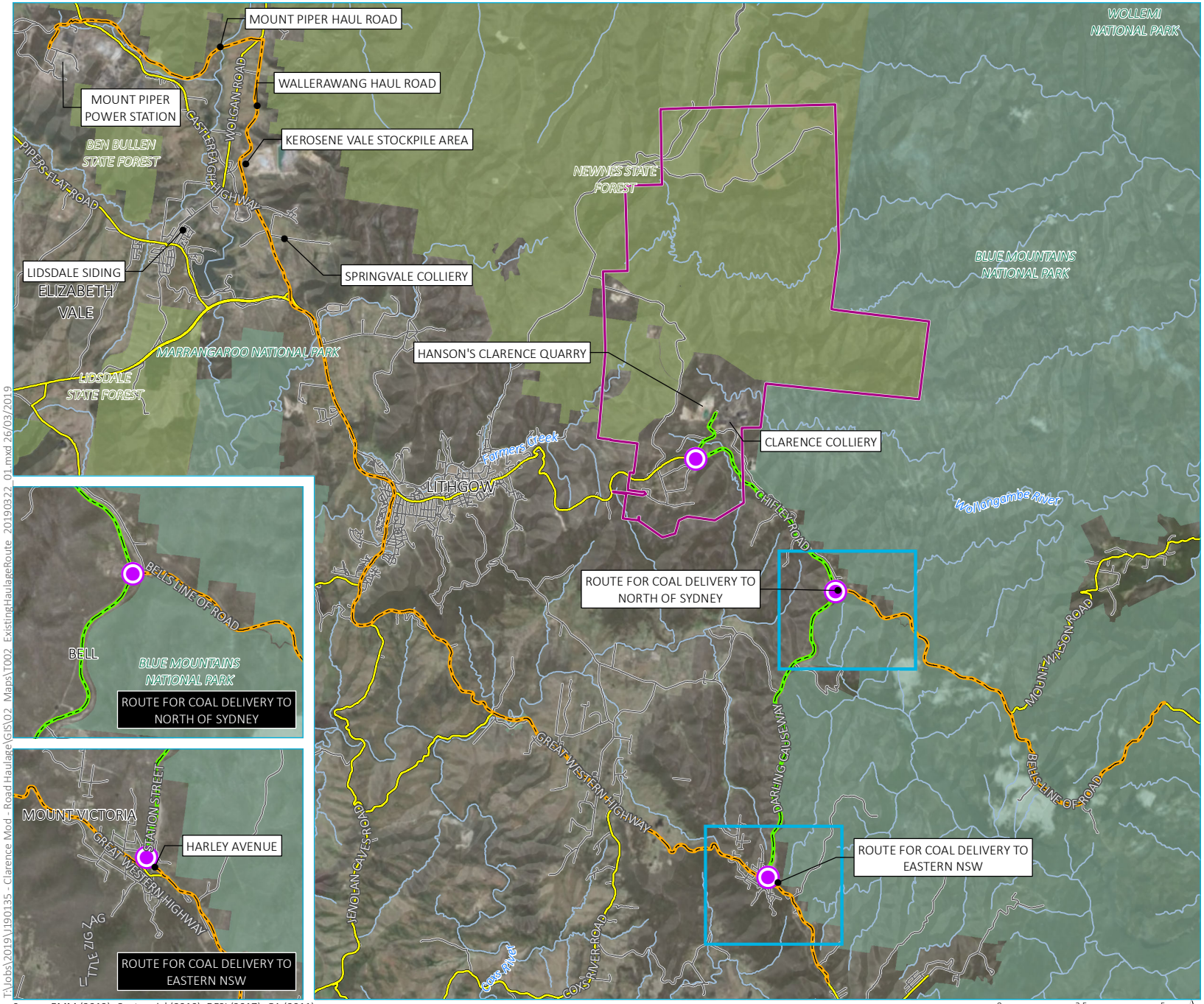
- Clarence Colliery holding boundary
- Rail line
- Major local road
- Local road
- NPWS reserve
- State forest

RMS classified road

- Auslink
- State
- Regional

Clarence Colliery
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Figure 1.1

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KEY

- Clarence Colliery holding boundary
- Haulage route
- Assessed haulage route
- Assessed intersection
- Main road
- LocalRoad
- Watercourse
- NPWS reserve
- State forest

Existing haulage routes and assessed intersections

Clarence Colliery
Traffic impact assessment
Figure 1.2

Source: EMM (2019); Centennial (2019); DFSI (2017); GA (2011)

0 2.5 5 km
GDA 1994 MGA Zone 56

N

T:\Jobs\2019\J190135 - Clarence Mod - Road Haulage\GIS\02 Maps\T002 ExistingHaulageRoute 20190322 01.mxd 26/03/2019

EMM creating opportunities

1.3 Assessment guidelines and the scope of this assessment

This TIA has been prepared generally in accordance with the requirements of the NSW Roads and Traffic Authority (RTA) (now NSW Roads and Maritime Services (RMS)) (RTA 2002) *Guide to Traffic Generating Developments.* The assessed haulage route which is the subject of this TIA is shown inFigure 1.2.

This TIA assessment includes:

- identification of the site and the locality road network affected by the project;
- identification of the existing daily and peak hourly traffic volumes using these routes, including intersection capacity assessments;
- identification of the accident history record and any road safety issues for these roads;
- identification of any site car parking, pedestrian and cyclist access issues and public transport accessibility requirements for the project (not applicable in this instance);
- identification of additional future daily and peak hourly traffic movements generated by the project; and
- assessment of the future effects of this traffic on traffic capacity and safety for the road network and intersections and any consequent need for mitigation measures to address these impacts.

The TIA previously prepared by GHD (2013) as part of the environmental assessment for an earlier modification to DA 504-00 considered impacts associated with 25 trucks per day (ie 50 truck movements) travelling along the western haul route (refer Figure 1.2). This assessment assumed that the average load per truck would be 32 t and that trucks would travel along the western haul route 125 days per year to transport a total of 100,000 t per year.

As part of the proposed modification, the daily truck movements between the intersection of Station Street and Harley Avenue, in Mount Victoria, and the Wallerawang Power Station Haul Road (ie haulage to the west) will remain within the assessed and approved limits (ie 25 trucks per day or 50 truck movements). The increased tonnage along the western haul route will be achieved through an increase to the number of days per year that truck movements will occur (ie from approximately 125 days per year to 250 days per year).

In this assessment, traffic impacts are assessed on the basis of the effect of increased road movements on the road and intersection capacities during peak hours and on a daily basis. The proposed modification will not change the GHD (2013) findings regarding the sections of the western haul route, between Mount Victoria and Wallerawang.

A site inspection was performed on 15 January 2019. This included photographing the Clarence Colliery Road access intersection on Chifley Road (herein referred to as the 'site access intersection'), and the approved haulage route between Clarence Colliery and Bell. A selection of these photographs, together with additional photographs from Google Street View along sections of the approved haulage route between Bell and Mount Victoria are provided in Appendix A.

Morning and afternoon peak-period intersection traffic surveys were undertaken at the Clarence Colliery Road/Chifley Road intersection on Wednesday 12 December 2018 and at two other intersections at Bell and Mount Victoria on Wednesday 27 February 2019.

2 Existing traffic

2.1 Road network

As noted in Section 1.1, coal is transported from Clarence Colliery to off-site locations by either rail or road.

The road network in the immediate locality of Clarence Colliery is shown in Figure 1.2. Photographs showing the typical road width and condition at various locations on the existing local road network, including Chifley Road, Clarence Colliery Road and Darling Causeway are shown in Appendix A.

Intersection traffic surveys were undertaken at three intersections for the morning and afternoon traffic peak periods:

- the site access intersection;
- the intersection between Chifley Road, Bells Line of Road and Darling Causeway at Bell; and
- the intersection of Station Street with Harley Avenue at Mount Victoria.

The morning peak period surveys was were undertaken from 6:30 am to 9:00 am and the afternoon peak period surveys were undertaken from 2:30 pm to 6:00 pm.

The surveys measured the existing peak hourly traffic movements and were used to estimate the current daily traffic volumes for key sections of the assessed haulage route. The morning and afternoon peak hours were different at each intersection.

The traffic survey results are attached in Appendix B.

2.1.1 Clarence Colliery Road

Clarence Colliery Road is the main access road connecting to the main car park and gates of Clarence Colliery's pit top area. Clarence Colliery Road intersects Chifley Road approximately 10 km east of Lithgow. Clarence Colliery Road is a two-lane two-way sealed road with narrow shoulder widths. It connects with two other unsealed roads that provide access to Hanson's Clarence Quarry (approximately 350 m west of Clarence Colliery) and neighbouring residences via Sandham Road (refer Figure 1.2). The road has a sign-posted speed limit of 50 km/hr and the sealed road width is approximately 6.8–7.5 m.

2.1.2 Chifley Road

Chifley Road south of Clarence Colliery Road extends west to Lithgow and south-east to Bell. Most sections of Chifley Road are two-way two-lane sealed roads and some parts have additional lanes or increased shoulder widths to improve road safety. The general two-way two-lane road width between Clarence Colliery Road and Bell is approximately 7.2–7.6 m. Chifley Road is approximately 20-km long from Lithgow in the west to Bell in the east. Chifley Road is an RMS-approved 19 m B-double route.

The road carriageway width and road surface of Chifley Road are currently being improved by RMS. These road improvements will further improve existing road conditions and are expected to mitigate the very minor potential road capacity and intersection traffic delay impacts from the proposed modification.

2.1.3 Darling Causeway (Station Street)

The Darling Causeway route is approximately 10-km long from Bell to Mount Victoria. The road has been constructed to a generally similar sealed width as Chifley Road and the Bells Line of Road route east of Bell and is generally between 7–8 m wide. Darling Causeway has wide gravel shoulders along most sections. The road alignment also generally runs parallel to the railway line between Mount Victoria and Bell and consequently avoids having many steep gradients, although the road alignment is not always as level as the parallel rail route. The sign-posted speed limit is generally 80 km/hr on the rural sections. Within the urban area of Mount Victoria, the road (Station Street) has a 60 km/hr speed limit and increased road width and kerb and guttering in the areas where kerbside parking occurs.

2.1.4 Harley Avenue

Harley Avenue is an urban road, wholly within the township of Mount Victoria. It connects Station Street and the Great Western Highway, east of Mount Victoria. The road generally has one travel lane and an additional parking lane in each direction. There is a primary school on the southern side of Harley Avenue, so the route is subject to a 40 km/hr speed limit during the relevant times on weekdays during school terms.

As noted in Section 1.2, the increase in daily truck movements requiring assessment is limited to the existing haulage route between Clarence Colliery and the intersection of Station Street and Harley Avenue via Darling Causeway.

2.1.5 Great Western Highway

The Great Western Highway either to the east or the west of Mount Victoria, is a high standard arterial road, which either has multiple traffic lanes in each direction, or where there is only a single traffic lane in each direction, the road has wide sealed shoulders.

As noted in Section 1.2, with the exception of a small proportion of trucks that continue to destinations in the north-west of Sydney via Bells Line of Road, the existing haulage route to both the east and west includes heavy vehicle movements along the Great Western Highway (for delivery of coal to eastern NSW and west to MPPS beyond Lithgow).

The future maximum daily heavy vehicle volumes for the coal which is transported by road via the Great Western Highway, either to the east or the west of Mount Victoria, will not increase.

2.2 Daily traffic volumes

2.2.1 Road network

The daily traffic volume data from RMS's Daily Traffic Volume Viewer is only available for Chifley Road for 2006, 2008 and 2009. More recent daily traffic volumes for Chifley Road and the other routes in this assessment have been estimated based on the intersection traffic count data provided in Appendix B and are summarised in Table 2.1.

Table 2.1 Estimation of daily traffic volumes from peak hourly intersection counts

Location	Morning peak hourly volume (two-way)	Afternoon peak hourly volume (two-way)	Estimated daily traffic volume (two-way total)
Clarence Colliery Road (north of Chifley Road)	61	74	675
Chifley Road (west of site access intersection)	206	265	2,355
Chifley Road (east of site access intersection)	183	235	2,090
Chifley Road (west of Darling Causeway)	170	220	1,950
Darling Causeway (south of Chifley Road)	80	82	810
Station Street (north of Harley Avenue)	111	114	1,125
Station Street (south of Harley Avenue)	41	80	605

Note: Daily traffic volumes are estimated as 10 x the average morning and afternoon peak hourly volumes.

2.2.2 Clarence Colliery Road

The peak hour and daily traffic volumes currently using Clarence Colliery Road, shown in Table 2.2, are a combination of the colliery workforce light vehicle movements, colliery coal-truck movements for and truck movements from Hanson's Clarence Quarry, which also uses the road for its normal operations.

The colliery is currently approved to truck up to 200,000 t per year to domestic markets using the public road network. Up to 100,000 t per year can be sent to the west with the remainder, up to 200,000 t per year, sent to the east. Trucking of coal to the west occurs only between 7 am to 10 pm Monday to Saturday and between 8 am to 10 pm on Sunday and public holidays. The current approval authorises up to 25 one-way truck trips from Clarence Colliery per day (ie 50 daily truck movements in total).

During the two days of the intersection traffic surveys in December 2018 and February 2019, the total daily number of coal loads transported on each day was 12 trucks (ie 24 daily truck movements in total), all travelling to and from the east via Mount Victoria. The current daily traffic volumes using Clarence Colliery Road which are shown in Table 2.2 include approximately 170 additional daily truck movements (ie 85 arriving and 85 leaving) travelling to and from Hanson's Clarence Quarry.

Table 2.2 Current peak hourly car and heavy vehicle traffic movements using Clarence Colliery Road

Road	Light vehicle movements	Heavy vehicle movements	Total vehicle movements
Morning peak hour	43	18	61
Afternoon peak hour	53	21	74
Equivalent daily total	480[1]	195[1]	675[1]

Note: 1. The daily light and heavy vehicle movements were calculated based on 10 x the surveyed peak hourly volumes.

2.3 Road improvement projects

RMS is currently upgrading sections of Chifley Road as part of a $95 million investment program for upgrades on the Great Western Highway and Bells Line of Road through the Greater Blue Mountains area. Several sections of

Chifley Road are currently affected by roadworks where lower speed limits of 60 km/h or 40 km/h are imposed. The most relevant upgrade to this assessment is on Chifley Road east of the site access intersection and includes:

- replacing and removing the existing road bridge across the Main Western Rail Line;
- widening and realigning the approaches to the proposed new bridge on Chifley Road; and
- upgrading the intersection of Chifley Road and the road into the Clarence Colliery (ie at the site access intersection).

Work on the approaches to the new bridge started on Monday 29 October 2018 and continues on weekdays between 7:00 am and 6:00 pm and Saturdays between 8:00 am and 1:00 pm, weather permitting. Work is expected to be completed in 2020. For the safety of workers and motorists, changed traffic conditions are in place, including single lane closures and reduced speed limits of 40 km/h and 60 km/h.

The replacement of the existing road over rail bridge across the Main Western Rail Line will improve the site access intersection through the inclusion of an eastbound acceleration lane from the site access intersection. These arrangements will improve the existing road capacity and operations for heavy vehicle movements from Clarence Colliery and Hanson's Clarence Quarry.

The contractor for the construction of the new bridge is expected to be announced in March 2019 with bridge replacement works starting in mid-2019.

2.4 Intersections

The primary intersections potentially affected by additional project-related traffic movements are the site access intersection and two intersections along the combined haulage route at Bell and Mount Victoria. These intersections are identified on Figure 1.2 and detailed aerial images of the road layout and the number of turning lanes at each intersection are shown in Figure 2.1, Figure 2.2 and Figure 2.3, respectively.

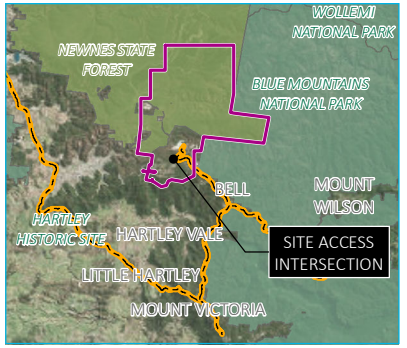
The current RMS intersection level of service (LOS) standards for traffic analysis which is undertaken using SIDRA or similar traffic analysis programs for intersections is summarised in Table 2.3.

Table 2.3 Intersection level of service (LOS) standards

Level of service	Average delay (seconds per vehicle)	Traffic signals, roundabout	Priority intersection ('Stop' and 'Give Way')
A	<14	Good operation	Good operation
B	15–28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	29–42	Satisfactory	Satisfactory, but accident study required
D	43–56	Operating near capacity	Near capacity and accident study required
E	57–70	At capacity. At traffic signals, incidents will cause extensive delays. Roundabouts require other control mode.	At capacity; required other control mode
F	>71	Unsatisfactory with excessive queuing	Unsatisfactory with excessive queuing; requires other control mode

Source: *Guide to Traffic Generating Developments* (RTA 2002).





KEY

- Clarence Colliery holding boundary (inset)
- Haulage route
- Assessed intersection

Site access intersection

Source: EMM (2019); DFSI (2017); GA (2011)

0 50 100 m

GDA 1994 MGA Zone 56

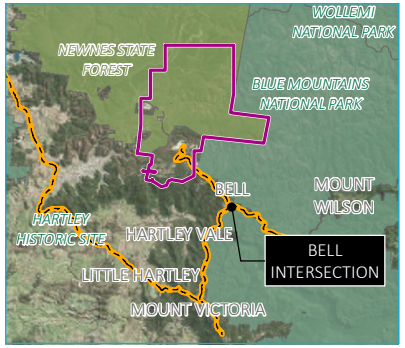
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Clarence Colliery
Traffic impact assessment
Figure 2.1

EMM
creating opportunities

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KEY

- Clarence Colliery holding boundary (inset)
- Haulage route
- Assessed intersection
- Rail line
- NPWS reserve

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Source: EMM (2019); DFSI (2017); GA (2011)

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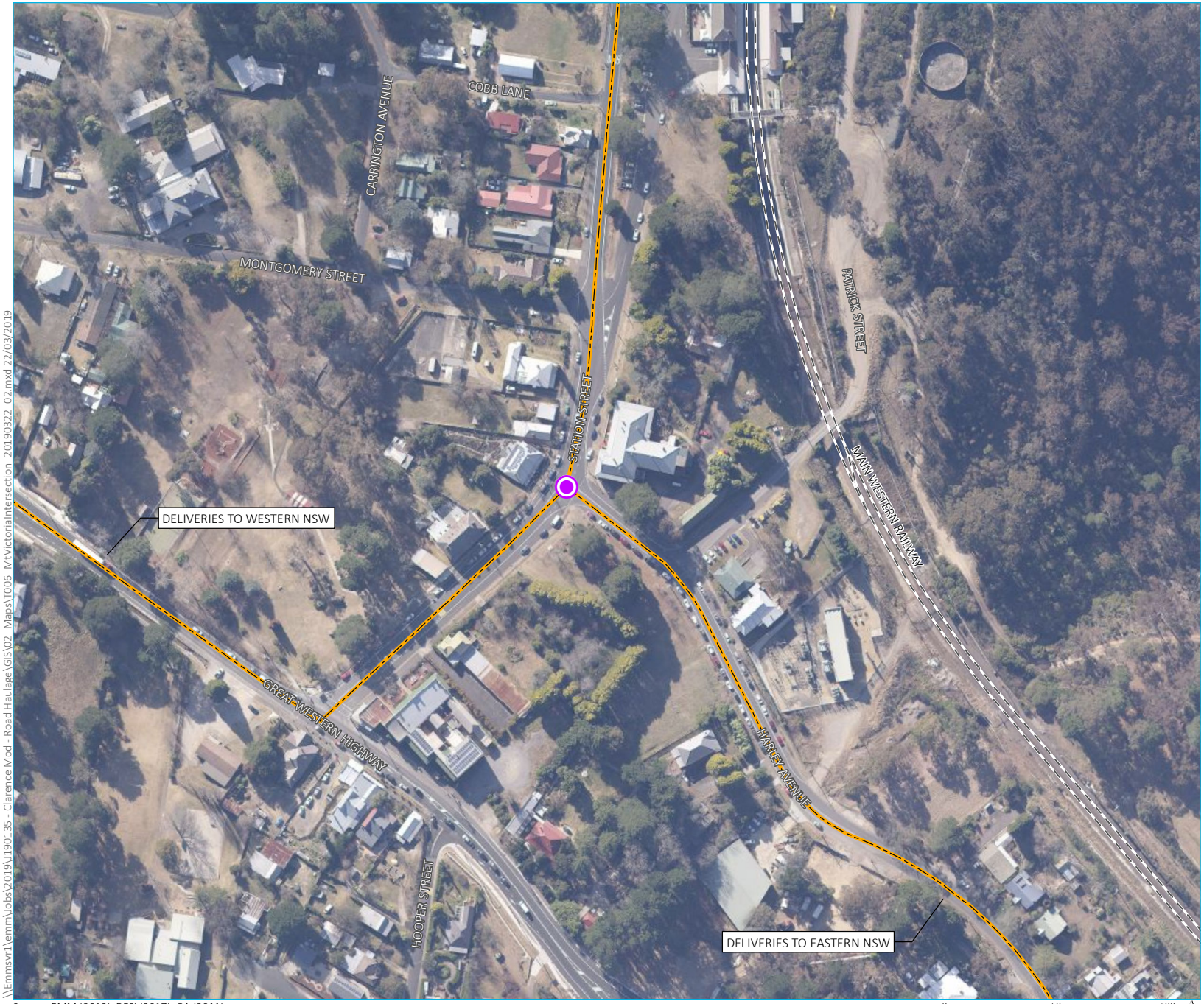
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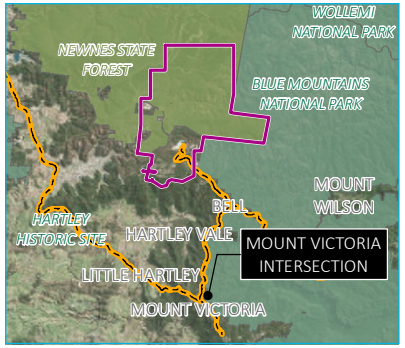
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Intersection at Bell

Clarence Colliery
Traffic impact assessment
Figure 2.2

EMM
creating opportunities





KEY

- Clarence Colliery holding boundary (inset)
- Haulage route
- Assessed intersection
- Rail line

Source: EMM (2019); DFSI (2017); GA (2011)

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GDA 1994 MGA Zone 56

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Intersection at Mount Victoria

Clarence Colliery
Traffic impact assessment
Figure 2.3

EMM
creating opportunities

2.4.1 Site access intersection

The site access intersection (ie Clarence Colliery Road/Chifley Road – refer Figure 2.1) is a T-junction. There are 80 km/h speed limit signs approximately 250 m to the west and 300 m to the east of this intersection. The speed limit on Clarence Colliery Road is 50 km/h. There is a channelised right turn (CHR) treatment and an auxiliary left turn (AUL) treatment on the major road (Chifley Road) based on Austroads (2017) *Part 4 Intersection Design Standards*. Additional road width is provided at the intersection to provide better visibility and to ensure smoother turns for heavy vehicles. The intersection design currently satisfies the minimum Austroads requirements for a rural intersection with additional CHR and AUL turning lanes. Photographs of the site access intersection are included in Appendix A.

As noted in Section 2.3, RMS is currently upgrading Chifley Road and construction work is being carried out near the intersection. Consequently, a lower speed limit of 60 km/h is enforced on the Chifley Road. There is also a temporary lane closure at the intersection and the road shoulder is currently being used by the westbound through traffic to maintain safe intersection traffic operations.

The current peak hourly traffic volumes at the site access intersection and proportions of heavy vehicle traffic from the intersection traffic survey are summarised in Table 2.4. The morning survey was undertaken from 6:30 am to 9:00 am and the afternoon survey was undertaken from 2:30 pm to 6:00 pm.

Table 2.4 Surveyed peak hourly and heavy vehicle traffic volumes at the site access intersection

Road	Direction	Morning peak (8:00 am–9:00 am)			Afternoon peak (3:15 pm–4:15 pm)		
		Total vehicles	Heavy vehicles	% of heavy vehicles	Total vehicles	Heavy vehicles	% of heavy vehicles
Chifley Road (west)	Westbound	107	7	6.54%	160	7	4.38%
	Eastbound	99	10	10.10%	105	9	8.57%
Chifley Road (east)	Westbound	88	8	9.09%	121	12	9.92%
	Eastbound	95	15	15.79%	114	15	13.16%
Clarence Colliery Road	Northbound (incoming)	23	7	30.43%	13	10	76.92%
	Southbound (outgoing)	38	11	28.95%	61	11	18.03%

The proportion of heavy vehicle movements using Clarence Colliery Road is generally higher during the morning peak hour than the afternoon peak hour. The average proportions of heavy vehicle traffic using each road are calculated as ratios of total heavy vehicle numbers to all vehicle numbers during these two peak hours:

- Chifley Road (west): 7.01%;
- Chifley Road (east): 11.96%; and
- Clarence Colliery Road: 28.89%.

