



CENTURION NORTH

Progressive Rehabilitation and Closure Plan

Prepared for: Department of Environment, Science and Innovation

Prepared by: Peabody Energy Australia Pty Ltd

EA and PRCP Schedule holder: Centurion Coal Mining Pty Ltd

Tenure number: ML 1790 and ML 70495

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GLOSSARY of TERMS and ABBREVIATIONS

Key terms and abbreviations, and associated definitions used in this report are listed below.

Term / abbreviation	Description
3P grasses	Native and naturalised exotic grass species that are perennial, palatable, and productive plants to stock.
AEP	Annual exceedance probability
ALA	Atlas of Living Australia
AMD	Acid and Metalliferous Drainage (AMD). Includes acid/acidic drainage, pH-neutral and metalliferous drainage and sulphide-derived saline drainage – and/or any combination of these.
BMC	BHP Mitsui Coal Pty Limited
BOM	Bureau of Meteorology (Australia)
Brigalow TEC	Brigalow (<i>Acacia harpophylla</i> dominated and co-dominated) Threatened Ecological Community
CCM	Centennial Coal Mine Pty Ltd
CCP	Community Consultation Plan
CEC	Cation exchange capacity
Centurion North	Centurion North Development
Centurion North MLs	ML 1790 and ML 70495
CND	Centurion North Development
cm	Centimetres
CSG	Coal seam gas
CSIRO	Commonwealth Scientific and Industrial Research Organisation (Australia)
DCCEEW	Commonwealth Department of Climate Change, Energy, the Environment and Water
DES	Department of Environment and Science (now DETSI)
DESI	Department of Environment, Science and Innovation (Queensland) (The Adminstrating Authority, now DETSI)
DotE	Commonwealth Department of the Environment (now DCCEEW)
DETSI	Department of the Environment, Tourism, Science and Innovation (Queensland) (formerly DESI)
DM	Dry matter (with reference to vegetation)
DNRMMRRD	Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development (formerly Department of Resources (Queensland))
DoR	Department of Resources (Queensland) (now DNRMMRRD)
DSI	Detailed site investigation
DSITI	Department of Science, Information Technology and Innovation (Queensland) (now part of DETSI)
DTMR	Department of Transport and Main Roads (Queensland)
EA	Environmental Authority (in terms of the <i>Environmental Protection Act 1994</i> , Queensland)
EC	Electrical conductivity
EIS	Environmental Impact Statement
EP Act	<i>Environmental Protection Act 1994</i> (Queensland)
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i> (Commonwealth)
ESA	Environmentally Sensitive Areas
ESP	Exchangeable sodium percentage

GLOSSARY of TERMS and ABBREVIATIONS

Key terms and abbreviations, and associated definitions used in this report are listed below.

Term / abbreviation	Description
FoS	Factor of safety
GMS	Goonyella Middle Seams
Ha	Hectares
IRC	Isaac Regional Council
km	Kilometer
LGA	Local Government Area
LIKT	Locally Important Koala Tree
LOD	Land outcomes document
LSA	Land suitability assessment
m	Metres
Mine waste	Material comprising overburden, ± coarse/fine reject (dewatered), ± waste coal. Sometimes called ‘mineral waste’ or ‘mining waste’.
mm	millimetres
ML	Mining Lease
NC Act	Nature Conservation Act 1992 (Queensland)
NNTT	National Native Title Tribunal - an independent body established under the Native Title Act 1993 in Australia as a special measure for the advancement and protection of Aboriginal and Torres Strait Islander peoples.
NUMA	Non-use management area
Overburden	Non-carbonaceous or carbonaceous mineral waste located above (overburden proper) or between coal seams. Carbonaceous overburden is generated during mining of non-ore material and may be represented by sedimentary units (non-coal) rich in organic carbon. Carbonaceous overburden does not include coarse reject, seam floor, seam roof or coal partings. Overburden reports to spoils dumps.
PAF	Potentially acid forming
Peabody	Peabody Energy Australia Pty Ltd
PMLU	Post-mining land use
PRC plan	Progressive Rehabilitation and Closure Plan (in terms of the <i>Environmental Protection Act 1994</i> (Queensland))
PRCP Guideline	Progressive Rehabilitation and Closure Plan Guideline (November 2019) (DES, Queensland)
PSI	Preliminary site investigation
QA/QC	Quality Assurance and Quality Control
RA	Rehabilitation area. As defined in the PRCP Guideline: a rehabilitation area, for a post-mine land use, means an area of land in the post-mine land use to which a rehabilitation milestone for the post-mining use relates.
RE	Regional ecosystems
Reject	Waste material produced during coal washing, separated from run-of-mine (ROM) coal in the coal handling and preparation plant. Can be separated and disposed as fine rejects (tailings) and coarse reject, or co-disposed as mixed plant reject which is a mixture of coarse reject and ‘dewatered’ fine reject
ROM	Run-of-mine

GLOSSARY of TERMS and ABBREVIATIONS

Key terms and abbreviations, and associated definitions used in this report are listed below.

Term / abbreviation	Description
RM	Rehabilitation milestone. As defined in the PRCP Guideline: a rehabilitation milestone, for the rehabilitated land, means each significant event or step necessary to rehabilitate the land to a stable condition (section 115 of the EP Act).
RRR	Residual risk rating (with reference to the risk assessment)
SEVT	Semi-evergreen vine thicket
SIS	Surface-to-Inseam wells
Spoil	Mine waste comprising non-ore (non-ROM) material such as overburden and waste coal. Within this report, unless stated otherwise, spoil is assessed as a whole (bulk material) with no distinction made between carbonaceous and non-carbonaceous overburden.
TDS	Total dissolved solids
TEC	Threatened ecological communities
Terrestrial Study Area	Study Area used for the terrestrial ecology survey completed E2M (2025a and 2025b), which includes the Centurion North MLs.
UIS	Underground In-Seam
VPW	Vertical Production Wells
Waste coal	Sub-economical coal that reports to the spoil dumps as waste. Waste coal can be fresh or oxidised. All oxidised and coked (cindered) coal is waste.
WoNS	Weeds of National Significance
WQOs	Water Quality Objectives

1. INTRODUCTION

Centurion Coal Mining Pty Ltd (a subsidiary of Peabody Energy Australia Pty Ltd (Peabody)) holds the Environmental Authority (EA) P-EA-100658735 for mining leases (ML) ML 1790 and ML 70495. These MLs are situated in Bowen Basin, central Queensland, approximately 50 kilometres (km) north of Moranbah, as shown in **Figure 1-1**.

ML 1790 and ML 70495 are collectively referred to as the Centurion North MLs and form part of the Centurion North Development (CND, hereafter referred to as 'Centurion North'). The Centurion North MLs are located immediately adjacent to and directly north of the Centurion Coal Mine (CCM), an existing underground longwall mine located on ML 6949 operated under a separate EA (refer **Figure 2-1**).

Details of the EA and PRCP Schedule are:

- EA and PRCP Schedule Holder: Centurion Coal Mining Pty Ltd
- EA Number: P-EA-100658735 (26 March 2025) (**Appendix 1**)
- PRCP Schedule Number: P-PRCP-100669070_V3 (**Appendix 11**)
- Land description: ML 1790, ML 70495

Historically the Centurion North MLs formed part of the Wards Well MLs which ML 1790, ML 70495, ML 70443 and ML 4752, and were formerly held by Stanmore SMC Pty Ltd (SMC) subject to the Wards Well EA (EPPR00668513). A Progressive Rehabilitation and Closure Plan (PRC plan / PRCP) Schedule for Wards Well MLs was originally approved by the Department of Environment and Science (DES) on 31 January 2022. The Centurion North MLs were transferred under a commercial arrangement between SMC and Peabody on 3 September 2024.

This PRC plan refers to the Wards Well MLs (also 'Wards Well') in the context of historical or background information that formed part of the original PRC plan application in February 2021 resulting in the current approved PRCP Schedule. However, this PRC plan has been modified to remove reference to activities that will not form part of Centurion North. This PRC plan utilizes the same appendices that supported the original application. While these appendices reference the original Wards Well MLs, they still offer relevant and useful supporting data.

This PRC plan has been prepared for Centurion North to meet the requirements of the Progressive Rehabilitation and Closure Plan Guideline (PRCP Guideline).

This PRC plan comprises two parts:

- **Section A:** Rehabilitation planning part – provides information about the site, the rehabilitation plans, and evidence and justification to support the development of the proposed PRCP Schedule; and
- **Section B:** PRCP Schedule – includes maps of rehabilitation and closure outcomes for the site and tables of time-based milestones.

This PRC plan also includes **Section C: Appendices**, which provides key information and specialist studies used to support development of this plan.

1.1 PRCP for exploration activities and early works

An update of the PRCP Schedule was approved by the Department of the Environment, Tourism, Science and Innovation (DETSI) on 26 March 2025 (P-PRCP-100669070_V3, refer **Appendix 11**) for exploration drilling and associated tracks. This current PRC plan includes consideration of additional exploration activities and early works to support future longwall extraction. A description of this works considered in this PRC plan is provided in **Section 2.1.3**.

The uncertain nature of the outcomes of the exploration activities and early works, and the potential requirement for a future amendment process has been taken into consideration in development of this PRCP Schedule.

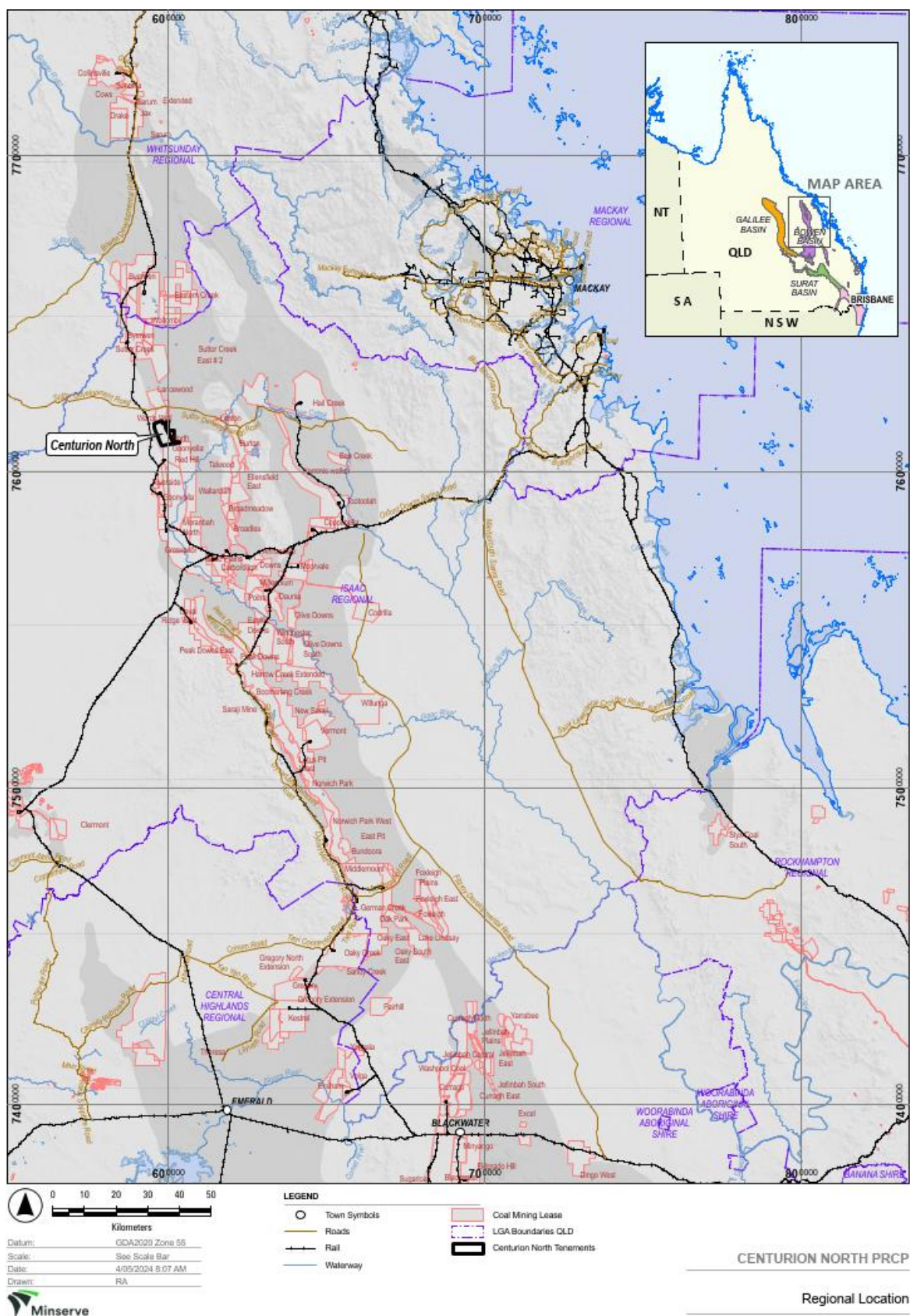


Figure 1-1 Regional Location map

2. SECTION A: REHABILITATION PROJECT PLANNING

Legislative Requirement

In accordance with Section 126C(1)(b) and (c)(ii) of the *Environmental Protection Act 1994* (EP Act), the rehabilitation planning part of the PRC plan must include a description of:

- Each resource tenure, including the area of each tenure;
- The relevant activities to which the application relates;
- The likely duration of the relevant activities; and
- How and where the relevant activities are to be carried out, including maps.

PRCP Guideline

The following spatial information must be submitted as part of the PRC plan:

- The location and maximum extent of disturbance footprint for the mine life;
- The Post-mining Land Use (PMLU) and Non-use Management Area (NUMA) for the area within the resource tenures; and
- Any sensitive receptors.

In addition to the list above, the PRC plan must include spatial information outlining the rehabilitation and improvement areas that correspond to the proposed PRCP Schedule. The spatial information must show the locations of the rehabilitation and improvement areas for a 10-year period (minimum).

All spatial information must be prepared and submitted in accordance with the guideline '*Spatial Information Submission*' (ESR/2018/4337).

2.1 Project description

The Centurion North MLs are located within the northern region of the Bowen Basin approximately 30 km south of Glenden and approximately 150 km south-west of Mackay in Central Queensland. It is located immediately to the north of the existing CCM (owned and operated by Peabody) and approximately 50 km north of Moranbah (**Figure 1-1**).

Centurion North MLs cover approximately 3,471 hectares (ha) and is identified as a hard coking coal resource.

EA P-EA-100658735 limits activity at Centurion North for exploration activities, early works and ancillary infrastructure. Exploration drilling and seismic surveys have been occurring since the 1970s. It is anticipated that exploration drilling will continue on the Centurion North MLs in accordance with the EA and PRC Schedule requirements (or subsequent amendments) until a sufficient understanding of the resource is gained, further informing future mining operations.

2.1.1 Mining tenements

Details of the Centurion North MLs are provided in **Table 2-1** along with the location and boundaries of these MLs shown in **Figure 2-1**.

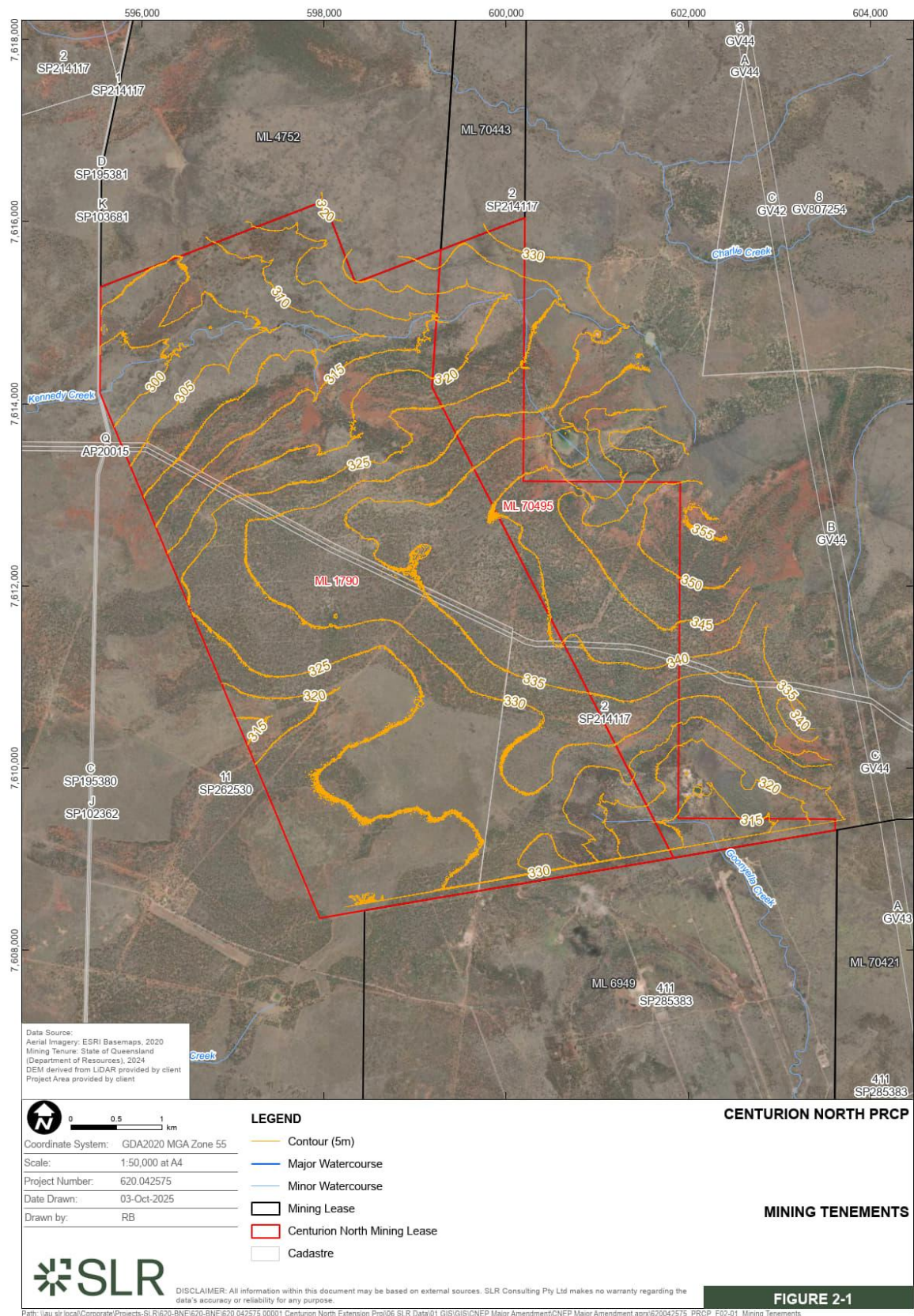


Figure 2-1 Mining Tenements

Table 2-1 Centurion North mining tenements

Mining Lease	Name	EA holder	Purpose	Area (ha)
ML 1790	Part of Centurion North	Centurion Coal Mining Pty Ltd	Mining for coal and mineral hydrocarbons	2,722.8
ML 70495	Part of Centurion North	Centurion Coal Mining Pty Ltd	Mining coal	747.8
Total area				3,470.60

2.1.2 Mine features and infrastructure on-site

The main features and infrastructure (approved and proposed) within the EA for Centurion North are summarised in **Table 2-2** and illustrated in **Figure 2-2**.

