Central Queensland Coal Project

Chapter 6 – Traffic and Transport

Supplementary Environmental Impact Statement

CDM Smith

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Central Queensland Coal Project

Chapter 6 – Traffic and Transport

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6 Traffic and Transport

This chapter provides details of the proposed use of both existing infrastructure and future planned infrastructure to transport materials, products and wastes to and from the Central Queensland Coal Project, as well as proposed transport for site personnel.

The purpose of this chapter is to assess the current and potential traffic and transport impacts associated with the construction and operation of the Project. The required supplies and services will access the site through the existing road transport network which will provide access to the mine via new entry roads. The transport of product coal will be by existing rail infrastructure to the Dalrymple Bay Coal Terminal (DBCT) then by sea. Site personnel will largely commute daily.

The chapter describes the existing infrastructure, as appropriate, and provides an assessment of potential traffic and transport impacts associated with the construction and operation of the Project. Mitigation measures to manage any potential adverse impacts over the life of the mine are also provided. The chapter is a summary of the Traffic and Transport report prepared by GTA in Appendix A4a – Road Impact Assessment and the Geotechnical Assessment prepared by Cardno in Appendix A4b – Geotechnical Assessment of Open Cut Mining Adjacent to the Bruce Highway.

Matters raised in submissions to the EIS relating to Chapter 6 – Traffic and Transport include:

- Assessment of blasting impacts to the Bruce Highway and road users;
- Potential for geotechnical impacts to the Bruce Highway from the development of the two open cut pits;
- The rationale and methods for the Road Impact Assessment (RIA);
- Mine access point locations and design;
- Impacts to the rail network including ballast fouling, reduction in service;
- Coal wagon veneering;
- Air emissions (discussed in Chapter 12 – Air Quality);
- Preparation of a Road Use Management Plan; and
- The location of the coal conveyor.

For the purpose of clarity Central Queensland Coal does not propose to undertake any Project related activities that require the closure of the Bruce Highway. Further and for the purpose of clarity, Central Queensland Coal does not propose to use the Bruce Highway for the hauling of coal as all coal will be transported by rail to the DBCT.

Consultation with central and regional Department of Transport and Main Roads (DTMR) officers has occurred on several occasions during 2018 to discuss comments to the original EIS Chapter and to obtain more recent data. This Chapter and the updated RIA at Appendix A4a address the submissions received in respect of EIS Chapter 6 – Traffic and Transport and Appendix A4a Central Queensland Coal Road Impact Assessment, consultation with DTMR and the more recent information provided by DTMR. A draft Road-Use Management Plan (RMP) has been prepared and is included as Appendix A4c. Appendix A13 includes the full details of all submissions received for the Project.

6.1 Project Overview

Central Queensland Coal Proprietary Limited (Central Queensland Coal) and Fairway Coal Proprietary Limited (Fairway Coal) (the joint Proponents), propose to develop the Central Queensland Coal Mine Project (the Project). As Central Queensland Coal is the senior proponent, Central Queensland Coal is referred to throughout this Supplementary Environmental Impact Statement (SEIS). The Project comprises the Central Queensland Coal Mine where coal mining and processing activities will occur along with a train loadout facility (TLF).

The Project is located 130 km northwest of Rockhampton in the Styx Coal Basin in Central Queensland. The Project is located within the Livingstone Shire Council (LSC) Local Government Area (LGA). The Project is generally located on the "Mamelon" property, described as real property Lot 11 on MC23, Lot 10 on MC493 and Lot 9 on MC496. The TLF is located on the "Strathmuir" property, described as real property Lot 9 on MC230. A small section of the haul road to the TLF is located on the "Brussels" property described as real property Lot 85 on SP164785.

The Project will involve mining a maximum combined tonnage of up to 10 million tonnes per annum (Mtpa) of semi-soft coking coal (SSCC) and high grade thermal coal (HGTC). The Project will be located within Mining Lease (ML) 80187 and ML 700022, which are adjacent to Mineral Development Licence (MDL) 468 and Exploration Permit for Coal (EPC) 1029, both of which are held by the Proponent. It is intended that all aspects of the Project will be authorised by a site specific environmental authority (EA).

Development of the Project is expected to commence in 2019 with initial early construction works and extend operationally for approximately 19 years until the depletion of the current reserve, and rehabilitation and mine closure activities are successfully completed.

The Project consists of two open cut operations that will be mined using a truck and shovel methodology. The run-of-mine (ROM) coal will ramp up to approximately 2 Mtpa during Stage 1 (2019 - 2022), where coal will be crushed, screened and washed to SSCC grade with an estimate 80% yield. Stage 2 of the Project (2023 - 2037) will include further processing of up to an additional 4 Mtpa ROM coal within another coal handling and preparation plant (CHPP) to SSCC and up to 4 Mtpa of HGTC with an estimated 95% yield. At full production two CHPPs, one servicing Open Cut 1 and the other servicing Open Cut 2, will be in operation. Rehabilitation works will occur progressively through mine operation, with final rehabilitation and mine closure activities occurring between 2036 and 2038.

A new TLF will be developed to connect into the existing Queensland Rail North Coast Rail Line. This connection will allow the product coal to be transported to the established coal loading infrastructure at the DBCT.

Access to the Project will be via the Bruce Highway. The Project will employ a peak workforce of approximately 275 people during construction and between 100 (2019) to 500 (2030) during operation, with the workforce reducing to approximately 20 during decommissioning. Central Queensland Coal will manage the Project construction and ongoing operations with the assistance of contractors.

This SEIS supports the original EIS by including responses to submissions that were made during the public notification period regarding the original EIS. Material changes to the Project since the release of the EIS are also discussed.

6.2 Environmental Objectives and Performance Criteria

The environmental objectives and performance criteria have been updated in response to comments received from the DTMR. Suggested amendments proposed by DTMR have been modified in consideration of the requirement for blasting operations and the need from time to time for short duration road closures due to safety requirements. Matters associated with Blast Management are discussed in Section 6.7.5.

6.2.1 Environmental Objectives

The environmental objectives of the Project in relation to traffic and transport are:

- To protect the safety, health and well-being of the existing community, Project employees and visitors using State, local and mine-site road networks; and
- Protect the transport efficiency and condition of the public road network.

6.2.2 Performance Criteria

The performance criteria adopted for traffic management are:

- No public road users or mine personnel are injured because of traffic or traffic related impacts from the Project's construction or operation;
- No intersections, roads or other traffic related components associated with the Project present a safety hazard to the public or mine staff / contractors;
- Transport efficiency is maintained (e.g. avoiding road closures of the National Highway (Bruce) during mine blasting operations);
- The condition of infrastructure is preserved (road and rail crossing infrastructure during construction and operations e.g. no subsidence of the Bruce Highway in the future); and
- Road users are not significantly delayed or affected due to the construction or operation of the Project.

6.3 Relevant Legislation and Guidelines

Traffic and transport is governed by several legislative acts, policies and guidelines which are briefly outlined in Chapter 1 – Introduction and described further in the following sections.

6.3.1 State Legislation

6.3.1.1 Transport Infrastructure Act 1994

The *Transport Infrastructure Act 1994* encourages effective integrated planning and efficient transport infrastructure management for the planning and management of road, rail and air infrastructure. The DTMR is responsible for maintaining State Controlled Roads (SCR), of which the Bruce Highway divides the Project and will be used for access. Approvals under this Act will be required for any upgrades to SCRs and SCR intersections.

6.3.1.2 Transport Operations (Road Use Management) Act 1995

The *Transport Operations (Road Use Management) Act 1995* manages vehicles on Queensland roads by:

- Identifying vehicles, drivers and other road users and the establishment of performance standards;
- Establishing rules for road behaviours;
- Monitoring compliance with the Act;
- Mandating approvals for over dimension vehicles;
- Managing non-performing vehicles, drivers and other road users;
- Controlling access to the road network; and
- Managing traffic to enhance safety and transport efficiency.

6.3.1.3 Land Act 1994

The *Land Act 1994* provides a framework for the allocation of State land as leasehold, freehold or other tenure and their subsequent management. Approvals relating to the use or development of infrastructure on unallocated state land, leasehold land, road or reserve may need to be obtained by the Central Queensland Coal for road and intersection upgrades.

6.3.2 Guidelines

6.3.2.1 Road Planning and Design Manual

The DTMR Road Planning and Design Manual (2013) provides the policy and framework for the planning and design of new and upgraded roads in Queensland. It is an agreed set of corporate standards that includes consideration of local circumstances.

6.3.2.2 The Guidelines for Assessment of Road Impacts of Development

The Guidelines for Assessment of Road Impacts of Development (GARID) (DTMR 2006) provide information about the processes involved to assess road impacts triggered by a proposed development. Assessable impacts are defined by the DTMR as any development which has a material increase of 5 per cent (%) or greater of traffic over existing levels measured in either the annual average daily traffic (AADT), peak hour traffic or equivalent standard axles (ESAs).

6.3.2.3 Guide to Traffic Impact Assessment, Department of Transport and Main Roads, September (2017)

GARID was superseded by the Guide to Traffic Impact Assessment (DTMR 2017). Whilst the EIS has been assessed under the auspices of GARID, as the relevant guidance document at the time the EIS was prepared, the Guide to Traffic Impact Assessment, (DTMR 2017) has been used for the revised assessment. A draft RMP has been developed in accordance with the requirements outlined in the DTMR Guideline for Preparing a Road-Use Management Plan, (2018) (see Appendix A4c) and will include an RMP Commitments Table.

6.4 Assessment Methodology

6.4.1 Road

Road impacts have been assessed in accordance with DTMRs Guide to Traffic Impact Assessment (GTIA), Transport and Main Roads.

Consistent with the requirements set out in the guidelines, the methodology adopted for the RIA includes:

- Review existing road conditions and operations, and establish a baseline condition (i.e. road operation without the Project);
- Prepare estimates of Project generated traffic based on the intended haul routes of heavy vehicles and workforce requirements;
- Prepare scenarios for the traffic assessment which consider baseline and Project traffic generation estimates at critical Project milestones (referred herein as design horizons);
- Determine anticipated road impacts of the Project for each of the identified design horizons, in accordance with threshold levels and rationale provided within GTIA. Specifically, the following impacts have been considered:
    - Impact of the proposed vehicular access intersection on the existing road network provided as part of the Project
    - Impact of Project related traffic on existing road link capacity for key haul routes
    - Impact of Project related heavy vehicle movements on existing pavement condition.
- Where impacts were identified as exceeding GTIA defined threshold levels, recommendations to "avoid", "manage" or "mitigate" these impacts have been provided; and
- Review and assess road safety risks that might arise as a result of the Project and identify mitigation measures to ensure no worsening of these risks.

Under the Guide to Traffic Impact Assessment, Transport and Main Roads, September (2017) RIAs are now referred to Traffic Impact Assessments (or TIAs). To avoid confusion with terminology used for the EIS and SEIS, the phrase RIA will be used rather than TIA, as the original assessment was completed under the auspices of GARID, which refers to RIAs as the assessment method.

The adopted methodology is further detailed in Table 6-1.

Table 6-1 Road impact assessment methodology

Assessment Type	RIA Methodology
Access Intersection Assessment	Undertake a Turn Warrant Assessment using the methodology provided within TMR's 'Road Planning and Design Manual' (RPDM) to determine appropriate turn treatments and associated intersection geometry at the proposed access intersection. These initial design considerations will inform the development of the mine plan to be detailed further as the Project progresses. The analysis is provided in Appendix A4a – Road Impact Assessment.

Assessment Type	RIA Methodology
Road Link Impact Assessment	In accordance with GTIA defined threshold levels, identify road sections where Project generated traffic is expected to exceed 5% of baseline traffic volumes. The scope of the road link impact assessment has included the Bruce Highway between Rockhampton and Mackay (the intended haul route). Where Project impacts of greater than 5% were identified, an analysis of theoretical road link capacity was undertaken in accordance with the methodology outlined within Austroads (2009) 'Guide to Traffic Management Part 3: Traffic Studies and Analysis'. Comparison of anticipated road link performance against a minimum operational Level of Service (LOS) threshold 'D' was undertaken. The analysis is provided in Appendix A4a - Road Impact Assessment.
Pavement Impact Assessment	The TMR Northern Region 'Assessment of Road Impacts of Development Proposals – Notes for Contribution Calculations' was developed as a supplement to GTIA and specifically identifies the methodology to calculate pavement impacts on SCRs. The PIA has been undertaken in accordance with the formulas and parameters provided in this document and includes assessment of the Bruce Highway between Rockhampton and Mackay. The analysis is provided in Appendix A4a - Road Impact Assessment.
Road Safety Risk Assessment	Development will ensure that a road's safety is not significantly worsened as a result of the development and that any pre-existing or development-introduced unacceptable safety risk is addressed. 'Significantly worsened' is defined in terms of the change in the safety risk rating (for example, from low to medium or from medium to high). A road safety risk assessment in accordance with GTIA is to be undertaken to identify potential road safety risks and ensure they are not 'significantly worsened' because of the Project. The analysis is provided in Appendix A4a - Road Impact Assessment.

6.4.2 Rail

Product coal will be stockpiled and loaded onto trains and transferred via the Queensland Rail (QR) North Coast Line (NCL) and then a short section of the Aurizon Goonyella rail corridor to the east coast port of DBCT at Mackay. The northern boundary of the TLF abuts the QR NCL. Works within the adjacent NCL corridor to connect the Project rail loop to the existing NCL at the Project boundary, will be carried out by QR as separate works to those authorised by this EIS.

The loaded train will comprise one diesel-electric locomotive hauling initially 44 coal wagons and then 66 coal wagons, with a load limit of 20 tonne per axle due to the QR NCL characteristics.

QR will be providing the piece of rail infrastructure that connects the Central Queensland Coal rail loop to the QR NCL mainline rail infrastructure. In providing this connecting rail infrastructure, QR will make any necessary changes to the signalling system that currently exists on its NCL for the safe working of coal trains on and off the Central Queensland Coal rail loop.

Minimal impacts on the environment from coal dust deposition, from the use of the rail network during coal haulage, has the potential to occur. Coal dust assessment and mitigation are discussed in more detail in Chapter 12 – Air Quality.

6.4.3 Air

It is not expected that any of the Project's permanent workforce will be fly-in fly-out and use air transport. As such, it is not anticipated that there will be any impact to the capacity or scheduling of flights to or from Mackay or Rockhampton Airports. Air transport is therefore not considered further in this study.

6.4.4 Sea

Product coal will be loaded onto ships at the east coast port of DBCT at Mackay. A port allocation will be secured to export coal from the Project separately to the EIS process. DBCT has a nominal capacity of 85 Mtpa and in 2012 to 2013 had a throughput of 62.4 Mtpa. As Central Queensland Coal's throughput will be contained within existing approved capacities at DBCT, no new coastal works, dredging or materials handling infrastructure would be required because of the Project. All ship transportation will be undertaken in accordance with extant legislation and standard operating procedures at the DBCT and travel through designated shipping areas. Based on this, impacts on shipping and the coastal and marine environments are not considered further within this EIS. Impacts to the DBCT operations are discussed at Section 6.12.4.

6.5 Existing Transport Infrastructure and Values

This section provides details on the existing infrastructure proposed to be used to transport materials, products and people to and from the Project site. The proposed transport infrastructure to be used is roads and rail.

6.5.1 Road Network

6.5.1.1 Bruce Highway

All traffic associated with the Project is assumed to access the Project site via the two proposed access intersections (eastern side and western side) each forming a T-intersection with the Bruce Highway. Project traffic is anticipated to be generally limited to the Bruce Highway between Rockhampton and Mackay. Characteristics of the Bruce Highway proximate to the Project (and at the proposed access location) are described in Table 6-2.

Table 6-2 Bruce Highway road characteristics (proximate to the Project site)

Characteristic	Description
Direction	Northwest – Southeast
Jurisdiction	DTMR
Cross-Section	Two-lane / Two-way / Undivided
Pavement	Sealed
AADT	~2,000vpd
Speed Limit	110 km/h

The typical cross-section of the Bruce Highway proximate to the Project site is presented in Figure 6-1.

Figure 6-1 Bruce Highway (typical cross-section)

The geometry of the Bruce Highway varies to the south of the Project, with provision for overtaking lanes available on approach to Rockhampton and a four-lane / two-way / divided arrangement available south of Yeppoon Road.

Consultation with DTMR and review of DTMR's 'Queensland Transport and Roads Investment Program 2017-18 to 2020-21' (QTRIP) has been undertaken with regards to known future planning for the Bruce Highway between Mackay and Rockhampton. For the Bruce Highway between Mackay and Rockhampton the works identified in QTRIP are presented in Table 6-3. As described a number of capacity improvement projects are planned on the Bruce Highway, generally within close proximity to the regional centres of Mackay and Rockhampton. These works are planned to be undertaken prior to 2021.

Table 6-3 QTRIP works schedule

Project Location	Location Description	Works Description
Bruce Highway – Rockhampton northern access upgrade	Rockhampton – Yeppoon Road – Parkhurst	Duplicate from two to four lanes
Bruce Highway (St Lawrence – Mackay)	Kalarka Road and Mosquito Creek	Construct overtaking lane/s
	Camila	Construct overtaking lane/s
	Lagoon Street	Improve Intersection/s
	Sarina Northern Access	Construct Roundabout/s
	Hay Point Road – Temples Lane	Undertake transport project planning

Upgrades identified in Table 6-3 are generally projects to improve road capacity and improve intersection operation and are therefore expected to have a net benefit to the Project. Details regarding the timing and extent of these upgrade works is not currently known. On this basis, the additional capacity likely to be available from the upgrades has not been considered in the RIA to allow for a worst-case assessment.

