
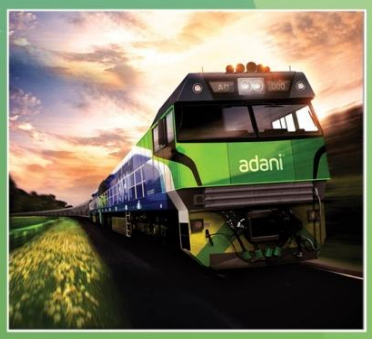

Adani Mining Pty Ltd

NORTH GALILEE BASIN RAIL PROJECT

Environmental Impact Statement

Appendix D Scenic amenity and lighting

November 2013

This North Galilee Basin Rail Project scenic amenity and lighting 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 Purpose") and may not be used by, or relied on by any entity 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.

The Report is based on conditions encountered and information reviewed, including assumptions made by GHD, at the time of preparing the Report. Assumptions made by GHD are contained through the Report, including (but not limited to) concept design and operations information provided by Adani.

To the maximum extent permitted by law GHD expressly disclaims responsibility for or liability arising from:

- *any error in, or omission in connection with assumptions, or*
- *reliance on the Report by a third party, or use of the Report other than for the Purpose.*

Executive summary

This scenic amenity and lighting report describes the existing visual environment of the North Galilee Basin Rail Project (NGBR Project). The study area for this report was defined by the area in which the NGBR Project could be seen, as inferred from desktop assessment.

For descriptive purposes, the landscape of the study area was divided into six landscape character units (LCUs). Land within a given LCU would be expected to have common landscape characteristics and sensitivity to visual change. The landscape of the study area was comprised of the following six broad landscape character units:

- LCU 1 – Coastal
- LCU 2 – Port
- LCU 3 – Mining
- LCU 4 – Coastal Lowland Valleys
- LCU 5 – Inland Valleys
- LCU 6 – Upland and Mountains.

To cope with the large number of locations from which the NGBR Project may be viewed, a series of key viewing locations was selected where the volume or sensitivity of potentially sensitive visual receptors was relatively high.

A total of 32 viewing locations were assessed, representing nine roads and 23 homesteads. Zones of Theoretical Visibility (ZTV) were generated for views representing homesteads. Given the transient nature of views from roads, ZTVs were not generated.

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Terms and abbreviations

Terms and abbreviations	Definition
Adani	Adani Mining Pty Ltd
AHD	Australian Height Datum
Background view/long distance	Six – 16 km - Textures are no longer visible, but mountain and valley forms, skylines and ridgelines are important (Forest Practice Board Tasmania, 2006)
Cut	An excavation for constructing below the natural ground level
DERM	Former Queensland Department of Environment and Resource Management
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
Fill	Earth used to construct an embankment
Final NGBR Project footprint	The final rail corridor (nominal 100 m wide corridor) including all ancillary activities will be known as the 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. Temporary construction facilities are expected to include laydown areas, construction depots (warehousing, fuel storage, vehicle storage, administration facilities, etc.), sleeper manufacturing yards, construction accommodation camps, quarries and borrow pits, access tracks into the corridor and other necessary infrastructure associated with the construction functions of the NGBR Project.
Final rail corridor	The final rail corridor is a nominal 100 m wide corridor
Foreground view/short distance	Zero to one kilometre – Is the visual zone where colour contrast and textural detail are most clearly perceived (Forest Practice Board Tasmania, 2006).
Landscape feature	A component, part or feature of the landscape that is prominent or eye-catching, e.g. hills, buildings, vegetation
Landscape quality	Largely subjective judgement based on particular characteristics that influence the way in which the environment is experienced, including special interests such as cultural associations or heritage interests, the presence and/or type of elements and condition
Landscape sensitivity	The extent to which landscape can accept a change of a particular type and scale without unacceptable adverse impacts on its character
Landscape value	Areas of formally designated landscape that through national or local consensus, reflect the value placed by society on particular environments and/or their features
LCU	Landscape Character Unit
LGA	Local Government Area

Terms and abbreviations	Definition
Middleground view /medium distance	One to six kilometres – different elements in the landscape are visually apparent (Forest Practice Board Tasmania, 2006)
NGBR	North Galilee Basin Rail
Preliminary investigation corridor	The preliminary investigation corridor is a 1,000 m wide corridor
Sensitive visual receptor	Person and/or viewer group that has the potential to experience an impact
State-controlled roads	Road classification is an indication of the functional role a road plays within a region. The Department of Transport and Main Roads has jurisdiction over roads of State or regional significance and has four administrative classifications in its hierarchy of roads, herein all referred to as State-controlled roads. These are: • National Highway • State Strategic Road • Regional Road • District Road
Study area	The visual catchment of the NGBR Project
the NGBR Project	North Galilee Basin Rail Project
TOR	Terms of Reference
Viewing locations	Viewing locations are used in this report to typify the views experienced by potentially sensitive visual receptors throughout the visual catchment of the proposal. Viewing locations in this report often represent a viewing area, rather than one exact point
Visual amenity	The value of a particular area or view in terms of what is seen
Visual catchment	Extent of potential visibility to or from a specific area, feature or proposal
Visual impact	Changes in the appearance of the landscape or in the composition of available views as a result of development; and people's responses to these changes and the overall impact to visual amenity. This can be positive (i.e. beneficial or an improvement), negative (i.e. adverse or a detraction) or neutral (neither enhance nor detract)
ZTV	Zone of Theoretical Visibility

1. Introduction

1.1 Project overview

Adani Mining Pty Ltd (Adani) proposes the construction and operation of the North Galilee Basin Rail Project (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.

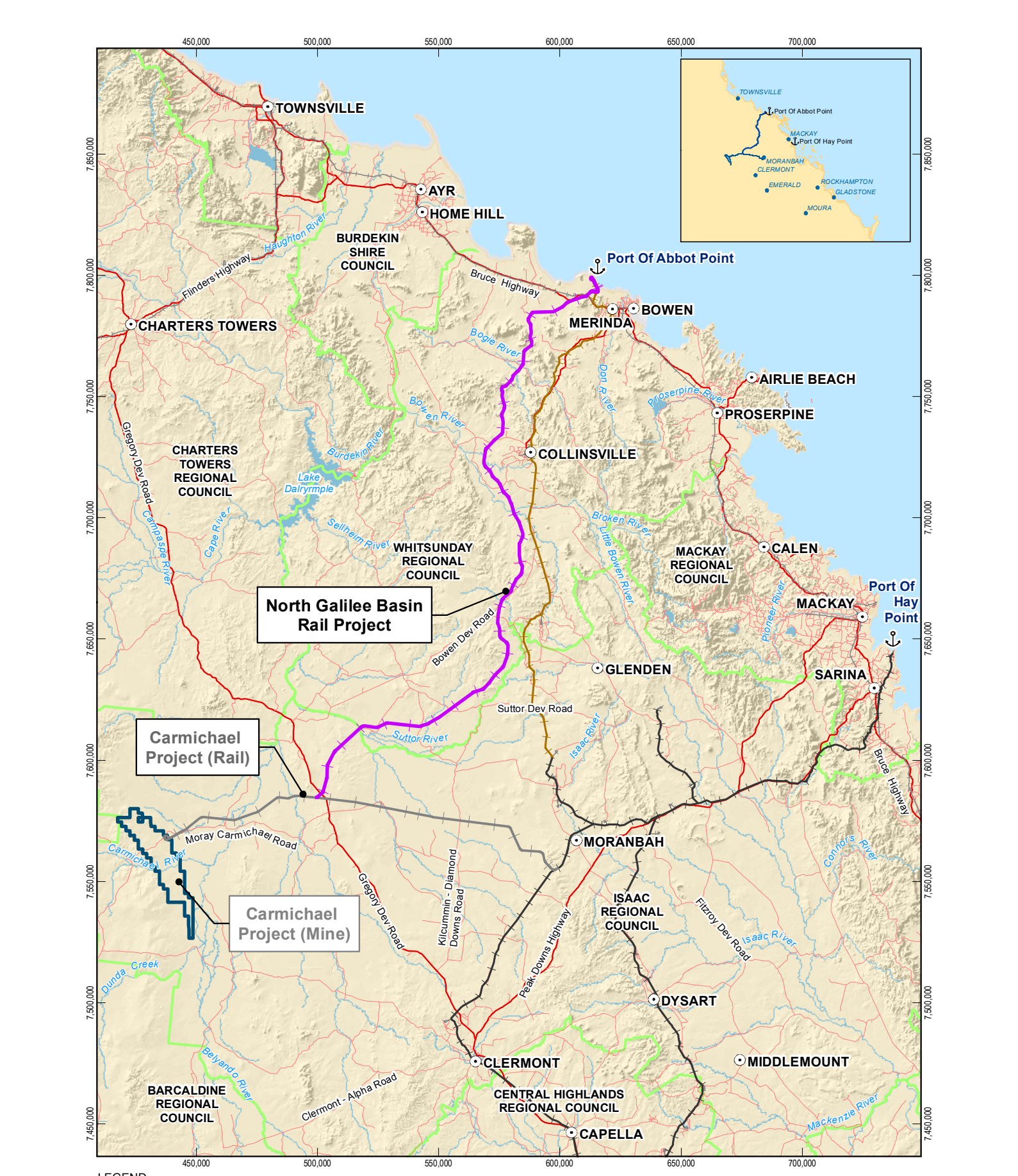
During construction, quarries and borrow pits within acceptable haulage distances will be required to provide a cost effective source of fill, gravel, aggregate and ballast. The number and location of borrow pits and quarries will be investigated further during detailed design and each may require screening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

1.2 Scope of report

The purpose of this scenic amenity and lighting report is to describe the existing scenic amenity values of relevance to the NGBR Project. The scope of this report was defined by the following tasks:

- Characterisation of existing environment within visual catchment of the NGBR Project
- Identification of focal points, landmarks, waterways and other features contributing to the landscape quality of the area
- Identification of sensitive receptors and viewing locations
- Development of zone of theoretical visibility at each sensitive receptor and viewing location
- Development of criteria to describe landscape sensitivity and modification of views.

This scenic amenity and lighting report was prepared in accordance with the Terms of Reference (TOR) for the NGBR Project. A table that cross-references the contents of this report and the TOR is included in Volume 2 Appendix A TOR cross-reference.



LEGEND

- Town
- Major Port
- Other Rail Network
- Goonyella System
- Newlands System
- Major Road
- Local Road
- Watercourse
- Local Government Area
- Carmichael Project (Rail)
- North Galilee Basin Rail
- Carmichael Project (Mine)

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

N

Adani Mining Pty Ltd

North Galilee Basin Rail Project

Project location

Job Number 41-26457
Revision B
Date 29 Aug 2013

Figure 1-1

G:\41\26457\06 GIS\Maps\MXD\0001_Overview\41_26457_0005_rev_b.mxd

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

Data Source: © 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).

2. Methodology

2.1 Study area

The study area for the purpose of this scenic amenity and lighting report was defined by the visual catchment of the NGBR Project, or the area from which the NGBR Project could reasonably be seen. The visual catchment was determined through a review of the North Galilee Basin Rail Concept Design Report (Aarvee Associates 2013), aerial photographs and topographic maps. Landform and vegetation screening were also considered in determining the visual catchment.

2.2 Data sources

This scenic amenity and lighting report relied on the following data sources:

- Aerial photography
- Topographic maps with contours at 10 m (Department of Environment and Resource Management (DERM) 2010)
- Burdekin Catchment 25 m Digital Elevation Model (DEM) (DNRM 2013)
- Hillshade (Shuttle Radar Topography Mission Shaded Relief)
- Road network maps (DERM 2010)
- Rail network maps (DERM 2007)
- Proposed rail alignments
- Homestead locations (GA 2007)
- Cadastral maps (DERM 2012)
- Water course maps (GA 2007)
- Digital Cadastral Database (DCDB) to delineate protected areas (DERM 2011)
- Local Government Area (LGA) boundaries
- Interim Biogeographic Regionalisation for Australia (IBRA; DEH 2005)
- Survey maps from field work.

2.3 Legislation and guidelines

Legislation relevant to this scenic amenity and lighting report is as follows:

- *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)
- *Native Title Act 1993*
- *Vegetation Management Act 1999*
- *Aboriginal Cultural Heritage Act 2003*
- *Sustainable Planning Act 2009.*

There are no guidelines for the assessment of landscape and visual effects specific to Australia. This assessment has followed standard industry practice which is to refer to the Guidelines for Landscape and Visual Impact Assessment 2rd edition (2002) published by The Institute of Landscape Architects and the Institute for Environmental Management and Assessment (UK).

Generally, terminology and assessment methods have been derived from Visual Landscape Planning in Western Australia, produced by the Western Australian Planning Commission (2007) and A Manual for Forest Landscape Management (2006) produced by the Forest Practice Board of Tasmania.

2.4 Desktop assessment

The methodology for the scenic amenity and lighting assessment responds to particular requirements and constraints including the scale and nature of the NGBR Project.

The desktop study includes a review of publicly available information (refer Section 2.2) and relevant legislation and guidelines (refer Section 2.3).

2.4.1 Identification of sensitive receptors

Potential sensitive visual receptors were identified with the aid of mapping data sources (refer Section 2.2) and a site survey (refer Section 2.5). Sensitive visual receptors are defined as a person and/or viewer group that would experience a potential impact. They are taken from viewing locations where the NGBR Project may be visible to residents, or areas where visitors spend extended amounts of time. Sensitive receptors include homesteads as well as areas from which fixed or transient views would be possible, but where the time of stay is shorter, such as roads and rail lines. Sensitive receptors are listed in Section 3.3.

2.4.2 Calculation of zone of theoretical visibility

A zone of theoretical visibility (ZTV) is the theoretic assessment of visibility to or from a designated point in the landscape using elevation data to calculate the extent of visibility of that point from anywhere in the study area. The mapping does not take account of buildings or vegetation screening and hence reflects a ‘bare-earth landscape’, which for the visual impact assessment process represents the "worst case scenario". The ZTV generated for this assessment is based on Burdekin Catchment 25 m DEM (DNRM 2013) and an observer eye height of 1.7 m. A ZTV was generated for each of the homesteads identified within five kilometres of the preliminary investigation corridor (refer Appendix A).

2.4.3 Definition of landscapes and landscape character areas

For the purpose of the assessment, the definition of a landscape encompassed the following:

- Landscape character and context
- Views and prospects
- Historical landscapes
- Anthropogenic landscapes.

Landscape character areas are considered to be common landscape types (defined by features and characteristics) and highlight any principal landscape features. A description of the landscape character differentiates between subjective assessments and objective description, and is provided from both within the study area, and from the wider landscape.

The categorising of the landscape character areas include:

- Landform
- Vegetation
- Intensity
- Character of land.

Landscape categorisation was informed by a review of information during the desktop study. Particular attention was paid to the relevant regions/subregions selected from the Interim Biogeographic Regionalisation for Australia regions and subregions (IBRA; DEH 2005). This national data set, which classifies the land surface of Australia, is derived from specialist ecological knowledge and the assessment of climate, geomorphology, landform, lithology, and characteristic flora and fauna (IBRA; DEH 2005). These attributes are useful in defining landscape character.

2.5 Site survey

A site survey was undertaken to verify the following aspects of the desktop assessment:

- Characterisation of the landscape
- Identification of sensitive receptors
- Views and visibility from sensitive receptors.

The site survey was conducted in May 2013 by two qualified landscape architects, during conditions of good visibility.

Representative public and private viewing locations were selected, recorded and photographed. Viewing locations were selected to represent typical views from sensitive receptors and views of particular visual features of importance.

2.6 Limitations

The level of detail of this scenic amenity and lighting report was limited to the information provided in the North Galilee Basin Rail Concept Design Report (Aarvee Associates 2013) and publicly available information.

Key viewing locations were selected as the most sensitive viewing locations or where the NGBR Project is likely to be viewed by the greatest number of people. Permission to access some viewing locations was not granted at the time of the survey. In such cases, the nearest publicly accessible viewing location was used in combination with a desktop assessment.

3. Existing environment

3.1 Overview

The following sections provide an overview of the existing landscape character and viewing location in the vicinity of the NGBR Project preliminary investigation corridor. This assessment reviews the land use, landform, vegetation, surface water and how they influence the landscape character of the study area. Site wide land use, topography and landscape features contribute directly to landscape character and visual amenity.

