ENVIRONMENTAL ASSESSMENT

Duralie Extension Project

APPENDIX H
ROAD TRANSPORT ASSESSMENT

GLOUCESTER COAL

ResourceStrategies

Duralie Extension Project

Road Transport Assessment

4 November 2009
Final

Prepared for
Duralie Coal Pty Ltd

Halcrow MWT

Duralie Extension Project
Road Transport Assessment

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This report has been issued and amended as follows:

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Halcrow MWT
Suite 20, 809 Pacific Highway, Chatswood, NSW 2067 Australia
Tel +61 2 9410 4100 Fax +61 2 9410 4199
www.halcrow.com/australasia

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References

Source Book for Australian Roads, Australian Road Research Board (1985)

Guide to Traffic Engineering Practice Part 2: Roadway Capacity, Austroads (1988)

Guide to Traffic Engineering Practice Part 3: Traffic Studies, Austroads (2004)

Road Design Guide, NSW Roads and Traffic Authority (1996)

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Traffic Volume Data Hunter and Northern Regions, NSW Roads and Traffic Authority (2004)

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H1 Introduction

This report has been prepared on behalf of Duralie Coal Pty Ltd (DCPL) to present the results of an assessment of the road transport implications of a proposal to continue and extend operations at the Duralie Coal Mine (DCM) for an additional nine years, and to increase annual run-of-mine (ROM) coal production from 1.8 million tonnes per annum (Mtpa) up to 3.0 Mtpa. The proposed development is known as the Duralie Extension Project (the Project).

This study has been undertaken with reference to the environmental assessment requirements of the New South Wales (NSW) Department of Planning for this Project. The assessment has therefore been prepared in accordance with the NSW Roads and Traffic Authority's (RTA) (2002) *Guide to Traffic Generating Developments*, and where relevant, makes reference to the RTA's (1996) *Road Design Guide*.

An appreciation of the existing traffic situation around the DCM can be gained by examining the existing road network, traffic volumes on the existing road network, traffic generated by the existing transport activity at the DCM, observed growth in background traffic, and safety aspects of the road system. These aspects are discussed in this report, along with potential impacts from the Project.

The remainder of the report is set out as follows:

- Section H2 describes the existing and proposed operating characteristics of the DCM.
- Section H3 describes the existing road transport conditions on the road system around the DCM.
- Section H4 assesses the potential impacts of the Project.
- Section H5 presents the conclusions of the investigation.

In the course of preparing this report, enquiries were made of Great Lakes Council and the RTA regarding background traffic data and road safety. The data provided is presented in this report.

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H2 Existing and Proposed Coal Mine Operations

H2.1 Existing Operations at the Duralie Coal Mine

The DCM is owned and operated by DCPL, a subsidiary of Gloucester Coal Ltd, and has been operating since March 2003. It is located approximately 10 kilometres (km) north of the village of Stroud and approximately 20km south of Stratford in the Gloucester Valley in NSW. The location of the DCM in its regional context is shown on **Figure H-1** of this report. Vehicular site access to the DCM is via the 3km long sealed DCM access road off The Bucketts Way as shown in **Figure H-2**.

Activities at the DCM take place 24 hours per day, seven days per week. Mining of coal at the DCM is generally undertaken between the hours of 7.00am and 9.00pm, and waste rock is moved during the night.

ROM coal is loaded by excavator into rear dump haul trucks from the open pit and transported to the DCM Coal Handling Plant, including a rotary breaker, at the main infrastructure area. Mined waste rock is placed in the waste rock emplacement.

Sized ROM coal from the rotary breaker is transferred by conveyor to the 2,250 tonne (t) coal loadout bin for loading into train wagons. Sized ROM coal from the DCM is loaded into wagons on a dedicated train that runs between the DCM and Stratford Coal Mine (SCM) on the North Coast Railway. Train movements to the SCM occur between 7.00am and 10.00pm. At the SCM, the coal is unloaded and processed in the SCM Coal Handling and Preparation Plant.

H2.1.1 Existing Workforce Characteristics and Traffic Generation

The existing DCM workforce of 120 people functions on a shift basis, with shift times varying for the different contractors. Table H2.1 summarises the nominal shift times and approximate number of employees per shift. Approximately 90 employees are present at the DCM on an average weekday.

ROAD TRANSPORT ASSESSMENT

FIGURE H-1

Regional Location

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DURALIE COAL

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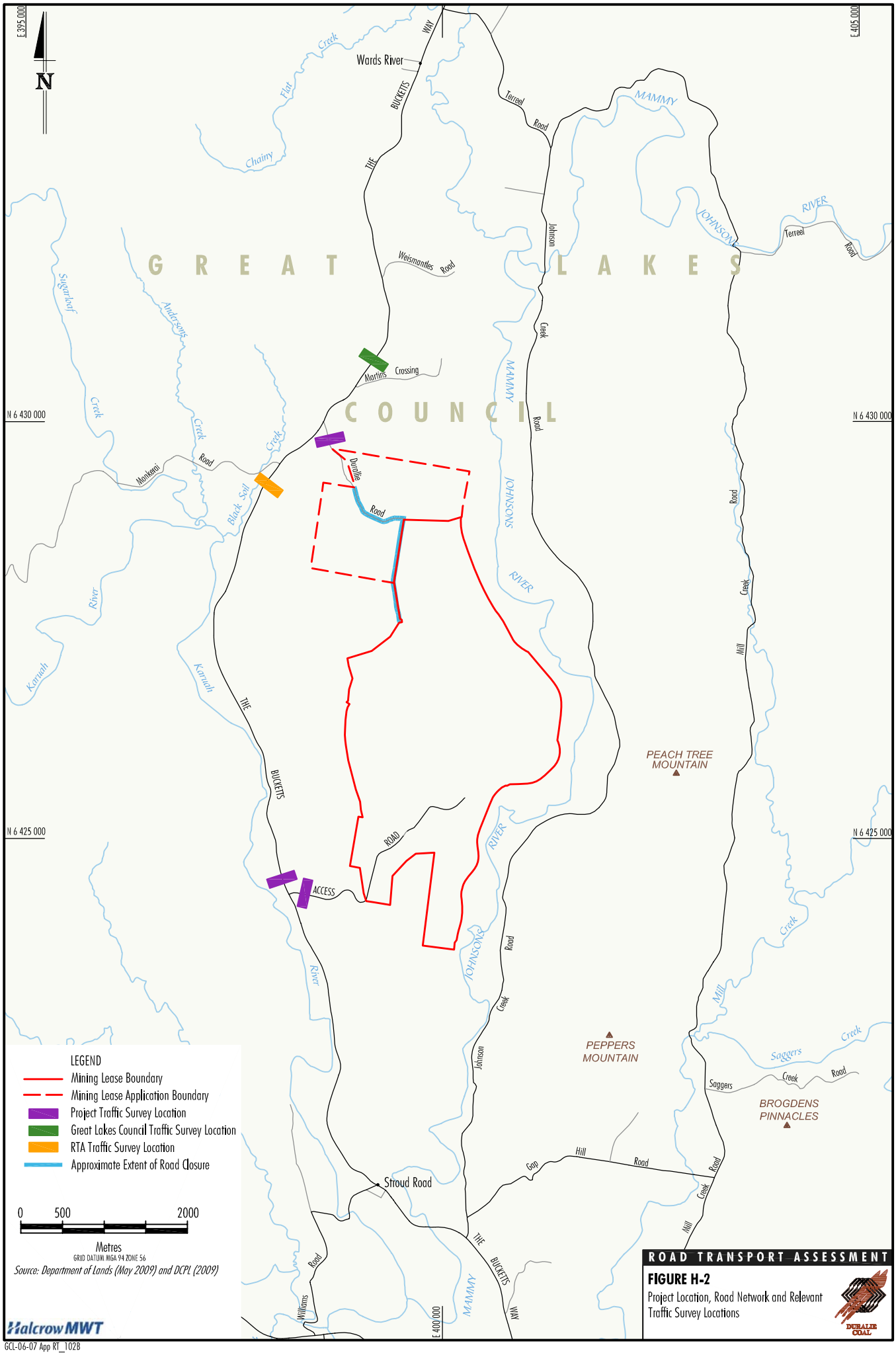

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Table H2.1 – Existing Shifts at the DCM

Source	Employees	Nominal Shift Start	Nominal Shift Finish
DCPL	9	7.00am	5.00pm
Mining Contractor (Day)	52[1]	6.00am	6.00pm
Mining Contractor (Night)	39[1]	6.00pm	6.00am
Earthworks Contractor	13	7.00am	5.00pm
Rail Contractor (Day)	4	6.00am	2.00pm
Rail Contractor (Night)	3	2.00pm	10.00pm
Total	**120**	**-**	**-**

[1] Two-thirds of the total Mining Contractor workforce is present each day.

Employees travel to and from the DCM by car, and DCPL has advised a typical occupancy of 1.2 employees per vehicle applies to the mining contractor employees. Conservatively assuming one employee per vehicle for the remainder of the workforce, the 90 employees arriving and leaving at the start and end of shifts each weekday would typically generate some 158 light vehicle trips per day (vehicle trips/day). A trip is a one way movement, so an employee vehicle arriving and departing generates two vehicle trips.

The workforce is primarily drawn from the local area between Stroud and Gloucester. DCPL has provided the following information on the distribution of the source of the existing employees at the DCM:

- Gloucester - 46%;
- Stroud/Dungog - 21%;
- Newcastle - 13%;
- Lower Hunter - 6%;
- Taree/Wingham - 6%;
- Forster/Tuncurry - 4%; and
- Other - 4%.

Based on the distribution of the source of employees listed above, employees would thus generate around 84 light vehicle trips/day on The Bucketts Way north of the DCM, and 74 light vehicle trips/day on The Bucketts Way south of the DCM.