There may be a need to improve / upgrade (e.g. road widenings) sections / elements of the Bruce Highway in the future as a result of other future projects and developments (by others), or currently unknown growth in traffic which may result in road capacity impacts. Should any future improvements / upgrades be required to the Bruce Highway proximate to the Project site due to the

above-mentioned factors, it is expected that DTMR and/or the future proponent of these projects will be responsible for providing the required future upgrades.

6.5.1.2 Baseline Traffic Volumes

Background traffic volumes have been sourced from DTMR, by way of 2015 and 2016 AADT segment reports (obtained 2 February 2017 and 12 June 2017 respectively) for the Bruce Highway between Rockhampton and Mackay. A copy of these segment reports is presented in Appendix A of Appendix A4a – Road Impact Assessment, with a summary of data provided in Table 6-4.

For the purposes of converting AADT volumes to peak hour volumes (for the road link and intersection assessments), a peak-to-daily ratio of 15% has been assumed, in accordance with guidance for rural roads provided in the RPDM 1st Edition – Chapter 5.

Growth rates obtained from historic data detailed within the AADT segment reports indicate that the Bruce Highway has experienced periods of negative growth for various road sections over the past five to ten years. This could be attributable to a slowdown in mining sector projects occurring within the region, and the conclusion of construction activities associated with large project development. As such, a growth rate of 2% per annum (linear) has been adopted to inform the basis of future traffic forecasts, to reflect typical background traffic growth in the absence of major project development. This assumption is considered conservative and therefore appropriate for determining a worst-case scenario for the RIA.

It is further noted that a review of the projects seeking approval from DES and the Coordinator-General projects currently available online indicates that there are no major projects planned near the Project. Should any such projects become apparent in the future, these will be considered in the context of any future road safety impact assessment.

Table 6-4 Baseline traffic volumes - Bruce Highway 2015/2016

Road Name	Segment	AADT						Historic Growth	
		NBD	HV%	SBD	HV%	Total	HV%	5 Yr	10 Yr
Bruce Highway (Rockhampton – St Lawrence)	Archer St (lights)	9,388	11.9	6,996	10.4	16,384	11	-6.7%	-
	100m Sth Knight St	16,118	8.5	17,462	8.8	33,580	9	0.0%	0.5%
	Boland St	12,153	7.8	12,411	7.8	24,564	8	0.6%	0.4%
	800m Sth Rton-Yeppoon Rd	8,194	10.4	8,516	10.1	16,710	10	0.7%	1.2%
	200m Sth Mason Ave (Parkhurst)	5,969	12.7	5,862	13.6	11,831	13	1.4%	2.0%
	150m North Terra Nova Dr	3,785	19.3	3,710	14.4	7,495	17	-0.8%	0.4%
	200m North 14 Mile Ck Rd	2,022	27.7	2,048	21.7	4,070	25	-1.3%	0.2%
	40m Sth Mountain Ck (Kunwarara)	1,332	24.2	1,295	24.7	2,627	24	-0.3%	1.2%
	1km south of Montrose Creek	1,163	28.6	1,117	29.3	2,280	29	-1.9%	0.0%
	South of Waverley Creek	956	31.4	1,001	30.3	1,957	31	-3.3%	-1.4%
Bruce Highway (St Lawrence – Mackay)	North of Clairview	1,060	28.0	1,099	31.0	2,159	30	-2.3%	-0.9%
	WiM Site Koumala	1,755	21.9	1,721	23.5	3,476	23	0.1%	0.8%

Road Name	Segment	AADT						Historic Growth	
		NBD	HV%	SBD	HV%	Total	HV%	5 Yr	10 Yr
	South of Armstrong's Beach Turnoff	2,053	19.7	2,057	32.9	4,110	26	-0.8%	0.2%
	Sichter Street - Broad Street	4,638	15.7	2,458	9.2	7,096	13	-11.7%	-6.4%
	Between Sarina and Sarina - Homebush TO	3,641	29.7	3,837	26.6	7,478	28	-3.7%	-0.9%
	Sarina - Homebush Road to Hay Point TO	3,204	10.3	3,342	27.2	6,546	19	-4.1%	-1.2%
	North of Macks Truck Stop	5,205	17.8	5,171	16.9	10,376	17	-3.0%	-0.4%
	Broadsound Road Permanent Counter	6,900	12.4	6,845	12.3	13,745	12	-2.0%	-0.9%
	City Gates to Lagoon Street	12,562	15.7	11,856	11.6	24,418	14	-2.1%	3.3%
	Lagoon St to Bridge Rd	9,327	19.2	9,167	11.6	18,494	15	-4.4%	0.5%
	George Street Pedestrian Crossing	10,011	8.5	9,693	8.7	19,704	9	-8.3%	-6.2%

6.5.1.3 Mount Bison Road

A realignment of Mount Bison Road and a corresponding new intersection with the Bruce Highway is discussed in Section 6.7.1.2. Mount Bison Road is located directly south of Tooloombah Creek and south of the proposed Project access.

This realignment and new intersection are intended to provide public access to existing agricultural uses on the western side of the Bruce Highway. It will also provide access to MIA1 and associated mine infrastructure. The final design of the road will take into consideration the Wetland Protection Area buffer zone, of which the existing public road already dissects.

As construction of the infrastructure on the western side of the Bruce Highway will not commence until 2028 based on current planning, the design of the intersection has not been finalised. Approval of the intersection design and for construction will be required from the Fitzroy District DTMR Office and a TMP to undertake works in and near the Bruce Highway will be required prior to the commencement of construction. The TMP will be prepared in accordance with the requirements of the GTIA.

6.5.2 Rail Network

6.5.2.1 Rail Lines

The Project is anticipated to utilise the nearby NCL rail line. This line is a principal regional freight and passenger line with the QR network, running the length of coastal Queensland between Nambour in the south and Cairns in the north. Long distance passenger and high-speed Tilt Train services also operated in the line servicing central and north Queensland.

6.5.2.2 Level Crossings

Several level crossings have been identified on the Bruce Highway between Rockhampton and Mackay. An inspection of aerial photography and publicly available QR network details, indicate that most of the train lines associated with these level crossings are minor, single track lines, typically servicing the localised land uses. As a result, train services are not expected to be frequent and therefore unlikely to be significantly impacted by anticipated Project road volumes. Notwithstanding, QR has advised that this would need to be confirmed following lodgement of the EIS. There are also several level crossings associated with the NCR rail line, particularly within Rockhampton.

Central Queensland Coal has submitted access proposals to both QR and Aurizon for below rail access for the transport of product coal to the DBCT. Both QR and Aurizon have confirmed that adequate capacity exists in the existing rail networks to facilitate the requested haulage requirements.

Central Queensland Coal is also in discussions with a rail operator to transport the coal by its diesel hauled coal wagon train. The operator will work with QR to schedule and operate the trains to minimise any impacts on road transport particularly at road / rail level crossings.

6.5.3 Environmental Values

Potential impacts on environmental values due to the Project's traffic generation are generally described throughout this chapter and other chapters of the EIS. Several environmental values have been identified and assessed. The assessment of impacts on natural environmental values are generally within other chapters of the EIS (refer to Table 6-5).

Table 6-5 Environmental values

Environmental value	Description	Chapter
Air Quality	Emissions from vehicles. Dust from haul road usage. Coal dust from TFL facility. Coal dust generation during rail haul. Conventional dust from construction and upgrading of roads and intersections.	Chapter 12 – Air Quality
Noise and Vibration	Noise from construction and operational traffic. Noise from construction activities associated with upgrading of roads and intersections.	Chapter 13 – Noise and Vibration
Surface Water	Contamination of water ways from traffic associated with the Project, including spills and contaminated run-off.	Chapter 9 – Surface Water
Health and Safety	Road use and safety. Traffic collisions.	Chapter 20 – Health and Safety
Hazard and Risk	Spills, accidents and emergency response plans.	Chapter 21 – Hazard and Risk

Landholder access will primarily be an issue during realignment of Mount Bison Road and the corresponding new intersection with the Bruce Highway (See Section 6.7.1.2). These will be addressed prior to the commencement of construction in 2027.

6.6 Traffic Generation and Distribution

Project traffic volumes have been estimated based on operational assumptions and forecasts for the Project for the following Project phases (Table 6-6).

These Project phases represent the critical design years when considering likely Project traffic generation associated with forecast workforce requirements (see Appendix A4a – Road Impact Assessment for more information).

Table 6-6 Project phases

Project Phase	Project Year	Year
Peak of Construction Phase	2	2020
Construction of western MIA and operation of eastern MIA	10	2028
Peak of operational phase	12	2030
Decommissioning and 20-year design horizon	20	2038

6.6.1 Workforce Traffic Generation

A construction workforce for the Project of approximately 275 people will be required at peak construction period. The workforce will be a combination of local commute workers and Drive in/Drive out (DiDo). A proposed workforce of between 100 to 500 employees will be required during the mine operations. The Project's labour resources will be sourced from within the local area (Marlborough, Ogmore, St Lawrence, Clairview, Yaamba and The Caves), whilst regional workers are assumed to reside in either Yeppoon, Rockhampton or Mackay) as a DiDo workforce. A workforce of approximately 20 will be required during decommissioning.

Estimates of workforce generated traffic are detailed in Table 6-7 based on information provided in Appendix A4a – Road Impact Assessment.

Table 6-7 Workforce traffic generation summary

Design year	Bruce Highway Eastern Access				Bruce Highway Western Access				Total (vpd)
	AM Peak (vph)		PM Peak (vph)		AM Peak (vph)		PM Peak (vph)		
	In	Out	In	Out	In	Out	In	Out	
2020	176	95	95	176	-	-	-	-	542
2028	59	50	50	59	141	10	10	23	402
2030	119	100	100	119	119	100	100	119	876
2038	8	-	-	8	8	-	-	8	32

vph – vehicles per hour, vpd – vehicles per day

6.6.2 Heavy Vehicle Traffic Generation

All materials, plant and equipment are intended to be delivered to the Project via road-based transport. It is expected that construction traffic will primarily involve a mix of rigid trucks, articulated vehicles (i.e. semi-trailers) and B-Doubles. Some oversize loads are also expected, particularly during the CHPP, dump station, stacker / reclaimer and heavy mining equipment construction and installation phase. These loads will be hauled from either the Port of Brisbane, Mackay, or Gladstone.

Quarry materials for the construction of the access road and haul road base materials will be sourced from existing offsite quarries. Once access to site is established, materials will be sourced from a combination of on-lease deposits where possible and licensed offsite quarries. Specific details regarding quantity of materials and other plant and equipment is yet to be determined. Upon

finalising the freight details of heavy vehicles, a freight summary spreadsheet will be developed and provided to DTMR.

All ROM and product coal will be hauled internally through the site to the TLF, using private infrastructure and will not require access to any Council controlled roads or SCRs. As such, the Bruce Highway will not be affected by any internal haul movements associated with moving product coal around the mining lease.

A summary of anticipated two-way heavy vehicle movements for the Project is provided in Table 6-8. State-based movements are inclusive of heavy vehicle movements originating and destined to Rockhampton, Mackay and Gladstone. The directional distribution assumptions applied within the RIA are provided in Figure 6-2.

Table 6-8 Total Project heavy vehicle movements

Project Phase	Vehicle Type	Origin / Destination		
		Local	Regional	State[1]
Construction (2019 – 2020 and 2027 – 2029)	Rigid Truck	320	380	10
	Semi-Trailer	1,015	96	292
	B-Double	-	250	50
	Oversized	-	-	70
	Sub-total	**1,335**	**726**	**422**
Operational (2019 – 2037)	Rigid Truck	4,575	37,005	845
	Semi-Trailer	-	2,176	-
	B-Double	-	9,518	-
	Oversized	-	-	272
	Sub-total	**4,575**	**48,699**	**1,117**
Project Total	Rigid Truck	*4,895*	*37,385*	855
	Semi-Trailer	*1,015*	*2,272*	292
	B-Double	-	*9,768*	50
	Oversized	-	-	342
	Total	***5,910***	***49,425***	***1,539***

1 Note that state-based movements include movements from the Port of Gladstone, Port of Mackay and / or, Port of Brisbane

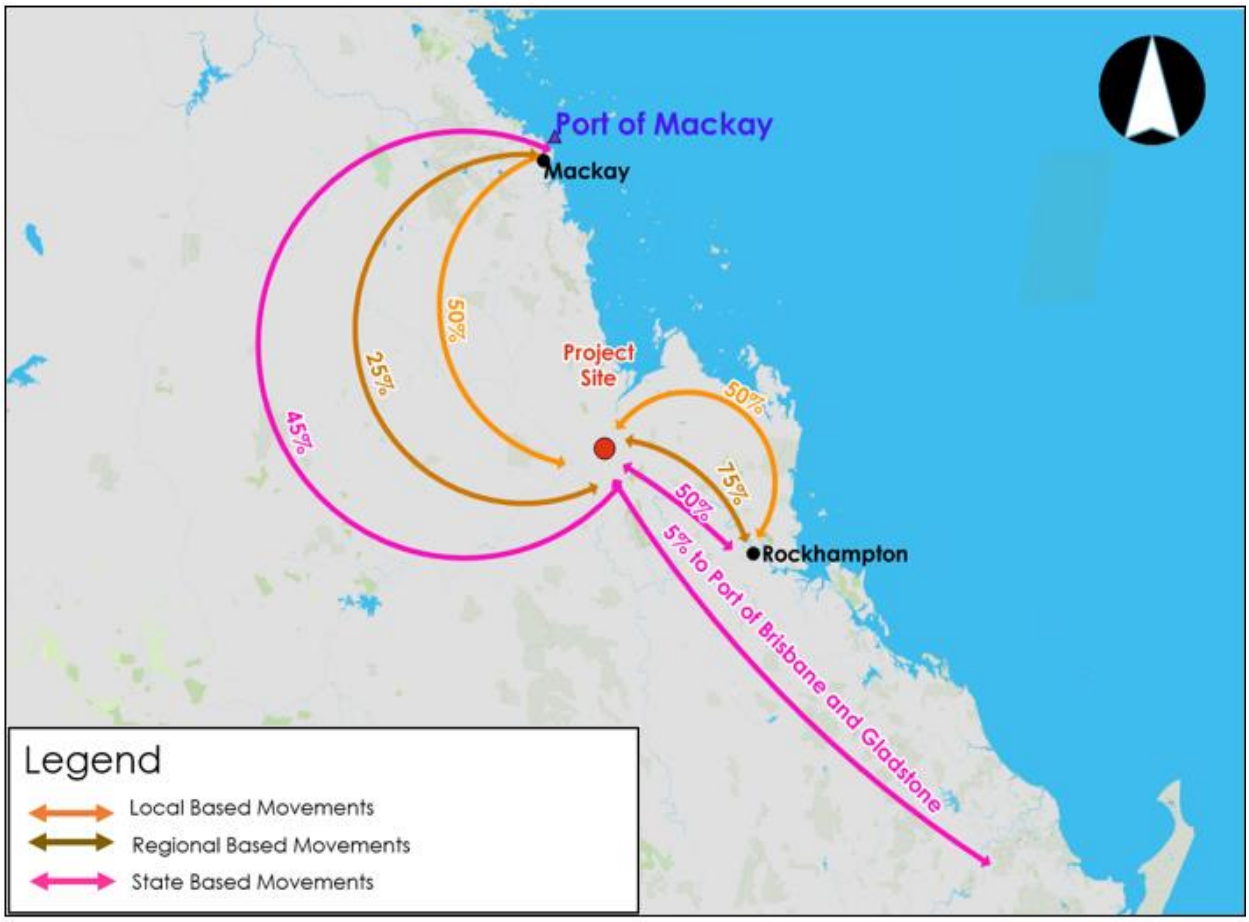


Figure 6-2 Assumed construction and operational directional proportions of heavy vehicles

The total Project volumes provided in Table 6-8 have been disaggregated into annual projections based on the following rationale:

- Heavy vehicle generation associated with construction has been separated into two distinct time horizons. The first construction phase will occur during 2019 and 2020. The second construction phase will commence at approximately 2027 and will continue into 2029;
- Approximately two thirds of the construction effort will be required during the first construction phase, and the remaining third will be required during the second construction phase; and
- The annualised heavy vehicle operations profile has been approximated based on the work force projections for the operations phase. It has been assumed that the heavy vehicle generation for each year is directly proportional to the employee requirements for that same year.

A summary of the estimated annual heavy vehicle haul movements for each of the identified design phases is provided in Table 6-9.

Table 6-9 Annual heavy vehicle movements

Project Phase	Vehicle Type	Heavy Vehicle Movements (Annual)			
		2020	2028	2030	2038[1]
Construction	Rigid Truck	157	65	-	-
	Semi-Trailer	312	233	-	-
	B-Double	67	50	-	-

Project Phase	Vehicle Type	Heavy Vehicle Movements (Annual)			
		2020	2028	2030	2038[1]
	Oversized	16	7	-	-
	Sub-Total	**552**	**355**	**-**	**-**
Operation	Rigid Truck	1,719	2,575	5,150	-
	Semi-Trailer	88	132	264	-
	B-Double	386	578	1,155	-
	Oversize	11	17	33	-
	Sub-Total	**2,204**	**3,302**	**6,602**	**-**
Project Total	Rigid Truck	1,876	2,640	5,150	-
	Semi-Trailer	400	365	264	-
	B-Double	453	628	1,155	-
	Oversize	27	24	33	-
	Total	***2,756***	***3,657***	***6,602***	**-**

[1]Heavy vehicle movement projections have not been scoped by the Proponent for the decommissioning phase. However, the volume of any heavy vehicle haul movements associated with decommissioning are expected to be smaller in magnitude when compared to the construction or operational phases.

