

Adani Mining Pty Ltd

NORTH GALILEE BASIN RAIL PROJECT

Environmental Impact Statement

Appendix K Transport

November 2013

This North Galilee Basin Rail Project transport existing environment report (“the Report”) has been prepared by GHD Pty Ltd (“GHD”) on behalf of and for Adani Mining Pty Ltd (“Adani”) in accordance with an agreement between GHD and Adani.

The Report may only be used and relied on by Adani for the purpose of informing environmental assessments and planning approvals for the proposed North Galilee Basin Rail Project (“The NGBR Project”) and may not be used by, or relied on by any person other than Adani.

The services undertaken by GHD in connection with preparing the Report were limited to those specifically detailed in Section 1.2 of the Report.

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Executive summary

This report presents the findings of a desktop review of the existing traffic conditions and transport infrastructure that are likely to be impacted by the Northern Galilee Basin Rail (NGBR Project). It includes consideration of the condition and capacity of the surrounding road network and, describes existing rail, air and sea transport infrastructure.

The NGBR Project final rail corridor will cross 23 public roads, stock routes and road reserves. This report has been prepared to assess key intersections and approach roads comprising State-controlled roads and local council roads which will facilitate access for construction and operation traffic to/from the final rail corridor (nominally 100 m wide), construction camp sites and ancillary facilities. The key State-controlled roads considered include:

- Bruce Highway
- Bowen Developmental Road
- Gregory Developmental Road
- Suttor Developmental Road.

The key local roads considered include:

- Glenore Road
- Stratford Road
- Strathalbyn Road
- Strathmore Road.

In order to understand the existing traffic volumes on selected key roads, 2012 Annual Average Daily Trips (AADT) data was sourced from Department of Transport and Main Roads (DTMR). A Level of Service (LOS) approach was then used to determine the existing performance of the key roads. The analysis showed that the existing key roads are operating at LOS B or better which indicates free and uninterrupted travelling conditions.

Bowen Developmental Road, Suttor Developmental Road and Gregory Developmental Road are approved heavy vehicle routes which are likely to be utilised by the NGBR Project to transport construction materials to and from the construction sites.

There is currently no pedestrian or cyclist infrastructure along the key roads. This is due to the rural setting and long distances from surrounding communities, the high speed environment of the road network (e.g. the Bruce Highway) and the low pedestrian and cyclist volumes. There is also a lack of public and private bus services within the study area.

The proposed NGBR Project will run along the western extent of the Newlands rail network primarily interacting with this rail service in the northern section of the NGBR Project in the vicinity of Abbot Point. There are no passenger rail services close to the study area.

There are seven airports located around the NGBR Project including one international airport and six regional airports. The international airport is Townsville Airport. The regional airports include Charters Towers Airport, Proserpine/Whitsunday Coast Airport, Mackay Airport, Moranbah Airport, Clermont Airport and Emerald Airport. The closest airports to the NGBR Project are Proserpine/Whitsunday Coast Airport and Moranbah Airport.

The existing bulk ports within the vicinity of the NGBR Project include:

- Port of Townsville
- Port of Mackay
- Port of Abbot Point
- Port of Hay Point (including Dalrymple Bay Coal Terminal and Hay Point Coal Terminal).

The Ports of Townsville and Abbot Point may provide facilities suitable for the import of construction materials, components and pre-assembled modules for construction of the NGBR Project.

No future transport infrastructure upgrades are planned which will have an impact on the NGBR Project with the exception of upgrading of the Bruce Highway and improvement works occurring on the Bowen Developmental Road.

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Terms and abbreviations

Terms and abbreviations	Definition
AADT	Annual Average Daily Traffic (expressed as number of vehicles)
Adani	Adani Mining Pty Ltd
DIDO	Drive-in-drive-out
DNRM	Department of Natural Resources and Mines
DTMR	Department of Transport and Main Roads
FIFO	Fly-in-fly-out
Final NGBR Project footprint	The final NGBR Project footprint will accommodate all rail infrastructure required for construction and operation, scalable to accommodate 100 mtpa product coal transport, including passing loops, a maintenance road, rolling stock maintenance (provisioning, fuel storage and refuelling, maintenance, etc.), water supply and pipeline, track and signalling maintenance facilities, staff crib, accommodation and training facilities and other necessary infrastructure associated with the operational functions of the NGBR Project.
Final rail corridor	The final rail corridor is a nominal 100 m wide corridor
GARID	Guidelines for Assessment of Road Impacts of Development
GHD	GHD Pty Ltd
IRC	Isaac Regional Council
LOS	Level of service
MIDQ	Minister of Industrial Development QLD
Mtpa	Million tonne per annum
NGBR Project	North Galilee Basin Rail Project
NQBP	North Queensland Bulk Ports Corporation Limited
Preliminary investigation corridor	The preliminary investigation corridor is a nominally 1,000 m wide corridor
SCR	State-controlled road
TOR	Terms of Reference

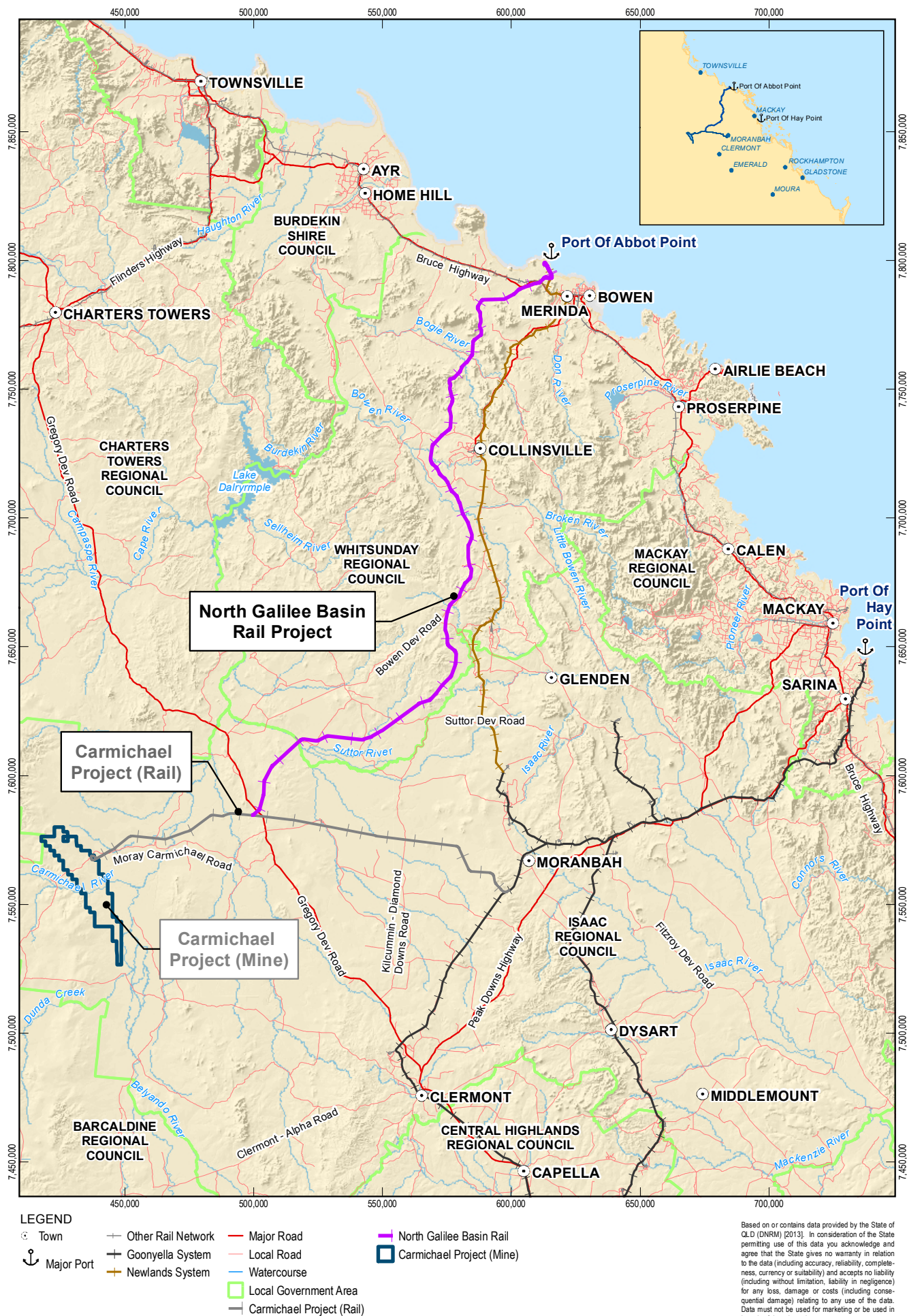
1. Introduction

1.1 Project overview

Adani Mining Pty Ltd (Adani) proposes the construction and operation of the North Galilee Basin Rail Project (the NGBR Project), a multiuser, standard gauge, greenfield rail line that will transport coal from mines in the northern Galilee Basin to the Port of Abbot Point. The NGBR Project is approximately 300 km in length and connects the proposed Carmichael Coal Mine and Rail Project's east-west rail corridor, approximately 70 km east of the proposed Carmichael Coal Mine in the vicinity of Mistake Creek, with supporting infrastructure at the Port of Abbot Point (refer Figure 1-1). The NGBR Project will have an operational capacity of up to 100 million tonnes per annum (mtpa) of coal product expected to be sourced from both Adani and third-party mines in the northern Galilee Basin. Key features of the NGBR Project include:

- Approximately 300 km of standard gauge, bi-directional rail track located within a nominal 100 m wide rail corridor (the final rail corridor)
- A rail maintenance access road running parallel to the rail track for approximately 300 km and wholly within the final rail corridor
- Seven passing loops, each 4.3 km in length
- Signalling infrastructure
- Approximately 4.5 km of fill greater than 15 m in depth (11 locations) and approximately 3.4 km of cut greater than 15 m in depth (nine locations)
- At-grade and grade-separated road, rail, stock and occupational crossings
- Bridge and culvert structures at major waterways and drainage lines, and various other longitudinal and cross drainage structures
- A rolling stock maintenance facility near the Port of Abbot Point including provisioning line, train maintenance line, wagon and locomotive service sheds, wash bay and queuing line
- Five temporary accommodation camps for construction workers
- A temporary construction depot at the southern end of NGBR Project
- Temporary construction yards, concrete batching plants, bridge and track laydown areas and heavy vehicle turning circles.

During construction, quarries and borrow pits within acceptable haulage distances will be required to provide a cost effective source of fill, gravel, aggregate and ballast. The number and location of borrow pits and quarries will be investigated further during detailed design and each may require screening and crushing plants to process material.



Based on or contains data provided by the State of QLD (DNRM) (2013). In consideration of the State permitting use of this data you acknowledge and agree that the State gives no warranty in relation to the data (including accuracy, reliability, completeness, currency or suitability) and accepts no liability (including without limitation, liability in negligence) for any loss, damage or costs (including consequential damage) relating to any use of the data. Data must not be used for marketing or be used in breach of the privacy laws.

1:2,000,000 (at A4)
0 10 20 30 40 50
Kilometres
Map Projection: Universal Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia (GDA)
Grid: Map Grid of Australia 1994, Zone 55



adani

Adani Mining Pty Ltd
North Galilee Basin Rail Project

Job Number 41-26457
Revision B
Date 29 Aug 2013

Project location

Figure 1-1

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Level 9, 145 Ann St Brisbane QLD 4000 T +61 7 3316 3000 F +61 7 3316 3333 E bne@mail@ghd.com W www.ghd.com

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Data Sources: © Commonwealth of Australia (Geoscience Australia); Town, Railways, Watercourses: (2007); DNRM: LGA, (2011); Hillshade (2009); DMR: State Roads (2008); DME: EPC1690 (2010), EPC1080 (2011); Adani: Alignment Opt9 Rev3 (2012), NGBR: Alignment Opt6 Rev 2 (2013).

1.2 Scope of report

This transport report has been prepared to support the Environmental Impact Statement for the NGBR Project. This report provides an overview of the existing traffic conditions and transport infrastructure that have the potential to be impacted by the NGBR Project. It includes consideration of the condition and capacity of the surrounding road network and describes the existing rail, air and sea transport infrastructure. Particular attention is given to the existing vehicular volumes and the performance of selected key intersections and roads. A review has been conducted on the existing traffic and transport for the following eight key intersections and approach roads comprising State-controlled roads (SCR) and local council roads that will facilitate access for construction and operation traffic to and from the final rail corridor (nominally 100 m wide), construction camp sites and ancillary facilities:

Key intersections

- Bruce Highway/New Access Road (near chainage 14 km) - provides access to/from construction camp 1 located at chainage 15 km
- Glenore Road/New Access Road (near chainage 34 km) - provides access to/from the bridge laydown area
- Strathalbyn Road/New Access Road (near NGBR chainage 62 km) - provides access to/from construction camp 2 located at chainage 62 km
- Bowen Developmental Road/New Access Road (near chainage 120 km) - provides access to/from construction camp 3 located at chainage 124 km
- Bowen Developmental Road/New Access Road (near chainage 170 km) - provides access to/from construction camp 4 located at chainage 170 km
- Suttor Developmental Road/Stratford Road (near chainage 230 km) - provides access to/from bridge laydown area
- Stratford Road/New Access Road (near chainage 262 km) - provides access to/from construction camp 5 located at chainage 263 km
- Gregory Developmental Road/New Access Road (near chainage 305 km) - provides access to/from the flashbutt welder, ballast stockpile, and bridge laydown area

Key State-controlled roads

- Bruce Highway
- Bowen Developmental Road
- Suttor Developmental Road
- Gregory Developmental Road

Key local Council roads

- Glenore Road
- Stratford Road
- Strathalbyn Road
- Strathmore Road.

This report has been prepared with consideration of the *Guidelines for Assessment of Road Impacts of Development* (GARID), Department of Transport and Main Roads (DTMR), 2006, as

well as the Terms of Reference (TOR) for the NGBR Project. A table that cross-references the contents of this report and the TOR is included as Volume 2 Appendix A2 TOR cross reference.

Planned and future transport infrastructure upgrades which may impact the surrounding transport network in the study area are also identified.

2. Methodology

2.1 Study area

The study area is defined by the NGBR Project preliminary investigation corridor (nominally 1,000 m wide) and the immediate surrounding road network which will be utilised by construction and operation traffic to access the corridor, camp sites and ancillary infrastructure facilities.