On Chifley Road west of the site access intersection, heavy vehicle traffic proportion is 8.25% during the morning peak hour and 6.04% during the afternoon peak hour.

On Chifley Road east of the site access intersection, heavy vehicle traffic proportion is 12.57% during the morning peak hour and 11.49% during the afternoon peak hour.

On Clarence Colliery Road north of Chifley Road, the heavy vehicle traffic proportion is high at 29.51% during the morning peak hour but reduces slightly to 28.38% during the afternoon peak hour.

2.4.2 Darling Causeway/Chifley Road/Bells Line of Road intersection at Bell

The Darling Causeway/Chifley Road/Bells Line of Road intersection at Bell (refer Figure 2.2) is a T-junction with two split (auxiliary) turning lanes. It is approximately 6.6 km south-east of the site access intersection. Chifley Road becomes known as Bells Line of Road to the east of this intersection. There is currently a 60 km/hr speed limit zone on all three approaches to the intersection. The current peak hourly traffic volumes at the intersection and proportions of heavy vehicle traffic from the intersection traffic survey are summarised in Table 2.5.

Table 2.5 Surveyed peak hourly and heavy vehicle traffic volumes at Darling Causeway/Chifley Road/Bells line of road intersection

Road	Direction	Morning peak (7:45 am–8:45 am)			Afternoon peak (3:45 pm–4:45 pm)		
		Total vehicles	Heavy vehicles	% of heavy vehicles	Total vehicles	Heavy vehicles	% of heavy vehicles
Chifley Road (west)	Westbound	95	13	13.68%	100	6	6.00%
	Eastbound	75	15	20.00%	120	12	10.00%
Bells Line of Road (east)	Westbound	99	11	11.11%	103	2	1.94%
	Eastbound	59	9	15.25%	117	7	5.98%
Darling Causeway	Northbound	30	8	26.67%	38	4	10.53%
	Southbound	50	12	24.00%	44	5	11.36%

The proportion of heavy vehicle movements accessing this intersection is generally higher during the morning peak traffic hours than the afternoon peak hours. The average proportions of heavy vehicle traffic using each road are calculated as ratios of total heavy vehicle numbers to all vehicle numbers during these two peak hours:

- Chifley Road (west): 11.79%;
- Bells Line of Road (east): 7.67%; and
- Darling Causeway: 17.90%.

On Chifley Road west of the intersection, the heavy vehicle traffic proportion is 16.47% in the morning peak hour and 8.18% during the afternoon peak hour.

On Bells Line of Road east of the intersection, the heavy vehicle traffic proportion is 12.66% in the morning peak hour and 4.09% during the afternoon peak hour.

On Darling Causeway south of the intersection, the heavy vehicle traffic proportion is high at 25% in the morning peak hour but reduces to 10.98% during the afternoon peak hour.

2.4.3 Station Street/Harley Avenue intersection at Mount Victoria

The Station Street/Harley Avenue intersection (refer Figure 2.3) is a T-junction approximately 9.9 km south of the Chifley Road/Darling Causeway intersection. It is about 100 m north of the southern end of Darling Causeway (Station Street) route at Mount Victoria where it joins the Great Western Highway. The speed limit is 60 km/h on Darling Causeway and 50 km/h on Harley Avenue at the intersection. The current peak hourly traffic volumes at

the intersection and proportions of heavy vehicle traffic from the intersection traffic survey are summarised in Table 2.6.

Table 2.6 Surveyed peak hourly and heavy vehicle traffic volumes at Station Street/Harley Avenue intersection

Road	Direction	Morning peak (8:15 am–9:15 am)			Afternoon peak (2:30 pm–3:30 pm)		
		Total vehicles	Heavy vehicles	% of heavy vehicles	Total vehicles	Heavy vehicles	% of heavy vehicles
Station Street (north)	Northbound	47	6	12.77%	50	4	8.00%
	Southbound	64	13	20.31%	64	5	7.81%
Station Street (south)	Northbound	22	5	22.73%	38	1	2.63%
	Southbound	19	6	31.58%	42	2	4.76%
Harley Avenue	Westbound	28	1	3.57%	32	4	12.50%
	Eastbound	48	7	14.58%	42	4	9.52%

The proportion of heavy vehicle movements accessing this intersection is generally higher during the morning peak traffic hours than the afternoon peak hours. The average proportions of heavy vehicle traffic using each road are calculated as ratios of total heavy vehicle numbers to all vehicle numbers during these two peak hours:

- Station Street (north): 12.44%;
- Station Street (south): 11.57%; and
- Harley Avenue: 10.67%.

On Station Street north of the intersection, the heavy vehicle traffic proportion is 17.12% in the morning peak hour and 7.89% during the afternoon peak hour.

On Station Street south of the intersection, the heavy vehicle traffic proportion is high at 26.83% in the morning peak hour then reduces noticeably to 3.75% during the afternoon peak hour.

On Harley Avenue east of the intersection, the heavy vehicle traffic proportion is 10.53% in the morning peak hour and 10.81% during the afternoon peak hour.

2.5 Existing SIDRA intersection analysis results

A detailed SIDRA intersection analysis has been performed to identify the current intersection performance (refer Appendix C) for the three assessed haulage route intersections.

LOS is an index of the operational performance of an intersection and is based on the average delay per vehicle for the highest delayed movement. LOS ranges from A (very good) to F (over capacity/highly congested), as shown in Table 2.3. Generally, it is desirable to aim for achieving a LOS C or better at all major road intersections. However, in practice, it is reasonable for some intersections to operate at LOS D during peak times.

Another common measure of intersection performance is the degree of saturation (DOS), which provides an overall measure of the capability of the intersection to accommodate additional traffic. A DOS of 1.0 indicates that an intersection is operating at capacity. The desirable maximum DOS for an intersection with road traffic sign controls in place is 0.8.

At the site access intersection, the highest average delays occur when vehicles turn right onto Clarence Colliery Road from the east. The LOS for all movements during the morning and afternoon peak hours is LOS A (indicating good intersection operation – refer Table 2.3). The results of the SIDRA intersection analysis indicate that:

- during the morning peak hour (8:00 am–9:00 am), the DOS is 0.049 (4.9%) and critical average vehicle delay is 8.5 seconds; and
- during the afternoon peak hour (3:15 pm–4:15 pm), the DOS is 0.081 (8.1%) and critical average vehicle delay is 8.5 seconds.

At the Chifley Road/Darling Causeway intersection, the highest average delays occur when vehicles turn right onto Bells Line of Road from the south. The LOS for all movements during the morning and afternoon peak hours is LOS A (indicating good intersection operation). The results of the SIDRA intersection analysis indicate that:

- during the morning peak hour (7:45 am–8:45 am), the DOS is 0.043 (4.3%) and critical average vehicle delay is 9.6 seconds; and
- during the afternoon peak hour (3:45 pm–4:45 pm), the DOS is 0.054 (5.4%) and critical average vehicle delay is 9.5 seconds.

For the Station Street/Harley Avenue intersection, the highest average delays occur when vehicles turn right onto Harley Avenue from the south. The LOS for all movements during the morning and afternoon peak hours is LOS A (indicating good intersection operation). The results of the SIDRA intersection analysis indicate that:

- during the morning peak hour (8:15 am9:15 am), the DOS is 0.029 (2.9%) and critical average vehicle delay is 5.8 seconds; and
- during the afternoon peak hour (2:30 pm3:30 pm), the DOS is 0.031 (3.1%) and critical average vehicle delay is 5.9 seconds.

2.6 Traffic safety

Current traffic safety conditions along the assessed haulage route have been assessed from the most recent five-year reported accident history for 2013–2017, for personal injury (casualty) accidents.

There is generally good or acceptable intersection visibility at all the assessed intersections along the haulage route. However, the narrow existing road over rail bridge across the Main Western Rail Line, east of Clarence, has been identified as a safety risk by RMS due to its outdated design and this bridge is scheduled to be replaced by RMS by 2020 (refer Section 2.3).

The traffic safety conditions for Chifley Road, east of the site access intersection and the Darling Causeway route between Bell and Mount Victoria, have been reviewed from the most recent five-year casualty accident history records (refer Table 2.7). A total of 13 personal injury traffic accidents occurred within the assessed area over the 5-year period, representing a low annual average accident rate of 2.6 accidents per year.

Table 2.7 Crash history for assessed haulage route

Year	Location	Degree of crash	Type of crash	Type of location
2013	Intersection with Chifley Road at Bell	Minor/Other injury	Motorcycle; car	T-junction
2014	Darling Causeway, between intersection with Montgomery Street and intersection with Harley Avenue	Moderate injury	Heavy truck	2-way undivided
	Intersection with the Great Western Highway at Mount Victoria	Minor/Other injury	Car; pedestrian	T-junction
	Chifley Road, 1 km north Darling Causeway intersection	Serious injury	Car	2-way undivided
2015	Intersection with Chifley Road at Bell	Moderate injury	Car	2-way undivided
	Darling Causeway, 4.9 km south the Intersection at Bell	Serious injury	Heavy truck; car	2-way undivided
	Intersection with the Great Western Highway at Mount Victoria	Moderate injury	Car	2-way undivided
	Intersection with the Great Western Highway at Mount Victoria	Moderate injury	Car	2-way undivided
	Chifley Road, 30 m south Valley View Road	Minor/Other injury	Car	2-way undivided
2016	Intersection with Chifley Road at Bell	Fatal	Motorcycle	2-way undivided
	Darling Causeway, 350 m south the Intersection at Bell	Serious injury	Car	2-way undivided
	Darling Causeway, 1.8 km south the Intersection at Bell	Minor/Other injury	Motorcycle	2-way undivided
	Chifley Road, 50 m south Valley View Road	Serious injury	Motorcycle	2-way undivided

Source: Centre for Road Safety – TfNSW (2019)

Further analysis of the overall Lithgow LGA casualty accident history for heavy vehicles identifies that the annual number of casualty accidents involving heavy vehicles has reduced progressively from nine accidents in 2013 to two accidents in 2017.

Of the 31 heavy vehicle casualty accidents that were reported in the Lithgow LGA from 2013 to 2017, two were fatal, but did not occur on the assessed haulage route for this TIA. Two of the reported crashes on the assessed haulage route in Table 2.7 for the period 2013–2017 involved heavy vehicles but no fatalities. There was one fatal accident on the assessed haulage route involving a motorcycle.

3 Proposed modification

As noted in Section 1.2, Centennial Coal is seeking to modify DA 504-00 pursuant to Section 4.55(2) of the EP&A Act to:

- increase total allowable coal haulage off-site by road from 200,000 t to 300,000 t, on an annual basis, for a limited period of time up to 31 December 2020; and
- increase total allowable coal haulage off-site to the west by road from 100,000 t to 200,000 t, on an annual basis, for a limited period of time up to 31 December 2020.

No change to total coal haulage off-site to the east by road (a maximum of 200,000 t per calendar year) is proposed as part of this modification.

As per Condition 7B Schedule 2 of DA 504-00, trucking of coal to the west occurs only between 7:00 am and 10:00 pm Monday to Saturday and between 8:00 am and 10:00 pm on Sundays and public holidays. It is not proposed to modify these hours.

To achieve the proposed increase in total coal haulage by road, there will need to be an increase to the maximum daily number of trucks required to transport coal from Clarence Colliery on the days when both the eastern and western routes are operating, from 25 trucks per day (ie 50 truck movements) to 40 trucks per day (ie 80 truck movements). On these days, the maximum hourly number of trucks dispatched may increase from about 6 loads per hour currently to about 8 loads per hour, for the duration of the proposed modification.

However, on both of the intersection traffic survey days for this report, where the actual daily number of coal truck loads transported was 12 (ie 24 daily truck movements in total), all of which travelled to and from the east via Mount Victoria, there were typically only 2 truckloads per hour dispatched during the morning and the afternoon peak hours of the intersection traffic survey period.

The differences between these three scenarios of existing traffic (as surveyed), existing (typical maximum) and the proposed (typical maximum) daily and peak hourly truck loads generated by Clarence Colliery's coal haulage operations are summarised in Table 3.1.

Table 3.1 Existing and proposed daily truck loads

Timing	Existing (as surveyed)	Existing (typical maximum)	Proposed (typical maximum)
Daily truck loads despatched either to the east or west	12	25	40
Typical morning or afternoon peak period hourly truck loads	2	6	8

For maximum daily truck movements, the proposed modification will result in an additional 15 daily truck loads (ie 30 daily truck movements) travelling along the assessed haulage route, in comparison to the existing approved operations.

During the future morning and afternoon traffic peak hours there will typically be two additional peak hourly truck loads (ie four additional peak hourly truck movements) at each of the key intersections along the assessed haulage route in comparison to the existing typical maximum hourly operations.

However, in comparison to the existing surveyed peak hourly intersection operations during December 2018 and February 2019 (refer Appendix B), there will be about 6 additional peak hourly truck loads (ie 12 additional peak

hourly truck movements) during the morning and afternoon peak hours at each of the key intersections along the assessed haulage route.

4 Assessment of traffic impacts

4.1 Road carriageway

As detailed in Chapter 3, an anticipated 15 additional daily loads (30 additional heavy vehicle movements) will generally be travelling on Clarence Colliery Road and the other assessed sections of the haulage route via Chifley Road and Darling Causeway (Station Street).

However, in comparison to the existing 12 daily loads, which were transported during the December 2018 and February 2019 intersection traffic surveys, the corresponding additional future daily loads will be 28 (corresponding to 56 additional daily heavy vehicle movements) travelling on the assessed eastern and western haulage routes via Mount Victoria.

4.2 Daily traffic volumes

The existing daily traffic volumes for the local road network have been determined from intersection traffic survey data during the morning and afternoon peak hours (refer Table 2.1 and Appendix B).

The existing daily traffic volumes (based on the intersection traffic surveys) and the predicted maximum additional daily truck movements along the assessed transport route are summarised in Table 4.1.

Table 4.1 Existing and proposed daily traffic volumes

Road	Existing daily traffic (as surveyed-all vehicles)	Future additional daily traffic (truck movements) under average or maximum proposed operations	Percentage increase
Clarence Colliery Road (north of Chifley Road)	675	30–56	+4.4–8.3%
Chifley Road (west of site access intersection)	2,355	0	0
Chifley Road (east of site access intersection)	2,090	30–56	+1.4–2.7%
Chifley Road (west of Darling Causeway)	1,950	30–56	+1.5–2.9%
Darling Causeway (south of Chifley Road)	810	30–56	+3.7–6.9%
Station Street (north of Harley Avenue)	1,125	30–56	+2.7–5.0%
Station Street (south of Harley Avenue)	605	0	0

Note: 1. The 2019 existing daily traffic volume is based on 10 x the hourly volumes from the intersection traffic surveys.

The additional traffic on Clarence Colliery Road generated by the proposed modification will increase daily traffic volumes by approximately 4.4%–8.3%.

The additional traffic on Chifley Road between Clarence Colliery and Bell generated by the proposed modification will increase daily traffic volumes by approximately 1.4%–2.9%.

The additional traffic on Darling Causeway and Station Street between Bell and Mount Victoria generated by the proposed modification will increase daily traffic volumes by approximately 2.7%–6.9%.

As a result of the proposed modification, the daily traffic volume increases at the assessed locations will be generally less than 10% and the existing daily traffic movements and traffic conditions along these routes will be effectively unchanged with a negligible impact on the locality road network.

Also, in view of the existing generally good safety record of the three roads along the assessed haulage route, the proposed modification should not have any adverse traffic safety impacts for the existing local and regionally based traffic which is using these roads.

4.3 Intersection impacts

The existing (as surveyed) morning and afternoon peak hour traffic performance of the three key intersections along the assessed haulage route has been summarised as a function of the LOS and critical traffic delays at intersections in Section 2.5 and in Appendix C.

The existing (typical maximum) and proposed (typical maximum) intersection traffic performance for the three assessed intersections is compared in Table 4.2. The detailed SIDRA output summary sheets for each peak hour traffic period considered at each intersection are included in Appendix D.

Table 4.2 Summary of existing and proposed maximum intersection traffic operations

Intersection	Peak hour	Existing typical maximum traffic			Proposed typical maximum traffic		
		LOS	DOS	DEL	LOS	DOS	DEL
Site access intersection	Morning peak hour (8:00 am–9:00 am)	A	0.055	8.8	A	0.058	8.9
	Afternoon peak hour (3:15 pm–4:15 pm)	A	0.087	8.5	A	0.090	8.5
Chifley Road/Bells Line of Road/Darling Causeway	Morning peak hour (7:45 am–8:45 am)	A	0.043	9.6	A	0.043	9.7
	Afternoon peak hour (3:45 pm–4:45 pm)	A	0.054	9.5	A	0.054	9.6
Station Street/Harley Avenue	Morning peak hour (8:15 am–9:15 am)	A	0.031	5.8	A	0.032	5.8
	Afternoon peak hour (2:30 pm–3:30 pm)	A	0.034	5.9	A	0.036	5.9

Note: LOS – level of service, DOS – degree of saturation, DEL – vehicle delay by time (seconds).

The SIDRA analysis results comparison in Table 4.2 for the site access intersection show the intersection is currently operating at a very low DOS (0.055–0.087). With the proposed modification, there will be small increases in the intersection DOS (0.058–0.090) but there will be negligible additional traffic delay or other intersection capacity impacts from the additional truck traffic which will be using the intersection. The site access intersection LOS will remain at A for all the morning and afternoon peak traffic scenarios considered.

The site access intersection has plenty of capacity to grow in terms of future traffic volume. Further intersection upgrade and improvement works, including an additional eastbound acceleration lane are also in the process of being implemented by RMS at this intersection (refer Section 2.3). The benefit of the future intersection upgrade works has not been specifically analysed as part of this assessment as the existing intersection design has been assessed and found to be adequate with minimal impacts (ie without the proposed intersection improvements).

The SIDRA analysis results for the other two assessed intersections provided in Table 4.2 also show there will be either no or very minor additional traffic delay or DOS intersection capacity impacts from the additional typical maximum traffic which will be using these intersections with the proposed modification. The intersection LOS will remain at A for all the morning and afternoon peak traffic scenarios considered for these two intersections.

4.4 Car parking

No additional car parking areas at Clarence Colliery are required as part of the proposed modification.

5 Summary and conclusion

This TIA has assessed the daily road traffic flow and morning and afternoon peak hour intersection traffic capacity impacts of the proposed modification.

In comparison to the existing surveyed traffic conditions on the two days when intersection traffic surveys were undertaken as part of this TIA, the proposed modification will introduce an additional 15–28 daily truck loads (ie 30–56 daily truck movements). The existing typical maximum truck loads which are dispatched along the existing haulage route, during either the morning or afternoon traffic peak hours is six, which will increase to eight under the proposed modification. This will result in an additional two peak hourly truck loads (ie four peak hourly truck movements) travelling along the assessed haulage route during the assessed future peak hourly traffic periods.

The proportional daily traffic increases from the additional daily truck movements on Clarence Colliery Road, Chifley Road, Darling Causeway and Station Street will be approximately 1.4%–8.3% of existing traffic. As these daily traffic volume increases will all be generally less than 10% of the existing daily traffic movements, the daily and peak hourly traffic conditions along these roads will remain effectively unchanged with negligible traffic flow impacts for the local road network.

The recent five year road safety and casualty accident history statistics for Chifley Road and Darling Causeway/Station Street show a low average annual accident rate of 2.6 casualty accidents per year occurring along the total combined 16–17 km length of the assessed haulage route. There were a low number of accidents over this period for the truck traffic using these roads and the future additional daily truck movements from the proposed modification should have no adverse traffic safety impacts on these roads.

The three assessed intersections along the haulage route (ie the site access intersection, Chifley Road/Darling Causeway/Bells Line of Road intersection at Bell and Station Street/Harley Avenue intersection at Mount Victoria) are currently operating at a very low DOS (with traffic volume to capacity ratios of approximately 0.031–0.087) during the existing typical maximum haulage conditions for the colliery.

Under the proposed modification there will be effectively minimal or no additional traffic delay or other intersection capacity impacts from the typical maximum additional peak hourly truck traffic which will be using these intersections. The assessed intersection LOS will remain at A at all three intersections for all the morning and afternoon peak traffic scenarios considered.

The road carriageway width and road surface of Chifley Road are currently being improved by RMS. These road improvements will further improve existing road conditions and are expected to mitigate the very minor potential road capacity and intersection traffic delay impacts from the proposed modification.

No additional car parking is required at Clarence Colliery as a result of the proposed modification.

Abbreviations

DEL	vehicle delay by time (seconds)
DOS	degree of saturation
EMM	EMM Consulting Pty Ltd
EP&A Act	NSW *Environmental Planning & Assessment Act 1979*
LGA	local government area
LOS	level of service
RMS	NSW Roads and Maritime Services
SEE	statement of environmental effects
TfNSW	Transport for NSW
TIA	traffic impact assessment

References

Australian Standard, AS2890.1 :2004 Parking facilities Part 1: Off-street car parking.

Austroads 2017, *Guide to Road Design – Part 4 Intersection Design Standards*.

NSW Roads and Maritime Services (RMS) 2002, *Guide to Traffic Generating Developments* (RTA).

NSW Roads and Maritime Services (RMS), *Traffic Volume Viewer, https://www.rms.nsw.gov.au/about/corporate-publications/statistics/traffic-volumes/aadt-map/index.html#/?z=6*, accessed February 2019.

Transport for NSW (TfNSW), *Centre for Road Safety*, *https://roadsafety.transport.nsw.gov.au/statistics/interactivecrashstats/lga_stats.html?tablga=1*, accessed February 2019.