H2.1.2 Existing Deliveries

DCPL has advised that deliveries account for some 56 heavy vehicle trips per week (noting that a trip is a one way movement, so a truck arriving and departing generates two trips). Deliveries by oversize vehicles generate around six vehicle trips per year (vehicle trips/year).

The majority of deliveries (around 90%) take place during the day, and are generally spread throughout the day. Deliveries to the DCM are generally sourced as follows:

- Gloucester - 40%;
- Newcastle - 14%;
- Singleton - 14%; and
- Other - 32%.

Noting that deliveries tend to occur on weekdays, heavy vehicles associated with deliveries to the DCM would account for up to 12 heavy vehicle trips/day on weekdays. Based on the distribution of the source of deliveries listed above, deliveries related to the DCM generate approximately eight heavy vehicle trips/day on The Bucketts Way north of the DCM, and four heavy vehicle trips/day on The Bucketts Way south of the DCM.

H2.1.3 Other DCM Traffic Generation

In addition to employees arriving and leaving the DCM for shifts, and heavy vehicle delivery movements, the DCM generates vehicle trips on the public road system as a result of the following day-to-day operations:

- Exploration activities – approximately 20 vehicle trips/day, of which approximately 30% are by heavy vehicles.
- General light vehicle movements (e.g. travel to SCM, environmental monitoring) – approximately 20 vehicle trips/day.
- Visitors and short-term contractors – approximately 30 vehicle trips/day, of which approximately 33% are by heavy vehicles.

The vehicle trips associated with the above tend to occur on weekdays. They have a similar source distribution to the employees and deliveries, i.e., approximately 60/40 north/south split (refer to Sections H2.1.1 and H2.1.2) with the exception of the general light vehicle movements from the DCM which predominately travel to and from the north. Vehicle movements associated with these day to day operations of the DCM would account for up to 16 heavy vehicle trips/day and 54 light vehicle trips/day on weekdays. Approximately 50 vehicle trips/day on The Bucketts Way north of the DCM, and 20 vehicle trips/day on The Bucketts Way south of the DCM are estimated to be generated from these movements.

H2.2 Project Description

The Project proposes to extend the life of the DCM by nine years, by extending the open pit mining areas and increasing production of ROM coal from 1.8 Mtpa up to 3.0 Mtpa. The main activities associated with development of the Project would include:

- continued development of open pit mining operations at the DCM to facilitate a ROM coal production rate of up to approximately 3 Mtpa, including:
  - extension of the existing approved open pit in the Weismantel Seam to the north-west (i.e. Weismantel Extension open pit) within Mining Lease (ML) 1427 and Mining Lease Application (MLA) 1; and
  - open pit mining operations in the Clareval Seam (i.e. Clareval North West open pit) within ML 1427 and MLA 1;
- ongoing exploration activities within existing exploration tenements;
- progressive backfilling of the open pits with waste rock as mining develops, and continued and expanded placement of waste rock in out-of-pit waste rock emplacements;
- increased ROM coal rail transport movements on the North Coast Railway between the DCM and SCM in line with increased ROM coal production;
- continued disposal of excess water through irrigation (including development of new irrigation areas within ML 1427 and MLA 1);
- raising of the existing approved Auxiliary Dam No.2 embankment from relative level (RL) 81 m to approximately RL 100m to provide significant additional on-site storage capacity to manage excess water on-site;

- progressive development of dewatering bores, pumps, dams, irrigation infrastructure and other water management equipment and structures;
- development of new haul roads and internal roads;
- upgrade of existing facilities and supporting infrastructure as required in line with increased ROM coal production;
- continued development of soil stockpiles, laydown areas and gravel/borrow pits;
- establishment of a permanent Coal Shaft Creek alignment adjacent to the existing DCM mining area;
- ongoing monitoring and rehabilitation; and
- other associated minor infrastructure, plant, equipment and activities.

The potential road transport impacts associated with the Project would relate principally to the following:

- increase in workforce traffic generation resulting from the proposed increase in the on-site workforce from 120 people to 135 people;
- life of mine increased by nine years;
- operating hours and shift hours unchanged;
- closure of Cheerup Road and the last 1km of Durallie Road to allow for the development of the open pits and associated operations (see **Figure H-2**);
- occasional use of Durallie Road (maximum of ten light vehicle trips/day and two heavy vehicle trips/day) for DCM related activities such as access to exploration and irrigation areas and transport of some equipment; and
- increase in deliveries (such as diesel) and servicing in response to increased production.

All ROM coal produced at the Project would continue to be transported by rail to the SCM and no road haulage of ROM coal is proposed.

The additional 15 employees would be mining contractors, with an estimated additional eight during the day shift and seven during the night shift. As in the existing situation, only two-thirds of these additional contractors, i.e., approximately ten employees, would be present on-site each day, due to the shift arrangements. The shift times are expected to remain largely unchanged.

H3 Background Road Transport Conditions

An appreciation of the existing road transport conditions can be gained by examining the road network, existing traffic volumes, past growth in traffic volumes, and the safety history of the locality. These aspects are discussed below.

H3.1 Road Hierarchy

It is usual to classify roads according to a road hierarchy, in order to determine their functional role within the road network. Changes to traffic flows on the roads can then be assessed within the context of the road hierarchy. Roads are classified according to the role they fulfil and the volume of traffic they should appropriately carry given their classification. There are various classification systems used by local authorities and the RTA. The RTA has set down the following guidelines for the functional classification of roads:

- Arterial Road – typically a main road carrying over 15,000 vehicles per day (vehicles/day) and fulfilling a role as a major inter-regional link (over 1,500 vehicles per hour [vehicles/hour]).
- Sub-arterial Road – defined as secondary inter-regional links, typically carrying volumes between 5,000 and 20,000 vehicles/day (500 to 2,000 vehicles/hour).
- Collector Road – provides a link between local roads and regional roads, typically carrying between 2,000 and 10,000 vehicles/day (250 to 1,000 vehicles/hour). At volumes greater than 5,000 vehicles/day, residential amenity begins to decline noticeably.
- Local Road – provides access to individual allotments, carrying low volumes, typically less than 2,000 vehicles/day (250 vehicles/hour).

In recent years the RTA has adopted a classification system relating to funding purposes. It defines roads as:

- State Roads – performing an important state function for which the RTA funds 100% of the maintenance cost. State roads are essentially arterial roads.

- Regional Roads – roads performing a significant regional function and for which the RTA and Council contribute 50% each towards maintenance. Regional roads are essentially sub-arterial roads.
- Local Roads – roads performing a local or collector function and for which the Council funds 100% of the maintenance cost.

Great Lakes Council does not have a formally adopted road hierarchy for the roads serving the DCM, other than the RTA's state, regional and local road classifications. The hierarchy of roads of relevance to the DCM is provided in Section H3.2.

H3.2 Existing Road Network

The existing road network in the vicinity of the DCM is shown in **Figure H-1** and **Figure H-2** of this report, and is described below.

The Bucketts Way (Main Road 90) extends from Pacific Highway (State Highway 10) at Karuah in the south to Gloucester in the north, then to Pacific Highway at Nabiac in the east. It thus provides an alternative route to Pacific Highway between Port Stephens and Taree. The Bucketts Way is classified as a regional road.

In the vicinity of the DCM, The Bucketts Way has a single travel lane in each direction, and a posted speed limit of 90 kilometres per hour (km/hr). The carriageway is typically 7.0 metres (m) wide, with central linemarking, painted edge lines, and sealed shoulders of varying widths. At its intersection with the DCM access road, The Bucketts Way is widened to provide a separate 130 m right turn deceleration lane and a separate 130m left turn deceleration lane for traffic turning into the access road. This is consistent with a type "CHR" channelised right turn treatment and type "AUL" auxiliary left turn lane treatment for the through leg as set out in the RTA's (1996) *Road Design Guide*. Sight distances at this intersection are good.

The Bucketts Way has been the subject of upgrading works in recent years, with significant sections now rehabilitated and upgraded.

DCM Access Road extends eastward from The Bucketts Way. It is a private roadway, which provides access only for DCM-related traffic. It has a single travel lane in each direction, and the carriageway is approximately 7.0 to 7.5m wide. It has double centre lines, and a posted speed limit of 50km/hr. The DCM access road is flared at its intersection with The Bucketts Way, and is aligned such that it intersects with The Bucketts Way at a right angle. The access road is signposted as a private road, with no unauthorised access permitted.

Durallie Road is classified as a local road, and extends in a south-easterly direction from The Bucketts Way about 6km north of the DCM access road intersection and connects The Bucketts Way with Cheerup Road in the north of the Project area. Durallie Road is sealed for about 30m from its intersection with The Bucketts Way, and is unsealed for the remainder of its length. The carriageway width of Durallie Road varies along its length, and it is typically single lane width, with space for vehicles to pass at low speed. Durallie Road provides access to a limited number of private properties and Cheerup Road only.

Durallie Road forms a tee intersection with The Bucketts Way, and Durallie Road is flared at its approach to the intersection. The intersection has a basic layout, with no auxiliary turn lanes or shoulder widening treatments. Through vehicles on The Bucketts Way must slow or stop if a vehicle ahead is waiting to turn left or right into Durallie Road. The basic rural intersection layout is appropriate for the intersection as the amount of turning traffic is small.

Cheerup Road is a local road that extends southwards from the eastern end of Durallie Road, and terminates at the boundary of ML 1427. It follows a reasonably straight alignment and has an unsealed surface of varying width, although typically single lane width, with opportunities for vehicles to pass at low speed.

Other local roads in the vicinity of the DCM, e.g. Johnsons Creek Road (located to the east of the DCM), carry low to moderate traffic volumes, and negligible traffic associated with the existing DCM. They have sections of relatively poor alignment which provide a lower level of comfort, safety and convenience than The Bucketts Way.