3.2 Landscape character units

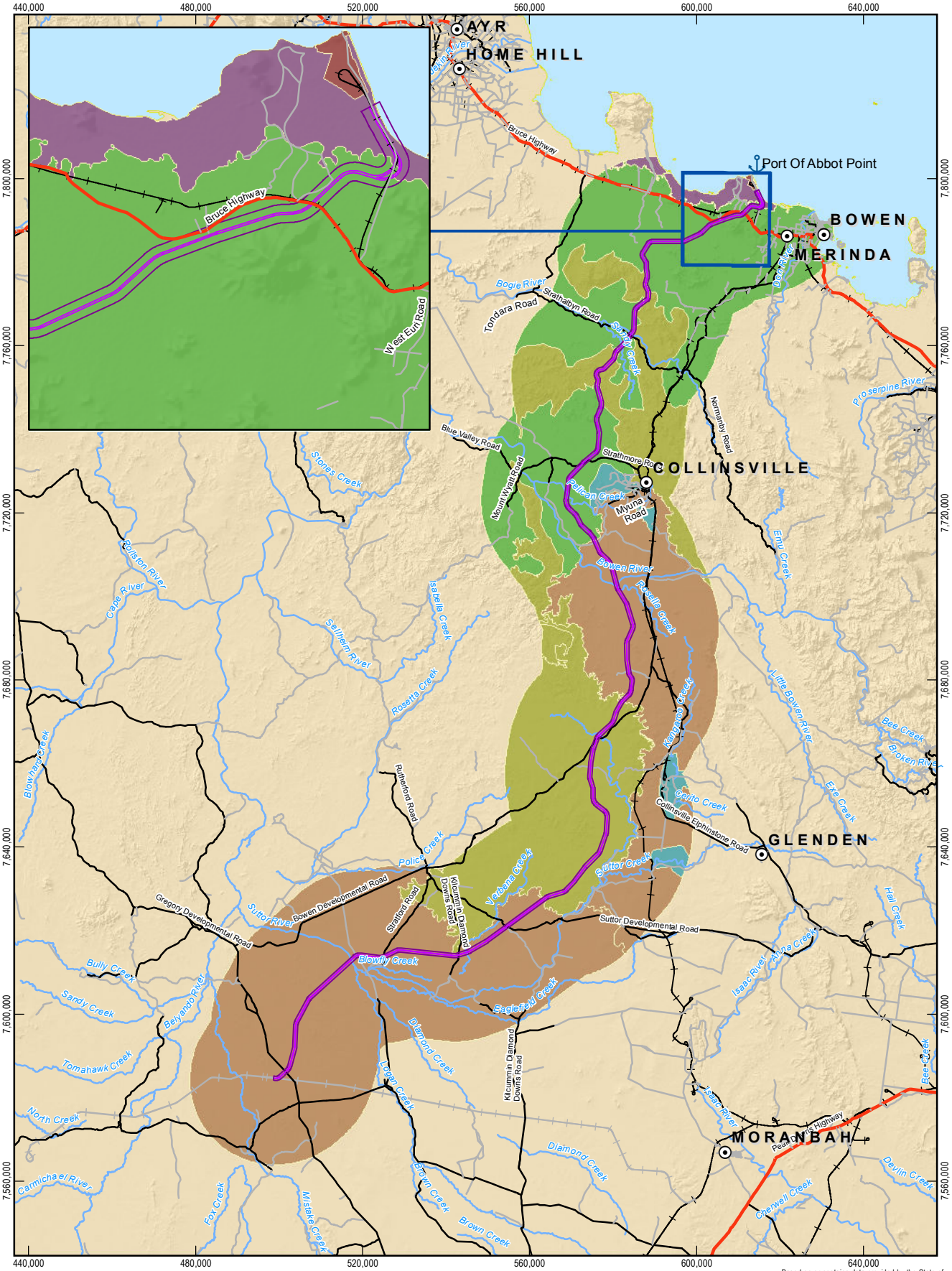
The study area has been divided into six Landscape Character Units (LCUs) to identify those areas that share common landscape features and visual characteristics. Categorisation by LCU enables general statements to be made about landscapes and their sensitivity, although it should be recognised that landscapes surrounding the NGBR Project vary with land use, orientation and exposure.

The elements that contribute to the identification of LCUs include landform, vegetation, surface water, land use, significant features and views of the study area.

The LCUs recognised for this assessment are:

- LCU1 – Coastal
- LCU2 – Port
- LCU3 – Mining
- LCU4 – Coastal Lowland Valleys
- LCU5 – Inland Valleys
- LCU6 – Upland and Mountains.

The LCUs are mapped in Figure 3-1 and described in detail below.



LEGEND

- Population Centres
- Major Port
- Highway
- Main Road
- Local Road
- Carmichael Project (Rail)
- Railway
- Watercourse (Major)

Landscape Character Areas
- Coastal
- Coastal Lowland Valleys
- Inland Valleys
- Mining
- Port
- Upland & Mountains

- North Galilee Basin Rail 1000m Corridor
- North Galilee Basin Rail 100m Corridor

1:1,300,000 Paper Size A4

0 10 20 40

Kilometres

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

N

Adani Mining Pty Ltd
North Galilee Basin Rail Project

Job Number	41-26457
Revision	B
Date	28 Aug 2013

Landscape Character Areas

Figure 3-1

145 Ann Street Brisbane QLD 4000 Australia T 61 7 3316 3000 F 61 7 3316 3333 E bnemail@ghd.com W www.ghd.com

Data source: GA: Populated Places, Railway, Watercourse/2007; Adani: NGBR Corridor 13/05/2013, NGBR Corridor 06/06/2013, Camichael Rail Project/2013; DNRM: Roads/2010; GHD: Landscape Character Areas/2013, Created by:MS

3.2.1 LCU1 - Coastal

The Coastal LCU is shown in Plate 3-1 and Plate 3-2. The landscape character elements are provided in Table 3-1.

Plate 3-1 View along beach in LCU 1

Plate 3-2 View towards low coastal area of LCU 1

Table 3-1 LCU1 – Coastal landscape character elements and assessment

LCU1 - Coastal	
Landscape/visual element	Description
Location	LCU 1 is the coastal region to the north of the study area. This coastal zone is adjacent to the Great Barrier Reef World Heritage Area (GBRWHA). The NGBR Project preliminary investigation corridor is located within this LCU between chainage 6.80 km and 7.00 km.
Landform and significant landscape features	The topography is generally low and flat coastal plains (elevation less than 10 m) with prominent isolated hills (280 m). There are beaches along the shorelines.
Vegetation	Low coastal heath and scrub with areas of bushland.
Water	Coastal waters Caley Valley wetlands (adjacent to the Port of Abbot Point) Rivers and tidal floodplains.
Land use	Two protected areas to the west (Abbot Bay Resources Reserve, Cape Upstart National Park) and adjacent to GBRWHA Rural (grazing).

3.2.1 LCU2 - Port

The Port LCU is shown in Plate 3-3 and Plate 3-4. The landscape character elements are provided in Table 3-2.

Plate 3-3 View of Port activities

Plate 3-4 View of Port and rail activities

Table 3-2 LCU2 - Port

LCU2 - Port	
Landscape/visual element	Description
Location	LCU 2 consists of the area around the Port of Abbot Point in the coastal region to the north of the study area. The Port of Abbot Point is adjacent to the GBRWHA. The NGBR Project preliminary investigation corridor is located within this LCU between chainage 0.00 km in the north to 6.80 km and 6.50 km in the south.
Landform and significant landscape features	The topography is generally low and flat coastal plains (elevation less than 10 m) with hill (45 m) to the north of LCU 2. There are beaches along the shorelines to the east.
Vegetation	Low to medium height coastal heath and scrub.
Water	Coastal Waters (adjacent to the Port of Abbot Point) Caley Valley wetlands (adjacent to the Port of Abbot Point).
Land use	Industrial port activities Coal handling and stockpiles areas Single trestle jetty with conveyor connection to berth located 2.75 km off-shore Rail infrastructure and operations.

3.2.1 LCU3 - Mining

The Mining LCU is shown in Plate 3-5 and Plate 3-6. The landscape character elements are provided in Table 3-3.

Plate 3-5 Typical view of mining infrastructure

Plate 3-6 Typical view of mine overburden bund

Table 3-3 LCU3 - Mining

LCU3 - Mining	
Landscape/visual element	Description
Location	LCU 3 consists of areas of commercial mining operations. There is one mine located within the study area at Collinsville and a number of other mines in the wider area. The NGBR Project preliminary investigation corridor is not located within this LCU.
Landform and significant landscape features	These heavily modified areas consist of the following elements: Deep extraction areas Large berms of excess soil and materials.
Vegetation	Generally cleared areas with some natural regeneration in places.
Water	Water retention and settlement ponds Natural and modified watercourses.
Land use	Active extractive activities Ancillary infrastructure Coal handling and stockpile areas Rail infrastructure.

3.2.1 LCU4 – Coastal Lowland Valleys

The Coastal Lowland Valleys LCU is shown in Plate 3-7, Plate 3-8 and Plate 3-9. The landscape character elements are provided in Table 3-4.

Plate 3-7 Typical short distance view in Coastal Lowland Valleys LCU

Plate 3-8 Typical medium distance view in Coastal Lowland Valleys LCU

Plate 3-9 Typical long distance view in Coastal Lowland Valleys LCU

Plate 3-10 Typical long distance view in Coastal Lowland Valleys LCU

Table 3-4 LCU4 – Coastal Lowland Valleys

LCU4 – Coastal Lowland Valleys	
Landscape/visual element	Description
Location	The areas defined as the Coastal Lowland Valleys is generally located between the Bruce Highway in the north to east of Collinsville. The NGBR Project preliminary investigation corridor is located within this LCU between: • Chainage 6.50 km and 7.00 km to 46.60 km • Chainage 52.60 km to 59.20 km • Chainage 60.70 km to 66.30 km • Chainage 76.70 km to 119.800 km.
Landform and significant landscape features	The topography consists of gentle undulating low plains with isolated hills. Many views in the areas are framed by prominent hills and mountains in the distance (LCU6).
Vegetation	Cleared broad acre pasture/grazing land with rough, native grasslands on flatland areas Some areas have scattered/clumped acacia/eucalypt species Native stands of trees often intersect pastures and line road edges.
Water	The major rivers include: • Bowen River • Pelican Creek • Rosella Creek • Suttor Creek • Verbena Creek. Possible flood plains in low-lying areas in wet season Numerous ephemeral creeks and drainage lines with riparian zones and degraded non-wooded drainage lines.
Land use	Rural (grazing) Sparse rural-residential properties Main settlements in the area are Collinsville, and the small village of Mount Coolon Sealed roads: • Bruce Highway (State-controlled road) • Bowen Developmental Road (State-controlled road) Unsealed roads: • Strathalbyn Road (local council road) • Strathmore Road (local council road) The North Coast Line is a freight and passenger line located near the coast running in an east-west direction The Collinsville Newlands Branch Line is a freight line that runs in a north-south direction.

3.2.1 LCU5 – Inland Valleys

The Inland Valleys LCU is shown in Plate 3-11, Plate 3-12, Plate 3-13 and Plate 3-14. The landscape character elements are provided in Table 3-5.

Plate 3-11 Typical short distance view in Inland Valleys

Plate 3-12 Typical medium distance view in Inland Valleys

Plate 3-13 Typical long distance view in Inland Valleys

Plate 3-14 Typical long distance view in Inland Valleys

Table 3-5 LCU5 – Inland Valleys

LCU5 – Inland Valleys	
Landscape/visual element	Description
Location	The area defined as the Inland Valleys is located between Collinsville in the north to east of the Gregory Developmental Road. The NGBR Project preliminary investigation corridor is located within this LCU between: Chainage 119.90 km and 162.30 km Chainage 220.00 km and 306.90 km.
Landform and significant landscape features	The topography consists of gentle undulating plains with views to the Wyarra Hills to the west; Leichhardt ranges to the north and Redcliffe tableland to the east.
Vegetation	Cleared broad acre pasture/grazing land with rough, native grasslands on flatland areas Some areas have scattered/clumped acacia/eucalypt species Native stands of trees often intersect pastures and line road edges.
Water	The major rivers in the area include: • Bogie River • Sandy Creek • Bowen River • Pelican Creek Numerous ephemeral creeks and drainage lines with riparian zones and degraded non-wooded drainage lines.
Land use	Rural (grazing) Sparse rural-residential properties Collinsville is the main settlement in the area. Sealed roads : • Gregory Developmental Road (State-controlled road) • Bowen Developmental Road (State-controlled road) Unsealed roads • Myuna Road (local council road) • Suttor Developmental (State-controlled road) • Glenavon Road (local council road) • Stratford Road (local council road) The Collinsville Newlands Branch Line is a freight line that runs in a north-south direction from the Port of Abbot Point to Newlands mine. The Newlands System is a freight rail line that runs in a north-south direction from Newlands mine to Goonyella mine.

3.2.1 LCU6 – Upland and Mountains

The Upland and Mountains LCU is shown in Plate 3-15 and Plate 3-16. The landscape character elements are provided in Table 3-6.

Plate 3-15 Typical short distance view in Upland and Mountains

Plate 3-16 Typical medium distance view in Upland and Mountains

Table 3-6 LCU6 – Upland and Mountains

LCU6 – Upland and Mountains	
Landscape/visual element	Description
Location	This area consists of the Leichhardt Range and the Clarke Range and its associated peaks of Mount Abbot, Mount Aberdeen, Mount Herbert, The Twins, Wyarra Hills. The NGBR Project preliminary investigation corridor is located within this LCU between: • Chainage 46.70 km and 52.50 km • Chainage 59.30 km and 60.60 km • Chainage 66.40 km and 76.60 km • Chainage 162.40 km and 219.90 km.
Landform and significant landscape features	The Upland and mountains LCU has raised areas with prominent ridges and steep hills with flat areas between them. These areas forms part of the Great Dividing Range.
Vegetation	Open native grassy woodland on rocky outcrops/slopes Dense coverage of vegetation with approximate 50 per cent canopy cover in areas. The species in the area are casuarina with eucalypt and acacia species.
Water	The major rivers in the area include: • Bogie River • Bowen River

LCU6 – Upland and Mountains	
Landscape/visual element	Description
	• Sandy Creek. Numerous ephemeral creeks and drainage lines with riparian zones and degraded non-wooded drainage lines.
Land use	Rural (grazing) Sparse rural-residential properties Sealed roads • Bowen Developmental Road (State-controlled road). Unsealed roads • Strathalbyn Road (local council road) • Glenavon Road (local council road) • Stratford Road (local council road). Limited other roads which are generally restricted to unsealed roads and tracks some with low-level concrete stream crossings. Three Nature Refuges (NR): • Aberdeen NR (approximately 7.5 km to final rail corridor) • Mount Pleasant NR (approximately 7.5 km to final rail corridor) • Hells Gate NR (approximately nine kilometres to final rail corridor). Two National Parks (NP): • Mount Aberdeen NP (approximately four kilometres to the final rail corridor) • Mount Abbot NP (approximately nine kilometres to final rail corridor).

3.3 Viewing locations and Sensitive Visual Receptors

Due to the large number of locations from which the NGBR Project may be viewed, a representative series of key viewing locations was selected where the volume or sensitivity of sensitive visual receptors was relatively high.

Residential properties likely to be impacted by the NGBR Project were identified through desktop study, generation of ZTVs and site assessments. It was considered that residential properties likely to be impacted by the NGBR Project were those within five kilometres of the final rail corridor. Viewing locations are presented in Figure 3-2 and described in Sections 3.1.1 to 0. A ZTV has been calculated for each viewing location and these are located in Appendix A.

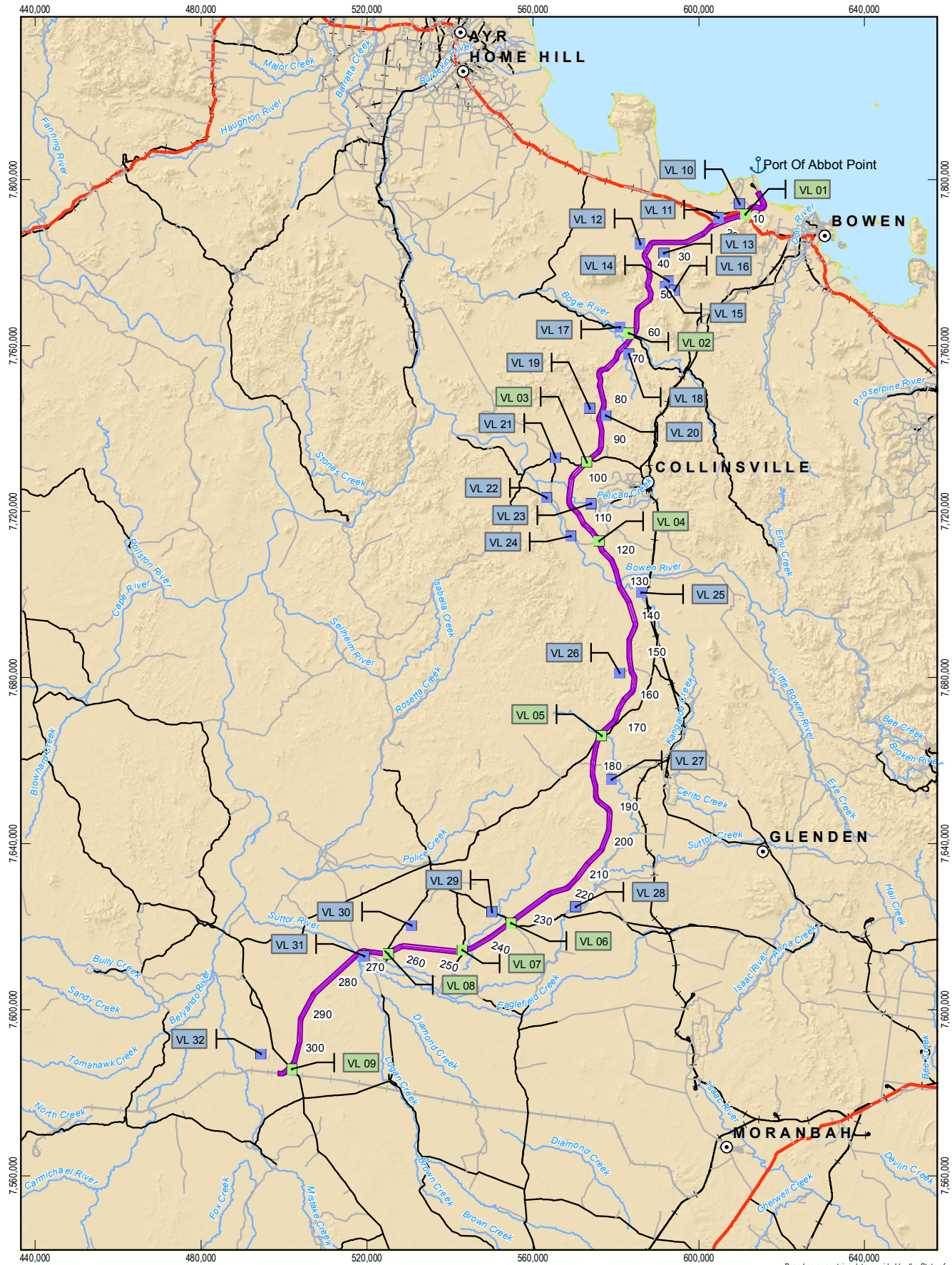
Table 3-7 Viewing locations

Viewing location	Description
Viewing location 1	Bruce Highway Intersection
Viewing location 2	Strathalbyn Road Intersection
Viewing location 3	Strathmore Road Intersection
Viewing location 4	Myuna Road Intersection
Viewing location 5	Bowen Developmental Road Intersection
Viewing location 6	Suttor Developmental Road Intersection
Viewing location 7	Glenavon Road Intersection
Viewing location 8	Stratford Road
Viewing location 9	Gregory Developmental Road Intersection
Viewing location 10	Homestead 1
Viewing location 11	Homestead 2
Viewing location 12	Homestead 3
Viewing location 13	Homestead 4
Viewing location 14	Homestead 5
Viewing location 15	Homestead 6
Viewing location 16	Homestead 7
Viewing location 17	Homestead 8
Viewing location 18	Homestead 9
Viewing location 19	Homestead 10
Viewing location 20	Homestead 11
Viewing location 21	Homestead 12
Viewing location 22	Homestead 13
Viewing location 23	Homestead 14

Viewing location	Description
Viewing location 24	Homestead 15
Viewing location 25	Homestead 16
Viewing location 26	Homestead 17
Viewing location 27	Homestead 18
Viewing location 28	Homestead 19
Viewing location 29	Homestead 20
Viewing location 30	Homestead 21
Viewing location 31	Homestead 22
Viewing location 32	Homestead 23

3.1 Lighting

The existing environment has little anthropogenic lighting influences, with the exception of lit areas in the vicinity of existing roads, mines, rail and port infrastructure.