The annual heavy vehicle traffic generation summarised in Table 6-9 has been converted to projected hourly heavy vehicle movements by using the following rationale:

- There are approximately 250 operational days per year;
- Haul movements would generally be undertaken in a 12-hour period;
- The distribution of haul movements is uniform (i.e. flat) for the 12-hour period; and
- The split between IN / OUT movements is 50 / 50.

Using the above rationale, hourly heavy vehicle movements are expected to be less than three vehicles per hour (total of in and out movements). To allow for a conservative estimate, a nominal heavy vehicle volume of 10 vehicles per hour (total of in and out movements) has been adopted for a worst-case assessment for the road link and intersection turn warrant assessments. The estimated hourly heavy vehicle movements are presented in Table 6-10.

Table 6-10 Hourly heavy vehicle movements

Design year	Bruce Highway Eastern Access				Bruce Highway Western Access			
	AM Peak (vph)		PM Peak (vph)		AM Peak (vph)		PM Peak (vph)	
	In	Out	In	Out	In	Out	In	Out
2020	5	5	5	5	-	-	-	-
2028	5	5	5	5	5	5	5	5
2030	5	5	5	5	5	5	5	5

vph – vehicles per hour

6.7 Infrastructure Changes Since the EIS

The following outlines changes to the transport infrastructure since the release of the original EIS.

6.7.1 Mine Entry Points

The Central Queensland Coal Project has been amended based on advice from DTMR, such that two vehicular accesses are proposed (i.e. staggered T-intersections). These will provide access to both sides of the Bruce Highway. The following sections discuss the two new intersections that will be required to service the eastern and western sections of the mine.

Once the access design configurations are finalised an application, inclusive of design and associated drawings and safety assessment, will be submitted to DTMR for assessment and approval.

6.7.1.1 Eastern Mine Entry Point

The original entry point to the Project infrastructure on the eastern side of the Bruce Highway was located approximately 3.3 km from Deep Creek was approximately 28.3 km north of Marlborough. After optimisation of the mine design, the entry point will now be located at 7485879.29N 774297.14E, approximately 600 m north of Deep Creek and approximately 25 km north of Marlborough.

The location of the new entry point provides a shorter and more direct route to the CHPP and MIA 2 avoiding unnecessary disturbance that would have occurred with the construction of the original access point.

The road intersection has been designed in accordance with the DTMR design guidelines and standards for a posted speed of 100 kilometres per hour (kph) and design speed of 110 kph. The design allows for 85 m turning lanes with 110 m painted chevron median warning features. The relevant guidelines are:

- DTMR's Road Planning and Design Manual (2nd Edition) Volume 3: Guide to Road Design (2013); and
- Austroad's Guide to Road Design Part 4A: Unsignalised and Signalised Intersections (2017 Edition).

A road safety audit will be undertaken as part of finalising the detailed design and approvals stage for the eastern mine site access with the Bruce Highway.

The location of the new eastern entry point is shown at Figure 6-3 to Figure 6-6.

An indicative general arrangement of the new entry point is at Figure 6-7.

Figure 6-3 Eastern entry point looking north

Figure 6-4 Eastern entry point looking south

Figure 6-5 Eastern entry point looking east

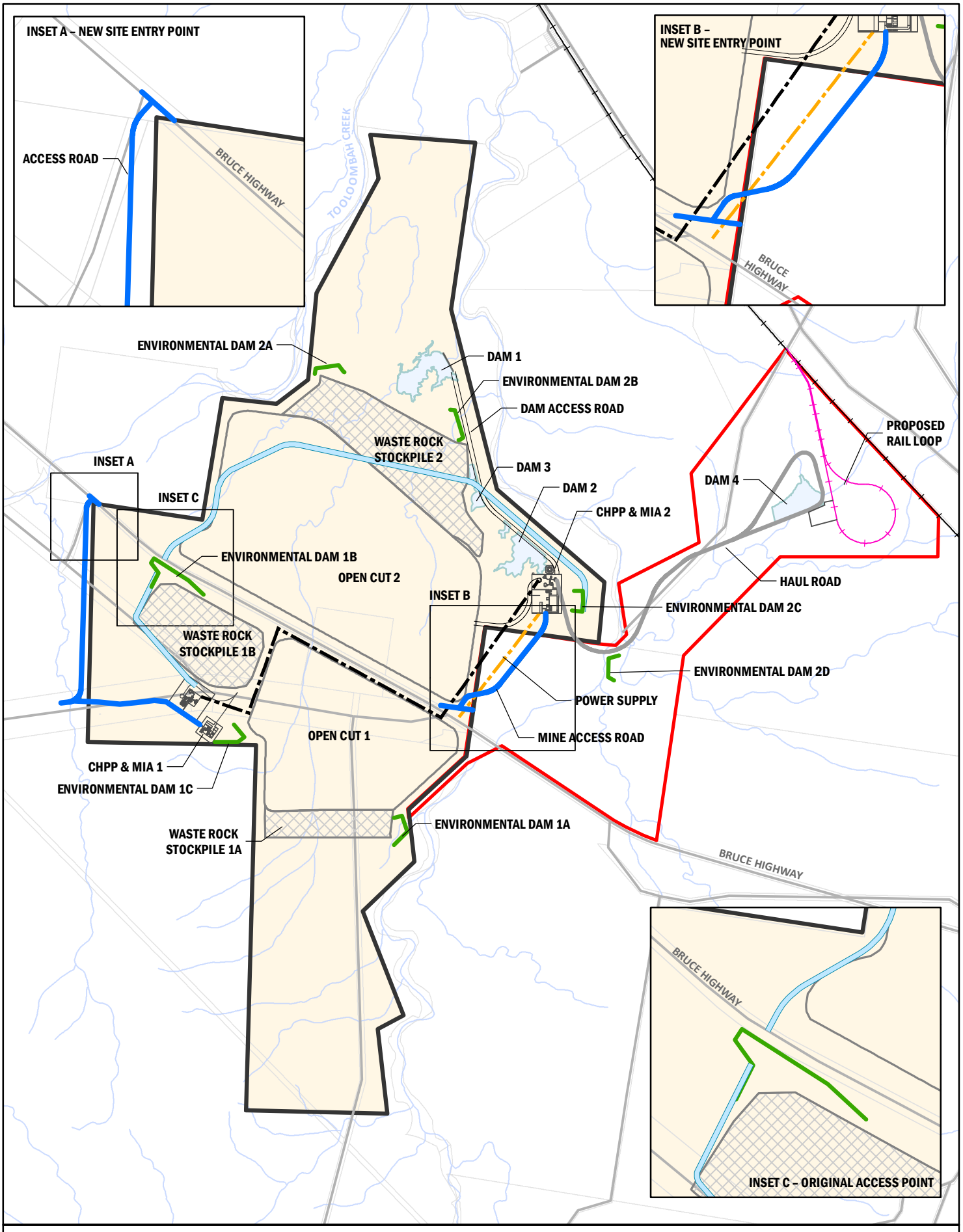
6.7.1.2 Western Mine Entry Point

The western access from the Central Queensland Coal mine site to the Bruce Highway will not be required until approximately 2027. The entry point is indicatively located at 7488079.9N 770623.9E, which is approximately 29 km north of Marlborough. This location may change due operational requirements or because of future discussions with DTMR and the LSC and is therefore considered as indicative.

The road intersection will be designed in accordance with the DTMR design guidelines and standards in place at the time of design for a posted speed of 100 kilometres per hour (kph) and design speed of 110 kph.

A road safety audit and impact assessment will be undertaken as part of finalising the detailed design and approvals stage for the western mine site access with the Bruce Highway.

The location of the indicative entry point is shown at Figure 6-6 and an indicative general arrangement of the entry point is at Figure 6-8.



N

0 0.5 1 km

Scale @ A4 1:50,000
Date: 16/10/18
Drawn: Gayle B.

Legend

- New mine access road
- Original mine access road
- ML 80187
- ML 700022
- Open-cut Mine Pit
- Waste Rock Area
- Haul Road
- Mine infrastructure
- Overland Conveyor
- Power
- Rail Balloon Loop
- Road
- Environmental Dams
- Main road
- Cadastral boundary
- North Coast Rail Line
- Watercourse
- Dam

DATA SOURCE
Waratah Coal, 2018
QLD Open Source Data, 2018

Figure 6-6
Revised entry points to eastern and western areas of mine

CDM Smith

BRUGGEMANNGD \\brbsvr1\PRO\Project\1000111 - Styx SEIS Post submission work\7Work\3GIS\DATA\MXD\Chapter 6_Supp_Report_Traffic and Transport\1000111 R1 Revised Entry Points__6-2.mxd 10/16/2018

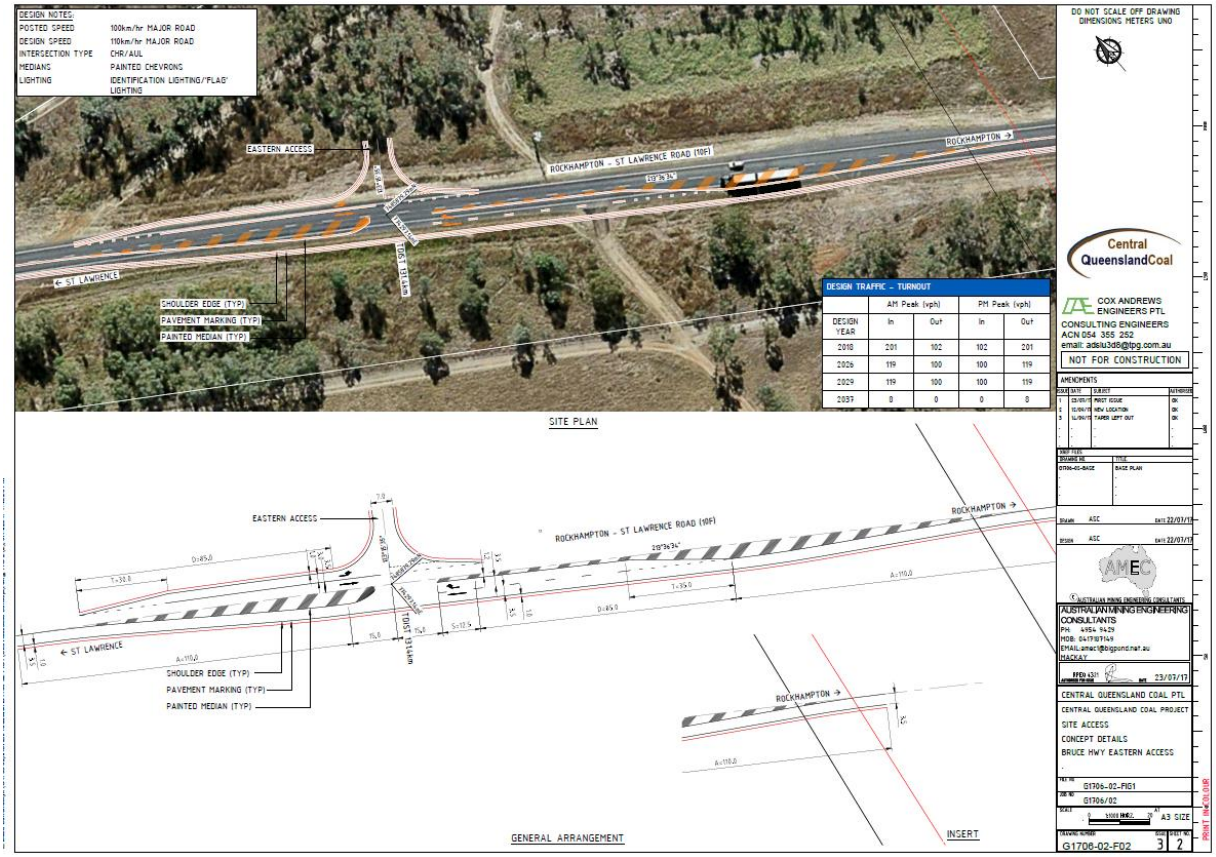


Figure 6-7 Revised site access concept details Bruce Highway eastern access

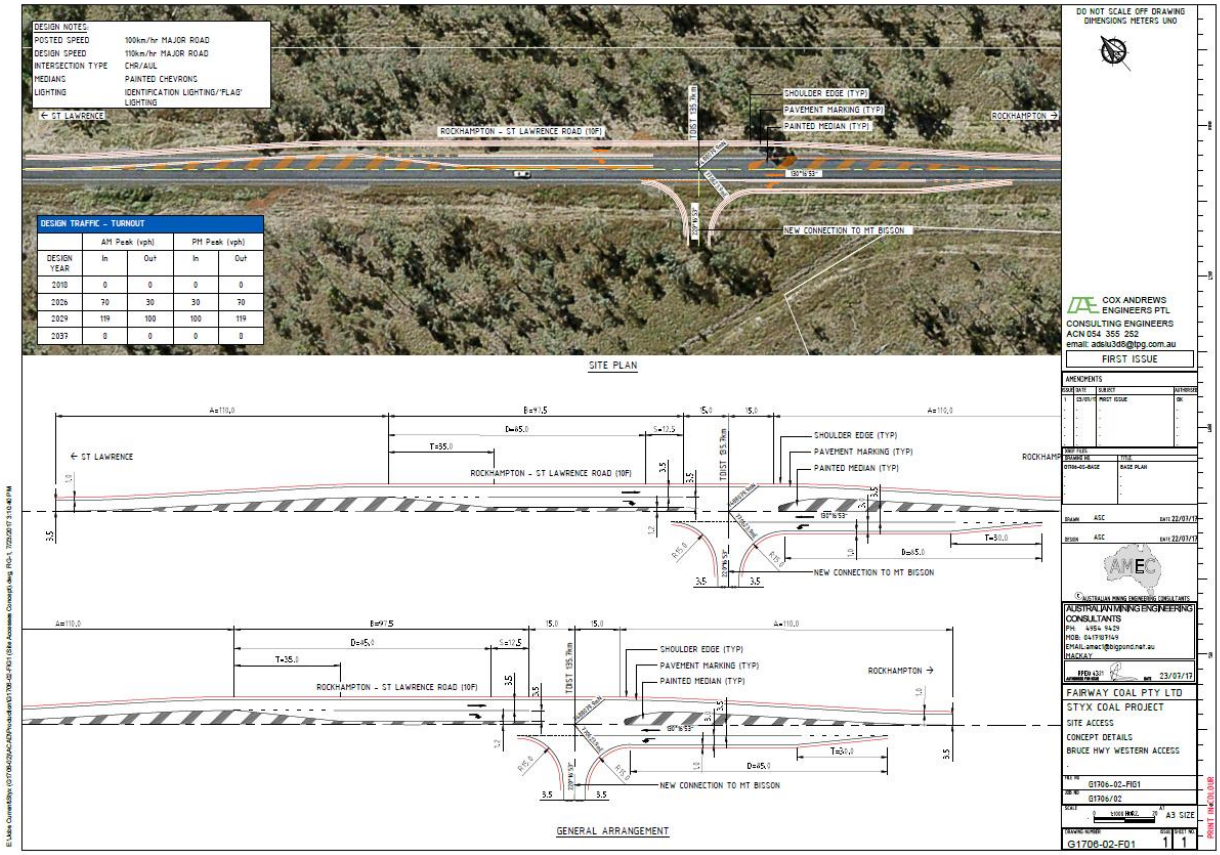


Figure 6-8 Indicative site access concept details Bruce Highway western access

6.7.2 Workers' Accommodation Camp

The workers' accommodation camp will now not proceed. A workers' accommodation camp was referenced in the RIA included in the EIS at Appendix A4a, to be located at Mamelon. This was referenced solely to advise the possibility of this workers' camp being utilised for the Project. As it was unconfirmed, the RIA assessment assumed that this camp would not be available for use by the Project, with the full workforce assumed to be located elsewhere (see Section 6.7.1). Consequently, workforce traffic is included in the assessment.

As the workers' accommodation camp will now not proceed, the Marlborough Caravan Park will seek to provide for accommodation needs (dependent on a separate assessment required to be undertaken by the owners of the Marlborough Caravan Park which will consider the change to traffic impacts). This scenario could reasonably be assumed to reduce the impact of workforce traffic on surrounding roads as outlined in the RIA, due to the site's location relative to the Project. Approvals for amendments to the existing State and Council Controlled Road network to support the expansion of the Marlborough Caravan Park will be sought by the Caravan Park owners separate to the Central Queensland Coal Project process.

6.7.3 On-site Parking

Central Queensland Coal commits to ensuring adequate parking will be provided for within the Mine to ensure no vehicles are parked within the State Controlled Road corridor.

6.7.4 Open Cut 1 Conveyor

The conveyor arrangement proposed in the original EIS has been redesigned and repositioned and will no longer be located under the existing Deep Creek road bridge. The conveyor will now pass beneath the Bruce Highway at a location that will be determined in conjunction with DTMR. As the conveyor will not be operational until 2028, the design of the culvert and conveyor arrangement has not been finalised; however, an indicative design is shown Figure 6-9.