H3.3 Existing Traffic Volumes and Composition

H3.3.1 Traffic Volumes 2008

Great Lakes Council undertook a survey of traffic on The Bucketts Way during September 2008. The survey was conducted 1.7km north of Monkerai Road, which lies about 5.5km north of the intersection of The Bucketts Way with the DCM access road (**Figure H-2**). The survey data is presented in **Attachment HA**.

This data indicates that at that location in 2008, The Bucketts Way carried an average of 1,300 vehicles/day on weekdays. Friday was the busiest day with 1,565 vehicles/day. The distribution of traffic throughout the day does not show distinct morning or evening peaks, rather a steady increase through the day, with a peak occurring in the late afternoon or evening on most days.

H3.3.2 Project Traffic Surveys

To quantify existing traffic conditions at key locations in the vicinity of DCM, additional traffic surveys were conducted over a one week period in July and August 2009 at the following locations, which are also shown on **Figure H-2**:

- The Bucketts Way north of the DCM access road;
- Durallie Road south of The Bucketts Way; and
- DCM access road east of The Bucketts Way.

At each location, hourly traffic volumes were recorded by direction, together with the classification of vehicles using the Austroads (2004) Vehicle Classification System, which is included in **Attachment HA**.

H3.3.3 Surveyed Traffic Volumes

The results of the traffic surveys are summarised in Table H3.1, and full results are presented in **Attachment HA**. The morning peak hour results are for the busiest hour before midday, and the evening peak hour results are for the busiest hour after midday. They do not necessarily occur at the same time at the three locations.

Table H3.1 – Surveyed Two Way Traffic Volumes 2009

	The Bucketts Way	Durallie Road	DCM Access Road
Average Weekday			
Daily (vehicles/day)	1,518	37	240
AM Peak (vehicles/hour)	116	5	42
PM Peak (vehicles/hour)	137	3	34
Saturday			
Daily (vehicles/day)	1,436	29	109
AM Peak (vehicles/hour)	147	4	17
PM Peak (vehicles/hour)	137	3	30
Sunday			
Daily (vehicles/day)	1,585	20	101
AM Peak (vehicles/hour)	146	3	24
PM Peak (vehicles/hour)	169	6	18

During the survey period, it is noted that DCPL exploration activities were being undertaken in the area off Durallie Road. These exploration activities generated some atypical trips on Durallie Road on weekdays, estimated at approximately six to eight vehicle trips/day.

H3.3.4 Existing Roadway Capacity

The Austroads (1988) *Guide to Traffic Engineering Practice Part 2: Roadway Capacity* provides guidelines for the capacity of two lane, two-way rural roads. Level of Service is defined as a qualitative measure describing the operational conditions within a traffic stream as perceived by drivers and/or passengers. A Level of Service definition generally describes these conditions in terms of factors such as speed and travel time, freedom to manoeuvre, traffic interruptions, comfort, convenience and safety. Level of Service A provides the best traffic conditions, with no restriction on desired travel speed or overtaking. Level of Service B to D describes progressively worse traffic conditions. Level of Service E occurs when traffic conditions are at or close to capacity, and there is virtually no freedom to select desired speeds or to manoeuvre in the traffic stream. The service flow rate for Level of Service E is taken as the capacity of a lane or roadway.

Austroads (1988) presents a general method for assessing the Level of Service on two way, two lane rural roads which can be applied to The Bucketts Way and the DCM access road. This is a general assessment for planning purposes only, rather than a detailed assessment of the particular characteristics of these roads. Assuming generally rolling terrain, and peak hour volumes around 10% of daily volumes, the maximum Annual Average Daily Traffic (AADT) for various Levels of Service is shown below in Table H3.2.

Table H3.2 – Level of Service for Two Lane Two Way Rural Roads

Level of Service	Maximum AADT
A	1,100
B	2,800
C	5,200
D	8,000
E	14,800

Source: Austroads (1988).

Comparison between these volumes and the surveyed volumes suggests that The Bucketts Way is currently operating at Level of Service B, and the DCM access road at Level of Service A.

With regard to Durallie Road, the Australian Road Research Board's (1985) *Source Book for Australian Roads* indicates that unsealed roads maintained under traffic are usually considered suitable for up to about 120 vehicles/day. Durallie Road carries less than one third of this volume, and is therefore considered to operate at a good Level of Service with respect to its capacity.

H3.3.5 Surveyed Traffic Composition

The surveys described in Section H3.3.2 also provided data on the composition of traffic on the key roads. Light vehicles include motorcycles, cars, vans, 4WDs, and utes (including those towing a trailer or caravan). Heavy vehicles include single unit trucks and buses with two to four axles and articulated vehicles such as semi-trailers, rigid trucks with trailers and B Doubles.

On the average weekday over the survey period, The Bucketts Way and Durallie Road both carry around 17% heavy vehicles. The DCM access road carries around 12% heavy vehicles.

H3.3.6 DCM Traffic Generation

The results of the traffic survey conducted on the DCM access road provide data on the existing volumes and types of vehicles generated by the DCM over a typical week. This data is presented below in Table H3.3.

Table H3.3 – Surveyed DCM Traffic Generation

	Daily (vehicle trips/day)			AM Peak (vehicle trips/hour)			PM Peak (vehicle trips/hour)		
	Light	**Heavy**	**Total**	**Light**	**Heavy**	**Total**	**Light**	**Heavy**	**Total**
Monday	178	30	208	31	4	35	40	0	40
Tuesday	240	22	262	44	2	46	40	3	43
Wednesday	221	26	247	39	1	40	34	3	37
Thursday	214	25	239	43	2	45	35	0	35
Friday	209	34	243	40	2	42	26	0	26
Saturday	92	17	109	16	1	17	29	1	30
Sunday	84	17	101	22	2	24	14	4	18
Weekday Average	212	28	240	40	2	42	35	1	36

The DCM thus generates an average of 240 vehicle trips/day on weekdays, and around 100 to 110 vehicle trips/day on weekend days. The reduction in weekend traffic generation occurs because administration staff and earthwork contractors generally work weekdays only, and the majority of deliveries and site visitors tend to occur on weekdays.

The DCM is therefore considered to have its greatest contribution to traffic flows on the surrounding road system on weekdays, noting that weekend and weekday volumes are not significantly different on The Bucketts Way (refer to Table H3.1). The assessment of potential impacts of the Project which follows in Section H4 therefore focuses on weekdays.

H3.3.7 Contribution of DCM Traffic on Road System

Table H3.4 presents the estimated spread of traffic currently generated by the DCM on the surveyed roads, based on the recent surveys (Section H3.3.2) and the sources of employees, deliveries and the day-to-day operational movements provided by DCPL (Section H2.1).

Table H3.4 – Average Weekday Traffic Generated by DCM (vehicle trips/day)

	The Bucketts Way North	The Bucketts Way South[1]	Durallie Road[2]	DCM Access Road
DCM Traffic				
Light Vehicles	124	88	0	212
Heavy Vehicles	18	10	0	28
All Vehicles	*142*	*98*	*0*	*240*
Non-DCM Traffic				
Light vehicles	1,131	1,131	25	0
Heavy vehicles	245	245	5	0
All Vehicles	*1,376*	*1,376*	*30*	*0*
Total Traffic				
Light vehicles	1,255	1,219	25	212
Heavy vehicles	263	255	5	28
All Vehicles	*1,518*	*1,474*	*30*	*240*

[1] Total traffic calculated from the surveyed and DCM traffic components north of the DCM access road.

[2] Volumes adjusted from surveys to reflect expected typical use of Durallie Road without exploration activities during the survey period.

Thus the DCM is estimated to generate some 142 vehicle trips/day north of the DCM access road, and 98 vehicle trips/day south of the DCM access road (Table H3.4). On this basis, the DCM traffic makes up only a small proportion (9.4%) of the total traffic on The Bucketts Way north of the DCM access road, and has a smaller proportion of heavy vehicles (11.7%) than the estimated non-DCM background traffic on The Bucketts Way (17.8%).

H3.4 Historic Annual Average Daily Traffic on RTA Roads

The RTA publishes traffic volume data at selected locations on its roads. Available data on roads in the vicinity of the DCM was collated. Table H3.5 presents historic AADT data for the RTA's surveyed locations on The Bucketts Way between 1986 and 2004, and shows how changes in daily traffic volumes has occurred on these roads over that period.

Table H3.5 – Historic Annual Average Daily Traffic Data 1986 to 2004

Location on MR90 The Bucketts Way	1986	1988	1990	1992	1995	1998	2001	2004
North of SH10 Pacific Hwy	-	1,794	-	2,066	2,594	2,729	2,657	2,667
Limeburners Creek N of C'town Road	1,461	-	1,524	-	2,744	2,056	2,351	2,747
Booral South of Buladelah Road	1,580	-	-	-	-	-	-	-
Booral North of Buladelah Road	1,582	-	1,695	-	-	-	-	-
Washpool Bridge South of MR101	1,291	-	1,444	-	1,496	1,581	1,655	2,043
Stroud Road at Railway Overbridge	1,157	-	-	-	-	-	-	-
Weismantels South of Dungog Road*	955	972	1,106	1,162	1,270	1,307	1,333	1,627
Weismantels North of Dungog Road	1,026	-	1,168	-	1,823	1,297	1,328	1,643
Gloucester/Great Lakes boundary	976	-	1,391	-	1,431	1,181	1,388	1,555
Gloucester North of Hume St	3,117	-	3,806	1,468	4,609	4,262	3,282	4,095
Gloucester 1.1km N of Church St	1,297	1,284	1,433	1,458	1,539	1,625	1,553	1,649

Source: RTA (2004).

* Site closest to the DCM.