2.2 Data sources

The data sources relied on for this report are outlined in Table 2-1.

Table 2-1 Data sources

Description	Source
Physical road network	Department of Natural Resources and Mines
Heavy vehicle network	Queensland Government - Approved routes for higher mass limits for vehicles with road friendly suspensions 2009
Railway facilities	Geosciences Australia
Air transport facilities	Geosciences Australia
Sea transport facilities	Geosciences Australia
Planned and future transport infrastructure	Queensland Transport and Roads Investment Program 2013-14 to 2016-17
Vehicular demand data	Department of Transport and Main Roads
Accident data	Department of Transport and Main Roads

2.3 Legislative and guidelines

This transport assessment has been conducted according to the *Guidelines for the Assessment of Road Impacts of Developments* (GARID), published by the Department of Transport and Main Roads (DTMR), 2006. GARID states that DTMR will not approve development unless any road impacts of the development can be managed to maintain a safe and efficient road system for all road users, as required by the *Transport Infrastructure Act 1994*. This approach is supported by the legislative powers of both the *Sustainable Planning Act 2009* and the *State Development and Public Works Organisation Act 1971* which enable DTMR to impose conditions to mitigate the road impacts of proposed developments as part of the development planning process. Other guidelines that were considered included:

- Austroad Guide to Traffic Engineering Practice - Part 2: Roadway Capacity
- DTMR's Road Planning and Design Manual 2nd edition 2013
- DTMR Queensland Road Safety Action Plan 2013 - 2015

2.4 Desktop assessment

A desktop assessment was undertaken for this report, which involved the following tasks for the relevant transport components:

- Road transport – the identification and review of the road transport network including:
 - Existing roads, key roads and key intersections
 - Existing heavy vehicle network
 - Existing public transport network
 - Existing active transport network
- Rail transport – the identification and review of the existing freight and passenger rail facilities in the region
- Air transport – the identification and review of the existing air transport facilities likely to support the NGBR Project (airports)
- Sea transport – the identification and review of existing sea transport facilities likely to support the NGBR Project (sea ports).

In addition, the assessment also involved the following:

- Identification and review of existing vehicular demand and percentage of heavy vehicles on the key roads and intersections
- Determination of the existing road link capacity for the impacted roads
- Identification and review of historical accident statistics proximate the key intersections
- Identification of any planned and future transport infrastructure upgrades which may impact the network performance in the study area.

2.5 Road link performance criteria

The approach roads that would provide access to the NGBR Project final rail corridor, camp sites and ancillary infrastructure during construction and operation have been selected as key roads for this assessment.

A Level of Service (LOS) approach has been undertaken to determine the performance of selected key roads with reference to Austroad Guide to Traffic Engineering Practice – Part 2: Roadway Capacity. The Austroad guideline defines LOS as a qualitative measure describing operations within a traffic stream. The LOS categories and associated characteristics for rural roads are defined in Table 2-2. All roads within the study area are considered rural roads.

Table 2-2 LOS for rural roads

LOS	Description	Performance
A	Free, unrestricted flow	Very good
B	Mostly free flow, few disruptions	Very good
C	Stable flow	Good
D	Mostly stable flow, some delays	Acceptable
E	Congested flow, delays common	Poor
F	Forced flow	Poor

Source: Austroad Guide to Traffic Engineering Practice Part 2: Roadway Capacity

In general, the road terrain is assumed to be level and the design hour volume to Annual Average Daily Traffic (AADT) ratio is 0.13 for all key road sections. A value of 0.13 was selected as it falls within the middle of the Austroads *Guide to Road Design* recommended range of 11 per cent to 16 per cent for rural situations where peak hour volumes or peak hour percentages are not available

Table 2-3 shows the values for various LOS categories for a rural road in level terrain, with varying ratios of design hour volume to AADT. For the purpose of the assessment, a practical capacity of 10,400 vehicles per day has been assumed as a threshold capacity limit (at LOS D) for two-lane rural road. As per the Austroad guideline, LOS D is considered acceptable as it is an indication of generally stable flows with some delays. Remedial measures would be required for road links operating at LOS E or worse.

Table 2-3 Maximum AADTs for various LOS on rural roads on level terrain

Design hour volume to AADT ratio	Level of service (vehicles per day)				
	A	B	C	D	E
0.10	2,400	4,800	7,900	13,500	22,900
0.11	2,200	4,400	7,200	12,200	20,800
0.12	2,000	4,000	6,600	11,200	19,000
0.13	1,900	3,700	6,100	10,400	17,600
0.14	1,700	3,400	5,700	9,600	16,300
0.15	1,600	3,200	5,300	9,000	15,200

Source: Austroad Guide to Traffic Engineering Practice, Part 2: Roadway Capacity, Table 3.9, from TRB Highway Capacity Manual (1985) Table 8.10

2.6 Accident analysis

A high level desktop accident analysis was carried out for the selected key intersections and road sections to identify existing traffic safety issues. DTMR provided relevant regional crash data for the following time period:

- Fatal crashes to 31 May 2013 and hospitalisation crashes to 28 February 2013
- Medical treatment, minor injury and property damage crashes to 31 December 2010.

The full set of crash data was not available for 2011 to 2013 therefore accident data for the five years between 2006 and 2010 was used for the purpose of this study.

2.7 Limitations

The assessment conducted for this report has been desktop only and site investigations have not been conducted to verify desktop information. The assessment is based on information provided by Adani including information contained in the North Galilee Basin Concept Design Report (Aarvee Associates 2013).

3. Existing environment

3.1 Road transport network

Construction and operation of the NGBR Project will require use of the surrounding road network for the movement of construction materials, plant and equipment, workers, supervisory personnel, and additional supporting infrastructure. The classification of roads can be used as an indication of the functional role each road plays within a region. Roads of state or regional significance fall under the jurisdiction of DTMR and are considered SCRs. SCRs have four administrative classifications as follows:

- National Highway
- State Strategic Road
- Regional Road
- District Road.

Local councils have jurisdiction over local roads which play a functional role in local traffic movements.

3.1.1 Roads and stock routes intersected by the NGBR Project

The NGBR Project final rail corridor will intersect a number of occupational (private farms) trails, public roads and stock routes.

Public roads, stock routes and road reserves

The NGBR Project final rail corridor will cross 23 public roads, stock routes and road reserves. Details of the identified public roads, stock routes and road reserves are listed in Table 3-1.

Table 3-1 Public road, stock route and road reserve crossings

Crossing	Chainage	Treatment proposed	Property owner
Abbot Point Road	-5.25 km	Road Under Rail	Privately owned by North Queensland Bulk Ports (NQBP) passing through MIDQ property.
Abbot Point Road	-6.70 km	Road Under Rail	Privately owned by NQBP passing through MIDQ property.
Abbot Point Road	6.11 km	At-grade	DTMR SCR passing through Minister of Industrial Development QLD (MIDQ) property.
Bruce Highway	12.27 km	Road Under Rail	DTMR SCR passing through MIDQ property.
Glenore Road	34.05 km	At-grade	Whitsunday Regional Council (WRC) road passing through Salisbury Plains property.
Road / Stock Crossing (gazetted stock)	57.34 km	At-grade	Department of Natural Resources and Mining (DNRM) have governance over the easements which form part of the National

Crossing	Chainage	Treatment proposed	Property owner
route U398BOWN05)			Stock Route Network. WRC road passing through Eton Vale property.
Strathalbyn Road	61.58 km	At-grade	WRC road passing through Eton Vale property.
Stock Crossing (gazetted stock route U398BOWN04)	62.77 km	At-grade	DNRM have governance over the easements which form part of the National Stock Route Network. This stock route passing adjacent to Eton Vale and Glen Alpine properties.
Road / Stock Crossing (gazetted stock route U398BOWN04)	79.55 km	At-grade	DNRM have governance over the easements which form part of the National Stock Route Network. WRC road passing adjacent to Tabletop and Bakara properties.
Road reserve (not constructed)	83.70 km	Close	WRC road passing through Bakara property.
Strathmore Road & Stock Crossing (gazetted stock route U321BOWN01)	97.89 km	At-grade	DNRM have governance over the easements which form part of the National Stock Route Network. WRC road passing through Strathmore property.
Road reserve (not constructed)	117.11 km	Close	WRC road passing through Birralelee property.
Road Crossing (Minor Road)	120.46 km	At-grade	WRC road passing through Birralelee property.
Stock Crossing (gazetted stock route U409BOWN02)	133.32 km	At-grade	DNRM have governance over the easements which form part of the National Stock Route Network.
Road reserve (not constructed)	139.27 km	Close	WRC road passing through Havilah property.
Road Crossing (Minor Road)	153.92 km	Road Under Rail	WRC road passing through Fig Tree property.
Bowen Developmental road	173.20 km	Road Over Rail	DTMR SCR passing through Cerito Property. A road diversion is proposed to maintain or improve horizontal geometry and to mitigate any resultant skew angle on the proposed bridge structure.

Crossing	Chainage	Treatment proposed	Property owner
Cerito Road (Minor Road)	177.82 km	Close	WRC road passing through Cerito property.
Cerito Road (Minor Road)	180.25 km	At-grade	WRC road passing through Cerito property.
Stock Crossing (gazetted stock route U403BOWN02)	186.37 km	At-grade	DNRM has governance over the easements which form part of the National Stock Route Network
Road reserve (not constructed)	205.84 km	Close	WRC road passing through Terang property.
Suttor Developmental Road	231.27 km	At-grade	DTMR SCR passing adjacent to Gleneva and Chesterfield properties. A road diversion is proposed to maintain or improve horizontal geometry and to mitigate any resultant skew angle on the proposed bridge structure.
Kilcummin Diamond Downs Road	244.68 km	At-grade	WRC road passing through Glen Avon Property.
Stratford Road	262.95 km	At-grade	Isaac Regional Council (IRC) road passing through Stratford Property.
Stock Crossing (gazetted stock route U402BOWN01)	269.63 km	At-grade	DNRM has governance over the easements which form part of the National Stock Route Network
Gregory Developmental Road	303.79 km	Road Over Rail	DTMR SCR passing through Disney and Twin Hills properties

Occupational (private farm) trails

There are total of 54 occupational trails that will be intersected by the NGBR Project final rail corridor. Details of the intersected occupational trails are listed in Table 3-2.

Table 3-2 Occupational (private farm) trail crossings

No	Chainage	Treatment proposed	Lot plan	Property name
1	10.85	Underpass	1RP705785	Unnamed
2	18.55	At-grade	3HR1686	Unnamed
3	20.59	Underpass	24RP805036	Salisbury Plains
4	26.69	At-grade		
5	36.53	At-grade	4SB687	Nevada

No	Chainage	Treatment proposed	Lot plan	Property name
6	37.73	At-grade		
7	42.42	Underpass		
8	43.63	Underpass	SB279	Thurso
9	48.58	At-grade	3SB514	White Kangaroo
10	52.65	Underpass		
11	58.80	Underpass	13SP232519	Eton Vale
12	67.32	At-grade	5047PH370	Glen Alpine
13	72.09	At-grade		
14	83.55	Underpass	86DK154	Bakara
15	84.84	At-grade		
16	91.35	Underpass	3SP132678	Strathmore
17	105.70	At-grade		
18	109.56	At-grade	9DK17	Myuna
19	114.48	At-grade		
20	115.25	At-grade	618PH2106	Birrlee
21	119.50	Underpass		
22	125.41	At-grade		
23	126.83	At-grade		
24	131.75	Underpass		
25	140.35	At-grade	62SP195387	Havilah
26	142.07	At-grade		
27	151.90	Underpass	4SP171921	Fig Tree
28	157.05	Underpass		
29	169.90	Underpass	510SP171920	Cerito
30	184.35	Underpass		
31	186.60	Underpass		
32	187.95	At-grade	667PH1321	Mount Lookout Holdings
33	193.45	At-grade		
34	200.27	Underpass		
35	211.65	At-grade	1DK244	Terang
36	215.58	At-grade		
37	219.54	At-grade		
38	222.50	At-grade		

No	Chainage	Treatment proposed	Lot plan	Property name
39	224.95	At-grade		
40	229.40	At-grade	1943SP221555	Verbena
41	230.24	At-grade		
42	232.15	At-grade	1DK150	Chesterfield
43	234.95	At-grade	3DC91	Cantaur Park
44	241.95	At-grade		
45	250.05	At-grade	3821PH1304	Stratford
46	253.98	At-grade		
47	266.62	At-grade		
48	273.0	At-grade		
49	274.05	At-grade	10BL49	Avon Downs
50	283.37	At-grade		
51	289.08	At-grade	4SP116046	Disney
52	295.51	Underpass		
53	298.97	At-grade		
54	302.92	At-grade		

3.1.2 Key State-controlled roads and local roads

The following SCRs and local roads are considered relevant to the NGBR Project as they form the key road network that will be utilised by construction and operation traffic to access the final rail corridor, camp sites and ancillary facilities:

State-controlled roads

- Bruce Highway
- Bowen Developmental road
- Gregory Developmental Road
- Suttor Developmental Road.

Local Roads

- Glenore Road
- Stratford Road
- Strathalbyn Road
- Strathmore Road.

Bruce Highway

The Bruce Highway is the main north-south coastal road connecting Brisbane in the south to Cairns in the north. As part of the National Network, the highway is of a strategic national

importance and receives funding from Federal and State/Territory governments. Its length is approximately 1,700 kilometres. Several major cities along the route include Maryborough, Rockhampton, Mackay, Townsville, and Cairns.

In the vicinity of the NGBR Project (Northern portion), the Bruce Highway is a two-lane highway.

Bowen Developmental road

Bowen Developmental Road is a district road under the jurisdiction of the DTMR. It intersects with the Bruce Highway at a T-intersection in the township of Bowen and then proceeds in a south-western direction passing Bogie, Mount Coolon and the town of Collinsville, and ends at T-intersection with Gregory Developmental Road. In general, Bowen Developmental Road is a sealed two-lane road.

Gregory Developmental Road

Gregory Developmental Road runs in an approximate north-south direction and is approximately 360 km in length. The road links Charters Towers to the north with Clermont to the south. Gregory Developmental Road intersects with Bowen Developmental Road at a priority controlled T-intersection immediately south-east of Mount Douglas, and ends at a priority controlled T-intersection with Peak Downs Highway north of Clermont. DTMR is the highway authority of the Gregory Developmental Road and this highway is classified as a State Strategic Road. In general, Gregory Developmental Road is a sealed two-lane road.