Table 2-2 Mine features and infrastructure at Centurion North

Mine domain	Mine feature name
Exploration activities and early works	Drill holes and pads, including service boreholes, gas risers and boreholes for gas conformance, specific gas emission, spontaneous combustion testing, geotechnical and exploration
	Vertical and lateral SIS wells
	Historic holes and pads
Ancillary infrastructure	Roads and tracks
	Bleeder shaft
	Disturbance for Future Goaf Drainage Lines
	Laydown area

Historical exploration drilling and seismic surveys are shown in the final site design map (**Figure 10-1**), as well as included in the hectares in the PRCP Schedule.

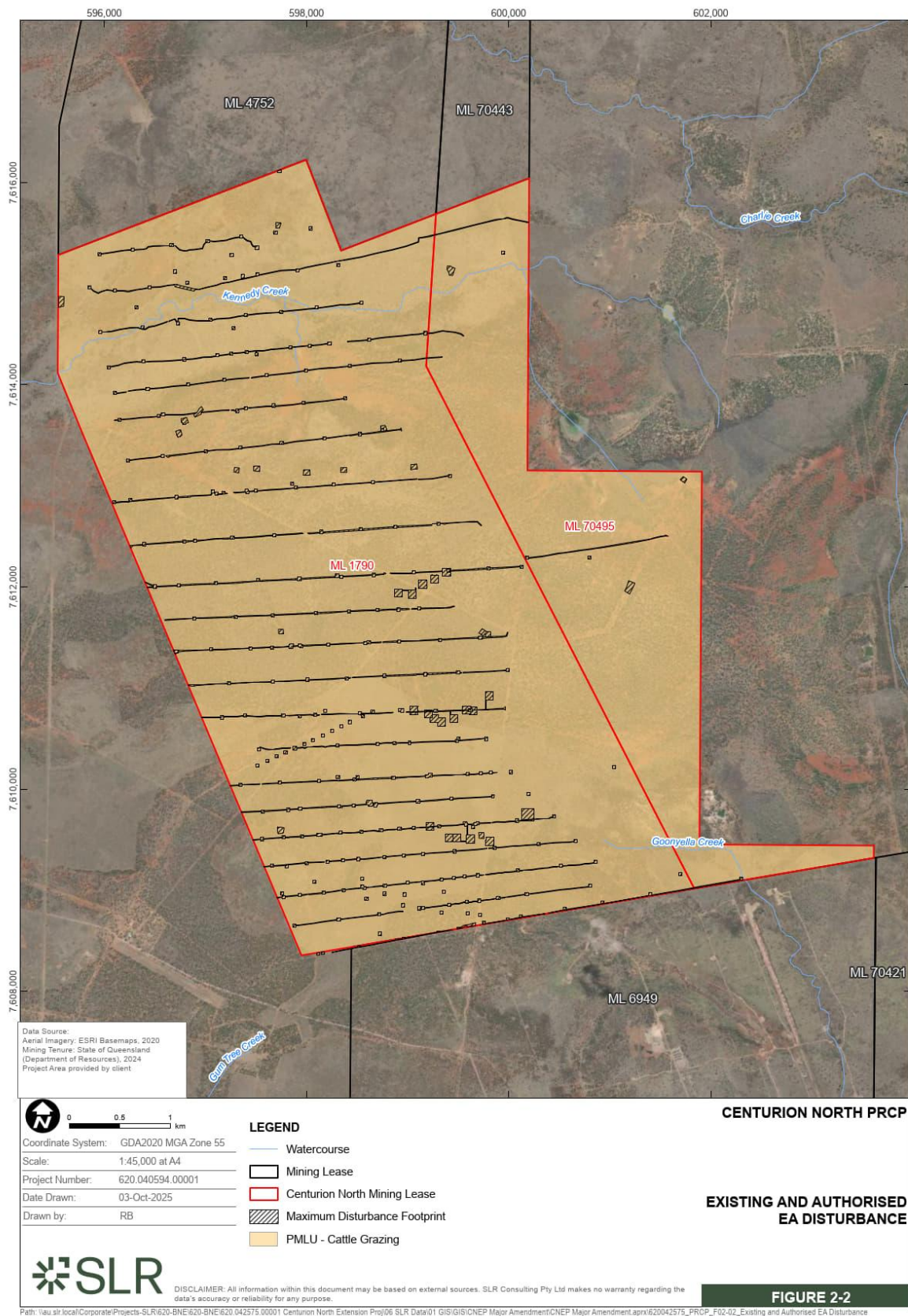


Figure 2-2 Existing and Authorised EA Disturbance

2.1.3 Type of mining operation

The Centurion North MLs, at the time of updating this PRC plan, is a greenfield mine site with some historic exploration activities.

Peabody plans to continue exploration activities, environmental data assessment and other early works activities at Centurion North where these are authorised under the EA and PRCP Schedule. These proposed activities include:

- Pilot coal seam gas (CSG) exploration and access tracks (approved under current P-EA-100658735 (26 March 2025) and P-PRCP-100669070_V3 (26 March 2025);
- Proposed exploration activities and early works to support future longwall extraction (subject of current Major EA Amendment application):
 - Construction of new access tracks;
 - Installation of a laydown area;
 - Construction of drill pads for Surface-to-Inseam (SIS) wells, Vertical Production Wells (VPW), gas risers, service boreholes, other boreholes and a bleeder shaft;
 - Drilling and operation of vertical and lateral SIS wells to drain gas from coal seam;
 - Construction of gas risers to manage gas transfer to surface facilities;
 - Construction of service boreholes to transfer materials from the surface to underground;
 - Drilling of boreholes for gas, coal propensity, geotechnical and exploration sampling purposes;
 - Development of a bleeder shaft for mine ventilation and safe gas drainage;
 - Disturbance for future goaf drainage lines;
 - Construction of gate roads; and
 - Completion of Underground In-seam (UIS) Gas Drainage.

Surface activities and underground activities proposed as part of the current EA Amendment application are illustrated in **Figure 2-3** and **Figure 2-4**.

The construction of the gate roads and UIS gas drainage will be accessed from the existing CCM underground roadway network from ML 6949. All waste products generated from underground activities will be managed and co-disposed with waste generated from the CCM in accordance with the CCM Waste Management Procedure.

2.1.4 Proposed duration of the operation

Exploration activities have been occurring at Wards Well (which includes the Centurion North MLs) since the 1970s, with BHP Mitsui Coal Pty Limited (BMC) (previous EA holder) having conducted exploration drilling and seismic surveys since 2010. Peabody plans to continue exploration activities and early works at Centurion North where these are authorised under the EA.

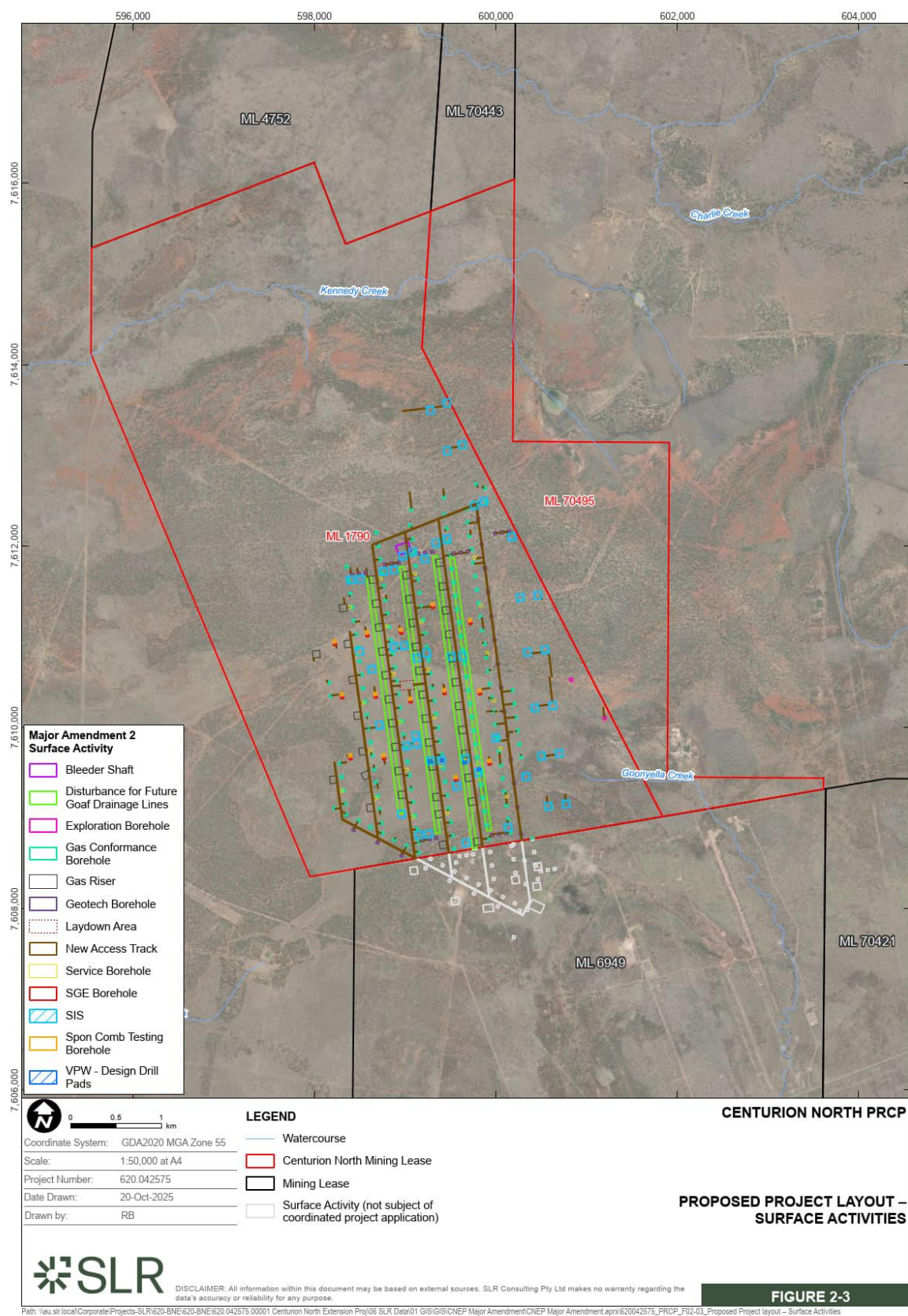


Figure 2-3 Proposed Project Layout – Surface Activities

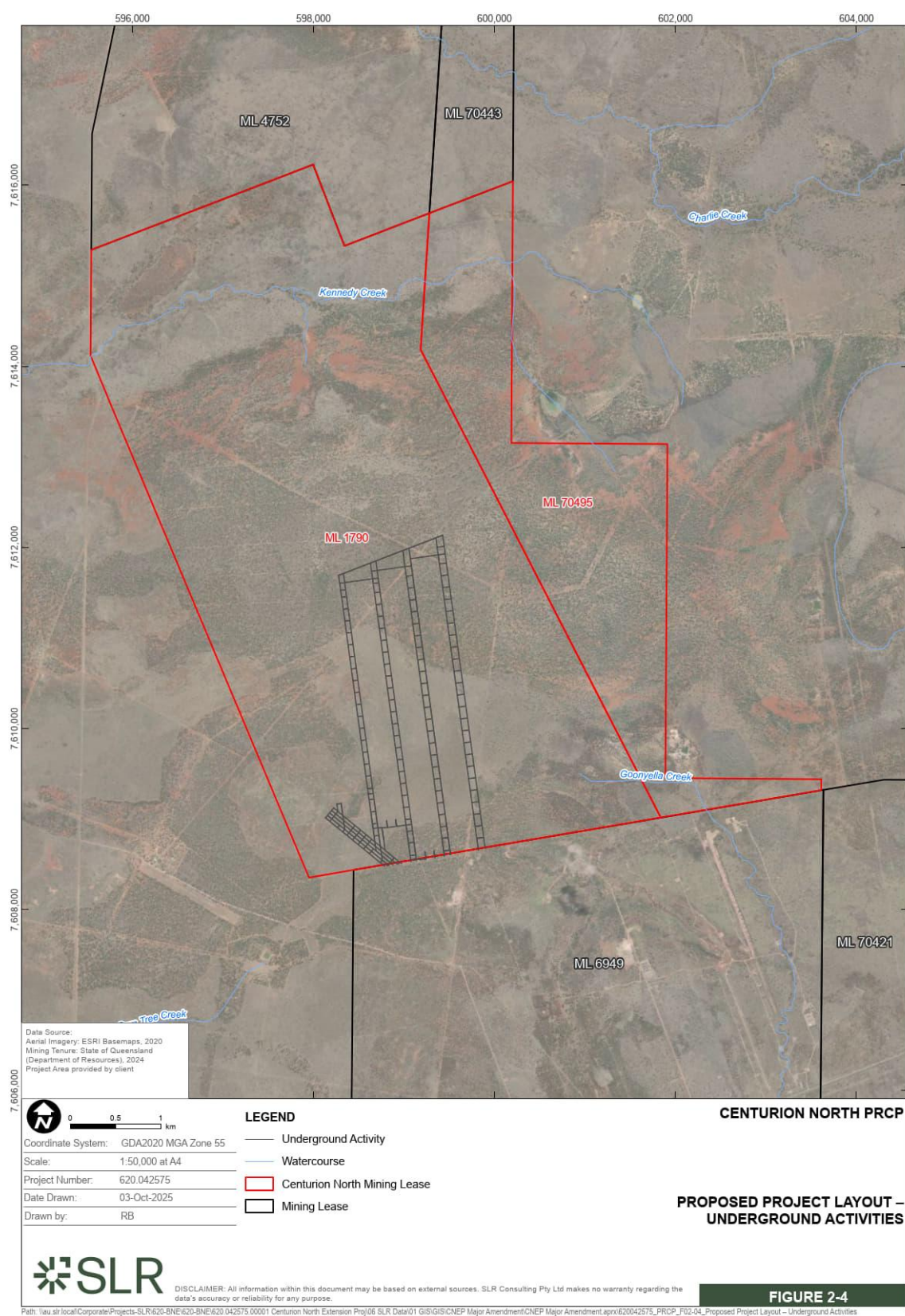


Figure 2-4 Proposed Project Layout – Underground Activities

2.2 Baseline information

PRCP Guideline (Section 3.1)

In addition to the legislative requirements, the following information about the site, where relevant, is considered necessary by the administering authority (as per section 126C(1)(j) of the EP Act) to decide whether to approve the PRCP Schedule:

- Site topography (locally and regionally);
- Climate (general and specific (rain, evaporation, temperatures)) including long-term projections;
- Geological setting;
- Site hydrology and fluvial networks;
- Groundwater levels and properties;
- Soil types, properties, and productivity;
- Land stability (pre-existing land degradation/erosion and predisposition to ongoing stability issues);
- Vegetation communities and ecological data (including existing regional ecosystem mapping);
- Fauna presence and populations;
- Pre-mining land use; and
- Identification of underlying landholders.

PRC plans must include any baseline information collected as part of an Environmental Impact Statement (EIS) process or original EA application. If this information is unavailable, the reasons should be explained in this section of the rehabilitation planning part.

Any expansion to an existing site must demonstrate how it has been designed for closure. The rehabilitation/improvement planning must include data from when mining first commenced up until planned surrender. The provisions of the EP Act include an exceptional circumstance for when land is available for rehabilitation.

2.2.1 Site topography

The regional topography of the Bowen Basin is dominated by flat to gently sloping landforms and low rolling hills.

The topographical features of the Centurion North MLs and surrounding area are consistent with the regional landscape and consist of level plains and gently undulating plains and rises (**Figure 2-5**). Within the footprint of the Centurion North MLs, the highest ground elevations lie at the western boundary of the area (about RL355) with the lowest in the north-east of the area (about RL295).

The Centurion North MLs encompass two shallow valleys, associated with Kennedy Creek and Goonyella Creek.



Figure 2-5 General site topography

2.2.2 Climate

Centurion North MLs are located in a semi-arid area with warm dry winters and hot humid summers. Weather data was collected at the Moranbah Water Treatment Plant (Station No. 034038) between 1972 and 2012 and since 2012 it has been collected at the Moranbah Airport (Station No. 034035) (BoM, 2025a). The Moranbah weather stations are located about 60 km south of the Centurion North MLs.

2.2.2.1 Temperature

Relevant temperate data for the Centurion North Study Area was access from the Bureau of Meteorology (2025a) based on monthly climate statistics for Moranbah Airport (Station No. 034035). Maximum temperatures range from 24°C in June/July to 35°C in December/January, with minimum temperatures ranging from 8°C in July to 21°C in January and February.

2.2.2.2 Rainfall

Although rainfall occurs throughout the year, it is more prevalent in the summer months (December, January and February) (Table 2-3).

Table 2-3 Moranbah monthly weather (Source: BoM, 2025a)

Month	Station no. 034038 (1972-2012)		Station no. 034035 (2012-2025)	
	Mean rainfall (mm)	Mean rainfall (mm)	Mean minimum temperature (°C)	Mean maximum temperature (°C)
January	103.8	104.1	21.5	34.5
February	100.7	92.9	21.4	33.7
March	55.4	81.2	20.4	32.8
April	36.4	32.0	16.9	30.2
May	34.5	30.8	12.8	26.9
June	22.1	23.2	9.8	24.5

Month	Station no. 034038 (1972-2012)		Station no. 034035 (2012-2025)	
	Mean rainfall (mm)	Mean rainfall (mm)	Mean minimum temperature (°C)	Mean maximum temperature (°C)
July	18.0	34.0	8.7	24.3
August	25.0	13.6	9.1	26.8
September	9.1	13.3	12.7	30.1
October	35.7	24.6	16.3	33.2
November	69.3	33.2	19.0	34.6
December	103.9	61.4	20.6	35.0
Annual	613.9	559.8	15.8	30.6

2.2.2.3 Evaporation

The evaporation rate is highest in the summer months - mean daily rate of 8.2 mm in January, and lowest in the cooler months - mean daily rate of 3.6 mm in June. The annual average rate of evaporation is 2,372.5 mm, which greatly exceeds the annual rainfall a characteristic feature of semi-arid environments.

2.2.2.4 Wind

The region tends to have winds of low velocity (less than 10 km/hr) with the prevailing wind direction predominantly from the north and north-east during spring and summer and from the south-east during autumn and winter (Willy Weather, 2020).

Wind records for Moranbah for January-April show an easterly predominance of moderate strength (1-20 km/h), with easterlies dominating during May-July with some south-easterly influence. Easterly winds predominate for August and December which trend north to north-easterly from October-December (Willy Weather, 2020).

2.2.3 Geological setting

Centurion North MLs are located within the Bowen Basin in Central Queensland. The Bowen Basin is part of a connected group of Permian-Triassic basins in eastern Australia that includes the Sydney and Gunnedah Basins. The Bowen Basin contains large reserves of Permian coals, which have been mined on a large scale by open-cut and underground methods since the 1970s.