LEGEND

- Population Centres
- Major Port
- Sensitive Visual Receptor Locations
- Road Intersections
- Homesteads
- Highway
- Main Road
- Local Road
- Railway
- Watercourse (Major)
- Carmichael Project (Rail)
- North Galilee Basin Rail 1000m Corridor
- North Galilee Basin Rail 100m Corridor

1:1,300,000 Paper Size A4

0 10 20 40

Kilometres

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

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Adani Mining Pty Ltd
North Galilee Basin Rail Project

Job Number	41-26457
Revision	A
Date	29 Aug 2013

Viewing Locations

Figure 3-2

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145 Ann Street Brisbane QLD 4000 Australia T 61 7 3316 3000 F 61 7 3316 3333 E bnemail@ghd.com W www.ghd.com

Data source: GA: Populated Places, Railway, Watercourse/2007; Adani: NGBR Corridor 13/05/2013, NGBR Corridor 06/06/2013, Camichael Rail Project/2013, Chainage/2013; DNRM: Roads/2010; GHD/GA/Adani: Sensitive Visual Receptor Locations/2013. Created by:MS

3.1.1 Viewing location 1: Bruce Highway

The Bruce Highway is a State-controlled highway running from Cairns in the north to Brisbane in the south as shown in Plate 3-17, and described in Table 3-8.

Plate 3-17 View southeast from entrance to Bruce Highway

Table 3-8 Viewing location 1: Bruce Highway

Viewing location 1	
Landscape/visual element	Description
Location	This viewing location is approximately 21 km northwest of Bowen.
Landform and significant landscape features	Landscape is a gently undulating plain with steep isolated ridges to the south. The road is at an approximate height of 6 m Australian Height Datum (AHD) at this location.
Vegetation	Primarily cleared agricultural pasture with scattered and clumped eucalypt species and shrubs.
Water	Battery Creek to the immediate east of this location. Numerous other creeks and drainage lines with riparian zones and degraded non-wooded drainage lines.
Land use	• Primarily cleared rural pasture • Port of Abbot Point bulk port is located to the north • Bruce Highway, which is a State-controlled highway, runs parallel to the North Coast Line, a freight and passenger line and is located immediately north.
Visual context	Views range from a short to medium distance and are screened/filtered by the steeper topography to the south. Views in this area are primarily composed of: • Agricultural land and associated activities/infrastructure • Rail infrastructure • Rocky treed outcrops and open grasslands. • Views are experienced by local road users and rail passengers.

3.1.2 Viewing location 2: Strathalbyn Road

The Strathalbyn Road is an unsealed local council road, shown in Plate 3-18, and further described in Table 3-9.

Plate 3-18 View southeast on Strathalbyn Road

Table 3-9 Viewing location 2: Strathalbyn Road

Viewing location 2	
Landscape/visual element	Description
Location	Strathalbyn Road runs from the Bowen Developmental Road in the east connecting with Tondara Road in the west, which in turn connects with the Bruce Highway in the north. The viewing location is located approximately 20 km west of Bowen Developmental Road intersection.
Landform and significant landscape features	The landscape is a gently undulating plain with views to a ridge seven kilometres to the east which is composed of Mount Pleasant and Mount Aberdeen. The road is at an approximate height of 152 m AHD in this location.
Vegetation	Primarily cleared open pasture/grazing land with scattered and clumped eucalypt species and shrubs. Areas of eucalypt woodland with medium height canopy towards the Bogie River on northern side of road. Very open across plains to the south with few trees.
Water	Bogie River is located 700 m to the north. There are other drainage lines with riparian zone and degraded non-wooded drainage lines within the area.
Land use	Strathalbyn Road is an unsealed local council road. Primarily agricultural related activities with the majority of the land cleared for grazing.
Visual context	Views range from short to medium in distance. Views range from screened/filtered by steeper topography and woodland to open views across lowland cleared pasture land. Views are composed of hills, open pasture or grasslands and wooded grasslands Mount Pleasant and Mount Aberdeen form a background to medium to long distance views to the east. Views are experienced by local road users and landowners.

3.1.3 Viewing location 3: Strathmore Road

Strathmore Road is an unsealed road local council road, shown in Plate 3-19, and described further in Table 3-10.

Plate 3-19 View southeast on Strathmore Road

Table 3-10 Viewing location 3: Strathmore Road

Viewing location 3	
Landscape/visual element	Description
Location	Strathmore Road runs from the Bowen Developmental Road in the east connecting with Myuna Road and Mount Wyatt Road in the west. This viewing location is located on Strathmore Road approximately 14.5 km west of the intersection with the Bowen Developmental Road.
Landform and significant landscape features	The landscape is gently undulating plain. The road is at an approximate height of 120 m AHD in this location.
Vegetation	Primarily cleared open pasture/grazing land with isolated eucalypt and acacia species and shrubs with regrowth in grasslands.
Water	A number of drainage lines with riparian zone and degraded non-wooded drainage lines within the area.
Land use	Strathmore Road is an unsealed local council road. Primarily agricultural related activities with the majority of the land cleared for grazing.
Visual context	Views range from short to medium distance Views range from screened/filtered by steeper topography and woodland to open views across lowland cleared pasture land Views are composed of hills, open pasture or grasslands and wooded grasslands. Views are experienced by local road users.

3.1.4 Viewing location 4: Myuna Road

Myuna Road is shown in Plate 3-20 and described in Table 3-11. It is a local road running from Collinsville in the east to Strathmore Road in the west.

Plate 3-20 View west on Myuna Road

Table 3-11 Viewing location 4: Myuna Road

Viewing location 4	
Landscape/visual element	Description
Location	Myuna Road runs from Collinsville in the east connecting with Strathmore Road in the west.
Landform and significant landscape features	The landscape is a gently undulating plain. The road is at an approximate height of 150 m AHD in this location.
Vegetation	Primarily cleared pasture/grazing land. Approximately 50 per cent coverage of eucalypt and acacia species and shrubs, grouped in tree clumps or in larger woodland areas.
Water	A number of drainage lines with riparian zone and degraded non-wooded drainage lines within the area that feed into the Bowen River.
Land use	Myuna Road is an unsealed local council road. Primarily agricultural related activities with the majority of the land cleared for grazing.
Visual context	Views range from short to medium in distance Views range from screened/filtered by steeper topography and woodland to open views across lowland cleared pasture land Views are composed of hills, open pasture or grasslands and wooded grasslands. Views are experienced by local road users.

3.1.5 Viewing location 5: Bowen Developmental Road

The Bowen Developmental Road is a State-controlled road that connects Bowen to the Gregory Developmental Road as shown in Plate 3-21, and described in Table 3-12.

Plate 3-21 View west from Bowen Developmental Road

Table 3-12 Viewing location 5: Bowen Developmental Road

Viewing location 5	
Landscape/visual element	Description
Location	This location is on Bowen Developmental Road approximately 23 km south of the junction with Collinsville-Elphinstone Road.
Landform and significant landscape features	This is a raised area which is over 200 m higher than the river plains to the north and south. The road is at an approximate height of 320 m AHD in this location. The landscape consists of undulating hills, with rocky outcrops scattered throughout.
Vegetation	Dense coverage of vegetation with approximate 50 per cent canopy cover. The dominant species in the area is casuarina with eucalypt and acacia species and shrubs also present.
Water	The Bowen River is approximately 710 m to the northeast. A minor creek known as Lily Creek is located to the southeast at an approximate distance of 330 m. This creeks feeds into the Bowen River.
Land use	Bowen Developmental Road is a sealed road State-controlled road. Primarily agricultural related activities.
Visual context	Views are short in distance. Views are screened/filtered by the vegetation cover. Views are experienced by road users.

3.1.6 Viewing location 6: Suttor Developmental Road

The Suttor Developmental Road is a State-controlled road running from the Peak Downs Highway north of Nebo to the Bowen Developmental Road at Mount Coolon as shown in Plate 3-22, and described in Table 3-13.

Plate 3-22 View west on Suttor Developmental Road

Table 3-13 Viewing location 6: Suttor Developmental Road

Viewing location 6	
Landscape/visual element	Description
Location	This viewing location is located approximately 25 km southeast of Mount Coolon on Suttor Developmental Road.
Landform and significant landscape features	The landscape is considered to be a gently undulating plain. The road is at an approximate height of 221 m AHD in this location.
Vegetation	Vegetation cover is composed of grassland with mid-height shrubs and trees. Dominant eucalypt coverage with acacia species, grouped in tree clumps and in larger woodland areas.
Water	Verbena Creek is located to the west at an approximate distance of two kilometres. A number of minor drainage lines with riparian zone and degraded non-wooded drainage lines that feed into the Verbena Creek are also present within the study area.
Land use	Suttor Developmental Road is an unsealed road. Primarily agricultural related activities with the majority of the land used for grazing.
Visual context	Views are short to medium in distance. Views are screened/filtered by the vegetation cover. Views are composed of wooded grasslands. Views are experienced by local road users.

3.1.7 Viewing Location 7: Glenavon Road

The Glenavon Road is an unsealed local road running from Suttor Developmental Road in the north to Diamond Downs-Eaglefield Road in the southeast as shown in Plate 3-23, and described in Table 3-14.

Plate 3-23 View south on Glenavon Road

Table 3-14 Viewing location 7: Glenavon Road

Viewing location 7	
Landscape/visual element	Description
Location	This viewing location is located approximately 14 km south of the intersection with Suttor Developmental Road.
Landform and significant landscape features	The landscape is considered to be a gently undulating plain. The road is at an approximate height of 221 m AHD in this location.
Vegetation	Vegetation cover is composed of grassland with mid-height shrubs and trees. Dominant eucalypt species coverage with acacia species, grouped in tree clumps and in larger woodland areas.
Water	Verbena Creek is located to the east at an approximate distance of 1.8 km. A number of minor drainage lines with riparian zone and degraded non-wooded drainage lines that feed into the Verbena Creek are also present within the area.
Land use	Glenavon Road is an unsealed road. Primarily agricultural related activities with the majority of the land used for grazing.
Visual context	Views are short to medium in distance. Views are screened/filtered by vegetation cover. Views are composed of wooded grasslands. Views are experienced by local road users.

3.1.8 Viewing location 8: Stratford Road

The Stratford Road is an unsealed local council road, running from the Suttor Developmental Road in the north, shown in Plate 3-24, and described further in Table 3-15.

Plate 3-24 View north on Stratford Road

Table 3-15 Viewing location 6: Stratford Road

Viewing location 8	
Landscape/visual element	Description
Location	This viewing location is located on Stratford Road approximately 19.5 km southwest of intersection with Suttor Developmental Road.
Landform and significant landscape features	The landscape is a flat plain in the vicinity of this viewing location. The road is at an approximate height of 203 m AHD in this location.
Vegetation	Vegetation cover is composed of open grassland with scattered shrubs and trees.
Water	Blowfly Creek is located to the south at an approximate distance of 2.3 km. A number of minor drainage lines with riparian zone and degraded non-wooded drainage lines are also present within the area.
Land use	Primarily agricultural related activities with the majority of the land used for grazing. Stratford Road is an unsealed local council road.
Visual context	Views are short to medium in distance. Views are screened/filtered by the vegetation cover. Views are composed of open grassland plains with isolated and grouped trees and shrubs. Views are experienced by local road users.

3.1.9 Viewing location 9: Gregory Developmental Road

The Gregory Developmental Road is a state strategic road running from Charters Tower in the north to Clermont in the south as shown in Plate 3-25, and described in Table 3-16.

Plate 3-25 View north on Gregory Developmental Road

Table 3-16 Viewing location 9: Gregory Developmental Road

Viewing location 9	
Landscape/visual element	Description
Location	This viewing location is located approximately 39 km south of the Belyando Crossing service station/rest area
Landform and significant landscape features	The topography is flat in the vicinity of this viewing location gently rising to high points in the north, east and south.
Vegetation	A combination of broad acre pastures of rough native grassland with scattered shrubs, and areas of dense acacia woodlands.
Water	Low lying plains, may be flooded in wet season. Creeks are located approximately two km to the north-east and south-west of the road.
Land use	Primarily agricultural, used for broad acre cattle grazing. The road is a state strategic road, used for travel between Clermont (south) and Charters Towers (north).
Visual context	The scattered vegetation allows for long and wide views to low lying hills. The dense woodlands provide enclosed, immediate views. Views are experienced by regional and local road users.

3.1.10 Viewing location 10: Homestead 1

The homestead is accessed from the Bruce Highway between Ayr in the northwest and Bowen in the southeast. Views from this area are as shown in Plate 3-26 and Plate 3-27, and described in Table 3-17.

Plate 3-26 View northeast from entrance on Bruce Highway

Plate 3-27 View south from property entrance on Bruce Highway

Table 3-17 Viewing location 10: Homestead 1

Viewing location 10	
Landscape/visual element	Description
Location	The viewing location is 25 km northwest of Bowen on the Bruce Highway. The homestead is located approximately 2.5 km northeast of the property entrance on the Highway. The homestead is located to the north of the highway
Landform and significant landscape features	Low flat landscape with prominent hills to the south at approximate height of 700 m AHD. The residential property is located at an approximate height of 11 m AHD. The land falls to the north towards the coast.
Vegetation	Primarily cleared agricultural pasture on lowland areas with scattered and clumped eucalypt species and shrubs.
Water	Drainage lines with riparian zone and degraded non-wooded drainage lines are present in the area.
Land use	Activities in the local area include port, rail and farming related activities, and have the following land use features. • Primarily cleared lowland agricultural pasture • Bruce Highway, situated immediately to the south • Port of Abbot Point to the north.
Visual context	Views range from a short to medium distance and are screened/filtered by the steeper topography to the south. Views in this area are primarily composed of: • Agricultural land and associated activities/infrastructure • Rail line and the highway

Viewing location 10	
Landscape/visual element	Description
	• Rocky treed outcrops and open grasslands • Views experienced by residents and workers on the station. • A ZTV has been calculated for this location and a map of this can be seen in Appendix A.

3.1.11 Viewing location 11: Homestead 2

The homestead is accessed from the Bruce Highway between Ayr in the northwest and Bowen in the southeast. Views from this area are as shown in Plate 3-28, and described in Table 3-18.

Plate 3-28 View southwest from Homestead 2

Table 3-18 Viewing location 11: Homestead 2

Viewing location 11	
Landscape/visual element	Description
Location	The viewing location is located 28 km northwest of Bowen on the Bruce Highway. There are a number of homesteads on this property which is located to the north of the highway.
Landform and significant landscape features	Low flat landscape with prominent hills to the south at approximate height of 700 m AHD. The residence is located at approximately 12 m AHD. The land falls to the north towards the coast.
Vegetation	Primarily cleared agricultural pasture on lowland areas with scattered and clumped eucalypt species and shrubs. Open grassy woodland on rocky outcrops/slopes.
Water	Splitters Creek classified as a minor watercourse is located to the west at an approximate distance of 700 m. A number of other minor drainage lines with riparian zone and degraded non-wooded drainage lines are also present within the area.

Viewing location 11	
Landscape/visual element	Description
Land use	Activities in the local area include port, rail and farming related activities, and have the following land use features. • Primarily cleared lowland agricultural pasture • Bruce Highway, situated immediately to the south • Port of Abbot Point to the north.
Visual context	Views range from a short to medium distance and are screened/filtered by the steeper topography to the south. Views in this area are primarily composed of: • Agricultural land and associated activities/infrastructure • Rail line and the highway • Rocky treed outcrops and open grasslands. A ZTV has been calculated for this location and a map of this can be seen in Appendix A.

3.1.12 Viewing location 12: Homestead 3

The homestead is accessed via Nevada Road from the Bruce Highway between Ayr in the northwest and Bowen in the southeast. Views from this area are as shown in Plate 3-29, and described in Table 3-19.

Plate 3-29 View southeast from Homestead 3

Table 3-19 Viewing location 12: Homestead 3

Viewing location 12	
Landscape/visual element	Description
Location	The viewing location is located 48 km northwest of Bowen on the Bruce Highway. The homestead is located approximately 15 km south of the Bruce Highway accessed via Nevada Road.
Landform and significant landscape features	Flat topography surrounding homestead with prominent hills in the mid distance. Mount Abbot is located eight kilometres to the southwest, it has an approximate height of 1,056 m AHD. Mount Mackenzie located 12 km to the south-east has an approximate height of 514 m AHD. The residential property is located at approximately 41 m AHD.
Vegetation	Primarily cleared open pasture/grazing land to the west. Creek with woodland dense vegetation with scattered and clumped eucalypts species and shrubs located to the immediate east.
Water	Finley Creek is located to the east at an approximate distance of 250 m to the east of the homestead. Other drainage lines with riparian zone and degraded non-wooded drainage lines present in the wider area.
Land Use	Primarily farming related activities with cleared lowland pasture used for cattle grazing.
Visual Context	Views to the east are of a short distance and are screened/filtered by dense vegetation. A ZTV has been calculated for this location and a map of this can be seen in Appendix A.