Suttor Developmental Road

Suttor Developmental Road is a partly sealed road and connects Mount Coolon in the west to Nebo to the east. It stretches from Mount Coolon at a T-intersection with Bowen Developmental Road to Collinsville-Elphinstone Road. DTMR is the highway authority of the Suttor Developmental Road and it is classified as a Regional Road. In general, Suttor Developmental Road is a sealed two-lane road.

Glenore Road

Glenore Road is under the jurisdiction of the Whitsunday Regional Council. It is an unsealed single lane no-through road with an at-grade rail crossing and T-intersection with the Bruce Highway at its northern extent. The primary function of this road is to provide access to horticultural land and local residents.

Stratford Road

Stratford Road is under the jurisdiction of the Isaac Regional Council. It is an unsealed single lane no-through road that intersects with the Suttor-Developmental Road at its north eastern extent. The primary function of the road is to provide access to horticultural land and other industries.

Strathalbyn Road

Strathalbyn Road is under the jurisdiction of the Whitsunday Regional Council. It intersects with the Bowen Developmental Road at a T-intersection in the suburb of Bogie and has an at-grade rail crossing at its eastern extent. It then proceeds in a north-west direction providing access to local residents and horticultural land. Strathalbyn Road is an unsealed no-through single lane road.

Strathmore Road

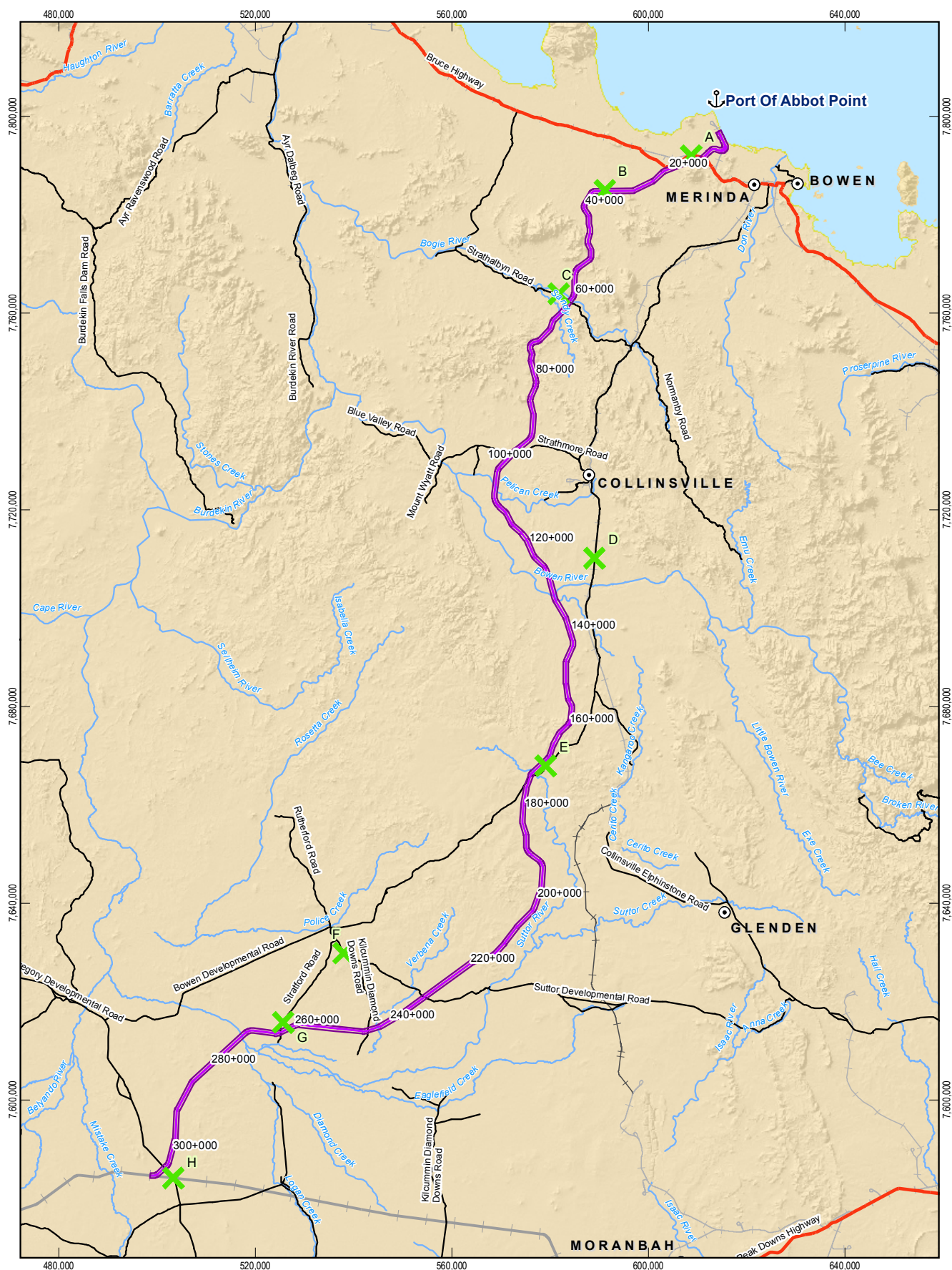
Strathmore Road is under the jurisdiction of the Whitsunday Regional Council. It intersects with the Bowen Developmental Road at a T-intersection north west of the township Collinsville and then proceeds in a westerly direction. It is an unsealed single lane road which intersects with Myuna Road, Tabletop/Johnny Cake Road and Blue Valley Road and eventually changes to Mount Wyatt Road. The primary function of this road is to provide access to horticultural and industrial land uses and local residents.

3.1.3 Key intersections and road sections

Intersections (new and existing) to facilitate access to the NGBR Project final rail corridor, construction camp sites and ancillary infrastructure have been selected for assessment. The key intersections are listed below:

- A - Bruce Highway/New Access Road (near chainage 14 km)
- B - Glenore Road/New Access Road (near chainage 34 km)
- C - Strathalbyn Road/New Access Road (near NGBR chainage 62 km)
- D - Bowen Developmental Road/New Access Road (near chainage 120 km)
- E - Bowen Developmental Road/New Access Road (near chainage 170 km)
- F - Suttor Developmental Road/Stratford Road (near chainage 230 km)
- G - Stratford Road/New Access Road (near chainage 262 km)
- H - Gregory Developmental Road/New Access Road (near chainage 305 km).

The locations of key intersections (labelled intersection numbers A to H) are shown in Figure 3-1.

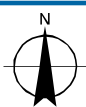


LEGEND

- Population Centres
- Major Port
- Key Intersections
- Highway
- Main Road
- Carmichael Project (Rail)
- Existing/Other Rail Network
- Watercourses (Major)
- North Galilee Basin Rail 1000m Corridor
- North Galilee Basin Rail 100m Corridor

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Kilometres
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55



Adani Mining Pty Ltd
North Galilee Basin Rail Project

Job Number 41-26457
Revision C
Date 29 Aug 2013

Location of Key Intersections

Figure 3-1

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Data source: GA: Populated Places, Railway, Watercourse 2007; Adani: NGBR Corridor 13/05/2013 NGBR Corridor 06/06/2013, Carmichael Rail Project/2013, Chainage/2013; DNRM: Roads/2010; GHD: Study Intersections/2013. Created by:MS

Bruce Highway/New Access Road intersection (near chainage 14 km)

The proposed intersection is located off the Bruce Highway approximately 2.5 km west of the NGBR Project chainage 12.3 km. At the intersection, the Bruce Highway is a two-way, two-lane sealed section of road and will provide a vehicular access to the Construction Camp 1 and Concrete Batch Plant 1. Historical accident data (between 2006 and 2010) showed two collisions, out of those one occurred in 2006 (hit object) and second occurred in 2009 (overturned). The indicative location of this intersection is shown in Figure 3-2. The photo inserted in Figure 3-2 is looking in a south direction.

Glenore Road/New Access Road intersection (near chainage 34 km)

The proposed intersection is located off Glenore Road near chainage 34 km of the NGBR Project. At the intersection, Glenore Road is an unsealed single lane no-through road that intersects with the Suttor-Developmental Road at its north eastern extent. This intersection will provide access to the ancillary infrastructure such as the bridge laydown area and track laydown area. Historical accident data (between 2006 and 2010) at this location showed no collisions. The indicative location of this intersection is shown in Figure 3-3. The photo insert in Figure 3-3 is looking in a south direction.

Strathalbyn Road/New Access Road (near chainage 62 km)

The proposed intersection is located off Strathalbyn Road which intersects the NGBR Project at chainage 62 km. At the intersection, Strathalbyn Road is a two-way, two-lane unsealed section of road and would provide vehicular access to Construction Camp 2, and Concrete Batch Plant 2. Historical accident data (between 2006 and 2010) at this location showed no collisions. The indicative location of this intersection is shown in Figure 3-4.

Bowen Developmental Road/New Access Road intersection (near chainage 120 km)

The proposed intersection is located off Bowen Developmental Road and is situated approximately 18 km east of NGBR Project chainage 120 km. At the intersection, Bowen Developmental Road is a two-way, two-lane sealed section of road and this intersection would provide vehicular access to Construction Camp 3 and Concrete Batch Plant 3.

Historical accident data (between 2006 and 2010) at this location showed no collisions. An accident (collision) was recorded in 2009 along Bowen Developmental Road approximately 3.4 km south of the key intersection. The indicative location of this intersection can be seen in Figure 3-5.

Bowen Developmental Road/New Access Road (near chainage 170 km)

The proposed intersection is located off Bowen Developmental Road and is situated approximately one kilometre east of the NGBR Project chainage 170 km. At the intersection, Bowen Developmental Road is a two-way, two-lane sealed section of road and will provide vehicular access to Construction Camp 4, construction yard, Concrete Batch Plant 4 and the bridge laydown area. Historical accident data (between 2006 and 2010) at this location showed no collisions. An accident (collision) was recorded in 2006 along Bowen Developmental Road approximately 2.2 km south-west of the key intersection. The indicative location of this intersection can be seen in Figure 3-6.

Suttor Developmental Road/Stratford Road intersection (near chainage 230 km)

This existing intersection is located approximately 6.5 km south-east of Mount Coolon. At this location, Suttor Developmental Road is a two-way, two-lane unsealed section of road and will

provide vehicular access to the bridge laydown area. Historical accident data (between 2006 and 2010) at this location showed one hit object collision which was recorded in 2007. The indicative location of this intersection can be seen in Figure 3-7

Stratford Road/New Access Road intersection (near chainage 262 km)

The proposed intersection is located off Stratford Road and situated approximately 2 km northwest of the NGBR Project chainage 263 km. At the intersection, Stratford Road is a two-way unsealed road and will provide vehicular access to Construction Camp 5 and Concrete Batch Plant 5. Historical accident data (between 2006 and 2010) at this location showed no collisions. The indicative location of this intersection can be seen in Figure 3-8. The photo insert in Figure 3-8 is looking in a south direction.

Gregory Developmental Road/New Access Road intersection (near chainage 305 km)

The proposed intersection is located off Gregory Developmental Road and situated approximately five kilometres northwest of Gregory Developmental Road and Glen Avon Road intersection. At the intersection, Gregory Developmental Road is a two-way, two-lane sealed road and will provide vehicular access to the ancillary features such as the construction depot (including flashbutt welder, ballast stockpile) and bridge laydown area.

Historical accident data (between 2006 and 2010) at this location showed no collisions.

Figure 3-9 shows the indicative location of the proposed Gregory Developmental Road/New Access Road intersection. The photo insert in Figure 3-9 is looking in a north direction.

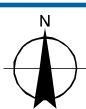


LEGEND

- | | | | |
|--|---|----------------------|-------------------|
| Bruce Highway/New Access Road Intersection | North Galilee Basin Rail 1000m Corridor | Bridge Laydown Area | Construction Camp |
| Highway | North Galilee Basin Rail 100m Corridor | Concrete Batch Plant | Turning Circle |
| Railway | | | |

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Kilometres
Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55



adani

Adani Mining Pty Ltd
North Galilee Basin Rail Project
Bruce Highway/New Access
Road intersection location
(near chainage 14 km)

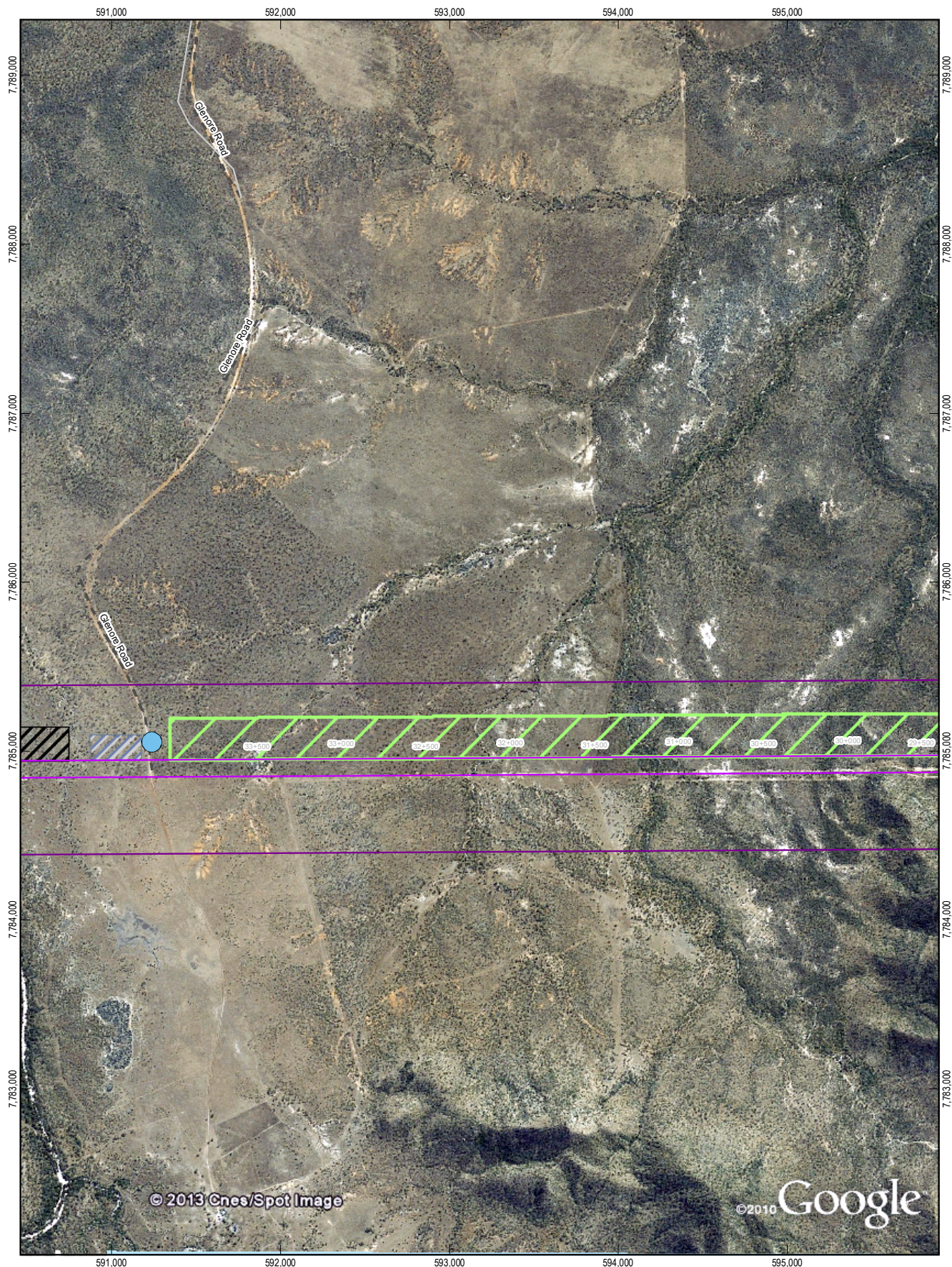
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Revision B
Date 29 Aug 2013