Appendix A

Photographs of the local road network

Photographs captured 15 January 2019
Google Street View imagery captured 4-7 March 2019






A.1 Site access intersection (ie Chifley Road/Clarence Colliery Road)



Photograph A.1 Site access intersection, looking east



Photograph A.2 Site access intersection, looking west



Photograph A.3 **Clarence Colliery Road Entrance, looking north**



Photograph A.4 **Site access intersection, looking north**

A.2 Chifley Road (east)



Photograph A.5 Chifley Road, heading west from Bell



Photograph A.6 Chifley Road, 80 km/h speed limit



Photograph A.7 **Chifley Road, 60 km/h near roadworks zone**



Photograph A.8 **Chifley Road, RMS road upgrade signpost**

A.3 Clarence Colliery Road



Photograph A.9 Clarence Colliery Road, near site access intersection



Photograph A.10 Clarence Colliery Road, unsealed shoulder

A.4 Darling Causeway between Bell and Mount Victoria



Photograph A.11 View looking south 1 km south of Bell (Source: Google Street View 2019)



Photograph A.12 View looking south 2 km south of Bell (Source: Google Street View 2019)



Photograph A.13 **View looking south 3 km south of Bell (Source: Google Street View 2019)**



Photograph A.14 **View looking south 4 km south of Bell (Source: Google Street View 2019)**



Photograph A.15 **View looking south 5 km south from Bell (Source: Google Street View 2019)**



Photograph A.16 **View looking north 1 km north from Mt Victoria (Source: Google Street View 2019)**



Photograph A.17 View looking north 2 km north from Mt Victoria (Source: Google Street View 2019)



Photograph A.18 View looking north 3 km north from Mt Victoria (Source: Google Street View 2019)



Photograph A.19 View looking north 4 km north from Mt Victoria (Source: Google Street View 2019)



Photograph A.20 View looking north 5 km north from Mt Victoria (Source: Google Street View 2019)

A.5 Great Western Highway



Photograph A.21 View looking east 5 km east from Mt Victoria (Source: Google Street View 2019)



Photograph A.22 View looking west 5 km west from Mt Victoria (Source: Google Street View 2019)




Appendix B

Intersection traffic surveys






R.O.A.R. DATA

Reliable, Original & Authentic Results

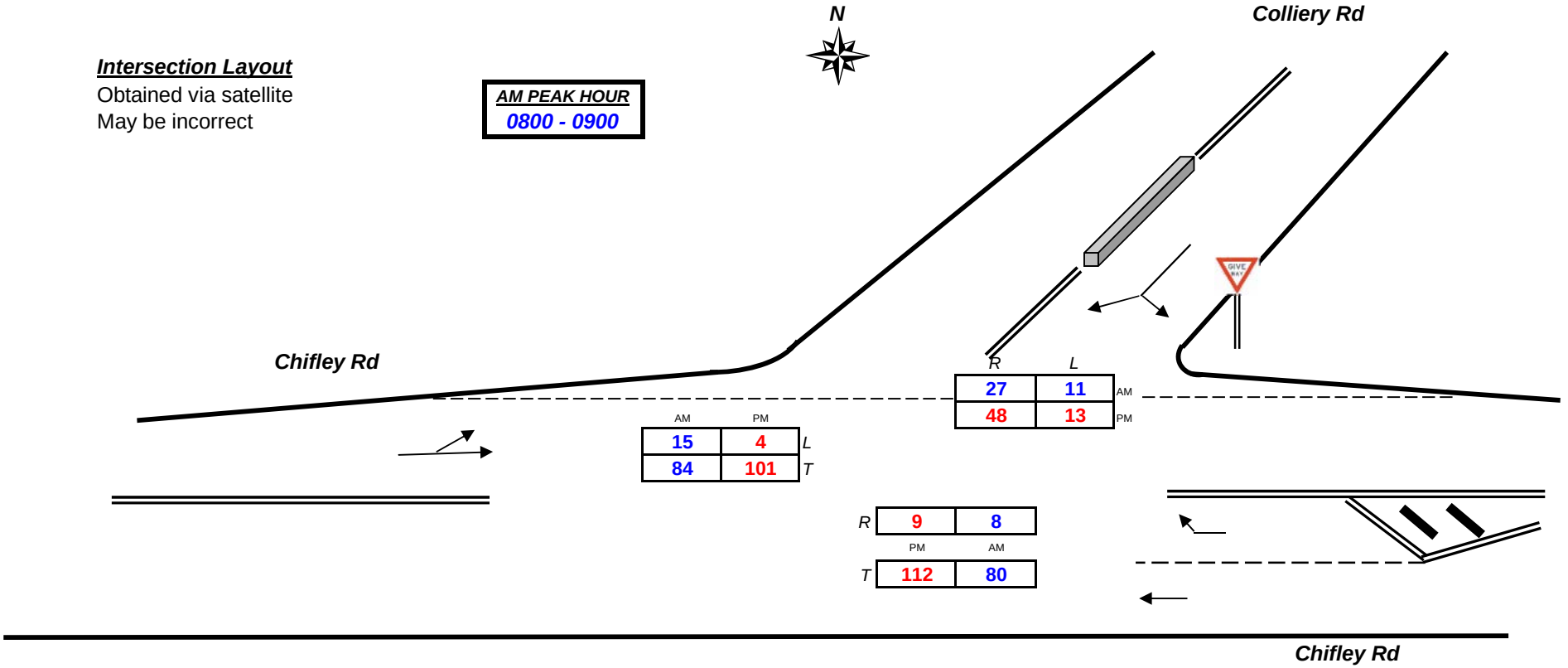
Ph.88196847, Mob.0418-239019

Client : EMM
Job No/Name : 6995 CLARENCE Colliery
Day/Date : Wednesday 12th December 2018

Intersection Layout

Obtained via satellite
May be incorrect

AM PEAK HOUR
0800 - 0900



PM PEAK HOUR
1515 - 1615

Weather >>>

R.O.A.R. DATA

Reliable, Original & Authentic Results

Ph.88196847, Mob.0418-239019

Client : EMM
Job No/Name : 6995 CLARENCE Colliery
Day/Date : Wednesday 12th December 2018

PEDS	WEST	NORTH	EAST	
Time Per	*Chifley Rd*	*Colliery Rd*	*Chifley Rd*	TOT
0630 - 0645				**0**
0645 - 0700				**0**
0700 - 0715		NOT		**0**
0715 - 0730		REQUIRED		**0**
0730 - 0745				**0**
0745 - 0800				**0**
0800 - 0815				**0**
0815 - 0830				**0**
0830 - 0845				**0**
0845 - 0900				**0**
Per End	**0**	**0**	**0**	**0**

PEDS	WEST	NORTH	EAST	
Peak Per	*Chifley Rd*	*Colliery Rd*	*Chifley Rd*	TOT
0630 - 0730	0	0	0	**0**
0645 - 0745	0	0	0	**0**
0700 - 0800	0	0	0	**0**
0715 - 0815	0	0	0	**0**
0730 - 0830	0	0	0	**0**
0745 - 0845	0	0	0	**0**
0800 - 0900	0	0	0	**0**
PEAK HR	**0**	**0**	**0**	**0**

Lights	WEST		NORTH		EAST		
	Chifley Rd		*Colliery Rd*		*Chifley Rd*		
Time Per	T	L	R	L	R	T	TOT
0630 - 0645	9	27	1	0	7	9	**53**
0645 - 0700	10	10	1	0	2	9	**32**
0700 - 0715	12	5	1	0	1	12	**31**
0715 - 0730	10	2	1	1	1	16	**31**
0730 - 0745	17	4	0	0	2	17	**40**
0745 - 0800	15	4	1	1	1	17	**39**
0800 - 0815	12	4	2	0	0	14	**32**
0815 - 0830	23	4	17	3	1	18	**66**
0830 - 0845	21	2	2	0	1	22	**48**
0845 - 0900	20	3	2	1	1	23	**50**
Per End	**149**	**65**	**28**	**6**	**17**	**157**	**422**

Heavies	WEST		NORTH		EAST		
	Chifley Rd		*Colliery Rd*		*Chifley Rd*		
Time Per	T	L	R	L	R	T	TOT
0630 - 0645	2	0	0	5	0	0	**7**
0645 - 0700	1	0	0	4	1	0	**6**
0700 - 0715	1	0	0	2	1	1	**5**
0715 - 0730	0	1	0	1	0	2	**4**
0730 - 0745	1	1	0	0	1	0	**3**
0745 - 0800	2	0	0	0	3	0	**5**
0800 - 0815	5	1	0	1	3	2	**12**
0815 - 0830	1	0	2	2	1	0	**6**
0830 - 0845	0	0	2	1	1	0	**4**
0845 - 0900	2	1	0	3	0	1	**7**
Per End	**15**	**4**	**4**	**19**	**11**	**6**	**59**

Combined	WEST		NORTH		EAST		
	Chifley Rd		*Colliery Rd*		*Chifley Rd*		
Time Per	T	L	R	L	R	T	TOT
0630 - 0645	11	27	1	5	7	9	**60**
0645 - 0700	11	10	1	4	3	9	**38**
0700 - 0715	13	5	1	2	2	13	**36**
0715 - 0730	10	3	1	2	1	18	**35**
0730 - 0745	18	5	0	0	3	17	**43**
0745 - 0800	17	4	1	1	4	17	**44**
0800 - 0815	17	5	2	1	3	16	**44**
0815 - 0830	24	4	19	5	2	18	**72**
0830 - 0845	21	2	4	1	2	22	**52**
0845 - 0900	22	4	2	4	1	24	**57**
Per End	**164**	**69**	**32**	**25**	**28**	**163**	**481**

Lights	WEST		NORTH		EAST		
	Chifley Rd		*Colliery Rd*		*Chifley Rd*		
Peak Per	T	L	R	L	R	T	TOT
0630 - 0730	41	44	4	1	11	46	**147**
0645 - 0745	49	21	3	1	6	54	**134**
0700 - 0800	54	15	3	2	5	62	**141**
0715 - 0815	54	14	4	2	4	64	**142**
0730 - 0830	67	16	20	4	4	66	**177**
0745 - 0845	71	14	22	4	3	71	**185**
0800 - 0900	76	13	23	4	3	77	**196**
PEAK HR	**76**	**13**	**23**	**4**	**3**	**77**	**196**

Heavies	WEST		NORTH		EAST		
	Chifley Rd		*Colliery Rd*		*Chifley Rd*		
Peak Per	T	L	R	L	R	T	TOT
0630 - 0730	4	1	0	12	2	3	**22**
0645 - 0745	3	2	0	7	3	3	**18**
0700 - 0800	4	2	0	3	5	3	**17**
0715 - 0815	8	3	0	2	7	4	**24**
0730 - 0830	9	2	2	3	8	2	**26**
0745 - 0845	8	1	4	4	8	2	**27**
0800 - 0900	8	2	4	7	5	3	**29**
PEAK HR	**8**	**2**	**4**	**7**	**5**	**3**	**29**

Combined	WEST		NORTH		EAST		
	Chifley Rd		*Colliery Rd*		*Chifley Rd*		
Peak Per	T	L	R	L	R	T	TOT
0630 - 0730	45	45	4	13	13	49	**169**
0645 - 0745	52	23	3	8	9	57	**152**
0700 - 0800	58	17	3	5	10	65	**158**
0715 - 0815	62	17	4	4	11	68	**166**
0730 - 0830	76	18	22	7	12	68	**203**
0745 - 0845	79	15	26	8	11	73	**212**
0800 - 0900	84	15	27	11	8	80	**225**
PEAK HR	**84**	**15**	**27**	**11**	**8**	**80**	**225**

R.O.A.R. DATA

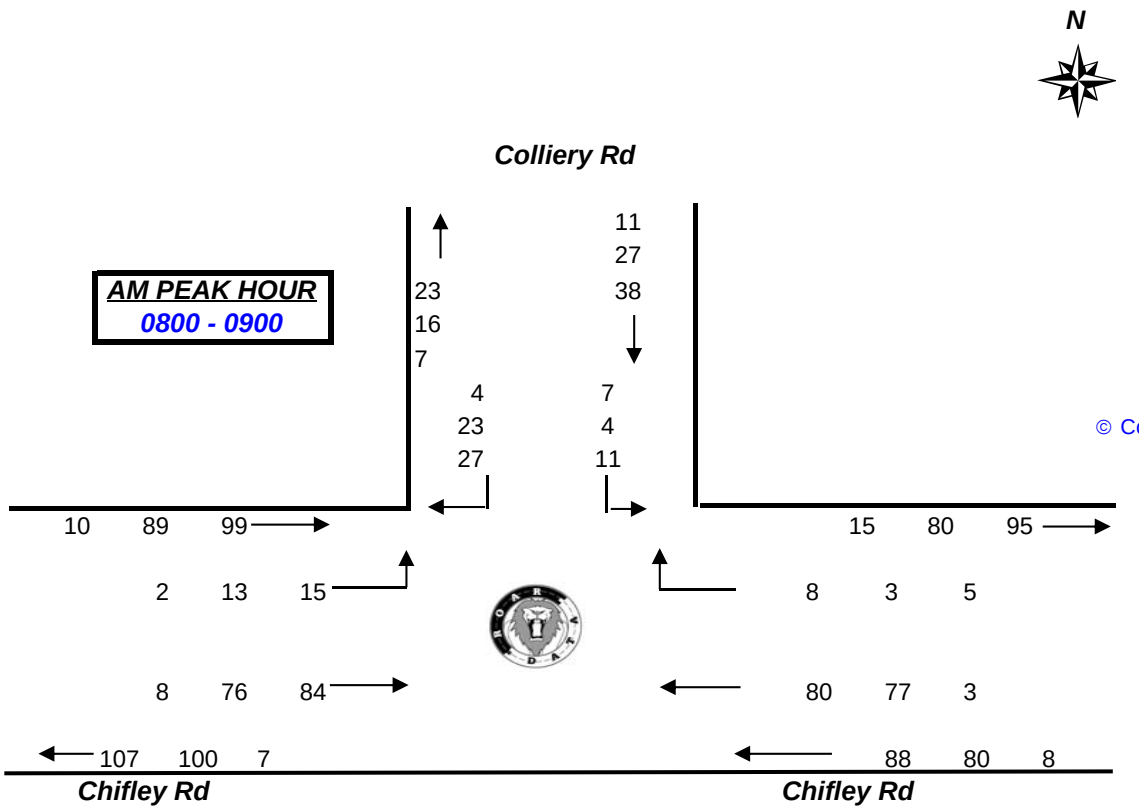
Reliable, Original & Authentic Results

Ph.88196847, Mob.0418-239019

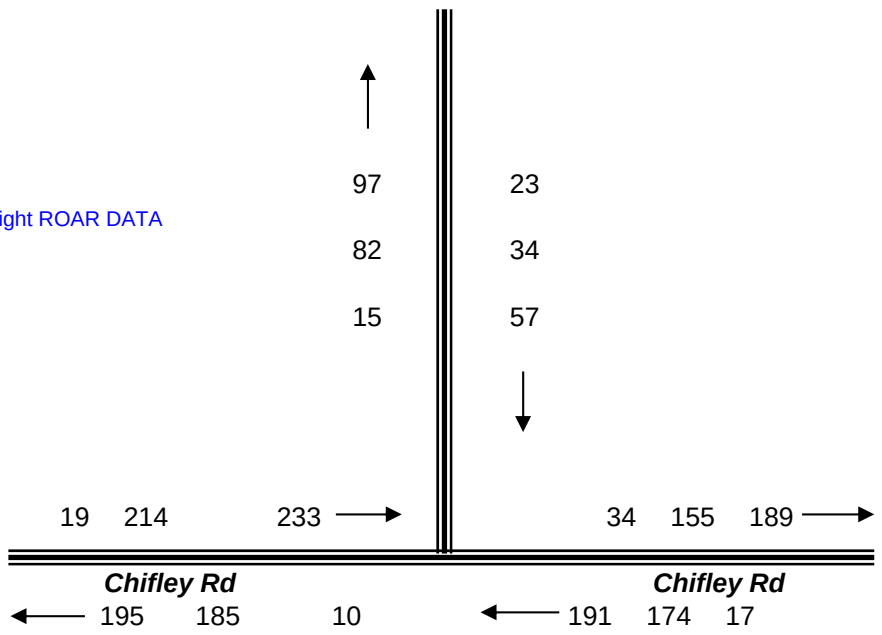
Client : EMM
Job No/Name : 6995 CLARENCE Colliery
Day/Date : Wednesday 12th December 2018

TOTAL VOLUMES FOR COUNT PERIOD

AM PEAK HOUR
0800 - 0900



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R.O.A.R. DATA

Reliable, Original & Authentic Results

Ph.88196847, Mob.0418-239019

Client : EMM
Job No/Name : 6995 CLARENCE Colliery
Day/Date : Wednesday 12th December 2018

Lights

	WEST		NORTH		EAST		
	Chifley Rd		*Colliery Rd*		*Chifley Rd*		
Time Per	**T**	**L**	**R**	**L**	**R**	**T**	**TOT**
1430 - 1445	23	0	4	1	0	20	**48**
1445 - 1500	22	1	7	1	1	13	**45**
1500 - 1515	18	2	15	3	1	12	**51**
1515 - 1530	22	0	22	5	0	25	**74**
1530 - 1545	23	2	6	0	0	20	**51**
1545 - 1600	26	1	4	0	0	31	**62**
1600 - 1615	22	0	12	1	0	33	**68**
1615 - 1630	19	1	9	3	1	17	**50**
1630 - 1645	12	0	6	1	1	18	**38**
1645 - 1700	13	1	1	0	0	19	**34**
1700 - 1715	19	0	5	0	0	13	**37**
1715 - 1730	19	0	0	0	0	20	**39**
1730 - 1745	14	1	4	1	0	19	**39**
1745 - 1800	9	0	1	0	0	18	**28**
Per End	**261**	**9**	**96**	**16**	**4**	**278**	**664**

Heavies

	WEST		NORTH		EAST		
	Chifley Rd		*Colliery Rd*		*Chifley Rd*		
Time Per	**T**	**L**	**R**	**L**	**R**	**T**	**TOT**
1430 - 1445	1	0	0	2	4	3	**10**
1445 - 1500	0	0	0	1	1	1	**3**
1500 - 1515	1	1	0	2	1	1	**6**
1515 - 1530	0	0	2	1	2	1	**6**
1530 - 1545	2	1	0	0	3	0	**6**
1545 - 1600	4	0	2	2	2	1	**11**
1600 - 1615	2	0	0	4	2	1	**9**
1615 - 1630	3	0	0	1	0	1	**5**
1630 - 1645	1	0	1	0	0	1	**3**
1645 - 1700	1	0	0	1	2	0	**4**
1700 - 1715	2	0	0	2	0	4	**8**
1715 - 1730	0	0	0	0	0	0	**0**
1730 - 1745	0	0	0	0	0	0	**0**
1745 - 1800	1	0	0	0	2	0	**3**
Per End	**18**	**2**	**5**	**16**	**19**	**14**	**74**

Combined

	WEST		NORTH		EAST		
	Chifley Rd		*Colliery Rd*		*Chifley Rd*		
Time Per	**T**	**L**	**R**	**L**	**R**	**T**	**TOT**
1430 - 1445	24	0	4	3	4	23	**58**
1445 - 1500	22	1	7	2	2	14	**48**
1500 - 1515	19	3	15	5	2	13	**57**
1515 - 1530	22	0	24	6	2	26	**80**
1530 - 1545	25	3	6	0	3	20	**57**
1545 - 1600	30	1	6	2	2	32	**73**
1600 - 1615	24	0	12	5	2	34	**77**
1615 - 1630	22	1	9	4	1	18	**55**
1630 - 1645	13	0	7	1	1	19	**41**
1645 - 1700	14	1	1	1	2	19	**38**
1700 - 1715	21	0	5	2	0	17	**45**
1715 - 1730	19	0	0	0	0	20	**39**
1730 - 1745	14	1	4	1	0	19	**39**
1745 - 1800	10	0	1	0	2	18	**31**
Per End	**279**	**11**	**101**	**32**	**23**	**292**	**738**

Lights

	WEST		NORTH		EAST		
	Chifley Rd		*Colliery Rd*		*Chifley Rd*		
Peak Per	**T**	**L**	**R**	**L**	**R**	**T**	**TOT**
1430 - 1530	85	3	48	10	2	70	**218**
1445 - 1545	85	5	50	9	2	70	**221**
1500 - 1600	89	5	47	8	1	88	**238**
1515 - 1615	93	3	44	6	0	109	**255**
1530 - 1630	90	4	31	4	1	101	**231**
1545 - 1645	79	2	31	5	2	99	**218**
1600 - 1700	66	2	28	5	2	87	**190**
1615 - 1715	63	2	21	4	2	67	**159**
1630 - 1730	63	1	12	1	1	70	**148**
1645 - 1745	65	2	10	1	0	71	**149**
1700 - 1800	61	1	10	1	0	70	**143**
PEAK HR	**93**	**3**	**44**	**6**	**0**	**109**	**255**

Heavies

	WEST		NORTH		EAST		
	Chifley Rd		*Colliery Rd*		*Chifley Rd*		
Peak Per	**T**	**L**	**R**	**L**	**R**	**T**	**TOT**
1430 - 1530	2	1	2	6	8	6	**25**
1445 - 1545	3	2	2	4	7	3	**21**
1500 - 1600	7	2	4	5	8	3	**29**
1515 - 1615	8	1	4	7	9	3	**32**
1530 - 1630	11	1	2	7	7	3	**31**
1545 - 1645	10	0	3	7	4	4	**28**
1600 - 1700	7	0	1	6	4	3	**21**
1615 - 1715	7	0	1	4	2	6	**20**
1630 - 1730	4	0	1	3	2	5	**15**
1645 - 1745	3	0	0	3	2	4	**12**
1700 - 1800	3	0	0	2	2	4	**11**
PEAK HR	**8**	**1**	**4**	**7**	**9**	**3**	**32**

Combined

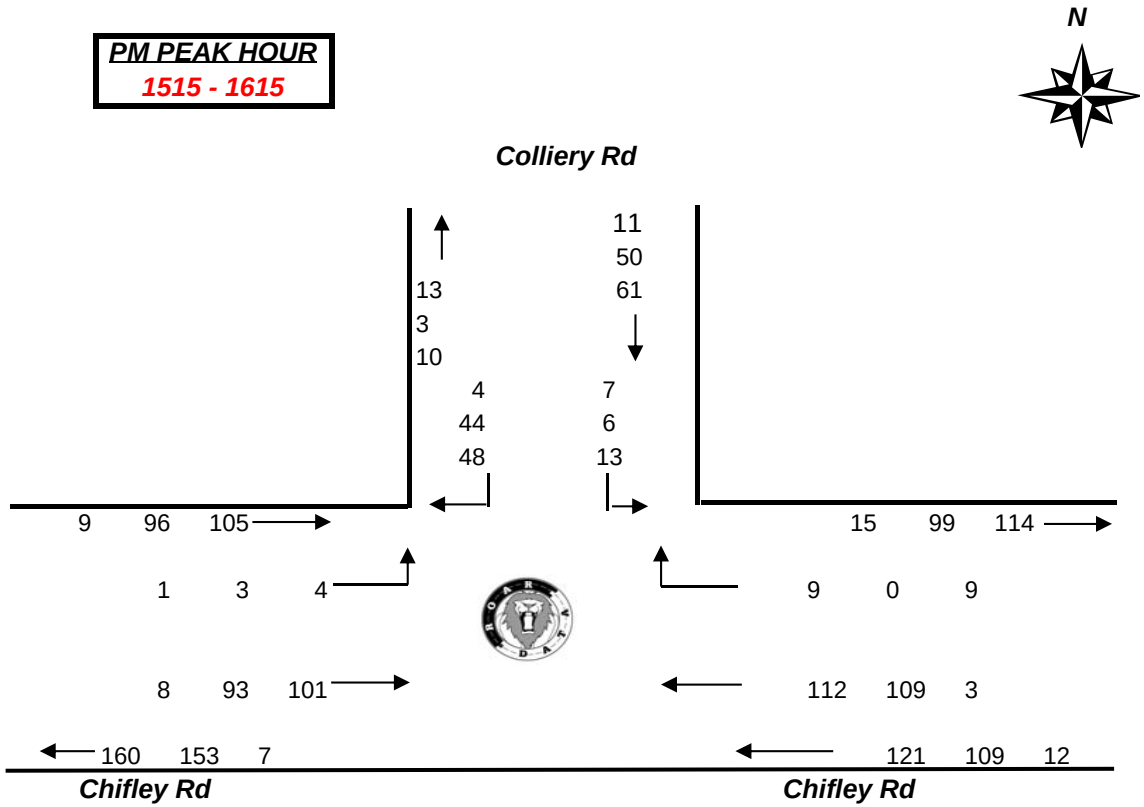
	WEST		NORTH		EAST		
	Chifley Rd		*Colliery Rd*		*Chifley Rd*		
Peak Per	**T**	**L**	**R**	**L**	**R**	**T**	**TOT**
1430 - 1530	87	4	50	16	10	76	**243**
1445 - 1545	88	7	52	13	9	73	**242**
1500 - 1600	96	7	51	13	9	91	**267**
1515 - 1615	101	4	48	13	9	112	**287**
1530 - 1630	101	5	33	11	8	104	**262**
1545 - 1645	89	2	34	12	6	103	**246**
1600 - 1700	73	2	29	11	6	90	**211**
1615 - 1715	70	2	22	8	4	73	**179**
1630 - 1730	67	1	13	4	3	75	**163**
1645 - 1745	68	2	10	4	2	75	**161**
1700 - 1800	64	1	10	3	2	74	**154**
PEAK HR	**101**	**4**	**48**	**13**	**9**	**112**	**287**

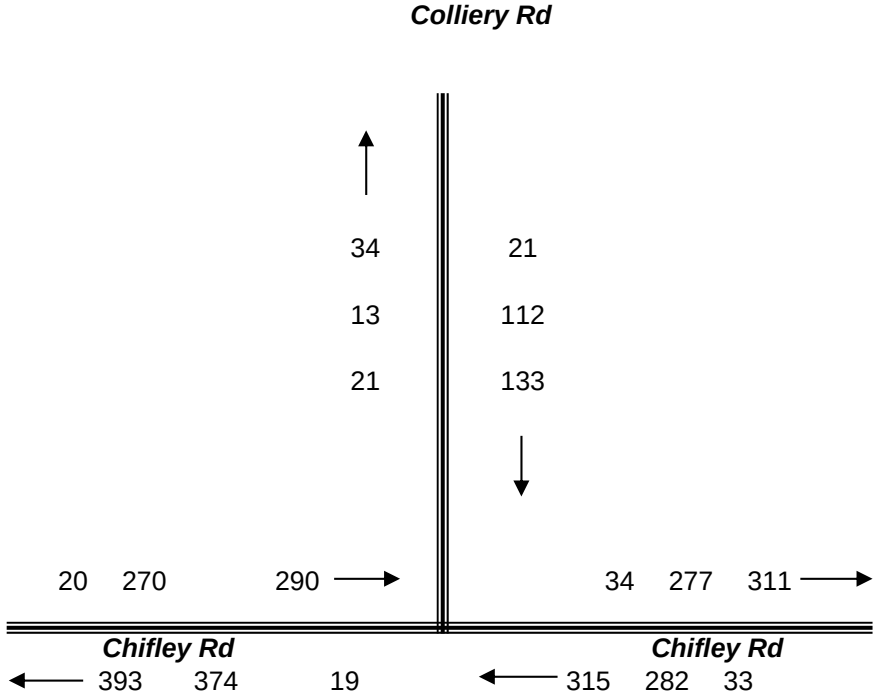
R.O.A.R. DATA
Reliable, Original & Authentic Results
Ph.88196847, Mob.0418-239019