The Permian coal deposit associated with the Centurion North MLs is situated on the north-western margin of the Bowen Basin, west of the Nebo Synclinorium and on the southern side of the Collinsville Shelf. The deposit dips broadly eastwards at between 2 to 5 degrees, with local steepening in places. In the district the Bowen Basin is characterised by typical basin-fill fluvial (and some marine) sediments, comprising mudstones, siltstones, sandstones and coal seams. Both normal and thrust faults are present.

2.2.3.1 Coal seams

The following two major coal bearing geological formations of Permian age occur in the Centurion North area:

- Fort Cooper Coal Measures; and
- Moranbah Coal Measures.

The MCM is comprised of three coal seam groups (listed in stratigraphic order from youngest to oldest):

- Goonyella P seam;
- Goonyella Middle seam (GMS); and
- Goonyella Lower seam.

2.2.4 Site hydrology and fluvial networks

The Centurion North MLs are located within the Burdekin and Fitzroy Basins. The boundary between the two basins crosses the south-eastern corner of Centurion North MLs. The basins, as they relate to Centurion North MLs, are as follows:

- **Burdekin Basin** – Majority of ML 1790 and northern portion of ML 70495. The portion of the site within the Burdekin Basin is contained within the Suttor River Sub-basin and the Upper Suttor River catchment. The ephemeral Kennedy Creek (**Figure 2-6**) and its tributaries drain the Centurion North MLs within the Burdekin Basin to the west. This creek drains into the Suttor River, which in turn runs to the north and into Lake Dalrymple (130 km to the north-west) and the Burdekin River.
- **Fitzroy Basin** – South-east corner of ML 1790 and the southern half of ML 70495 (in total, approximately 515 ha). The portion of the site within the Fitzroy Basin is contained within the Isaac River Sub-basin and Isaac Northern Rivers catchment. This portion of the Centurion North area drains toward Goonyella Creek, whose headwaters are located in ML 1790.

Figure 2-7 illustrates the location of the basins and mining leases.



Figure 2-6 Ephemeral Kennedy Creek that drains the Centurion North area within the Burdekin Basin to the west.

The Centurion North MLs do not interact with the potential flood hazard area (Queensland Globe, 2025), as illustrated in **Figure 2-7**.

The environmental values and water quality objectives established for the Burdekin and Fitzroy Basins under the Queensland Environment Protection (Water and Wetland Biodiversity) Policy (2019) are documented in the following:

- NQ Dry Tropics 2016, Burdekin Region Water Quality Improvement Plan 2016, NQ Dry Tropics, Townsville; and
- Isaac River Sub-basin Environmental Values and Water Quality Objectives Basin No. 130 (Part).

The environmental values identified for the Upper Suttor River are summarised in **Table 2-4**.

Table 2-4 Water environmental values for the Centurion North area (Source: BHP, 2021a)

Basin	Catchment	Aquatic ecosystems	Irrigation	Farm use	Stock watering	Aquaculture	Human consumption	Primary recreation	Secondary recreation	Visual recreation	Raw drinking water	Industrial use	Cultural and spiritual
Burdekin (Draft)	Upper Suttor River – Surface Waters	✓	-		✓	-	✓	✓	✓	✓	✓	✓	✓
	Upper Suttor River – Groundwaters	-	✓	✓	✓	-	-	-	-	-	✓	✓	-
Fitzroy	Isaac Northern Tributaries – Surface Waters	✓	✓	✓	✓	-	✓	✓	✓	✓	✓	✓	✓
	Isaac River – Groundwaters	✓	✓	✓	✓	-	-	✓	-	-	✓	-	✓

Note: The Environmental values provided within the NQ Dry Tropics 2016, Burdekin Region Water Quality Improvement Plan 2016 are draft only.

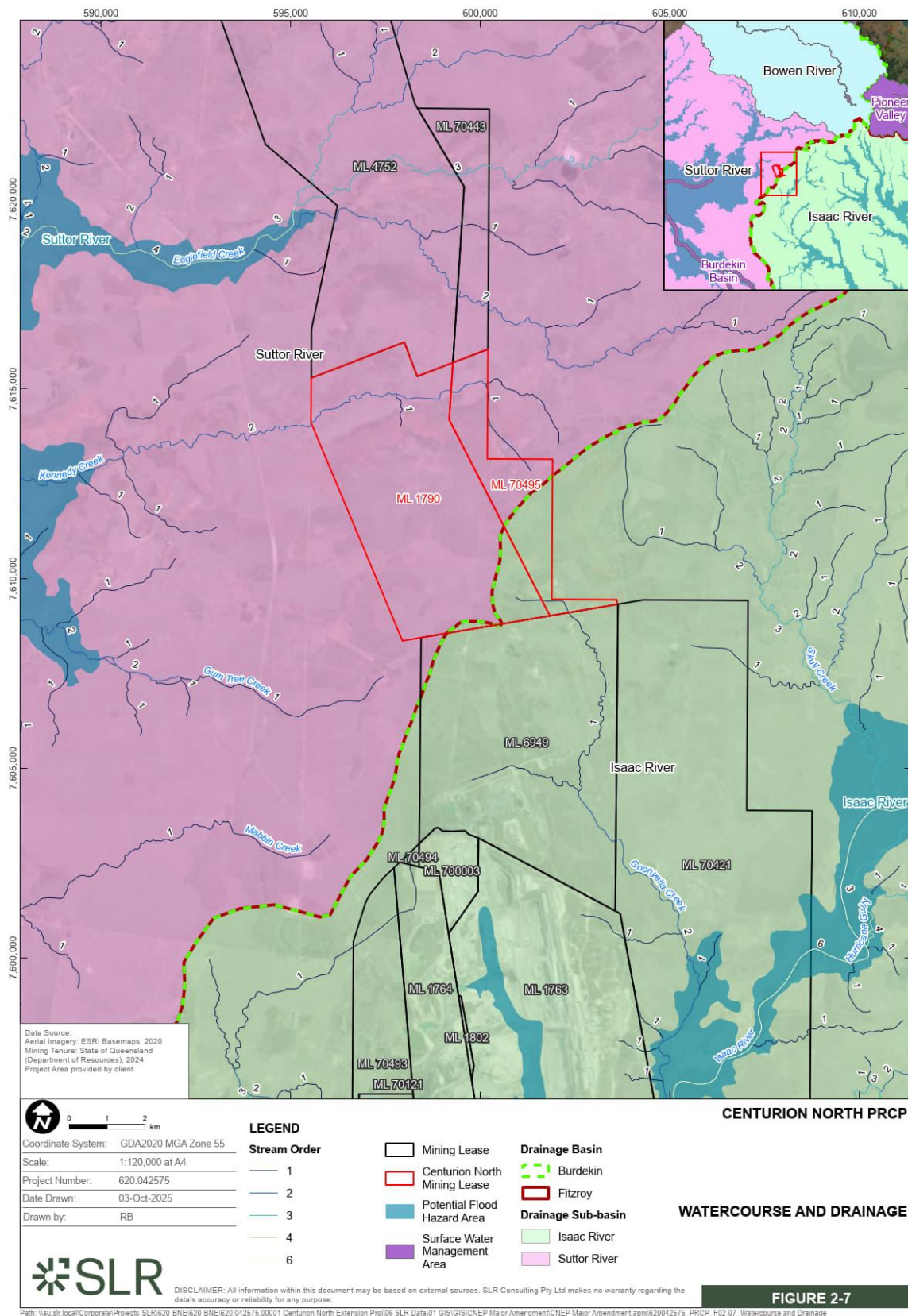


Figure 2-7 Watercourses and Drainage (Source: Queensland Globe, 2025)

A summary of watercourses and dams located within and immediately surrounding the Centurion North MLs are summarised in **Table 2-5**.

No fourth order streams or above, or diversions, are present within the Centurion North mining leases.

Table 2-5 Summary of Centurion North watercourses and dams (BHP, 2021a; Appendix 3)

Watercourse	Perennially	Hierarchy	Stream order	Comment
Burdekin Basin				
Kennedy Creek	Non-perennial	Minor	2	Runs east to west across ML 70495 and ML 1790. Two minor first order streams drain into the creek from the south. Drains into Eaglefield Creek approximately 10 km to the west of the investigation area.
Lake Dalrymple/Burdekin Falls Dam	-	-	-	Located approximately 140 km to the north-west of the site.
Farm dams	-	-	-	Numerous small farm water supply dams are present within and immediately surrounding the Centurion North MLs.
Fitzroy Basin				
Goonyella Creek	Non-perennial	Minor	1	Headwaters located in the south-eastern corner of ML1790, running to the east along the southern boundary of ML70495 before turning south and draining into the Isaac River.
Burton Gorge Dam	Permanent	-	-	Located on the Isaac River approximately 15 km to the east of the investigation area.
Farm dams	-	-	-	Numerous small farm water supply dams are present within and immediately surrounding the investigation area.

2.2.5 Groundwater levels and properties

A hydrogeological assessment and development of pre- and post-mining hydrogeological conceptual models has been undertaken to support the PRC plan and is contained in **Appendix 4**. Hydrogeological information summarised within this PRC plan is extracted from this assessment.

The groundwater levels and properties for the identified hydrostratigraphic units associated with the Centurion North MLs include the following:

- **Quaternary alluvium** – is located in alluvial sediments associated with Eaglefield, Charlie and Kennedy creek river systems. Quaternary alluvium is also located on older floodplain sediments and alluvial flats. These aquifers are considered porous media aquifers with groundwater occurring within the media pore spaces and are generally unconfined. The depth and availability of the Quaternary alluvium aquifer is likely to be variable and dependant on weather conditions.

Therefore, this aquifer is not typically targeted for groundwater extraction at Centurion North. Ecosystems along the creek lines that are potentially groundwater dependent, may be associated with this aquifer. Typical thicknesses of the quaternary alluvium aquifers are believed to be between 15 and 25 m.

- **Tertiary strata** – comprises of vesicular basalt flows following Tertiary palaeochannels incised into the Permian Basement. This strata is the predominant aquifer targeted by groundwater extraction bores used for stock watering in the proximity of Centurion North. The typical Total Dissolved Solid (TDS) range between 480 and 2,900 mg/L, which is suitable for stock watering; however, it has limited suitability for other beneficial uses such as irrigation, domestic, recreation or drinking water. Groundwater within basalt is a second porosity aquifer with groundwater transmitted through fractures and joints. Low permeability sediment deposits, weathering horizons between basalt flows and low permeability basalts within the centre of the flows, compartmentalise the aquifer. Typical groundwater levels for the Tertiary strata are between 6 and 60 metres (m) below ground surface, with flow typically from north-east to south-west.
- **Permian strata** – comprises of siltstone, sandstone, calcareous, carbonaceous shales and coal. This aquifer is not expected to be a significant aquifer at Centurion North. The Permian strata is identified primarily as a porosity aquifer in the sandstone units and a secondary porosity aquifer in the shales, siltstone and coal units. The occurrence of the aquifer is variable depending on the interconnection of fractures, faulting and extent of porous sediments. The aquifer is generally considered to be a confined aquifer with lower permeability overburden rocks acting as a confining unit to groundwater in the coal seams. Existing data indicates the water levels are between 6.8 and 42.1 m below ground and has a higher salinity than those within the Tertiary strata. This aquifer is generally not targeted for beneficial use due to salinity and low recharge rates.

A baseline hydrogeological conceptual model (Golder, 2020) illustrating the above hydrostratigraphic units and groundwater flows is illustrated in **Figure 2-8**.

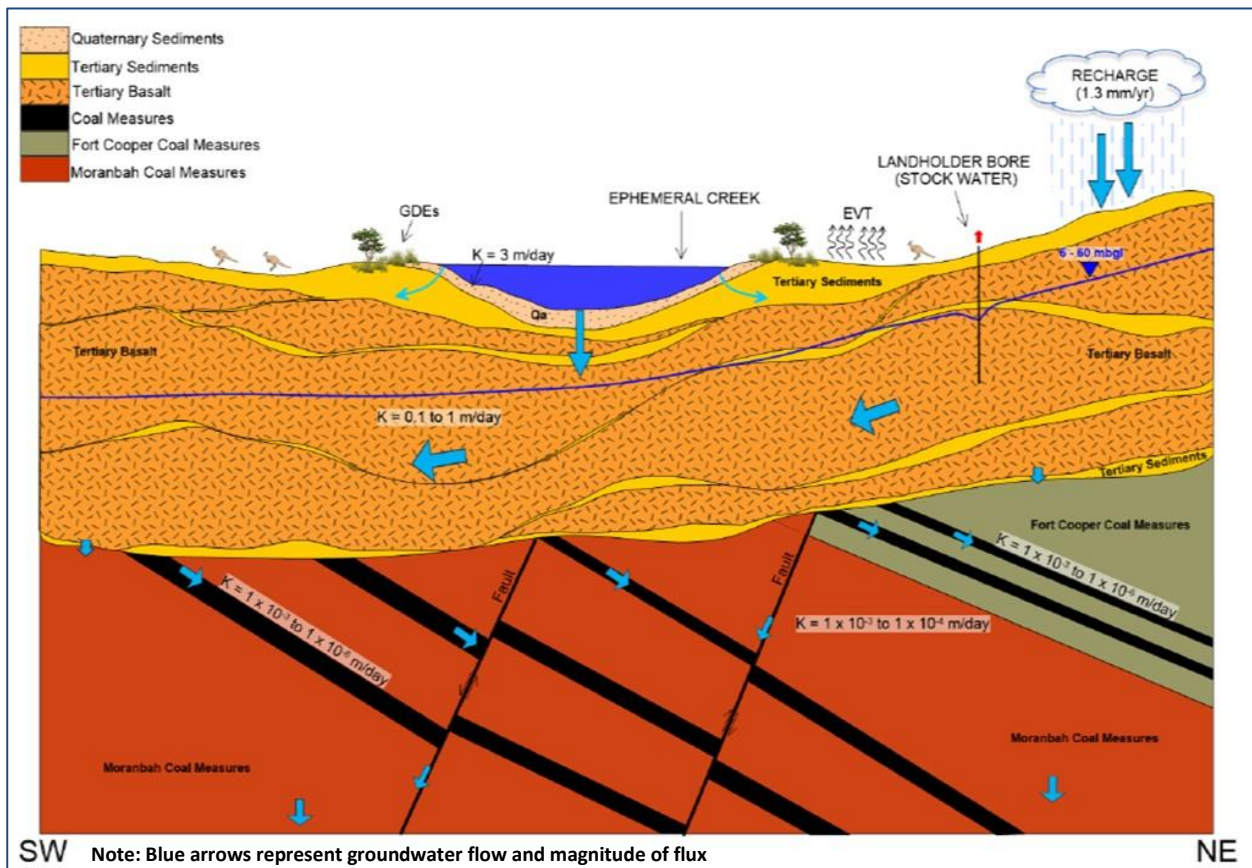


Figure 2-8 Baseline hydrogeological conceptual model (Golder, 2020)

The environmental values for groundwater established for the Upper Suttor River and Isaac River under the Queensland Environment Protection (Water and Wetland Biodiversity) Policy (2019) are summarised in **Table 2-4**. The Highlands Underground Water Area (Burdekin Basin) and the Isaac Connors Groundwater Management Area (Fitzroy Basin) intersect the southern portions of ML 1790 and ML 70495 (**Figure 2-9**).

A bore census for Wards Well (which included the Centurion North MLs) was completed in 2012 by Australian Groundwater & Environmental Consultants Pty Ltd (AGE, 2012). As part of this census, six bores are located within five km of the Centurion North MLs (refer **Figure 2-9**). Five of the six bores were in use for stock watering use, with one bore noted to be abandoned.

According to the Queensland Groundwater Database (Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development (DNRMMRRD), 2025a), there are 68 registered groundwater bores within 10 km of the Centurion North MLs (refer **Figure 2-9**) which are listed as existing. One of the bores (132496) was listed for water supply purposes and is located approximately 10 km west of ML 1790. The majority of the registered bores (49) were listed for monitoring purposes. The usage for the remaining 18 bores was not listed, however is expected to be stock watering or monitoring.

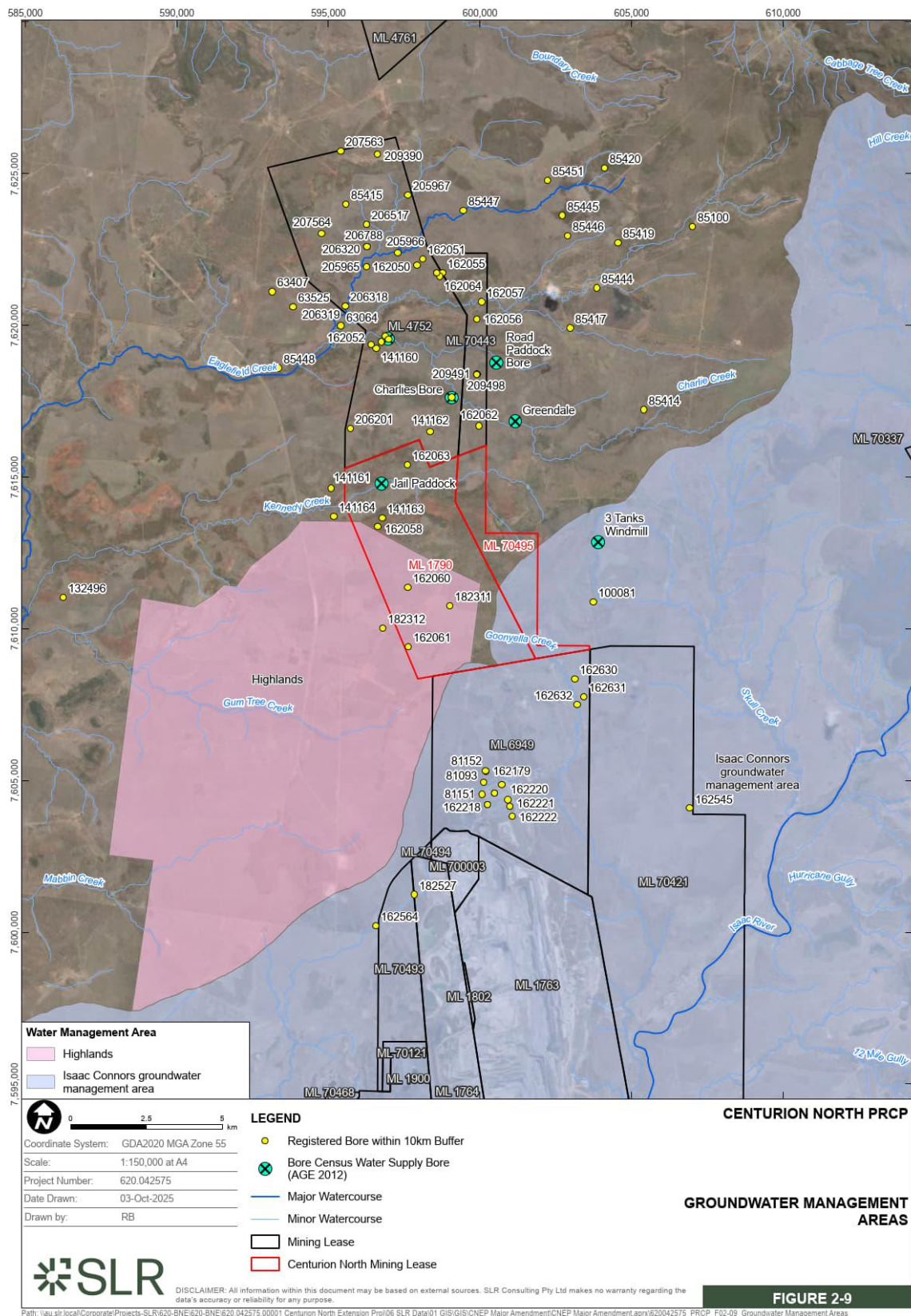


Figure 2-9 Groundwater management areas (Source: Queensland Globe, 2025; AGE, 2012; DNRMMRRD, 2025)

Groundwater monitoring of the Tertiary aquifers has been undertaken since 2011 for parameters specified within the EA, including a range of metals, total recoverable hydrocarbons, pH, electrical conductivity (EC) and alkalinity. As mining operations have not commenced at Centurion North, the groundwater monitoring results are indicative of background concentrations. Locations of the existing monitoring bores are shown on **Appendix 4**, Figure 3.