Figure 3-2

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Data source: GA: Populated Places, Railway, Watercourse/2007; Adani: NGBR Corridor 13/05/2013 NGBR Corridor 06/06/2013, Proposed Access Roads/2013, Ancillary Features/2013; DNRm: Roads/2010; Google: Imagery/2013. Created by:MS

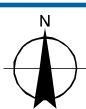


LEGEND

- | | | |
|--|---|---------------------------------|
| Glen Road/New Access Road Intersection | North Galilee Basin Rail 1000m Corridor | Bridge Laydown Area |
| Local Road | North Galilee Basin Rail 100m Corridor | Rolling Stock Maintenance Depot |
| Track | Track Laydown Area | |

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Kilometres
Map Projection: Universal Transverse Mercator
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Grid: GDA 1994 MGA Zone 55



Adani Mining Pty Ltd
North Galilee Basin Rail Project
Glenore Road/New Access
Road intersection location
(near chainage 34 km)

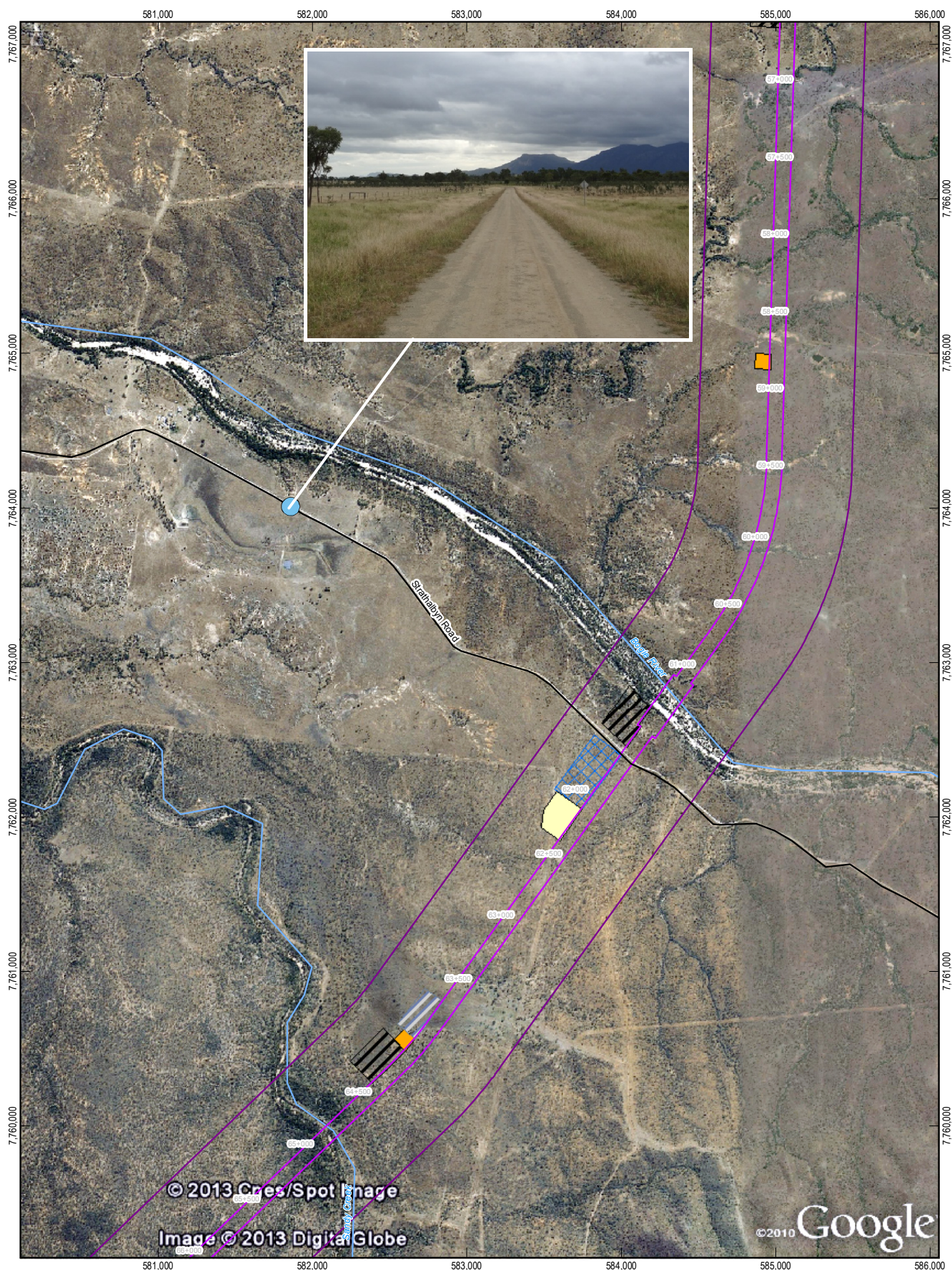
Job Number	41-26457
Revision	C
Date	29 Aug 2013

Figure 3-3

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Data source: GA: Populated Places, Railway, Watercourse/2007; Adani: NGBR Corridor 13/05/2013 NGBR Corridor 06/06/2013, Camichael Rail Project/2012, Proposed Access Roads/2013, Ancillary Features/2013; DNRM: Roads/2010. Created by:MS

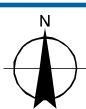


LEGEND

- | | | | |
|--------------------------------------|--|----------------------|-------------------|
| Strathalbyn Road/
New Access Road | North Galilee Basin
Rail 1000m Corridor | Bridge Laydown Area | Construction Camp |
| Main Road | North Galilee Basin
Rail 100m Corridor | Concrete Batch Plant | Turning Circle |
| Watercourses (Major) | | | |

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Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55



adani

Adani Mining Pty Ltd
North Galilee Basin Rail Project
Strathalbyn Road/
New Access Road
(near chainage 62 km)

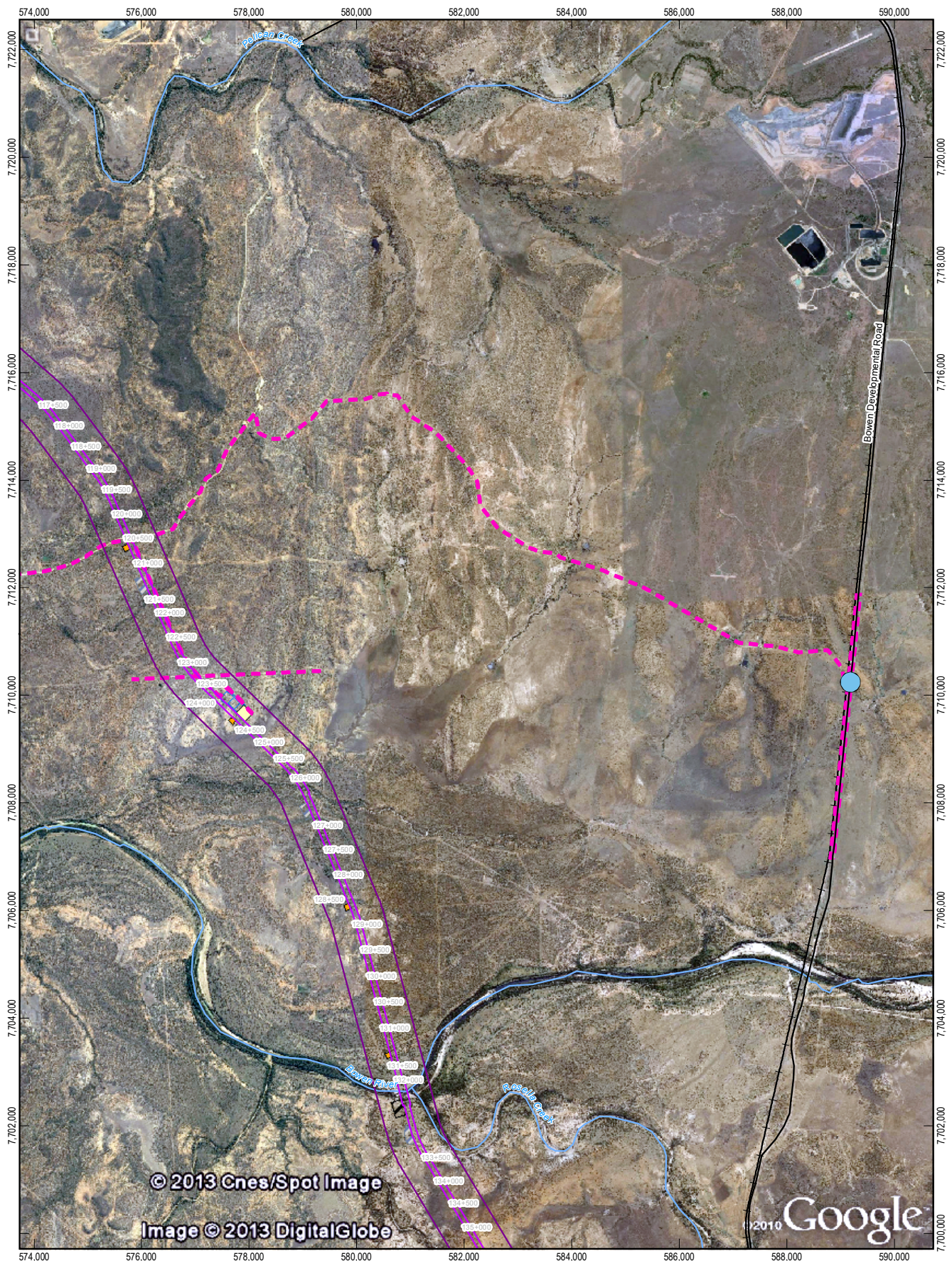
Job Number	41-26457
Revision	C
Date	29 Aug 2013

Figure 3-4

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Data source: GA: Populated Places, Railway, Watercourse 2007; Adani: NGBR Corridor 13/05/2013 NGBR Corridor 06/06/2013, Camichael Rail Project/2012, Proposed Access Roads/2013, Ancillary Features/2013; DNRM: Roads/2010, Potential Habitat/2011. Created by:MS

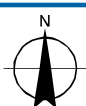


LEGEND

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|---|--|----------------------------|--------------------|
| ● Bowen Developmental Road/
New Access Road Intersection | North Galilee Basin
Rail 1000m Corridor | Alignment Functional Areas | Construction Camp |
| — Main Road | North Galilee Basin
Rail 100m Corridor | Bridge Laydown Area | Track Laydown Area |
| — Watercourses (Major) | Proposed Access Road | Concrete Batch Plant | Turning Circle |
| — Railway | | | |

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Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55



Adani Mining Pty Ltd
North Galilee Basin Rail Project
Bowen Developmental Road/New
Access Road intersection location
(near chainage 120 km)

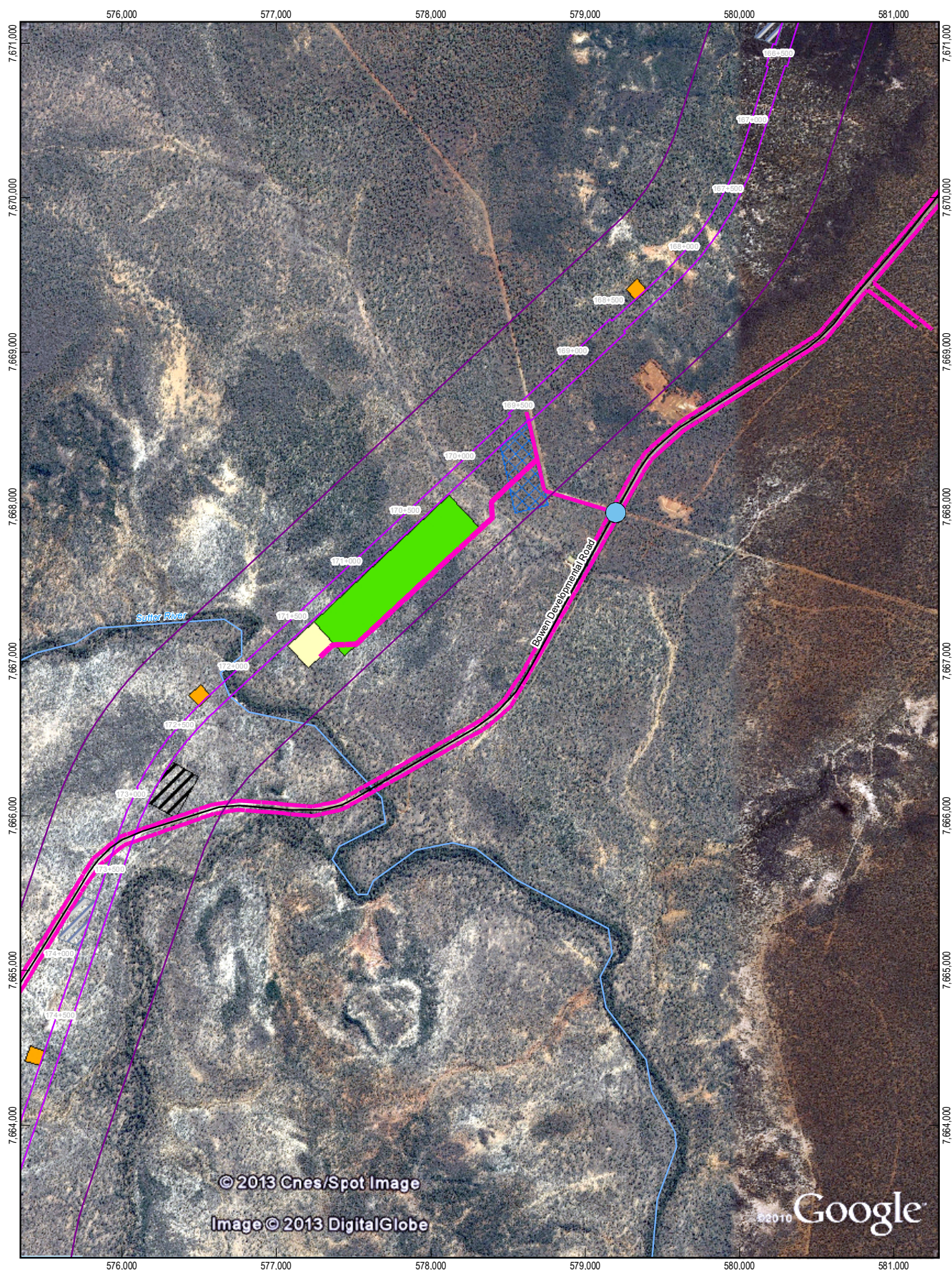
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Date 29 Aug 2013