The RTA's survey location on The Bucketts Way near Dungog Road (Monkerai Road) is the location closest to the DCM for which data is available, and is shown in **Figure H-2**. This site shows a growth in AADT of an average of 3.9% per annum between 1986 and 2004. The growth has been reasonably steady over that period, with an increase in the rate of growth between 2001 and 2004, during which time, daily traffic increased by approximately 300 vehicles/day. It is noted that it is during this period that the DCM was constructed and commenced operating, thus the growth during this period is likely to be partly attributable to DCM traffic. Excluding this period which is likely to be influenced by the development of the DCM, background growth over the period 1986 to 2001 occurred at an average rate of 2.6% per annum.

H3.5 Road Safety Review

Validated crash data was obtained from RTA Hunter Region for the most recent three year period available, being from 1 July 2005 to 30 June 2008. Preliminary data for the nine month period following this was also obtained. One crash was reported during the nine month period of non-validated data, and this has been excluded from the assessment, as its location is poorly identified. The data is presented in **Attachment HB**.

The data is based on crashes reported to the Police, and included the area along The Bucketts Way from Johnsons Creek Road to Martins Crossing. Over the three year period of validated data, there were ten reported crashes in the study area, with no fatal crashes, five injury crashes, and five non-injury tow-away crashes. The RTA data nominates speed as a factor in two of the accidents, and fatigue as a factor in two of the accidents.

The crash data was reviewed to determine whether there was any pattern regarding the crashes which may suggest an inherent safety issue with the road system.

No crashes were reported at the intersections of The Bucketts Way with Durallie Road or the DCM access road. Other crashes along The Bucketts Way were scattered, with no concentration of accidents occurring at any particular location. Only one of the crashes occurred at an intersection, and seven of the ten crashes involved a single vehicle.

Crashes which occurred within 500m of the DCM access road and Durallie Road intersections with The Bucketts Way were as follows:

- 250m north of the DCM Entrance – a southbound truck left the carriageway on a straight section and struck a fence. This occurred during rain, with a wet road surface at 11.30am on 20 August 2007.
- 200m north of the DCM Entrance – a northbound car went on the incorrect side of the road and left the road on a curve. This occurred in fine weather and dry road surface conditions at 11.30am on 3 October 2007.

- 50m south of Durallie Road – a northbound truck in Bucketts Way struck straying stock in foggy weather on a dry road surface in darkness at 3.30am on 14 September 2006.
- 1km south of Weismantles Road (approximately 350m south of Durallie Road) – a southbound car left the road on a curve and struck a fence. This occurred in darkness with fine weather and a dry road surface at 11.30pm on 29 December 2005.

Neither speed nor fatigue were indicated as contributing factors in any of the above crashes. Review of the RTA data has identified no particular accident pattern or causation factors in the local area.

H3.6 Other Developments

There are no known existing or approved significant traffic generating developments that have the potential to significantly impact traffic volumes or safety in the vicinity of the DCM.

Notwithstanding the above, consideration of background traffic growth (Section H3.4) has been included in the assessment of future road transport conditions provided in Section H4 and this provides allowance for cumulative traffic growth.

H4 Future Road Transport Conditions

The remainder of this report assesses the likely implications of the Project on the road network surrounding the DCM. The two future time horizons of particular interest to the Project with regard to traffic conditions are:

- Year 2010, being when the Project commences, including operation traffic and growth in background traffic; and
- Year 2019, being the final year of the Project, including operational traffic and the accumulated growth in background traffic would be at its highest during the life of the Project.

In order to compare future conditions with and without the proposed Project, traffic conditions at the time horizons above were assessed, and are discussed in this section.

H4.1 Future Traffic Volumes – No Project

As described in Section H3.4, increases in daily traffic have occurred on The Bucketts Way which are unrelated to operations at the DCM. Growth in daily traffic occurred at an average rate of 2.6% per annum between 1986 and 2001, prior to the commencement of operations at the DCM. An increase in the growth rate occurred between 2001 and 2004, resulting in an average growth rate from 1986 to 2004 of 3.9% per annum.

Construction at the DCM commenced in May 2002 and mining operations commenced in 2003, thus it is likely that traffic associated with the DCM at least partly contributed to the observed increase in the growth rate between 2001 and 2004.

Based on the recorded growth rates discussed above, future growth in traffic on The Bucketts Way has been estimated to occur at a rate of 3% per annum. This is somewhat higher than the observed growth between 1986 and 2001, and lower than that in the period 1986 to 2004 which included the effects of the commencement of construction and operations at the DCM. The growth was applied to the non-DCM traffic, assuming that the DCM-generated traffic would remain unchanged in 2010 and would not occur in 2019 without the proposed Project, and that no other development would take place on the DCM site.

It is not expected that any change would occur to traffic volumes on Durallie Road or the DCM access road as a result of background growth, i.e. growth which is unrelated to Project activity.

Forecasts of daily traffic at the surveyed locations are presented below in Table H4.1 for the existing and two future time horizons under investigation.

Table H4.1 – No Project Average Weekday Traffic (vehicles/day)

	Existing	Year 2010	Year 2019
Light Vehicles			
The Bucketts Way North of the DCM	1,255	1,289	1,470
The Bucketts Way South of the DCM[1]	1,219	1,253	1,470
Durallie Road[2]	25	25	25
DCM Access Road	212	212	0
Heavy Vehicles			
The Bucketts Way North of the DCM	263	270	319
The Bucketts Way South of the DCM[1]	255	262	319
Durallie Road[2]	5	5	5
DCM Access Road	28	28	0
Total Vehicles			
The Bucketts Way North of the DCM	1,518	1,559	1,789
The Bucketts Way South of the DCM[1]	1,474	1,515	1,789
Durallie Road[2]	30	30	30
DCM Access Road	240	240	0

[1] Total traffic calculated from the surveyed and DCM traffic components north of the DCM access road.

[2] Volumes adjusted from surveys to reflect expected typical use of Durallie Road without exploration activities during the survey period.

Thus without the Project, it is anticipated that The Bucketts Way north of the DCM would carry approximately 1,559 vehicles/day in 2010 and 1,789 vehicles/day in 2019 (Table H4.1).

H4.2 Traffic Generated by the Project

As discussed in Section H2.2, the Project would generate additional traffic as a result of the proposed increase in the workforce from 120 people to 135 people, and an increase in Project deliveries. Changes to traffic conditions would also result from the proposed closure of Cheerup Road and the last 1km of Durallie Road and changes to current resident access along these roads. The various components of the proposed changes to traffic conditions are discussed in this section.

H4.2.1 Use of Durallie Road for DCM Activities

During the Project traffic surveys, Durallie Road carried some 37 vehicles/day at its intersection with The Bucketts Way (Table H3.1). As described in Section H3.3.3, during the survey period, exploration activities were being undertaken in the area off Durallie Road. These exploration activities generated some atypical trips on Durallie Road on weekdays, estimated to be approximately six to eight vehicle trips/day. Without these exploration activities, Durallie Road would therefore be expected to carry approximately 30 vehicles/day on weekdays.

The closure of Cheerup Road and the last 1km of Durallie Road to allow for the development of the Project open pits and associated operations is not expected to significantly reduce current traffic volumes on Durallie Road. This is because there would be only one modification to existing property access locations, and Durallie Road and Cheerup Road provide no through traffic function.

The Project is anticipated to occasionally generate up to ten light and two heavy vehicle trips/day on weekdays on Durallie Road for DCM-related activities such as access to exploration and irrigation areas and transport of equipment. These movements are assumed to be on average 50% to and from the north, and 50% to and from the south. The occasional use of Durallie road would also marginally increase the number of movements on The Bucketts Way north of the DCM and on the DCM access road, as DCM vehicles using Durallie Road would originate and return to the DCM.

H4.2.2 Project Employee Traffic Generation

The proposed increase in total employees from 120 to 135 would result in a small increase in traffic associated with employees arriving at and leaving the DCM at the start and ends of their shifts.

The additional 15 employees would be mining contractors, with an estimated additional eight contractors during the day shift and seven contractors during the night shift. As in the existing situation, only two-thirds of these additional contractors, i.e., approximately ten employees, would be present on-site each day, due to the shift arrangements.

Based on the existing car occupancy of 1.2 employees per vehicle for mining contractors, the additional ten employees at the site each day would generate an estimated additional 16 light vehicle trips/day to and from the DCM. Based on the existing distribution of the source of employees (Section H2.1.1) ten light vehicle trips/day would be expected to occur on The Bucketts Way north of the DCM, and six light vehicle trips/day on The Bucketts Way south of the DCM.

H4.2.3 Project Delivery Traffic Generation

The increase in the maximum ROM coal production rate at the DCM from 1.8 to 3.0Mtpa would result in an increase in the need for deliveries of products (e.g. diesel), to the DCM.

It is estimated that the two-thirds increase in ROM coal production would result in a 50% increase in delivery vehicles trips to and from the DCM. On this basis, the Project would result in an additional six heavy vehicle trips/day for deliveries, of which around four would occur on The Bucketts Way north of the DCM, and two on The Bucketts Way south of the DCM.

H4.2.4 Other Project Traffic

Vehicle movements associated with exploration activities and visitors/short-term contractors (Section H2.1.3) would remain unchanged for the Project. There would however be a small increase in trips generated by employees moving from the DCM associated with the occasional use of Durallie Road. This would be expected to generate an additional 12 vehicle trips/day during weekdays.

These trips would be limited to the DCM access road, Durallie Road and The Bucketts Way between the DCM access road and Durallie Road.

H4.2.5 Total Project Traffic Generation

The overall average weekday traffic generation of the Project, and its spread onto the road system is summarised in Table H4.2.