The final design and construction of the culvert arrangement that will accommodate the conveyor beneath the Bruce Highway will be undertaken to be consistent with the design and construction requirements in place at the time of construction. A staged construction approach will be implemented to maintain the movement of two-way traffic along the Bruce Highway at all times through the construction zone.

Approval of the culvert design and for construction will be required from the Fitzroy District DTMR Office and a TMP to undertake works in and near the Bruce Highway will be required prior to the commencement of construction. The TMP will be prepared in accordance with the requirements of the Guide to Traffic Impact Assessment, Transport and Main Roads, September (2017) and consultation with DRMR District Officers as part of a Section 33 approval for works.

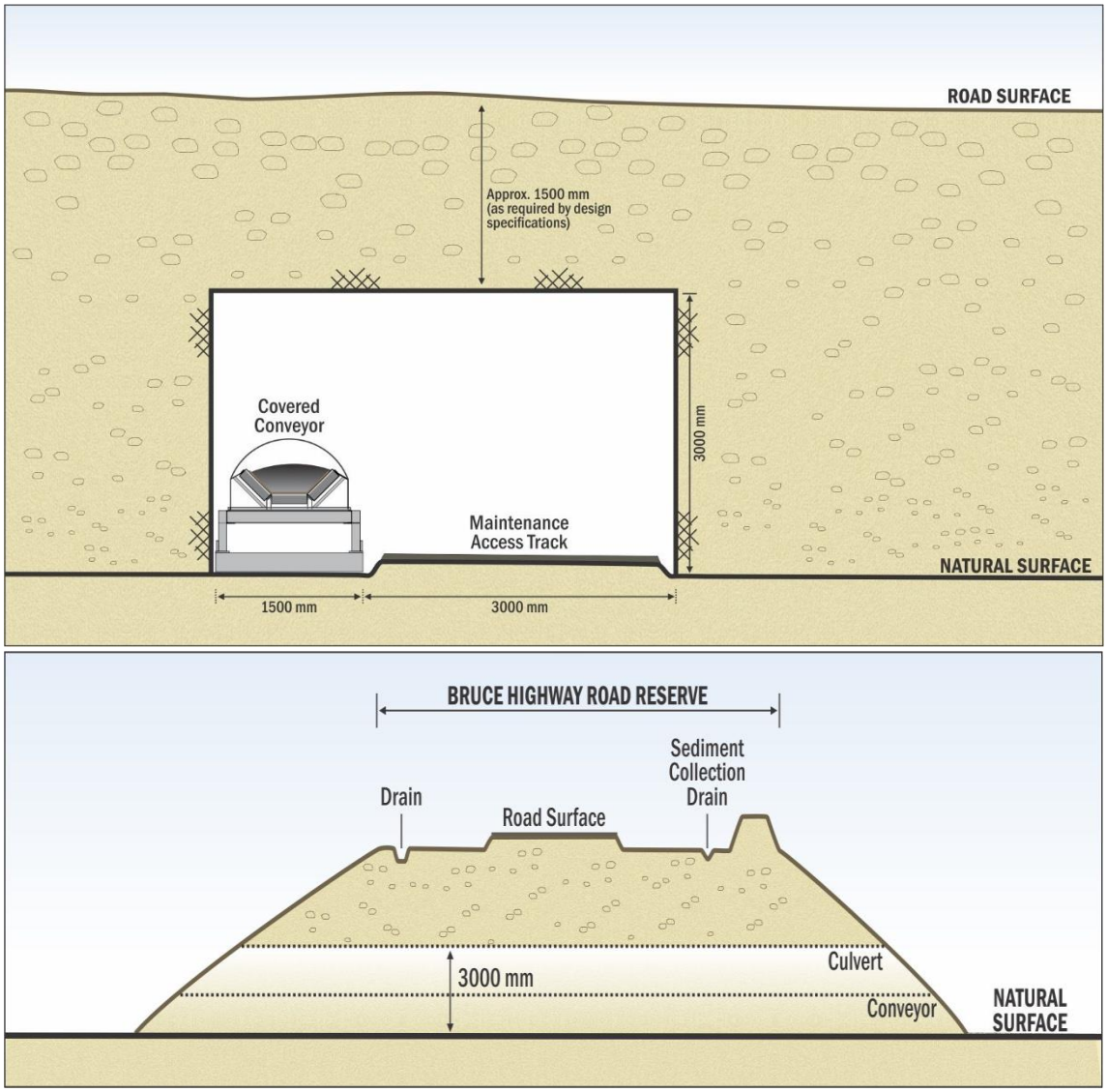


Figure 6-9 Indicative conveyor arrangement under the Bruce Highway

To provide an appreciation of the traffic management which could be applied to the construction of the culvert, a concept on the methodology has been prepared and is illustrated at Figure 6-10. This method involves a staged construction which will maintain the movement of two-way traffic along the Bruce Highway at all times through the construction zone.

The first stage (Stage 1) involves creating the work zone and laying additional pavement to increase the existing road width to maintain two-way traffic. Once the additional pavement is established, the existing westbound lane would be closed.

The second stage (Stage 2) is a mirrored switch from the first stage, laying additional pavement to increase the existing road width to maintain two-way traffic and closing the eastbound lane, hence creating the Stage 2 and final work zone.

This methodology provides uninterrupted construction activity in each work zone at a time whilst maintaining two-way traffic to flow on the Bruce Highway.

It is important to note that Central Queensland Coal commits to ensuring no Project related activities will be undertake which require the complete closure of the Bruce Highway to traffic.

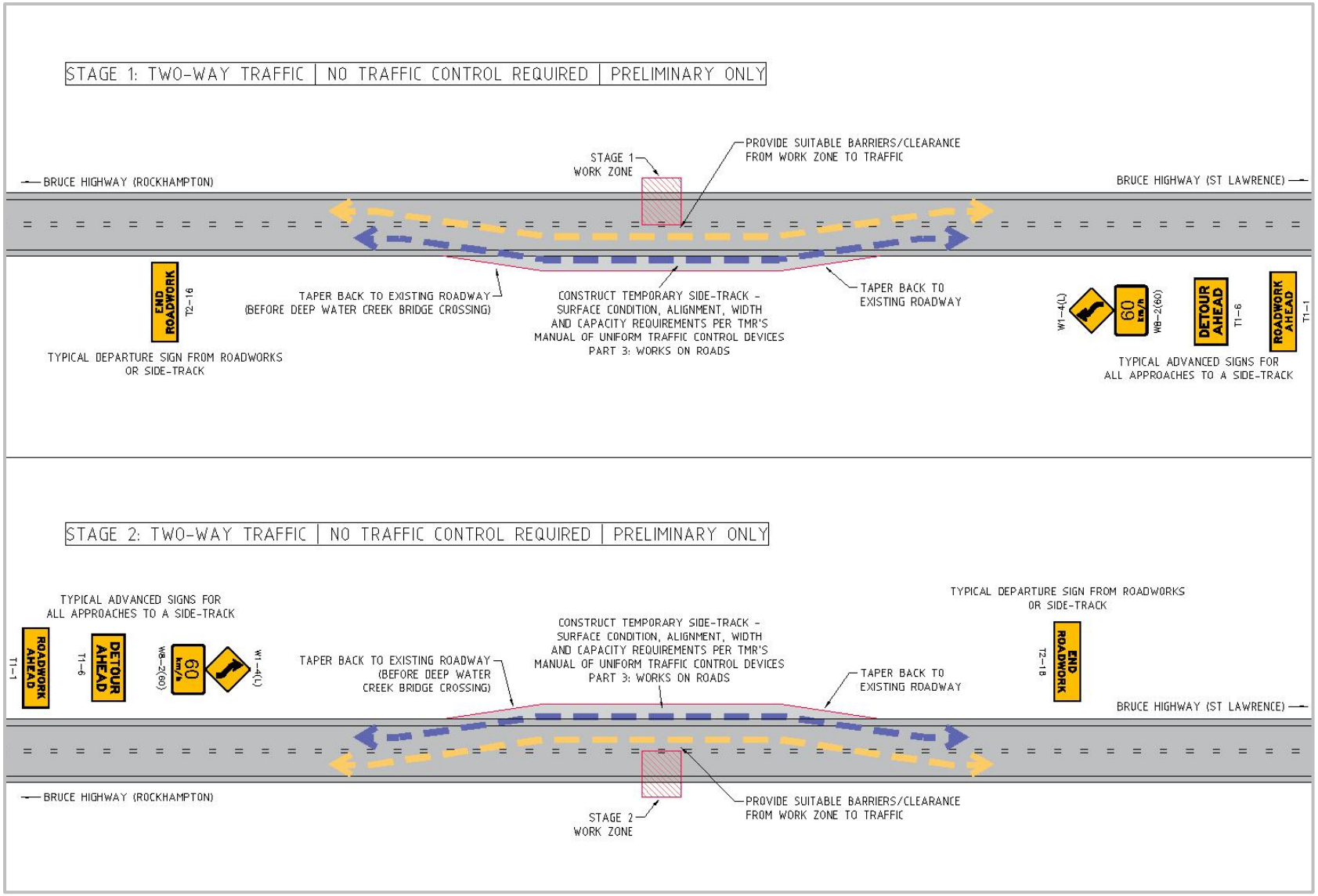


Figure 6-10 Concept traffic management methodology

6.7.5 Blast Management

Following discussions with DTMR since the release of the EIS, Central Queensland Coal has agreed to avoid undertaking blasting activities that will require the closure of the Bruce Highway. For clarity, Central Queensland Coal is not proposing any Project related activity that will require the closure of the Bruce Highway. Central Queensland Coal will continue to work with DTMR to establish appropriate blasting programs that facilitate the mining of coal in proximity of the Bruce Highway and avoid the need for road closures during blast periods.

Procedures to safely manage blasting will be articulated in a Blast Management Plan (BMP) which will be prepared prior to the commencement of blast activities that may impact upon the safety of users of the Bruce Highway. All potential impacts associated with blasting activities will be assessed. This Plan will be submitted to DTMR for review within a minimum of three months prior to blasting. As these procedures will be developed in conjunction with DTMR, it is not anticipated that there will be operational impacts to vehicles on the Bruce Highway due to blasting activities associated with the Project.

6.8 Traffic Impact Assessment

This section assesses anticipated Project impacts on the proposed haul routes (Bruce Highway from Rockhampton to Mackay) with due consideration of forecast traffic volumes "with" and "without" the Project. This assessment has been undertaken in accordance with the principles outlined in GARID which states:

> *"Traffic operation impacts need to be considered for any section of state-controlled road where the construction or operational traffic generated by the development equals or exceeds 5% of the existing AADT on the road section, intersection movements or turning movements."*

This approach is also consistent with the Guide to Traffic Impact Assessment, Transport and Main Roads, September (2017).

6.8.1 Project Assumptions

The following sections provide additional clarification on the assumptions used for the assessment of traffic impacts. Assumptions regarding the Project details (e.g. workforce and heavy vehicle numbers) have been provided developed by Central Queensland Coal as based at the current stage of planning and design. These are considered to be the best available estimates at this stage of Project planning.

6.8.1.1 Vehicular Access

The Project proposes to incorporate two vehicular accesses to provide entry to both sides of the Bruce Highway (i.e. two approach legs providing access to the Project). These are discussed in Section 6.7.1.

6.8.1.2 Vehicle Origins

With regards to the origins of workforce and heavy vehicles, three classifications have been considered, namely:

- Local (i.e. sourced from local townships);
- Regional (i.e. sourced from the surrounding region); and
- State (i.e. sourced from elsewhere within Queensland).

It is understood that the Project's workforce will be sourced entirely from people living within the local or regional area (e.g. existing residents and/or new residents that choose to reside locally or regionally as a result of the Project's approval) as per the details provided in Figure 4.1 of the RIA report included as Appendix A4a to the EIS. The 2011 census data was used to gain an understanding of the proportional size of local towns (i.e. Clairview, St Lawrence, Ogmore and Marlborough), and not as a basis to confirm that sufficient population is located within these towns to service the Project. It is expected that these towns will be used to accommodate a portion of the workforce, with the availability of accommodation being estimated based on the size of each town (i.e. population). It is noted that the proportion of population between these local towns has not changed substantially in 2016 census data. Furthermore, this was used as a secondary check to confirm that assumptions used in the TIA were reasonable with regards to expected workforce locations.

With regards to heavy vehicle movements, both local and regional trips are assumed to originate from either Rockhampton or Mackay. These trips account for most heavy vehicle movements (i.e. ~85% of heavy vehicle traffic). Therefore, impacts beyond Rockhampton and Mackay are expected to be minimal, noting that only a small proportion of heavy vehicle traffic is expected beyond these towns (i.e. Project traffic expected to be less than 5% of base traffic), and that this traffic is expected to distribute to surrounding roads, further lessening impacts.

6.8.1.3 Workforce Traffic Type

Workforce estimates have been split into construction, operational and rehabilitation workforces. For the period 2019 to 2037, the rehabilitation workforce is incorporated into construction and operational workforce estimates. From 2037 to 2038 operation activities will cease and dedicated rehabilitation works will be the dominant activity at site. During 2037 to 2038 the workforce is expected to be substantially reduced when compared to peak periods (i.e. ~5% of peak workforce).

6.8.2 Projected Increases in AADT

Coal mines are key generators of traffic in the local area. Traffic volumes in central Queensland have seen a marked decrease in recent years as the construction phase of the mining boom evolved into the production phase. From a review of several regional roads between Townsville and Gladstone, traffic volumes appear to have decreased progressively by between 10-30% p.a. during 2012 and 2014.

The comparison of baseline traffic to the Project traffic, to determine whether the 5% traffic impact threshold is exceeded, is summarised in Table 6-11.

Table 6-11 Estimated AADT

Road Name	Road Section	% Increase of AADT		
		2020	2028	2030
Bruce Highway (Rockhampton – St Lawrence)	@ Archer St(Lights) (Rockhampton)	2.2%	1.8%	2.9%
	100m Sth Knight St	1.1%	0.9%	1.4%
	@ Boland St	1.5%	1.2%	1.9%
	800m Sth Rton-Yeppoon Rd	2.1%	1.8%	2.8%
	200m Sth Mason Ave (Parkhurst)	3.0%	2.5%	4.0%
	150m North Terra Nova Dr	4.8%	4.0%	6.3%
	200m North 14 Mile Ck Rd	25.7%	21.6%	34.4%

Road Name	Road Section	% Increase of AADT		
		2020	2028	2030
	40m south of Mountain Ck (Kunwarara)	67.1%	56.3%	89.4%
	1km south of Montrose Creek	31.5%	26.4%	41.7%
	South of Waverley Creek (St Lawrence)	36.7%	30.8%	48.5%
Bruce Highway (St Lawrence – Mackay)	North of Clairview (St Lawrence)	33.2%	27.9%	44.0%
	WiM Site Koumala	3.2%	2.7%	4.0%
	South of Armstrong's Beach Turnoff	2.7%	2.3%	3.4%
	Sichter Street - Broad Street	1.6%	1.3%	1.9%
	Between Sarina and Sarina - Homebush TO	1.5%	1.3%	1.8%
	Sarina - Homebush Road to Hay Point TO	1.7%	1.5%	2.1%
	North of Macks Truck Stop	1.1%	0.9%	1.3%
	Broadsound Road Permanent Counter	0.8%	0.7%	1.0%
	City Gates to Lagoon Street	0.5%	0.4%	0.6%
	Lagoon St to Bridge Rd	0.6%	0.5%	0.7%
	George Street Pedestrian Crossing (Mackay)	0.6%	0.5%	0.7%

* Based on potential increase in output from current 8.8 Mtpa to 10 Mtpa

Based on the summary provided in Table 6-11, the impact of forecast Project traffic exceeds 5% for the following road segments of the Bruce Highway:

- 150 m North Terra Nova Drive;
- 200 m North 14 Mile Ck Road;
- 40 m south of Mountain Creek (Kunwarara);
- 1 km south of Montrose Creek;
- South of Waverley Creek; and
- North of Clairview.

6.8.3 Road Link Capacity Assessment

A road link capacity assessment has been undertaken for those road links where Project traffic volumes are expected to exceed 5% of base traffic. The road links adopted are consistent with the road link sections detailed in DTMR's AADT reports for the Bruce Highway (as provided in Appendix A of the RIA included as Appendix A4a to the EIS). Start and end locations of these segments are mapped within these AADT reports as provided in Appendix A of the RIA at Appendix A4a.

The theoretical baseline road link capacity of affected road links (as identified in Section 6.8.2) has been calculated in accordance with Austroads GTM: Part 3 for a single-lane flow of traffic. This applied methodology excludes overtaking lanes from the calculation and assumes a single lane of traffic flow in one direction. All affected road links are expected to operate within capacity, with the exception of the segment '150m North Terra Nova Drive' which is expected to operate marginally over capacity. Overtaking lanes are present within this section of the road link and hence operational capacity is expected to be more than the calculated theoretical capacity. It is expected that this road link will operate within the operational capacity with the Project traffic as a result of

overtaking lanes. Notwithstanding, mitigation measures to offset any potential operational impacts as a result of the Project generated traffic have been considered (to be detailed in the RMP prepared for the Project), such as:

- Staggering shift start / end times such that traffic does not coincide with network peak periods;
- Scheduling deliveries and heavy vehicle movements such that they do not occur during network peak periods; and
- Investigating workforce shuttle bus services and car sharing systems to reduce Project traffic.