The existing groundwater data, collected by BMC and SMC, indicates that selected analytes may be present at background concentrations above the Water Quality Objectives (WQOs) for the Burdekin and/or Fitzroy Basins. Therefore, site-specific trigger levels and closure criteria will need to be developed in consideration of the “*Using monitoring data to assess groundwater quality and potential environmental impacts – Version 2*” (DES, 2021).

2.2.6 Soil types, properties and productivity

A soil resources and pre-mining assessment of agricultural land suitability was undertaken in 2011 to determine soil type and properties to understand baseline soil characteristics and suitable rehabilitation resources (SKM, 2012; **Appendix 5**). The scale of survey was 1:25,000 for planned disturbed areas and up to 1:50,000 for planned undisturbed areas, equivalent to a high intensity soil survey (McKenzie *et al*, 2008). Soil types were identified according to the Australian Soil Classification. A follow-up site observation of the surface condition was undertaken in 2020; this focussed on soil characteristics within the planned box-cut area (not part of Centurion North).

During the 2011 soil survey, site access challenges prohibited machinery access to sample and examine soil profiles in the planned box-cut area. These access challenges were again identified during the 2020 observation. During the 2020 observation, an assessment was completed on vegetation communities, surface condition and topsoil physical characteristics, with comparisons made to soils that have been examined in more detail adjacent to the area. Light self-mulching clays were identified in the A1 horizon in the box-cut area with surface cracking present. This is consistent with Vertosols identified in the adjacent area during the 2011 assessment, at sites 85, 86 and 87 (SKM, 2012).

Both the survey and observation found Vertosols, Sodosols, Dermosols and Kandosols to be present (**Figure 2-10**). A summary of physical properties of these soil types is described in **Table 2-6**, with the associated rehabilitation-related chemical properties (from a productivity perspective) provided in **Table 2-7**. All soil types within the Centurion North area support a pre-mining land use of grazing.

Table 2-6 Soil types within the Centurion North MLs

Australian Soil Classification	Properties	Area (%)	Area (ha)
Vertosol	Occurring on plains/floodplains and mafic volcanic rocks	17%	575
	Brown, Grey and Black, greater than 35% clay content, self-mulching over Basalt		
	Soils may become saline to epihypersodic with depth		
	Moderately to well drained and are generally alkaline to very alkaline with depth		
Dermosol	Occurring on low angle pediments with low shrublands, to surrounding Vertosol plains	23%	781
	Red, Brown Light to Medium Clays, well-structured and well drained		
	Dispersion potential		
	Poor drainage and low overall fertility		

Australian Soil Classification	Properties	Area (%)	Area (ha)
Kandosol	Occurring on level to gently undulating plains often in association with ferricrete deposits Red Sandy Loams and Medium Clays Often very deep (>3m) and clay-rich Good surface drainage Good pasture soil with low to moderate fertility	53%	1,786
Sodosol	Occurring on alluvial and part-colluvial deposits, as well as igneous, sedimentary and metamorphic rocks Sodic Duplex and Gradational Brown Loams Dispersive, hard setting and prone to erosion Good surface drainage and poor subsoil drainage Sodosol areas are grazed but erosion is present	7%	245

Table 2-7 Rehabilitation-related chemical properties and productivity of soil types found within the Centurion North area

Parameter	Unit	Vertosol	Dermosol	Kandosol	Sodosol
pH _{water}	N/A	7.8 - 8.6	7.2 - 7.8	6.7 - 7.5	
EC _{water}	dS/m	0.1 - 0.66	0.025 - 0.15	0.014 - 0.034	
Plant Available Water Content	mm	125 - 450	100 - >125	>125	
Organic carbon	%	5.1	1.4	3.6	
Cation Exchange Capacity (CEC)	cmol/kg	57 - 72.4	8.1 - 20.3	17.4 - 31	Sodosols - minimal disturbance; hence data has not been included
Exchangeable sodium percentage (ESP)	%	0 - 12	5 - 11	0 - 5	
Ca/Mg ratio	N/A	1.1 - 2.1	0.8 - 1.2	1.2 - 1.7	
Productivity	-	Predominant soil type in the region. Soil properties sufficient to support grasses and native trees	Suitable for rehabilitation for cattle grazing on flat to gentle slopes	Suitable for rehabilitation of steeper slopes due to good soil structure	

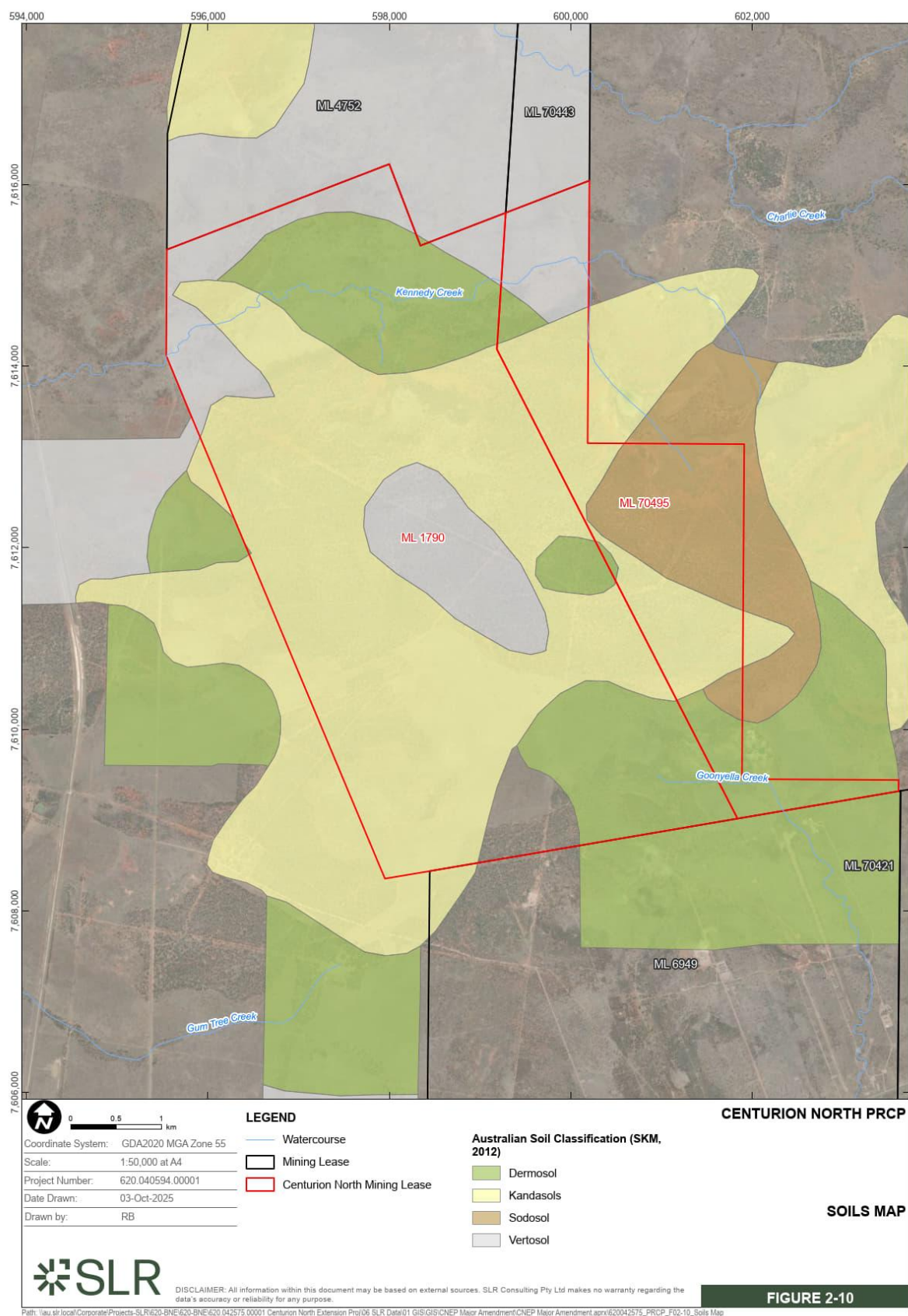


Figure 2-10 Soils map

Figure 2-11 illustrates various areas that are characteristic of the local soil types and associated vegetation.

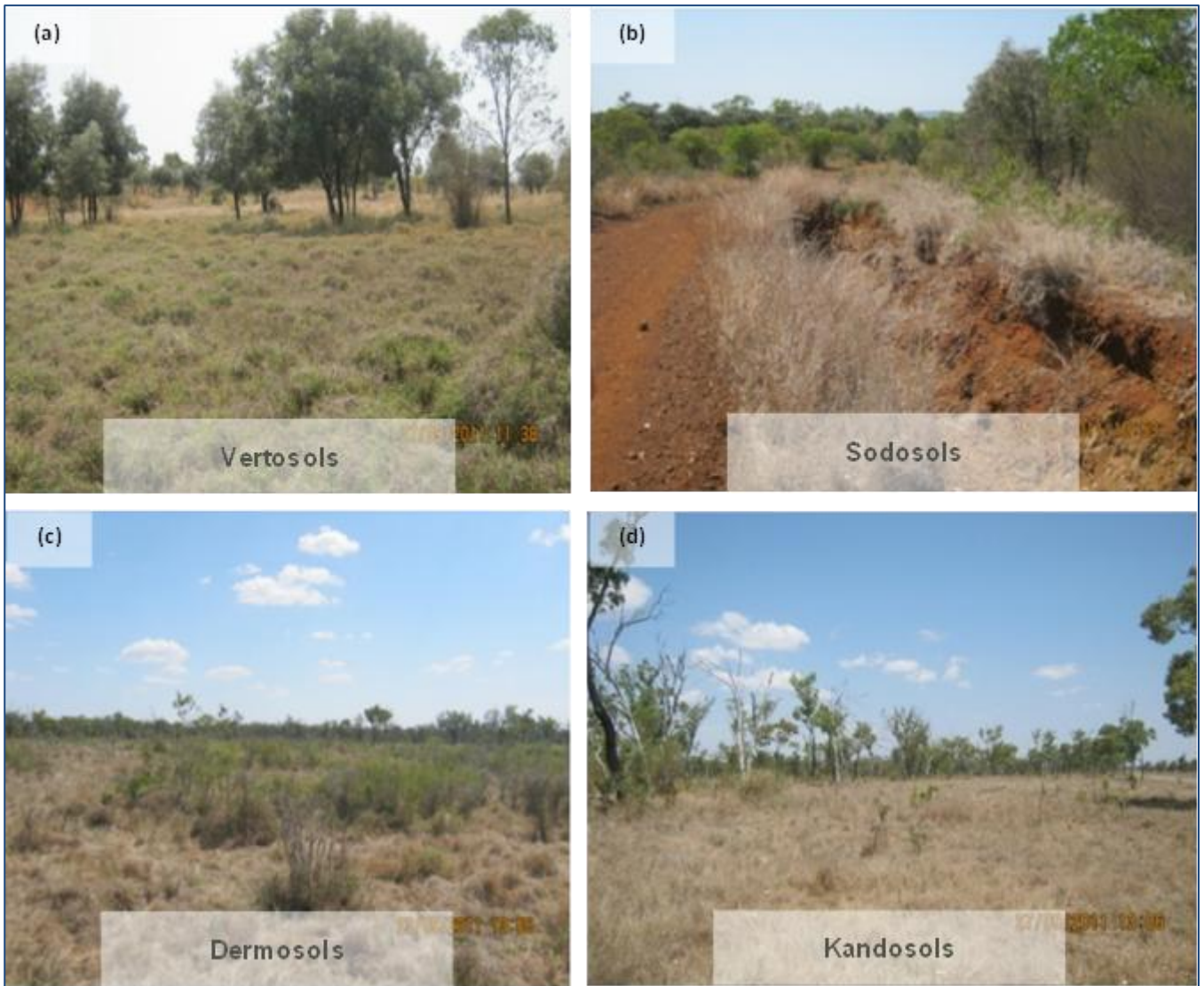


Figure 2-11 Areas that are characteristic of the local soil types and vegetation - a) Brigalow and grasslands with cattle grazing on cracking clay Vertosols; b) Ironbark, Brigalow and erosion-prone areas on Sodosols; c) Low shrubs and grassland with cattle grazing on Dermosols and d) Open grasslands with remnant vegetation and cattle grazing on Kandosols.

2.2.7 Land stability

The regional topography is dominated by flat to gently sloping landforms which is consistent with the landscape at Centurion North. In the context of land stability, erosion is isolated to areas of the landscape where land use has exposed soil types with limited erosion resistance. Pre-mining surface erosion in drainage areas and creek crossings is evident across the site and is mainly associated with existing grazing activities and historically cleared areas. During the soil survey, erosion was noted at 16 of the 98 sample locations and on all four soil types.

Erosion was most prevalent on Sodosols in the north-east of the soil survey area and will have a tendency to be unstable if not ameliorated post-disturbance. Stream bank erosion was also identified within drainage lines, and sheet erosion on land adjacent to dirt tracks (see **Figure 2-12**).

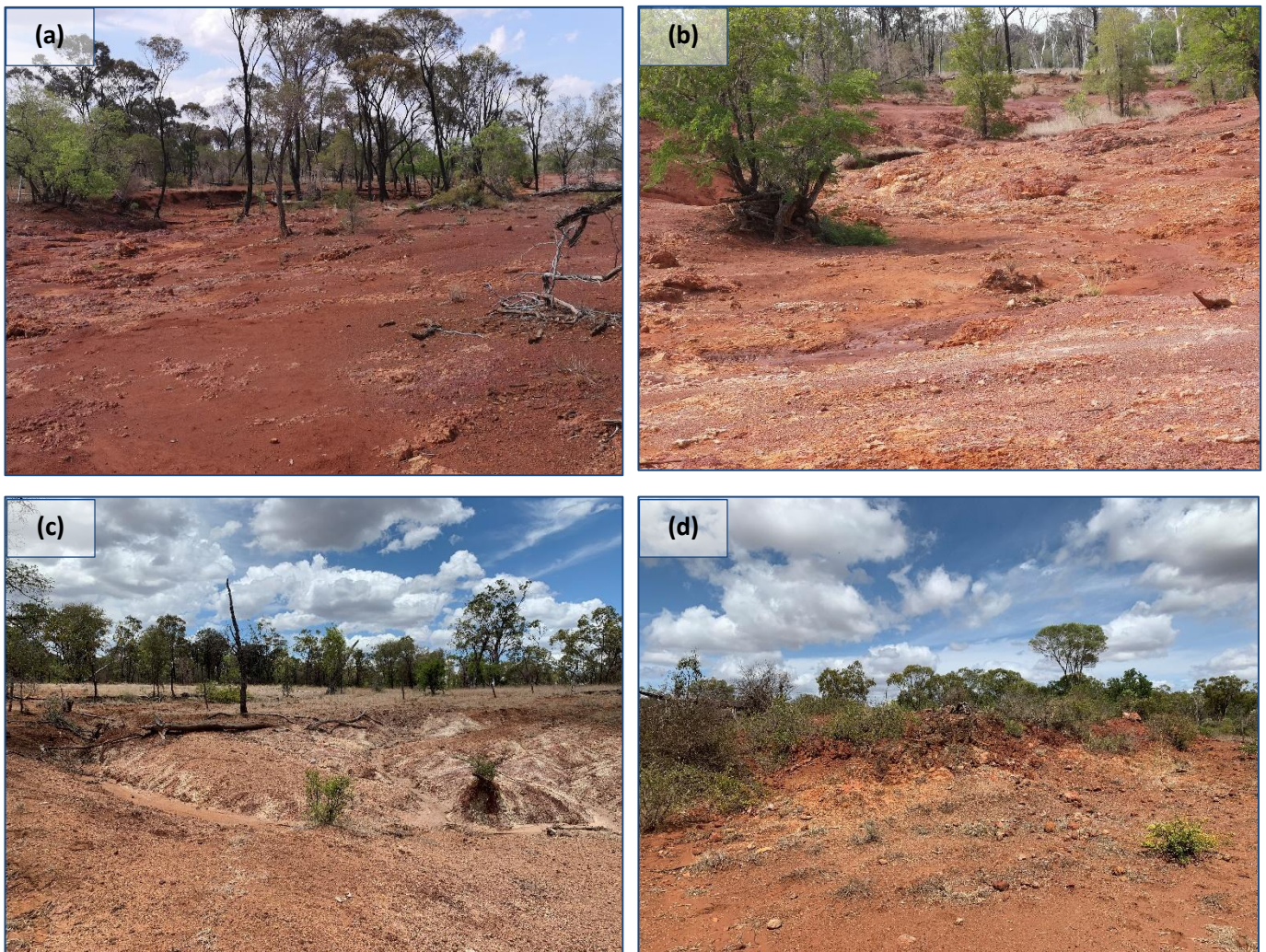


Figure 2-12 Evidence of surface erosion due to existing grazing activities and historical land clearance - a) Sheet erosion adjacent to creek; b) Stream bank erosion; c) Sheet erosion leading to flow concentrating features; and d) Stream bank erosion.

2.2.8 Vegetation communities and ecological data

2.2.8.1 Vegetation communities

The vegetation communities at Centurion North comprises a mix of non-remnant pasture, remnant vegetation and regrowth vegetation. Disturbance due to historical land uses, including grazing, have created a mosaic of intact and regrowth communities at varying stages of maturity which are interspersed with non-remnant areas.

Vegetation is also dominated by natural grasslands and *Eucalyptus orgadophila* open grassy woodlands on basalt derived soils, much of which is in remnant condition. The southern area is dominated by a mosaic of *Eucalyptus crebra* and *Eucalyptus populnea* woodlands on weathered Tertiary surfaces, with small pockets of semi-evergreen vine thicket (SEVT) and sections of Brigalow dominated woodlands on the southern boundary.

Waterways that traverse the northern and central portion of the Study Area support fringing riparian Eucalypt communities.

Terrestrial ecology surveys were undertaken across a Study Area (hereafter referred to as the Terrestrial Study Area) that included the Centurion North MLs in 2024 and 2025 (E2M, 2025a; **Appendix 6**; E2M, 2025b). The surveys identified a total of approximately 3,730 ha of remnant vegetation and 409 ha of mature regrowth was ground-truthed within the Terrestrial Study Area. A summary of REs, associated vegetation condition class and area is provided in **Table 2-8**.