Client : EMM
Job No/Name : 6995 CLARENCE Colliery
Day/Date : Wednesday 12th December 2018

PM PEAK HOUR
1515 - 1615

TOTAL VOLUMES FOR COUNT PERIOD





R.O.A.R. DATA

Reliable, Original & Authentic Results

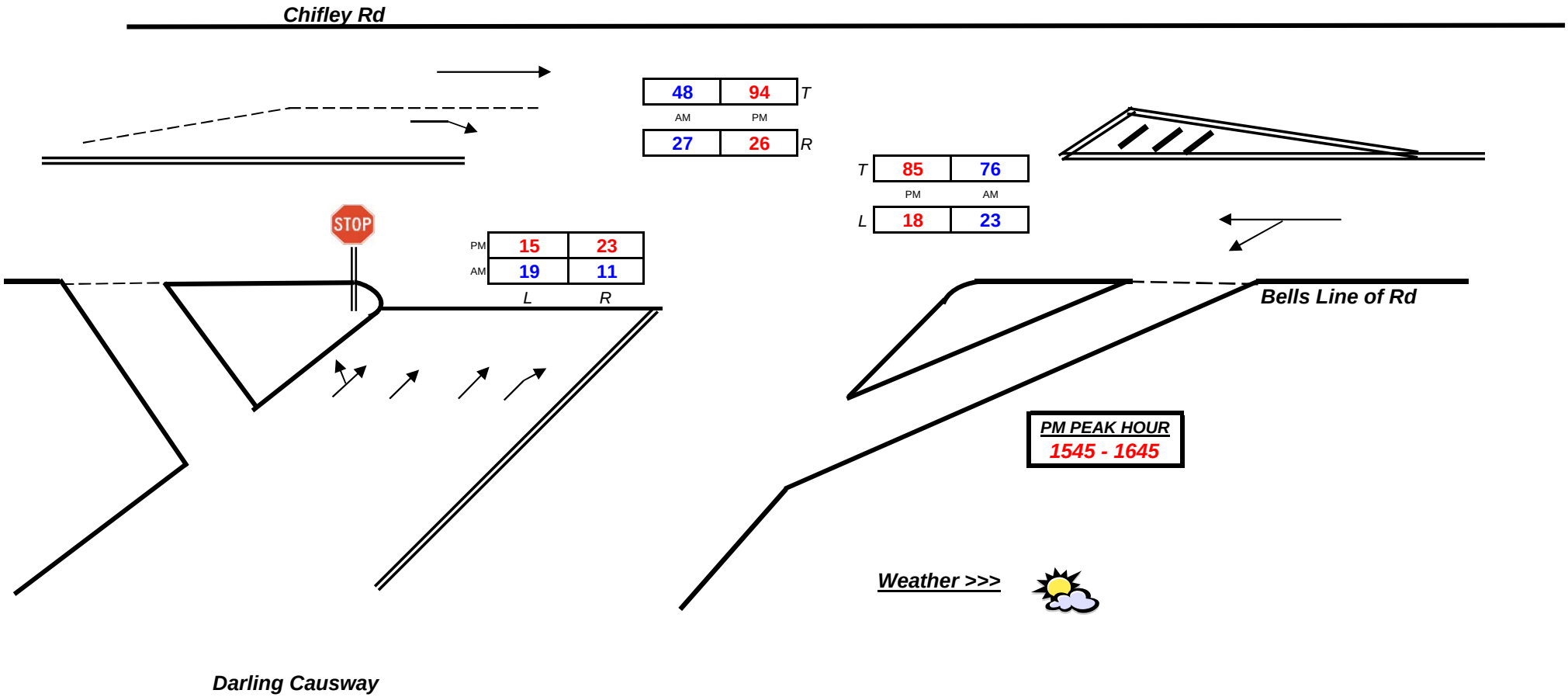
Ph.88196847, Mob.0418-239019

Client : EMM
Job No/Name : 7029 MT VICTORIA Clarence Colliery
Day/Date : Wednesday 27th February 2019

Intersection Layout
Obtained via satellite
May be incorrect

AM PEAK HOUR
0745 - 0845

Combined figures only



R.O.A.R. DATA

Reliable, Original & Authentic Results

Ph.88196847, Mob.0418-239019

Client : EMM
Job No/Name : 7029 MT VICTORIA Clarence Colliery
Day/Date : Wednesday 27th February 2019

PEDS	WEST	SOUTH	EAST	
Time Per	*Chifley Rd*	*Darling*	*Bells Line of*	TOT
0630 - 0645	0	0	0	**0**
0645 - 0700	0	0	0	**0**
0700 - 0715	0	0	0	**0**
0715 - 0730	0	0	0	**0**
0730 - 0745	0	0	0	**0**
0745 - 0800	0	0	0	**0**
0800 - 0815	0	0	0	**0**
0815 - 0830	0	0	0	**0**
0830 - 0845	0	0	0	**0**
0845 - 0900	0	0	0	**0**
Per End	**0**	**0**	**0**	**0**

PEDS	WEST	SOUTH	EAST	
Peak Per	*Chifley Rd*	*Darling*	*Bells Line of*	TOT
0630 - 0730	0	0	0	**0**
0645 - 0745	0	0	0	**0**
0700 - 0800	0	0	0	**0**
0715 - 0815	0	0	0	**0**
0730 - 0830	0	0	0	**0**
0745 - 0845	0	0	0	**0**
0800 - 0900	0	0	0	**0**
PEAK HR	**0**	**0**	**0**	**0**

Lights	WEST		SOUTH		EAST		
	Chifley Rd		*Darling Causway*		*Bells Line of Rd*		
Time Per	T	R	L	R	L	T	TOT
0630 - 0645	12	0	11	3	1	6	**33**
0645 - 0700	2	0	2	3	0	15	**22**
0700 - 0715	9	0	1	6	3	3	**22**
0715 - 0730	8	4	1	4	2	14	**33**
0730 - 0745	15	4	0	4	4	13	**40**
0745 - 0800	8	3	2	3	5	19	**40**
0800 - 0815	8	4	3	3	3	17	**38**
0815 - 0830	13	10	2	2	7	14	**48**
0830 - 0845	11	3	5	2	3	20	**44**
0845 - 0900	11	4	2	2	4	14	**37**
Per End	**97**	**32**	**29**	**32**	**32**	**135**	**357**

Heavies	WEST		SOUTH		EAST		
	Chifley Rd		*Darling Causway*		*Bells Line of Rd*		
Time Per	T	R	L	R	L	T	TOT
0630 - 0645	2	1	2	0	0	4	**9**
0645 - 0700	0	0	1	1	1	0	**3**
0700 - 0715	2	0	1	2	1	3	**9**
0715 - 0730	0	3	0	0	1	1	**5**
0730 - 0745	1	5	2	0	0	2	**10**
0745 - 0800	1	2	3	0	1	3	**10**
0800 - 0815	3	1	1	0	0	0	**5**
0815 - 0830	1	0	0	0	3	3	**7**
0830 - 0845	3	4	3	1	1	0	**12**
0845 - 0900	2	1	0	1	0	1	**5**
Per End	**15**	**17**	**13**	**5**	**8**	**17**	**75**

Combined	WEST		SOUTH		EAST		
	Chifley Rd		*Darling Causway*		*Bells Line of Rd*		
Time Per	T	R	L	R	L	T	TOT
0630 - 0645	14	1	13	3	1	10	**42**
0645 - 0700	2	0	3	4	1	15	**25**
0700 - 0715	11	0	2	8	4	6	**31**
0715 - 0730	8	7	1	4	3	15	**38**
0730 - 0745	16	9	2	4	4	15	**50**
0745 - 0800	9	5	5	3	6	22	**50**
0800 - 0815	11	5	4	3	3	17	**43**
0815 - 0830	14	10	2	2	10	17	**55**
0830 - 0845	14	7	8	3	4	20	**56**
0845 - 0900	13	5	2	3	4	15	**42**
Per End	**112**	**49**	**42**	**37**	**40**	**152**	**432**

Lights	WEST		SOUTH		EAST		
	Chifley Rd		*Darling Causway*		*Bells Line of Rd*		
Peak Per	T	R	L	R	L	T	TOT
0630 - 0730	31	4	15	16	6	38	**110**
0645 - 0745	34	8	4	17	9	45	**117**
0700 - 0800	40	11	4	17	14	49	**135**
0715 - 0815	39	15	6	14	14	63	**151**
0730 - 0830	44	21	7	12	19	63	**166**
0745 - 0845	40	20	12	10	18	70	**170**
0800 - 0900	43	21	12	9	17	65	**167**
PEAK HR	**40**	**20**	**12**	**10**	**18**	**70**	**170**

Heavies	WEST		SOUTH		EAST		
	Chifley Rd		*Darling Causway*		*Bells Line of Rd*		
Peak Per	T	R	L	R	L	T	TOT
0630 - 0730	4	4	4	3	3	8	**26**
0645 - 0745	3	8	4	3	3	6	**27**
0700 - 0800	4	10	6	2	3	9	**34**
0715 - 0815	5	11	6	0	2	6	**30**
0730 - 0830	6	8	6	0	4	8	**32**
0745 - 0845	8	7	7	1	5	6	**34**
0800 - 0900	9	6	4	2	4	4	**29**
PEAK HR	**8**	**7**	**7**	**1**	**5**	**6**	**34**

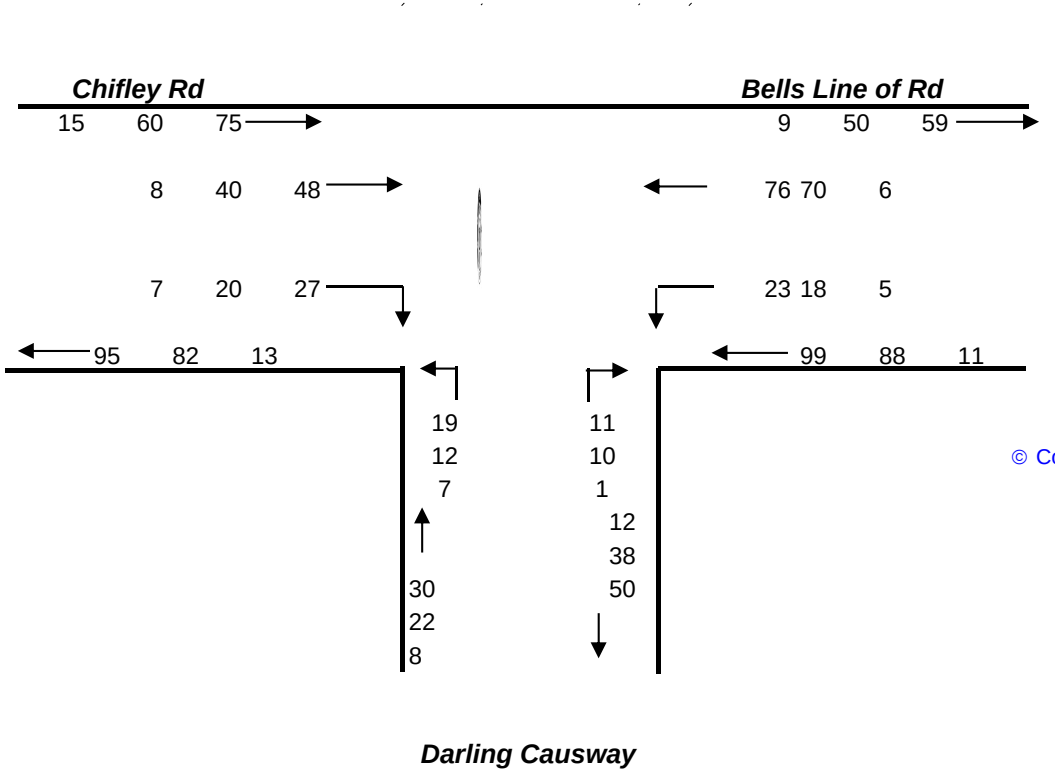
Combined	WEST		SOUTH		EAST		
	Chifley Rd		*Darling Causway*		*Bells Line of Rd*		
Peak Per	T	R	L	R	L	T	TOT
0630 - 0730	35	8	19	19	9	46	**136**
0645 - 0745	37	16	8	20	12	51	**144**
0700 - 0800	44	21	10	19	17	58	**169**
0715 - 0815	44	26	12	14	16	69	**181**
0730 - 0830	50	29	13	12	23	71	**198**
0745 - 0845	48	27	19	11	23	76	**204**
0800 - 0900	52	27	16	11	21	69	**196**
PEAK HR	**48**	**27**	**19**	**11**	**23**	**76**	**204**

R.O.A.R. DATA
Reliable, Original & Authentic Results
Ph.88196847, Mob.0418-239019

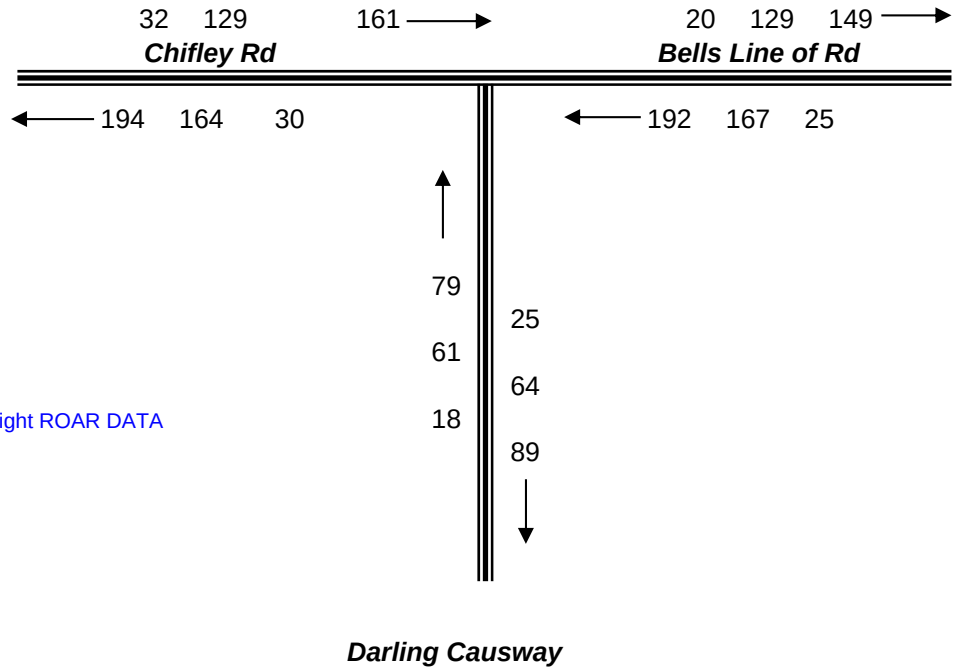
Client : EMM
Job No/Name : 7029 MT VICTORIA Clarence Colliery
Day/Date : Wednesday 27th February 2019

AM PEAK HOUR
0745 - 0845

TOTAL VOLUMES FOR COUNT PERIOD



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R.O.A.R. DATA

Reliable, Original & Authentic Results

Ph.88196847, Mob.0418-239019

Client : EMM
Job No/Name : 7029 MT VICTORIA Clarence Colliery
Day/Date : Wednesday 27th February 2019

PEDS	WEST	SOUTH	EAST	
Time Per	Chifley Rd	Darling	Bells Line of	TOT
1430 - 1445	0	0	0	0
1445 - 1500	0	0	0	0
1500 - 1515	0	0	0	0
1515 - 1530	0	0	0	0
1530 - 1545	0	0	0	0
1545 - 1600	0	0	0	0
1600 - 1615	0	0	0	0
1615 - 1630	0	0	0	0
1630 - 1645	0	0	0	0
1645 - 1700	0	0	0	0
1700 - 1715	0	0	0	0
1715 - 1730	0	0	0	0
1730 - 1745	0	0	0	0
1745 - 1800	0	0	0	0
Per End	0	0	0	0

PEDS	WEST	SOUTH	EAST	
Peak Per	Chifley Rd	Darling	Bells Line of	TOT
1430 - 1530	0	0	0	0
1445 - 1545	0	0	0	0
1500 - 1600	0	0	0	0
1515 - 1615	0	0	0	0
1530 - 1630	0	0	0	0
1545 - 1645	0	0	0	0
1600 - 1700	0	0	0	0
1615 - 1715	0	0	0	0
1630 - 1730	0	0	0	0
1645 - 1745	0	0	0	0
1700 - 1800	0	0	0	0
PEAK HR	0	0	0	0

Lights	WEST		SOUTH		EAST		
	Chifley Rd		Darling		Bells Line of		
Time Per	T	R	L	R	L	T	TOT
1430 - 1445	15	6	0	9	4	13	47
1445 - 1500	18	2	1	8	5	19	53
1500 - 1515	26	4	2	2	4	14	52
1515 - 1530	18	5	2	9	6	19	59
1530 - 1545	16	3	2	6	6	14	47
1545 - 1600	37	5	3	8	1	20	74
1600 - 1615	16	8	0	6	5	13	48
1615 - 1630	18	4	7	1	7	28	65
1630 - 1645	16	4	1	8	5	22	56
1645 - 1700	10	4	3	0	4	10	31
1700 - 1715	13	4	2	4	6	17	46
1715 - 1730	17	7	2	1	1	13	41
1730 - 1745	15	4	0	2	4	15	40
1745 - 1800	12	2	1	1	6	14	36
Per End	247	62	26	65	64	231	695

Heavies	WEST		SOUTH		EAST		
	Chifley Rd		Darling		Bells Line of		
Time Per	T	R	L	R	L	T	TOT
1430 - 1445	0	3	2	0	1	4	10
1445 - 1500	5	0	0	0	0	1	6
1500 - 1515	4	0	1	0	0	0	5
1515 - 1530	2	0	0	0	0	1	3
1530 - 1545	0	0	3	0	0	1	4
1545 - 1600	1	1	1	0	0	1	4
1600 - 1615	1	2	1	0	0	0	4
1615 - 1630	3	1	2	0	0	1	7
1630 - 1645	2	1	0	0	0	0	3
1645 - 1700	3	1	0	0	0	0	4
1700 - 1715	2	0	0	0	0	0	2
1715 - 1730	0	0	0	0	0	1	1
1730 - 1745	1	0	1	0	1	0	3
1745 - 1800	0	0	3	0	0	0	3
Per End	24	9	14	0	2	10	59

Combined	WEST		SOUTH		EAST		
	Chifley Rd		Darling		Bells Line of		
Time Per	T	R	L	R	L	T	TOT
1430 - 1445	15	9	2	9	5	17	57
1445 - 1500	23	2	1	8	5	20	59
1500 - 1515	30	4	3	2	4	14	57
1515 - 1530	20	5	2	9	6	20	62
1530 - 1545	16	3	5	6	6	15	51
1545 - 1600	38	6	4	8	1	21	78
1600 - 1615	17	10	1	6	5	13	52
1615 - 1630	21	5	9	1	7	29	72
1630 - 1645	18	5	1	8	5	22	59
1645 - 1700	13	5	3	0	4	10	35
1700 - 1715	15	4	2	4	6	17	48
1715 - 1730	17	7	2	1	1	14	42
1730 - 1745	16	4	1	2	5	15	43
1745 - 1800	12	2	4	1	6	14	39
Per End	271	71	40	65	66	241	754

Lights	WEST		SOUTH		EAST		
	Chifley Rd		Darling		Bells Line of		
Peak Per	T	R	L	R	L	T	TOT
1430 - 1530	77	17	5	28	19	65	211
1445 - 1545	78	14	7	25	21	66	211
1500 - 1600	97	17	9	25	17	67	232
1515 - 1615	87	21	7	29	18	66	228
1530 - 1630	87	20	12	21	19	75	234
1545 - 1645	87	21	11	23	18	83	243
1600 - 1700	60	20	11	15	21	73	200
1615 - 1715	57	16	13	13	22	77	198
1630 - 1730	56	19	8	13	16	62	174
1645 - 1745	55	19	7	7	15	55	158
1700 - 1800	57	17	5	8	17	59	163
PEAK HR	87	21	11	23	18	83	243

Heavies	WEST		SOUTH		EAST		
	Chifley Rd		Darling		Bells Line of		
Peak Per	T	R	L	R	L	T	TOT
1430 - 1530	11	3	3	0	1	6	24
1445 - 1545	11	0	4	0	0	3	18
1500 - 1600	7	1	5	0	0	3	16
1515 - 1615	4	3	5	0	0	3	15
1530 - 1630	5	4	7	0	0	3	19
1545 - 1645	7	5	4	0	0	2	18
1600 - 1700	9	5	3	0	0	1	18
1615 - 1715	10	3	2	0	0	1	16
1630 - 1730	7	2	0	0	0	1	10
1645 - 1745	6	1	1	0	1	1	10
1700 - 1800	3	0	4	0	1	1	9
PEAK HR	7	5	4	0	0	2	18

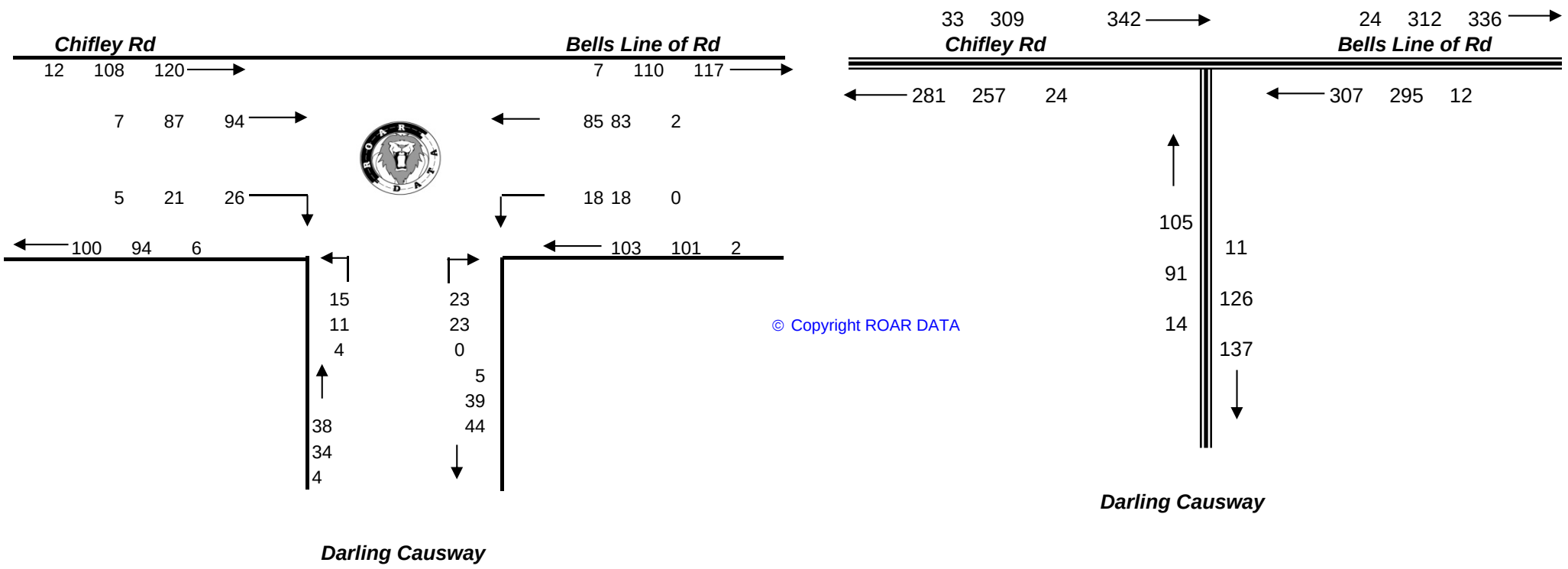
Combined	WEST		SOUTH		EAST		
	Chifley Rd		Darling		Bells Line of		
Peak Per	T	R	L	R	L	T	TOT
1430 - 1530	88	20	8	28	20	71	235
1445 - 1545	89	14	11	25	21	69	229
1500 - 1600	104	18	14	25	17	70	248
1515 - 1615	91	24	12	29	18	69	243
1530 - 1630	92	24	19	21	19	78	253
1545 - 1645	94	26	15	23	18	85	261
1600 - 1700	69	25	14	15	21	74	218
1615 - 1715	67	19	15	13	22	78	214
1630 - 1730	63	21	8	13	16	63	184
1645 - 1745	61	20	8	7	16	56	168
1700 - 1800	60	17	9	8	18	60	172
PEAK HR	94	26	15	23	18	85	261