3.1.13 Viewing location 13: Homestead 4

The homestead is accessed from the Bruce Highway between Ayr in the northwest and Bowen in the southeast. Views from this area are as shown in Plate 3-30, and described in Table 3-20. Note: Access was not granted at the time of the site visit. Assessment is based on previous visits to the area.

Plate 3-30 View south on Glenore Road towards direction of Homestead 4.

Table 3-20 Viewing location 13: Homestead 4

Viewing location 13	
Landscape/visual element	Description
Location	The viewing location is located 45 km northwest of Bowen on the Bruce Highway. The homestead is located approximately 16 km south of the Highway accessed via Glenore Road.
Landform and significant landscape features	Flat topography surrounding homestead with prominent hills in the mid distance. Mount Abbot range is located approximately 12 km to the southwest and has an approximate height of 1,056 m AHD. Mount Mackenzie is located to the south at a height of approximately 514 m AHD. The residential property is located at approximately 53 m AHD.
Vegetation	Primarily cleared open pasture/grazing land with scattered and clumped eucalypt species and shrubs to the north of the homestead to the boundary fence line. North of the boundary fence line medium to high denser coverage of medium height eucalypt woodland
Water	Butchers Creek is located to the immediate southwest of the homestead. This feeds into the Elliot River which is located 900 m to the northwest of property. There are many other drainage lines with riparian zone and degraded non-wooded drainage lines within the area.
Land use	Primarily farming related activities with cleared lowland pasture used for cattle grazing.
Visual context	Views to the north are of a middle distance and are screened/filtered by vegetation. Mount Elliot, Mount Mackenzie and Mount Abbot form a background to long distance views to the south-east and south-west. These views are experienced by the occupants of the residential property. A ZTV has been calculated for this location and a map of this can be seen in Appendix A.

3.1.14 Viewing location 14: Homestead 5

Homestead 5 is accessed via Thurso Road which connects to Bowen Developmental Road. Views from this area are as shown in Plate 3-31, and described in Table 3-21.

Plate 3-31 View west from Thurso Road at entrance to Homestead 5

Table 3-21 Viewing location 14: Homestead 5

Viewing location 14	
Landscape/visual element	Description
Location	Thurso Road is located approximately 38 km southwest of Bowen on the Bowen Developmental Road. The homestead is located 16 km west on Thurso Road. This viewpoint is located at the entrance gate to Homestead 5 which is approximately 1.2 km south of the homestead.
Landform and significant landscape features	The landscape is a gently undulating plain with two prominent hills that rise steeply. The closest is approximately six kilometres to the west at a height of 528 m AHD with Mount Abbot (1,056 m) 12 km to the west. The homestead is located at approximately height of 66 m AHD.
Vegetation	Primarily cleared open pasture/grazing land with scattered and clumped eucalypt species and shrubs to the west of the homestead for approximately two kilometres. From that point moving west it changes to thicker coverage of medium height vegetation.
Water	Stockyard Creek is located to the west and south of the homestead this feeds into the Elliot River which is located 200 m to the east. There are many other drainage lines with riparian zone and degraded non-wooded drainage lines within the area.
Land use	Primarily farming related activities with cleared lowland pasture used for cattle grazing.
Visual context	The short distance views are filtered by vegetation and topography. The middle ground distance are of two prominent hills that rise steeply in contrast to the flat plains and these form the background to the views in this direction These views are experienced by the occupants of the residential property. A ZTV has been calculated for this location and a map of this can be seen in Appendix A.

3.1.15 Viewing location 15: Homestead 6

Homestead 6 is accessed via Thurso Road which connects to Bowen Developmental Road. Views from this area are as shown in Plate 3-32, and described in Table 3-22.

Plate 3-32 View west from Thurso Road at entrance Homestead 6

Table 3-22 Viewing location 15: Homestead 6

Viewing location 15	
Landscape/visual element	Description
Location	Thurso Road is located approximately 38 km southwest of Bowen on the Bowen Developmental Road. The homestead is located 14 km west on Thurso Road. This viewpoint is located at the entrance gate to Homestead 6 which is approximately 950 m southeast of the homestead.
Landform and significant landscape features	The landscape is a gently undulating plain with two prominent hills that rise steeply. The closest is approximately 5.2 km to the west at a height of 528 m AHD with Mount Abbot (1,056 m AHD) 11.2 km to the west. The homestead is located at approximately height of 74 m AHD.
Vegetation	Primarily cleared open pasture/grazing land with scattered and clumped eucalypt species and shrubs to the west of the homestead. The creek lines located to the west have taller denser vegetation in the riparian zone.
Water	Stockyard Creek is located 100 m to the west of the homestead this feeds into the Elliot River. There are a number of other drainage lines with riparian zone within the area.
Land use	Primarily farming related activities with cleared lowland pasture used for cattle grazing.
Visual context	Views to the west are open with some filtered by vegetation. The short distance views are filtered by vegetation along the creek alignment. The middle ground distance are of two prominent hills that rise steeply in contrast to the flat plains and these form the background to the views in this direction These views are experienced by the occupants of the residential property. A ZTV has been calculated for this location and a map of this can be seen in Appendix A.

3.1.16 Viewing location 16: Homestead 7

Homestead 7 is accessed via Thurso Road which connects to Bowen Developmental Road. Views from this area are as shown in Plate 3-33, and described in Table 3-23.

Plate 3-33 View west from Thurso Road at entrance to Homestead 7

Table 3-23 Viewing location 16: Homestead 7

Viewing location 16	
Landscape/visual element	Description
Location	Thurso Road is located approximately 38 km southwest of Bowen on the Bowen Developmental Road. Homestead 7 is located 11 km west on Thurso Road. This viewpoint is located at the entrance gate to Homestead 7 which is approximately 800 m southeast of the homestead.
Landform and significant landscape features	The landscape is a gently undulating plain with two prominent hills that rise steeply. The closest is approximately seven kilometres to the west at a height of 528 m AHD with Mount Abbot (1,056 m AHD) 13 km to the west. The homestead is located at approximately height of 79 m AHD.
Vegetation	Primarily cleared open pasture/grazing land with scattered and clumped eucalypt species and shrubs to the west of the homestead. The creek lines located to the west have taller denser vegetation in the riparian zone.
Water	There are a number of drainage lines with riparian zone within the area that feeds into the Elliot River.
Land use	Primarily farming related activities with cleared lowland pasture.
Visual context	Views to the west are open with some filtered by vegetation. Some short distance views are filtered by vegetation along the creek alignment. The middle ground distance are of two prominent hills that rise steeply in contrast to the flat plains and these form the background to the views in this direction These views are experienced by the occupants of the residential property. A ZTV has been calculated for this location and a map of this can be seen in Appendix A.

3.1.17 Viewing location 17: Homestead 8

Homestead 8 is located directly adjacent to Strathalbyn Road as shown in Plate 3-34, and described in Table 3-24.

Plate 3-34 View southeast from Homestead 8

Table 3-24 Viewing location 17: Homestead 8

Viewing location 17	
Landscape/visual element	Description
Location	Homestead 8 is located on Strathalbyn Road approximately 23 km west of Bowen Developmental Road intersection. The homestead is located directly adjacent to the road.
Landform and significant landscape features	The landscape is a flat plain with views to a ridge 9.5 km to the east which is composed of Mount Pleasant and Mount Aberdeen. The residential property is located at approximately 132 m AHD.
Vegetation	Primarily cleared open pasture/grazing land with scattered and clumped eucalypt species and shrubs. Areas of eucalypt woodland with medium height canopy towards Bogie River on northern side of road. Very open across plains to the south with few trees.
Water	Bogie River located 300 m to the north of residence. There are also drainage lines with riparian zone and degraded non-wooded drainage lines within the area.
Land use	Primarily agricultural related activities with the majority of the land cleared for grazing, as well as use of Strathalbyn Road.
Visual context	Views range from short to medium in distance. Views range from screened/filtered by steeper topography and woodland to open views across lowland cleared pasture land. Views are composed of hills, open pasture or grasslands and wooded grasslands. Mount Pleasant and Mount Aberdeen form a background to medium to long distance views to the east. These views are experienced by the occupants of the residential property and road users of the Strathalbyn Road. A ZTV has been calculated for this location and a map of this can be seen in Appendix A.

3.1.18 Viewing location 18: Homestead 9

Homestead 9 is located on a private road accessed via Strathalbyn Road as shown in Plate 3-35, and described in Table 3-25.

Plate 3-35 View west from Homestead 9

Table 3-25 Viewing location 18: Homestead 9

Viewing location 18	
Landscape/visual element	Description
Location	Homestead 9 is located on a private road approximately five kilometres to the south of Strathalbyn Road approximately 19 km west of Bowen Developmental Road intersection.
Landform and significant landscape features	Topography is a flat plain with views northwest to a Mount Abbot (1,056 m AHD).
Vegetation	Primarily cleared open pasture/grazing land with scattered and clumped eucalypt species and shrubs. Areas of eucalypt woodland with medium height canopy towards Sandy Creek on western side of homestead.
Water	Sandy Creek is located 950 m to the west of the homestead. There are a number of other drainage lines with riparian zone and degraded non-wooded drainage lines within the area.
Land use	Primarily agricultural related activities with the majority of the land cleared for grazing.
Visual context	Views range from short to medium in distance. Views range from screened/filtered by steeper topography and woodland to open views across lowland cleared pasture land. Views are composed of hills, open pasture or grasslands and wooded grasslands. A ZTV visibility has been calculated for this location and a map of this can be seen in Appendix A.

3.1.19 Viewing location 19: Homestead 10

Homestead 10 is located on a private road accessed via Strathmore Road as shown in Plate 3-36 and described in Table 3-26.

Plate 3-36 View northeast from Homestead 10

Table 3-26 Viewing location 19: Homestead 10

Viewing location 19	
Landscape/visual element	Description
Location	Homestead 10 is located on a private road approximately 15 km to the north of Strathmore Road and approximately nine kilometres west of Bowen Developmental Road intersection.
Landform and significant landscape features	Topography is undulating with an isolated raised hill called Tabletop located 1.3 km to the south.
Vegetation	Primarily cleared open pasture/grazing land with scattered and clumped eucalypt species and shrubs.
Water	There are a number of drainage lines with riparian zone and degraded non-wooded drainage lines within the area that are tributaries of Bowen River.
Land use	Primarily agricultural related activities with the majority of the land cleared for cattle grazing.
Visual context	Views range from short to medium in distance. Views range from screened/filtered by steeper topography and woodland to open views across lowland cleared pasture land. Views are composed of hills, open pasture or grasslands and wooded grasslands. A ZTV visibility has been calculated for this location and a map of this can be seen in Appendix A.

3.1.20 Viewing location 20: Homestead 11

Homestead 11 is located on a private road accessed from Strathmore Road. Views from the homestead are shown in Plate 3-37, and described in Table 3-27.

Plate 3-37 View west from Homestead 11

Table 3-27 Viewing location 20: Homestead 11

Viewing location 20	
Landscape/visual element	Description
Location	Homestead 11 is located on a private road approximately 12 km to the north of Strathmore Road and approximately nine kilometres west of Bowen Developmental Road intersection.
Landform and significant landscape features	Topography is undulating with an isolated raised hill called Tabletop located 2.5 km to the west.
Vegetation	Primarily cleared open pasture/grazing land with scattered and clumped eucalypt species and shrubs.
Water	There are a number of drainage lines with riparian zone and degraded non-wooded drainage lines within the area that are tributaries of Bowen River.
Land use	Primarily agricultural related activities with the majority of the land cleared for cattle grazing.
Visual context	Views range from short to medium in distance. Views range from screened/filtered by steeper topography and woodland to open views across lowland cleared pasture land. Views are composed of hills, open pasture or grasslands and wooded grasslands. A ZTV visibility has been calculated for this location and a map of this can be seen in Appendix A.

3.1.21 Viewing location 21: Homestead 12

Homestead 12 is located directly adjacent to Strathmore Road. Views from the homestead are shown in Plate 3-38, and described in Table 3-28.

Plate 3-38 View east from Homestead 12

Table 3-28 Viewing location 21: Homestead 12

Viewing location 21	
Landscape/visual element	Description
Location	Homestead 12 is located on Strathmore Road approximately 22 km west of the intersection with Bowen Developmental Road. The Myuna Road intersection is located in the immediate vicinity. The homestead is located directly adjacent to the road.
Landform and significant landscape features	Very flat open landscape. There are distant views of mountains to the east. The residential property is located at approximately 91 m AHD.
Vegetation	Primarily cleared open pasture/grazing land with scattered and clumped eucalypt species and shrubs. Medium height vegetation associated with the riparian zones of the creeks within the area.
Water	Strathmore Creek is located 400 m to the north of homestead. There are also drainage lines with riparian zone and degraded non-wooded drainage lines within the area that are tributaries of the Bowen River.
Land use	Primarily agricultural related activities with the majority of the land cleared for cattle grazing. Strathmore Road is an unsealed local council road.
Visual context	Views range from short to long in distance. Views range from screened/filtered by vegetation and topography to open views across lowland cleared pasture land. Views are composed of hills, open pasture or grasslands and wooded grasslands. These views are experienced by the occupants of the residential property and road users of the Strathmore Road. A ZTV for this location can be seen in Appendix A.

3.1.22 Viewing location 22: Homestead 13

Homestead 13 is located directly adjacent to Myuna Road. Views from the homestead are shown in Plate 3-39, and described in Table 3-29.

Plate 3-39 View east from Homestead 13

Table 3-29 Viewing location 22: Homestead 13

Viewing location 22	
Landscape/visual element	Description
Location	Homestead 13 is located on Myuna Road approximately 10 km south of Strathmore Road intersection. The homestead is located directly adjacent to the road.
Landform and significant landscape features	Generally flat landscape. The residential property is located at an approximate height of 106 m AHD.
Vegetation	Cleared pasture/grazing land and grasslands on lowland areas dispersed with eucalypt trees. Areas of eucalypt woodland visible in the distance.
Water	Bowen River located in close proximity to the south of the residence but it is not visible. Other drainage lines with riparian zone and degraded non-wooded drainage lines also present in the area.
Land use	Primarily agricultural related activities with the majority of the land cleared for grazing. One minor unsealed road connects the property to Bowen Developmental Road and Strathmore Road.
Visual context	Views are medium in distance and are open across the cleared pasture lowland. They are composed of, open pasture or grasslands and wooded grasslands. These views are experienced by the occupants of the residential property and road users of the Myuna Road. A ZTV visibility has been calculated for this location and a map of this can be seen in Appendix A.

3.1.23 Viewing location 23: Homestead 14

Homestead 14 is accessed via a private road to the southwest of the Collinsville Mine. It is described in Table 3-30. Access to the property was not granted at the time of the site visit and therefore no photo is available. This assessment is based on previous visits to the area.

Table 3-30 Viewing location 23: Homestead 14

Viewing location 23	
Landscape/visual element	Description
Location	Homestead 14 is located southwest of Collinsville Mine operated by Xstrata Coal, Itochu Coal Resources and Sumitomo.
Landform and significant landscape features	Topography is gently undulating. The mine forms a significant landscape feature. The homestead is located adjacent to the Pelican Creek. Property located at an approximate height of 135 m AHD.
Vegetation	Areas of remanent riparian vegetation predominantly eucalypt with weed species throughout. Primarily cleared open pasture/grazing land and grasslands on lowland areas to the west and south. Cleared open grassy woodland surrounding the mine site to the east.
Water	Pelican Creek is located to the immediate south of the homestead. Drainage lines with riparian zone and degraded non-wooded drainage lines also located in the area.
Land use	Activities in the local area include mining and farming related activities. Collinsville mine which is a large open cut coal mine dominates the local land use. A number of minor (local) unsealed roads connect the mine area to local routes and used for mine and farm access.
Visual context	Views range from short distance and screened/filtered (steeper topography and woodland) to open (lowland cleared pasture land). They are composed of open cut mining and associated activities/infrastructure, rocky treed outcrops, open pasture or grasslands and wooded grasslands. Views are experienced by occupants of residential property. A ZTV visibility has been calculated for this location and a map of this can be seen in Appendix A.

3.1.24 Viewing location 24: Homestead 15

Homestead 15 is located directly adjacent to Myuna Road. The views from the property are shown Plate 3-40, and described in Table 3-32.

Plate 3-40 View northeast from Homestead 15

Table 3-31 Viewing location 24: Homestead 15

Viewing location 24	
Landscape/visual element	Description
Location	Homestead 14 is located on Myuna Road approximately 22 km south of Strathmore Road intersection. The homestead is located directly adjacent to the road.
Landform and significant landscape features	Generally flat landscape with distant views to mountains. The homestead is located at an approximate height of 110 m AHD.
Vegetation	Cleared pasture/grazing land and grasslands on lowland areas dispersed with eucalypt trees. Areas of eucalypt woodland visible in the distance.
Water	Bowen River located in close proximity to the south of the residence but it is not visible. Other drainage lines with riparian zone and degraded non-wooded drainage lines also present in the area.
Land use	Primarily agricultural related activities with the majority of the land cleared for grazing.
Visual context	Views are medium in distance and are open across the cleared pasture lowland. They are composed of, open pasture or grasslands and wooded grasslands. These views are experienced by the occupants of the residential property and road users of the Myuna Road. A ZTV visibility has been calculated for this location and a map of this can be seen in Appendix A.

3.1.25 Viewing location 25: Homestead 16

Homestead 16 is located on a private road accessed off Bowen Developmental Road. Views from are shown in Plate 3-41, and described in Table 3-32.