Endangered (VM Act class) REs were associated with Cainozoic sand plains (land zone 5) and undulating country on fine grained sedimentary rocks (land zone 9) within the Terrestrial Study Area. Of Concern (VM Act class) REs were located along riparian corridors (land zone 3) and Cainozoic basalt plains (land zone 8) within the Terrestrial Study Area.

Table 2-8 Ground-truthed REs within the Terrestrial Study Area (Source: E2M, 2025a; E2M, 2025b)

RE	RE description	RE type	Biodiversity status	VM Act class	Broad Vegetation Group (BVG) (1:1M)	Extent within Terrestrial Study Area (ha)
11.3.25d	<i>Eucalyptus tereticornis</i> , <i>E. camaldulensis</i> and <i>Melaleuca bracteata</i> woodland fringing drainage lines	Remnant	Of concern	Least concern	22c	30.54
11.5.3	<i>Eucalyptus brownii</i> woodland on Cainozoic sand plains and/or remnant surfaces	Remnant	No concern at present	Least concern	17a	170.11
		Mature regrowth	No concern at present	Least concern	17a	29.64
		Non-remnant: young woody regrowth	NA	NA	NA	29.91
11.5.9c	<i>Eucalyptus crebra</i> +/- <i>Corymbia intermedia</i> +/- <i>E. moluccana</i> +/- <i>C. dallachiana</i> woodland. Occurs on Cainozoic sandplains formed on plateaus and broad crests of hills and ranges. Soils are generally deep red earths.	Remnant	No concern at present	Least concern	18b	2,119.64
		Mature regrowth	No concern at present	Least concern	18b	35.35
		Non-remnant: young woody regrowth	NA	NA	NA	34.66
11.5.15	Semi-evergreen vine thicket on Cainozoic sand plains and/or remnant surfaces	Remnant	Endangered	Least concern	7a	32.02
		Mature regrowth	Endangered	Least concern	7a	3.99
		Non-remnant: young woody regrowth	NA	NA	NA	118.59

RE	RE description	RE type	Biodiversity status	VM Act class	Broad Vegetation Group (BVG) (1:1M)	Extent within Terrestrial Study Area (ha)
11.5.16	<i>Acacia harpophylla</i> open forest in depressions on Cainozoic sand plains and remnant surfaces	Remnant	Endangered	Endangered	25a	196.66
		Mature regrowth	Endangered	Endangered	25a	221.16
		Non-remnant: young woody regrowth	NA	NA	NA	170.08
11.5.17	<i>Eucalyptus tereticornis</i> and <i>E. camaldulensis</i> woodland in depressions on Cainozoic sand plains and remnant surfaces	Remnant	Endangered	Endangered	34d	4.16
11.7.1x1	Semi-evergreen vine thicket on the slopes and scarps of rocky residual ranges with Cainozoic lateritic duricrust.	Remnant	Of concern	Least concern	7a	10.67
11.7.2	<i>Acacia</i> spp. woodland on Cainozoic lateritic duricrust. Scarp retreat zone	Remnant	No concern at present	Least concern	24a	3.50
11.8.5	<i>Eucalyptus orgadophila</i> open woodland on Cainozoic igneous rocks	Remnant	No concern at present	Least concern	11a	421.79
		Mature regrowth	No concern at present	Least concern	11a	20.19
11.8.11	<i>Dichanthium sericeum</i> grassland on Cainozoic igneous rocks.	Remnant	Of concern	Of concern	30b	741.57

RE	RE description	RE type	Biodiversity status	VM Act class	Broad Vegetation Group (BVG) (1:1M)	Extent within Terrestrial Study Area (ha)
11.9.5	<i>Acacia harpophylla</i> and/or <i>Casuarina cristata</i> open forest to woodland on fine-grained sedimentary rocks	Mature regrowth	Endangered	Endangered	25a	99.48
Non-remnant	Cleared paddocks and disturbed areas dominated by introduced pasture grasses such as <i>Cenchrus ciliaris</i>	non-remnant: other vegetation	NA	NA	NA	320.95

2.2.8.2 Category B environmental sensitive areas – endangered regional ecosystems

Under the EP Act, all Regional Ecosystems (REs) with a biodiversity status as Endangered are classified as a Category B Environmentally Sensitive Areas (ESA).

Requirements for managing impacts to Category B ESAs are included in the EA P-EA-100658735 and the PRCP Schedule (P-PRCP-100669070_V3). Condition PRCP4 requires: *“Rehabilitation of areas disturbed in Category B Environmentally Sensitive Area or within 500m of a Category B Environmentally Sensitive Area must commence as soon as practicable to the extent that erosion impacts are minimised and be completed as soon as practicable but no longer than three (3) months after completion of the disturbance activity”*.

Category B ESAs are defined as remnant and high value regrowth endangered (Biodiversity Status) REs including (illustrated in **Figure 2-13**):

- 11.5.15 – Semi-evergreen vine thicket on Cainozoic sand plains and/or remnant surfaces;
- 11.5.16 – *Acacia harpophylla* open forest in depressions on Cainozoic sand plains and remnant surfaces; and
- 11.9.5 – *Acacia harpophylla* and/or *Casuarina cristata* open forest to woodland on fine-grained sedimentary rocks.

Exploration activities and early works have been designed to avoid, where possible Category B ESAs, or have implemented management actions to reduce impacts such as minimising ground impacts by slashing or accessing each proposed drill site utilising existing tracks wherever possible. Where new tracks are required, tracks will be positioned to cause the least environmental impact.

2.2.8.3 Threatened ecological communities

Three threatened ecological communities (TECs) listed as Matters of National Significance under the *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act) were ground-truthed within the Centurion North Study Area (E2M, 2025b), and included:

- Brigalow (*Acacia harpophylla* dominated and co-dominated) Threatened Ecological Community (Brigalow TEC);
- Natural Grasslands of the Queensland Central Highlands and northern Fitzroy Basin (Best quality and Good quality); and
- Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions (SEVT TEC).

The Brigalow TEC was identified in small patches across the Terrestrial Study Area, within a total area of 493.61ha of the Terrestrial Study Area (**Figure 2-13**). Natural Grasslands dominate the centre and north of the Centurion North MLs - patches meeting the key diagnostic and condition threshold of the TEC in good quality were identified within an area of 369.25 ha and best quality within 159.44 ha (**Figure 2-13**). SEVT TEC was identified in small, isolated patches within an area of 42.69 ha (**Appendix 6**) (**Figure 2-13**).

For exploration activities and early works, areas of Brigalow and SEVT TEC are subject to management measures to reduce impacts, including opportunities to further minimise disturbance through managed slashing.

2.2.8.4 Threatened flora

One threatened flora species, king bluegrass (*Dichanthium queenslandicum*), which is currently listed as Endangered under the EPBC Act and Vulnerable under the Nature Conservation Act 1992 (NC Act), was identified within the Terrestrial Study Area (E2M, 2025a; **Appendix 6**; E2M, 2025b).

1,800 tussocks of this species were identified within the northern part of the Terrestrial Study Area in association with areas of remnant bluegrass grasslands and open woodlands on basalt plains with low weed abundance. Preferred habitat mapped for the species within the Terrestrial Study Area includes areas of remnant bluegrass grasslands and open woodlands on basalt plains with low weed abundance (RE 11.8.11 and 11.8.5) where records of *D. queenslandicum* were present within the Terrestrial Study Area.

There are no specific requirements in the Centurion North EA or PRCP Schedule for inclusion of threatened flora species in the rehabilitation planning.

2.2.8.5 Weeds

Three weed species listed as Weeds of National Significance (WoNS) under the National Weeds Strategy and restricted matters under the *Queensland Biosecurity Act 2014* were recorded within the Terrestrial Study Area (E2M, 2025a). These weeds included:

- Harrisia cactus (*Harrisia martinii*) – WoNS, Category 3 Biosecurity Act status;
- Velvet tree pear (*Opuntia tomentosa*) – WoNS, Category 3 Biosecurity Act status; and
- Parthenium (*Parthenium hysterophorus*) - WoNS, Category 3 Biosecurity Act status.

Other weeds species that are not listed as WoNS or associated with Biosecurity Act status were prevalent throughout the Terrestrial Study Area, including buffel (*Cenchrus ciliaris*), Indian bluegrass (*Bothriochloa pertusa*), and red natal grass (*Melinis repens*).

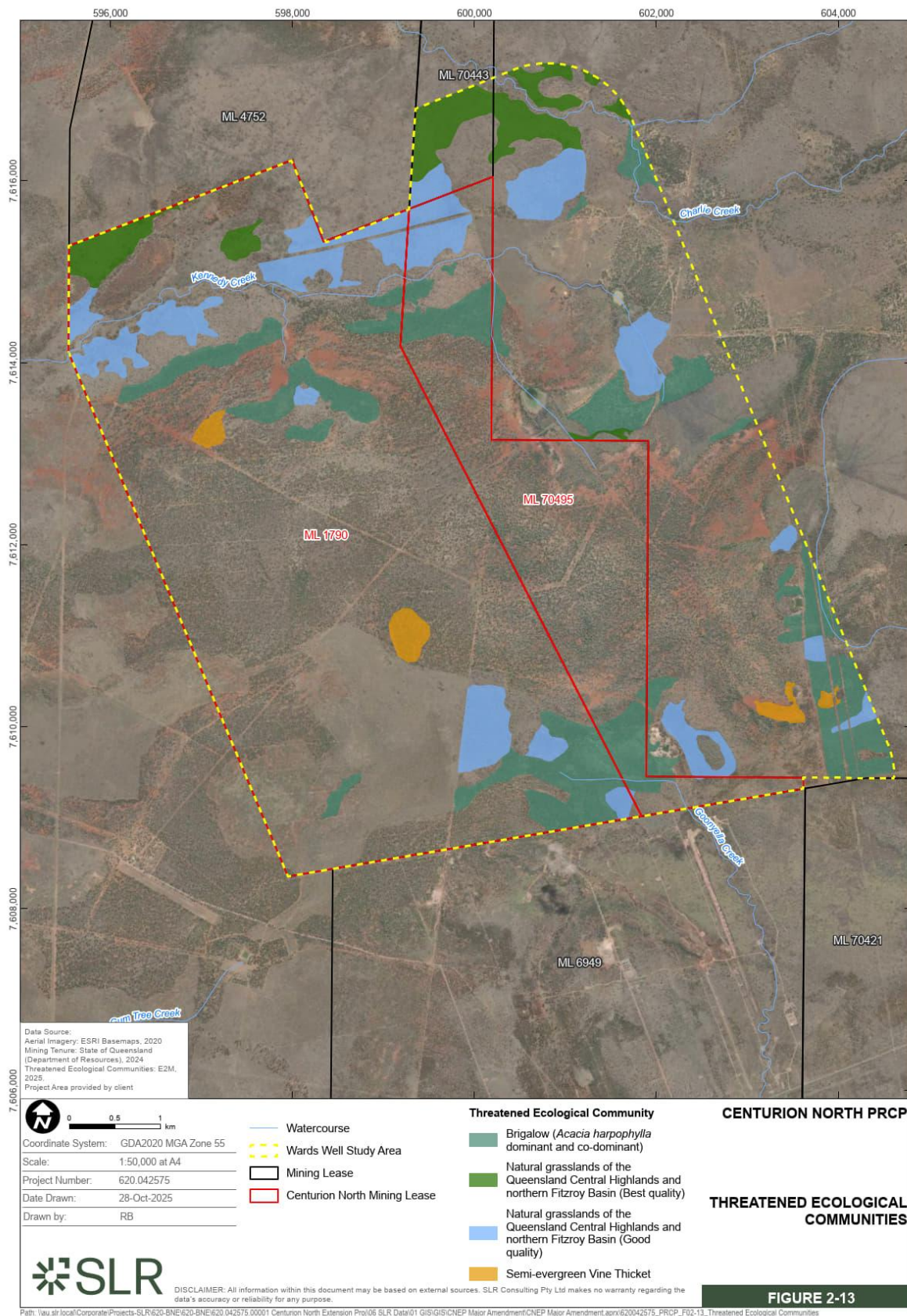


Figure 2-13 TEC mapping

2.2.9 Fauna presence and populations

Terrestrial ecology surveys were undertaken across the Terrestrial Study Area in 2024 (E2M, 2025a; **Appendix 6**; E2M, 2025b). The surveys identified the likelihood of occurrence assessment identified two threatened fauna species and one conservation significant species that are known to occur within the Study Area. Given the presence of mapped habitat within the Terrestrial Study Area, these species are also considered known to occur. The species included:

- Koala (*Phascolarctos cinereus*) – Endangered under the EPBC Act and NC Act.
- Short-beaked echidna (*Tachyglossus aculeatus*) – Special least concern under the NC Act.
- Squatter pigeon (southern) (*Geophaps scripta scripta*) – Vulnerable under the EPBC Act and the NC Act.

Three species listed under the EPBC Act and/or NC Act were considered likely to occur within the Terrestrial Study Area, due to their presence of suitable habitat, records in the region, and wide-ranging nature of the species. These species include:

- White-throated needletail (*Hirundapus caudacutus*) – Vulnerable under the EPBC Act and the NC Act;
- Latham's snipe (*Gallinago hardwickii*) – Migratory under the EPBC Act and Special lease concern under the NC Act;
- Australian painted snipe (*Rostratula australis*) – Endangered under the EPBC Act and NC Act; and
- Ornamental snake (*Denisonia maculata*) – Vulnerable under the EPBC Act and NC Act.

2.2.9.1.1 Koala

Individuals were identified from two BAR locations within areas of *Eucalyptus crebra* woodland (RE 11.5.9c) and *Eucalyptus brownii* woodland (RE 11.5.3). Calls were recorded on four separate nights at 13 intervals and were mostly recorded after midnight and in the early hours of the morning. No individuals were identified during spotlighting or diurnal surveys in the wet or dry season surveys, and no scat or scratches were positively identified for the species. These findings indicate that the species is at a low density in the local landscape. The landscape is highly fragmented with the Terrestrial Study Area having limited connectivity to other tracts of remnant vegetation or major watercourses with riparian woodland where the species is commonly recorded in the region.

Koala habitat within the Terrestrial Study Area has been mapped as either breeding and foraging or dispersal habitat in consideration of *A review of koala habitat assessment criteria and methods* (Youngentob et al., 2021), as follows:

- Breeding and foraging habitat - areas of remnant and high value regrowth riparian vegetation communities that are dominated by or contain locally important koala trees, which comprise REs 11.3.25d, 11.5.3, 11.5.15, 11.5.17 and 11.8.5.
- Dispersal habitat - areas of remnant and high value regrowth *Acacia harpophylla* dominated communities that provide ancillary trees, comprising REs 11.5.16 and 11.9.5.

2.2.9.1.2 Short-beaked Echidna

One individual was identified in the Terrestrial Study Area in remnant *Eucalyptus crebra* woodland (RE 11.5.9c). Scats attributable to the species were also recorded in multiple locations in remnant vegetation within the Terrestrial Study Area.

Short-beaked echidna habitat within the Terrestrial Study Area has been mapped as:

- Breeding and foraging habitat - areas of remnant and high-value regrowth vegetation, including all wooded REs; and

- Dispersal habitat – other vegetated areas, including grasslands and young woody regrowth vegetation providing limited habitat features such as large woody debris, shrubby areas and logs suitable for short-beaked echidna and provides dispersal habitat between areas of preferred habitat.

2.2.9.1.3 Squatter Pigeon (southern)

A total of 65 squatter pigeon (southern) individuals were recorded across the Terrestrial Study Area. Records were in proximity to dams where there were trees nearby to disperse into when startled. Wooded areas with tree cover had lower levels of grass productivity with mid-dense to sparse ground cover. These areas are likely to be more suitable for squatter pigeon (southern) foraging habitat.

Squatter pigeon (southern) habitat within the Terrestrial Study Area has been mapped as breeding, foraging or dispersal habitat with guidance from the DCCEEW species profile (DCCEEW, 2025), as follows:

- Breeding and foraging habitat – areas within 1 km of permanent water source suitable for breeding, that are areas of remnant and mature regrowth eucalypt woodland REs suitable for foraging.
- Foraging habitat - areas within 3 km of permanent water source that are areas of remnant and mature regrowth eucalypt woodland REs suitable for foraging.

2.2.9.1.4 White-throated Needletail

White-throated needletail was not detected during the field surveys, however, has been previously recorded nearby (approximately 20 km) the MLs (Atlas of Living Australia (ALA), 2025) and is considered likely to occur. Suitable habitat for the species includes remnant and high-value regrowth vegetation that supports air space for aerial foraging.

2.2.9.1.5 Australian Painted Snipe

The Australian painted snipe was not detected during survey events, however, the species is highly mobile and may utilise areas of habitat within the Terrestrial Study Area intermittently for foraging and roosting and is considered likely to occur. The species may use areas within the Terrestrial Study Area periodically after high rain events. Periodical foraging and roosting habitat for this species includes areas of wetland from overflow of dams, and seasonal gilgais of varying sizes in brigalow vegetation.

The Terrestrial Study Area contains 69.20 ha of foraging and roosting habitat for the Australian painted snipe.

2.2.9.1.6 Latham's Snipe

Latham's snipe was not detected during survey events. However, the species is highly mobile and may use areas within the Terrestrial Study Area periodically after high rain events. These areas are associated with overflows of man-made dams and shallow to moderate gilgais containing ephemeral water in brigalow vegetation.

2.2.9.1.7 Ornamental snake

The Ornamental snake was not identified in the Terrestrial Study Area during targeted field surveys. However, habitat for the species is likely to occur, consisting of remnant RE 11.5.16 containing deep gilgais where woody debris is present with enough water retention to support breeding habitat, and young woody regrowth brigalow vegetation with shallow to moderately deep gilgais of varying sizes with woody debris and enough water retention to support frog breeding habitat.

2.2.9.2 Migratory Fauna

The likelihood of occurrence assessment identified two migratory fauna species that are likely to occur within the Terrestrial Study Area, including:

- Fork-tailed swift (*Apus pacificus*) – Migratory under the EPBC Act and Special least concern under the NC Act;
- Glossy ibis (*Plegadis falcinellus*) – Migratory under the EPBC Act; and
- Oriental cuckoo (*Cuculus optatus*) - Migratory under the EPBC Act and Special least concern under the NC Act.

No migratory fauna were identified in the [Terrestrial](#) Study Area during the field surveys.

2.2.9.2.1 Fork-tailed Swift

Fork-tailed swift was not detected during the field surveys, however, has been previously recorded nearby (approximately 20 km) the MLs (ALA, 2025) and is considered likely to occur. Suitable habitat for the species includes a broad range of vegetation communities that support feeding resources in which they fly in the airspace above.

2.2.9.2.2 Glossy ibis

Glossy ibis was not detected during the field surveys, however the species may use areas within the Terrestrial Study Area periodically after heavy or prolonged seasonal rain events. Suitable habitat in the Terrestrial Study Area is associated with overflow of man-made dams and shallow to moderate gilgais containing ephemeral water.