R.O.A.R. DATA
Reliable, Original & Authentic Results
Ph.88196847, Mob.0418-239019

Client : EMM
Job No/Name : 7029 MT VICTORIA Clarence Colliery
Day/Date : Wednesday 27th February 2019

PM PEAK HOUR
1545 - 1645

TOTAL VOLUMES FOR COUNT PERIOD



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R.O.A.R. DATA

Reliable, Original & Authentic Results

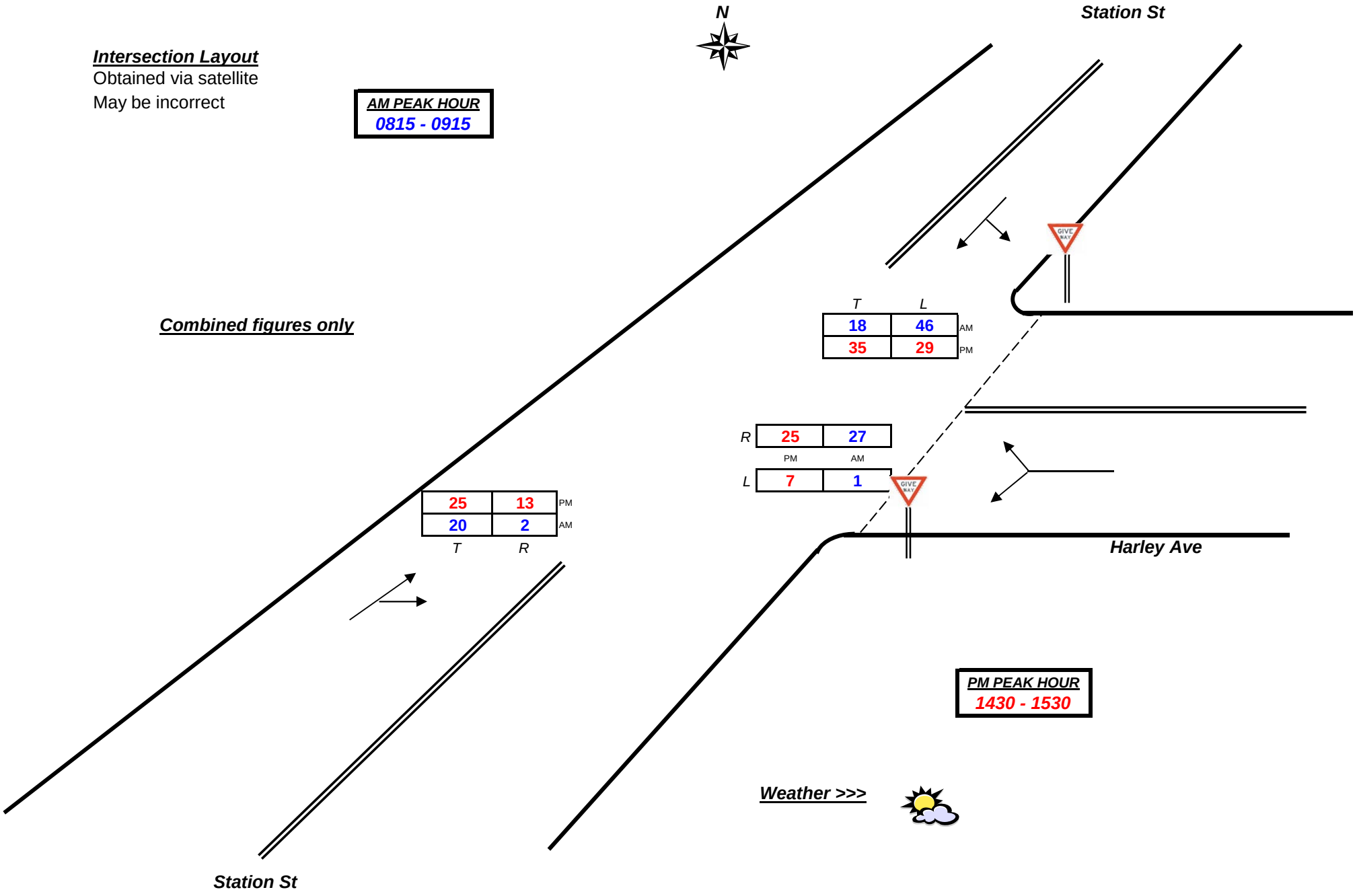
Ph.88196847, Mob.0418-239019

Client : EMM
Job No/Name : 7029 MT VICTORIA Clarence Colliery
Day/Date : Wednesday 27th February 2019

Intersection Layout
Obtained via satellite
May be incorrect

AM PEAK HOUR
0815 - 0915

Combined figures only



PM PEAK HOUR
1430 - 1530

Weather >>>

R.O.A.R. DATA

Reliable, Original & Authentic Results

Ph.88196847, Mob.0418-239019

Client : EMM
Job No/Name : 7029 MT VICTORIA Clarence Colliery
Day/Date : Wednesday 27th February 2019

PEDS	NORTH	EAST	SOUTH	
Time Per	*Station St*	*Harley Ave*	*Station St*	TOT
0700 - 0715	1	0	0	**1**
0715 - 0730	0	1	0	**1**
0730 - 0745	0	0	0	**0**
0745 - 0800	0	0	0	**0**
0800 - 0815	0	0	1	**1**
0815 - 0830	0	1	1	**2**
0830 - 0845	0	0	0	**0**
0845 - 0900	0	0	1	**1**
0900 - 0915	0	0	0	**0**
0915 - 0930	0	0	1	**1**
Per End	**1**	**2**	**4**	**7**

PEDS	NORTH	EAST	SOUTH	
Peak Per	*Station St*	*Harley Ave*	*Station St*	TOT
0700 - 0800	1	1	0	**2**
0715 - 0815	0	1	1	**2**
0730 - 0830	0	1	2	**3**
0745 - 0845	0	1	2	**3**
0800 - 0900	0	1	3	**4**
0815 - 0915	0	1	2	**3**
0830 - 0930	0	0	2	**2**
PEAK HR	**0**	**1**	**2**	**3**

Lights	NORTH		EAST		SOUTH		
	Station St		*Harley Ave*		*Station St*		
Time Per	T	L	R	L	R	T	TOT
0700 - 0715	1	1	5	0	0	5	**12**
0715 - 0730	4	2	4	0	0	6	**16**
0730 - 0745	1	4	5	0	0	4	**14**
0745 - 0800	1	5	3	2	3	3	**17**
0800 - 0815	2	8	4	1	2	6	**23**
0815 - 0830	4	12	4	1	0	6	**27**
0830 - 0845	1	4	5	0	2	2	**14**
0845 - 0900	1	11	6	0	0	4	**22**
0900 - 0915	6	12	11	0	0	3	**32**
0915 - 0930	7	5	7	2	4	1	**26**
Per End	**28**	**64**	**54**	**6**	**11**	**40**	**203**

Heavies	NORTH		EAST		SOUTH		
	Station St		*Harley Ave*		*Station St*		
Time Per	T	L	R	L	R	T	TOT
0700 - 0715	0	2	0	0	0	0	**2**
0715 - 0730	0	0	1	0	0	2	**3**
0730 - 0745	2	0	1	0	0	1	**4**
0745 - 0800	0	3	2	0	0	0	**5**
0800 - 0815	1	1	0	0	0	0	**2**
0815 - 0830	2	3	1	0	0	2	**8**
0830 - 0845	0	0	0	0	0	0	**0**
0845 - 0900	1	0	0	0	0	1	**2**
0900 - 0915	3	4	0	0	0	2	**9**
0915 - 0930	0	0	0	0	1	1	**2**
Per End	**9**	**13**	**5**	**0**	**1**	**9**	**37**

Combined	NORTH		EAST		SOUTH		
	Station St		*Harley Ave*		*Station St*		
Time Per	T	L	R	L	R	T	TOT
0700 - 0715	1	3	5	0	0	5	**14**
0715 - 0730	4	2	5	0	0	8	**19**
0730 - 0745	3	4	6	0	0	5	**18**
0745 - 0800	1	8	5	2	3	3	**22**
0800 - 0815	3	9	4	1	2	6	**25**
0815 - 0830	6	15	5	1	0	8	**35**
0830 - 0845	1	4	5	0	2	2	**14**
0845 - 0900	2	11	6	0	0	5	**24**
0900 - 0915	9	16	11	0	0	5	**41**
0915 - 0930	7	5	7	2	5	2	**28**
Per End	**37**	**77**	**59**	**6**	**12**	**49**	**240**

Lights	NORTH		EAST		SOUTH		
	Station St		*Harley Ave*		*Station St*		
Peak Per	T	L	R	L	R	T	TOT
0700 - 0800	7	12	17	2	3	18	**59**
0715 - 0815	8	19	16	3	5	19	**70**
0730 - 0830	8	29	16	4	5	19	**81**
0745 - 0845	8	29	16	4	7	17	**81**
0800 - 0900	8	35	19	2	4	18	**86**
0815 - 0915	12	39	26	1	2	15	**95**
0830 - 0930	15	32	29	2	6	10	**94**
PEAK HR	**12**	**39**	**26**	**1**	**2**	**15**	**95**

Heavies	NORTH		EAST		SOUTH		
	Station St		*Harley Ave*		*Station St*		
Peak Per	T	L	R	L	R	T	TOT
0700 - 0800	2	5	4	0	0	3	**14**
0715 - 0815	3	4	4	0	0	3	**14**
0730 - 0830	5	7	4	0	0	3	**19**
0745 - 0845	3	7	3	0	0	2	**15**
0800 - 0900	4	4	1	0	0	3	**12**
0815 - 0915	6	7	1	0	0	5	**19**
0830 - 0930	4	4	0	0	1	4	**13**
PEAK HR	**6**	**7**	**1**	**0**	**0**	**5**	**19**

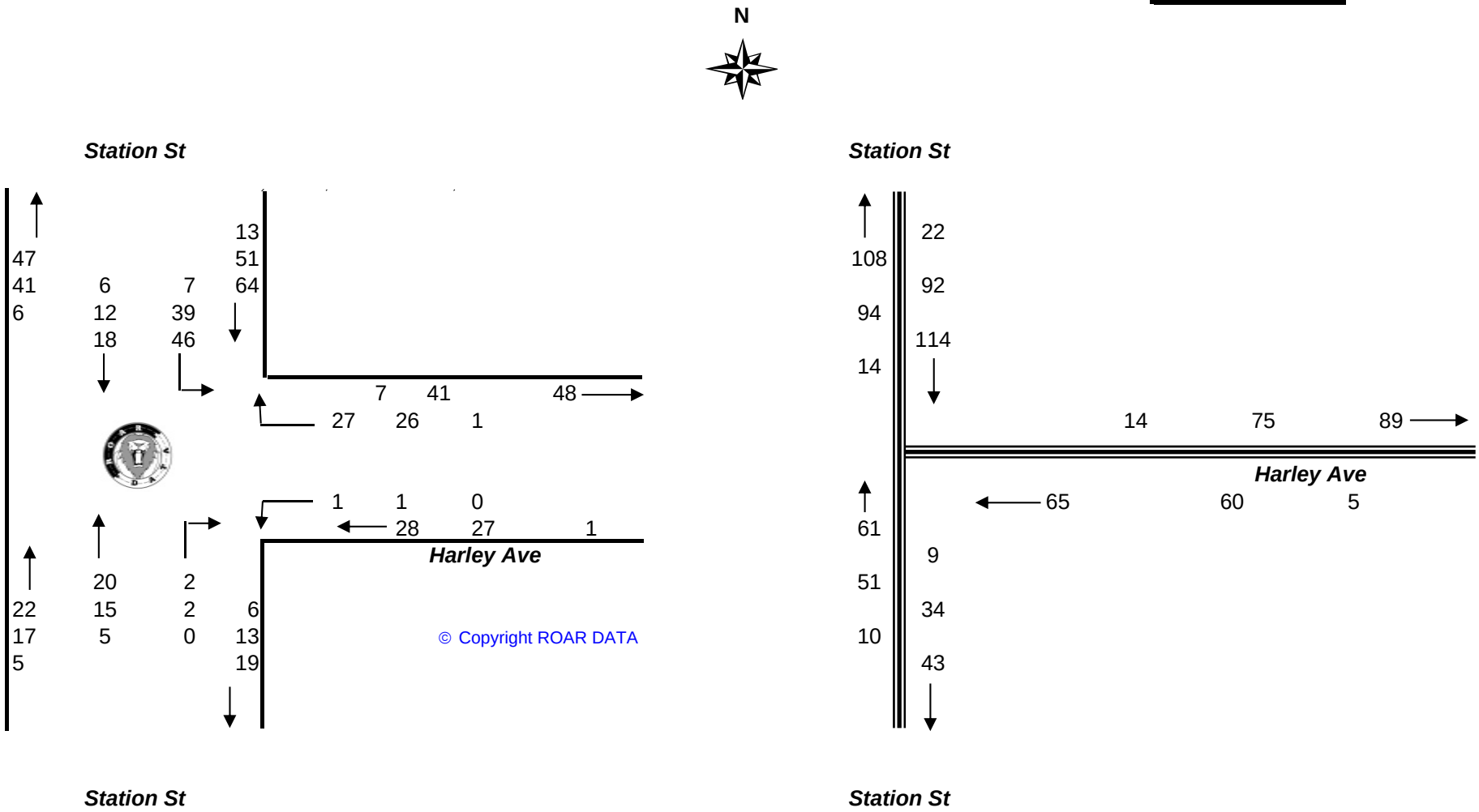
Combined	NORTH		EAST		SOUTH		
	Station St		*Harley Ave*		*Station St*		
Peak Per	T	L	R	L	R	T	TOT
0700 - 0800	9	17	21	2	3	21	**73**
0715 - 0815	11	23	20	3	5	22	**84**
0730 - 0830	13	36	20	4	5	22	**100**
0745 - 0845	11	36	19	4	7	19	**96**
0800 - 0900	12	39	20	2	4	21	**98**
0815 - 0915	18	46	27	1	2	20	**114**
0830 - 0930	19	36	29	2	7	14	**107**
PEAK HR	**18**	**46**	**27**	**1**	**2**	**20**	**114**

R.O.A.R. DATA
Reliable, Original & Authentic Results
Ph.88196847, Mob.0418-239019

Client : EMM
Job No/Name : 7029 MT VICTORIA Clarence Colliery
Day/Date : Wednesday 27th February 2019

AM PEAK HOUR
0815 - 0915

TOTAL VOLUMES FOR COUNT PERIOD



R.O.A.R. DATA

Reliable, Original & Authentic Results

Ph.88196847, Mob.0418-239019

Client : EMM
Job No/Name : 7029 MT VICTORIA Clarence Colliery
Day/Date : Wednesday 27th February 2019

PEDS

Time Per	NORTH Station St	EAST Harley Ave	SOUTH Station St	TOT
1430 - 1445	3	0	0	**3**
1445 - 1500	4	0	0	**4**
1500 - 1515	5	2	0	**7**
1515 - 1530	1	0	1	**2**
1530 - 1545	7	0	0	**7**
1545 - 1600	0	0	0	**0**
1600 - 1615	0	6	6	**12**
1615 - 1630	0	0	0	**0**
1630 - 1645	0	0	0	**0**
1645 - 1700	0	0	0	**0**
1700 - 1715	2	0	0	**2**
1715 - 1730	0	0	0	**0**
1730 - 1745	0	1	0	**1**
1745 - 1800	0	0	2	**2**
Per End	**22**	**9**	**9**	**40**

PEDS

Peak Per	NORTH Station St	EAST Harley Ave	SOUTH Station St	TOT
1430 - 1530	13	2	1	**16**
1445 - 1545	17	2	1	**20**
1500 - 1600	13	2	1	**16**
1515 - 1615	8	6	7	**21**
1530 - 1630	7	6	6	**19**
1545 - 1645	0	6	6	**12**
1600 - 1700	0	6	6	**12**
1615 - 1715	2	0	0	**2**
1630 - 1730	2	0	0	**2**
1645 - 1745	2	1	0	**3**
1700 - 1800	2	1	2	**5**
PEAK HR	**13**	**2**	**1**	**16**

Lights

Time Per	NORTH Station St T	NORTH Station St L	EAST Harley Ave R	EAST Harley Ave L	SOUTH Station St R	SOUTH Station St T	TOT
1430 - 1445	15	11	8	1	3	5	**43**
1445 - 1500	6	2	8	0	1	6	**23**
1500 - 1515	7	4	1	2	7	7	**28**
1515 - 1530	5	9	4	4	1	7	**30**
1530 - 1545	6	10	4	1	1	10	**32**
1545 - 1600	1	9	5	2	4	5	**26**
1600 - 1615	6	6	6	2	2	5	**27**
1615 - 1630	1	12	7	1	1	6	**28**
1630 - 1645	6	7	5	1	0	7	**26**
1645 - 1700	2	6	3	0	2	5	**18**
1700 - 1715	5	8	8	0	5	3	**29**
1715 - 1730	3	6	2	1	1	4	**17**
1730 - 1745	8	6	6	0	1	4	**25**
1745 - 1800	4	7	7	1	0	2	**21**
Per End	**75**	**103**	**74**	**16**	**29**	**76**	**373**

Heavies

Time Per	NORTH Station St T	NORTH Station St L	EAST Harley Ave R	EAST Harley Ave L	SOUTH Station St R	SOUTH Station St T	TOT
1430 - 1445	1	2	0	0	0	0	**3**
1445 - 1500	1	1	1	0	1	0	**4**
1500 - 1515	0	0	0	0	0	0	**0**
1515 - 1530	0	0	3	0	0	0	**3**
1530 - 1545	0	0	0	0	0	0	**0**
1545 - 1600	1	1	1	0	0	0	**3**
1600 - 1615	0	0	2	0	0	0	**2**
1615 - 1630	0	3	1	0	0	0	**4**
1630 - 1645	0	1	0	0	0	0	**1**
1645 - 1700	0	0	0	0	0	0	**0**
1700 - 1715	0	0	0	0	0	0	**0**
1715 - 1730	0	0	0	0	0	0	**0**
1730 - 1745	0	0	5	0	0	0	**5**
1745 - 1800	0	1	0	0	0	0	**1**
Per End	**3**	**9**	**13**	**0**	**1**	**0**	**26**

Combined

Time Per	NORTH Station St T	NORTH Station St L	EAST Harley Ave R	EAST Harley Ave L	SOUTH Station St R	SOUTH Station St T	TOT
1430 - 1445	16	13	8	1	3	5	**46**
1445 - 1500	7	3	9	0	2	6	**27**
1500 - 1515	7	4	1	2	7	7	**28**
1515 - 1530	5	9	7	4	1	7	**33**
1530 - 1545	6	10	4	1	1	10	**32**
1545 - 1600	2	10	6	2	4	5	**29**
1600 - 1615	6	6	8	2	2	5	**29**
1615 - 1630	1	15	8	1	1	6	**32**
1630 - 1645	6	8	5	1	0	7	**27**
1645 - 1700	2	6	3	0	2	5	**18**
1700 - 1715	5	8	8	0	5	3	**29**
1715 - 1730	3	6	2	1	1	4	**17**
1730 - 1745	8	6	11	0	1	4	**30**
1745 - 1800	4	8	7	1	0	2	**22**
Per End	**78**	**112**	**87**	**16**	**30**	**76**	**399**

Lights

Peak Per	NORTH Station St T	NORTH Station St L	EAST Harley Ave R	EAST Harley Ave L	SOUTH Station St R	SOUTH Station St T	TOT
1430 - 1530	33	26	21	7	12	25	**124**
1445 - 1545	24	25	17	7	10	30	**113**
1500 - 1600	19	32	14	9	13	29	**116**
1515 - 1615	18	34	19	9	8	27	**115**
1530 - 1630	14	37	22	6	8	26	**113**
1545 - 1645	14	34	23	6	7	23	**107**
1600 - 1700	15	31	21	4	5	23	**99**
1615 - 1715	14	33	23	2	8	21	**101**
1630 - 1730	16	27	18	2	8	19	**90**
1645 - 1745	18	26	19	1	9	16	**89**
1700 - 1800	20	27	23	2	7	13	**92**
PEAK HR	**33**	**26**	**21**	**7**	**12**	**25**	**124**

Heavies

Peak Per	NORTH Station St T	NORTH Station St L	EAST Harley Ave R	EAST Harley Ave L	SOUTH Station St R	SOUTH Station St T	TOT
1430 - 1530	2	3	4	0	1	0	**10**
1445 - 1545	1	1	4	0	1	0	**7**
1500 - 1600	1	1	4	0	0	0	**6**
1515 - 1615	1	1	6	0	0	0	**8**
1530 - 1630	1	4	4	0	0	0	**9**
1545 - 1645	1	5	4	0	0	0	**10**
1600 - 1700	0	4	3	0	0	0	**7**
1615 - 1715	0	4	1	0	0	0	**5**
1630 - 1730	0	1	0	0	0	0	**1**
1645 - 1745	0	0	5	0	0	0	**5**
1700 - 1800	0	1	5	0	0	0	**6**
PEAK HR	**2**	**3**	**4**	**0**	**1**	**0**	**10**

Combined

Peak Per	NORTH Station St T	NORTH Station St L	EAST Harley Ave R	EAST Harley Ave L	SOUTH Station St R	SOUTH Station St T	TOT
1430 - 1530	35	29	25	7	13	25	**134**
1445 - 1545	25	26	21	7	11	30	**120**
1500 - 1600	20	33	18	9	13	29	**122**
1515 - 1615	19	35	25	9	8	27	**123**
1530 - 1630	15	41	26	6	8	26	**122**
1545 - 1645	15	39	27	6	7	23	**117**
1600 - 1700	15	35	24	4	5	23	**106**
1615 - 1715	14	37	24	2	8	21	**106**
1630 - 1730	16	28	18	2	8	19	**91**
1645 - 1745	18	26	24	1	9	16	**94**
1700 - 1800	20	28	28	2	7	13	**98**
PEAK HR	**35**	**29**	**25**	**7**	**13**	**25**	**134**

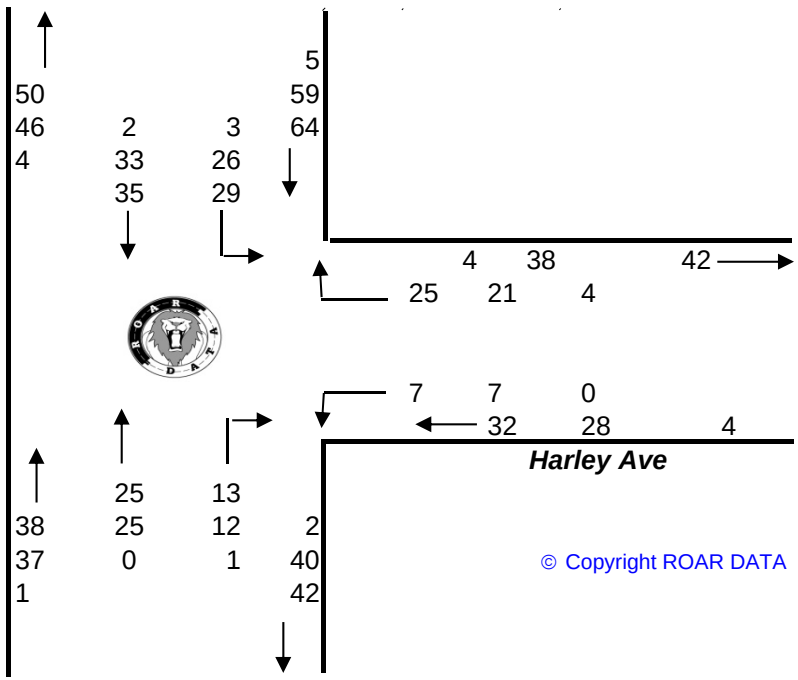
R.O.A.R. DATA
Reliable, Original & Authentic Results
Ph.88196847, Mob.0418-239019