Plate 3-41 View southwest from entrance to Homestead 16

Table 3-32 Viewing location 25: Homestead 16

Viewing location 25	
Landscape/visual element	Description
Location	Homestead 16 is located on a private road approximately 1.5 km to the southwest of the Bowen Developmental Road entrance. The Newlands System is a freight rail line that runs in a north-south direction from Newlands mine to Goonyella mine and is located at the entrance to the property. The entrance is located approximately 26 km south of Collinsville.
Landform and significant landscape features	The area is a flat river plain. The homestead is situated at approximately 131 m AHD.
Vegetation	Cleared pasture/grazing land and grasslands on lowland areas dispersed with eucalypt trees
Water	Rosella Creek is located 300 m to the west of the homestead. This creek is a tributary of the Bowen River located to the north. Other drainage lines with riparian zone and degraded non-wooded drainage lines also present in the area.
Land use	Primarily agricultural related activities with the majority of the land cleared for cattle grazing.
Visual context	Views to the east are short in distance due to the presence of tall vegetation associated with the riparian zone of Rosella Creek. These views are experienced by the occupants of the homestead. A ZTV visibility has been calculated for this location and a map of this can be seen in Appendix A.

3.1.26 Viewing location 26: Homestead 17

Homestead 17 is located on a private road accessed off Bowen Developmental Road. Views from the homestead are shown in Plate 3-42, and described in Table 3-33.

Plate 3-42 View east from Homestead 17

Table 3-33 Viewing location 26: Homestead 17

Viewing location 26	
Landscape/visual element	Description
Location	Homestead 17 is located on a private road approximately 8.5 km to the west of Bowen Developmental Road and approximately 47 km south of Collinsville.
Landform and significant landscape features	Gently undulating landscape. The land rises to the west in the form of a low long ridge at approximate height of 250 m AHD. The residential property is located at an approximate height of 216 m AHD.
Vegetation	Cleared open pasture/grazing land dispersed with eucalypt trees. A denser area of vegetation is located to the east of the homestead around the dam.
Water	Farm dam located to the east of the homestead. Drainage lines with riparian zone and degraded non-wooded drainage lines also present in the area.
Land use	Primarily agricultural related activities with the majority of the land cleared for grazing. The property is accessed by a private (unsealed) road from Bowen Developmental Road.
Visual context	Views range from short to medium distance and are screened/filtered by topography and woodland to the east and are open cleared pasture land to the north. Views are experienced by the occupants of the residential property. A ZTV visibility has been calculated for this location and a map of this can be seen in Appendix A.

3.1.27 Viewing location 27: Homestead 18

Homestead 18 is located on a private road accessed off Bowen Developmental Road. Views from the homestead are shown in Plate 3-43, and described in Table 3-34.

Plate 3-43 View west from Homestead 18

Table 3-34 Viewing location 27: Homestead 18

Viewing location 27	
Landscape/visual element	Description
Location	Homestead 18 is located on a private road approximately 10 km to the east of Bowen Developmental Road and approximately 47 km northwest of Mount Coolon.
Landform and significant landscape features	Gently undulating landscape. The residential property is located at an approximate height of 303 m AHD.
Vegetation	Dense consistence coverage of vegetation with approximate 50 per cent canopy cover. The dominant species in the area is Casuarina with eucalypt and acacia species and shrubs also present.
Water	Suttor River to the immediate east of residential location. Drainage lines with riparian zone and degraded non-wooded drainage lines also present in the vicinity.
Land use	Primarily agricultural related activities with the majority of the land cleared for grazing. The property is accessed by a private (unsealed) road from Bowen Developmental Road.
Visual context	Views range from short to medium distance and are screened/filtered by densely wooded grasslands. Views are experienced by the occupants of the residential property. A ZTV visibility has been calculated for this location and a map of this can be seen in Appendix A.

3.1.28 Viewing location 28: Homestead 19

Homestead 19 is located on a private road accessed off Suttor Developmental Road. Views from the homestead are shown in Plate 3-44 and Plate 3-45, and described in Table 3-35.

Plate 3-44 View northwest from Homestead 19

Plate 3-45 View north from Homestead 19

Table 3-35 Viewing location 28: Homestead 19

Viewing location 28	
Landscape/visual element	Description
Location	Homestead 19 is located on a private road approximately four kilometres to the north of Suttor Developmental Road and approximately 39 km southeast of Mount Coolon.
Landform and significant landscape features	The land to the northwest of the homestead consists of rolling mountains at an elevated generally over 300 m AHD. The area to the southeast is a river floodplain associated with the Suttor River. The homestead is situated at approximately 263 m AHD.
Vegetation	Dense consistence coverage of medium height vegetation to the northwest. The dominant species in the area is Casuarina with eucalypt and acacia species and shrubs also present.
Water	The Suttor River is located approximately 280 m to the southeast of the homestead. Drainage lines with riparian zone and degraded non-wooded drainage lines that feed into Suttor River also present in the vicinity.
Land use	Primarily agricultural related activities with the majority of the land cleared for cattle grazing.
Visual context	Views are generally characterised by the topography and the presence of local vegetation. Views to the northwest are short distance and are of medium height vegetation Views are experienced by the occupants of the residential property. A ZTV visibility has been calculated for this location and a map of this can be seen in Appendix A.

3.1.29 Viewing location 29: Homestead 20

Homestead 20 is located directly adjacent to Suttor Developmental Road. The views from the homestead entrance are shown Plate 3-46, and described in Table 3-36.

Plate 3-46 View southeast from entrance to Homestead 20

Table 3-36 Viewing location 29: Homestead 20

Viewing location 29	
Landscape/visual element	Description
Location	Homestead 20 is located on Suttor Developmental Road approximately 20 km southeast of Mount Coolon. The homestead is located adjacent to the road.
Landform and significant landscape features	The landscape in the area is a gently undulating plain. The homestead is at an approximate height of 246 m AHD.
Vegetation	Vegetation cover is composed of grassland with mid-height shrubs and trees. Dominant eucalypt coverage with acacia species, grouped in tree clumps and in larger woodland areas.
Water	Verbena Creek is located to the east at an approximate distance of 1.7 km. A number of minor drainage lines with riparian zone and degraded non-wooded drainage lines that feed into the Verbena Creek are also present within the area.
Land use	Primarily agricultural related activities with the majority of the land used for grazing. Glenavon Road is an unsealed local road.
Visual context	Views are short to medium in distance. Views are screened/filtered by the vegetation cover. Views are composed of wooded grasslands. Views are experienced by the occupants of the residential property and local road users. A ZTV visibility has been calculated for this location and a map of this can be seen in Appendix A.

3.1.30 Viewing location 30: Homestead 21

Homestead 21 is located on a private road accessed off Stratford Road. Views from the homestead are shown in Plate 3-47, and described in Table 3-37.

Plate 3-47 View south from Homestead 21

Table 3-37 Viewing location 30: Homestead 21

Viewing location 30	
Landscape/visual element	Description
Location	Homestead 21 is located on a private road approximately 1.5 km to the southeast of Stratford Road. It is approximately 12 km from the entrance to the junction with Suttor Developmental Road and approximately 18 km (in total) southeast of Mount Coolon.
Landform and significant landscape features	The landscape is a flat plain in the vicinity of this viewing location. The homestead is at an approximate height of 217 m AHD.
Vegetation	Vegetation cover is composed of open grassland with scattered shrubs and trees.
Water	Minor drainage lines with riparian zone and degraded non-wooded drainage lines are also present within the area.
Land use	Primarily agricultural related activities with the majority of the land used for cattle grazing.
Visual context	Views are short to medium in distance. Views are screened/filtered by the vegetation cover. Views are composed of open grassland plains with isolated and grouped trees and shrubs that get denser and filter views in the distance. Views are experienced by the occupants of the residential property. A ZTV visibility has been calculated for this location and a map of this can be seen in Appendix A.

3.1.31 Viewing location 31: Homestead 22

Homestead 22 is located on Stratford Road. Views from the homestead are shown in Plate 3-48 and Plate 3-49, and described in Table 3-38.

Plate 3-48 View north from Homestead 22

Plate 3-49 View northwest from Homestead 22

Table 3-38 Viewing location 31: Homestead 22

Viewing location 31	
Landscape/visual element	Description
Location	Homestead 22 is located on Stratford Road. It is approximately 30 km from the entrance to the junction with Suttor Developmental Road and approximately 40 km (in total) southeast of Mount Coolon.
Landform and significant landscape features	The landscape is a flat river plain in the vicinity of this viewing location. The homestead is at an approximate height of 196 m AHD.

Viewing location 31	
Landscape/visual element	Description
Vegetation	Vegetation cover is composed of open grassland with scattered shrubs and trees.
Water	Suttor River located 1.9 km to the west. Many minor drainage lines with riparian zone and degraded non-wooded drainage lines associated with the river are also present within the area.
Land use	Primarily agricultural related activities with the majority of the land used for cattle grazing.
Visual context	Views are short to medium in distance. Views are screened/filtered by the vegetation cover. Views are composed of open grassland plains with isolated and grouped trees and shrubs that get denser and filter views in the distance Views are experienced by the occupants of the residential property. A ZTV visibility has been calculated for this location and a map of this can be seen in Appendix A.

3.1.32 Viewing location 32: Homestead 23

Homestead 23 is located on a private road accessed off Gregory Developmental Road. Views from are shown in Plate 3-50 and Plate 3-51, and described in Table 3-39.

Plate 3-50 View southeast from entrance to Homestead 23

Plate 3-51 View northeast on Gregory Developmental Road (three kilometres from entrance) in direction of Homestead 23

Table 3-39 Viewing location 32: Homestead 23

Viewing location 32	
Landscape/visual element	Description
Location	Homestead 23 is located on a private road approximately 3.3 km to the southwest of the entrance on Gregory Developmental Road. The entrance is approximately 28 km from to the junction with Bowen Developmental Road.
Landform and significant	The homestead is located on the south-western side of a ridge that has a north-south alignment. There is a high point of 301 m AHD

Viewing location 32	
Landscape/visual element	Description
landscape features	approximately 1.8 km to the east of the homestead
Vegetation	A combination of broad acre pastures of rough grassland with scattered shrubs, and areas of dense acacia woodlands.
Water	Low-lying plains, may be flooded in wet season to the west. Minor drainage lines with riparian zone and degraded non-wooded drainage lines draining from the surrounding hills draining west to Mistake Creek.
Land use	Primarily agricultural, used for broad acre cattle grazing. Gregory Developmental Road located three km to the east of the homestead is a primary road, used for travel between Clermont (south) and Charters Towers (north).
Visual context	Views are short to medium in distance. Views are screened/filtered by the vegetation cover and topography. Views are composed of open grassland plains with isolated and grouped trees and shrubs that get denser and filter views in the distance. Views are experienced by the occupants of the residential property. A ZTV visibility has been calculated for this location and a map of this can be seen in Appendix A.

4. Key findings

The landscape of the study area was comprised of the following six broad landscape character units.

- LCU 1 – Coastal
- LCU 2 – Port
- LCU 3 – Mining
- LCU 4 – Coastal Lowland Valleys
- LCU 5 – Inland Valleys
- LCU 6 – Upland and Mountains.

The existing environment has little anthropogenic lighting influences, with the exception of lit areas in the vicinity of existing roads, mines, rail and port infrastructure.

A total of 32 viewing locations were assessed, including a representation of nine roads and 23 homesteads. ZTVs were generated for views representing homesteads. Given the transient nature of views from roads, ZTVs were not generated.

5. References

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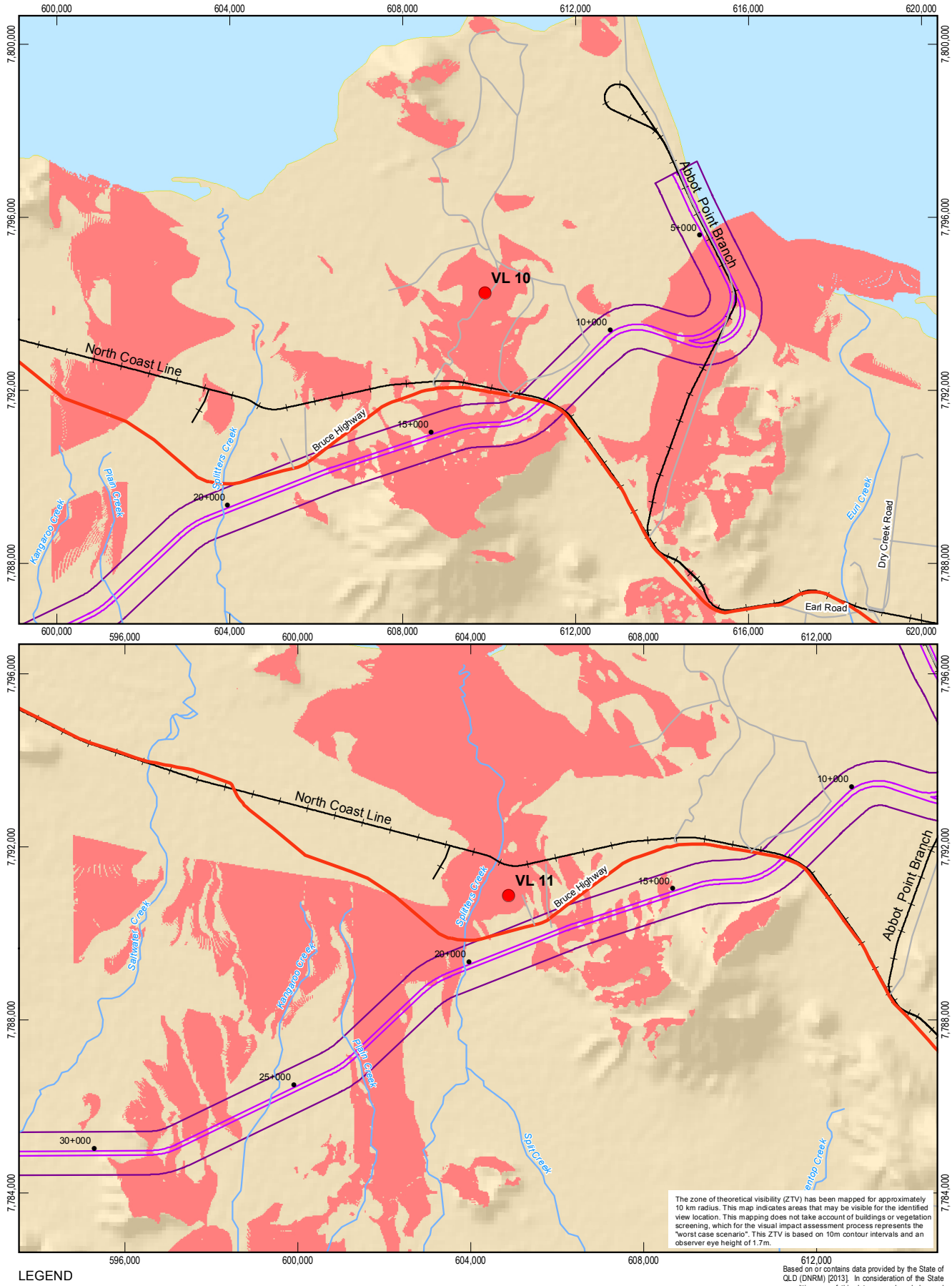
Appendices

Appendix A Homestead zones of theoretical visibility



The zone of theoretical visibility (ZTV) has been mapped for approximately 10 km radius. This map indicates areas that may be visible for the identified view location. This mapping does not take account of buildings or vegetation screening, which for the visual impact assessment process represents the "worst case scenario". This ZTV is based on 10m contour intervals and an observer eye height of 1.7m.

LEGEND

- Chainage
- View Locations
- Highway
- Main Road
- Local Road
- Railway
- Watercourse (Major)
- Watercourse (Minor)
- Zone of theoretical visibility (ZTV)
- Visible
- North Galilee Basin Rail 1000m Corridor
- North Galilee Basin Rail 100m Corridor

1:125,000 Paper Size A4

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Kilometres

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

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Adani Mining Pty Ltd
North Galilee Basin Rail Project

Job Number 41-26457
Revision A
Date 11 Jul 2013

Landscape and Visual Impact Assessment
Viewing Locations 10-11

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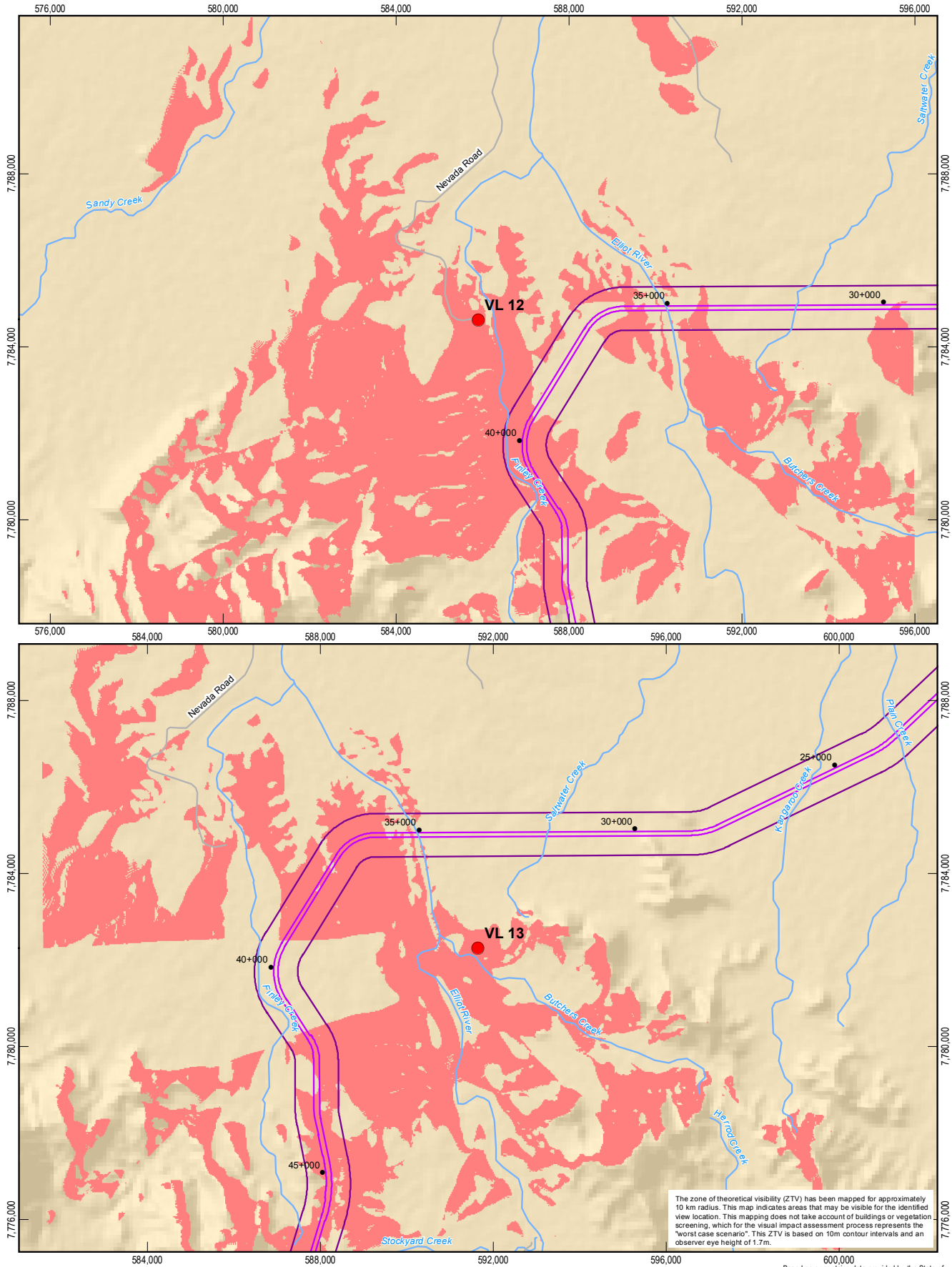
145 Ann Street Brisbane QLD 4000 Australia T 61 7 3316 3000 F 61 7 3316 3333 E bnemail@ghd.com W www.ghd.com

Data source: GA: Populated Places, Railway/2007; Adani: NGBR Corridor 13/05/2013, NGBR Corridor 06/06/2013, GHD: ZTV, Homesteads/2013; DNRM: Roads/2010. Created by:MS



The zone of theoretical visibility (ZTV) has been mapped for approximately 10 km radius. This map indicates areas that may be visible for the identified view location. This mapping does not take account of buildings or vegetation screening, which for the visual impact assessment process represents the "worst case scenario". This ZTV is based on 10m contour intervals and an observer eye height of 1.7m.