Table H4.2 – Average Weekday Project Traffic Distribution (vehicle trips/day)

	The Bucketts Way North	The Bucketts Way South	Durallie Road	DCM Access Road
Existing DCM Traffic				
Light Vehicles	124	88	0	212
Heavy Vehicles	18	10	0	28
All Vehicles	*142*	*98*	*0*	*240*
Additional Project Traffic				
Light Vehicles	20	6	10	26
Heavy Vehicles	6	2	2	8
All Vehicles	*26*	*8*	*12*	*34*
Total Future DCM Traffic				
Light vehicles	144	94	10	238
Heavy vehicles	24	12	2	36
All Vehicles	*168*	*106*	*12*	*274*

The Project would thus be expected to generate an additional 34 vehicle trips/day on the surrounding road system.

H4.3 Future Traffic Volumes with the Project

Table H4.3 summarises the two way traffic volumes on the surrounding roads with and without the Project traffic. This assumes that all existing background traffic on Durallie Road would continue to use Durallie Road once it is partially closed as it provides only limited local property access, and no through traffic function.

Table H4.3 – Future Average Weekday Traffic Volumes (vehicles/day)

	No Project			With Project	
	2009	**2010**	**2019**	**2010**	**2019**
Light Vehicles					
The Bucketts Way North	1,255	1,289	1,470	1,309	1,614
The Bucketts Way South[1]	1,219	1,253	1,470	1,259	1,564
Durallie Road[2]	25	25	25	35	35
DCM Access Road	212	212	0	238	238
Heavy Vehicles					
The Bucketts Way North	263	270	319	276	343
The Bucketts Way South[1]	255	262	319	264	331
Durallie Rd[2]	5	5	5	7	7
DCM Access Road	28	28	0	36	36
Total Vehicles					
The Bucketts Way North	1,518	1,559	1,789	1,585	1,957
The Bucketts Way South[1]	1,474	1,515	1,789	1,523	1,895
Durallie Road[2]	30	30	30	42	42
DCM Access Road	240	240	0	274	274

[1] Total traffic calculated from the surveyed and DCM traffic components north of the DCM access road.

[2] Volumes adjusted from surveys to reflect expected typical use of Durallie Road without exploration activities during the survey period.

The results in Table H4.3 indicate that the traffic expected to be generated by the Project would have only a minor impact on the traffic volumes on the surrounding roads such as The Bucketts Way.

The proportion of heavy vehicles on The Bucketts Way and Durallie Road would remain similar to the existing level of around 17%. The proportion of heavy vehicles on the DCM access road is expected to increase slightly to 13%.

H4.4 Potential Impacts of the Project on Traffic Conditions

H4.4.1 DCM Access Road and its Intersection with The Bucketts Way

With the additional traffic generated by the Project, the existing "CHR" and "AUL" treatments at the intersection of The Bucketts Way and the DCM access road (as described in Section H3.2) would remain the most appropriate treatments for this intersection. The flaring of the DCM access road caters for the swept path of heavy vehicles, and allows vehicles turning left and right out of the access road to do so independently. Sight distances are good, and no works are considered to be required at this intersection to address the minor increase in traffic expected to result from the Project.

The DCM access road would continue to operate at Level of Service A based on the Austroads guide presented in Table H3.2 (Section H3.3.4). The existing single travel lane in each direction on the DCM access road would thus be more than adequate to accommodate the anticipated traffic that it would carry with the Project traffic.

H4.4.2 The Bucketts Way

The volume of traffic generated by the DCM would make only a very small contribution to the future traffic volumes on The Bucketts Way north of the DCM (7% to 11% in 2010, and 6% to 9% in 2019). The projected traffic increases with or without the Project traffic would not warrant any upgrading works to The Bucketts Way. The Bucketts Way would continue to operate at Level of Service B based on the Austroads guide presented in Table H3.2 (Section H3.3.4).

H4.4.3 Durallie Road and its Intersection with The Bucketts Way

As described in Section H2.2, Cheerup Road and the last 1km of Durallie Road would be closed to allow for the development of the Project. It has been assumed that all existing background traffic on Durallie Road would continue to use Durallie Road once it is partially closed, as it is not expected to significantly reduce current traffic volumes. This is because there would be only one modification to existing property access locations and because Durallie Road and Cheerup Road provide no through traffic function.

DCPL would occasionally use Durallie Road (estimated maximum of ten light and two heavy vehicle trips/day) for DCM-related activities, such as access to exploration and irrigation areas and transport of some equipment.

Turning movements into and out of Durallie Road would therefore remain very low, and no additional intersection treatments with respect to widening or auxiliary lanes or the like would be warranted.

H4.4.4 Road Level Crossings

Local road level crossings associated with the North Coast Railway between the DCM and the SCM are located on local roads on either side of The Bucketts Way.

The Project would increase the number of trains travelling on the North Coast Railway between the DCM and the SCM from a maximum of 37 trains per week to 39 trains per week (i.e. an increase of two trains per week). The Project is not expected to increase road traffic movements at these local road level crossings.

As the increase in the number of trains on the North Coast Railway between the DCM and the SCM would be small, and the Project would be unlikely to generate additional road traffic movements at the local road level crossings, it is considered that the incremental risk of road and rail traffic interaction associated with the slightly increased DCM rail movements at these local road level crossings would be low.

H4.4.5 Blasting

During mining operations there would be occasions when blasting would be required within 500 m of Durallie Road. Approvals would be sought from the RTA and the Great Lakes Council to close Durallie Road for periods of less than 15 minutes to allow blasting to occur.

It is recommended that the existing DCM Blast Monitoring Program be reviewed and revised for the Project, to include the following details regarding the closure of Durallie Road during blasting:

- method of road closure;
- signage providing advance warning and at the end of the road closure;
- review of traffic volumes;
- period of closure and expected queue lengths;
- access for emergency services;
- notification process; and
- monitoring and reporting requirements.

The Blast Management Plan would be prepared in consultation with the Great Lakes Council and the RTA and in accordance with the RTA's (2006) *Traffic Control at Worksites Manual.*

H4.4.6 DCM Lighting

As described in Section H2.2, the Project includes the extension of open pit mining areas, including a northern extension of the existing DCM open pit, mining the Weismantel seam and mining of the Clareval seam to the north-west of the existing open pit. As a result, the open pit mining areas would extend further to the north and portions of the Project would be visible from a short section of The Bucketts Way to the north of the DCM. A visual screen would be established to screen views of the Project open pits and waste rock emplacements from along the eastern side of relevant section of The Bucketts Way (in consultation with the relevant landholders). The screen would be established at the boundary of the relevant property and The Bucketts Way road reserve. In addition, DCPL would locate relevant lighting plants so that they would be directed away from vehicles travelling south on The Bucketts Way.

H4.4.7 Road Safety Impacts

With the establishment of a suitable visual screen along The Bucketts Way and the operation of relevant lighting plants so that they would be directed away from vehicles travelling south on The Bucketts Way, it is considered that Project operational lighting would not present a potential risk to road safety on The Bucketts Way.

As the increases in traffic resulting from the Project would be minimal, and no particular accident pattern or causation factors were identified in the local area, it follows that no significant road safety issues are anticipated as a result of the Project.

H4.4.8 Oversize Vehicles

A number of overheight or overwidth loads may be generated on an occasional basis during the life of the Project. The number of these oversize loads is anticipated to be small, at around six vehicle trips/year. All such loads would be transported with the relevant permits, licences and escorts as required by the regulatory authorities. The proposed route would be negotiated with the relevant local councils on a case-by-case basis.

H4.4.9 On-Site Car Parking

The number of formal parking bays at the DCM on-site car parking area would not be increased as a result of the Project, as the existing parking area more than adequately caters for demand, which would increase only slightly with the Project.

H5 Conclusions

This study has found that the extension of the life of the DCM and expansion of its production capacity would have only minor impacts on the operation of the surrounding road system. The contribution of the Project to total traffic on the surrounding road network would decline over time, as background traffic levels increase.

No significant impacts on the performance and safety of the road network are expected to arise as a result of the Project and no specific management or mitigation measures are considered to be warranted.

Attachment HA Traffic Survey Data

Site 1 The Bucketts Way North of Mine Access Road **North**

Day	*Wed*	*Thu*	*Fri*	*Sat*	*Sun*	*Mon*	*Tue*	*W/Day*	*W/End*	*7 Day*
Time	29-Jul-09	30-Jul-09	31-Jul-09	1-Aug-09	2-Aug-09	3-Aug-09	4-Aug-09	*Ave.*	*Ave.*	*Ave*
0:00	4	3	3	3	1	2	3	3	2	3
1:00	0	0	2	4	1	2	0	1	3	1
2:00	1	4	2	2	7	2	0	2	5	3
3:00	3	12	2	2	1	2	4	5	2	4
4:00	12	7	16	8	0	8	17	12	4	10
5:00	10	14	15	7	3	18	15	14	5	12
6:00	27	31	26	12	14	43	25	30	13	25
7:00	31	33	46	28	18	45	40	39	23	34
8:00	36	33	24	56	26	51	41	37	41	38
9:00	65	76	60	70	32	64	61	65	51	61
10:00	42	56	61	65	66	47	46	50	66	55
11:00	57	43	64	48	73	59	49	54	61	56
12:00	54	47	48	68	70	36	39	45	69	52
13:00	44	51	74	53	65	44	47	52	59	54
14:00	44	61	69	68	59	64	58	59	64	60
15:00	63	68	91	50	58	55	65	68	54	64
16:00	66	60	89	81	80	65	71	70	81	73
17:00	52	57	81	38	56	51	58	60	47	56
18:00	29	26	45	31	38	25	28	31	35	32
19:00	20	28	50	22	22	13	19	26	22	25
20:00	15	12	38	7	10	11	13	18	9	15
21:00	14	7	19	12	10	5	9	11	11	11
22:00	5	5	14	11	6	5	10	8	9	8
23:00	4	8	7	6	4	6	4	6	5	6
Total	**698**	**742**	**946**	**752**	**720**	**723**	**722**	**766**	**736**	**758**