That the road link assessment has not been extended beyond Rockhampton and Mackay on the following basis:

- The workforce is not expected to be located in areas beyond Rockhampton in the south and beyond Mackay to the north. The Proponent's workforce fatigue management policy eliminates members of the workforce traveling from areas beyond Rockhampton and Mackay for typical weekday commuting travel purposes. As such, based on current planning and a reasonable expectation of where the workforce would reside, traffic generated by the workforce is not expected to extend to the SCR south of Rockhampton or north of Mackay; and
- Although there are state trips associated with heavy vehicles which will result in vehicle trips outside of the Rockhampton to Mackay cordon, these trips account to a relatively small percentage (in the order of about 10 – 20 vehicle movements per hour for the Project design horizons) of the overall Project generated traffic. Furthermore, these trips are expected to diminish beyond Rockhampton and Mackay post each construction period, in turn lessening the Project generated traffic impacts on the SCR network.

6.8.4 Access Intersection Assessment

The Project proposes to gain vehicular access to both sides of the Bruce Highway as discussed in Section 6.7.1. To achieve this access, new intersections (see Section 6.7.1) are proposed.

A turn warrant assessment has been undertaken in accordance with the methodology provided in the RPDM Volume 3: Part 4A for the proposed Project access. Both eastern and western access scenarios have been assessed and indicative designs are provided at Section 6.7.1. The required form for the access intersection is provided in Figure 6-7 and Figure 6-8, which is based on the requirements set out in Austroads GRD: Part 4A.

6.8.5 Pavement Impact Assessment

The impact of traffic can deteriorate road pavements over time, resulting in surface wear and small cracks, potentially allowing water to enter the underlying surface of the pavement. In combination with continual stress due to traffic flow, this water infiltration can weaken the pavement, causing potholes, major cracks, deformation and ultimately road failure. This impacts speed, efficiency and safety of the traffic using the road and requires ongoing maintenance activities.

Equivalent Standard Axles (ESA) conversion factors have been calculated using the methodology provided by the TMR, which is based on the Austroads GPT: Part 2. The adopted ESA conversion factors are as detailed in Table 6-12.

Table 6-12 ESA conversion factors

Vehicle Type	ESA Conversion Factor	
	Unloaded	Loaded
Bus/Truck	0.54	2.98
Semi-Trailer	0.51	4.93
B-Double	0.53	6.30
Oversized	0.54	7.66

Source: Typical conversion factors based on legal loading, base loading and axle grouping of heavy vehicle types

A 50/50 split has been assumed between loaded and unloaded heavy vehicles entering and exiting the site. This assumes that there will be deliveries to the site as well as removal of material to the site. Background ESAs were estimated using heavy vehicle data detailed in DTMR Annual average daily traffic (AADT) reports and adopting a conversion factor of 2.9 ESAs / HV, as recommended in DTMR's 'Assessment of Road Impacts of Development Proposals – Notes for Contribution Calculations'.

A summary of the Project generated heavy vehicle movements (and ESAs) on each haul segment is provided in Appendix A4a – Road Impact Assessment. Based on the calculated development ESAs, impacts of greater than 5% have not been identified for any section of the Bruce Highway. On this basis, and as per the methodology detailed in the guidelines, assessment of contributions has not been undertaken, with the pavement impacts of the Project considered insignificant.

6.8.6 Intersection Impact Assessment

Project impacts on SCR intersections are expected to be minimal, with Project traffic typically adding additional through movements on the Bruce Highway. Turning movements will be disbursed to multiple intersections based on workforce and heavy vehicle origins and destinations, minimising impacts to each intersection. On this basis, the road link capacity assessment undertaken is considered appropriate for the assessment of Project impacts on the external SCR environment.

6.8.7 Road Safety Risk Assessment

Safety on the SCR network is a key consideration for developments interacting with the SCR network. A safety assessment has been identified as necessary due to the following:

- Increase in traffic volumes as a result of the Project;
- The introduction of new infrastructure (i.e. new access intersections with the Bruce Highway);
- Increase in number of conflict points between vehicles and other vehicles (as a result of the new access intersections); and
- Reduced road link capacity as a result of narrower road and shoulder widths along Bruce Highway (for impacted road links).

Potential safety risks resulting from the Project have been identified and rated as presented in Figure 6-11. All risks are expected to be within a medium level with the development (and mitigation measures where needed) as summarised in Figure 6-11. Furthermore, as noted in GTIA a road safety audit is required for major developments with AADT's larger than 8,000 on roads with speeds exceeding 80 km/hr. As such, the draft RMP details the need to undertake a road safety audit on impacted SCR road links at the detailed design stage of the Project, particularly the detailed design and approval stage for each of the Project's site accesses with the Bruce Highway.

Risk Item	Without Development			With Development			Mitigation Measures	With Development & Mitigation		
	Likelihood	Consequence	Risk Rating	Likelihood	Consequence	Risk Rating		Likelihood	Consequence	Risk Rating
Increased through traffic along SCR network resulting in congestion and potential for vehicle collision	1	2	L	2	2	L	No Action			
Introducing of a new access intersection resulting in vehicles slowing down to turn in a high speed environment	1	1	L	4	3	M	Ensure access intersections are designed appropriately to meet the turn warrant requirements detailed in section 6.2 of the RIA.	2	2	L
Increased risk of vehicle collision due to driver fatigue	3	5	H	4	4	H	Monitoring of workforce hours and driver behaviours to be incoporated into the RMP to address this risk	2	5	M
Closure of parts of Bruce Highway associated with the construction of the access intersection interrupting traffic flow in a high speed environment	1	1	L	4	3	M	Ensure an approved Traffic Management Plan is in place to accommodate safe vehicle movements during closures	2	2	L
Debris/Construction material on roads during the construction phase of the project	2	2	L	4	1	M	Ensure a construction management plan is in place to address impacts on SCR's as a result of project generated debris and construction materials	2	2	L
Undertaking construction and/or mining works during night time where visibility might be limited due to poor lighting	1	2	L	3	5	H	Ensure a construction management plan is in place to addressing construction works during night time	2	2	L
Driving to/from the development at nigth time where visibility might be limited due to poor lighting	4	5	H	5	5	H	Ensure appropriate ligthing is provided along the SCR network to and from the site, with special consideration proximate to the site accesses.	2	5	M
Operational impacts on 150m North Terra Nova Dr road link as a result of Project generated traffic	2	2	L	4	3	M	Stagger the arrival times of Project traffic such that it does not coincide with the network peak to mitigate potential capacity issues	2	2	L

Figure 6-11 Project related road safety risk assessment

A qualitative risk assessment identifying potential impacts and risks to the surrounding environment has also been undertaken and detailed in Section 6.13.

In addition to the road safety risk assessment, analysis of the recorded accidents on the Bruce Highway, proximate to the Project and specifically its frontage, indicates the following:

- A single accident was recorded further than 5 km of the Project, in the preceding five year period;
- This accident did not result in a fatality; and
- The accident involved a single vehicle colliding with an object, causing the vehicle to veer off the carriageway.

It is considered that this type of crash is typical for the use, type and function of the Bruce Highway within the area, and therefore the crash data suggests that the Bruce Highway proximate to the Project does not pose any atypical safety risks or hazards that need to be factored into the access design. Notwithstanding, this would need to be confirmed with detailed site inspections during the detailed design phase for the access intersection.

6.8.8 Oversized Vehicles

The Project is likely to utilise oversized vehicles for some of the transport activities as part of construction and operations. The use of these vehicles will be undertaken in accordance with the National Heavy Vehicle Regulator guidelines and be subject to permit applications and DTMR approvals for the use of such vehicles. The use of these vehicles will be assessed as part of these permit applications.

6.8.9 Public Transport

There are no school bus routes which utilise the Bruce Highway in the vicinity of either access point into the mine.

The Marlborough State Primary School provides a local bus service which operates along the Bruce Highway between Kooltandra Road and Princhester Siding Road before returning to Marlborough to drop off students (Figure 6-12). This service operates between approximately 7:40 am and 9:00 am and 3:00 pm and 4:00 pm on school days. All pick-up points are on the highway near individual property accesses or near local road intersections.

Regional school bus services operate from Marlborough through to Rockhampton (Figure 6-13) for students attending secondary school at Rockhampton and to the north of the Project, from Clairview to Chelona (Figure 6-14).

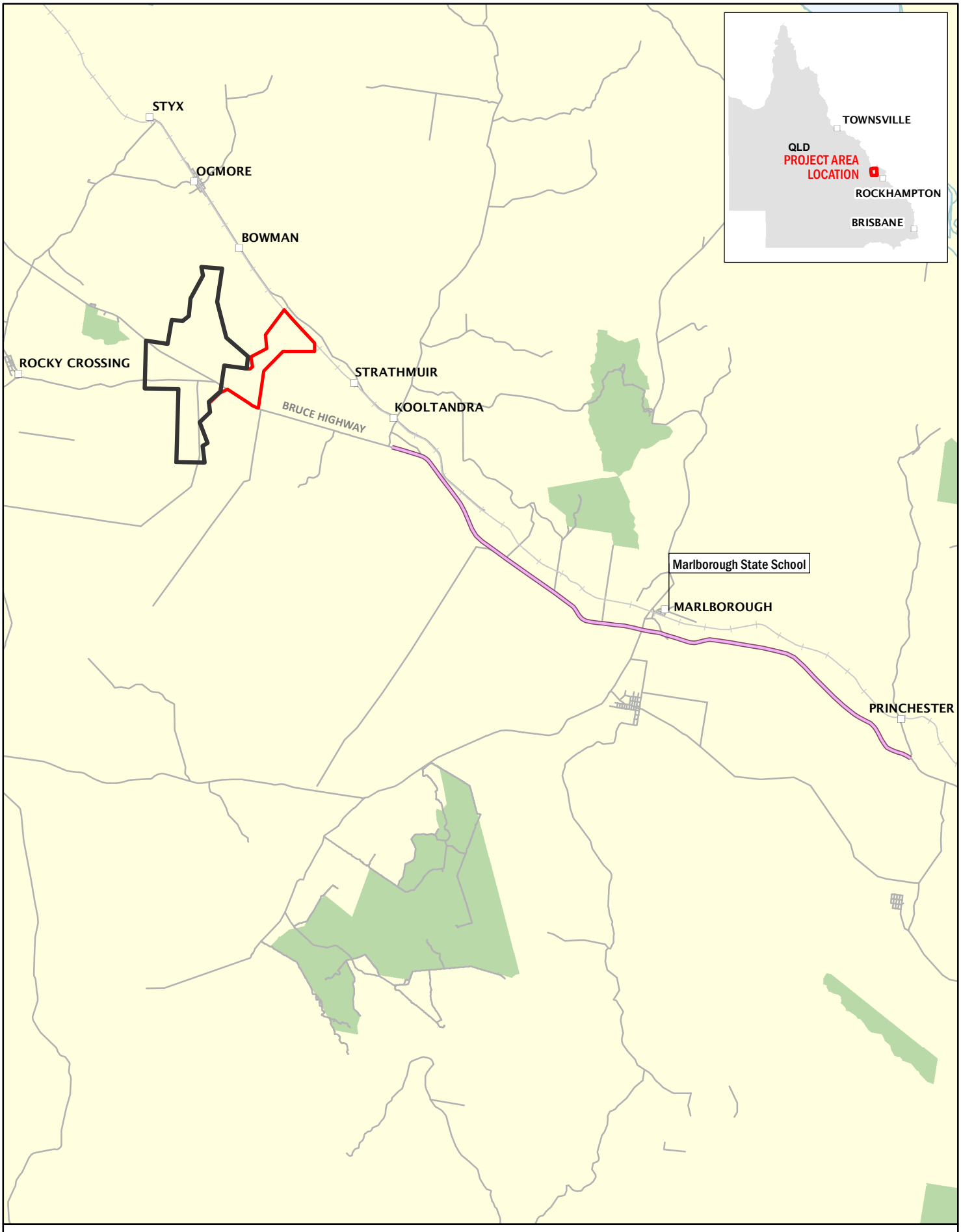
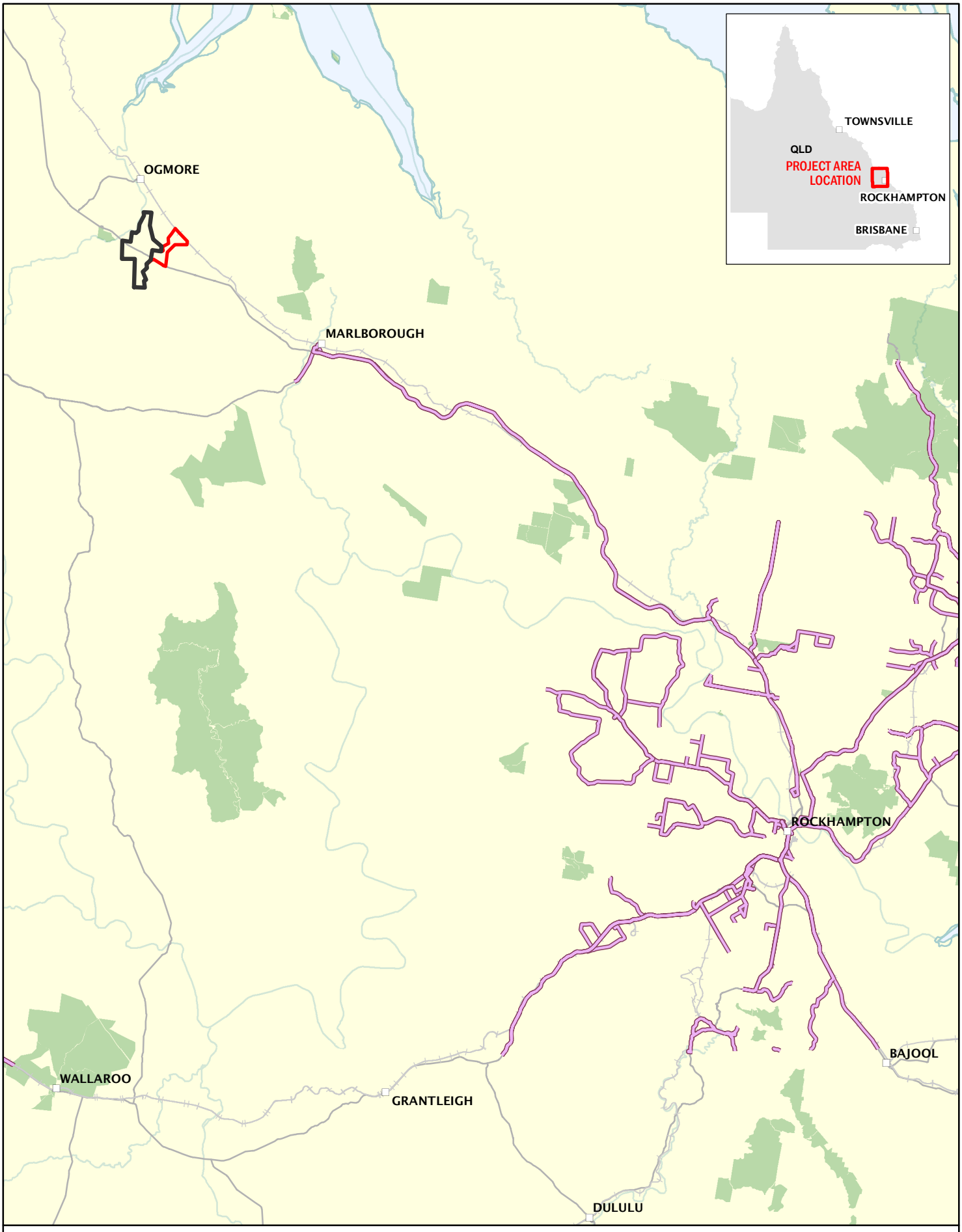


Figure 6-12
Marlborough State School bus route

Scale @ A4 1:250,000
Date: 22/11/18
Drawn: Gayle B.

DATA SOURCE
Waratah Coal, 2018
QLD Open Source Data, 2018

CDM Smith



N

0 5 10 km

Scale @ A4 1:650,000
Date: 22/11/18
Drawn: Gayle B.