Figure 3-5

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Data source: GA: Populated Places, Railway, Watercourse/2007; Adani: NGBR Corridor 13/05/2013 NGBR Corridor 06/06/2013, Proposed Access Roads/2013, Ancillary Features/2013; DNRM: Roads/2010; Google: Imagery/2013. Created by:MS

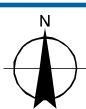


LEGEND

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|--|--|----------------------|--------------------|
| Bowen Development Road/
New Road Intersection | North Galilee Basin
Rail 1000m Corridor | Proposed Access Road | Construction Camp |
| Main Road | North Galilee Basin
Rail 100m Corridor | Construction Yard | Track Laydown Area |
| Watercourses (Major) | Bridge Laydown Area | Concrete Batch Plant | Turning Circle |

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Kilometres
Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55



adani

Adani Mining Pty Ltd
North Galilee Basin Rail Project
Bowen Developmental Road/New
Access Road intersection location
(near chainage 170 km)

Job Number 41-26457
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Date 29 Aug 2013

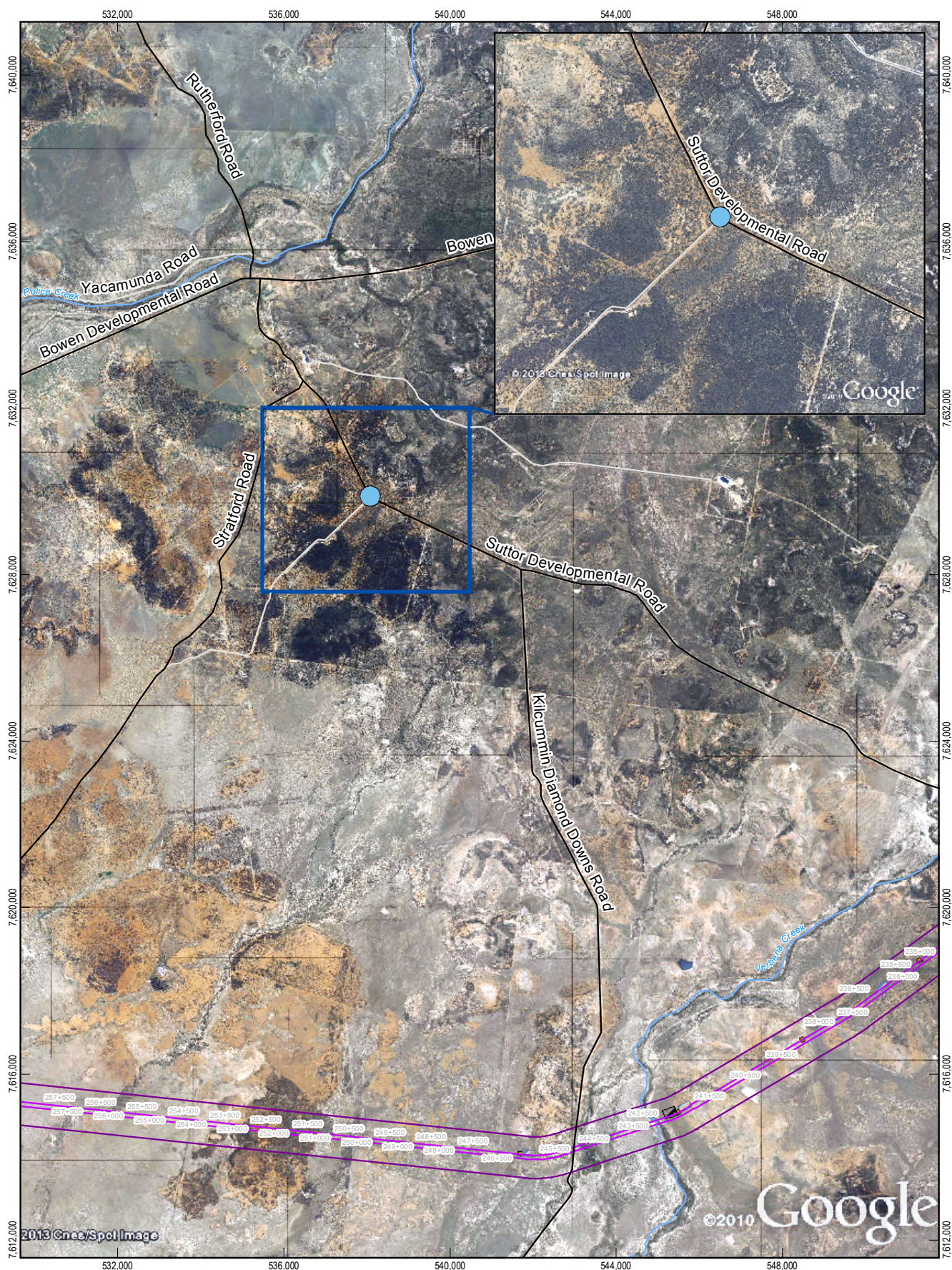
Figure 3-6

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LEGEND

- Sutor Developmental Road/Stratford Road Intersection
- Main Road
- Local Road
- Watercourses (Major)
- North Galilee Basin Rail 1000m Corridor
- North Galilee Basin Rail 100m Corridor
- Alignment Functional Areas
- Bridge Laydown Area
- Track Laydown Area
- Turning Circle

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Map Projection: Universal Transverse Mercator
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Adani Mining Pty Ltd
North Galilee Basin Rail Project
Sutor Developmental Road/
Stratford Road intersection
(near chainage 230 km)

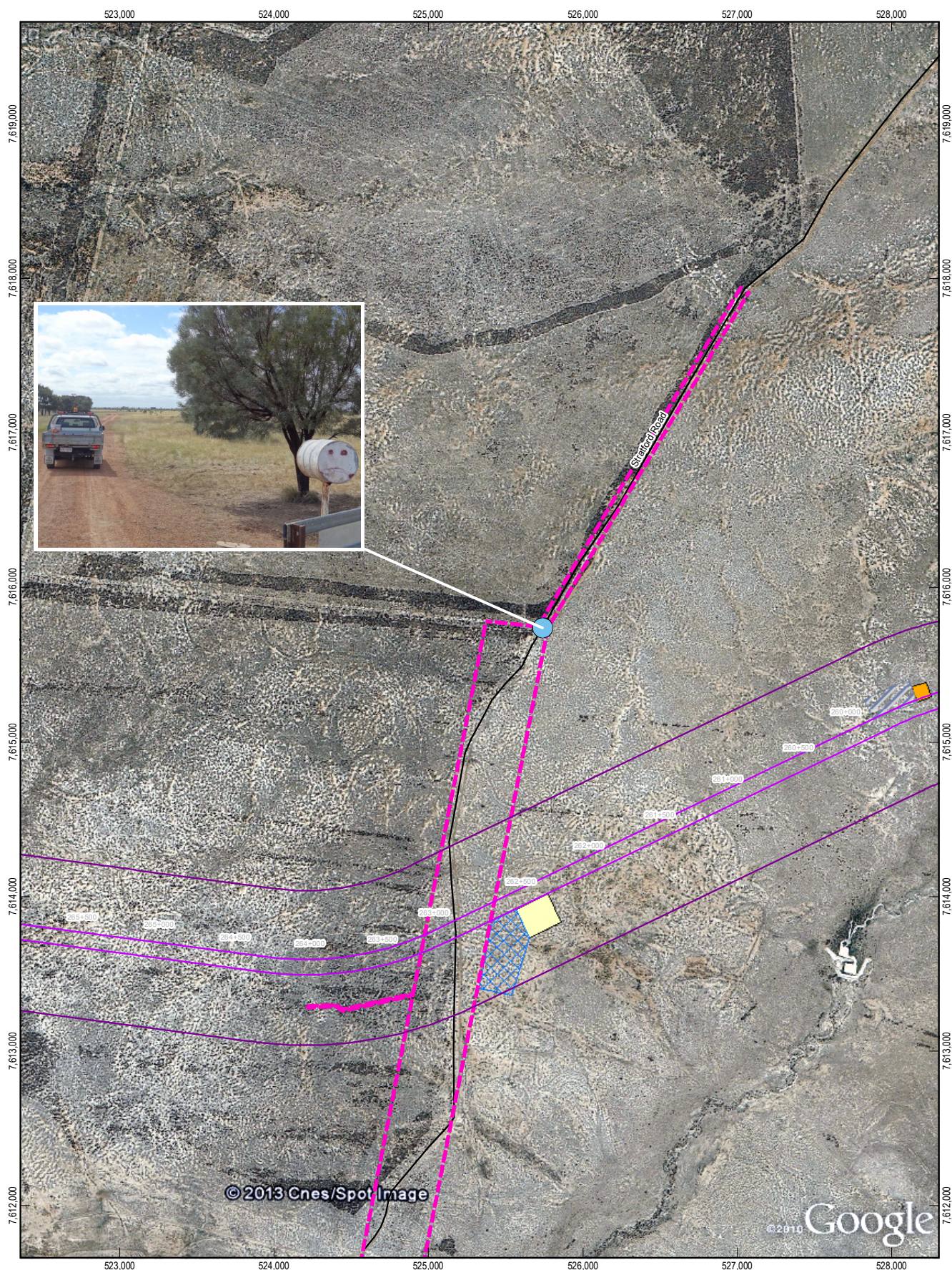
Job Number 41-26457
Revision C
Date 29 Aug 2013

Figure 3-7

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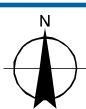


LEGEND

- Stratford Road/New Access Road Intersection
- Main Road
- North Galilee Basin Rail 1000m Corridor
- North Galilee Basin Rail 100m Corridor
- Proposed Access Road
- Alignment Functional Areas
- Concrete Batch Plant
- Construction Camp
- Track Laydown Area
- Turning Circle

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Kilometres
Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55



Adani Mining Pty Ltd
North Galilee Basin Rail Project
Stratford Road/New Access
Road intersection location
(near chainage 262 km)

Job Number 41-26457
Revision C
Date 29 Aug 2013

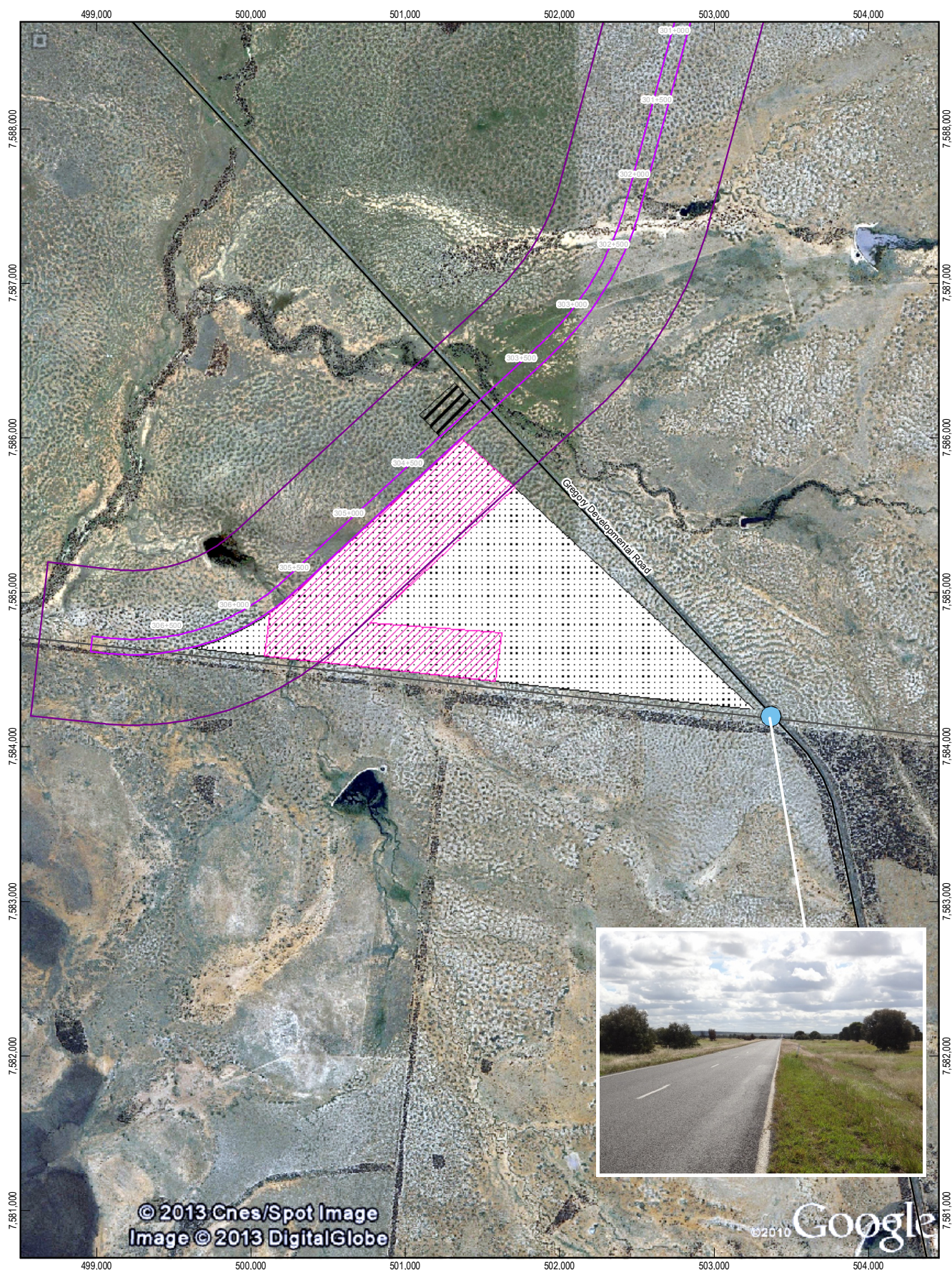
Figure 3-8

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Data source: Adani: NGBR Corridor 13/05/2013 NGBR Corridor 06/06/2013, Proposed Access Roads/2013, Ancillary Features/2013; DNRM: Roads/2010; Google: Imagery Extracted / Aug 2013. Created by:MS