Site 1 The Bucketts Way North of Mine Access Road **South**

Day	*Wed*	*Thu*	*Fri*	*Sat*	*Sun*	*Mon*	*Tue*	*W/Day*	*W/End*	*7 Day*
Time	29-Jul-09	30-Jul-09	31-Jul-09	1-Aug-09	2-Aug-09	3-Aug-09	4-Aug-09	*Ave.*	*Ave.*	*Ave*
0:00	1	2	3	0	0	1	2	2	0	1
1:00	0	0	1	0	2	1	1	1	1	1
2:00	0	2	3	0	3	2	0	1	2	1
3:00	3	3	2	3	2	4	1	3	3	3
4:00	6	6	4	4	5	12	14	8	5	7
5:00	19	23	26	15	2	26	26	24	9	20
6:00	57	51	47	17	18	55	49	52	18	42
7:00	45	47	42	31	17	46	44	45	24	39
8:00	48	52	62	41	30	50	48	52	36	47
9:00	42	53	56	49	45	53	51	51	47	50
10:00	54	41	70	82	64	60	48	55	73	60
11:00	45	62	77	58	73	50	36	54	66	57
12:00	38	68	60	54	66	57	46	54	60	56
13:00	52	54	76	40	67	40	43	53	54	53
14:00	89	59	65	61	100	61	52	65	81	70
15:00	65	76	76	69	111	61	65	69	90	75
16:00	63	47	53	56	86	35	48	49	71	55
17:00	42	51	59	40	90	68	46	53	65	57
18:00	25	26	44	21	42	24	21	28	32	29
19:00	12	12	28	15	20	13	12	15	18	16
20:00	8	7	4	10	9	4	6	6	10	7
21:00	6	6	8	10	6	2	5	5	8	6
22:00	2	7	2	6	5	3	5	4	6	4
23:00	3	6	5	2	2	1	1	3	2	3
Total	**725**	**761**	**873**	**684**	**865**	**729**	**670**	**752**	**775**	**758**

Site 2 Duralie Mine Access Road **West**

Day	*Wed*	*Thu*	*Fri*	*Sat*	*Sun*	*Mon*	*Tue*	*W/Day*	*W/End*	*7 Day*
Time	29-Jul-09	30-Jul-09	31-Jul-09	1-Aug-09	2-Aug-09	3-Aug-09	4-Aug-09	*Ave.*	*Ave.*	*Ave*
0:00	0	0	1	0	0	0	0	0	0	0
1:00	0	0	0	2	1	0	0	0	2	0
2:00	0	0	1	0	8	0	0	0	4	1
3:00	0	12	0	0	4	0	0	2	2	2
4:00	15	1	13	13	0	0	12	8	7	8
5:00	1	0	1	1	0	0	0	0	1	0
6:00	0	2	1	0	2	1	2	1	1	1
7:00	6	3	4	0	0	7	3	5	0	3
8:00	2	2	4	2	1	5	3	3	2	3
9:00	9	3	3	1	0	4	10	6	1	4
10:00	4	6	11	4	1	7	8	7	3	6
11:00	9	5	2	2	1	2	3	4	2	3
12:00	6	4	5	2	3	4	4	5	3	4
13:00	4	8	15	1	1	3	6	7	1	5
14:00	8	7	8	4	1	8	3	7	3	6
15:00	6	10	12	1	7	5	20	11	4	9
16:00	26	23	15	19	0	10	15	18	10	15
17:00	20	23	15	1	16	27	30	23	9	19
18:00	7	4	3	2	4	7	3	5	3	4
19:00	0	4	3	0	2	2	3	2	1	2
20:00	2	0	0	0	0	1	2	1	0	1
21:00	0	1	0	1	1	2	3	1	1	1
22:00	0	0	3	0	1	1	0	1	1	1
23:00	1	0	1	0	3	0	0	0	2	1
Total	**126**	**118**	**121**	**56**	**57**	**96**	**130**	**118**	**57**	**101**

Site 2 Duralie Mine Access Road **East**

Day	*Wed*	*Thu*	*Fri*	*Sat*	*Sun*	*Mon*	*Tue*	*W/Day*	*W/End*	*7 Day*
Time	29-Jul-09	30-Jul-09	31-Jul-09	1-Aug-09	2-Aug-09	3-Aug-09	4-Aug-09	*Ave.*	*Ave.*	*Ave*
0:00	0	0	0	0	0	0	0	0	0	0
1:00	0	0	0	1	0	0	0	0	1	0
2:00	0	0	1	0	0	0	0	0	0	0
3:00	0	0	0	0	0	0	0	0	0	0
4:00	0	1	0	2	0	5	9	3	1	2
5:00	7	8	7	16	2	8	5	7	9	8
6:00	40	43	41	3	22	34	44	40	13	32
7:00	9	9	9	7	5	10	11	10	6	9
8:00	10	8	14	1	0	12	9	11	1	8
9:00	4	3	7	2	4	4	14	6	3	5
10:00	8	5	3	2	1	2	3	4	2	3
11:00	5	5	5	0	2	3	0	4	1	3
12:00	5	6	12	0	1	8	10	8	1	6
13:00	4	8	2	2	2	4	3	4	2	4
14:00	3	2	4	1	0	2	2	3	1	2
15:00	5	5	1	4	0	2	5	4	2	3
16:00	11	4	4	11	0	5	3	5	6	5
17:00	8	12	11	0	2	13	13	11	1	8
18:00	1	1	0	0	0	0	0	0	0	0
19:00	0	0	0	0	2	0	0	0	1	0
20:00	0	0	0	0	0	0	0	0	0	0
21:00	0	1	0	1	1	0	0	0	1	0
22:00	0	0	0	0	0	0	1	0	0	0
23:00	1	0	1	0	0	0	0	0	0	0
Total	**121**	**121**	**122**	**53**	**44**	**112**	**132**	**122**	**49**	**101**

Site 3 Duralie Rd **North**

Day	*Wed*	*Thu*	*Fri*	*Sat*	*Sun*	*Mon*	*Tue*	*W/Day*	*W/End*	*7 Day*
Time	29-Jul-09	30-Jul-09	31-Jul-09	1-Aug-09	2-Aug-09	3-Aug-09	4-Aug-09	*Ave.*	*Ave.*	*Ave*
0:00	0	0	0	1	0	0	0	0	1	0
1:00	0	1	0	0	0	0	0	0	0	0
2:00	0	0	0	0	0	0	0	0	0	0
3:00	0	0	0	0	0	0	0	0	0	0
4:00	0	0	0	0	0	0	0	0	0	0
5:00	0	0	1	0	0	0	0	0	0	0
6:00	0	0	0	0	0	1	0	0	0	0
7:00	2	0	0	1	0	0	0	0	1	0
8:00	0	0	0	1	0	0	2	0	1	0
9:00	3	3	0	1	1	0	3	2	1	2
10:00	2	2	3	2	0	0	1	2	1	1
11:00	2	1	7	3	1	1	1	2	2	2
12:00	2	2	3	1	0	0	0	1	1	1
13:00	2	5	4	0	0	0	0	2	0	2
14:00	0	1	1	0	2	2	3	1	1	1
15:00	4	0	0	1	0	3	4	2	1	2
16:00	1	1	1	1	4	0	1	1	3	1
17:00	5	4	0	1	0	3	0	2	1	2
18:00	0	2	1	1	0	0	0	1	1	1
19:00	0	0	1	0	1	0	1	0	1	0
20:00	0	0	1	0	0	0	0	0	0	0
21:00	1	0	0	0	1	0	0	0	1	0
22:00	0	0	0	1	0	0	0	0	1	0
23:00	0	0	0	0	0	0	0	0	0	0
Total	**24**	**22**	**23**	**15**	**10**	**10**	**16**	**19**	**13**	**17**

Site 3 Duralie Rd **South**

Day	*Wed*	*Thu*	*Fri*	*Sat*	*Sun*	*Mon*	*Tue*	*W/Day*	*W/End*	*7 Day*
Time	29-Jul-09	30-Jul-09	31-Jul-09	1-Aug-09	2-Aug-09	3-Aug-09	4-Aug-09	*Ave.*	*Ave.*	*Ave*
0:00	0	1	0	0	0	0	0	0	0	0
1:00	0	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	0	0	0	0	0	0
3:00	0	0	0	0	0	0	0	0	0	0
4:00	0	0	0	0	0	0	0	0	0	0
5:00	0	0	0	0	0	0	0	0	0	0
6:00	2	2	2	0	0	2	1	2	0	1
7:00	2	1	0	1	0	0	0	1	1	1
8:00	0	1	1	1	0	0	1	1	1	1
9:00	6	5	3	3	0	0	4	4	2	3
10:00	0	2	4	2	3	0	0	1	3	2
11:00	3	0	4	0	1	3	2	2	1	2
12:00	2	4	3	1	1	0	0	2	1	2
13:00	0	1	1	0	0	0	1	1	0	0
14:00	2	0	0	1	0	2	5	2	1	1
15:00	2	2	1	0	1	1	0	1	1	1
16:00	0	2	0	2	2	0	1	1	2	1
17:00	1	1	1	1	0	1	0	1	1	1
18:00	1	0	0	0	1	0	0	0	1	0
19:00	0	0	0	0	0	0	1	0	0	0
20:00	0	0	2	1	0	0	0	0	1	0
21:00	1	0	0	1	1	0	0	0	1	0
22:00	0	0	0	0	0	0	0	0	0	0
23:00	0	0	1	0	0	0	0	0	0	0
Total	**22**	**22**	**23**	**14**	**10**	**9**	**16**	**18**	**12**	**17**

MetroCount Traffic Executive
Weekly Vehicle Counts (Virtual Week)