2.2.9.2.3 Oriental Cuckoo

Oriental cuckoo was not detected during the field surveys, however, has been previously recorded approximately 17 to 25 km from the Terrestrial Study Area (ALA, 2025) and is considered likely to occur. The species does not breed in Australia. Suitable habitat for the species' only includes intermittent roosting and foraging habitat (Department of the Environment (DotE), 2015). Suitable habitat for the species includes a broad range of vegetation communities that support feeding and dispersal of the species. Therefore, oriental cuckoo habitat within the MLs has been mapped as marginal habitat with guidance from the *Referral guideline for 14 birds listed as migratory species under the EPBC Act* (DotE, 2015).

Marginal habitat mapped for the species within the Terrestrial Study Area includes all areas of remnant and regrowth woodland communities that intermittently provide roosting, feeding and dispersal opportunities.

2.2.9.3 Pest Fauna

Five pest fauna species were recorded within the MLs. Four of these species were listed as restricted matters under the Biosecurity Act, including:

- Cane toad (*Rhinella marina*);
- Cat (*Felis catus*) – Category 3, 4 and 6 restricted matter;
- Wild dogs (*Canis lupus*) – Category 3, 4 and 6 restricted matter;
- European rabbit (*Oryctolagus cuniculus*) – Category 3, 4, 5, and 6 restricted matter; and
- Feral pig (*Sus scrofa*) – Category 3, 4, and 6 restricted matter.

Pest fauna species have varying adverse impacts on the environment. Pigs are known to contribute to habitat degradation by damaging the banks of wetlands, creek lines and gilgai, uprooting vegetation, causing soil erosion, spreading weeds and browsing/grazing native flora. Evidence of habitat degradation caused by pig rooting was observed within the Terrestrial Study Area including damage around gilgai as well as within SEVT vegetation.

Carnivorous pest fauna such as feral cats and dingos and opportunistic carnivores such as feral pigs, are known to directly predate native fauna. In addition, cane toads outcompete native amphibians and are toxic to animals such as ornamental snake that predate upon them.

2.2.10 Aquatic flora and fauna

2.2.10.1 Aquatic flora

There are no threatened aquatic flora species that occur in the Centurion North MLs relevant to the EPBC Act.

A number of conservation significant species (Special Least Concern under the *Nature Conservation (Plan) Regulation 2020*) are known to occur in the wider Isaac River and Suttor River drainage sub-basins.

2.2.10.2 Aquatic fauna

Two species of threatened aquatic reptiles and one mammal and/or their habitat may occur within the Centurion North MLs and surrounds (Hydrobiology, 2025a; **Appendix 7**; Hydrobiology, 2025b):

- White-throated snapping turtle (*Elseya albagula*) – Critically Endangered under EPBC Act;
- Fitzroy River turtle (*Rheodytes leukops*) – Endangered under EPBC Act, Endangered under *Nature Conservation (Animals) Regulation 2020*; and
- Platypus (*Ornithorhynchus anatinus*) – Special Lease Concern under *Nature Conservation (Animals) Regulation 2020*.

The highly ephemeral waterways of the Centurion North MLs and surrounds are likely to be unsuitable for these species. Neither the white-throated snapping turtle or the Fitzroy River turtle were caught or observed during recent surveys. Suitable habitat for the platypus was not identified during recent surveys.

The small, intermittent streams within the Centurion North MLs do not provide suitable habitat for fish species, and it is highly unlikely that species are present in the ephemeral creeks of Centurion North MLs and surrounds.

2.2.10.3 Aquatic GDEs

No subterranean GDEs are mapped by the BoM Atlas within or near (>100 km) of the Centurion North MLs, and no stygofauna have been recorded in the Centurion North MLs and surrounds.

High potential GDEs were mapped along Kennedy Creek, however field investigations found no sustained groundwater expression or GDE characteristics (Hydrobiology, 2025a; **Appendix 7**; Hydrobiology, 2025b). Any surface expressions of groundwater appeared to be minimal and short-lived as the creek system, and no subterranean GDEs or stygofauna were recorded from nearby bores.

Field surveys confirmed that the local creek systems are highly intermittent, with surface water and aquatic habitat only present following significant rainfall. The aquatic habitat present in Kennedy Creek is unlikely to be dependent on groundwater, particularly as there was no substantial aquatic habitat present. Field validation found no evidence of persistent baseflow or groundwater discharge, suggesting that aquatic GDE expression is limited and of low ecological persistence. In addition, no macrophytes or aquatic fauna that would be dependent on groundwater were present. No true stygofauna or short-range endemic stygofauna were collected during the survey effort.

2.2.11 Pre-mining land use

The pre-mining land use of the area is cattle grazing. Some areas have previously been subject to vegetation clearing. Farm infrastructure such as water tanks, property water pipelines, windmills, bores, water troughs, feed troughs and dams are located throughout the area (**Figure 2-14**):

- a) Cattle and feed stations; and
- b) Windmills for livestock watering.



Figure 2-14 Evidence of existing cattle grazing-related land uses

Existing soil erosion is evident in the Centurion North MLs and is mainly associated with existing land use grazing activities; this includes evidence of historically cleared drainage lines and creeks (i.e. gully erosion) (**Figure 2-12 (a) and (b)**).

The pre-mining land suitability classification for grazing of Wards Well (which includes the Centurion North MLs), according to the DSITI & DNRM (2015) Guidelines for Agricultural Land Evaluation in Queensland and the soil survey, is Class 2 for areas of Kandosol soil (i.e. suitable with minor limitations), and Class 3 for the Sodosol, Vertosol and Dermosol soil areas (i.e. suitable with moderate limitations). Class 2 land suitability covers approximately 53% of the Wards Well site and Class 3 covers the remaining 47% of the site.

2.2.12 Underlying landholders

The underlying landholders for the Centurion North MLs are shown in **Table 2-9**, and illustrated in **Figure 2-15**.

Table 2-9 Underlying landholders for the Centurion North MLs.

Mining Lease	Property	Landholder
ML 1790	Dabin Holding	Stanmore SMC Pty Ltd
	Denham Park	Stanmore SMC Pty Ltd
ML 70495	Dabin Holding	Stanmore SMC Pty Ltd

2.3 Design for closure

This PRC plan has been developed to proactively manage progressive rehabilitation of the Centurion North site to a stable PMLU, aiming to minimise long-term management requirements as well as associated closure costs. Importantly, a focused design for closure underpins all sections of this plan from:

- The proposed exploration methods to development of the rehabilitation knowledge base (baseline information);
- Engagement with relevant stakeholders to define suitable PMLUs;
- Defining and implementing rehabilitation practices to identify risks that could influence achievement of milestone criteria; and
- Demonstrating successful rehabilitation through defined site monitoring to develop a feasible PRCP Schedule.

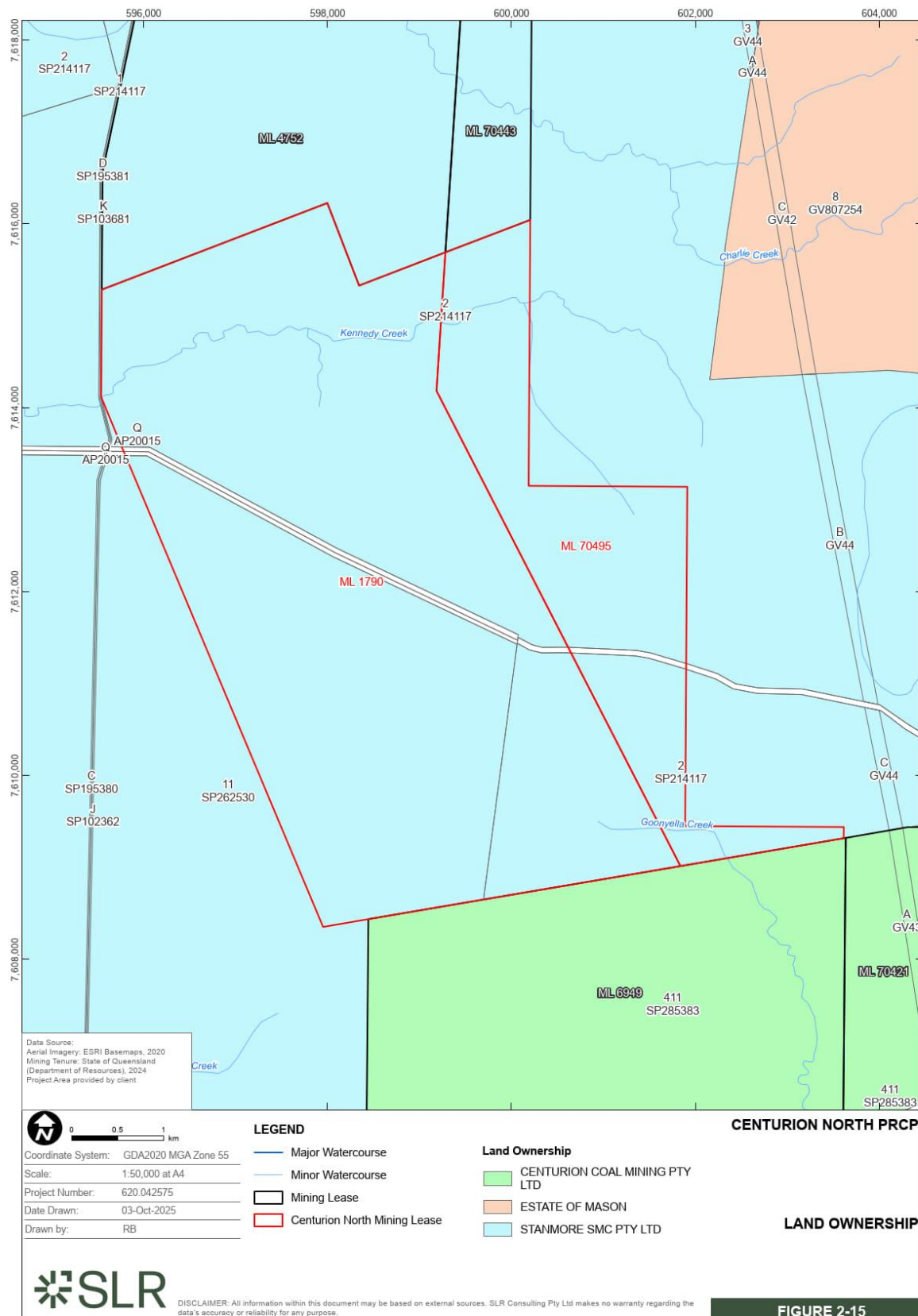


Figure 2-15 Land ownership

2.4 Rehabilitation and improvement planning

Legislative Requirement

In accordance with sections 126C(1)(b) and (c)(ii) of the EP Act, the rehabilitation planning part must include:

- Identification of all relevant activities on the mine site;
- The predicted duration of each of the relevant activities proposed for the mine site;
- The size/extent of the relevant activities; and
- Whether the different relevant activities can be progressively rehabilitated.

PRC Plan Guideline (Section 3.1)

Under section 126C(1)(j) of the EP Act, PRC plans must also include the following details about any existing rehabilitation already completed at the time of submission of the proposed PRC plan:

- A description of the rehabilitation works previously carried out;
- When the rehabilitation works commenced and were completed; and
- Whether the rehabilitation has been applied for or approved as progressively certified under the EP Act.

2.4.1 Relevant activities

The relevant activities at Centurion North that will require rehabilitation are provided in **Table 2-10**. This table also provides the predicted duration of each activity from when the activity commences i.e. where topsoil is stripped, until it is available for rehabilitation.

Rehabilitation of boreholes (including service boreholes) will commence following the extraction of the longwall panels relative to the boreholes. Rehabilitation of access tracks and drill pads is expected to commence within approximately 6 months following decommissioning (following the extraction of longwall panels). Longwall extraction is scheduled to commence in January 2030.

Table 2-10 Relevant activities requiring rehabilitation at Centurion North

Relevant activity	Predicted duration	Size (ha)	Availability for progressive rehabilitation
Exploration activities, early works and ancillary infrastructure (RA1)			
Exploration activities, early works and ancillary infrastructure	2021-2033	234	Areas to be progressively rehabilitated during this time period following the completion of longwall panels related to infrastructure, and within 6 months following decommissioning of access tracks and drill pads.

2.4.2 Rehabilitation areas and milestones

The activities in **Table 2-10** are grouped by rehabilitation area (RA). A rehabilitation area is defined in the PRCP Guideline as “an area of land in the post-mine land use to which a rehabilitation milestone for the post-mining use relates”. A rehabilitation milestone (RM) for the rehabilitated land, means each significant event or step necessary to rehabilitate the land to a stable condition (section 115 of the EP Act).

The RAs and RMs for Centurion North are referred to throughout this PRC plan and are summarised in **Table 2-11**. These are further illustrated in **Figure 10-2**, and detailed in the PRCP Schedule.

Table 2-11 Rehabilitation areas (RAs) and rehabilitation milestones (RMs) for Centurion North

Rehabilitation area (RA)	Rehabilitation milestone (RM)
RA1 Exploration activities, early works and ancillary infrastructure	RM1 Infrastructure decommissioning and removal
	RM2 Remediation of contaminated land
	RM3 Landform development and reshaping
	RM4 Surface preparation
	RM5 Revegetation (cattle grazing)
	RM6 Achievement of surface requirements (cattle grazing)
	RM7 Achievement of post-mining land use to a stable condition (cattle grazing)

2.4.3 Existing rehabilitation

Rehabilitation of drill pads, tracks and seismic has occurred at Centurion North as part of the Wards Well project. **Figure 2-16** shows a drill site before (a) and after rehabilitation (b), which included the following standard rehabilitation activities:

- Removing hole casings from drill holes;
- Draining any existing water from associated mud sumps;
- Backfilling drill chips in the drill hole and/or the associated mud sump;
- Blocking drill holes, and cementing surface hole where necessary;
- Removing all rubbish, casings and/or fencing from the site;
- Covering and levelling drill pad area to allow for settlement, and then covering with topsoil;
- Ripping associated tracks to promote regrowth;
- Re-spreading topsoil (previously removed from the site) over the area;
- Contour ripping immediately after topsoil placement to control erosion; and
- Seeding the area.

The existing rehabilitation of drill sites, and the subsequent trajectory towards achievement of milestone criteria, has been determined based on a combination of aerial imagery analysis before and after approved drilling programs, as well as by field visits which have indicated the self-regeneration of pastures on rehabilitated drill sites (**Figure 2-16(b)**).

No rehabilitation areas have applied for progressive certification under the EP Act.



Figure 2-16 Drill site DB12 before and after rehabilitation

2.4.4 Seismic activities

No further seismic activities are currently planned for Centurion North.

3. COMMUNITY CONSULTATION

Legislative Requirement

In accordance with section 126C(1)(c)(iii) and (iv) of the EP Act, the rehabilitation planning part of the PRC plan must include:

- Details of the consultation undertaken by the applicant in developing the proposed PRC plan; and
- Details of how the applicant will undertake ongoing consultation in relation to the rehabilitation to be carried out under the plan.

PRCP Guideline (Section 3.5)

In developing the proposed PRC plan, the community should at least be engaged on the plan for the mine, PMLUs or NUMAs, areas of disturbance, rehabilitation and management methods, progressive rehabilitation, and closure timeframes. Ongoing community consultation should continue throughout the stages of the mine life so that progressive rehabilitation and the socio-economic and environmental impacts related to mine closure can be discussed with the community.

Community consultation carried out through different processes (such as an EIS) may be used to address the requirements in section 126C(1)(c) of the EP Act. The details of this consultation must be provided in the rehabilitation planning part of the proposed PRC plan).

PRC plans are still required to meet the legislative requirements in section 126C(1)(c) of the EP Act. All proposed PRC plans must contain a community consultation plan regardless of whether the site has an existing EA.

3.1 Consultation to date

Land within Wards Well was acquired in 2007. Further compensation agreements on other land parcels were executed in 2011 - 2012. Engagement with the affected landowners was undertaken to develop compensation, leasing and agistment agreements. This included advice that:

- In the near term, exploration activities were the only activities planned;
- Underground mine was proposed for some time in the future; and
- Until land was required for exploration or mining, it would be available for cattle grazing within the terms of the agistment agreements and leases.

Consultation has been undertaken for Wards Well, which incorporates the Centurion North MLs, and therefore remains relevant.

In essence, the outcome of consultation during the acquisition processes was that landowners and cattle would be excluded from affected areas whilst land disturbance was occurring, and the land would then be rehabilitated, and the landform returned to a state suitable for cattle grazing. The existing use for grazing (managed under agistment agreements and leases) has been discussed with directly-affected landholders as part of regular meetings between SMC and these stakeholders.

Consultation undertaken as part of the application for the original PRC plan and PRCP Schedule preparation for Wards Well includes the following:

1. Meeting with Isaac Regional Council (IRC) about Wards Well's approved activities, PRC planning process and PMLUs; providing a presentation for Council's information, and an invitation for further discussion with Council about their involvement in future PRC plan consultations.

2. Writing to the three landholders that own or lease land within the MLs to provide a project update and information about the approved activities and PMLUs under Wards Well's EA; inviting feedback; and discussing ongoing engagement regarding the form of landholder involvement in future PRC planning consultations.
3. Writing to Widi People who are the Traditional Owners of land within ML1790 and ML70495 to provide an update on Wards Well and information on approved activities and PMLUs within the MLs.
4. Writing to utility owners and the owners of overlapping tenures (mining and gas exploration) within the Wards Well MLs to advise that a PRC plan was being prepared, and to let them know that further engagement in future stages of Wards Well's development will be undertaken.
5. Writing to other interested stakeholders including adjacent landholders, IRC and government representatives to advise that a PRC plan was being prepared; provide information about Wards Well's progressive rehabilitation and approved PMLUs; and invite stakeholders to contact SMC if they would like to discuss the PRC plan or obtain more information.

3.2 Community consultation register

A community consultation register has been provided as part of the application for the original PRC plan and PRCP Schedule in compliance with section 126C(1)(c)(iii) of the EP Act and includes:

- Identification of each community member/stakeholder;
- All recorded previous engagements with the community;
- Consultation date(s);
- Description of consultation type (e.g. letters, meetings and communication strategies);
- Information provided to the community;
- Issues raised/discussed;
- How issues raised and the outcomes of engagement have been considered in decision-making; and
- Commitments made by the applicant.

The stakeholders identified as part of this register are considered as having a genuine, demonstrable and legitimate interest in Wards Well's ongoing rehabilitation and closure planning. Relevant stakeholders identified for Wards Well's PRC planning and the proposed exploration program are provided in **Table 3-1**.

The complete community consultation register provided in **Appendix 8**, and will be a live instrument that will be updated for recording future consultation on Centurion North PRC plan.