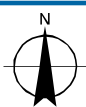


LEGEND

- | | | |
|---|---|-------------------------|
| Gregory Developmental Road/
New Access Road Intersection | North Galilee Basin
Rail 100m Corridor | Bridge Laydown Area |
| Main Road | North Galilee Basin
Rail 100m Corridor | Construction Depot Area |
| Carmichael
Project (Rail) | Rail Precinct Area | |

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Kilometres
Map Projection: Universal Transverse Mercator
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Grid: GDA 1994 MGA Zone 55



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Adani Mining Pty Ltd
North Galilee Basin Rail Project
Gregory Developmental Road/New
Access Road intersection location
(near chainage 305 km)

Job Number 41-26457
Revision B
Date 29 Aug 2013

Figure 3-9

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Data source: GA: Populated Places, Railway, Watercourse/2007; Adani: NGBR Corridor 13/05/2013 NGBR Corridor 06/06/2013, Carmichael Rail Project/2012, Proposed Access Roads/2013, Ancillary Features/2013; DNRM: Roads/2010; Google: Imagery/2013. Created by:MS

3.1.4 Existing traffic volumes and capacity of key roads

In order to understand the existing traffic volumes on selected key roads, AADT data for 2012 was sourced from DTMR. The AADT data available at the closest location to the study area was used. For any road section with multiple count sites, the highest AADT volume on the road was used for a conservative assessment. A LOS approach has been used to examine the existing performance of the selected key roads (refer Section 2.5). Table 3-3 provides the AADT and resulting LOS on all the selected key roads.

Table 3-3 Existing traffic volumes and LOS 2012

Road name (location)	AADT	LOS
Bruce Highway (near chainage 14 km) ¹	3,592	B
Glenore Road (near chainage 34 km) ²	29	A
Strathalbyn Road (near NGBR chainage 62 km) ¹	1,216	A
Bowen Developmental Road (near chainage 120 km) ³	1,386	A
Bowen Developmental Road (near chainage 170 km) ³	335	A
Suttor Developmental Road (near chainage 230 km) ¹	29	A
Stratford Road (near chainage 262 km) ¹	29	A
Gregory Developmental Road (near chainage 305 km) ³	710	A

Note:

1. No data available at location, closest AADT selected
2. No AADT is provided, therefore based on the road location an AADT of a similar road type has been used
3. No data available at location, closest and maximum AADT selected

Table 3-3 shows that all the selected key roads are operating at an existing LOS A with the exception of Bruce Highway (near chainage 14 km), which is operating at LOS B. The existing LOS at all the selected key roads is below LOS D, which indicates free and uninterrupted travelling conditions.

3.1.5 Existing heavy vehicle network

The percentage of heavy vehicles on the key roads is provided in Table 3-4. The heavy vehicle data was based on 2012 AADT counts sourced from DTMR. For any road with multiple count sites, the highest percentage heavy vehicle information (nearest the study area) was used for a conservative assessment.

Table 3-4 Percentage heavy vehicles on key roads

Road name (location)	Percentage of heavy vehicles
Bruce Highway (near chainage 14 km) ¹	16.8%
Glenore Road (near chainage 34 km) ²	10.3%
Strathalbyn Road (near chainage 62 km) ¹	9.4%
Bowen Developmental Road (near chainage 120 km) ³	10.9%
Bowen Developmental Road (near chainage 170 km) ³	14.6%

Road name (location)	Percentage of heavy vehicles
Suttor Developmental Road (near chainage 230 km) ¹	10.3%
Stratford Road (near chainage 262 km) ¹	10.3%
Gregory Developmental Road (near chainage 305 km) ³	17.4%

Note:

1. No data available at location, closest AADT selected

2. No AADT is provided, therefore based on the road location an AADT of a similar road type has been used

3. No data available at location, closest and maximum AADT selected

DTMR designates specific mass limits and vehicle types by route on the SCR network as summarised below:

- **Higher mass limits** apply to the following vehicles:
 - Tandem drive rigid trucks and prime movers
 - Tandem and tri-axle semi-trailers
 - Tandem and tri-axle dolly trailers
 - Single drive axle buses
 - Road trains
 - B-doubles
- **Major Highway System** routes apply to the following vehicles:
 - B-doubles – 23 metre and 25 metre
 - Road trains – Type 1 (36.5 metre) and Type 2 (53.5 meter).

The Bruce Highway is an approved higher mass limits route. Additionally, higher mass limit routes are available between Townsville and Burdekin Falls Dam, Charters Towers, Torrens Creek and some other towns westward of the highway. Higher mass limits routes are available in some areas around Home Hill, Bowen and Proserpine region.

A review of heavy vehicle routes shows that:

- Bowen Developmental Road between Bowen and Collinsville is an approved route for Type 1 (11 axle and 36.5 metres long) vehicles. This will provide direct access for Type 1 vehicles from the Port of Abbot Point to Construction Camp 3 and other ancillary infrastructure in the vicinity of the Construction Camp 3.
- Bowen Developmental Road between Collinsville, Mount Coolon and Belyando is also an approved route for Type 1 and Type 2 (16 axle and 53.5 metres long) vehicles. This will provide direct access for Type 1 vehicles from the Port of Abbot Point to Construction Camp 4 and associated ancillary infrastructure between Newlands rail system and Mount Coolon.
- Suttor Developmental Road between Mount Coolon and Eaglefield is also an approved route for Types 1 and 2 vehicles. This route will be used by Type 1 and Type 2 vehicles to access the bridge and track laydown areas and other ancillary infrastructures in the vicinity.
- Gregory Developmental Road between Belyando and Clermont is also an approved route for Types 1 and 2 vehicles. This route will be used by Type 1 and Type 2 vehicles to access the track construction depot and other ancillary infrastructures in the vicinity.

- Bruce Highway near NGBR final rail corridor is an approved route for B-Double vehicles. This will provide access for B-Double vehicles to Construction Camp 1 and other ancillary infrastructures in the vicinity of this camp.

A DTMR heavy vehicle network map is provided in Figure 3-10.



LEGEND

- Town
- Major Port
- Major Road
- Minor Road
- Watercourse
- Heavy Vehicle Road
- Major Highway System (Approved for Higher Mass Limits)
- Additional Roads Approved for Higher Mass Limits
- Existing/Other Rail Network
- Carmichael Project (Rail)
- Carmichael Project (Mine)
- North Galilee Basin Rail

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Kilometres
Map Projection: Universal Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia (GDA)
Grid: Map Grid of Australia 1994, Zone 55



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Heavy Vehicle Transport Network

Figure 3-10

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3.1.6 Existing public transport network

There is a lack of public and private bus services within the study area. The only operating service is a school bus operating between Bowen and Collinsville State School, and Mount Coolon and Collinsville State School. This local service is operated by Bowen Transit which also provides charter services. No other service is provided in the area with the exception of Greyhound intercity coaches which operates along the Bruce Highway servicing Mackay, Proserpine and Bowen.

3.1.7 Active transport network

Active transport networks include footpaths, on-street facilities such as bikeways, bike lanes and shared bicycle facilities. There is currently no pedestrian or cyclist infrastructure along the key roads. This is due to the rural setting and long distances from surrounding communities, the high speed environment of the road network and the low pedestrian and cyclist volumes.

3.2 Rail transport network

3.2.1 Freight network

Existing freight rail network of Central Queensland is shown in Figure 3-11 and includes the following freight line services:

- Blair Athol Branch Railway
- Central Line
- Collinsville-Newlands Branch Railway
- Curragh Branch Railway
- Finch Hatton Branch Railway
- Goonyella Branch Railway
- Great Northern Line
- Gregory Branch
- Kinrola Branch Railway
- Laleham Branch Railway
- North Coast Line
- Northern Missing Link
- Norwich Park Branch Railway
- Springsure Branch Railway
- Wotonga-Blair Athol Branch Railway
- Yaraka Branch Railway.

The NGBR Project final rail corridor is situated to the west of the Newlands rail network primarily interacting with this rail service (via proposed grade separated crossing) in the northern section of the corridor in the vicinity of Abbot Point.

All the existing freight rail networks in the region are narrow gauged track with 26.5 tonnes axle loads.

Other proposed rail transport infrastructure in the vicinity of the NGBR Project includes:

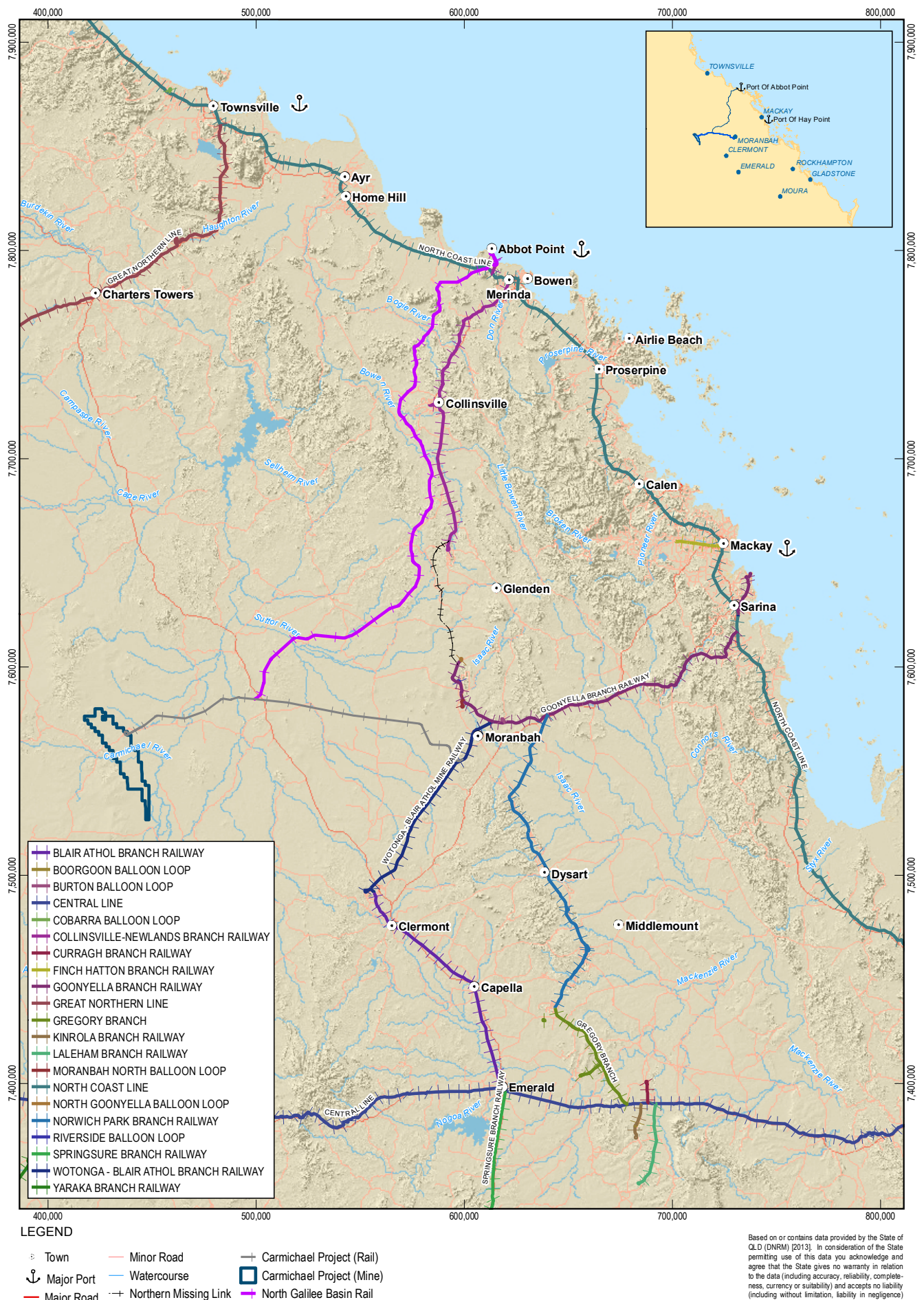
- GVK Hancock Coal Infrastructure Pty Ltd (GVK-Hancock) is developing the Alpha Coal Railway between its Alpha Coal and Kevin's Corner projects in the Galilee Basin near Alpha, Central Queensland. Technical design has been completed, and State and commonwealth approvals are advanced however no funding is currently allocated. Aurizon and GVK-Hancock have signed a non-binding term sheet to jointly progress the development of rail and port infrastructure to unlock Galilee Basin coal reserves including GVK Hancock's Alpha, Kevin's Corner and Alpha West coal mines and a process to support the next phase of coal growth in the Bowen Basin.
- Waratah Coal Pty Ltd's Galilee Coal Project which includes a new underground coal mine and associated infrastructure located 30 km north of Alpha in the Galilee Basin as well as a standard gauge rail link, from the mine to the boundary of the Abbot Point Sate Development Area. State approval was received from the Coordinator-General on 9 August 2013.
- Aurizon is investigating an integrated rail network from the Galilee and Bowen Basins to all Central Queensland coal ports. This includes upgrades and deviations to the existing Newlands rail line, from Goonyella and Abbot Point, and approximately 180 kilometres of new rail corridor from the Galilee Basin to the Newlands rail line. The proposal is referred to as the Central Queensland Integrated Rail Project. The Coordinator-General declared the Central Queensland Integrated Rail Project a 'significant project' requiring an Environmental Impact Statement on 27 January 2012.