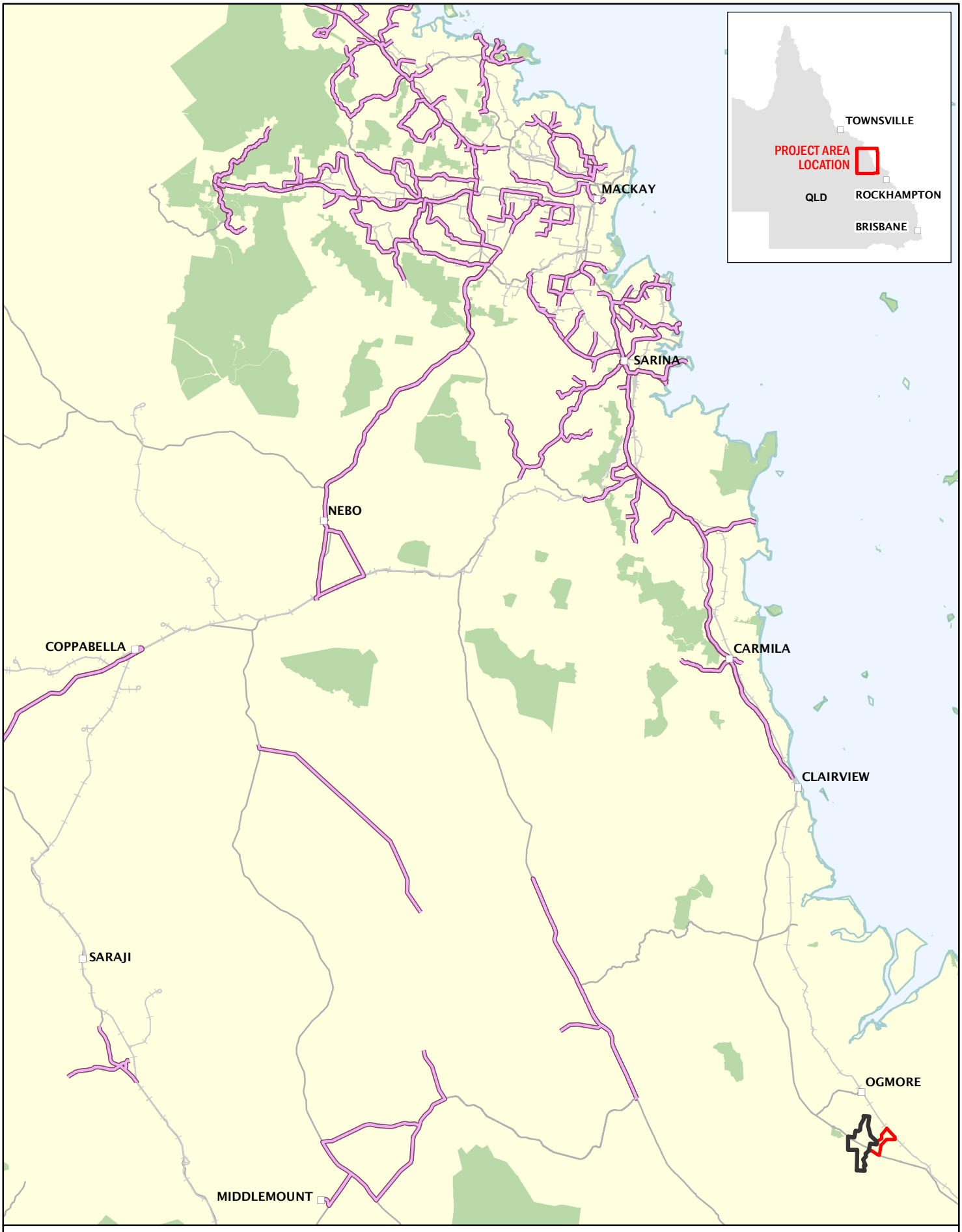
Legend

- ML 80187
- ML 700022
- School bus route
- Roads
- Rail network
- Protected areas

Figure 6-13
School bus routes - south between Marlborough and Rockhampton

DATA SOURCE
Waratah Coal, 2018
QLD Open Source Data, 2018

CDM Smith



N

0 10 20 km

Legend

- ML 80187
- ML 700022
- School bus route
- Roads
- Rail network
- Protected areas

Scale @ A4 1:900,000
Date: 22/11/18
Drawn: Gayle B.

Figure 6-14
School bus routes - north between Clairview and Chelona

DATA SOURCE
Waratah Coal, 2018
QLD Open Source Data, 2018

CDM Smith

6.8.10 Rail Crossings

Preliminary liaison with QR indicates that the requirement to undertake an ALCAM (ALCAM 2016) assessment for impacts to rail level crossings will be determined following lodgement of the EIS.

6.8.11 General Impacts Summary

Increased traffic and transport activities in the area has the potential to impact upon the existing transport infrastructure and values described in Section 6.5 if they are not appropriately managed. The potential impacts from the Project traffic and transport activities include:

- Potential for traffic accidents resulting in property damage or serious injury and fatality;
- Road delays on the Bruce Highway;
- Increase incidence of spills, fires or explosions because of the transportation of hazardous and dangerous goods;
- Small cracks and surface wear in the road because of increased traffic allowing water to enter the underlying surface of the pavement; and
- Damage to property and collision because of poor pavement or deteriorating pavement as a result of Project vehicles.

6.9 Geotechnical Impact Assessment of the Bruce Highway

An updated assessment of the potential geotechnical risks to the Bruce Highway associated with the Project has been undertaken. The assessment report is at Appendix A4b. This report supersedes the report originally provided in the EIS. As the Project has applied a buffer of 500 m from the Bruce Highway where no blasting is proposed, the findings of the assessment are considered to be conservative.

The Project comprises the opening of pit walls parallel to the highway on both sides for a total length of approximately 3 km. The maximum depth of the portions of the pits near the highway is approximately 150 m. The total width of the corridor between the pits used for the modelling is approximately 200 m, i.e. the distance from the road centreline to each pit wall is approximately 100 m.

Pits on either side of the highway will not be open concurrently and will be backfilled with spoil once the coal has been extracted. Safety berms will be provided between the highway and the pit walls. Overburden (surficial soils and weathered rock) will be excavated using standard earthmoving plant with a batter slope of 1H:1V. Rock cuts will be excavated with 45 m deep benches and 10m berms with pre-splitting to reduce disturbance.

6.9.1 Geotechnical Information

The majority of the geotechnical information used for the model was derived from exploration boreholes which were drilled primarily to provide information on the quality and distribution of the coal seams in the Project area. Selected boreholes near the highway alignment were re-analysed to provide geotechnical logs. This work was performed by a qualified experienced engineering geologist with R.P.E.Q. certification.

Rock strength properties were derived from logs, downhole sonic velocity tests and laboratory tests on cores from other boreholes in the Project area. Cross sections showing identified coal seams were developed and these together with the re-worked logs were used to prepare geotechnical cross sections for slope stability and deformation analyses. These cross sections were judged to provide a better indication of bedding inclination across the cross sections than could be determined based on the borehole logs.

6.9.2 Geotechnical Analysis Slope Stability

Slope stability analyses were undertaken using GeoStudio software. This software package is preferred by DTMR. Initial analyses were performed using a simplified model prepared before detailed mapping of coal seams was made available. The results showed factors of safety in excess of 1.5 for pit depths up to 100 m and in excess of 1.3 for pit depths up to 150 m using rock strength parameters shown at Table 6-13.

Table 6-13 Initial material properties

Material	Density (kN/m^3)	Angle of Internal Friction ϕ (degrees)	Cohesion (kPa)
Overburden (clay and CW rock)	19.6	25	40
Spoil	18.6	34	0
Mudstone CW	18.6	24	60
Mudstone MW	18.6	25	200
Mudstone Fr	19.6	38	200
Siltstone CW	24.5	43	60
Shale Fr Competent	24.5	15	38400
Sandstone HW	19.6	38	60
Sandstone Fr Weak	24.5	40	200
Sandstone Fr, Competent	24.5	28	27200
Coal Fr	14.7	35.5	420
Coal CW	11.8	22	0
Soot	11.8	9	0
Intraformational Shear Zone	-	25	9

Following analysis, further investigation of rock strength and elastic modulus properties was undertaken and a Hoek-Brown strength model was adopted with rock strength values derived from downhole sonic velocity tests. These were in general somewhat lower than typical laboratory strength values, hence it was judged that the strength model adopted was conservative and could potentially be improved by further investigation and testing prior to developing the pits nearby to the Bruce Highway.

The analysis produced the following results with probable lower bound strength values:

- > 2D circular slip failures produced FOS > 1.5 (As per DTMR requirement) for pit depths to 150 m;
- > Planar wedge failures produced FOS > 1.5 for pit depths to approximately 125 m and > 1.4 for pit depths to 150 m;
- > Seismic stability is not critical;
- > 3D wedge failures not analysed but not considered plausible; and

- > Analyses were done with pore pressure coefficient (Ru) = 0.15 as per DTMR requirements (this is considered to be conservative).

6.9.3 Geotechnical Analysis Deformation

Finite element deformation analyses were performed using Plaxis software. Mohr Coulomb modelling was used for overburden and spoil and Hoek-Brown modelling for rock and coal seams. The analysis showed maximum horizontal and vertical deflections at the highway centreline of 25 mm and 8 mm respectively. These results are preliminary but indicate that horizontal movement and settlement of the highway alignment is not likely to be significant.

6.10 Mitigation Measures

The management measures recommended to reduce the potential impacts are discussed in the following sections. The management measures will be prepared and implemented in close consultation with DTMR and LSC and will be in accordance with relevant transport authorities; work programs, methodologies, guidelines and design manuals.

6.10.1 Road-Use Management Plan

A draft RMP has been prepared and is included at Appendix A4c of the updated SEIS. It is expected that this document will be dynamic and continually updated during stages such as, detailed design, construction and operation.

Noting the Project has not received approval to commence, the draft RMP has been prepared based on current best understanding of the Project. A key update to the RMP will be the inclusion of a defined schedule of heavy vehicle, wide loads and over-dimensional / indivisible load movements, load types and load weights. Vehicle movements estimates have been assessed in the TIA; however, developing a detailed schedule at this point of time is not feasible as the schedule timing will be dependent on the SEIS assessment by the Federal and State Governments. Central Queensland Coal commits to finalising a RMP for DTMR consideration prior to the commencement of construction activities.

Specific strategies which have been considered as part of developing the draft RMP include:

- Undertaking a road safety assessment of the new intersections, prior to Project commencement for eastern access point and prior to the commencement of activities on the western side of the Bruce Highway for the western access point, and identifying any potential improvements needed to improve road safety. The safety assessment will consider:
  - Confirming total transport tasks for the Project including workforce, inputs and outputs, during the construction and operational phases. This will include a description of the expected volumes, weights and origins / destinations of materials, products, hazardous goods or wastes for each phase of the Project
  - Existing pavement conditions and defects which may lead to safety issues
  - Existing intersection performance (from a safety, not operational, perspective)
- Operation of workforce shuttle bus services to reduce private vehicle usage and overall resultant Project traffic;

- Implementation of workforce ridesharing scheme to increase vehicle occupancy and thus decreasing overall Project traffic;
- Adjusting shift times and heavy vehicle movement scheduling such that Project traffic peaks do not coincide with the road network peak period;
- Use of vehicle location tracking systems that allow monitoring of driver behaviour and traffic flow;
- Branding of vehicles and displaying a free call number for community members to contact if they have concerns or queries about driving behaviour;
- Developing policy on how long drivers can operate a vehicle and how many breaks they require; and
- Limiting overtime and developing safe driving plans.

The framework for the draft RMP is provided in Table 6-14. The TIA used to inform the draft RMP is at Appendix A4a and the draft RMP is at Appendix A4c of the updated SEIS.

Table 6-14 Preliminary RMP framework

Chapter	Sub Headings	Details
Introduction	Purpose RMP Objectives RMP Strategy	To outline the purpose, objectives and implementation of the RMP
Project Details	Description Construction Schedule Current LOS/standards of existing road network Project Traffic Generation	Section to provide Project background and details
Management Strategies	Road Safety Driver Behaviour Driver fatigue Transport Modes Transport Routes / Load Limits Road-link Width Deficiency Intersection Impact Pavement Impact	Section to provide details of adopted management strategies used to achieve transport targets
Transport Related Conditions of Development		Section to provide details on Conditions of Development relevant to transport and the status in satisfying these conditions
Stakeholder Consultation		Section to provide details of stakeholder consultation strategies and outcomes
Implementation Monitoring	Monitoring Processes Triggers for Revision	Section detailing the monitoring processes that are to be implemented to ensure strategies are correctly implemented and determine whether revisions to the RMP and associated strategies are required

6.10.2 DTMR Road Infrastructure

Road Sections

Results of the road link assessment indicate that all sections of the Bruce Highway proximate to the site (Mackay – Rockhampton) are expected to operate within the acceptable capacity. Notwithstanding, mitigation measures to offset potential operational impacts as a result of Project generated traffic has been considered and will be detailed in the RMP.

Intersections

Results of a turn warrant assessment indicate that the proposed site access require AUL and CHR turn treatments, for both the eastern and western access points. These treatments will be incorporated into the access arrangements as access designs further progress.

Pavement Impacts and Contribution

Central Queensland Coal's obligation towards pavement works has been assessed in accordance with the DTMR guidelines. The pavement loading impact has been classified as 'insignificant' and therefore no proponent funded contribution towards pavement maintenance or rehabilitation works is warranted. It is industry standard practice in Queensland to classify the pavement impacts of a project as insignificant where the project will impact existing conditions by less than 5%. Should the estimated material movements change significantly from those modelled in the SEIS, reassessment may potentially be warranted. Central Queensland Coal will liaise with DTMR should such material changes eventuate.

6.10.3 Traffic Safety

Historically, traffic incidents on local roads nearby the mine have been minimal. Therefore, by providing a sufficiently sealed access road with adequate sight distance and appropriately formed intersections, a safe driving environment for mine traffic will be provided.

To limit driver fatigue, communal transport for workers will be provided for mine staff between Ogmore and Marlborough, and further out to The Caves / Rockhampton and St Lawrence / Clairview if workforce numbers from those areas warrant shuttle services. Fatigue management strategies will be developed for external mine traffic in accordance to the RMP and relevant transport regulations. This will include measure for long haul of goods and services to the mine to adhere to required rest periods and safe driving practices.

The scheduling of shift changes and delivery of dangerous goods and oversize machinery will be structured to avoid school bus services. Ongoing consultation will be undertaken with local bus service providers to ensure appropriate scheduling is retained. The unformed casual pick-up areas used by the local bus service are considered suitable due to the existing traffic environment. If highway traffic volumes were to increase significantly as a result of the Project, provisions for more formalised bus facilities, including shelters, traffic signage and sealed bus stopping areas clear of the highway will be considered.

6.10.4 Dust and Noise

Dust, noise and vibration will be generated by vehicles that are travelling to the site and by vehicles moving around the Project site.

Project related impacts to air quality and associated mitigation measures are described in Chapter 12 – Air Quality. Traffic related mitigation measures include:

- The access points for the Project will be via sealed roads which will limit dust emissions;
- No hauling of coal or mineral waste will be undertaken on public roads;
- Load covers will be required on heavy vehicles carrying material that has the potential to generate dust to or from the Project site;
- Prior to leaving the site, overly dirty vehicles will be required to be washed; and
- Regular inspections of the access roads will be undertaken to ensure there is no build up of mud or and dust leading onto the Bruce Highway.

Project related noise impacts and associated mitigation measures are described in Chapter 13 – Noise and Vibration. There are no residents that will experience noise levels above Project limits associated with vehicle movements on public roads. As such no traffic specific mitigation measures other than minimising heavy vehicle movements through Ogmore and Marlborough are proposed.

6.10.5 Safety Bunds

Safety bunds are required to prevent access to pits, screen off mining operations from the Bruce Highway and control run off water, including any sedimentation. The proposed safety bunds are 6 m high with crest widths of 10 m. Batters are 1.5 (horizontal) on 1 (vertical) which is at the angle of repose. To reduce the potential for erosion, batters will be topsoiled and seeded to prevent scour and erosion. Crests will be formed to a slope at 1% towards the lease. Bunds will be constructed from track compacted, fresh spoil.

6.10.6 Drainage

Properly controlled drainage will be established to prevent run off water and sediment discharging off the mining lease onto the Bruce Highway road reserve and to prevent erosion of exposed excavated faces. A table drain area with a width of 10 m has been included between the Bruce Highway lease boundaries and the outside toes of the safety bunds. All run off water will be drained inside the lease boundaries and all sediment will be contained.

Sediment traps will be installed where required as part of mitigating potential mobilisation of sediments. Catch drains will be constructed along the highwall edge of the final void south west of the Bruce Highway and along the low wall edge of the box cut north east of the highway. These drains will prevent erosion of exposed faces prior to backfilling.

Any areas which will require topsoiling and seeding will be remediated as soon as possible to prevent scouring.

6.10.7 Transport of Dangerous Good and Hazardous Materials

The transportation of dangerous goods and hazardous materials on the State-controlled road network will require various permits and conditions relevant to the type of material being transported. Dependant on the type of dangerous goods or hazardous materials, requirements such as licenses, safety equipment and incident response plans must be approved prior to the transportation of these goods or materials.

The Australian Dangerous Goods Code (National Transport Commission 2017, Version 7.5) identifies the requirements for transporting dangerous goods by road. The code identifies a number of provisions required in the transport of dangerous goods including:

- Classification;
- Provisions and quantity exceptions;
- Packing requirements;
- Consignment procedures;
- Stowage, segregation and restraint;
- Bulk transfer;
- Documentation; and
- Safety equipment requirements for road vehicles.

The materials required for the Project which may be dangerous or hazardous include (but are not limited to) fuel, explosives and waste materials.

Central Queensland Coal commits to complying with all requirements for the transport of dangerous goods and hazardous materials as required by the Transport Operations (Road Use Management – Dangerous Goods) Regulation 2008.

6.10.8 Spillage During Transportation

To minimise potential health and safety implications from exposure and to mitigate and reduce the potential impact on the surrounding environment, a spillage action plan and procedure (for hazardous and dangerous goods) will be developed. The procedure would be applicable to all employees and contractors responsible for the transportation of materials to and from site and will provide general guidance for all substances used on the site.

6.10.9 Blasting

It is not anticipated that there will be any operational impacts to vehicles on the Bruce Highway due to blasting activities associated with the Project.