Table 3-1 Key stakeholders identified as part of the Wards Well’s community consultation register

Stakeholders	Details	Interests
Affected stakeholders		
Traditional owners - Widi People	The Widi People (whose claim was recognised by the National Native Title Tribunal (NNTT) in 2015) are the Traditional Owners of land to the east of Wards Well, with a small area of land within ML 1790 and ML 70495 within the Widi People’s claim area.	• Cultural heritage impacts. • Impacts on Native Title. • Potential for impacts on the cultural landscape or connections to Country. • Post-mining land use and landform / landscape. • Environmental management / stewardship. • Employment and business opportunities in exploration, environmental management and monitoring, and rehabilitation.
Affected landowners and lessees	SMC has agreements with three landholders within the Wards Well MLs – two landowners and two lessees of land owned by BMC. Land within the MLs is used for grazing. Compensation Agreements are in place for properties within the MLs. The two landholder properties do not overlap the Centurion North MLs; however they remain stakeholders.	• Access to land owned by SMC whilst not required for mining purposes. • Future access to and ownership of lands. • Compensation for impacts on land use. • Water access – water allocations, water pipelines. • Environmental management / stewardship. • PMLU and landform/landscape.
Utility owners • Powerlink • Aurizon • Sunwater • Department of Transport and Main Roads (DTMR)	Utility owners with assets within Wards Well MLs include Powerlink (electricity transmission), Sunwater (Burdekin water supply pipeline and Eungella water pipelines), Aurizon (rail infrastructure) and DTMR (Suttor Development Road and an unformed road). SMC engages with utility owners as required, i.e. through issue-specific or transactional engagement. Implementation of the PRC plan will require update to agreements with utility owners. Some infrastructure assets may not be located on the Centurion North MLs; however utility owners remain as stakeholders.	• Impact on assets/asset value. • Remediation of impacts on assets. • Service disruptions and mitigations. • Crossing/interface agreements.
Owners of overlapping tenures • Arrow Energy	Arrow Energy have overlapping tenures with the Wards Well MLs (for coal seam gas production). Relationships with overlapping tenures owners are managed as part of statutory and commercial processes.	• Any impacts on the use or availability of land within overlapping tenures. • Water access. • Access to land owned by SMC whilst not required for mining purposes. • Crossing/interface agreements.
Adjacent private landholders	To the east and west of Wards Well MLs, SMC owns land which is used as a buffer to manage the potential for conflicting land uses. Peabody’s North Goonyella mine adjoins the southern boundary of the mining lease. Land owned by private landowners is located to the west and east. Land	• Environmental management / stewardship. • PMLU and landform/landscape. • Access to land owned by BMC whilst not required for mining purposes. • Rehabilitation Schedule. • Future access to and ownership of lands.

Stakeholders	Details	Interests
	uses on adjacent land holdings include grazing and mining.	
Local Government Isaac Regional Council	Isaac Regional Council is the local government and planning authority for the Isaac Local Government Area (LGA) which encompasses some 58,000 km ² and 17 distinct and diverse communities.	- Local job opportunities. - Economic and community sustainability and transformation (towards post-mining). - Environmental stewardship. - Effects on Council services and infrastructure e.g. changes to infrastructure agreements, water supply or road maintenance. - Mine rehabilitation progress. - Management of closure impacts on employment and businesses. - Accordance with SMC rehabilitation plans with local and regional planning goals.
Interested stakeholders		
Other nearby landholders	Several landholders are located within a 5 to 6 km radius around Wards Well. SMC has established relationships with landholders to the south and east of Wards Well.	- Post-mining land use and landform/landscape. - Access to land owned by SMC. - Rehabilitation Schedule. - Future access to and ownership of lands.
Jangga People	The Jangga People (whose claim was recognised in 2012) are the Traditional Owners of land to the west of the Wards Well MLs.	- Potential for impacts on the cultural landscape or connections to Country. - PMLU and landform / landscape. - Employment and business opportunities in exploration, environmental management and monitoring, and rehabilitation.
Stanmore employees and contractors	Wards Well does not have an established on-site workforce. Exploration and land management functions are performed by contractors. Other SMC personnel will be interested in closure planning if they perceive that it may affect their employment security.	- Job opportunities. - Loss of jobs with closure. - Closure planning in context with other mining industry changes e.g. technology advances, autonomous haulage. - Workers' conditions. - Sustainability of communities that are dependent on mining.
Unions	Unions with members who are employed by SMC include the Construction, Forestry, Mining and Energy Union, the Australian Manufacturing Workers' Union and the Electrical Trades Union. SMC maintains relationships with unions with respect to enterprise bargaining agreements, working conditions and workplace health and safety.	

Stakeholders	Details	Interests
Businesses	SMC has processes to identify small, local businesses as well as business owned by traditional owners. Stanmore seeks to promote vendor growth through improving working capital in a timely manner, i.e. favorable payment terms.	• Opportunities to participate in supply chain (e.g. exploration, environmental management, rehabilitation). • Economic transformation (towards post-mining). • Economic and community sustainability. • Loss of supply opportunities with closure.
Community members and groups	SMC is strongly affiliated with the communities of Moranbah and nearby smaller regional towns (in the Isaac LGA).	• Local job opportunities. • Local business opportunities. • Community and regional sustainability. • Environmental management. • Future use of mined land. • With closure of an operation, loss of jobs and supply opportunities. • Rehabilitation Schedules.
Queensland Government	State government representatives and agencies with an interest in PRC planning include: • Office of the Minister for Resources (now Minister for Natural Resources and Mines, Manufacturing, and Regional and Rural Development) • Office of the Minister for Environment, Great Barrier Reef, Science and Innovation (now Minister for the Environment and Tourism and Minister for Science and Innovation) • Member for Burdekin • Member for Gregory • Shadow Minister for Resources and Critical Minerals (now Minister for Natural Resources and Mines, Manufacturing, and Regional and Rural Development) • Department of Resources (DoR) - Deputy Director-General for Georesources (now DNRMMRRD) • DESI – PRCP Team and Emerald Business Centre (now DETSI)	• Legislative compliance. • Resource development. • Employment opportunities. • Public interest. • Environmental management. • Financial assurance. • Environmental risk identification and management. • Future land use and landform. • Company responses to stakeholder views.
Federal Government	The Commonwealth Department of Climate Change, Energy, the Environment and Water is the lead agency for environmental protection at Commonwealth level.	

3.3 Ongoing consultation

3.3.1 Consultation objectives, engagement type and frequency

A dedicated Community Consultation Plan (CCP) has been compiled for Wards Well's PRC planning (BHP, 2021b) (**Appendix 8**). This plan documents the iterative consultation process to be followed to enable ongoing engagement with relevant stakeholders (**Table 3-2**) and will form the basis for consultation for Centurion North.

Table 3-2 Process to be followed for ongoing community consultation for the Centurion North PRC Plan

Consultation objective	Develop strong and cooperative stakeholder relationships with affected stakeholders to enable their informed consideration of PRC plans and identification of shared value and/or beneficial future land uses	
Stakeholders	Engagement type	Consultation frequency
- Landowners and lessees within the MLs - Traditional owners – Widi People and Jangga People - Adjacent private landholders - Isaac Regional Council - Utility owners – Powerlink, Aurizon, Sunwater, DTMR - Owners of overlapping tenures – Arrow Energy, Anglo American	Advise affected stakeholders in writing when the PRC plan is approved and provide a copy of the PRC plan for their information	One-off
	Provide information in writing to all affected stakeholders on PRC plan progress, and invite affected stakeholders' feedback on: the approved PMLU e.g. rehabilitation methods which would optimize future grazing opportunities areas where land disturbance through approved exploration activities are proposed i.e. any particular values in certain areas rehabilitation methods, schedule and milestones.	Initially on commencement of rehabilitation; subsequent consultation to be defined thereafter
	Meet with directly affected and adjacent landholders, Widi People and Jangga People to provide an update on the Centurion North concept plan, communicate progress with rehabilitation against the PRCP Schedule, and discuss any other items of interest (e.g. particular values pertaining to disturbed areas, or shared value initiatives).	Ongoing engagement process
	As part of biannual meetings with IRC (or as determined with Council), provide an update on the status of the EA (approved activities and PMLUs), the PRC plan and concept plan (as progressed), and progress with rehabilitation against the PRCP Schedule, and forecast upcoming PRC plan consultations for other CCM assets.	Bi-annual
	Notify affected stakeholders in writing when an EA amendment application for further exploration has commenced, providing information on the scope and location of the activities for which the amendment is sought, seeking feedback on the proposed updated rehabilitation schedule, disturbance footprint and proposed PMLUs to be included in the PRC plan/amendment accompanying the EA amendment application, and advising on how to access information about the EA amendment notification process.	One-off
	Meet with Widi People and Jangga People to provide an update on Centurion North and proposed disturbance areas / activities for which an EA amendment is sought. With Widi People, this will include consultation on cultural heritage management requirements, rehabilitation species,	Ongoing engagement process

Consultation objective	Develop strong and cooperative stakeholder relationships with affected stakeholders to enable their informed consideration of PRC plans and identification of shared value and/or beneficial future land uses	
Stakeholders	Engagement type	Consultation frequency
	methods and timeframes. This consultation may also identify Traditional Owners' interest in and capacity for involvement in rehabilitation works.	
	Meet with DTMR to develop an Infrastructure Plan and update/develop agreements, if required, with terms and conditions tailored to the planned exploration / mining activity as part of a future EA amendment application process.	Meetings as required
	Through correspondence and/or meetings, co-operate with Powerlink, Sunwater and Aurizon to develop interface agreements, if required, with terms and conditions tailored to the planned exploration/ mining activity as part of a future EA amendment application process.	One-off process
Consultation objective	Demonstrate transparency regarding SMC's PRC intentions and timeframes to local communities	
Stakeholders	Engagement type	Consultation frequency
Moranbah and Glenden community members and groups	Using CCM's website and community forums such as interagency meetings, partnership meetings and community and business networks, provide community updates on PRC planning (Centurion North-specific and portfolio wide) and advise community members of progress towards further exploration and development of Centurion North.	Ongoing engagement process
	Via Smart Transformations Advisory Committee members, CSIRO Local Voices pulse surveys and/or PRC plan-specific workshops or focus groups, seek the involvement of community members and groups in articulating community aspirations for rehabilitation of SMC operations, PMLUs and economic transformation.	One-off process
CCM employees, contractors and unions	Via internal CCM communications, provide regular updates on PRC planning (Centurion North-specific and portfolio wide) and updates on the Centurion North concept planning process.	Ongoing engagement process
Young people	Share accessible information (e.g. on-line or printed learning resources) with Moranbah and Glenden schools and community organisations (e.g. Moranbah Youth and Community Centre and Youth Advisory Committee) to enable young people to understand mine planning and rehabilitation planning and implementation.	One-off
Local businesses and suppliers	Via the Moranbah Traders Association, provide updates on PRC planning (Centurion North-specific and portfolio wide), including rehabilitation plans and progress, approved PMLUs and potential future supply opportunities.	One-off

Consultation objective	Develop strong and cooperative stakeholder relationships with affected stakeholders to enable their informed consideration of PRC plans and identification of shared value and/or beneficial future land uses	
Stakeholders	Engagement type	Consultation frequency
Elected representatives and Government agencies	Provide updates via letter and/or meeting on PRC planning to: • Office of the Minister for Natural Resources and Mines, Manufacturing, and Regional and Rural Development (Queensland) • Office of the Minister for the Environment and Tourism (Queensland) • Office of the Minister for Science and Innovation (Queensland) • Member for Burdekin (Queensland Parliament) • Member for Gregory (Queensland Parliament) • Member for Capricornia (Australian Parliament) • DETSI PRCP Team and Emerald Business Centre • Deputy Director-General for Georesources, DNRMMRRD • Assistant Secretary Assessments and Governance Branch, DCCEEW	As requested, or as agreed with individual representatives /agencies
Consultation objective	Incorporate community objectives and aspirations for land use and landform planning post-mining in future plans for Centurion North.	
Stakeholders	Engagement type	Consultation frequency
Traditional Owners and Indigenous businesses	Meet with Traditional Owners and Indigenous businesses to understand business capabilities and communicate the pipeline of opportunities relating to rehabilitation work and land management (portfolio-wide).	One-off
	In cooperation with Traditional Owners including Widi People, Jangga People and other First Nations within Isaac LGA, plan and implement an Indigenous business capability development program to match rehabilitation opportunities, if this is required.	One-off
Isaac Regional Council	Meet with IRC to understand Council's strategic analysis and planning for Isaac LGA and the Centurion North project area as relevant, to identify objectives to be considered as part of future PRC planning for Centurion North.	Annually, or as agreed with Council
	Share the results of CCM research and industry partnership projects relevant to rehabilitation with Council.	One-off, or as agreed with Council
	Participate in Council-led initiatives which aim to harness social value from mine closure and rehabilitation planning, and/or work towards from economic transformation.	As invited
Local businesses and suppliers	Share information on local supply opportunities relevant to rehabilitation implementation and hold a workshop/s for interested businesses, to identify and develop local capabilities for involvement in rehabilitation work.	One-off process

3.3.2 Consultation objectives, engagement type and frequency

Information to be released as part of ongoing community consultation will include:

- Rationale and scope for PRC Plan and PRCP Schedule;
- Approved activities and PMLUs for Centurion North;
- On-site activities and areas of disturbance;
- Proposed rehabilitation methods, schedule and milestones; and/or
- Opportunities for community consultation as part of the PRC Plan's implementation.

Where required, communication tools could include:

- A holding statement for general enquiries;
- Frequently asked questions and answers (FAQs) and a PRC Planning fact sheet available to support consultation activities;
- Face-to-face and virtual meetings; and/or
- Updates and fact sheets about PRC Planning.

3.3.3 Addressing feedback and comments

As noted in the PRCP Guideline, in addition to the annual return requirements that relate to EAs, if a PRC Plan applies to the activities, the annual return must also include an evaluation of the effectiveness of the PRC Plan, including the environmental management carried out under the PRCP Schedule, for the year to which the annual return relates.

Centurion North will monitor and report on the progress and outcomes of progressive rehabilitation activities against rehabilitation milestones provided in the PRCP Schedule. This monitoring will aim to demonstrate a successful rehabilitation trajectory towards achievement of the approved PMLU, and/or to inform corrective action where required, which will be reported as part of annual returns.

Information about rehabilitation progress will also be delivered as part of the consultation methods detailed in **Table 3-2**, and any feedback will be considered in subsequent updates of this PRC Plan.

The PRC Plan Community Consultation Register will also be updated as community consultation activities outlined in **Table 3-2** are completed. Feedback recorded in the Community Consultation Register will be considered in framing and detailing future PRC Plan amendments for Centurion North.

The above is also documented as part of the Community Consultation Register (**Appendix 8**).

3.3.3.1 Relationship with PRCP Schedule

Consultation was undertaken for the original PRC plan application and will continue as per the process documented in the CCP. Achievement of the PMLU of cattle grazing is consistent with the outcome of consultation completed to date.

4. POST-MINING LAND USES

Legislative Requirement

In accordance with section 126C(1)(d) of the EP Act, the rehabilitation planning part of the PRC Plan must state the extent to which each post-mining land use for land identified in the PRCP Schedule for the plan is consistent with:

1. The outcome of consultation with the community in developing the plan, and
2. Any strategies or plans for the land of a local government, the State or the Commonwealth.

PRCP Guideline (Section 3.2)

A PMLU is defined under section 112 of the EP Act as the purpose for which the land will be used after all relevant activities for the PRC Plan carried out on the land have ended. Relevant activity for a PRC plan is defined in the EP Act as the relevant activities to be carried out on land the subject of the plan. It is not the intention of this definition to include third-party activities or assets that continue to exist once mining activities have ceased, such as third-party pipeline easements, power easements or overlapping tenures for other EAs.

The rehabilitation planning part of the PRC plan must include a detailed description of the nominated PMLU(s) for the site. The description must include (where relevant), but is not limited to:

- A description of the use of the land;
- If applicable, the specific vegetation types (e.g. RE 13.2.9) or land suitability classification (e.g. Class 4);
- Identification of any permanent or essential management infrastructure to be included as part of the PMLU; and
- Completion criteria for measuring whether the PMLU has been successfully achieved.

Where a PMLU has been previously addressed in a land outcome document (LOD) and is able to be transitioned into the PRCP Schedule, the holder is not required to complete the information requirements under section 126C(1)(j) of the EP Act in this section for those PMLUs.

However, the legislative requirements under section 126C(1)(d) of the EP Act still apply. All PMLUs transitioned into the PRCP Schedule must still meet the requirements of a PMLU explained in this section, particularly that the PMLU can be rehabilitated to a stable condition.

4.1 Nominated PMLUs

Cattle grazing is approved in the PRCP Schedule as the only PMLU for the site.

The EA acceptance criteria for the PMLU of cattle grazing (**Table 4-1**) (as per the Wards Well EPPR00668513), as they existed prior to approval of the PRCP Schedule, were transitioned to the milestone criteria in the PRCP Schedule for the final milestone of achieving the post-mining land use to a stable condition. The approved PRCP Schedule has cattle grazing PMLU for all rehabilitation areas.

Table 4-1 Wards Well EA (EPPR00668513) post-mine land use objectives, indicators and acceptance criteria for cattle grazing

Goal	Objective	Indicator	Acceptance criteria
Safe to humans and wildlife	Safety hazards in rehabilitation are not significantly different to surrounding unmined landscapes subject to the same land use	Hazard assessment	No significant difference
Stable	Rehabilitation is geotechnically stable	Factor of safety	≥1.5
	Rehabilitation is erosionally stable	Extent, slope gradient and groundcover	1. Groundcover >50% 2. 70% of slopes ≤20%
Non-polluting	Rainfall runoff from rehabilitation achieves relevant water quality objectives for receiving waters	pH EC Turbidity	Not significantly different to upstream values
	Deep drainage from rehabilitation achieves relevant water quality objectives for groundwater	EC	Not significantly different to: a) the EPP (Water) schedule documents water quality objectives for relevant groundwater chemistry zones; or b) local water quality objectives developed in accordance with the Queensland Water Quality Guidelines
Able to sustain an agreed post-mining land use	Rehabilitation is suitable for sustainable cattle grazing	Land suitability assessment for cattle grazing	Land suitability class ≤3 or not different from pre-mining class if ≥4 Assessment completed in accordance with <i>Land Suitability Assessment (LSA) Framework for Open-Cut Coal Mine Rehabilitation 2018. (A rule-set for land suitability assessment of sustainable beef cattle grazing on land rehabilitated after open-cut coal mining in the Bowen Basin Queensland)</i> unless otherwise agreed in writing between the Adminstrating Authority and the environmental authority holder
		<i>Leucaena</i> stem density	<250 stems >2m height per ha (1 per 40m ²), mean total area

4.1.1 Grazing land suitability

The assessment of pre-mining and post-mining land suitability for cattle grazing, as specified in the PRCP Schedule, is based on the 'Rule-set for land suitability assessment of cattle grazing on coal mine rehabilitation' (hereafter referred to as the grazing rule-set) (Short, 2020).

The land use limitations in the grazing rule-set identified for cattle grazing have been selected from the comprehensive list provided in the Queensland Land Evaluation Guidelines based on:

- The target PMLU of sustainable cattle grazing;
- The regional-scale of application across the Bowen Basin; and
- Diagnostic attributes that can be readily correlated to mapping units at potential mapping scales of 1:50,000 and larger.

Table 4-2 provides further detail on the specific indicators for assessing land suitability class of the grazing ruleset. The Class 1 to Class 2 boundary represents the attribute level at which the limitation starts to affect productivity; and the Class 3 to Class 4 boundary determines whether the rehabilitation is suitable or not and therefore able to sustain an agreed PMLU of grazing as required under the PRCP Schedule.