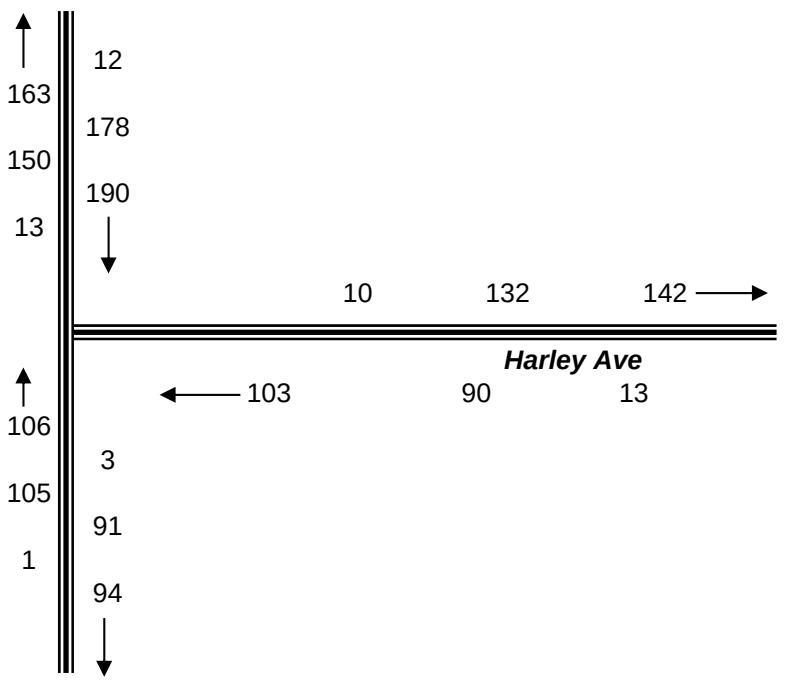
Client : EMM
Job No/Name : 7029 MT VICTORIA Clarence Colliery
Day/Date : Wednesday 27th February 2019

PM PEAK HOUR
1430 - 1530

TOTAL VOLUMES FOR COUNT PERIOD

N








Appendix C

SIDRA existing morning and afternoon traffic volume

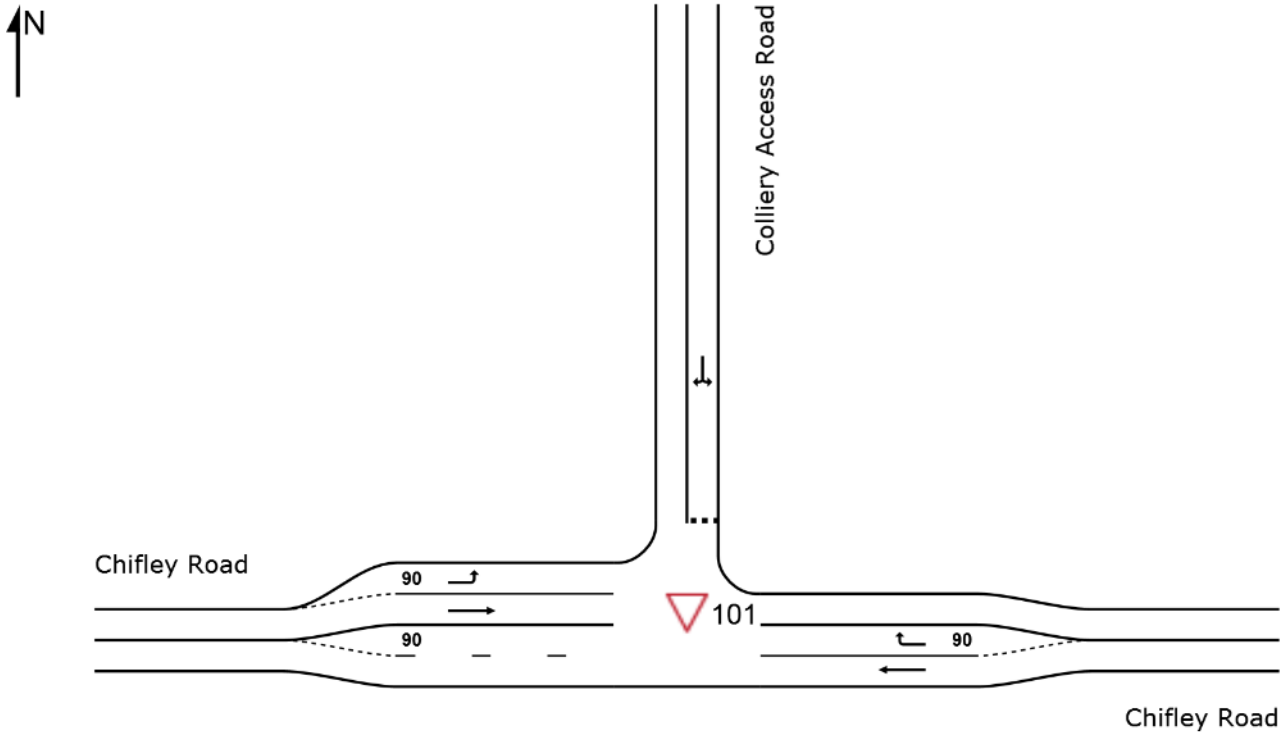





SITE LAYOUT

Site: 101 [Colliery Access Road Intersection AM peak]

Existing Intersection
Site Category: (None)
Giveway / Yield (Two-Way)



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MOVEMENT SUMMARY

Site: 101 [Colliery Access Road Intersection AM peak]

Existing Intersection
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Chifley Road												
5	T1	84	3.8	0.044	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	80.0
6	R2	8	62.5	0.009	8.5	LOS A	0.0	0.4	0.24	0.60	0.24	52.2
Approach		93	9.1	0.044	0.8	NA	0.0	0.4	0.02	0.05	0.02	76.3
North: Colliery Access Road												
7	L2	12	63.6	0.049	5.7	LOS A	0.2	1.6	0.29	0.55	0.29	41.8
9	R2	28	14.8	0.049	6.2	LOS A	0.2	1.6	0.29	0.55	0.29	49.9
Approach		40	28.9	0.049	6.1	LOS A	0.2	1.6	0.29	0.55	0.29	47.2
West: Chifley Road												
10	L2	16	13.3	0.009	7.2	LOS A	0.0	0.0	0.00	0.63	0.00	61.1
11	T1	88	9.5	0.048	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	80.0
Approach		104	10.1	0.048	1.1	NA	0.0	0.0	0.00	0.10	0.00	76.4
All Vehicles		237	12.9	0.049	1.8	NA	0.2	1.6	0.06	0.16	0.06	69.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Colliery Access Road Intersection PM peak]

Existing Intersection
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

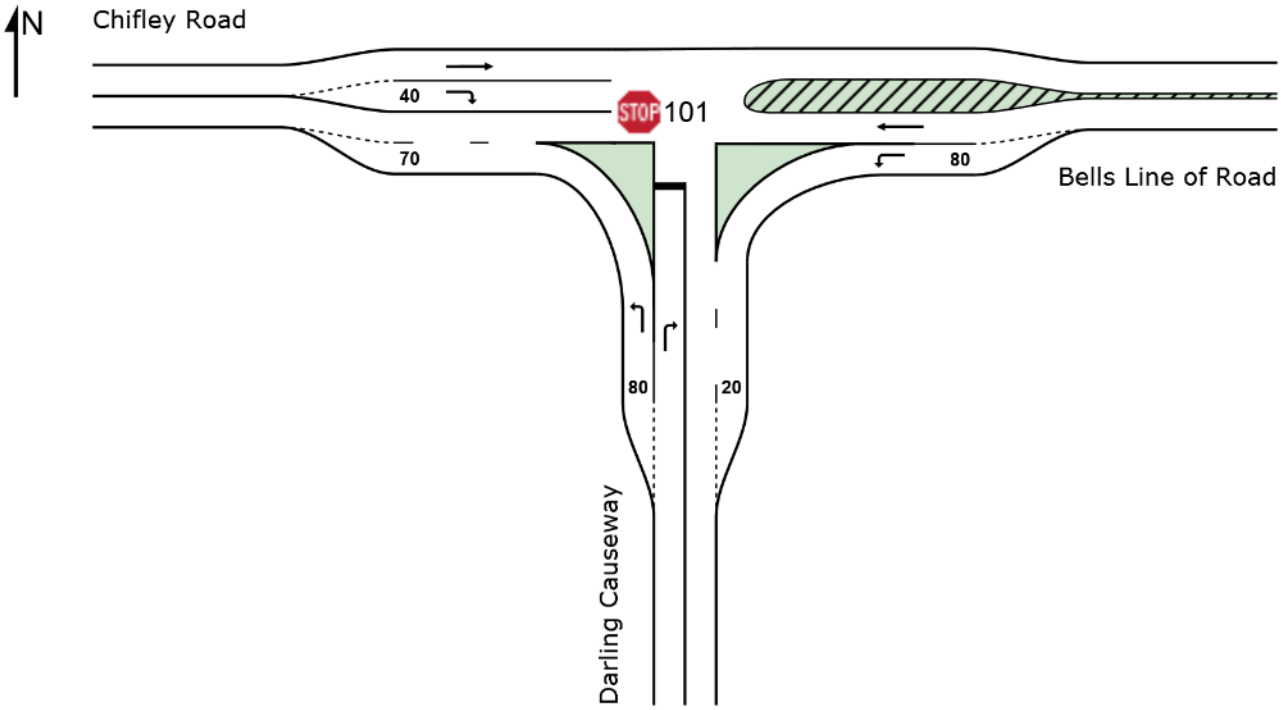
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Chifley Road												
5	T1	118	2.7	0.062	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	80.0
6	R2	9	100.0	0.012	8.5	LOS A	0.0	0.6	0.27	0.60	0.27	52.4
Approach		127	9.9	0.062	0.6	NA	0.0	0.6	0.02	0.04	0.02	77.0
North: Colliery Access Road												
7	L2	14	53.8	0.081	5.7	LOS A	0.3	2.5	0.34	0.58	0.34	43.0
9	R2	51	8.3	0.081	6.5	LOS A	0.3	2.5	0.34	0.58	0.34	50.9
Approach		64	18.0	0.081	6.4	LOS A	0.3	2.5	0.34	0.58	0.34	49.0
West: Chifley Road												
10	L2	4	25.0	0.003	7.4	LOS A	0.0	0.0	0.00	0.63	0.00	57.8
11	T1	106	7.9	0.057	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	80.0
Approach		111	8.6	0.057	0.3	NA	0.0	0.0	0.00	0.02	0.00	78.8
All Vehicles		302	11.1	0.081	1.7	NA	0.3	2.5	0.08	0.15	0.08	69.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 101 [Intersection at Bell AM peak]

New Site
Site Category: (None)
Stop (Two-Way)



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Organisation: EMM CONSULTING | Created: Friday, 8 March 2019 4:45:59 PM
Project: P:\SIDRA RESULTS\Clarence Colliery Road Haulage\Existing Intersection Results.sip8

MOVEMENT SUMMARY

Site: 101 [Intersection at Bell AM peak]

New Site
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Darling Causeway												
1	L2	20	36.8	0.014	6.0	LOS A	0.0	0.0	0.00	0.51	0.00	53.7
3	R2	12	9.1	0.014	9.6	LOS A	0.1	0.4	0.32	0.86	0.32	51.0
Approach		32	26.7	0.014	7.3	LOS A	0.1	0.4	0.12	0.64	0.12	52.7
East: Bells Line of Road												
4	L2	24	21.7	0.015	5.8	LOS A	0.0	0.0	0.00	0.52	0.00	54.2
5	T1	80	7.9	0.043	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach		104	11.1	0.043	1.4	NA	0.0	0.0	0.00	0.12	0.00	58.5
West: Chifley Road												
11	T1	51	16.7	0.029	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
12	R2	28	25.9	0.019	6.1	LOS A	0.1	0.7	0.19	0.53	0.19	51.9
Approach		79	20.0	0.029	2.2	NA	0.1	0.7	0.07	0.19	0.07	56.8
All Vehicles		215	16.7	0.043	2.5	NA	0.1	0.7	0.04	0.22	0.04	57.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Intersection at Bell PM peak]

New Site
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Darling Causeway												
1	L2	16	26.7	0.010	5.9	LOS A	0.0	0.0	0.00	0.51	0.00	54.0
3	R2	24	0.0	0.029	9.5	LOS A	0.1	0.8	0.36	0.86	0.36	51.2
Approach		40	10.5	0.029	8.1	LOS A	0.1	0.8	0.22	0.72	0.22	52.3
East: Bells Line of Road												
4	L2	19	0.0	0.010	5.6	LOS A	0.0	0.0	0.00	0.53	0.00	54.9
5	T1	89	2.4	0.047	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach		108	1.9	0.047	1.0	NA	0.0	0.0	0.00	0.09	0.00	59.0
West: Chifley Road												
11	T1	99	7.4	0.054	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
12	R2	27	19.2	0.018	6.1	LOS A	0.1	0.7	0.20	0.53	0.20	52.2
Approach		126	10.0	0.054	1.3	NA	0.1	0.7	0.04	0.11	0.04	58.1
All Vehicles		275	6.9	0.054	2.2	NA	0.1	0.8	0.05	0.19	0.05	57.5

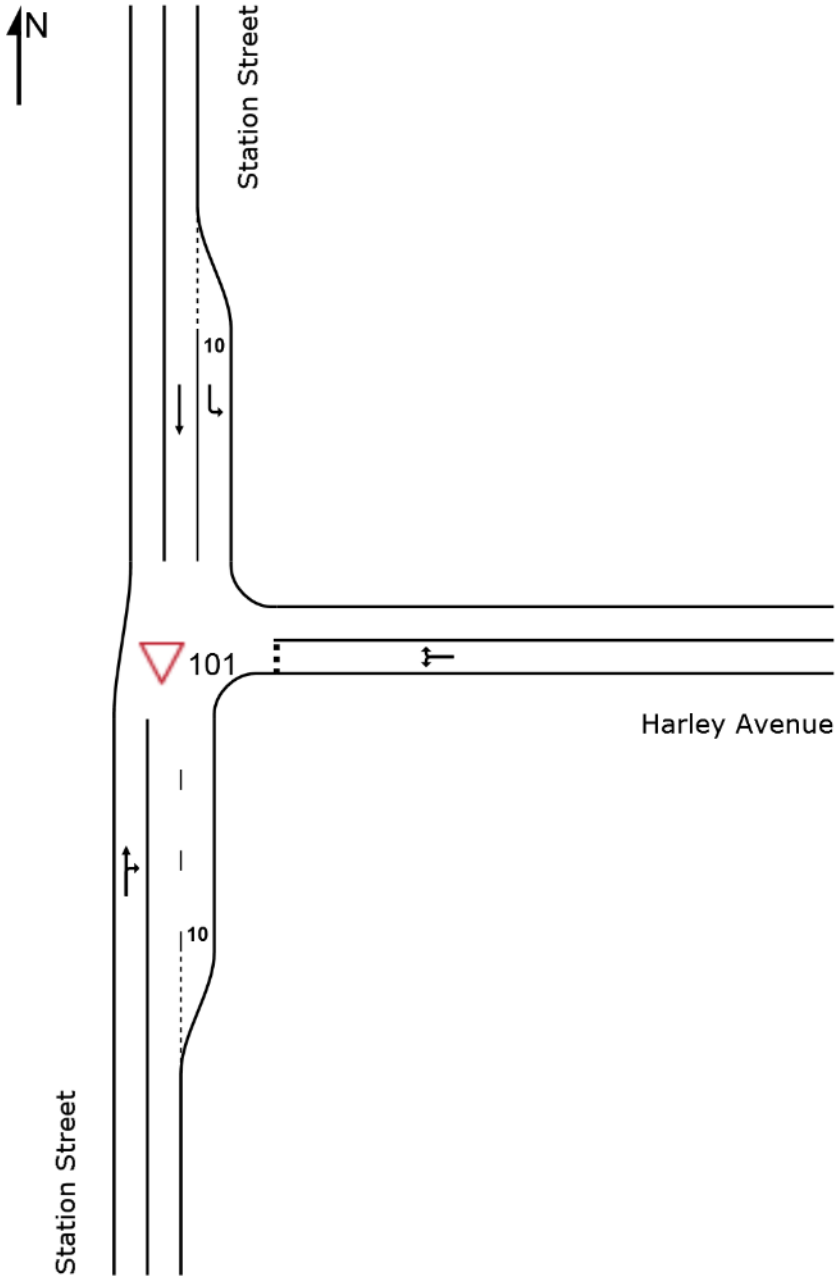
Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 101 [Intersection at Mount Victoria AM Peak]

Existing Intersection

Site Category: (None)
Giveway / Yield (Two-Way)



MOVEMENT SUMMARY

Site: 101 [Intersection at Mount Victoria AM Peak]

Existing Intersection

Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Station Street												
2	T1	21	25.0	0.014	0.0	LOS A	0.0	0.1	0.03	0.05	0.03	59.2
3	R2	2	0.0	0.014	5.8	LOS A	0.0	0.1	0.03	0.05	0.03	53.1
Approach		23	22.7	0.014	0.6	NA	0.0	0.1	0.03	0.05	0.03	58.6
East: Harley Avenue												
4	L2	1	0.0	0.027	4.6	LOS A	0.1	0.7	0.17	0.51	0.17	49.4
6	R2	28	3.7	0.027	5.0	LOS A	0.1	0.7	0.17	0.51	0.17	49.0
Approach		29	3.6	0.027	5.0	LOS A	0.1	0.7	0.17	0.51	0.17	49.0
North: Station Street												
7	L2	48	15.2	0.029	5.7	LOS A	0.0	0.0	0.00	0.57	0.00	53.0
8	T1	19	33.3	0.012	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach		67	20.3	0.029	4.1	NA	0.0	0.0	0.00	0.41	0.00	54.8
All Vehicles		120	16.7	0.029	3.6	NA	0.1	0.7	0.05	0.37	0.05	53.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Intersection at Mount Victoria PM Peak]

Existing Intersection

Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Station Street												
2	T1	26	0.0	0.025	0.1	LOS A	0.1	0.6	0.11	0.19	0.11	57.8
3	R2	14	7.7	0.025	5.9	LOS A	0.1	0.6	0.11	0.19	0.11	51.9
Approach		40	2.6	0.025	2.1	NA	0.1	0.6	0.11	0.19	0.11	55.6
East: Harley Avenue												
4	L2	7	0.0	0.031	4.7	LOS A	0.1	0.9	0.17	0.51	0.17	49.4
6	R2	26	16.0	0.031	5.3	LOS A	0.1	0.9	0.17	0.51	0.17	48.6
Approach		34	12.5	0.031	5.1	LOS A	0.1	0.9	0.17	0.51	0.17	48.7
North: Station Street												
7	L2	31	10.3	0.018	5.7	LOS A	0.0	0.0	0.00	0.57	0.00	53.2
8	T1	37	5.7	0.020	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach		67	7.8	0.020	2.6	NA	0.0	0.0	0.00	0.26	0.00	56.7
All Vehicles		141	7.5	0.031	3.0	NA	0.1	0.9	0.07	0.30	0.07	54.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.




Appendix D

SIDRA proposed morning and afternoon traffic volume






MOVEMENT SUMMARY

Site: 101 [Colliery Access Road Intersection AM peak]

Existing Maximum Traffic
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Chifley Road												
5	T1	84	3.8	0.044	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	80.0
6	R2	13	75.0	0.014	8.8	LOS A	0.1	0.6	0.25	0.61	0.25	51.9
Approach		97	13.0	0.044	1.2	NA	0.1	0.6	0.03	0.08	0.03	74.7
North: Colliery Access Road												
7	L2	16	73.3	0.055	5.9	LOS A	0.2	1.9	0.28	0.55	0.28	40.5
9	R2	28	14.8	0.055	6.3	LOS A	0.2	1.9	0.28	0.55	0.28	49.9
Approach		44	35.7	0.055	6.1	LOS A	0.2	1.9	0.28	0.55	0.28	46.0
West: Chifley Road												
10	L2	16	13.3	0.009	7.2	LOS A	0.0	0.0	0.00	0.63	0.00	61.1
11	T1	88	9.5	0.048	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	80.0
Approach		104	10.1	0.048	1.1	NA	0.0	0.0	0.00	0.10	0.00	76.4
All Vehicles		245	15.9	0.055	2.0	NA	0.2	1.9	0.06	0.17	0.06	67.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Colliery Access Road Intersection AM peak]

Future Maximum Traffic
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Chifley Road												
5	T1	84	3.8	0.045	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	80.0
6	R2	15	78.6	0.016	8.9	LOS A	0.1	0.7	0.25	0.61	0.25	51.9
Approach		99	14.9	0.045	1.3	NA	0.1	0.7	0.04	0.09	0.04	74.0
North: Colliery Access Road												
7	L2	18	76.5	0.058	5.9	LOS A	0.2	2.0	0.28	0.55	0.28	40.1
9	R2	28	14.8	0.058	6.3	LOS A	0.2	2.0	0.28	0.55	0.28	49.9
Approach		46	38.6	0.058	6.1	LOS A	0.2	2.0	0.28	0.55	0.28	45.6
West: Chifley Road												
10	L2	16	13.3	0.009	7.2	LOS A	0.0	0.0	0.00	0.63	0.00	61.1
11	T1	88	9.5	0.048	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	80.0
Approach		104	10.1	0.048	1.1	NA	0.0	0.0	0.00	0.10	0.00	76.4
All Vehicles		249	17.3	0.058	2.1	NA	0.2	2.0	0.07	0.18	0.07	67.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Colliery Access Road Intersection PM peak]

Existing Maximum Traffic
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Chifley Road												
5	T1	118	2.7	0.062	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	80.0
6	R2	14	100.0	0.017	8.5	LOS A	0.1	0.8	0.27	0.61	0.27	52.4
Approach		132	12.8	0.062	0.9	NA	0.1	0.8	0.03	0.06	0.03	75.8
North: Colliery Access Road												
7	L2	18	64.7	0.087	5.9	LOS A	0.3	2.8	0.34	0.59	0.34	41.5
9	R2	51	8.3	0.087	6.6	LOS A	0.3	2.8	0.34	0.59	0.34	50.9
Approach		68	23.1	0.087	6.4	LOS A	0.3	2.8	0.34	0.59	0.34	48.1
West: Chifley Road												
10	L2	4	25.0	0.003	7.4	LOS A	0.0	0.0	0.00	0.63	0.00	57.8
11	T1	106	7.9	0.057	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	80.0
Approach		111	8.6	0.057	0.3	NA	0.0	0.0	0.00	0.02	0.00	78.8
All Vehicles		311	13.6	0.087	1.9	NA	0.3	2.8	0.09	0.16	0.09	68.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Colliery Access Road Intersection PM peak]

Future Maximum Traffic
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Chifley Road												
5	T1	118	2.7	0.062	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	80.0
6	R2	16	100.0	0.019	8.5	LOS A	0.1	1.0	0.27	0.61	0.27	52.4
Approach		134	14.2	0.062	1.0	NA	0.1	1.0	0.03	0.07	0.03	75.3
North: Colliery Access Road												
7	L2	20	68.4	0.090	5.9	LOS A	0.3	3.0	0.33	0.59	0.33	40.9
9	R2	51	8.3	0.090	6.6	LOS A	0.3	3.0	0.33	0.59	0.33	50.9
Approach		71	25.4	0.090	6.4	LOS A	0.3	3.0	0.33	0.59	0.33	47.6
West: Chifley Road												
10	L2	4	25.0	0.003	7.4	LOS A	0.0	0.0	0.00	0.63	0.00	57.8
11	T1	106	7.9	0.057	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	80.0
Approach		111	8.6	0.057	0.3	NA	0.0	0.0	0.00	0.02	0.00	78.8
All Vehicles		315	14.7	0.090	2.0	NA	0.3	3.0	0.09	0.17	0.09	67.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: 101 [Intersection at Bell AM peak]

Existing Maximum Traffic
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Darling Causeway												
1	L2	24	47.8	0.017	6.1	LOS A	0.0	0.0	0.00	0.50	0.00	53.3
3	R2	12	9.1	0.014	9.6	LOS A	0.1	0.4	0.33	0.86	0.33	51.0
Approach		36	35.3	0.017	7.2	LOS A	0.1	0.4	0.11	0.62	0.11	52.5
East: Bells Line of Road												
4	L2	24	21.7	0.015	5.8	LOS A	0.0	0.0	0.00	0.52	0.00	54.2
5	T1	80	7.9	0.043	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach		104	11.1	0.043	1.4	NA	0.0	0.0	0.00	0.12	0.00	58.5
West: Chifley Road												
11	T1	51	16.7	0.029	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
12	R2	33	35.5	0.023	6.3	LOS A	0.1	1.0	0.20	0.53	0.20	51.5
Approach		83	24.1	0.029	2.5	NA	0.1	1.0	0.08	0.21	0.08	56.4
All Vehicles		223	19.8	0.043	2.7	NA	0.1	1.0	0.05	0.23	0.05	56.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Intersection at Bell AM peak]