Central Queensland Coal has committed to an interim 500 m buffer area off the Bruce Highway where no blasting will occur until a specific BMP for the buffer area has been approved by DES and DTMR. The current mine plan has no mining proposed within the interim buffer area until 2032 (i.e. 12 years from the commencement of construction). The commitment to no blasting within the interim buffer area will enable Central Queensland Coal to undertake blasting outside of the buffer

area in accordance with the current mine planning, whilst using the blast data to inform the preparation of the specific BMP for the interim buffer area.

The BMP for the interim buffer area will be prepared prior to the commencement of blast activities that have potential to impact upon the safety of users of the Bruce Highway. All potential impacts associated with blasting activities will be assessed and procedures to safely manage blasting will be articulated in the BMP. The BMP will be submitted to DTMR for review a minimum of six months prior to the commencement of blasting within the interim buffer areas.

All blasting programs will be designed by qualified personnel with the key guiding principles including but not limited to:

- Maximising blast efficiency whilst minimising ground vibration and airblast overpressure impacts;
- Licence compliance requirements;
- Minimising the potential for flyrock; and
- Minimising the potential for fume.

A pre-blast design will be prepared for each blast and submitted for approval to the Central Queensland Coal Drill and Blast Superintendent / Supervisor. All blasts will be designed and modelled using the Drill and Blast Inspection and Test Plan (ITP).

The control measures to ensure best practice will include but not be limited to:

- Ensuring adequate burden is present on all faces. Where necessary face surveying (laser profiling) will be employed to measure overburden between the blast faces and blast holes ensuring sufficient burden is present to prevent blowouts and blast anomalies;
- Use of adequate stemming lengths and of suitable materials for all blasts;
- Management of blast fume in accordance with the Central Queensland Coal Project – Fume Management Plan;
- Accurate recording of design and implemented practices including drilling, loading and initiation sequencing;
- Monitoring of blasts as mining progresses, in accordance with the Monitoring Program;
- Collection of photos and tracking of post blast impacts for all blasts, with the supplementary use of video footage when required; and
- Review of post blast monitoring data to enable continued refinement of predictive models and blasting outcomes.

Blasting operations at the Project will be undertaken in accordance with Queensland Legislation including the *Explosive Act 1999*, the *Coal Mining Safety and Health Act 1999* and with a commitment to undertake the following:

- Assessing meteorological conditions on the morning of the blast to identify adverse weather conditions that have potential to exacerbate blast overpressure impact on surrounding sensitive receptors. This would include temperature inversions and wind speed/direction which has the potential to exacerbate overpressure, dust and fume impacts;

- Should unfavourable meteorological conditions be observed prior to the blast, the Drill and Blast Engineer / Technician will consult with the Environment and Community Department to determine whether to delay or postpone the blast;
- Review the blast monitors in situ to ensure that they are fully operable;
- Notify all sensitive receptors within 2 km of Project, as well as internal stakeholders that blasting is to occur;
- Inspections and preparation of proposed blast areas to ensure all soft, loose or blast damaged material is removed prior to drilling;
- Use of adequate stemming, a delay detonation system and careful drilling and hole loading to ensure that the required blast design is implemented;
- Completion of the Project's Pre-Firing Checklist;
- Completion of Project's Drill and Blast ITP; and
- Completion of the Projects Drill and Blast Checklist.

Blasting will occur in accordance with the EA conditions. The expected frequency of blasting is as follows:

- Blasting will be limited to two blasts per day;
- Blasting will be limited to six blasts per week;
- Should an additional blast be required in the case of a misfire, then this additional blast and the misfire are counted as a single blast; and
- In circumstances where unfavourable weather conditions exist, to avoid excess explosive sleep time and minimise any potential environmental impacts, the mine may seek agreement for additional blasts to be fired on any given day.

6.10.9.1 Management of Fume

The Project commits to developing a Blast Fume Management Plan that will be focussed towards the prevention of blast fume. The control measures that will be implemented include:

- The use of appropriate and approved explosive product;
- Minimising shot sleep time;
- Stringent quality assurance systems employed by the blasting subcontractor; and
- Potentially, the measurement of the chemical composition of post blast fume using drones, currently being trialled in the Hunter Valley.

The Project's Blast Fume Management Plan, will specify that a risk assessment will be conducted prior to firing of each blast. This will include assessing the ground conditions, product type, the geometry of the blast with respect to sensitive receptors and potential topographic effects. This information will be used to establish an approval to blast plan based on the meteorological conditions on the specific day.

A "Fume Management Zone" (FMZ) will be determined for the blast with respect to the various sensitive receptors and on-site personnel in accordance with Table 6-15. Length of potential

exclusion distance downwind (m) with several different wind conditions covering the daytime stability classes (adapted from QGN20).

Weather conditions will be closely monitored up until the initiation time and form the basis for the approval to blast.

Table 6-15 Length of potential exclusion distance downwind (m) with several different wind conditions covering the daytime stability classes (adapted from QGN20)

Fume category	Initial NO_2 (ppm)	Downwind exclusion distance (m) required to maintain NO_2, concentration below 5ppm				Potential of 0.12 ppm (m) odour threshold	Cross-wind exclusion distance
		Stability class and wind speed					
		A (very unstable)	B (unstable)	C (slightly unstable)	D (Neutral)		
		Wind speed					
		6.8 – 12.6 km/h	2.9 – 10 km/h	1.4 – 4.3 km/h	1.4 – 2.2 km/h		
0	2	100	100	100	100	1,200	100
1	4	130	140	150	150	3,000	150
2	7	400	500	500	500	4,000	500
3	17	600	1,000	1,200	1,200	8,000	1,000
4	70	900	1,600	3,000	3,000	13,000	1,500
5	500	1,600	3,000	5,000	5,000	20,000	2,000

6.10.9.2 Management of Flyrock

The generation of fly rock is managed by incorporating appropriate controls in blast design. These controls include design of stemming length and stemming materials to minimise the potential for generating flyrock. Adequate burden, which is the design from the charge to the free face, is maintained to minimise the risk of generating fly rock due to face bursting. These measures are used to minimise the risk of injury to personnel (including users of the Bruce Highway) and damage to property, infrastructure (including the Bruce Highway) and equipment. Appropriate stemming will be used to improve stemming confinement and hence reduce the chance of fly rock and elevated air blast overpressure.

An appropriate exclusion zone will be established around each blast site in accordance with relevant mine safety regulations prior to firing each blast. Generally, the blast exclusion zone will be 250 m for equipment and 500 m for personnel. The exclusion zone will be established beyond the expected range of any flyrock with an additional margin of safety; being two for equipment and four for personnel. The establishment of this zone will minimise the risk of any injuries due to flyrock. Where an unusual level of flyrock is generated by blasting this information will be used to re-assess the adequacy of the blast design control measures.

The information will also be used to re-assess the size of the safety exclusion zone established for personnel and equipment in the vicinity of a blast.

6.10.9.3 Management of Dust

The management of dust emissions generated from drill and blast activities is managed through but not limited to the following:

- Use of drill rigs with integrated dust control measures;
- Water down of blast area during drill and loading procedures;
- Material selection for stemming to minimise dust generation;
- Assessing meteorological conditions to avoid adverse effects; and
- Ensure adequate confinement as per blast design.

6.10.9.4 Blast Monitoring

Monitoring of all blasts will be undertaken through the life of the Project. Continuous monitoring of all blasts will be conducted at some (or all) of the predetermined monitoring sites, dependent upon the location of activities within the ML.

In addition, blast monitoring will be undertaken to determine blast impacts on other infrastructure, where deemed necessary. The infrastructure blast monitoring locations will be determined utilising a risk-based approach, with blast monitoring potentially to be undertaken at appropriate sites including the TLF, Queensland North Coast Rail Line, Bruce Highway, road bridges, main access road, water pipeline and transmission lines. Portable blast monitors will be used for complaint based and infrastructure blast monitoring.

As results are collected from the blast monitoring program their interpretation is to be used to modify as necessary the detailed design of future blasts.

A combination of blast monitoring instrumentations will be used at fixed and temporary locations to record air-blast overpressure (dB(L)) and peak particle velocity (ppv) in a radial, vertical and transverse direction (mm/s), i.e. ground vibration. Instrumentation specifications and monitoring procedures are to be conducted in accordance with Australian Standard 2187.2 guidelines.

Calibrated monitors will be used for blast monitoring with calibrations conducted annually by an authorised laboratory. Copies of calibration certificates will be made available upon request. The date of last calibration is printed on each event report.

Portable and/or fixed fume monitoring stations will be utilised as required. The requirement and location of monitoring points will be determined as part of the pre-blast risk assessment.

A set of pre-determined monitoring sites will be established based upon the identified sensitive receptors. The provision of permanent monitoring stations will require consultation and agreement with the relevant landholders or asset owners.

The selection of monitoring sites will take into consideration the following:

- Representative of the dwelling / structure being monitored;
- Sources of potential interference (i.e. localised sources of vibration);
- Coupling of sensors (preference to utilise a buried concrete block in suitable ground conditions); and
- Secure location to minimise interference.

6.10.10 Geotechnical Assessment

It is not anticipated that there will be operational impacts to vehicles on the Bruce Highway due to geotechnical failures to the road infrastructure arising from the Project. The geotechnical assessment has shown that excavation of coal mining pits on either side of the highway is feasible without disruption to the highway.

Central Queensland Coal commits to undertaking additional geotechnical investigation within the first six months after the commencement of operations and further ongoing geotechnical assessments of the mining pit as it develops and approaches the 500 m blasting buffer zone. Requirements for additional investigation would be discussed and confirmed with DTMR and DES prior to proceeding.

6.11 Cumulative Traffic Impact Assessments

Growth rates obtained from historic data detailed within the AADT segment reports indicate that the Bruce Highway has experienced periods of negative growth for various road sections over the past five to ten years. This could be attributable to a slowdown in mining sector projects occurring within the region, and the conclusion of construction activities associated with large project development such as that at Curtis Island and Gladstone more generally. As such, a growth rate of 2% per annum (compound) has been adopted to inform the basis of future traffic forecasts, to reflect typical background traffic growth in the absence of major project development. This assumption is considered conservative and therefore appropriate for determining a worst-case scenario for the RIA.

A review of the DES and Coordinator-Generals project currently available online indicates that there are no major projects planned near the Project. Should any such projects become apparent in the future, these will be considered in the context of any future traffic impact assessments.

6.12 Impacts to the Rail Network and Port Facilities

The following Sections address submissions in respect of potential impacts to the existing Central Queensland Rail Network infrastructure between the Project and the Dalrymple Bay Coal Terminal DBCT. The potential impacts are considered in respect of the North Coast Line to Yukan and the Goonyella System Network from Yukan to the DBCT. This section addresses submissions in response to potential impacts to infrastructure.

Concerns have also been raised by nearby communities regarding the potential impact of coal dust emissions from coal trains associated with the Central Queensland Coal Project that will operate on the North Coast Line. Submissions relating to air quality are addressed in Chapter 12 – Air Quality.

6.12.1 Impacts to Existing Rail Services

Central Queensland Coal has been in discussions with QR for access capacity to its network (below rail) for the 148 km section of railway between the Central Queensland Coal train loading facility and Yukan and with Aurizon for access capacity for the 30 km section between Yukan to DBCT on the Aurizon network. Both QR and Aurizon have confirmed through the Indicative Access Proposal process that capacity is available for initial haulage tonnages.

Central Queensland Coal has undertaken modelling to assess the increases in volume within the QR and Aurizon network. Modelling based on a 1,034 m long train consist over 49 weeks, has identified

the following annualised number of trains per week would be added to the network without need for material optimisation of the existing network:

- 0.4 Mtpa: two per week;
- 1.6 Mtpa: eight per week; and
- 4 Mtpa: 20 per week.

As product output progresses to 5 Mtpa and then to 9.1 Mtpa product coal (forecast potential peak production) some modifications to the QR network by way of longer passing loops in particular locations and some track strengthening / conditioning work in the Yukan station yard in the Aurizon network will be necessary to cater for the increased rail tonnages (and number of trains). Central Queensland Coal will continue to work with QR and Aurizon regarding ongoing optimisation opportunities through the life of the mine.

Central Queensland Coal has consulted with both Aurizon and Pacific National (PN) for the above rail haulage services. Both rail operators have expressed a keen interest in undertaking this rail haulage and have confirmed crews and train rollingstock would be available and with the proper accreditation to complete the haulage task. Central Queensland Coal has also been in discussion with rail wagon manufacturers to design and manufacture special purpose rail wagons to increase haulage efficiencies as the required rail haulage volumes increase.

6.12.2 Impacts to Ballast Function from Lost Coal

The North Coast Line to Yukan and the Goonyella System Network from Yukan to the DBCT are managed by QR and Aurizon respectively. Both stakeholders have current processes and practices for the management of rail ballast.

Rail ballast consists of crushed granular rock, used to form a resilient bed beneath the sleepers. It is an essential structural component of the track as it transfers the forces of the train through the sub-ballast and formation.

The major function of ballast is to:

- resist vertical, lateral and longitudinal forces applied to the sleepers to retain the track in its required position;
- provide some of the resiliency and energy absorption for the track;
- facilitates maintenance surfacing and lining operations by the ability to rearrange ballast particles by tamping operations; and
- provide immediate drainage of water falling onto the track (Aurizon, 2014).

Rail ballast performs best when the ballast bed is free of fine fouling material as the voids allow the free flow of water as well as the movement of the ballast structure as it cushions the weight of the loaded train. Over time, fouling material such as lost coal, will fill the void spaces. Coal spilled or blown from wagons hastens the rate of ballast fouling, with the principal degradation mechanism being the loss of voids and consequently poor drainage (Aurizon, 2014). As the fine material in the ballast becomes saturated, the fouling material will act as a lubricating agent, leading to a decrease in track support and geometry. Fouling material in the void spaces also reduces the elasticity of the ballast which can cause damage to sleepers, fastenings and rollingstock as forces are reflected through the track structure (Aurizon, 2014).

Studies by Aurizon Network and Connell Hatch concluded that coal loss can be emitted from the following sources in the rail system:

- Wagon Surface: coal surface of loaded wagons;
- Door Leakage: coal leakage from doors of loaded wagons;
- Spilled coal in the corridor: wind erosion of spilled coal in corridor;
- Residual Coal: "carry back coal" in unloaded wagons and leakage of residual coal from doors; and
- Parasitic Coal: parasitic load on sills, shear plates and bogies of wagons due to poor loading practice (Connell Hatch, 2008).

To reduce the potential for ballast fouling there are good management practices already in place within the coal industry. Aurizon and QR have maintenance programs in place to minimise the impacts associated with ballast fouling. Central Queensland Coal commits to working with Aurizon and QR to implement consistent practices aimed at minimising the potential for rail ballast fouling associated with lost coal.

Dust suppression measures specific to the haulage of coal will be consistent with Aurizon's 2010 Coal Dust Management Plan (CDMP). The CDMP was prepared by QR Network on behalf of QR Limited and the Central Queensland coal supply chain in response to community concerns regarding dust from coal trains, specifically in the Central Queensland coal Goonyella, Blackwater and Moura rail systems connecting the Ports of Gladstone and Hay Point. The Project will utilise the North Coast Rail line and then a short section of the Goonyella rail corridor to the Dalrymple Bay Coal Terminal at Hay Point.

The CDMP is a voluntary guideline which outlines a range of actions and strategies available across the Central Queensland coal supply chain to address coal dust – specifically at load-out facilities, which coal train operators, rail network managers and at coal terminals and provides an overview of how participants can seek to mitigate coal dust depending on the extent of nuisance caused.

Mitigation measures proposed in the CDMP that are for consideration by the coal producer sector and which will be implemented by Central Queensland Coal are:

- Application of a veneer suppressant to the surface of loaded coal wagons (See Section 6.12.3);
- Train wagon loading practices and profiling such that effectiveness of veneering is improved, and the amount of parasitic coal that drops off during transit is reduced;
- Coal type testing for dustiness;
- Consideration of the design and operation of mine load-out infrastructure;
- Implementation of a coal moisture regulating system;
- Sill brushes used to remove excess coal on wagon sills;
- Conducting internal communication to ensure that all staff understand that coal rail dust mitigation is an integrated system that requires all parts of the stockpiling and out-loading system and staff to work together in a coordinated manner; and
- Batch weighing systems to accurately control the quantity of coal loaded into each coal wagon.

6.12.3 Coal Wagon Veneering

Central Queensland Coal commits to veneering of product coal in wagons prior to leaving the Central Queensland Coal TLF. Veneering involves the application of a water-based solution to the surface layer of coal on each wagon. Studies undertaken as part of developing the Aurizon Coal Dust Management Plan 2010 (see Connell Hatch, 2008) have shown veneering processes to be effective in reducing the levels of dust generated from coal train movements. Central Queensland Coal will continue to consult with QR and Aurizon in respect of implementing appropriate coal surface moisture content prior to loading trains to ensure effective application of veneering chemicals. Coal dust assessment and mitigation are discussed in more detail in Chapter 12 – Air Quality.

6.12.4 Impacts to DBCT Operations

Central Queensland Coal has been in discussions with DBCT management for access to the DBCT and have received confirmation through the Access Seeker process that the initial requests for access capacity can be met in full. This access approval is being achieved through the current nameplate capacity of 85 Mtpa. DBCT's throughput has been historically under the approved terminal capacity of 85 Mtpa (refer to Figure 6-15) and thus DBCT is able to take advantage of demand increases. Consequently, no additional infrastructure development or permits / approvals are necessary.