LEGEND

- Chainage
- View Locations
- Local Road
- Watercourse (Minor)
- Zone of theoretical visibility (ZTV): Visible
- North Galilee Basin Rail 1000m Corridor
- North Galilee Basin Rail 100m Corridor

1:125,000 Paper Size A4

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Kilometres

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

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Adani Mining Pty Ltd
North Galilee Basin Rail Project

Job Number 41-26457
Revision A
Date 11 Jul 2013

Landscape and Visual Impact Assessment
Viewing Locations 12-13

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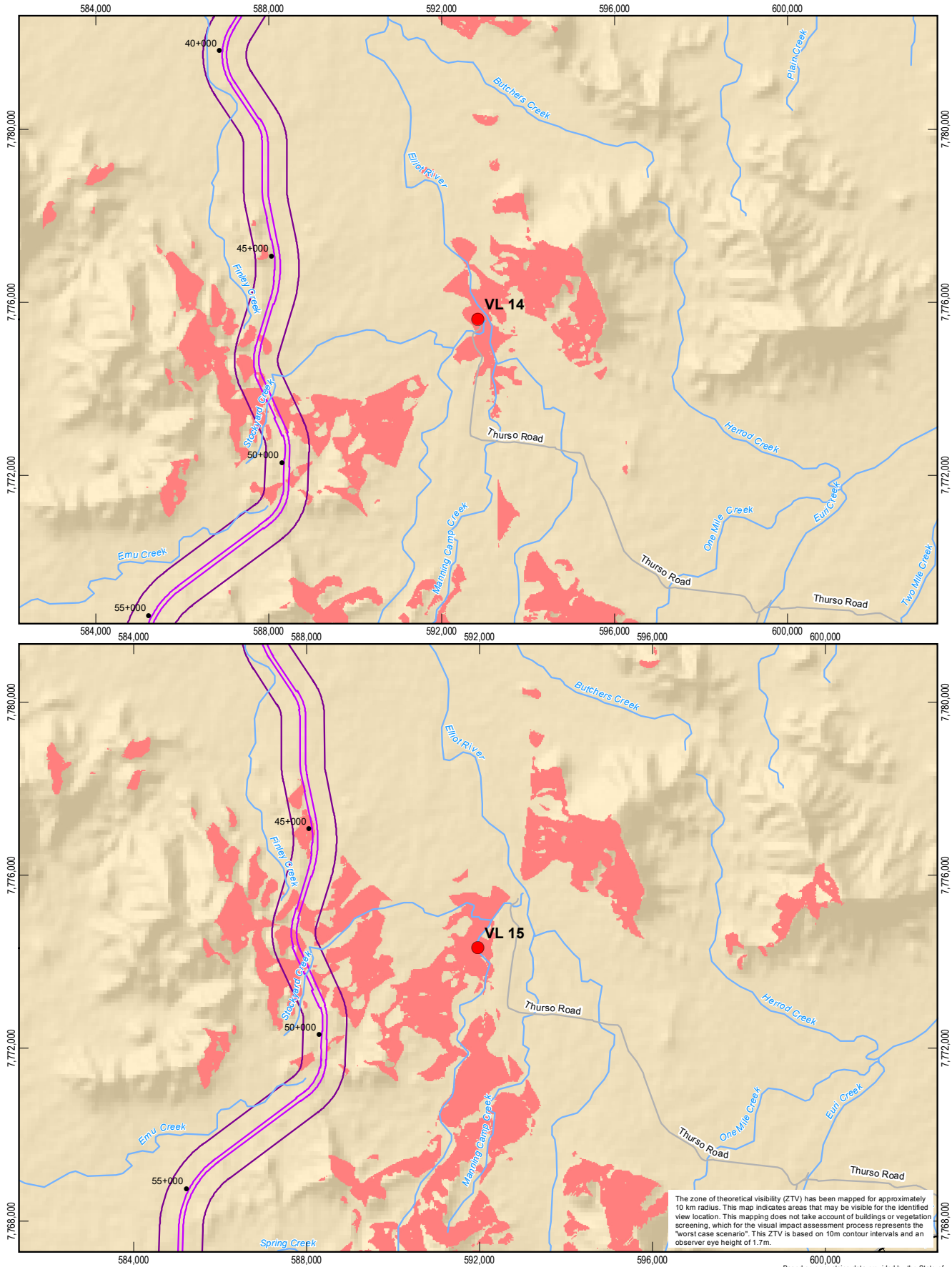

LEGEND

- Chainage
- View Locations
- Local Road
- Railway
- Watercourse (Minor)
- Zone of theoretical visibility (ZTV)
- Visible
- North Galilee Basin Rail 1000m Corridor
- North Galilee Basin Rail 100m Corridor

1:125,000 Paper Size A4

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Kilometres

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

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Adani Mining Pty Ltd
North Galilee Basin Rail Project

Job Number	41-26457
Revision	A
Date	11 Jul 2013

Landscape and Visual Impact Assessment
Viewing Locations 14 - 15

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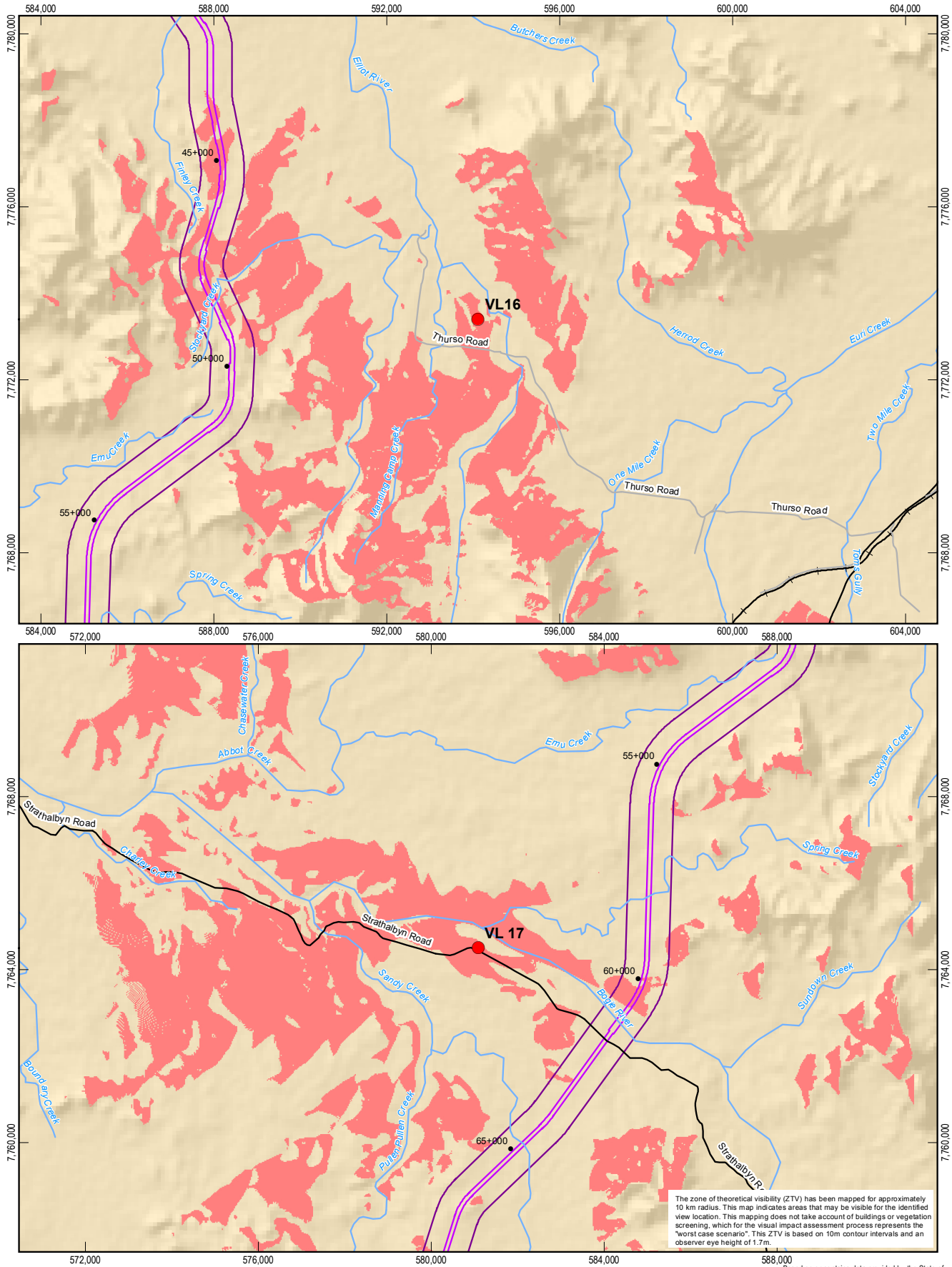

The zone of theoretical visibility (ZTV) has been mapped for approximately 10 km radius. This map indicates areas that may be visible for the identified view location. This mapping does not take account of buildings or vegetation screening, which for the visual impact assessment process represents the "worst case scenario". This ZTV is based on 10m contour intervals and an observer eye height of 1.7m.

LEGEND

- Chainage
- View Locations
- Highway
- Main Road
- Local Road
- Railway
- Watercourse (Major)
- Watercourse (Minor)
- Zone of theoretical visibility (ZTV)
- Visible
- North Galilee Basin Rail 1000m Corridor
- North Galilee Basin Rail 100m Corridor

1:125,000 Paper Size A4

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Kilometres

Map Projection: Transverse Mercator

Horizontal Datum: GDA 1994

Grid: GDA 1994 MGA Zone 55

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Adani Mining Pty Ltd

North Galilee Basin Rail Project

Job Number	41-26457
Revision	A
Date	11 Jul 2013

Landscape and Visual Impact Assessment

Viewing Locations 16 - 17

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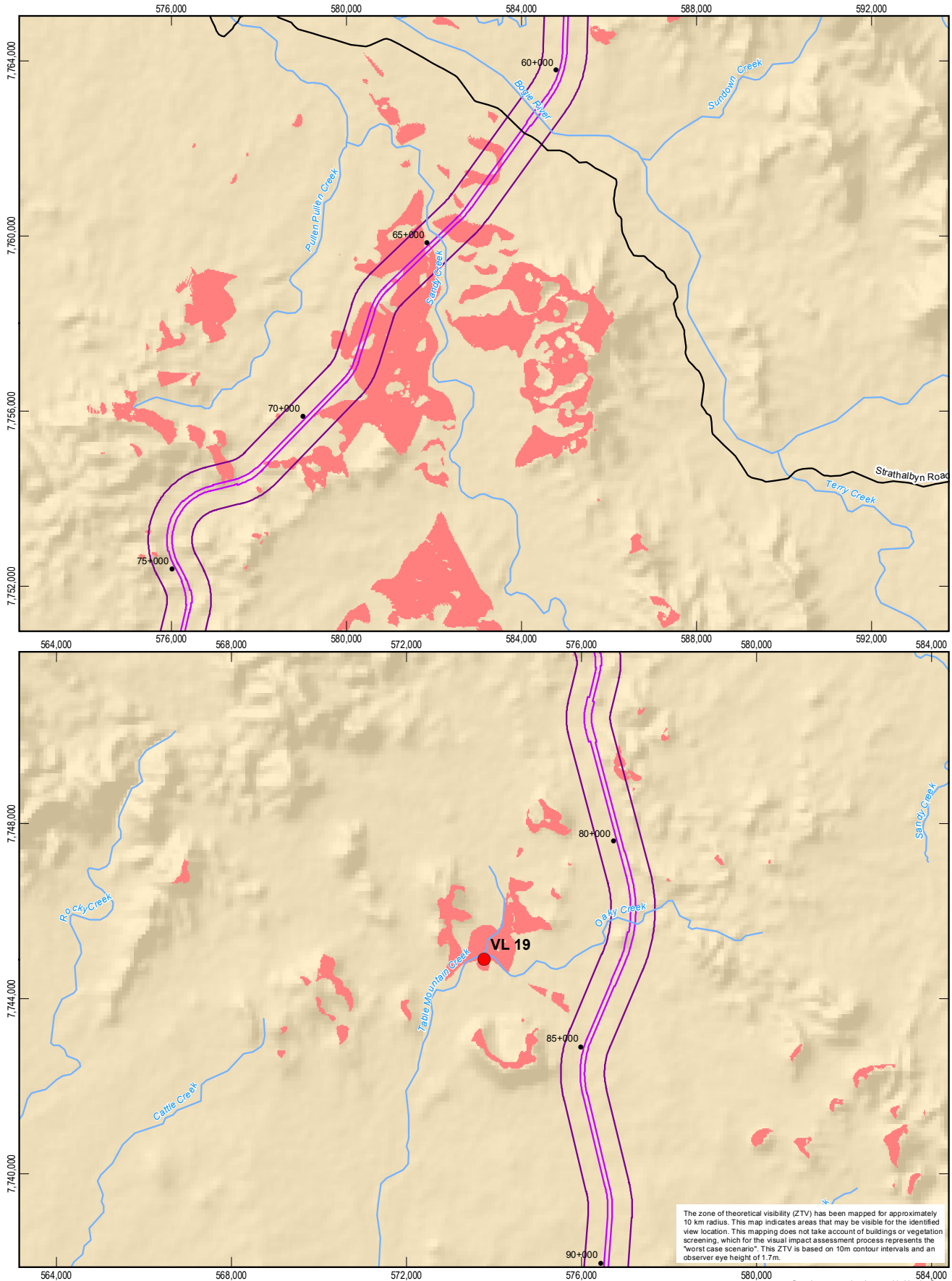
Data source: GA: Populated Places, Railway/2007; Adani: NGBR Corridor 13/05/2013, NGBR Corridor 06/06/2013, GHD: ZTV, Homesteads/2013; DNRM: Roads/2010. Created by:MS



LEGEND

- Chainage
- View Locations
- Highway
- Main Road
- Local Road
- Watercourse (Major)
- Watercourse (Minor)
- Zone of theoretical visibility (ZTV)
- Visible
- North Galilee Basin Rail 1000m Corridor
- North Galilee Basin Rail 100m Corridor

1:125,000 Paper Size A4

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Kilometres

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

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Adani Mining Pty Ltd
North Galilee Basin Rail Project