VirtWeeklyVehicle-301 -- English (ENA)

Datasets:

Site:	**[9005] MR90 BUCKETTS WAY, 1.7km NTH OF MONKERAI RD**
Direction:	7 - North bound A>B, South bound B>A., **Lane:** 0
Survey Duration:	11:10 Thursday, 4 September 2008 => 13:00 Tuesday, 16 September 2008
File:	G:\TCS\MICROCOM\2008\Regional Road Program (MR) 2008\MR90 Bucketts Way \900516Sep2008.EC0 (Plus)
Identifier:	K7974AAM MC56-6 [MC55] (c)Microcom 02/03/01
Algorithm:	Factory default
Data type:	Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time:	**11:10 Thursday, 4 September 2008 => 13:00 Tuesday, 16 September 2008**
Included classes:	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Speed range:	10 - 160 km/h.
Direction:	North, East, South, West (bound)
Separation:	All - (Headway)
Name:	Factory default profile
Scheme:	Vehicle classification (AustRoads94)
Units:	Metric (meter, kilometer, m/s, km/h, kg, tonne)
In profile:	Vehicles = 16212 / 16223 (99.93%)

Weekly Vehicle Counts (Virtual Week)

VirtWeeklyVehicle-301
Site: 9005.0SN
Description: **MR90 BUCKETTS WAY, 1.7km NTH OF MONKERAI RD**
Filter time: **11:10 Thursday, 4 September 2008 => 13:00 Tuesday, 16 September 2008**
Scheme: Vehicle classification (AustRoads94)
Filter: Cls(1 2 3 4 5 6 7 8 9 10 11 12) Dir(NESW) Sp(10,160) Headway(>0)

	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Averages 1 - 5	Averages 1 - 7
Hour									
0000-0100	2.0	3.0	5.0	2.0	3.5	4.5	5.0	3.0	3.6
0100-0200	1.0	2.5	2.0	1.0	2.5	2.0	4.0	1.9	2.3
0200-0300	2.0	1.5	1.0	2.0	1.0	2.0	6.0	1.5	2.3
0300-0400	5.0	1.5	0.0	8.0	4.5	4.0	4.5	3.8	3.9
0400-0500	12.5	17.0	16.0	11.0	18.0	8.0	3.0	15.3	12.0
0500-0600	45.0	34.5	34.0	34.0	25.5	20.5	9.0	34.8	28.1
0600-0700	72.5	64.5	85.0	72.0	58.5	23.5	8.5	68.5	51.0
0700-0800	71.0	72.5	79.0	75.0	71.0	39.5	25.0	72.9	59.3
0800-0900	79.5	75.0	84.0	73.0	78.0	82.0	58.5	77.8	75.3
0900-1000	85.5	**95.0<**	**99.0<**	76.0	90.0	97.0	120.0	89.5	95.8
1000-1100	91.0	83.5	87.0	**84.0<**	**101.5<**	**127.5<**	**123.5<**	90.4	**102.1<**
1100-1200	**101.5<**	88.0	77.0	79.0	101.0	125.5	116.5	**90.7<**	100.0
1200-1300	97.5	80.0	95.0	107.0	121.0	**110.0<**	120.0	100.7	105.1
1300-1400	94.0	44.0	88.0	105.5	**148.5<**	108.0	139.0	96.9	105.1
1400-1500	99.5	89.0	98.0	99.0	134.5	102.5	150.0	106.6	113.2
1500-1600	102.0	**112.0<**	**133.0<**	105.0	131.0	104.0	**194.5<**	**115.1<**	**126.5<**
1600-1700	**103.0<**	105.0	93.0	**114.5<**	139.5	99.5	141.5	114.0	116.2
1700-1800	87.5	75.0	88.0	84.0	125.0	59.5	108.5	94.5	91.0
1800-1900	42.5	34.0	50.0	46.0	75.5	38.5	57.5	51.5	50.3
1900-2000	22.0	18.0	20.0	33.0	49.0	23.5	32.5	30.8	29.8
2000-2100	17.5	21.0	18.0	22.0	36.0	17.0	24.5	23.8	22.8
2100-2200	10.5	12.0	10.0	10.0	19.0	9.0	16.5	12.6	12.7
2200-2300	9.0	5.0	7.0	13.0	15.0	9.0	9.0	10.8	10.2
2300-2400	5.0	6.0	5.0	6.5	14.5	5.0	4.0	7.9	6.8
Totals									
0700-1900	1054.5	953.0	1071.0	1048.0	1316.5	1093.5	1354.5	1100.5	1139.8
0600-2200	1177.0	1068.5	1204.0	1185.0	1479.0	1166.5	1436.5	1236.1	1256.1
0600-0000	1191.0	1079.5	1216.0	1204.5	1508.5	1180.5	1449.5	1254.7	1273.0
0000-0000	1258.5	1139.5	1274.0	1262.5	1563.5	1221.5	1481.0	1314.8	1325.2
AM Peak	1100	0900	0900	1000	1000	1000	1000		
	101.5	95.0	99.0	84.0	101.5	127.5	123.5		
PM Peak	1600	1500	1500	1600	1300	1200	1500		
	103.0	112.0	133.0	114.5	148.5	110.0	194.5		

* - No data.

AUSTROADS Vehicle Classification System

Level 1	Level 2		Level 3		AUSTROADS Classification	
Length (indicative)	Axles and Axle Groups		Vehicle Type			
Type	Axles	Groups	Typical Description	Class	Parameters	Typical Configuration
			LIGHT VEHICLES			
Short up to 5.5m		1 or 2	**Short** Sedan, Wagon, 4WD, Utility, Light Van, Bicycle, Motorcycle, etc	1	d(1) ≤ 3.2m and axles = 2	
	3, 4 or 5	3	**Short - Towing** Trailer, Caravan, Boat, etc	2	groups = 3 d(1) ≥ 2.1m, d(1) ≤ 3.2m, d(2) ≥ 2.1m and axles = 3, 4 or 5	
			HEAVY VEHICLES			
Medium 5.5m to 14.5m	2	2	**Two Axle Truck or Bus**	3	d(1) > 3.2m and axles = 2	
	3	2	**Three Axle Truck or Bus**	4	axles = 3 and groups = 2	
	> 3	2	**Four Axle Truck**	5	axles > 3 and groups = 2	
Long 11.5m to 19.0m	3	3	**Three Axle Articulated** Three axle articulated vehicle, or Rigid vehicle and trailer	6	d(1) > 3.2m, axles = 3 and groups = 3	
	4	> 2	**Four Axle Articulated** Four axle articulated vehicle, or Rigid vehicle and trailer	7	d(2) < 2.1m or d(1) < 2.1m or d(1) > 3.2m axles = 4 and groups > 2	
	5	> 2	**Five Axle Articulated** Five axle articulated vehicle, or Rigid vehicle and trailer	8	d(2) < 2.1m or d(1) < 2.1m or d(1) > 3.2m axles = 5 and groups > 2	
	≥ 6	> 2	**Six Axle Articulated** Six axle articulated vehicle, or Rigid vehicle and trailer	9	axles = 6 and groups > 2 or axles > 6 and groups = 3	
Medium Combination 17.5m to 36.5m	> 6	4	**B Double** B Double, or Heavy truck and trailer	10	groups = 4 and axles > 6	
	> 6	5 or 6	**Double Road Train** Double road train, or Medium articulated vehicle and one dog trailer (M.A.D.)	11	groups = 5 or 6 and axles > 6	
Large Combination Over 33.0m	> 6	> 6	**Triple Road Train** Triple road train, or Heavy truck and three trailers	12	groups > 6 and axles > 6	

Definitions: Group: Axle group, where adjacent axles are less than 2.1m apart
Groups: Number of axle groups
Axles: Number of axles (maximum axle spacing of 10.0m)

d(1): Distance between first and second axle
d(2): Distance between second and third axle