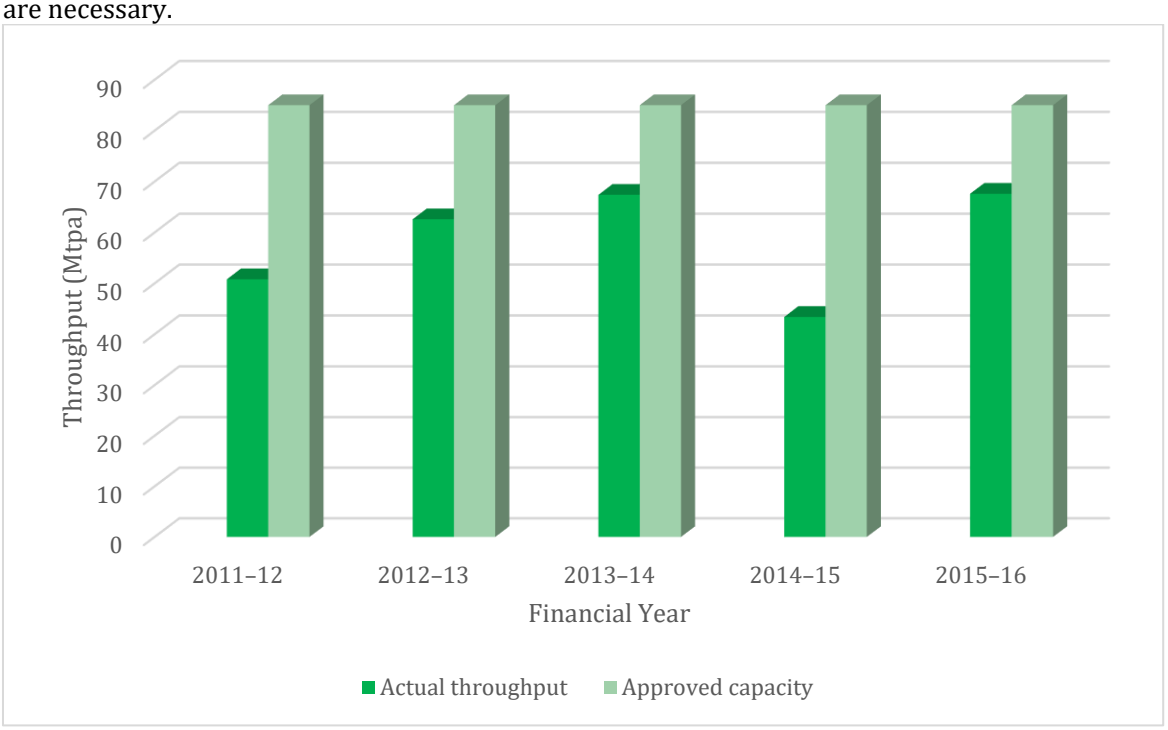


Figure 6-15 DBCT's actual throughput and approved capacity from 2011 to 2016

As mine production increases, Central Queensland Coal expects to be able to secure the required increase in port capacity by taking up existing capacity as it becomes available from other coal producers or in the worst case, secure capacity through DBCT expansions outlined in the DBCT Management – Master Plan 2016 (the Master Plan).

The Master Plan outlines an incremental expansion pathway for DBCT to ensure the terminal has the capacity to support the increases in coal demand (DBCTM 2016). The expansion pathway includes three stages (referred to as Zone 4, 8X and 9X) that will see the terminal throughput increase from 85 Mtpa up to 136 Mtpa should the demand for coal continue to rise. The Port also has approval for capital / maintenance dredging to ensure ships are not departing the Port short-loaded due to draught depth restrictions and the Port exports coal efficiently. Despite the proposed

increases in throughput, increased dredging has not been identified as a requirement to support these increases.

The expansion pathway as outlined in the Master Plan and the capital / maintenance dredging program have been developed to meet legislative requirements and environmental management guidelines / plans. This has been at the forefront of Port operations and development given the proximity of the Port to the Great Barrier Reef. These requirements and guidelines / plans include:

- The *Sustainable Ports Development Act 2015* - developed in response to UNESCO's position on the protection of the Great Barrier Reef. Focuses on future development of existing export coal facilities;
- The North Queensland Bulk Ports Sustainability Plan 2015+ - set a benchmark for whole-of-business sustainability planning in the Australia Port industry;
- The Reef 2050 Long-term Sustainability Plan – provides an overarching strategy for managing the Great Barrier Reef. North Queensland Bulk Ports was proactively involved in the development of this plan; and
- The Port of Hay Point Environmental Management Plan – outlines the environmental management practices and controls required by NQBP for current and potential users of the Port of Hay Point.

Given the above, it is confirmed that DBCT can support the Project through the unutilised port capacity, future capacity would also be available if needed through the expansion pathway as outlined in the Plan. The current maintenance dredging program will also be sufficient to support the Project's shipping requirements.

6.13 Qualitative Risk Assessment

Potential impacts and risks to the surrounding environment from traffic and transport related activities have been further assessed utilising the risk assessment framework outlined in Chapter 1 - Introduction as a basis.

For the purposes of risk associated with traffic and transport, risk levels are defined as follows:

- Extreme – Works must not proceed until suitable mitigation measures have been adopted to minimise the risk;
- High – Works will not proceed until suitable mitigation measures have been adopted to minimise the risk;
- Medium – Acceptable with formal review. Documented action plan to manage risk is required; and
- Low – Acceptable with review.

A qualitative risk assessment that outlines the potential impacts, the initial risk, control measures and the residual risk following the implementation of the control measures detailed in the previous sections is shown in Table 6-16. Risks represent pre-mitigated (potential) and post-mitigated (residual) risk levels. Further management and monitoring measures are identified in Section 6.910.

Table 6-16 Qualitative risk assessment

Issue and associated Project phase	Potential impacts	Potential risk	Mitigation measures	Residual risk
Impacts on school bus routes (Construction and Operation)	The Project is predicted to have negligible impacts on public and school bus transport activity. There are no known school bus routes which utilise the Bruce Highway proximate to the site access, which could therefore be directly impacted by works associated with construction of the access intersections or vehicles accessing the site. Potential impacts to the operation of school bus services relate to road safety and the interruption of services due to increased traffic and heavy vehicles.	Medium	A RMP will be produced and adopted. The Plan will include a specific section on managing any potential impacts to the school bus system. Mitigation measures include: ▪ Communities and schools will be notified of any changes to the road network; ▪ Operation of a shuttle bus for the Project workforce, to reduce Project traffic; ▪ Implementation of a ridesharing scheme to reduce Project traffic; ▪ Adjusting shift times and heavy vehicle movements scheduling such that Project traffic peaks do not coincide with the network peak periods; and ▪ Policies focussing on driver behaviour and fatigue management.	**Low**

Issue and associated Project phase	Potential impacts	Potential risk	Mitigation measures	Residual risk
Traffic Collision with Injury or Property Damage (Construction and Operation)	Increased traffic has the potential to result in traffic accidents. The expected increase in traffic volume may result in additional accidents. Workers suffering from driver fatigue who are operating a vehicle on the surrounding roads have the potential to be involved in traffic incidents. Impacts can range from property damage to serious injury and fatality putting the safety of other road users in jeopardy.	Medium	A RMP will be produced and adopted. Operators will be licensed and trained appropriately. Any construction and maintenance road works will be undertaken by suitably qualified contractors and with the appropriate approvals in place. Central Queensland Coal will work with DTMR should any works be required. Site speed limits will be enforced. Other mitigation measures to reduce the accident rate and severity may include: ▪ Compliance Guidelines for Driver fatigue management will be incorporated into the Safety and Health Management System; ▪ Driver education (local townships and mine staff) e.g. driver safety awareness, and not driving through flood waters; ▪ The haul road and mine area will be securely fenced so that farming and mining operations will be safely separated; and ▪ Buses will be provided to move the workforce around the Project area where appropriate.	**Low**
Impacts Associated with Traffic Delays (Construction and Operation)	It is not anticipated that the Project will result in significant traffic delays because of construction and operation. Short term delays will be associated with the construction of the Project and upgrading of the road network. These delays are short and will improve the safety of the roads.	Low	Operators will be licensed and trained appropriately. Any construction and maintenance road works will be undertaken by suitably qualified contractors with the appropriate approvals in place. Central Queensland Coal will work with DTMR should any works be required to ensure planning which avoids unnecessary traffic delays. Speed controls will be enforced on site.	Low

Issue and associated Project phase	Potential impacts	Potential risk	Mitigation measures	Residual risk
Impacts Associated with the Transportation of Hazardous and Dangerous Goods (Construction and Operation)	Road transport with be the primary mode for the movement of hazardous and dangerous goods to and from the Project. The transportation of hazardous and dangerous goods has the potential to increase the incidence of spills, fires or explosions. Refer to Chapter 20 – Health and Safety and Chapter 21 – Hazard and Risk, for further information.	Medium	Hazardous materials will be managed in accordance with relevant Australian Standards. Transport activities will comply with requirement of the Australian Dangerous Goods Code. Operators will be licensed and trained appropriately. Speed controls will be enforced on site. This is discussed further in Chapter 20 – Health and Safety and Chapter 21 – Hazard and Risk.	Low
Impacts to Intersection (Construction and Operation)	The Bruce Highway access points to the site requires CHR and short AUL turn treatments (refer Section 6.7.2).	Medium	Central Queensland Coal will work with DTMR if any upgrading of the Bruce Highway associated with the Project access road works. The access road intersection will be further assessed as part of the detailed design stage. Intersections will be examined regularly to ensure any deterioration does not cause intersection failure.	Low
Pavement Impacts (Construction and Operation)	Analysis of potential pavement impacts predict impacts of less than 5% on the Bruce Highway for the entirety of the Project operation.	Low	Pavement will be examined regularly to ensure any deterioration does not cause intersection failure. Where deemed necessary, Central Queensland Coal will work with DTMR if any pavement upgrades to the surrounding road network are required.	Low
Impacts to Landholder Access (Construction and Operation)	The haul road crosses a single rural property (Strathmuir). This property is a cattle farm. This has the potential to cause access problems with the potential to cause collision with cattle, farm machinery and people.	Medium	The proponent will maintain access to Strathmuir after the haul road is fenced. Options will be considered during the detailed project design for dedicated gates or box culverts. If gates are provided for local property access, advanced warning signage will be established. Any possible movements of cattle, farm machinery and people will occur via advance notice and real time positive radio communication between the Landholder and the Mine Operations personnel. An open line of communication between mine operators and farm owners will be maintained.	Low

Issue and associated Project phase	Potential impacts	Potential risk	Mitigation measures	Residual risk
Dust Deposition because of Rail Haulage (Operation)	Primary coal dust emission sources during the haulage includes: ▪ Coal dust wind erosion from loaded wagons in transit; ▪ Coal dust leakage from loaded wagons; and ▪ Coal dust wind erosion from spilled coal. Dust can lead to potential effects on plant function and impacts to human health. Impacts from coal dust generated during rail haulage is expected to be minimal. Impacts of dust are further discussed in Chapter 12 – Air Quality.	Low	Coal dust during haulage will be controlled through a number of measures, including: ▪ Compliance with Aurizon's Coal Dust Management Plan; ▪ Improved loading practices; ▪ Coal veneering; and ▪ Monitor coal dust, where possible. The proponent will implement the QR Network Coal Dust Management Plan (Aurizon 2010) requirements at the TLF, including the use of load profiling and coal wagon veneering load profiling, coal wagon veneering systems and associated support systems.	Low

6.14 Traffic Impact Assessment Conclusion

Based on the TIA and discussions presented within this report, the following conclusions are made with respect to road transport:

- Worst case traffic demands for the Project are expected to occur in:
  - 2020 (Project Year 2): Peak of construction phase
  - 2028 (Project Year 10): Construction of western MIA and operation of eastern MIA
  - 2030 (Project Year 12): Peak of operational phase
  - 2038 (Project Year 20): Decommissioning / rehabilitation and 20-year design horizon.
- A total of six road links on the Bruce Highway are expected to have Project traffic volumes which have greater than 5% of baseline traffic volumes. Road link 150 m North Terra Nova Drive is expected is operate marginally over theoretical capacity as a result of Project generated; however, the operational capacity of this road link is expected to be higher as overtaking lanes are present at this road link. Nonetheless, transport management strategies to reduce Project traffic will continue to be developed as the draft RMP is finalised, thereby mitigating potential impacts on this road link;
- A turn warrant assessment indicates that the proposed site accesses will provide AUL and CHR turn treatments, for both the eastern and western access points. These treatments will be incorporated into the access arrangements as designs are further finalised;
- Based on the calculated development ESAs, pavement impacts of greater than 5% have not been identified for any section of the Bruce Highway;
- Based on the Road Safety Risk Assessment all identified risks associated with the Project are expected to be within a medium level. It should also be noted that the assessment undertaken within this RIA is of a conservative nature based on the following:
  - Although origin / destination movements have been disaggregated into 'local', 'regional', and 'state', the RIA has assumed that these movements will impact haul roads (i.e. the Bruce Highway) for all sections between Mackay and Rockhampton. Though unlikely to occur (as local destinations will have a more localised impact)
  - A conservative growth rate of 2% per annum (linear) has been adopted despite AADT reports indicating negative growth for various sections the Bruce Highway over the past five to 10 years
  - Adopting lower vehicle occupancy rates compared to other RIA's conducted for EIS projects of a similar nature therefore resulting in higher Project generated traffic
  - Assuming heavy vehicle traffic generation to be ten vehicle movements per hour for a conservative approach, as the actual Project generated heavy vehicle movements result in less than three vehicle movements per hour.

No adverse impacts are expected to the existing rail network. Central Queensland Coal will continue to work with Aurizon and QR to ensure appropriate management regimes are established prior to the commencement of operations.

No impacts are expected in respect of the DBCT operations as the tonnages proposed by the Project are within the existing approvals for the port. No impacts are expected at regional airports as the Project will not be using a FIFO workforce.

6.15 Commitments

Central Queensland Coal's commitments, in relation to traffic and transport are provided in Table 6-17.

Table 6-17 Commitments – traffic and transport

Commitments
Develop, in conjunction with relevant State and local road authorities, a RMP to be finalised prior to commencement of construction activities.
Work with DTMR during Project design for the east and west site access roads from the Bruce Highway.
Complete road safety audits as part of finalising the detailed design and approvals stages for the eastern and western mine site accesses with the Bruce Highway.
Implement a Safety and Health Management System that integrates risk management elements and practices to safety of workers, contractors and the community.
Report and investigate incidents and complaints in accordance with relevant traffic management legislation and guidance.
Assess the potential traffic impacts of surveying and constructing the proposed conveyor and incorporate road-use management strategies in the Traffic Management Plan as part of the detailed design phase for the mine infrastructure to be located on the western side of the Bruce Highway.
Implement the QR Network Coal Dust Management Plan (2010) requirements at the TLF, including the use of load profiling and coal wagon veneering load profiling, coal wagon veneering systems and associated support systems.
Investigate the Implementation of measures aimed at reducing Project traffic generation such as providing a shuttle service and ride sharing schemes as required, along with scheduling shift times and heavy vehicle movements such that Project traffic does not coincide with road network peak periods.
Liaise with local school and bus companies to manage heavy traffic schedules and peak traffic volumes outside of school bus timetables.
Establish a 500 m buffer area off the Bruce Highway to remain in place until a specific BMP is established and approved by DES and DTMR for the buffer area.
Develop and implement a specific BMP for the interim buffer area.
Undertaking additional geotechnical investigation within the first 6 months after the commencement of operations and further ongoing geotechnical assessments of the mining pit as it develops and approaches the 500 m blasting buffer zone

6.16 ToR Cross-reference Table

Table 6-18 ToR cross-reference

Terms of Reference	Section of the EIS
8.16 Transport	
The EIS should include a clear summary of the total transport task for the project, including workforce, inputs and outputs, during the construction and operational phases.	Section 6.6
Proponents should make appropriate choices for modes of transport to ensure efficiency and minimise impacts on the community.	Section 6.6
Undertake the impact assessment in accordance with the EHP's *EIS information guideline—Transport*. The methods used should include the following matters: ▪ for impacts on roads: a Road impact assessment (RIA) report in accordance with the *Guidelines for assessment of road impacts of development* (Department of Main Roads, 2006), with traffic data in Department of Transport and Main Roads (DTMR) suitable formats; and ▪ for impacts on rail level crossings: the *Australian Level Crossing Assessment Model* (ALCAM) (ALCAM 2016).	Sections 6.4.1 and 6.8.10

Terms of Reference	Section of the EIS
Present the transport assessment for each project-affected mode (road, rail, air and sea) as appropriate for each phase of the project.	Section 6.4 and 6.8
Provide sufficient information to allow an independent assessment of how existing transport infrastructure will be affected by project transport at the local and regional level (e.g. local roads and state-controlled roads).	Sections 6.5, 6.6 and 6.7
Discuss how identified impacts will be mitigated for each transport mode. Mitigation strategies may include works, contributions or other strategies that can be documented in a *Road-Use Management Plan* (RMP).	Section 6.10
The strategies should be prepared in close consultation with relevant transport authorities (including local government).	Section 6.10
Strategies should consider the transport authorities' works programs and forward planning, and be in accordance with the relevant methodologies, guidelines and design manuals.	Section 6.10