Future Maximum Traffic
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Darling Causeway												
1	L2	26	52.0	0.019	6.1	LOS A	0.0	0.0	0.00	0.50	0.00	53.1
3	R2	12	9.1	0.014	9.7	LOS A	0.1	0.4	0.33	0.86	0.33	51.0
Approach		38	38.9	0.019	7.2	LOS A	0.1	0.4	0.10	0.61	0.10	52.5
East: Bells Line of Road												
4	L2	24	21.7	0.015	5.8	LOS A	0.0	0.0	0.00	0.52	0.00	54.2
5	T1	80	7.9	0.043	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach		104	11.1	0.043	1.4	NA	0.0	0.0	0.00	0.12	0.00	58.5
West: Chifley Road												
11	T1	51	16.7	0.029	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
12	R2	35	39.4	0.025	6.3	LOS A	0.1	1.1	0.20	0.53	0.20	51.4
Approach		85	25.9	0.029	2.6	NA	0.1	1.1	0.08	0.22	0.08	56.2
All Vehicles		227	21.3	0.043	2.8	NA	0.1	1.1	0.05	0.24	0.05	56.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Intersection at Bell PM peak]

Existing Maximum Traffic
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Darling Causeway												
1	L2	20	42.1	0.014	6.0	LOS A	0.0	0.0	0.00	0.50	0.00	53.5
3	R2	24	0.0	0.030	9.5	LOS A	0.1	0.8	0.37	0.86	0.37	51.2
Approach		44	19.0	0.030	8.0	LOS A	0.1	0.8	0.20	0.70	0.20	52.2
East: Bells Line of Road												
4	L2	19	0.0	0.010	5.6	LOS A	0.0	0.0	0.00	0.53	0.00	54.9
5	T1	89	2.4	0.047	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach		108	1.9	0.047	1.0	NA	0.0	0.0	0.00	0.09	0.00	59.0
West: Chifley Road												
11	T1	99	7.4	0.054	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
12	R2	32	30.0	0.022	6.2	LOS A	0.1	0.9	0.20	0.53	0.20	51.7
Approach		131	12.9	0.054	1.5	NA	0.1	0.9	0.05	0.13	0.05	57.8
All Vehicles		283	9.7	0.054	2.3	NA	0.1	0.9	0.05	0.20	0.05	57.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Intersection at Bell PM peak]

Future Maximum Traffic
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Darling Causeway												
1	L2	22	47.6	0.016	6.1	LOS A	0.0	0.0	0.00	0.50	0.00	53.3
3	R2	24	0.0	0.030	9.6	LOS A	0.1	0.8	0.37	0.86	0.37	51.2
Approach		46	22.7	0.030	7.9	LOS A	0.1	0.8	0.19	0.69	0.19	52.2
East: Bells Line of Road												
4	L2	19	0.0	0.010	5.6	LOS A	0.0	0.0	0.00	0.53	0.00	54.9
5	T1	89	2.4	0.047	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach		108	1.9	0.047	1.0	NA	0.0	0.0	0.00	0.09	0.00	59.0
West: Chifley Road												
11	T1	99	7.4	0.054	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
12	R2	34	34.4	0.024	6.3	LOS A	0.1	1.0	0.21	0.53	0.21	51.5
Approach		133	14.3	0.054	1.6	NA	0.1	1.0	0.05	0.13	0.05	57.6
All Vehicles		287	11.0	0.054	2.4	NA	0.1	1.0	0.06	0.21	0.06	57.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Intersection at Mount Victoria AM Peak]

Existing Maximum Traffic
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Station Street												
2	T1	23	31.8	0.016	0.0	LOS A	0.0	0.1	0.03	0.05	0.03	59.2
3	R2	2	0.0	0.016	5.8	LOS A	0.0	0.1	0.03	0.05	0.03	53.1
Approach		25	29.2	0.016	0.5	NA	0.0	0.1	0.03	0.05	0.03	58.7
East: Harley Avenue												
4	L2	1	0.0	0.030	4.6	LOS A	0.1	0.9	0.18	0.51	0.18	49.3
6	R2	31	10.3	0.030	5.1	LOS A	0.1	0.9	0.18	0.51	0.18	48.7
Approach		32	10.0	0.030	5.1	LOS A	0.1	0.9	0.18	0.51	0.18	48.8
North: Station Street												
7	L2	51	18.8	0.031	5.8	LOS A	0.0	0.0	0.00	0.57	0.00	52.8
8	T1	21	40.0	0.014	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach		72	25.0	0.031	4.1	NA	0.0	0.0	0.00	0.40	0.00	54.7
All Vehicles		128	22.1	0.031	3.6	NA	0.1	0.9	0.05	0.36	0.05	53.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Intersection at Mount Victoria AM Peak]

Future Maximum Traffic
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Station Street												
2	T1	24	34.8	0.017	0.0	LOS A	0.0	0.1	0.03	0.05	0.03	59.2
3	R2	2	0.0	0.017	5.8	LOS A	0.0	0.1	0.03	0.05	0.03	53.1
Approach		26	32.0	0.017	0.5	NA	0.0	0.1	0.03	0.05	0.03	58.7
East: Harley Avenue												
4	L2	1	0.0	0.032	4.6	LOS A	0.1	1.0	0.19	0.51	0.19	49.3
6	R2	32	13.3	0.032	5.2	LOS A	0.1	1.0	0.19	0.51	0.19	48.6
Approach		33	12.9	0.032	5.1	LOS A	0.1	1.0	0.19	0.51	0.19	48.6
North: Station Street												
7	L2	52	20.4	0.032	5.8	LOS A	0.0	0.0	0.00	0.57	0.00	52.8
8	T1	22	42.9	0.014	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach		74	27.1	0.032	4.0	NA	0.0	0.0	0.00	0.40	0.00	54.7
All Vehicles		133	24.6	0.032	3.6	NA	0.1	1.0	0.05	0.36	0.05	53.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Intersection at Mount Victoria PM Peak]

Existing Maximum Traffic
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Station Street												
2	T1	28	7.4	0.026	0.1	LOS A	0.1	0.6	0.11	0.19	0.11	57.8
3	R2	14	7.7	0.026	5.9	LOS A	0.1	0.6	0.11	0.19	0.11	51.9
Approach		42	7.5	0.026	2.0	NA	0.1	0.6	0.11	0.19	0.11	55.8
East: Harley Avenue												
4	L2	7	0.0	0.034	4.7	LOS A	0.1	1.1	0.18	0.51	0.18	49.3
6	R2	28	22.2	0.034	5.4	LOS A	0.1	1.1	0.18	0.51	0.18	48.3
Approach		36	17.6	0.034	5.2	LOS A	0.1	1.1	0.18	0.51	0.18	48.5
North: Station Street												
7	L2	33	16.1	0.020	5.7	LOS A	0.0	0.0	0.00	0.57	0.00	52.9
8	T1	39	10.8	0.021	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach		72	13.2	0.021	2.6	NA	0.0	0.0	0.00	0.26	0.00	56.5
All Vehicles		149	12.7	0.034	3.1	NA	0.1	1.1	0.08	0.30	0.08	54.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Intersection at Mount Victoria PM Peak]

Future Maximum Traffic
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Station Street												
2	T1	29	10.7	0.027	0.1	LOS A	0.1	0.7	0.11	0.18	0.11	57.8
3	R2	14	7.7	0.027	5.9	LOS A	0.1	0.7	0.11	0.18	0.11	51.9
Approach		43	9.8	0.027	2.0	NA	0.1	0.7	0.11	0.18	0.11	55.8
East: Harley Avenue												
4	L2	7	0.0	0.036	4.7	LOS A	0.1	1.2	0.19	0.51	0.19	49.3
6	R2	29	25.0	0.036	5.5	LOS A	0.1	1.2	0.19	0.51	0.19	48.2
Approach		37	20.0	0.036	5.3	LOS A	0.1	1.2	0.19	0.51	0.19	48.4
North: Station Street												
7	L2	34	18.8	0.021	5.8	LOS A	0.0	0.0	0.00	0.57	0.00	52.8
8	T1	40	13.2	0.022	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach		74	15.7	0.022	2.6	NA	0.0	0.0	0.00	0.26	0.00	56.5
All Vehicles		154	15.1	0.036	3.1	NA	0.1	1.2	0.08	0.30	0.08	54.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.










Turbot St
EXIT



Appendix B

Road traffic noise assessment

Memorandum

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4 April 2019

To: James Wearne
Group Manager Approvals
Centennial Coal Company Limited
From: James Small
Subject: J190135 - Clarence Colliery - Modification to development consent DA 504-00

1 Introduction

This document has been prepared by EMM Consulting Pty Limited (EMM) as part of the statement of environmental effects (SEE) for the proposed modification to the development consent (DA 504-00) for Clarence Colliery to increase the number of allowed road haulage.

Centennial Coal Company Limited (Centennial Coal) is seeking to modify DA 504-00 pursuant to Section 4.55(2) of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) to:

- increase total allowable coal haulage off-site by road from 200,000 tonnes (t) to 300,000 t, on an annual basis, for a limited period of time up to 31 December 2020; and
- increase total allowable coal haulage off-site to the west by road from 100,000 t to 200,000 t, on an annual basis, for a limited period of time up to 31 December 2020.

The proposed increase in total coal haulage by road will increase the total number of trucks which transport coal from Clarence Colliery from 25 trucks per day (ie 50 truck movements) to 40 trucks per day (ie 80 truck movements).

The traffic impact assessment previously prepared by GHD (2013) as part of the environmental assessment for an earlier modification to DA 504-00 considered impacts associated with 25 trucks per day (ie 50 truck movements) travelling along the western haul route (refer Figure 2.1). This assessment assumed that the average load per truck would be 32 t and that trucks would travel along the western haul route 125 days per year to transport a total of 100,000 t per year.

As part of the proposed modification, truck movements between the intersection of Station Street and Harley Avenue, in Mount Victoria, and the Wallerawang Power Station Haul Road (ie haulage to the west) will remain within assessed and approved limits (ie 25 trucks per day or 50 truck movements). Haulage of 100,000 t per year can be achieved well within these limits as an average of only about 18 daily truck movements are required. The increased tonnage along the western haul route will be achieved through an increase to the number of days per year that truck movements will occur (ie from approximately 125 days per year to 250 days per year).

Therefore, the increase in daily truck movements that requires assessment is limited to the existing haulage route between Clarence Colliery and the intersection of Station Street and Harley Avenue via Darling Causeway (refer Figure 2.1).

This assessment addresses potential noise impacts associated with increases in traffic noise level as a result of the proposed increase in truck movements.

Traffic noise generation has previously been assessed for Clarence Colliery in the *Road Traffic Noise Impact Assessment* (SLR 2013) prepared for a previous modification to DA 504-00 and is referenced in this memorandum.

2 Proposed modification

2.1 Existing operations and haulage route

Clarence Colliery has approval to send 200,000 t of coal off-site by road per calendar year. Up to 100,000 t can be sent to the west with the remainder (up to a total of 200,000 t) sent to the east.

The existing haulage route to the east (refer Figure 2.1) consists of:

- trucks turn left from Clarence Colliery Road onto Chifley Road; and
- trucks continue east to where Chifley Road intersects with Darling Causeway – from the intersection of Chifley Road and Darling Causeway, there are two options:
  - the majority of trucks turn right onto Darling Causeway and travel south towards Mount Victoria until turning left from Station Street onto Harley Avenue and left again onto the Great Western Highway (for delivery of coal to eastern NSW); or
  - a small proportion of trucks continue to destinations north of Sydney via Bells Line of Road.

The existing haulage route to the west (refer Figure 2.1) consists of:

- trucks turn left from Clarence Colliery Road onto Chifley Road;
- trucks continue east to where Chifley Road intersects with Darling Causeway; and
- trucks turn right onto Darling Causeway and travel south towards Mount Victoria until turning right from Station Street onto the Great Western Highway towards Lithgow.

Trucks currently deliver coal from Clarence Colliery to the Kerosene Vale Stockpile Site near Lidsdale or directly to Mount Piper Power Station (MPPS) (refer Figure 2.1). Trucks travel along the Castlereagh Highway before turning left onto the Wallerawang Power Station Haul Road and left onto the MPPS Haul Road, both of which are private haul roads with regular heavy vehicle movements associated with product coal haulage (refer Figure 2.1).

As per Condition 7B Schedule 2 of DA 504-00, trucking of coal to the west occurs only between 7:00 am and 10:00 pm Monday to Saturday and between 8:00 am and 10:00 pm on Sundays and public holidays.

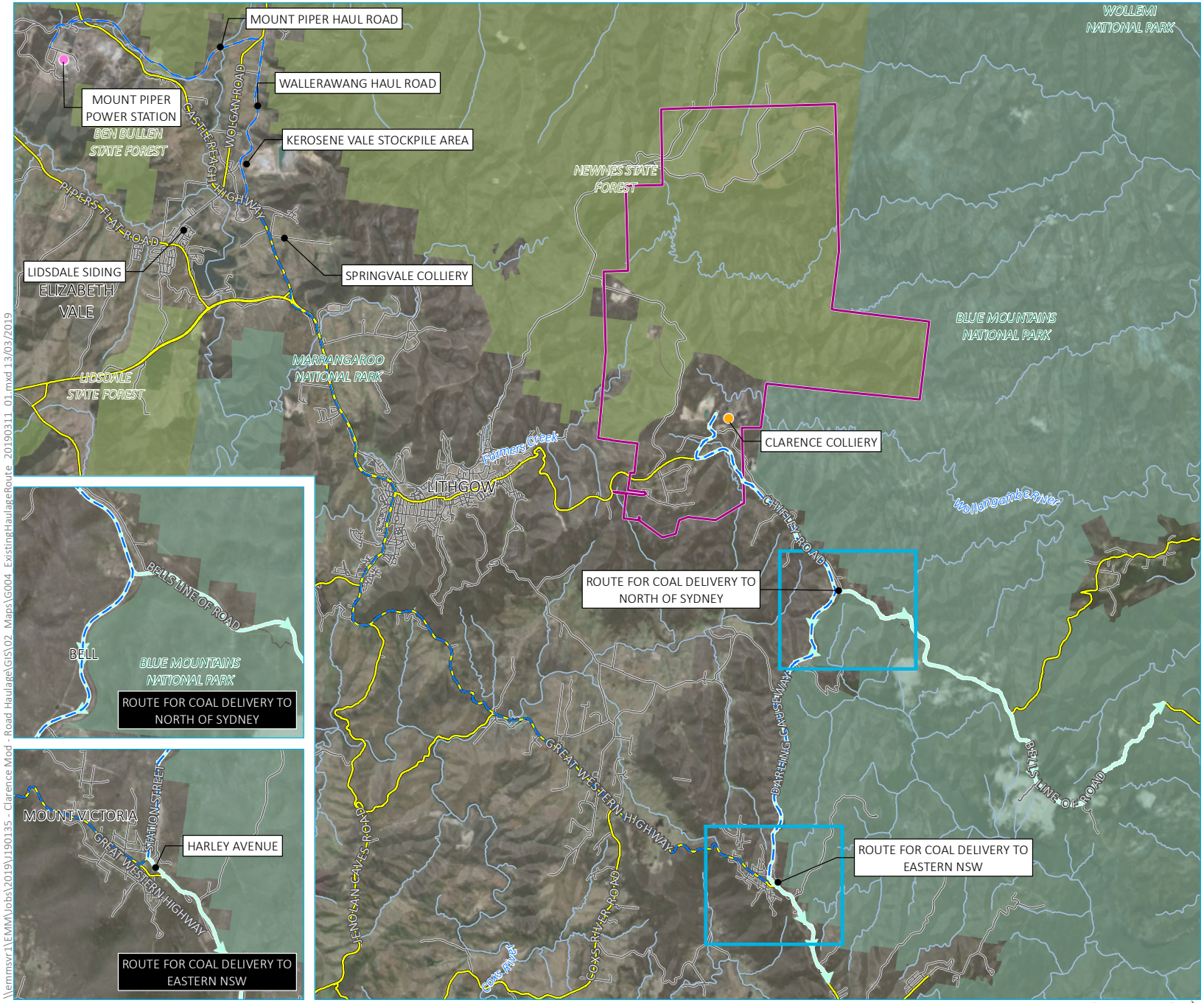
2.2 Proposed operations

It is proposed to modify the DA 504-00 to increase total allowable coal haulage off-site to the west by road from 100,000 t to 200,000 t for a limited period of time up to 31 December 2020.

No change to total coal haulage off-site to the east by road is proposed as part of this modification. This will remain at a maximum rate of 200,000 t per calendar year.

To achieve the proposed increase in total coal haulage by road there will need to be an increase to the total number of trucks permitted to transport coal from Clarence Colliery from 25 trucks per day (ie 50 truck movements) to 40 trucks per day (ie 80 truck movements). The increased truck movements requiring assessment is limited to the section of the existing haulage route between Clarence Colliery and the intersection of Station Street and Harley Avenue via Darling Causeway (refer Figure 2.1).

An assessment of the road noise generated by the proposed additional movements has been conducted to ensure that the proposed increase complies with the relevant road noise criteria.



\\emmsvr1\EMM\Jobs\2019\190135 - Clarence Mod - Road Haulage\GIS\02 Maps\G004 ExistingHaulageRoute 20190311 01.mxd 13/03/2019

Source: EMM (2019); Centennial (2019); DFSI (2017); GA (2011)

Existing haulage routes

Clarence Colliery
Road traffic noise assessment
Figure 2.1

EMM
creating opportunities

3 Acoustic criteria

Traffic noise from vehicles on public roads is assessed in accordance with the RNP (DECCW 2011). Acoustic criteria used to assess potential road noise impacts are provided in Table 3 of the RNP as reproduced in Table 3.1. 'Project type 3' applies to the proposed modification as identified in **bold** in Table 3.1.

Table 3.1 Road traffic noise assessment criteria for residential land uses (refer Table 3 of the RNP)

Road category	Type of project/land use	Assessment criteria – dB(A)	
		Day (7 am–10 pm)	Night (10 pm–7 am)
Freeway/arterial/ sub-arterial roads	1. Existing residences affected by noise from new freeway/arterial/sub-arterial road corridors.	$L_{Aeq, (15\ hour)}$ 55 (external)	$L_{Aeq, (9\ hour)}$ 50 (external)
	2. Existing residences affected by noise from redevelopment of existing freeway/arterial/subarterial roads.	$L_{Aeq, (15\ hour)}$ 60 (external)	$L_{Aeq, (9\ hour)}$ 55 (external)
	3. Existing residences affected by additional traffic on existing freeways/arterial/sub-arterial roads generated by land use developments.		
Local roads	4. Existing residences affected by noise from new local road corridors.	$L_{Aeq, (1\ hour)}$ 55 (external)	$L_{Aeq, (1\ hour)}$ 50 (external)
	5. Existing residences affected by noise from redevelopment of existing local roads.		
	6. Existing residences affected by additional traffic on existing local roads generated by land use developments.		

Source: RNP (DECCW 2011)

SLR (2013) prepared a road traffic noise impact assessment as part of the environmental assessment for a previous modification to DA 504-00. This was based on the *Traffic Impact Assessment* prepared by GHD (GHD 2013). With regard to compliance with the absolute assessment criteria provided in Table 3 of the RNP, SLR (2013) noted the following:

> Based upon existing peak road traffic movements presented in Table 6, the calculated existing day time $L_{Aeq(15hour)}$ noise levels, without Clarence Colliery operations, at the nearest roadside residential receivers exceed the criteria detailed in the RNP with exception of receiver locations R1, R2, R10 and R11. Reducing existing road traffic noise levels on the proposed haul route is not within the control of Clarence Colliery. The RNP (EPA, 2011) states that any increase in the total traffic noise level should be limited to 2dB above that of the corresponding 'no build option' (ie Clarence Colliery road haulage not in operation).

A comparison of the traffic volumes considered by GHD (2013) and the *Traffic Impact Assessment* (EMM 2019) for the currently proposed modification is as follows:

- For Chifley Road (east of Clarence Colliery), the 2013 annual average daily traffic (AADT) volume was 2,220 vehicles per day with 4% heavy vehicles. The 2019 counts indicated 1,950 vehicles per day with 11.8% heavy vehicles. The estimated increase from 2013 to 2019 has therefore been calculated to be 0.9 dB(A), generally associated with heavy vehicle traffic.

- For Darling Causeway, the 2013 AADT was 880 vehicles per day with 9% heavy vehicles. The 2019 counts indicated 810 vehicles per day with 17.9% heavy vehicles. The estimated increase from 2013 to 2019 has therefore been calculated to be 1.2 dB(A), generally associated with heavy vehicle traffic.

Given that traffic noise levels reported by SLR (2013) exceeded RNP criteria and there has been an increase in traffic volumes along the approved haulage route, it is expected that current traffic noise levels will also exceed RNP criteria. On this basis, noise from the proposed modification will be assessed against the 2 dB relative increase criterion.

4 Assessment of traffic noise generation

Potential traffic noise impacts due to the proposed increase in road haulage from Clarence Colliery is addressed in this section.

4.1 Existing traffic volumes

Traffic volumes have been established from traffic counts conducted in 2019 as part of the *Traffic Impact Assessment* (EMM 2019). Potential traffic generation requiring assessment will occur for the following road segments:

- Chifley Road – east of Clarence Colliery Access Road; and
- Darling Causeway – south of Bells Line of Road.

Traffic counts for the aforementioned roadways are provided in Table 4.1. Heavy vehicle traffic is assumed to be evenly spread throughout the 24-hour period. The assessment is based on a relative increase in noise level (ie 2 dB(A)) and, as such, is representative for increases during the day and night periods assuming an even spread of heavy vehicles.

Table 4.1 Assessment traffic volumes

Road segment	2019 traffic volumes (excluding Clarence Colliery)	
	Daily (24-hour) traffic	Heavy vehicles (%)
Chifley Road (east of Clarence Colliery Access Road)	1,926	10.7%
Darling Causeway (south of Bells Line of Road)	784	15.5%

4.2 Site traffic generation

Clarence Colliery currently generates up to 25 trucks per day (ie 50 truck movements). The proposed modification includes an increase to up to 40 trucks per day (ie 80 truck movements), an increase of 15 trucks per day (ie 30 truck movements).

For the purposes of this assessment, and in accordance with the RNP, the cumulative amount of traffic noise generated by Clarence Colliery's heavy vehicle movements has been compared to traffic noise in the absence of Clarence Colliery's heavy vehicle movements. This data is summarised in Table 4.2.

Table 4.2 Comparison of traffic noise generated by proposed additional road haulage (2019)

Road segment	Traffic volume (without Clarence Colliery)	Heavy vehicles (%)	Traffic volume with proposed increase	Heavy vehicles (%)	Increase in traffic noise level, dB(A)
Chifley Road (east of Clarence Colliery Access Road)	1,926	10.7%	2,006	14%	0.9
Darling Causeway (south of Bells Line of Road)	784	15.5%	864	23%	1.7

4.3 Discussion

Traffic noise levels recorded by SLR (2013) were deemed to exceed the RNP traffic noise assessment criterion of 60 dB(A) $L_{eq\ 15hour}$. On this basis, this assessment of traffic noise has been performed against the 2 dB(A) relative increase assessment criterion.

The RNP dictates that traffic generation from a site should be addressed as a 'build versus no build' situation to ensure that the overall traffic noise impact is acceptably addressed. This is to ensure that progressive increases in traffic volume from a site do not exceed a 'no-build' traffic noise level by more than 2 dB(A). Following this methodology, predicted noise levels indicate that 40 trucks per day (ie 80 truck movements) from Clarence Colliery will result in a traffic noise level increase on the 'no-build' scenario of 0.9 dB(A) and 1.7 dB(A) for Chifley Road and Darling Causeway, respectively.

It is noted that Clarence Colliery already contributes to the existing traffic noise level along the assessed roads. In this regard, the actual increase in noise experienced by receivers along the existing haulage route from the existing 25 trucks per day to the proposed 40 trucks per day will be less than that considered above in the 'no-build' scenario.

In either case, noise levels will not exceed the 2 dB(A) allowable increase assessment criterion and as such will satisfy the requirements of the RNP.

5 Conclusion

An assessment of traffic noise impacts associated with the proposed temporary increase in heavy vehicle traffic from Clarence Colliery along existing approved haulage routes has been conducted. EMM has determined that the total traffic noise generated by the proposed increase to 40 trucks per day will not exceed the RNP's 2 dB(A) allowable road traffic noise increase noise criterion.

Given the proposed increase in road haulage will result in an imperceptible increase in traffic noise level along affected roads and will only occur over an approximate 12-month period as a remedial measure, it is unlikely to impact residences according to RNP.

Yours sincerely



James Small
Associate
jsmall@emmconsulting.com.au

Review: NI 18/3/19

References

EMM Consulting Pty Limited (EMM) 2019, *Traffic Impact Assessment*, prepared for Centennial Coal by EMM Consulting Pty Ltd.

GHD Pty Ltd (GHD) 2013, *Clarence Colliery Road Haulage Section 75W Modification Traffic Impact Assessment*, prepared for Centennial Coal by GHD Pty Ltd.