Job Number	41-26457
Revision	A
Date	11 Jul 2013

Landscape and Visual Impact Assessment
Viewing Locations 18 - 19

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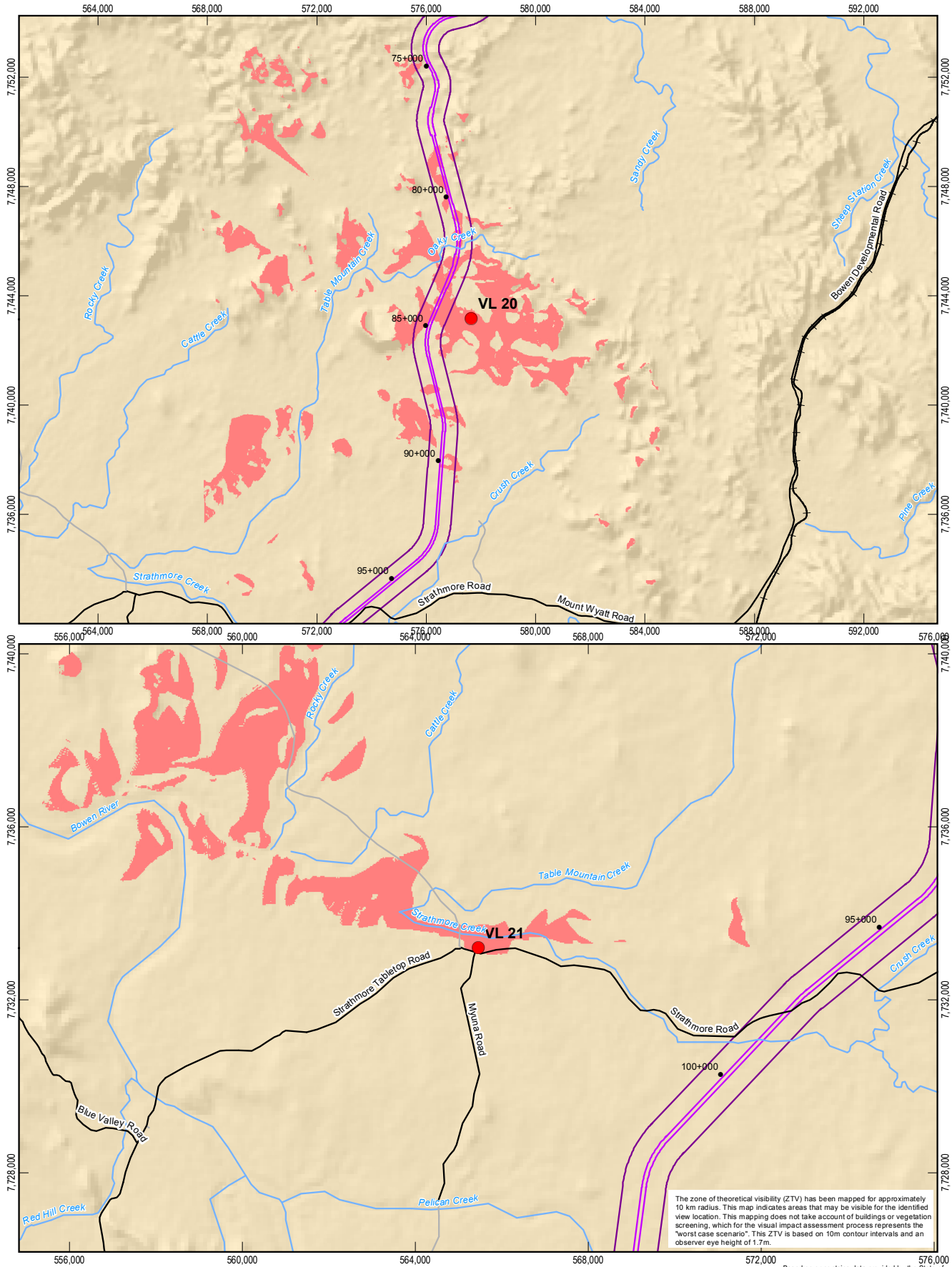
145 Ann Street Brisbane QLD 4000 Australia T 61 7 3316 3000 F 61 7 3316 3333 E bnemail@ghd.com W www.ghd.com

Data source: GA: Populated Places, Railway/2007; Adani: NGBR Corridor 13/05/2013, NGBR Corridor 06/06/2013, GHD: ZTV, Homesteads/2013; DNRM: Roads/2010. Created by:MS



LEGEND

- Chainage
- View Locations
- Highway
- Main Road
- Local Road
- Railway
- Watercourse (Major)
- Watercourse (Minor)
- Zone of theoretical visibility (ZTV)
- Visible
- North Galilee Basin Rail 1000m Corridor
- North Galilee Basin Rail 100m Corridor

1:125,000 Paper Size A4

0 0.5 1 2 3 4

Kilometres

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

N

Adani Mining Pty Ltd
North Galilee Basin Rail Project

Job Number	41-26457
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Date	11 Jul 2013

Landscape and Visual Impact Assessment
Viewing Locations 20 - 21

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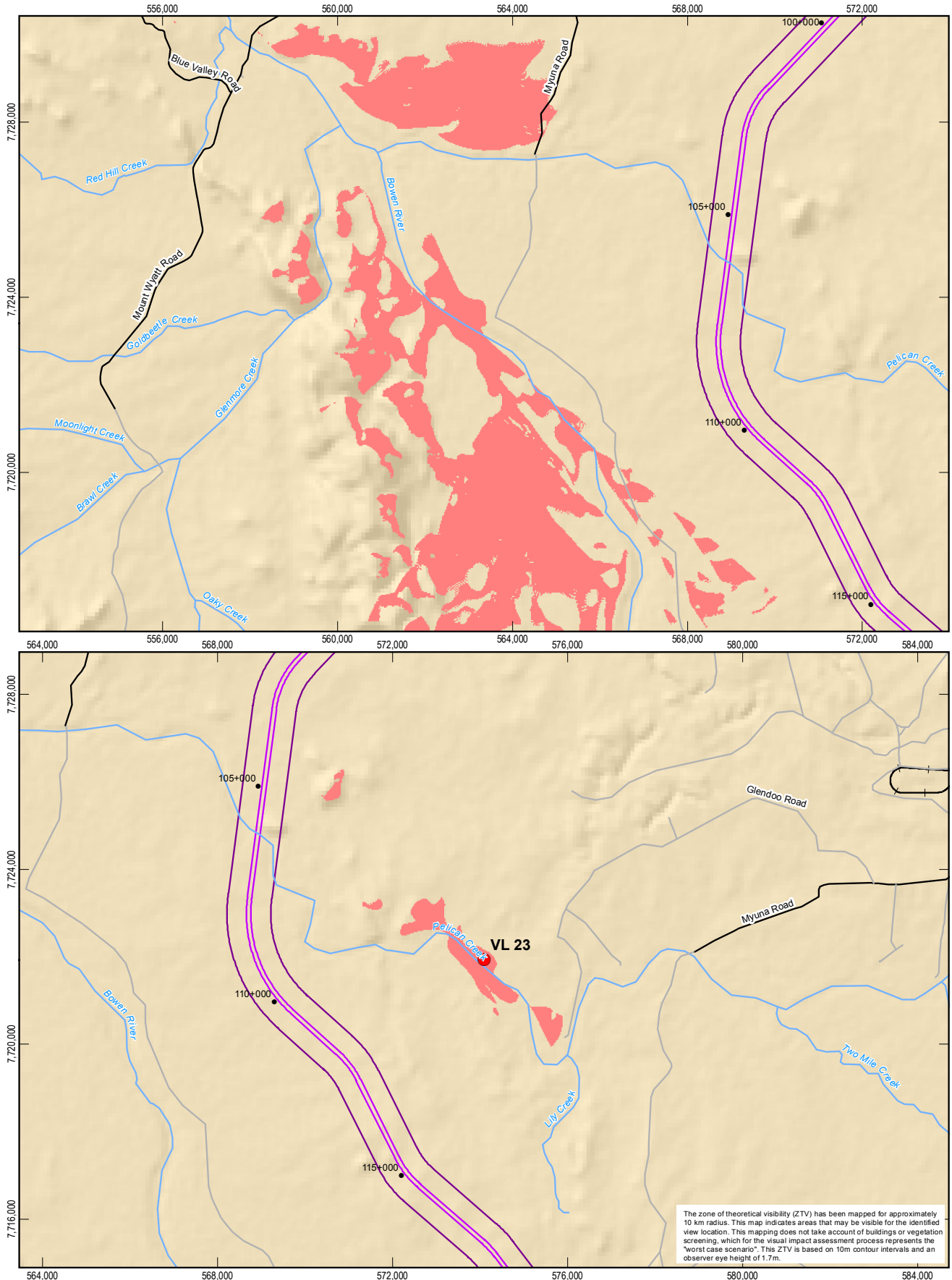
145 Ann Street Brisbane QLD 4000 Australia T 61 7 3316 3000 F 61 7 3316 3333 E bnemail@ghd.com W www.ghd.com

Data source: GA: Populated Places, Railway/2007; Adani: NGBR Corridor 13/05/2013, NGBR Corridor 06/06/2013, GHD: ZTV, Homesteads/2013; DNRM: Roads/2010. Created by:MS



The zone of theoretical visibility (ZTV) has been mapped for approximately 10 km radius. This map indicates areas that may be visible for the identified view location. This mapping does not take account of buildings or vegetation screening, which for the visual impact assessment process represents the "worst case scenario". This ZTV is based on 10m contour intervals and an observer eye height of 1.7m.

LEGEND

- Chainage
- View Locations
- Highway
- Main Road
- Local Road
- Railway
- Watercourse (Major)
- Watercourse (Minor)
- Zone of theoretical visibility (ZTV)
- Visible
- North Galilee Basin Rail 1000m Corridor
- North Galilee Basin Rail 100m Corridor

1:125,000 Paper Size A4

0 0.5 1 2 3 4

Kilometres

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

N

Adani Mining Pty Ltd
North Galilee Basin Rail Project

Job Number	41-26457
Revision	A
Date	11 Jul 2013

Landscape and Visual Impact Assessment
Viewing Locations 22 - 23

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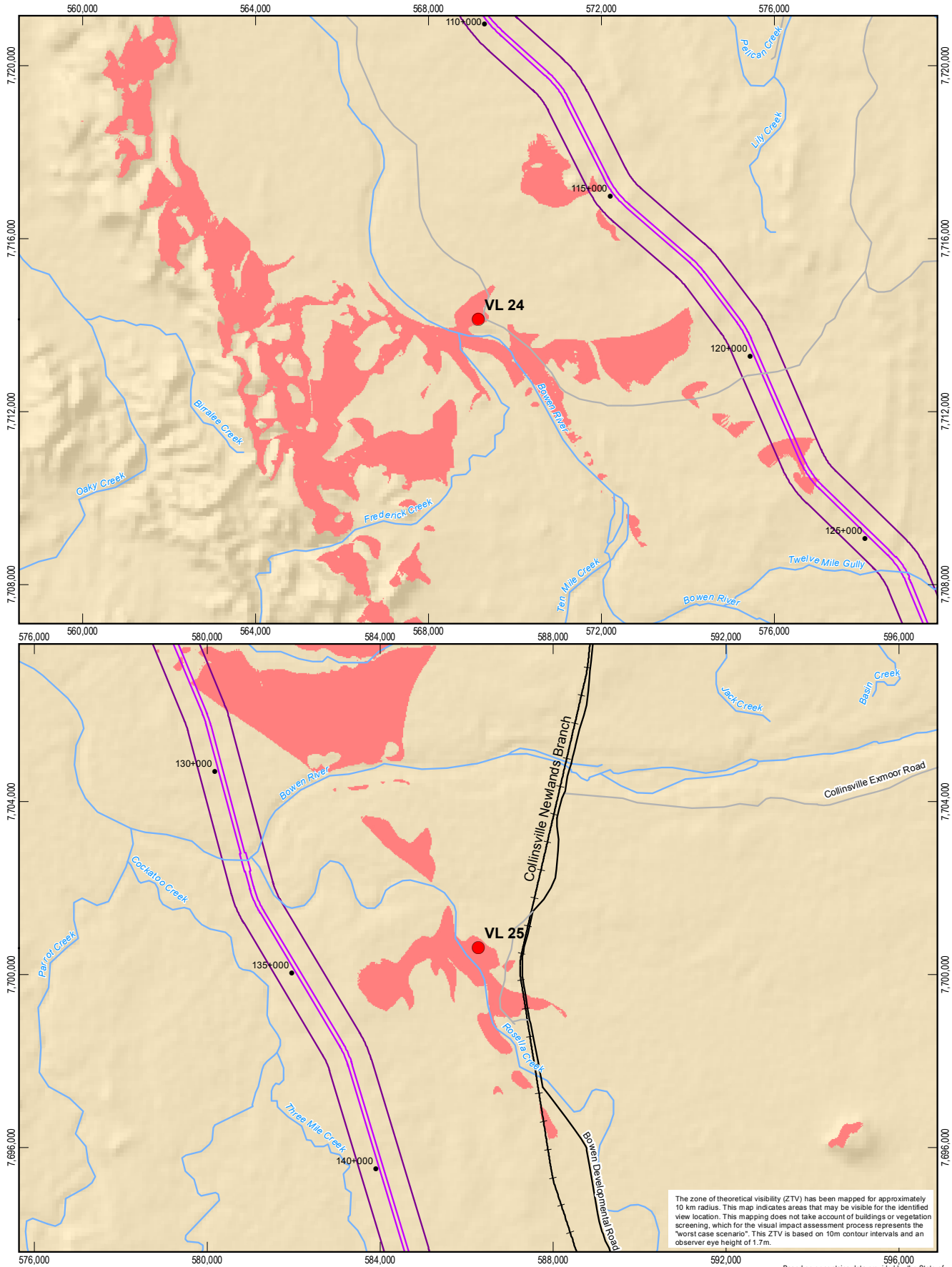
Data source: GA: Populated Places, Railway/2007; Adani: NGBR Corridor 13/05/2013, NGBR Corridor 06/06/2013, GHD: ZTV, Homesteads/2013; DNRM: Roads/2010. Created by:MS



LEGEND

- Chainage
- View Locations
- Highway
- Main Road
- Local Road
- Railway
- Watercourse (Major)
- Watercourse (Minor)
- Zone of theoretical visibility (ZTV) — Visible
- North Galilee Basin Rail 1000m Corridor
- North Galilee Basin Rail 100m Corridor

1:125,000 Paper Size A4

0 0.5 1 2 3 4

Kilometres

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

N

Adani Mining Pty Ltd
North Galilee Basin Rail Project

Job Number	41-26457
Revision	A
Date	11 Jul 2013

Landscape and Visual Impact Assessment
Viewing Locations 24 - 25

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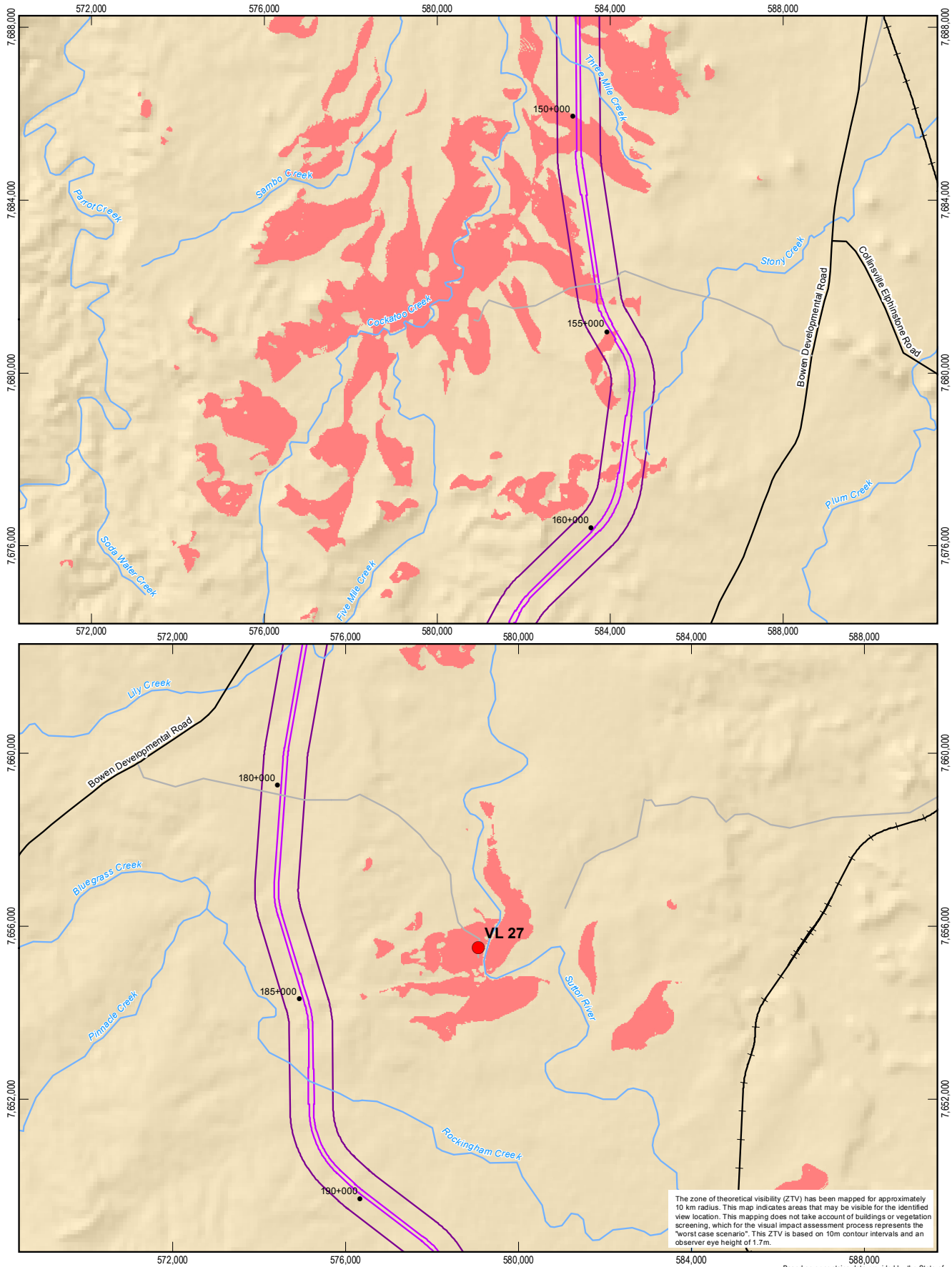
Data source: GA: Populated Places, Railway/2007; Adani: NGBR Corridor 13/05/2013, NGBR Corridor 06/06/2013, GHD: ZTV, Homesteads/2013; DNRM: Roads/2010. Created by:MS



LEGEND

- Chainage
- View Locations
- Highway
- Main Road
- Local Road
- Railway
- Watercourse (Major)
- Watercourse (Minor)
- Zone of theoretical visibility (ZTV) — Visible
- North Galilee Basin Rail 1000m Corridor
- North Galilee Basin Rail 100m Corridor

1:125,000 Paper Size A4

0 0.5 1 2 3 4

Kilometres

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

N

Adani Mining Pty Ltd
North Galilee Basin Rail Project

Job Number	41-26457
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Landscape and Visual Impact Assessment
Viewing Locations 26 - 27