Attachment HB RTA Crash Report

Detailed Crash Report - sorted

Natural Lighting

Hunter Region **Great Lakes LGA** **Stroud** **Bucketts Way**

Crash No.	Date	Day of Week	Time	Distance		ID Feature	Loc Type	Alignment	Weather	Surface Condition	Speed Limit	No. of Tus	Tu Type/Obj	Age/Sex	Street Travelling	Speed Travelling	Manoeuvre	Degree of Crash	Killed	Injured	Factors S	Factors F
494554	23/10/2005	Sun	18:00	300 m	S	RIVERWOOD DOWN OT	2WY	STR	Fine	Dry	100	1	CAR	M26	S in BUCKETTS WAY	85	Pull out opposite	N	0	0		
E145223392						Dusk	DCA: 502		Ovtak - Out of control													
Hunter Region						**Great Lakes LGA**	**Stroud Road**				**Bucketts Way**											
501638	24/10/2005	Mon	23:00	2 km	S	MONKERAI RD	2WY	CRV	Raining	Wet	90	1	CAR	M18	S in BUCKETTS WAY	90	Proceeding in lane	N	0	0	S	
E49225401						Darkness	DCA: 803 L		Off right bend into obj				Other fixed object									
Hunter Region						**Great Lakes LGA**	**Wards River**				**Bucketts Way**											
502153	29/12/2005	Thu	23:30	1 km	S	WEISMANTLES RD	2WY	CRV	Fine	Dry	100	1	CAR	M43	S in BUCKETTS WAY	100	Proceeding in lane	I	0	1		
E112374693						Darkness	DCA: 803 R		Off right bend into obj				Fence									
Hunter Region						**Great Lakes LGA**	**Wards River**				**Bucketts Way**											
516800	03/04/2006	Mon	17:30	4.7 km	S	MONKERAI RD	2WY	STR	Fine	Dry	90	2	4WD	M18	N in BUCKETTS WAY	80	Incorrect side	N	0	0		F
E26281844						Daylight	DCA: 201		Opp - Head on				CAR	U U	S in BUCKETTS WAY	90	Proceeding in lane					
Hunter Region						**Great Lakes LGA**	**Wards River**				**Bucketts Way**											
542839	14/09/2006	Thu	03:30	50 m	S	DURALLIE RD	2WY	CRV	Fog or mist	Dry	100	1	TRK	M67	N in BUCKETTS WAY	80	Proceeding in lane	N	0	0		
E27924333						Darkness	DCA: 609		On path - Hit animal				Straying stock									
Hunter Region						**Great Lakes LGA**	**Stroud Road**				**Bucketts Way**											
537443	24/09/2006	Sun	12:10		at	KARUAH ST	TJN	STR	Fine	Dry	60	2	M/C	M41	S in BUCKETTS WAY	80	Proceeding in lane	I	0	1	S	
E28006054						Daylight	DCA: 303		Same - Rear right				CAR	F26	S in BUCKETTS WAY	20	Turning right					
Hunter Region						**Great Lakes LGA**	**Stroud Road**				**Bucketts Way**											
548777	05/11/2006	Sun	22:00	1.5 km	S	MONKERAI RD	2WY	CRV	Raining	Wet	90	2	CAR	M42	N in BUCKETTS WAY	80	Incorrect side	I	0	1		
E28381476						Darkness	DCA: 201		Opp - Head on				CAR	F40	S in BUCKETTS WAY	80	Proceeding in lane					
Hunter Region						**Great Lakes LGA**	**Stroud Road**				**Bucketts Way**											
586880	20/08/2007	Mon	11:30	250 m	N	DURALIE MINE ENT	2WY	STR	Raining	Wet	90	1	TRK	M76	S in BUCKETTS WAY	60	Proceeding in lane	N	0	0		
E105461497						Daylight	DCA: 704		Right off cway into obj				Fence									
Hunter Region						**Great Lakes LGA**	**Stroud**				**Bucketts Way**											
596547	03/10/2007	Wed	11:30	200 m	N	DURALIE COAL M ENT	2WY	CRV	Fine	Dry	100	1	CAR	F54	N in BUCKETTS WAY	Unk	Incorrect side	I	0	1		
E31902877						Daylight	DCA: 800		Other on curve													
Hunter Region						**Great Lakes LGA**	**Stroud Road**				**Bucketts Way**											
611097	22/12/2007	Sat	02:00	200 m	S	REIDSDALE RD	2WY	STR	Fine	Dry	50	1	CAR	M43	S in BUCKETTS WAY	2	Proceeding in lane	I	0	1		F
E32577603						Darkness	DCA: 704		Right off cway into obj				Fence									

Detailed Crash Report - sorted

Crash No.	Date	Day of Week	Time	Distance	ID Feature	Loc Type	Alignment	Weather	Surface Condition	Speed Limit	No. of Tus	Tu Type/Obj	Age/Sex	Street Travelling	Speed Travelling	Manoeuvre	Degree of Crash	Killed	Injured	Factors
																				S F
Natural Lighting																				
Hunter Region				**Great Lakes LGA**		**Stroud Road**				**Bucketts Way**										
652417	03/01/2009	Sat	01:55	15 km N	DUNGOG RD	2WY	CRV	Raining	Wet	100	2	CAR	M19	N in BUCKETTS WAY	Unk	Proceeding in lane	N	0	0	S
E35810575				Darkness		DCA: 803	L	Off right bend into obj				CAR	M21	N in BUCKETTS WAY	Unk	Proceeding in lane				
												Embankment								

Report Totals: Total Crashes: 11 Fatal Crashes: 0 Injury Crashes: 5 Killed: 0 Injured: 5

Crashid dataset The Bucketts Way, Duralie Coal Mine, 3-years data 13-7-2009

Note: Ordered by: Crash Date,Crash Time,Crash No. Q3 2005 to Q3 2009 Data for the 9 month period prior to the generated date of this report are incomplete and are subject to change.

Summary Crash Report

# Crash Type		
Car Crash	9	81.8%
Light Truck Crash	2	18.2%
Rigid Truck Crash	0	0.0%
Articulated Truck Crash	0	0.0%
'Heavy Truck Crash	(0)	(0.0%)
Bus Crash	0	0.0%
"Heavy Vehicle Crash	(0)	(0.0%)
Emergency Vehicle Crash	0	0.0%
Motorcycle Crash	1	9.1%
Pedal Cycle Crash	0	0.0%
Pedestrian Crash	0	0.0%

' Rigid or Artic. Truck " Heavy Truck or Heavy Bus
These categories are NOT mutually exclusive

Location Type		
*Intersection	1	9.1%
Non intersection	10	90.9%

* Up to 10 metres from an intersection
~ 07:30-09:30 or 14:30-17:00 on school days

Collision Type		
Single Vehicle	7	63.6%
Multi Vehicle	4	36.4%

Road Classification		
Freeway/Motorway	0	0.0%
State Highway	0	0.0%
Other Classified Road	11	100.0%
Unclassified Road	0	0.0%

Contributing Factors		
Speeding	3	27.3%
Fatigue	2	18.2%
Alcohol	2	18.2%

Weather		
Fine	6	54.5%
Rain	4	36.4%
Overcast	0	0.0%
Fog or mist	1	9.1%
Other	0	0.0%

Road Surface Condition		
Wet	4	36.4%
Dry	7	63.6%
Snow or ice	0	0.0%

Natural Lighting		
Dawn	0	0.0%
Daylight	4	36.4%
Dusk	1	9.1%
Darkness	6	54.5%

Crash Movement		
Intersection, adjacent approaches	0	0.0%
Head-on (not overtaking)	2	18.2%
Opposing vehicles; turning	0	0.0%
U-turn	0	0.0%
Rear-end	1	9.1%
Lane change	0	0.0%
Parallel lanes; turning	0	0.0%
Vehicle leaving driveway	0	0.0%
Overtaking; same direction	0	0.0%
Hit parked vehicle	0	0.0%
Hit railway train	0	0.0%
Hit pedestrian	0	0.0%
Permanent obstruction on road	0	0.0%
Hit animal	1	9.1%
Off road, on straight	0	0.0%
Off road on straight, hit object	2	18.2%
Out of control on straight	0	0.0%
Off road, on curve	0	0.0%
Off road on curve, hit object	3	27.3%
Out of control on curve	0	0.0%
Other crash type	2	18.2%

CRASHES	11	
Fatal crash	0	0.0%
Injury crash	5	45.5%
Non-casualty crash	6	54.5%

CASUALTIES	5	
Killed	0	0.0%
Injured	5	100.0%
^ Unrestrained	0	0.0%

^ Belt fitted but not worn, No restraint fitted to position OR No helmet worn

Time Group		% of Day	
00:01 - 02:59	2	18.2%	12.5%
03:00 - 04:59	1	9.1%	8.3%
05:00 - 05:59	0	0.0%	4.2%
06:00 - 06:59	0	0.0%	4.2%
07:00 - 07:59	0	0.0%	4.2%
08:00 - 08:59	0	0.0%	4.2%
09:00 - 09:59	0	0.0%	4.2%
10:00 - 10:59	0	0.0%	4.2%
11:00 - 11:59	2	18.2%	4.2%
12:00 - 12:59	1	9.1%	4.2%
13:00 - 13:59	0	0.0%	4.2%
14:00 - 14:59	0	0.0%	4.2%
15:00 - 15:59	0	0.0%	4.2%
16:00 - 16:59	0	0.0%	4.2%
17:00 - 17:59	1	9.1%	4.2%
18:00 - 18:59	1	9.1%	4.2%
19:00 - 19:59	0	0.0%	4.2%
20:00 - 21:59	0	0.0%	8.3%
22:00 - 24:00	3	27.3%	8.3%

Street Lighting Off/Nil		% of Dark
5	of 6 in Dark	83.3%

Crashes		Casualties
1	2009	0
3	2007	2
4	2006	2
3	2005	1

~ School Travel Time		
Involvement	0	0.0%

McLean Periods			% Week
A	1	9.1%	17.9%
B	0	0.0%	7.1%
C	2	18.2%	17.9%
D	0	0.0%	3.5%
E	1	9.1%	3.6%
F	1	9.1%	10.7%
G	0	0.0%	7.1%
H	1	9.1%	7.1%
I	2	18.2%	12.5%
J	3	27.3%	10.7%

Speed Limit				
40 km/h or less	0	0.0%	80 km/h zone	0	0.0%
50 km/h zone	1	9.1%	90 km/h zone	4	36.4%
60 km/h zone	1	9.1%	100 km/h zone	5	45.5%
70 km/h zone	0	0.0%	110 km/h zone	0	0.0%
~ 40km/h or less	0	0.0%			

Day of the Week						# Holiday Periods					
Monday	3	27.3%	Thursday	2	18.2%	Sunday	3	27.3%	New Year	0	0.0%
Tuesday	0	0.0%	Friday	0	0.0%	WEEKDAY	6	54.5%	Aust. Day	0	0.0%
Wednesday	1	9.1%	Saturday	2	18.2%	WEEKEND	5	45.5%	Easter	0	0.0%
									Anzac Day	0	0.0%

Queen's BD	0	0.0%	Easter SH	0	0.0%			
Labour Day	0	0.0%	June/July SH	0	0.0%			
Christmas	1	9.1%	Sept./Oct. SH	1	9.1%			
January SH	0	0.0%	December SH	2	18.2%			

Crashid dataset The Bucketts Way, Duralie Coal Mine, 3-years data 13-7-2009
Note: Q3 2005 to Q3 2009 Data for the 9 month period prior to the generated date of this report are incomplete and are subject to change.

Percentages are percentages of all crashes. Unknown values for each category are not shown on this report.