NSW Government Department of Environment, Climate Change and Water (DECCW) 2011, *Road Noise Policy* (RNP).

SLR Consulting Australia Pty Ltd (SLR) 2013, *Road Traffic Noise Impact Assessment*, prepared for Centennial Coal by SLR Consulting Australia Pty Ltd.

Appendix C

Stakeholder correspondence

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Fassifern

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21 March 2019

Mr Steve O'Donoghue
Acting Director - Resource and Energy Assessments
NSW Department of Planning & Environment
GPO Box 39
Sydney NSW 2001

Dear Mr O'Donoghue

Re: Clarence Colliery DA 504-00 Modification

Background

Springvale Mine is the primary source of coal for the Eraring Energy owned Mount Piper Power Station. Due to continued lower yields from the Springvale Mine being experienced since mining commenced in the southern longwall blocks, a shortfall in coal supply to Mount Piper Power Station is predicted over the next 12 months. To compensate for the predicted shortfall in coal supply from the Springvale Mine, temporary supplementary coal supply arrangements are required.

One short term option identified to provide a supplementary coal supply to the MPPS is a temporary increase in the volume of coal that can be transported by truck from Clarence Colliery.

Clarence Colliery

Clarence Colliery is an underground coal mining operation within the Western Coalfield of NSW approximately 10 kilometres (km) east of Lithgow in the Lithgow local government area (LGA). The Clarence Colliery is a joint venture operation managed by Clarence Colliery Pty Ltd (a wholly owned subsidiary of Centennial Coal). Clarence Colliery operates under three approvals, with consent originally granted in 1976 for underground coal mining operations. The most recent approval (DA 504-00) was granted in 2005 by the now Department of Planning and Environment under Part 4 of the NSW Environmental Planning and Assessment Act 1979 (EP&A Act).

Clarence Colliery currently transports up to 200 000 tonnes per annum (tpa) of coal products by road to domestic customers. Up to 100,000 tpa of coal can be transported to the west with the reminder (up to 200,000 tpa) transported to the east.

Due to current contractual commitments in 2019, only 50,000 tonnes of coal will be available to send west to the Mount Piper Power Station this year.

Proposed Modification

Centennial Coal is seeking to modify the Clarence Colliery consent to allow for an:

- An increase in the total volume of coal that can be transported off site by truck from 200,000 tpa to 300,000 tpa; and
- An increase in the total volume of coal that can be transported to the west from 100,000 tpa to 200,000 tpa.

Centennial Coal Company Limited ABN 30 003 714 538

The increase in coal transport will be temporary and will be sought to cover the 2019 and 2020 calendar years.

The haul routes utilised will continue to be as is currently approved which is:

- Road haulage to the east
    - Chifley Road – Bells Line of Road to North Western Sydney; or
    - Chifley Road – The Darling Causeway – Harley Avenue – Great Western Highway to Sydney.
- Road haulage to the west
    - Chifley Road - The Darling Causeway - Station Street - Great Western Highway and the Castlereagh Highway to the Wallerawang Power Station Private Haul Road.

A maximum of 25 trucks per day will be required to transport 200,000 tpa of coal to the west and a maximum of 25 trucks per day will be required to transport coal to the east. Clarence Colliery is already approved to operate up to 25 trucks per day from the site in either direction. If approved however, there will be an increase in the maximum number of trucks operating along the Chifley Road and Darling Causeway roads between the Clarence Colliery pit top and the intersection of Station Street and Harley Avenue from 25/day to up to 40/day.

Environmental Assessment

A Statement of Environmental Effects is proposed to be prepared to support the modification application to the Clarence Colliery development consent (DA 504-00). The key issues to be assessed as part of the proposed modification will be traffic.

- A Traffic Impact Assessment; and
- A Road Traffic Noise Assessment

The assessments are proposed to consider the impacts of increased haul truck movements occurring between the Clarence Colliery Pit Top and the intersection of Station Street and Harley Avenue.

No other technical assessments are considered necessary to support the Statement of Environmental Effects.

Approval Pathway

Development consents may be modified under Section 4.55 of the EP&A Act provided that the development as modified will be substantially the same development as the development for which consent was originally granted. It is considered that the proposed increase in coal haulage from the Clarence Colliery up to 31 December 2020 will be substantially the same as the development for which consent was originally granted.

Due to the increase in coal haulage trucks on the public road network between the Clarence Colliery pit top and the intersection of Station Street and Harley Avenue, Centennial Coal considers that the appropriate approval pathway would be a modification to the Clarence Colliery development consent DA 504-00 pursuant to Section 4.55(2) of the EP&A.

Conclusion

Centennial Coal is seeking to modify the Clarence Colliery development consent (DA 504-00) to facilitate the supply of supplementary coal to the Mount Piper Power Station. It is proposed to modify the Clarence Colliery development consent pursuant to Section 4.55(2) of the EP&A Act. The proposed scope of assessments to support the Statement of Environmental Effects has been detailed above.

Centennial Coal is seeking confirmation from the Department of Planning and Environment on the proposed approval pathway for the modification and level of assessment proposed to support the Statement of Environmental Effects.

Please contact me on my mobile 0407 207 530 if you have any questions or require any further information in regards to this matter.

Yours sincerely



James Wearne
Group Approvals Manager

NSW GOVERNMENT | Planning & Environment

Planning Services
Resource Assessments
Contact: Rose-Anne Hawkeswood
Phone: 9274 6324
Email: roseanne.hawkeswood@planning.nsw.gov.au

Mr James Wearne
Group Manager Approval
Centennial Coal Company Ltd
100 Miller Road
FASSIFERN NSW 2283

Dear Mr Wearne

Clarence Colliery (DA 504-00) – Proposed Modification 4

I refer to your letter of 21 March 2019 seeking confirmation on the environmental assessment and approval pathway for the modification 5 proposal.

Based on the information provided, the Department confirms that the proposed activities can be characterised as a modification to the existing approval and can be assessed and determined under Section 4.55(2) of the *Environmental Planning and Assessment Act 1979.*

The Department will not be issuing formal Secretary's Environmental Assessment Requirements for the proposed modification, subject to the Modification Report being prepared in accordance with the assessment strategy detailed in your letter. Further to this strategy, the Modification Report should include consideration of the social and economic impacts of the modification.

Additionally, in preparing the Modification Report, the Department requires you to consult with the Roads and Maritime Service, Councils and the mine's Community Consultative Committee.

Given the nature of the proposal, the Department is likely to place the Modification Report, once accepted, on public exhibition for a period of at least 14 days.

If you wish to discuss this matter further, please contact Rose-Anne Hawkeswood on 9274 6324.

Yours sincerely

25/3/19

Stephen O'Donoghue
A/ Director
Resource and Energy Assessments

Centennial Coal
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25 March 2019

Email: andrew.muir@lithgow.nsw.gov.au

Mr Andrew Muir
Director Economic Development and Environment
Lithgow City Council
PO Box 19
180 Mort Street
Lithgow NSW 2790

Dear Mr Muir

Re: Clarence Colliery DA 504-00 Proposed Modification

Background

Springvale Mine is the primary source of coal for the Eraring Energy owned Mount Piper Power Station (MPPS). Due to continued lower yields from the Springvale Mine being experienced since mining commenced in the southern longwall blocks, a shortfall in coal supply to MPPS is predicted over the next 12 months. To compensate for the predicted shortfall in coal supply from the Springvale Mine, temporary supplementary coal supply arrangements are required.

One short term option identified to provide a supplementary coal supply to the MPPS is a temporary increase in the volume of coal that can be transported by truck from Clarence Colliery.

Clarence Colliery

Clarence Colliery is an underground coal mining operation within the Western Coalfield of NSW approximately 10 kilometres (km) east of Lithgow in the Lithgow local government area (LGA). The Clarence Colliery is a joint venture operation managed by Clarence Colliery Pty Ltd (a wholly owned subsidiary of Centennial Coal). Clarence Colliery operates under three approvals, with consent originally granted in 1976 for underground coal mining operations. The most recent approval (DA 504-00) was granted in 2005 by the now Department of Planning and Environment under Part 4 of the NSW Environmental Planning and Assessment Act 1979 (EP&A Act).

Clarence Colliery currently transports up to 200,000 tonnes per annum (tpa) of coal products by road to domestic customers. Up to 100,000 tpa of coal can be transported to the west with the reminder (up to 200,000 tpa) transported to the east.

Due to current contractual commitments in 2019, only 50,000 tonnes of coal will be available to send west to the Mount Piper Power Station this year.

Proposed Modification

Centennial Coal is seeking to modify the Clarence Colliery consent to allow for an:

- An increase in the total volume of coal that can be transported off site by truck from the current approved 200,000 tpa to 300,000 tpa; and

- An increase in the total volume of coal that can be transported to the west from the current approved 100,000 tpa to 200,000 tpa.

The increase in coal transport will be temporary and will be sought to cover the 2019 and 2020 calendar years.

The haul routes utilised will continue to be as is currently approved (and shown in **Figure 1**) which is:

- Road haulage to the east
    - Chifley Road – Bells Line of Road to North Western Sydney; or
    - Chifley Road – The Darling Causeway – Harley Avenue – Great Western Highway to Sydney.
- Road haulage to the west
    - Chifley Road - The Darling Causeway - Station Street - Great Western Highway and the Castlereagh Highway to the Wallerawang Power Station Private Haul Road.

A maximum of 25 trucks per day will be required to transport 200,000 tpa of coal to the west and a maximum of 25 trucks per day will be required to transport coal to the east. Clarence Colliery is already approved to operate up to 25 trucks per day from the site in either direction. If approved however, there will be an increase in the maximum number of trucks operating along the Chifley Road and Darling Causeway roads between the Clarence Colliery pit top and the intersection of Station Street and Harley Avenue from 25/day to up to 40/day.

Environmental Assessment

A Statement of Environmental Effects (SEE) is currently being prepared to support the modification application which will be submitted to the NSW Department of Planning and Environment for assessment and determination. The SEE has included consideration of traffic and transport impacts and impacts from road traffic noise. A summary of the outcomes of these assessments is provided below:

Traffic Impacts

An assessment of traffic impacts associated with the proposed temporary increase in heavy vehicle traffic from Clarence Colliery along existing approved haulage routes has been conducted by EMM Consulting (EMM). EMM have determined that the proportional daily traffic increases from the additional daily truck movements on Clarence Colliery Road, Chifley Road, Darling Causeway and Station Street will be approximately 1.4%–8.3% of existing traffic. As this daily traffic volume increases will all be generally less than 10% of the existing daily traffic movements, the daily and peak hourly traffic conditions along these roads will remain effectively unchanged with negligible traffic flow impacts for the local road network.

The recent five year road safety and casualty accident history statistics for Chifley Road and Darling Causeway/Station Street show a low average annual accident rate of 2.6 casualty accidents per year occurring along the total combined 16-17 km length of the assessed haulage route. There were a low number of accidents over this period for the truck traffic using these roads and the future additional daily truck movements from the proposed modification should have no adverse traffic safety impacts on these roads.

The three assessed intersections along the haulage route (i.e. the site access intersection, Chifley Road/Darling Causeway/Bells Line of Road intersection at Bell and Station Street/Harley Avenue intersection at Mount Victoria) are currently operating at a very low degree of saturation (DOS) with traffic volume to capacity ratios of approximately 0.03–0.08. As a result of the proposed modification, there will be no effective traffic delay or other intersection capacity impacts from the proposed additional peak hourly truck traffic which will be using these intersections. The assessed intersection level of service (LOS) will remain at A at all three intersections for all the morning and afternoon peak traffic scenarios considered. LoS A is a condition of free flow in which individual drivers are virtually unaffected by the presence of others in the traffic stream. Freedom to select desired speeds and to manoeuvre within the traffic stream is extremely high, and the general level of comfort and convenience provided is excellent.

The road carriageway width and road surface of Chifley Road are currently being improved by RMS. These road improvements will further improve existing road conditions and are expected to mitigate the very minor potential road capacity and intersection traffic delay impacts from the proposed modification.

Road Traffic Noise

An assessment of traffic noise impacts associated with the proposed temporary increase in heavy vehicle traffic from Clarence Colliery along existing approved haulage routes has been conducted by EMM. EMM has determined that the total traffic noise generated by the proposed increase to 40 trucks per day will not exceed the Road Noise Policy's (DECCW 2011) 2 dB(A) allowable road traffic noise increase noise criterion.

Given the proposed increase in road haulage will result in an imperceptible increase in traffic noise level along affected roads and will only occur over an approximate 18-month period, it is unlikely to impact residences according to the Road Noise Policy.

Conclusion

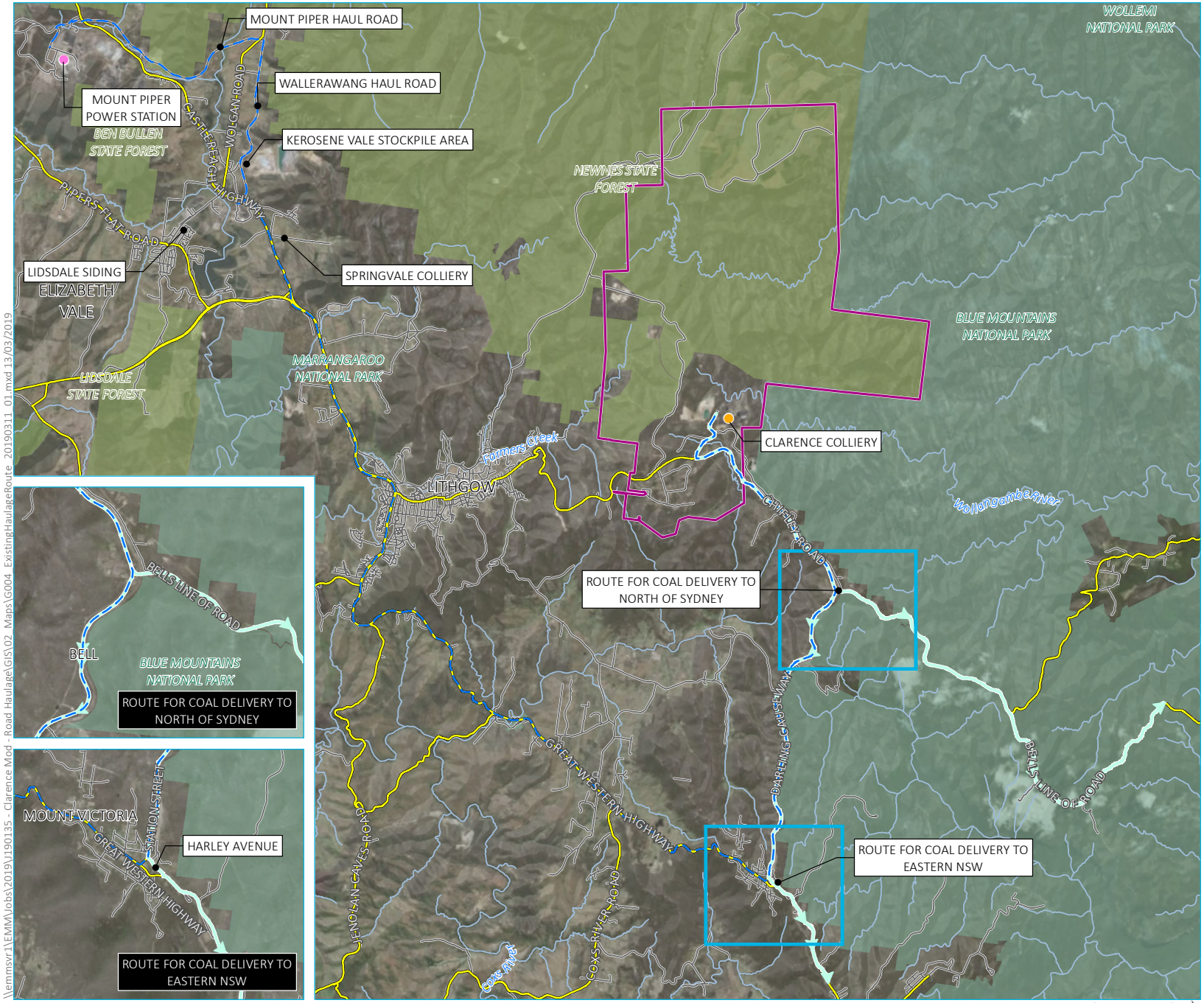
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Yours sincerely

James Wearne
Group Approvals Manager

Attached: Figure 1 – Approved Coal Haulage Routes



KEY

- Clarence Colliery holding boundary
- Clarence Colliery surface facilities
- Mount Piper Power Station
- Main road
- LocalRoad
- Watercourse
- NPWS reserve
- State forest

Existing haulage route

- West
- East

Source: EMM (2019); Centennial (2019); DFSI (2017); GA (2011)

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Existing haulage routes

Clarence Colliery
Road traffic noise assessment
Figure 1

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25 March 2019

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Blue Mountains City Council
Locked Bag 1005
Katoomba NSW 2780

To Whom It May Concern

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Background

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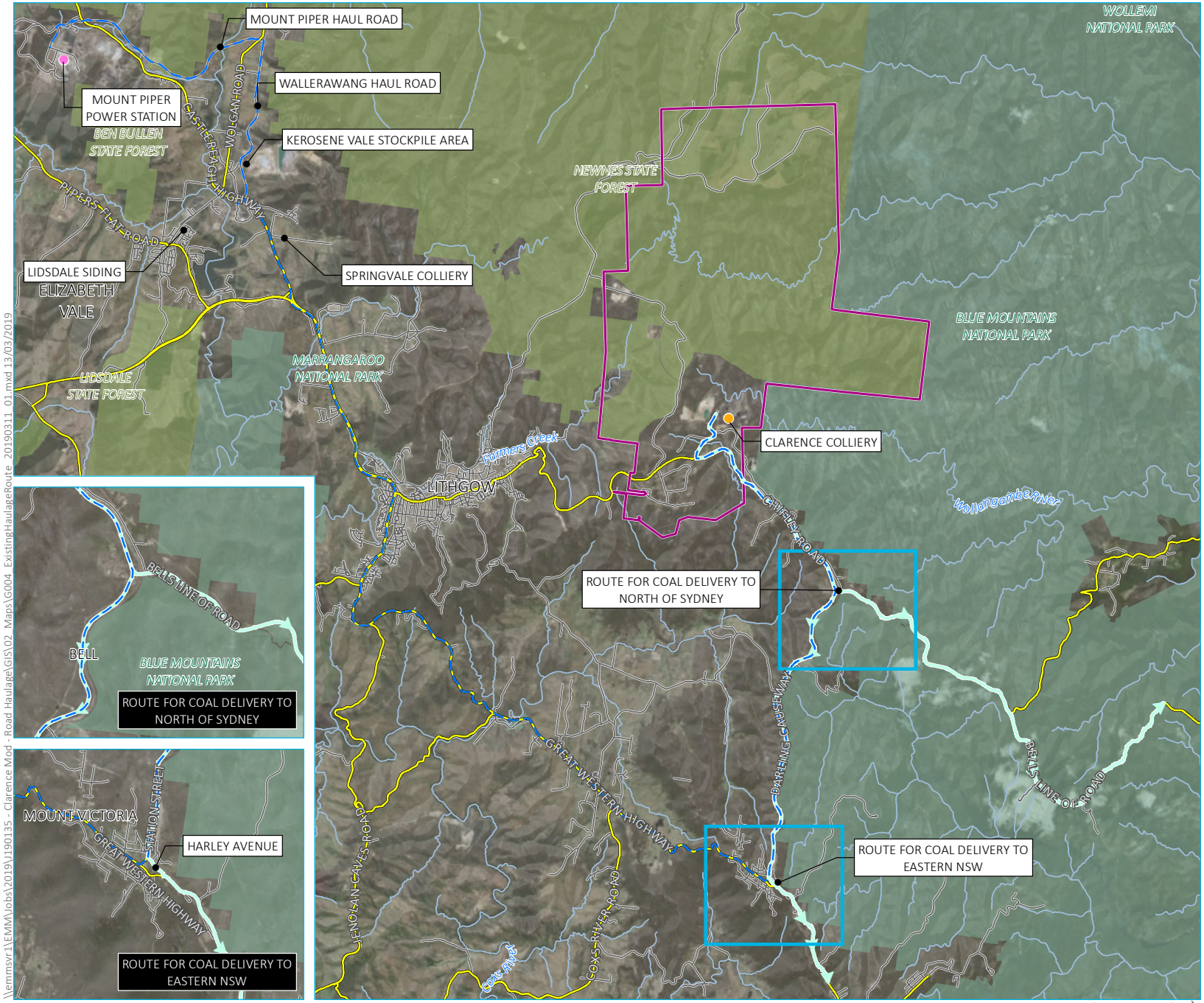
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25 March 2019

Email: Andrew.MCINTYRE@rms.nsw.gov.au

Mr Andrew McIntyre
Manager Land Use Assessment
Roads and Maritime Services
PO Box 334
Parkes NSW 2870

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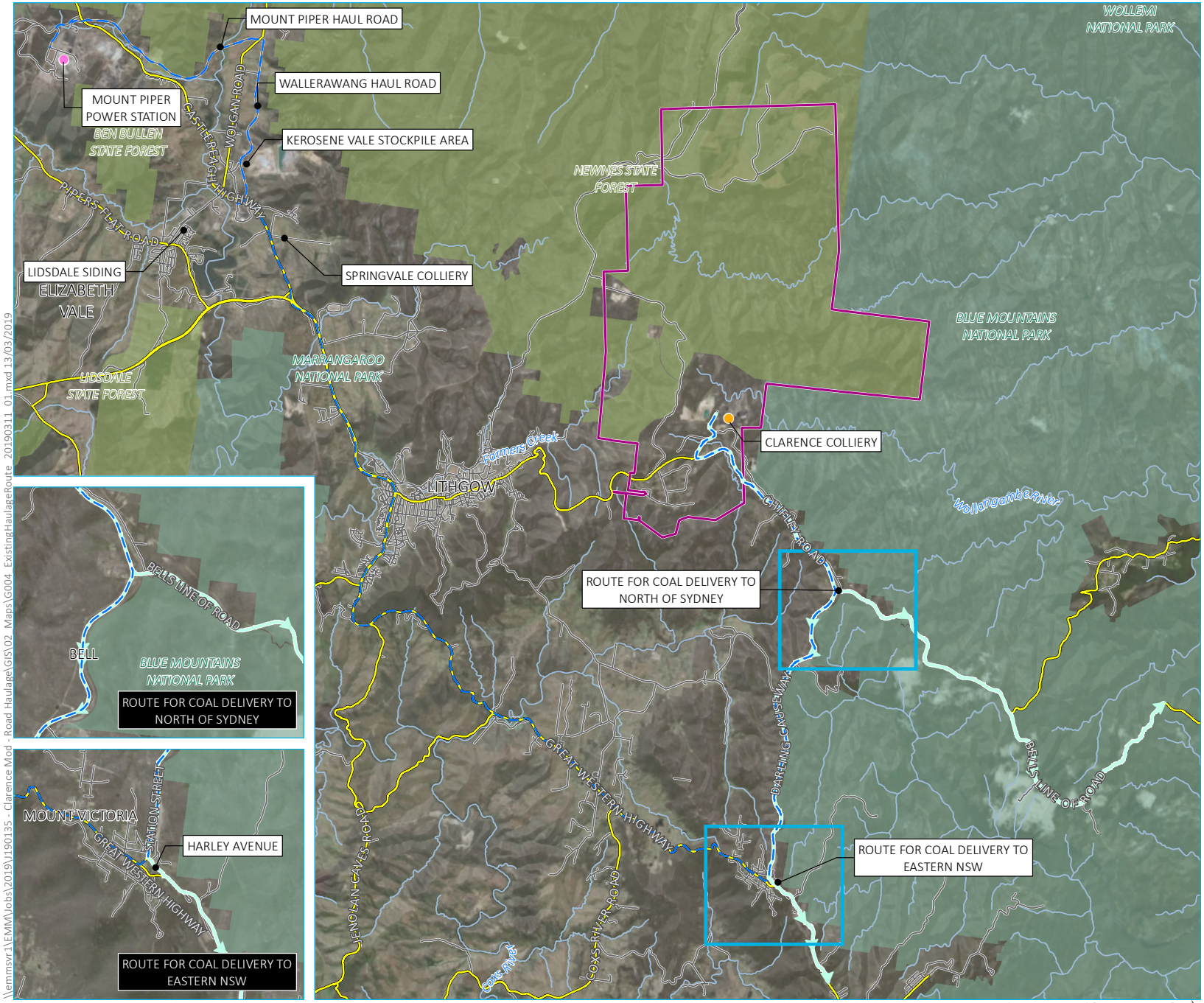
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