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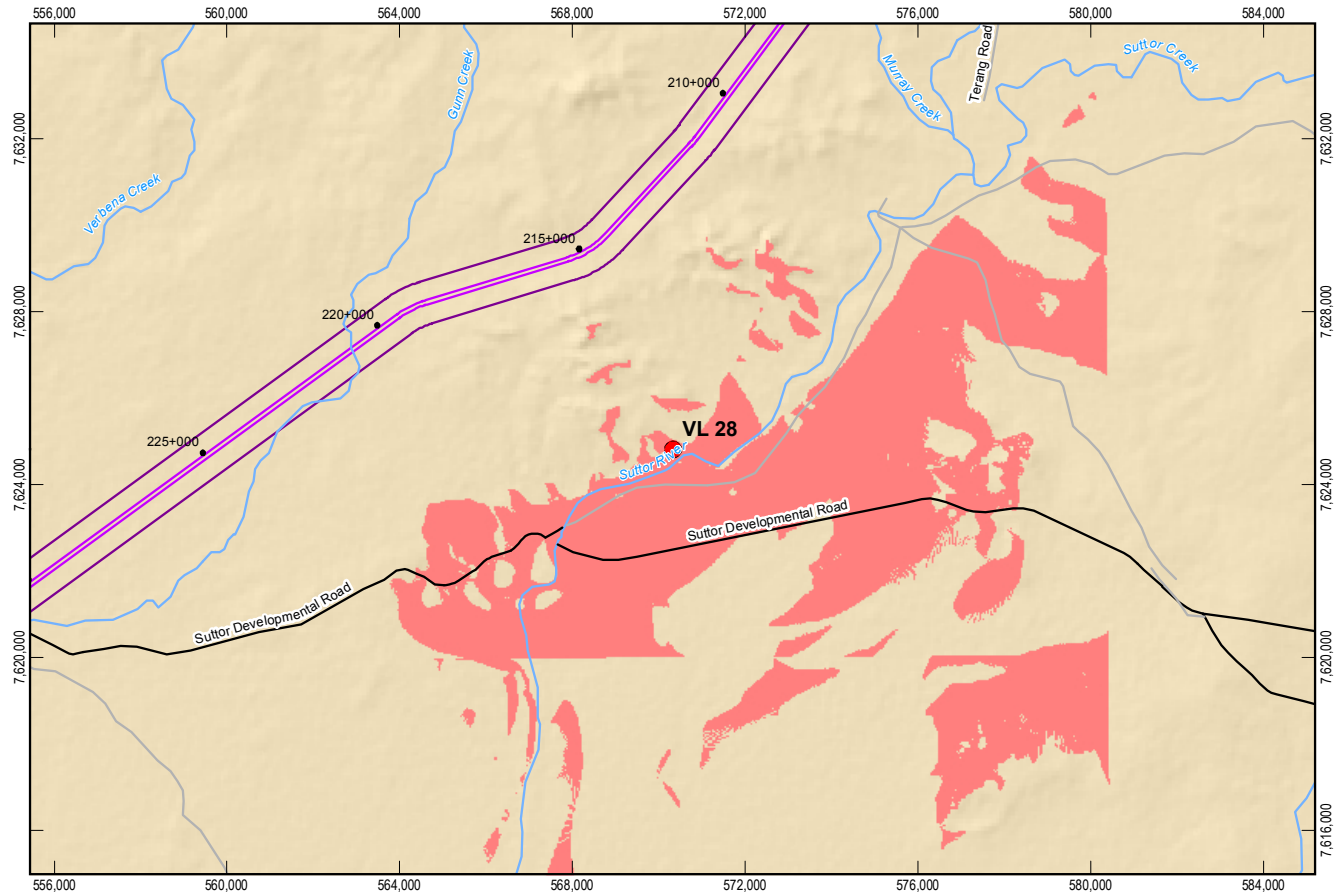
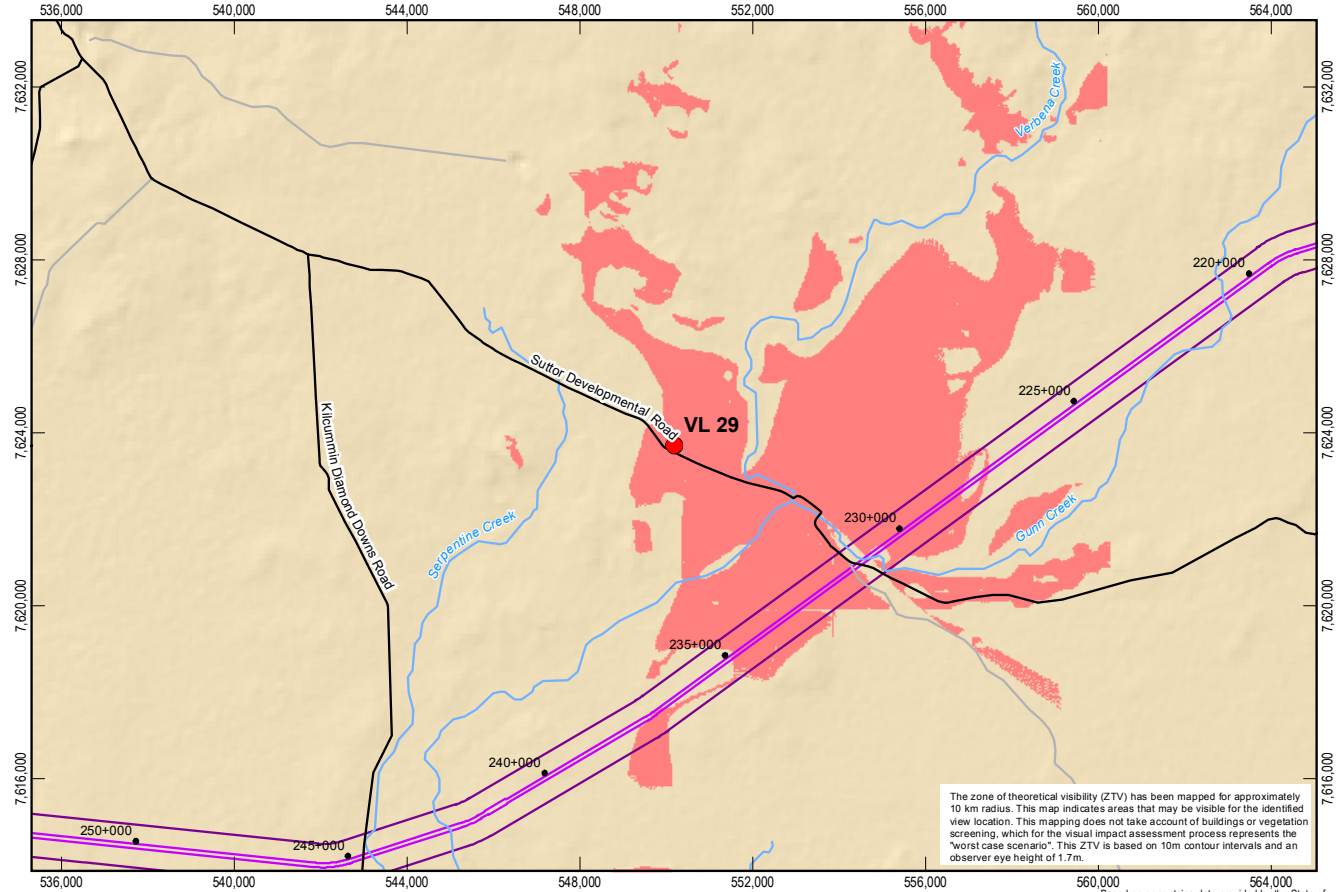
Data source: GA: Populated Places, Railway/2007; Adani: NGBR Corridor 13/05/2013, NGBR Corridor 06/06/2013, GHD: ZTV, Homesteads/2013; DNRM: Roads/2010. Created by:MS





The zone of theoretical visibility (ZTV) has been mapped for approximately 10 km radius. This map indicates areas that may be visible for the identified view location. This mapping does not take account of buildings or vegetation screening, which for the visual impact assessment process represents the "worst case scenario". This ZTV is based on 10m contour intervals and an observer eye height of 1.7m.

LEGEND

- Chainage
- View Locations
- Highway
- Main Road
- Local Road
- Railway
- Watercourse (Major)
- Watercourse (Minor)
- Zone of theoretical visibility (ZTV)
- Visible
- North Galilee Basin Rail 1000m Corridor
- North Galilee Basin Rail 100m Corridor

1:175,000 Paper Size A4

0 0.5 1 2 3 4

Kilometres

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

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Adani Mining Pty Ltd
North Galilee Basin Rail Project

Job Number	41-26457
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Date	29 Aug 2013

Landscape and Visual Impact Assessment
Viewing Locations 28 - 29

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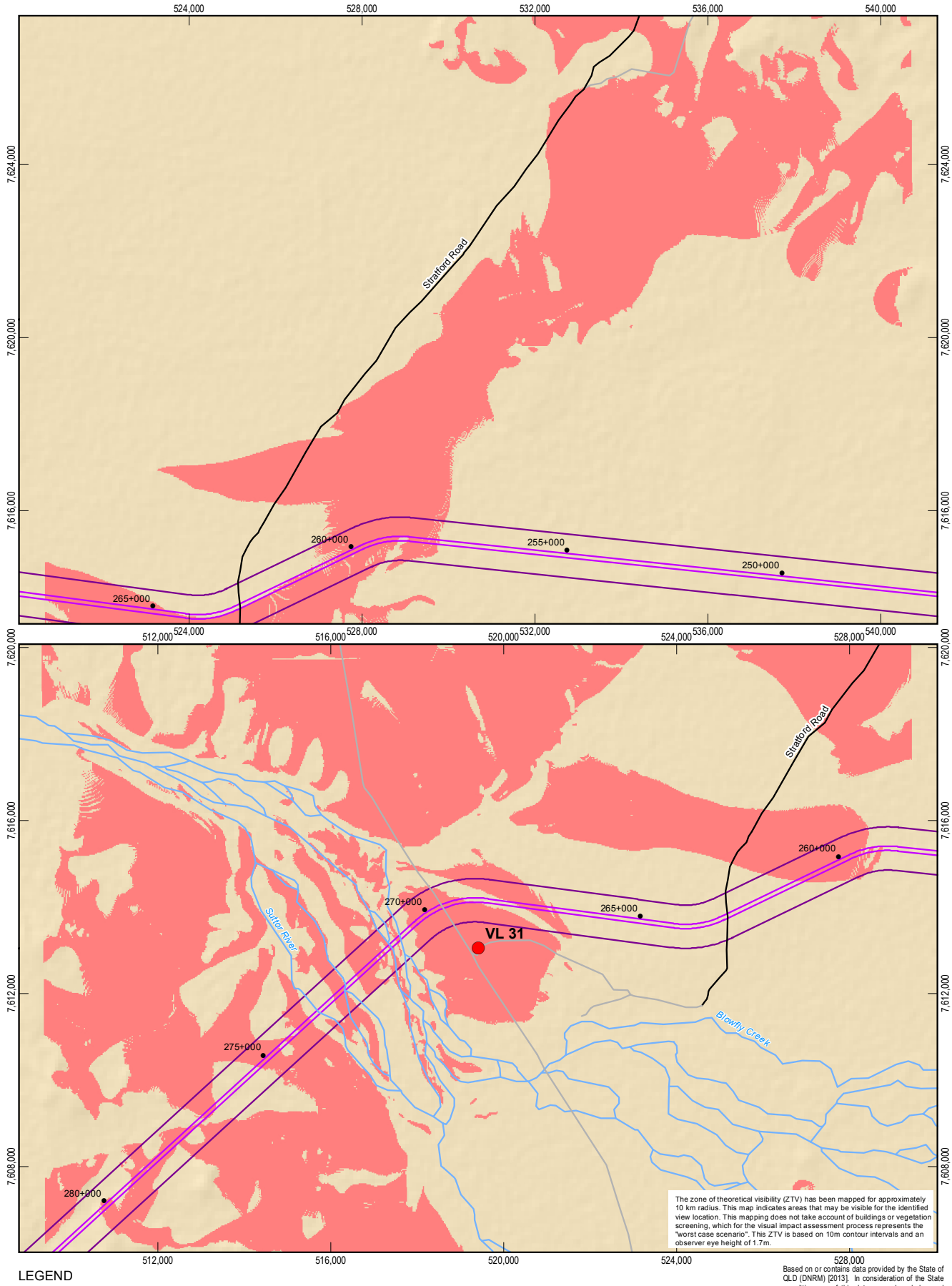
Data source: GA: Populated Places, Railway/2007; Adani: NGBR Corridor 13/05/2013, NGBR Corridor 06/06/2013, GHD: ZTV, Homesteads/2013; DNRM: Roads/2010. Created by:MS



LEGEND

- Chainage
- View Locations
- Highway
- Main Road
- Local Road
- Watercourse (Major)
- Watercourse (Minor)
- Zone of theoretical visibility (ZTV)
- Visible
- North Galilee Basin Rail 1000m Corridor
- North Galilee Basin Rail 100m Corridor

1:125,000 Paper Size A4

0 0.5 1 2 3 4

Kilometres

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

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Adani Mining Pty Ltd
North Galilee Basin Rail Project

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Revision	A
Date	11 Jul 2013

Landscape and Visual Impact Assessment
Viewing Locations 30 - 31

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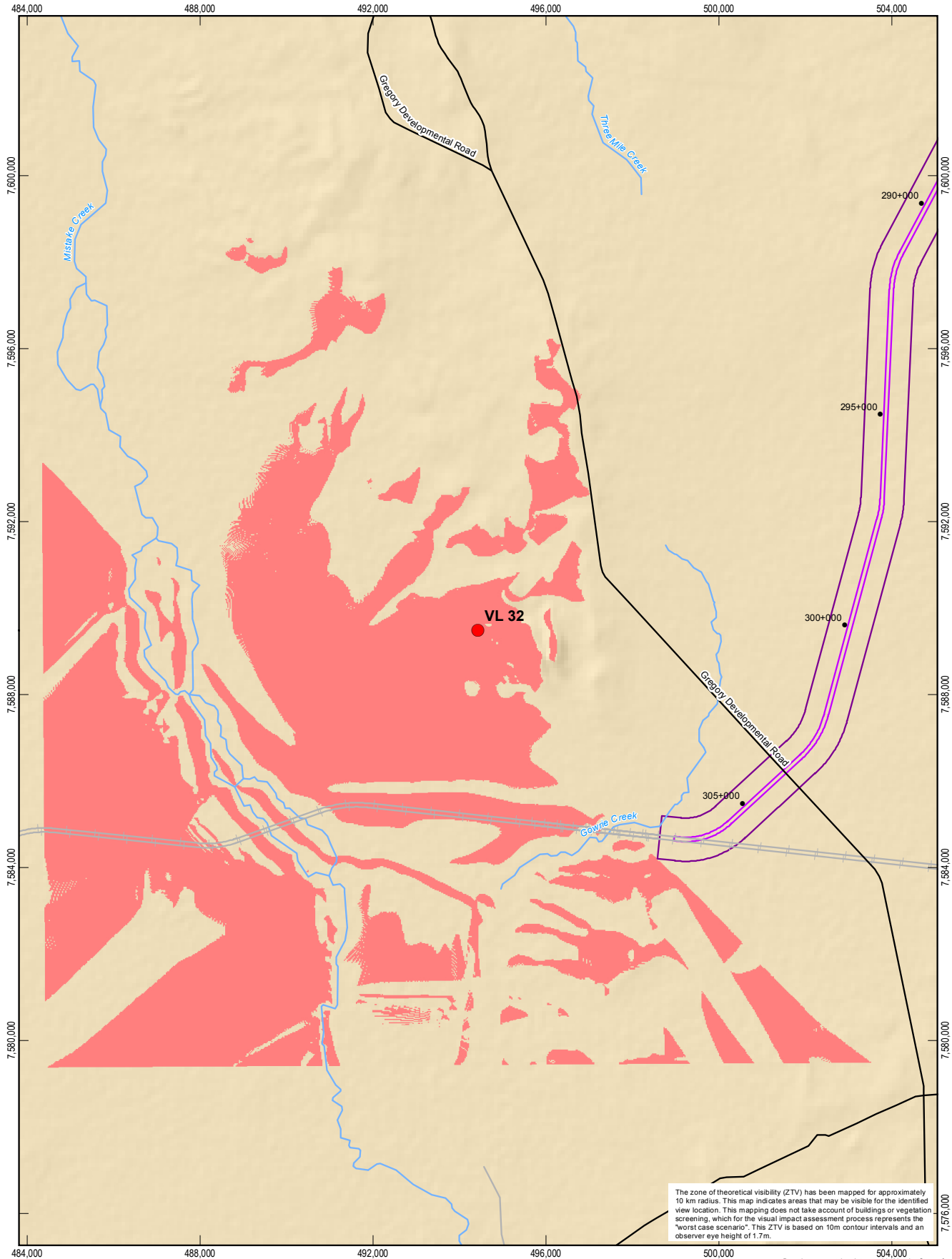
Data source: GA: Populated Places, Railway/2007; Adani: NGBR Corridor 13/05/2013, NGBR Corridor 06/06/2013, GHD: ZTV, Homesteads/2013; DNRM: Roads/2010. Created by:MS



LEGEND

- Chainage
- View Locations
- Highway
- Main Road
- Local Road
- Carmichael Project (Rail)
- Watercourse (Major)
- Watercourse (Minor)
- Zone of theoretical visibility (ZTV) — Visible
- North Galilee Basin Rail 1000m Corridor
- North Galilee Basin Rail 100m Corridor

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0 0.5 1 2 3 4

Kilometres

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

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Data source: GA: Populated Places, Railway/2007; Adani: NGBR Corridor 13/05/2013, NGBR Corridor 06/06/2013, GHD: ZTV, Homesteads/2013; DNRM: Roads/2010. Created by:MS

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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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Document Status

Rev No.	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
A	Laura Farrell	Nick Mcgowan	DRAFT	Philip Bradley	DRAFT	01 July 2013
0	Laura Farrell	Nick Mcgowan		Philip Bradley		10 July 2013

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