Adani has previously considered co-utilising a consolidated corridor with GVK Hancock Coal Infrastructure's proposed GVK Railway; however, with that railway's 60 mtpa capacity already fully allocated, uncertain development timeframes and a route that traverses large areas of floodplain, the potential for co-use of the railway is limited. Further discussion relating to the NGBR Project's relationship to other proposed infrastructure is provided in Volume 1 Chapter 1 Introduction.

3.2.2 Passenger rail network

The existing passenger rail network within Central Queensland is shown in Figure 3-12. The only passenger rail network to be intersected by the NGBR Project final rail corridor (via proposed grade-separated crossing) is the North Coast Line in the northern extent of the study area. There are three services currently operating in the vicinity of the NGBR Project study area:

- **Brisbane to Cairns** – Queensland Rail's "Sunlander" and Tilt Train passenger services links Brisbane to Cairns. The frequency of this service is two Tilt train services each way per week and three Sunlander services each way per week
- **Brisbane to Longreach** – Queensland Rail's "Sprit of the Outback" passenger services links Brisbane and Longreach. The frequency of this service is two trains each way per week
- **Mount Isa to Townsville** – Queensland RAILS "The Inlander" passenger services links Mt Isa and Townsville. The frequency of this service is one passenger service each way per week.



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Kilometres
Map Projection: Universal Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia (GDA)
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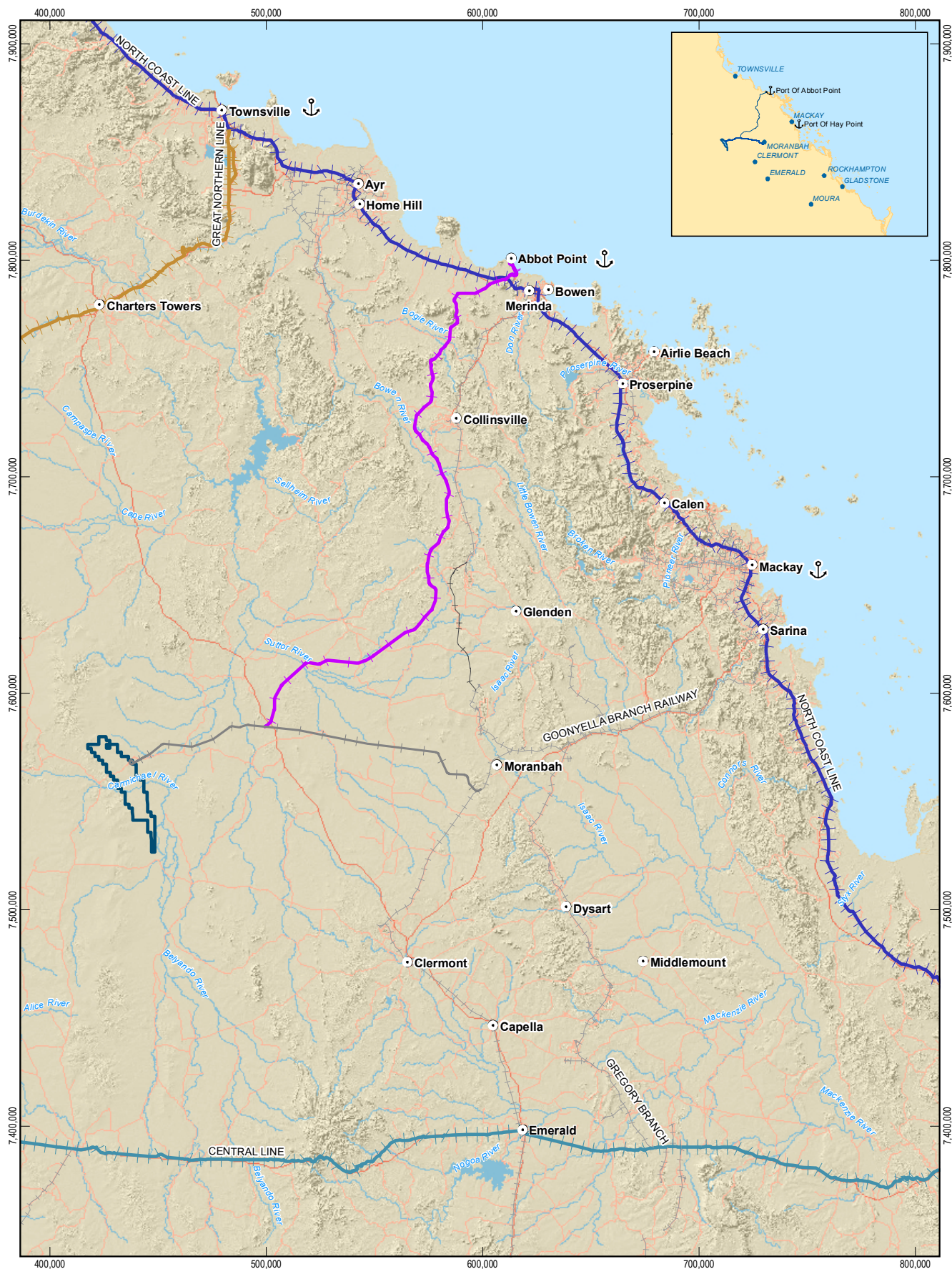
Freight Rail Transport Network

Figure 3-11

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LEGEND

- | | | |
|-------------|-----------------------------|---------------------------|
| Town | Northern Missing Link | Carmichael Project (Rail) |
| Major Port | Existing/Other Rail Network | Carmichael Project (Mine) |
| Major Road | Brisbane to Cairns | North Galilee Basin Rail |
| Minor Road | Brisbane to Longreach | |
| Watercourse | Townsville to Mt Isa | |

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Passenger Rail Transport Network

Figure 3-12

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3.3 Air transport facilities

International and regional airports could potentially serve the fly-in fly-out (FIFO) workforce for the NGBR Project. Currently there are seven airports located within the vicinity of the NGBR Project. Out of these, one is an international airport and six are regional airports.

The nearest international airport is Townsville airport. Townsville International Airport is the largest and only international airport in the Central Queensland region, providing connections from capital cities with direct flights servicing Brisbane, Melbourne and Sydney to outlying Central and North Queensland. The airport is situated approximately five kilometres to the north of Townsville city centre. Townsville Internal Airport processes over 1.6 million passengers annually.

The airport has two runways, of which the longest is 2,438 m. Townsville International Airport has four aerobridges (one international and three domestic) for aircraft up to the size of Boeing 767; and three ground level tarmac departure / arrival gates for regional flights at the northern end of the terminal.

Passenger airlines operating from Townsville International Airport include Qantas, Virgin Australia, Jetstar, Skytrans and American Airlines.

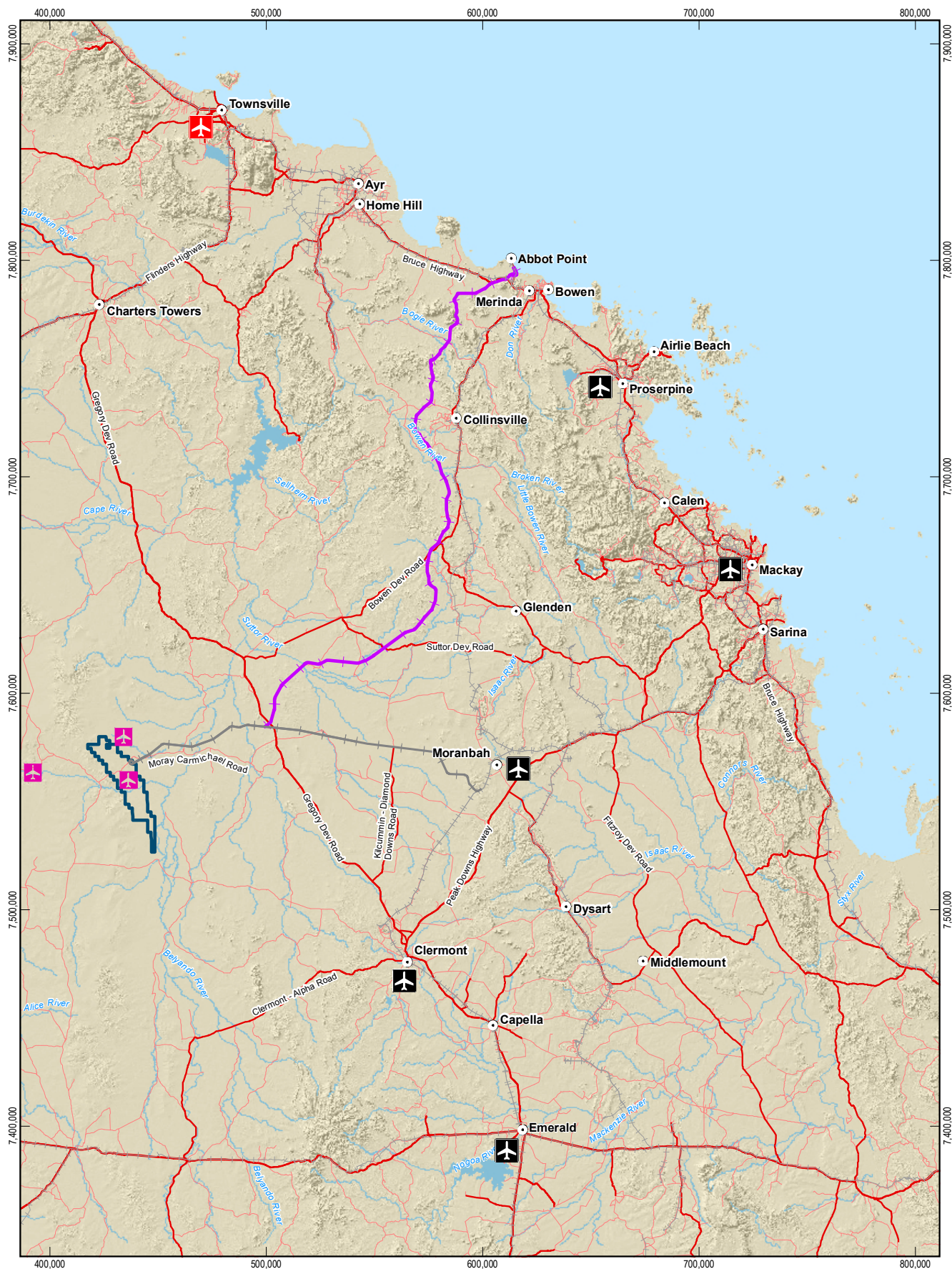
A number of mining charter flights also currently operate from Townsville International Airport to Cannington Mine, Century Mine, Phosphate Hill Mine, Mount Isa, Osbourne Mine, Mount Dore, Selwyn Mine and Emerald. The airlines which provide these chartered flights include Alliance Airlines and Brindabella Airlines.

The regional airports include:

- Proserpine/Whitsunday Coast Airport - Whitsunday Regional Council is the operator. Proserpine Airport is a domestic airport located approximately 10 km south of Proserpine. It has two asphalt surface runways, of which the longest is 2,073 m. Jetstar and Virgin Australia currently operate daily flights between Proserpine and Brisbane.
- Mackay Airport - Mackay Airport Pty Ltd is the operator. Mackay Airport is a domestic airport that operates flights to Brisbane, Sydney, Melbourne, Gladstone, Rockhampton, Townsville and Cairns. Airlines operating from Mackay Airport include Jetstar, Pel-Air (cargo), Qantas, Tiger Airways and Virgin Australia. Mackay Airport has two asphalt surfaced runways, of which the longest is 1,981 m. This places a limitation on the type of aircraft it can handle.
- Moranbah Airport - BHP Billiton Mitsubishi Alliance is the operator. Moranbah Airport is located off Goonyella Road, approximately six kilometres south of Moranbah. The airport has one runway which is 1,524 m long. Works at the airport (completed mid-2011) included resurfacing the airport runway, improving safety and enabling the airport to be used by larger capacity Q400 aircraft. The airlines currently operating from Moranbah Airport include QantasLink and Skytrans, with flights operating between Moranbah and Brisbane, Cairns, Townsville and Sunshine Coast.
- Clermont Airport - Isaac Regional Council is the operator of this airport. Clermont Airport has two runways, of which the longest is 1,311 m. It is situated just off the Peak Downs Highway near Clermont. Clermont Airport is operated by the IRC and caters to FIFO workforces of nearby mines.
- Emerald Airport – Central Highlands Regional Council are the operator. Emerald Airport is a regional airport located approximately six kilometres from the town of Emerald. It has

two runways, of which the longest is 1,900 m. The airport is serviced by two commercial airlines, Qantaslink and Virgin, which fly in and out of Emerald with over 60 services per week.

The locations of air transport facilities are provided in Figure 3-13. The closest airports to the NGBR Project are Proserpine/Whitsunday Coast Airport and Moranbah Airports.



LEGEND

- Town
- Major Road
- Minor Road
- Existing/Other Rail Network
- Watercourse

- Airport International
- Airport Regional
- Local Temporary Airstrips

- Carmichael Project (Rail)
- Project (Mine)
- North Galilee Basin Rail

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Kilometres
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North Galilee Basin Rail Project

Air Transport Facilities

Job Number 41-26457
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Figure 3-13

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3.4 Sea transport facilities

The existing bulk ports within the vicinity of the NGBR Project include:

- Port of Townsville
- Port of Mackay
- Port of Hay Point including Dalrymple Bay Coal Terminal and Hay Point Coal Terminal
- Port of Abbot Point.
- Dudgeon Point Coal Terminal

All of these ports are controlled by NQBP with the exception of Port of Townsville which is operated by the Port of Townsville Limited. The Ports of Townsville and Abbot Point would provide facilities suitable for the import of construction materials, components and pre-assembled modules for construction of the NGBR Project.

3.4.1 Port of Townsville

The Port of Townsville comprises nine berths catering for the import and export of a number of commodities, including:

- Fuel, oil and liquid petroleum gas
- Minerals, nickel ore, lead ingots, copper and zinc concentrates
- Containers
- Frozen beef and live cattle
- Cement
- Sugar and molasses
- Sulphuric acid and fertiliser
- Scrap metal, timber and general cargo
- Cruise ships.

Commodities are supplied to the port via both rail and road. The Port of Townsville provides facilities suitable for the import of construction materials, components and pre-assembled modules for construction of the NGBR Project.

An expansion to develop six new berths and reclamation of approximately 100 ha is currently being investigated.

3.4.2 Port of Mackay

The Port of Mackay is located within Mackay harbour and is Queensland's fourth busiest multi-commodity port in terms of cargo throughput. The port is operated by NQBP. The port comprises four berths catering for the import and export of a number of commodities, including:

- Sugar and sugar products, such as molasses
- Grain
- Sulphuric acid and fertilisers
- Petroleum and ethanol
- Vehicles and machinery.

3.4.3 Port of Hay Point

Hay Point is situated about 40 kilometres south of Mackay. The Port of Hay Point is one of the largest coal export ports in the world. It comprises two coal export terminals, Dalrymple Bay Coal Terminal and Hay Point Coal Terminal.

Dalrymple Bay Coal Terminal is leased from the State Government by Dalrymple Bay Coal Terminal Management Pty Ltd and Hay Point Coal Terminal is owned by BHP Billiton Mitsubishi Alliance and operated by Hay Point Services. Together these coal terminals service the mines in the Bowen Basin in central Queensland. The mines are linked to the port terminals through an integrated rail-port network.

Both terminals have purpose-built, rail inloading facilities, onshore stockpile yards and offshore wharves. The offshore wharves are serviced by conveyor systems, supported on jetties, which run out to sea and allow loading in deep water.

3.4.4 Port of Abbot Point and associated coal export terminals

The Port of Abbot Point is operated by NQBP. The Port of Abbot Point is located approximately 25 km north of Bowen and is Australia's most northerly coal port. The port comprises a single coal export terminal, Abbot Point Coal Terminal 1, which is owned (under long-term 99 year lease) by Adani Abbot Point Terminal Pty Ltd, a subsidiary of the Adani Group and operated by Abbot Point Bulkcoal Pty Ltd which is a subsidiary of Xstrata.

Abbot Point Coal Terminal 1 comprises a rail in-loading facility, coal handling and stockpile areas, and a dual trestle jetty and conveyors connected to two berths and ship-loaders, located 2.75 km offshore, with a capacity of 50 mtpa. Coal is supplied to the port via the Newlands rail system.

Adani Abbot Point Terminal Pty Ltd is proposing to develop a second terminal, Terminal 0, which will provide an additional rail in-loading facility, coal handling and stockpile areas, and a second trestle jetty and conveyors connected to two additional berths and ship-loaders. This will be located east of the existing terminal and have a capacity of 70 mtpa.

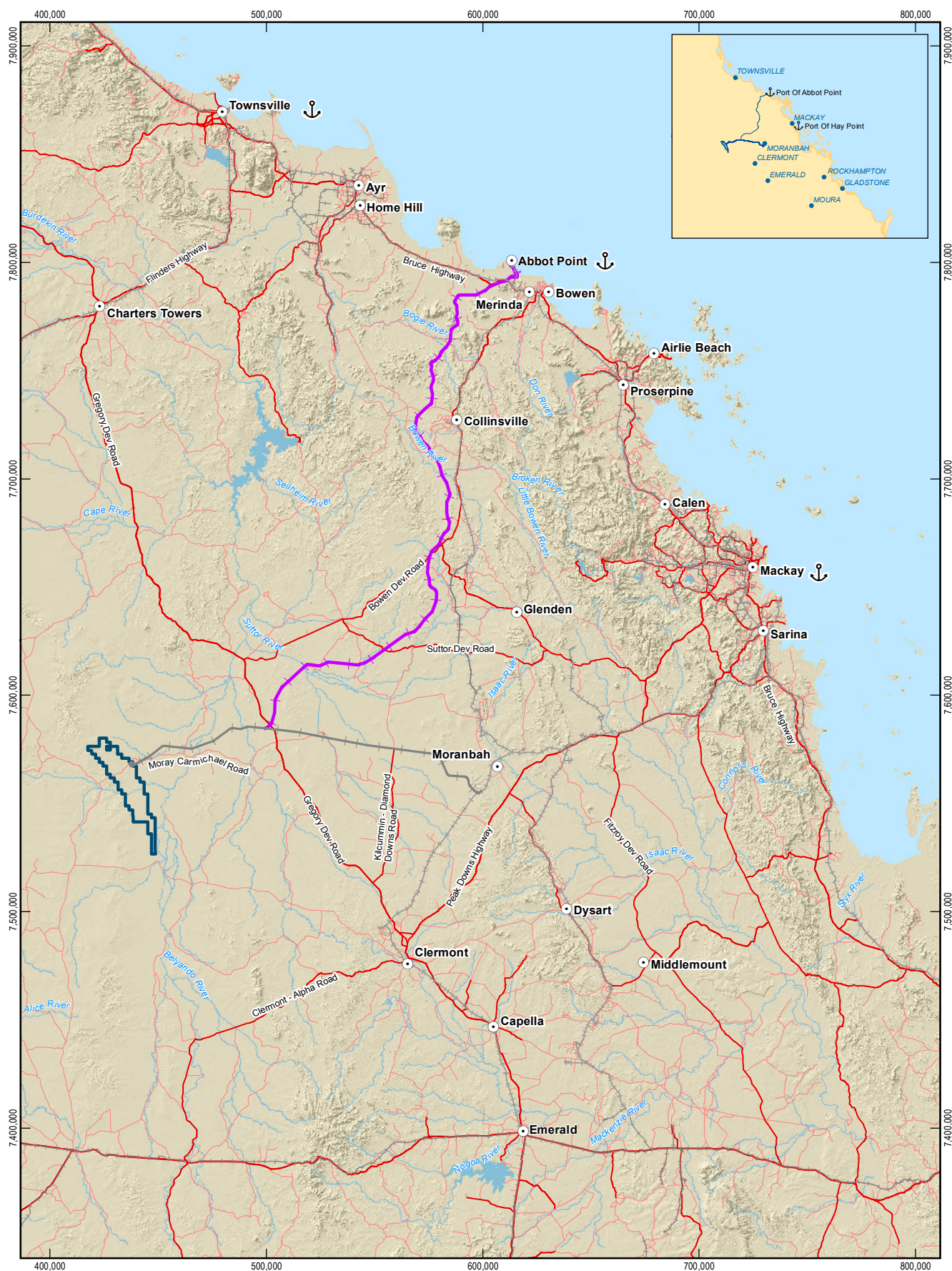
Two other terminals, Terminal 2 and Terminal 3, are also currently proposed for development in 2013-2014 and would each have a nominal capacity of 60 mtpa. Terminal 2 is proposed for development by BHP Billiton and Terminal 3 is proposed for development by GVK Hancock.

Locations of the existing sea ports around the NGBR project is provided in Figure 3-14.

3.4.5 Dudgeon Point Coal Terminal

Plans are progressing for the proposed Dudgeon Point Coal Terminals Project. This expansion at the Port of Hay Point involves two new coal terminals in the port, with an estimated capacity of up to 180 Mtpa. The two terminals will be constructed in stages over a 20-year period to meet industry demand. The first stage of development is expected to be a single terminal with a capacity of 30 Mtpa.

Dudgeon Point Project Management and Adani Mining Pty Ltd (Adani Group) are the preferred proponents for the development of new coal export infrastructure at Dudgeon Point.



LEGEND

- Town
- Minor Road
- Carmichael Project (Rail)
- Major Port
- Existing/Other Rail Network
- Carmichael Project (Mine)
- Major Road
- Watercourse
- North Galilee Basin Rail

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Kilometres
Map Projection: Universal Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia (GDA)
Grid: Map Grid of Australia 1994, Zone 55



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North Galilee Basin Rail Project

Sea Transport Facilities

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Figure 3-14

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Data Source: GHD: Ports (2010); GA: Gazetteed Names (2008); DNRM: State Roads (2008); DME:EPC1690 (2010); EPC1080 (2011); Adani: Alignment Op9 Rev3 (2012), NGBR Rail Option 6 Rev 2 (06/06/2013), Carmichael Project Rail (2013). Created by: AJ

3.5 Proposed transport infrastructure

The Queensland Transport and Roads Investment Program 2013-14 to 2016-17 (QTRIP) details the program of road works DTMR plan to deliver throughout Queensland over a four year period. Projects which have been identified in the immediate vicinity of the NGBR Project have been summarised in Table 3-5. No future road transport infrastructure upgrades are planned which will have an impact on the NGBR Project with the exception of upgrading of the Bruce Highway and improvement works occurring on the Bowen Developmental Road which will improve the ability to roads to cater for the movement of construction materials and workforce to/from the final rail corridor.

Table 3-5 QTRIP 2013-14 to 2016-17 program of works

Road name	Proposed works	Indicative total cost	Cost and timing
Bruce Highway	Overtaking lanes (Sarina-Cairns)	\$78,000	Approved 2013-14
Bruce Highway	Rest areas (Sarina-Cairns)	\$337,000	Approved 2013-14
Bruce Highway	Safety Initiatives	\$259,000	Approved 2013-14
Bruce Highway (Bowen-Ayr)	Improve intersection with Bowen Developmental Road	\$3,720,000	Estimated expenditure June 2013 \$120,000. Approved 2013-14 \$1,000,000. Indicative 2014-15 \$2,600,000
Bruce Highway (Bowen-Ayr)	Improve intersection with Lower Don Road	\$1,504,000	Estimated expenditure June 2013 \$104,000. Approved 2013-14 \$200,000. Indicative 2014-15 \$1,200,000
Bruce Highway (Bowen-Ayr)	Construct overtaking lanes south of Homestead Road	\$4,898,000	Estimated expenditure June 2013 \$601,000. Approved 2013-14 \$4,297,000
Bruce Highway (Bowen-Ayr)	Construct overtaking lanes at Rossiter Hill South	\$5,300,000	Estimated expenditure June 2013 \$807,000. Approved 2013-14 \$4,493,000
Bruce Highway (Bowen-Ayr)	Install, upgrade and replace roadside delineation	\$300,000	Estimated expenditure June 2013 \$100,000. Approved 2013-14 \$200,000
Bruce Highway (Bowen-Ayr)	Rehabilitate pavement	\$2,363,000	Estimated expenditure June 2013 \$314,000. Approved 2013-14 \$2,049,000
Bruce Highway (Bowen to Ayr)	Rehabilitate bridges and culverts	\$43,750,000	Estimated expenditure June 2013 \$22,281,000. Approved 2013-14 \$5,800,000. Indicative 2014-15 \$6,000,000. Indicative 2015-16 to 2016-17 \$9,669,000

Road name	Proposed works	Indicative total cost	Cost and timing
Bowen Developmental Road (Bowen to Collinsville)	Rehabilitate and overlay	\$10,000,000	Approved 2013-14 \$7,000,000. Indicative 2014-15 \$3,000,000
Strathmore Road	Pave and seal	\$700,000	Approved 2015-16 to 2016-17 \$350,000
Strathmore Road	Rehabilitate pavement	\$490,000	Approved 2014-15 to 2015-16 \$245,000
Townsville Port Road	Improve Woolcock Street/Mather Street interchange	\$10,000,000	Estimated expenditure June 2013 \$8,000,000. Approved 2013-14 \$2,000,000
Townsville Port Road	Improve traffic signals at Pilkington Street intersection	\$225,000	Approved 2013-14 \$225,000
Townsville Port Road	Improve traffic signals at Duckworth Street intersection	\$178,000	Approved 2013-14 \$178,000

Source: Queensland Transport and Roads Investment Program 2013-14 to 2016-17 (QTRIP)

Proposed rail infrastructure and proposed port infrastructure are discussed in Section 3.2 and Section 3.4 respectively.

4. Key findings

This report presents the findings of a desktop review of the existing traffic conditions and transport infrastructure that have the potential to be impacted by the NGBR Project. It includes consideration of the condition and capacity of the surrounding road network and, describes existing rail, air and sea transport infrastructure.

The NGBR Project final rail corridor will cross 23 public roads, stock routes and road reserves. Eight key intersections and approach roads comprising SCR and local council roads that will facilitate access to the NGBR Project during construction and operation have been identified.

The key SCR considered include:

- Bruce Highway
- Bowen Developmental Road
- Gregory Developmental Road
- Suttor Developmental Road.

The key local council roads considered include:

- Glenore Road
- Stratford Road
- Strathalbyn Road
- Strathmore Road.

AADT data for 2012 suggests that the selected key roads are all operating at a LOS B or better which indicates free and uninterrupted travelling conditions. Of these roads, Bowen Developmental Road, Suttor Developmental Road and Gregory Developmental Road are approved DTMR heavy vehicle routes which may be used to transport construction materials to and from the NGBR Project.

There is currently no existing pedestrian or cyclist infrastructure along any of the selected key roads due to the rural setting and long distances from surrounding communities, the high speed environment of the road network and the low pedestrian and cyclist volumes. There is also limited public and private bus services within the study area.

The NGBR Project final rail corridor is located to the west of the Newlands rail network primarily interacting with this rail service (via grade-separated crossing) in the northern section of the NGBR Project in the vicinity of Abbot Point. There are no passenger rail services close to the study area.

There are seven airports located around the NGBR Project including one international airport and six regional airports. The nearest international airport is Townsville Airport. The regional airports include Charters Towers Airport, Proserpine/Whitsunday Coast Airport, Mackay Airport, Moranbah Airport, Clermont Airport and Emerald Airport. The closest local regional airports to the NGBR Project are Proserpine/Whitsunday Coast Airport and Moranbah.

The existing bulk ports within the vicinity of the NGBR Project include:

- Port of Townsville
- Port of Mackay

- Port of Abbot Point
- Port of Hay Point (including Dalrymple Bay Coal Terminal and Hay Point Coal Terminal).

The Ports of Townsville and Abbot Point would provide facilities suitable for the import of construction materials, components and pre-assembled modules for construction of the NGBR Project.

No future transport infrastructure upgrades are planned which are relevant to the NGBR Project with the exception of upgrading of the Bruce Highway and improvement works occurring on the Bowen Developmental Road.

An assessment of the potential impacts of the NGBR Project on existing traffic conditions and transport infrastructure is provided in Volume 1 Chapter 14 Transport.

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145 Ann Street Brisbane QLD 4000

GPO Box 668 Brisbane QLD 4001

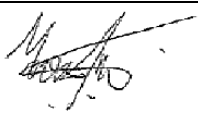

T: (07) 3316 3000 F: (07) 3316 3333 E: bnemail@ghd.com

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