It is important for long-term sustainable grazing land management on rehabilitated lands to plan for the establishment and maintenance of good condition pastures. The rehabilitation planning and revegetation process is therefore based on sowing preferred pasture species aligned to the associated rehabilitation soils and land topography. The ongoing assessment of pasture condition, after the revegetation process, is used to assess the condition of the pasture and guide ongoing maintenance and management of pastures on rehabilitated lands. The pasture condition milestones are described in further detail in

Section 7.

Table 4-2 Land suitability ruleset for cattle grazing on rehabilitation at Centurion North

Limitation	Indicator	Units	Suitability class				
			1	2	3	4	5
Water availability	PAWC in ERD	mm/0.6d	> 75	75 - 60	< 60 - 45	< 45 - 30	< 30
Nutrient supply	P in 0.1m	mg / kg	> 20	20 - 14	< 14 - 8	< 8 - 4	< 4
	pH in 0.1m	pH units	7.3 – 6.6	< 6.6. – 6.0 or > 7.3 – 8.0	< 6.0 – 5.5 or > 8.0 – 8.5	< 5.5 – 5.0 or > 8.5 – 9.0	< 5.0 or > 9.0
Soil physical factors	Surface soil structure	variable	Fine (peds < 10mm)	Coarse (peds > 10mm)	Surface crust	Very hard setting	Massive
Salinity	EC in ERD	dS/m	< 2	2 - < 4	4 - < 10	10 - < 16	≥ 16
Rockiness	Fragments on surface	%	< 5	5 - 10	10 - 30	30 - 60	> 60
Topography (slope)	Gradient, surface	%	< 5	5 - < 10	10 - < 15	15 - < 20	≥ 20
	Vertical interval, surface	m	Nil ripping furrows	Regular ripping furrows < 0.2m	Regular ripping furrows > 0.2 – 0.4m	Regular ripping furrows > 0.4 – 0.6m	Regular ripping furrows > 0.6m
Water erosion, surface soil	Slope (ESP in 0.1m < 6)	%	< 5	5 - 8	> 8 - 12	> 12 - 18	> 18
	Slope (ESP in 0.1m > 6 - < 14)	%	< 3	3 - 6	> 6 - 10	> 10 - 12	> 12
	Slope (ESP in 0.1m > 14)	%	< 1	1 - 2	> 2 - 4	> 4 - 6	> 6
Sub-soil erosion	ESP at 0.5m	%	< 7	7 - 14	> 14 - 23	> 23 - 34	> 34
Potentially acid forming (PAF) materials	pH < 4.5	pH units	Not likely to be present within 5m of surface	Not likely to be present within 3m of surface	Not likely to be present within 2m of surface	Present immediately below root zone (0.9 – 0.6m)	Present within root zone (surface 0.6m)

4.2 Community Consultation

Achievement of the PMLU of cattle grazing is consistent with the outcome of consultation completed to date (**Section 3**).

4.3 Regional planning integration

The PMLU at Centurion North considers the pre-mining land use, neighbouring land use and EA conditions. Existing land use in the area is primarily grazing of beef cattle. Some areas have been subject to cultivation (ploughing) and clearing. Centurion North and the neighbouring beef cattle stations also feature remnant woodland vegetation with farm infrastructure such as water tanks, windmills, troughs, and dams located throughout the area.

Under the Isaac Regional Planning Scheme (IRC, 2021), Centurion North is located in a ‘rural’ zone, which includes uses such as grazing, farming, forestry, tourism and extractive industries. Land use performance outcomes for this rural zone include ensuring development:

- (a) Is consistent with the rural character of the locality;
- (b) Supports the primary rural function of the zone;
- (c) Protects rural, natural and scenic values of the locality.

In addition, the Queensland Government, via its Mackay, Isaac and Whitsunday Regional Plan (Queensland Department of Local Government and Planning, 2012), maps Centurion North in a ‘regional landscape and rural production area’, which includes land used for agriculture, water catchment, traditional uses, conservation areas and native forests.

The defined uses in both plans are consistent with the PMLUs approved for Centurion North in the PRCP Schedule.

Relationship with PRCP Schedule

Due to the limited disturbance caused by the mining activities as well as minimal changes to the pre-mining landform, the PMLU will be cattle grazing. This is consistent with the pre-mining land use. The acceptance criteria for cattle grazing are the milestone criteria for achieving the PMLU in the PRCP Schedule.

The information in this section is relevant to the following highlighted
Rehabilitation Areas (RAs) and Rehabilitation Milestones (RMs) in the PRCP Schedule

RA1						
RM1	RM2	RM3	RM4	RM5	RM6	RM7

The following **Milestone Criteria** will demonstrate achievement of PMLU to a stable condition:

RM7	• A hazard assessment has been completed by an appropriately qualified person to confirm safety hazards in rehabilitation are not significantly different to surrounding unmined landscapes subject to the same land use. • Groundcover >50%. • Rainfall runoff from the area is not significantly different to upstream values for the following: pH, EC and turbidity. • Land suitability class ≤ 3, or not different from pre-mining class if ≥ 4. The assessment is to be conducted by an appropriately qualified person and completed in accordance with LSA Framework for Open-Cut Coal Mine Rehabilitation 2018 (A rule-set for land suitability assessment of sustainable beef cattle grazing on land rehabilitated after open-cut coal mining in the Bowen Basin Queensland) unless otherwise agreed in writing between the administering authority and the environmental authority holder. For RM7(d) if the land suitability class is assessed as not different from pre-mining class if ≥ 4 for all or a portion of a rehabilitation area, an assessment of reference sites must be carried out to determine if the limitation/s resulting in the class of ≥ 4 is consistent with that of reference sites. • Certification by an appropriately qualified person that pasture meets a pasture condition rating ≤ 3, based on the Pasture Condition Assessment Table as per Stocktake: Balancing Supply and Demand (https://futurebeef.com.au/workshops/sustainable-grazing/stocktake-balancing-supply-demand/), as provided in Table 9-6.
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5. NON-USE MANAGEMENT AREAS

Legislative Requirement

In accordance with sections 126C(1)(d), (g) and (h) of the EP Act, for each proposed non-use management area, the rehabilitation planning part of the PRC plan must:

- State the reasons the applicant considers the area cannot be rehabilitated to a stable condition;
- Include copies of reports or other evidence relied on by the applicant for each proposed non-use management area;
- State the extent to which the proposed non-use management area is consistent with the outcome of consultation with the community in developing the plan; and
- State the extent to which the non-use management area is consistent with any strategies or plans for the land of a local government, the State or the Commonwealth.

PRCP Guideline (Section 3.3)

A NUMA is defined in the EP Act as an area of land the subject of a PRC plan that cannot be rehabilitated to a stable condition after all relevant activities for the PRC plan carried out on the land have ended. Proposed NUMAs must be justified under the criteria set out in section 126D(2) of the EP Act.

The rehabilitation planning part of the PRC plan must also include:

- a) information demonstrating that the proposed footprint of each NUMA is as small as practicable;
- b) an assessment of the NUMA location options, having regard to the constraint of the resource location, with an analysis of the potential environmental harm and sensitivity of the surrounding environment of each option;
- c) a description of the proposed location of each NUMA and the environmental values of the surrounding environment; and
- d) evidence showing how the proposed location will prevent or minimise environmental harm.

In accordance with section 126D(1)(c) of the EP Act, the applicant must develop and implement management milestones within the PRCP Schedule which achieve best practice management and minimise environmental harm for any NUMAs contained in the proposed PRC plan. As part of the development of management milestones, the applicant must conduct a NUMA specific risk assessment to identify and quantify risks and associated controls. The risk assessment should have an overarching goal of identifying and controlling any significant risks to the community and the environment.

The proposed PRC plan must include a detailed description of the nominated NUMA(s) for the site. The description must include, but is not limited to:

- Description of the land at surrender;
- Any relevant safety features; and
- Completion criteria for measuring whether the NUMA has achieved sufficient improvement.

Where a NUMA has already been identified in a LOD and is able to be transitioned into the PRCP Schedule, the applicant is not required to comply with sections 126C(1)(g) or (h) or 126D(2) or (3) of the EP Act. NUMAs transitioned into the PRCP Schedule are not required to complete the information requirements under section 126C(1)(j) of the EP Act in this section for those NUMAs. However, the legislative requirements under section 126C(1)(d) of the EP Act still apply.

Where a NUMA has not been pre-approved and is proposed as part of the transition into the PRC plan, the applicant must include all of the requirements identified in this section.

5.1 Nominated NUMAs

There are no NUMAs planned for Centurion North.

5.2 Management methods

Not applicable. There are no NUMAs planned for Centurion North.

5.3 Community considerations

Not applicable. There are no NUMAs planned for Centurion North.

5.4 Regional planning integration

Not applicable. There are no NUMAs planned for Centurion North.

Relationship with PRCP Schedule

Not applicable. There are no NUMAs planned for Centurion North.

6. VOIDS IN FLOODPLAINS

Legislative Requirement

In accordance with section 126D(3) of the EP Act, if land the subject of the proposed PRCP Schedule will contain a void situated wholly or partly in a flood plain, the schedule must provide for the rehabilitation of the land to a stable condition.

PRCP Guideline (Section 3.4)

Section 41C of the EP Regulation states the decision considerations for a void situated wholly or partly in a flood plain. A void is considered to be located in a flood plain if the flood plain modelling shows that, when all relevant activities carried out on the land have ended, the land is the same height as, or lower than, the level modelled as the peak water level 0.1% Annual Exceedance Probability (AEP) for a relevant watercourse under the guideline Australian Rainfall and Runoff (2019).

Where a LOD has a pre-approved land outcome for a void with a location specified, flood plain modelling is not required. If a void has been identified as a NUMA in a LOD but the location is not identified, the applicant is required to carry out flood plain modelling in accordance with this section of the guideline. While the provision in the EP Act relating to voids located within a floodplain having to rehabilitate to a stable condition does not apply, the PRC plan must include how the proposed location of the void minimises risks to the environment. Therefore, the flood plain modelling is required to support the assessment of the proposed location of the void.

If there are no land outcomes identified in a LOD, the applicant is required to carry out flood plain modelling in accordance with this section of the guideline.

Relevance to Centurion North

The current Environmental Authority does not contemplate any residual voids to be left on the Centurion North MLs.

7. REHABILITATION AND MANAGEMENT METHODOLOGY

Legislative Requirement

In accordance with section 126C(1)(e) and (i), the rehabilitation planning part of the PRC plan must:

- For each proposed post-mining land use for land, state the proposed methods or techniques for rehabilitating the land to a stable condition in a way that supports the rehabilitation milestones under the proposed PRCP Schedule; and
- For each proposed non-use management area, state the proposed methodology for achieving best practice management of the area to support the management milestones under the proposed PRCP Schedule for the area.

PRCP Guideline (Section 3.6)

The proposed rehabilitation or management methodologies will underpin the development of the milestone criteria and support how the proposed PMLU will be achieved, or the NUMA will be managed. As per section 126C(1)(j) of the EP Act, the administering authority requires information describing how the proposed rehabilitation or management methodologies have been developed and will be implemented.

This section identifies a number of studies or reports that must be provided in the proposed PRC plan. If any of the required information outlined below is not relevant to the specific operation, the applicant must provide justification in the PRC plan outlining why the information is not required.

Information contained in this section was based on information developed for the Wards Well MLs, which incorporate the Centurion North MLs, and hence remain relevant. However, the only activity types on the Centurion North MLs are exploration activities, early works and ancillary infrastructure.

7.1 General rehabilitation practices

PRCP Guideline (Section 3.6.1)

This section outlines the range of information that the administering authority considers is necessary to underpin the development of the rehabilitation or management methodologies applicable to new and existing mines for most domains. The applicant must include the information as appendices to the rehabilitation planning part.

7.1.1 Hydrogeology

Assess the hydrogeology of the site and all connected strata and develop a conceptual model of the mine site's groundwater systems. This information must be integrated into the design of rehabilitation strategies and choice of PMLU or NUMA.

As detailed in **Section 2.2.5**, there are three hydrostratigraphic units identified in the Centurion North MLs, namely the Quaternary alluvium, Tertiary and Permian strata aquifers.

Recharge of the Quaternary alluvium and Tertiary strata aquifers is expected to only occur after heavy rainfall in the wet season, which creates flows within the ephemeral creeks and flooding.

Due to the compartmentalised nature of the basalt aquifer, recharge from groundwater flows from surrounding regional aquifers is not expected to be significant. Predominant recharge of the basalt

aquifers is expected to be from overlying quaternary alluvium aquifers and infiltration at basalt outcrops. Recharge of the Permian strata is likely to be driven by downward seepage or through flow from overlying/adjacent aquifers; infiltration at outcrop locations; and leakage between aquifers through faults or other structural discontinuities.

Primary discharge mechanisms in the Quaternary alluvium and Tertiary strata groundwater systems include evapotranspiration; through flow into adjacent or underlying aquifers; and groundwater extraction. Discharge from the Permian strata is likely to occur through down gradient flow into Permian - Triassic strata; flow into adjacent aquifers; seepage into underlying aquifers through structural discontinuities; and groundwater extraction (such as dewatering from existing / past mining activities).

Groundwater investigations at Wards Well (which includes the Centurion North MLs) to date have focused on the Tertiary strata, which are the aquifers predominantly targeted for groundwater use (stock watering). These aquifers are sodium chloride dominated with total dissolved solid concentrations ranging between 480 and 2,900 mg/L. Only limited groundwater data collected during exploration activities is available for the Permian aquifers. Review of available data indicated the salinity of the Permian aquifers is expected to be significantly higher than that within the overlying basalt aquifers.

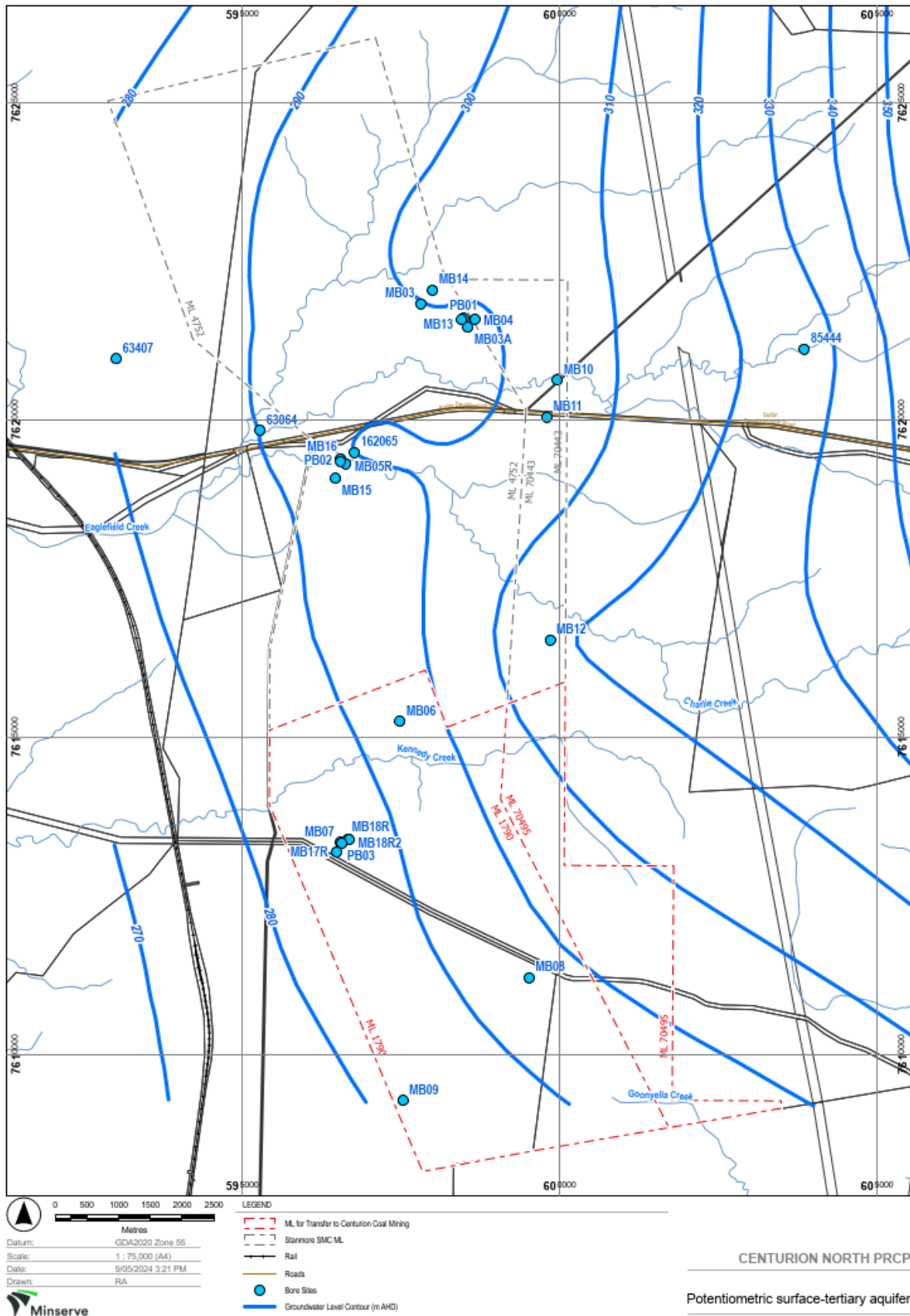
The potentiometric surface for the Tertiary basalt aquifer has been assessed using data from on-site monitoring bores and available registered bores. The general flow direction at Wards Well (including the Centurion North MLs) in the Tertiary basalts is from the northeast to the southwest. The potentiometric surface of the Tertiary strata is illustrated in **Figure 7-1**.

A review of the registered groundwater bores within 10 km of the Centurion North MLs identified a total of 68 bores, which were listed as existing (refer **Figure 2-9**). One of the bores was listed for water supply purposes and is located approximately 10 km west of ML 1790. The majority of the registered bores (49) were listed for monitoring purposes. The use of the remaining 18 bores was not listed, however is expected to be for stock watering or monitoring purposes.

It is noted that existing / past mining activities (including mining activities associated with the adjacent ML 6949) will have had an impact on groundwater within the Centurion North MLs and surrounds. Additional groundwater impacts will also occur as a result of the following activities:

- Approved and proposed gas extraction activities, requiring the removal of seam water from the targeted coal seam prior to extraction of coal seam gas;
- Proposed construction of underground gate roads, requiring the extraction of groundwater to enable construction; and
- Proposed future longwall panels, requiring the extraction of groundwater to enable extraction.

All groundwater impacts from the above approved and proposed activities will be confirmed during the next stage of this PRCP. This analysis will include potential impacts to the groundwater system in the post-closure period, including impacts on local groundwater use and groundwater dependent ecosystems.



Relationship with PRCP Schedule

The current Environmental Authority does not contemplate any significant excavation on the Centurion North MLs. All groundwater impacts from the approved and proposed activities will be confirmed during the next stage of this PRCP.

The information in this section is relevant to the following highlighted **Rehabilitation Areas** and **Rehabilitation Milestones** in the PRCP Schedule

RA1						
RM1	RM2	RM3	RM4	RM5	RM6	RM7

The following **Milestone Criteria** will demonstrate achievement of the Rehabilitation Milestones:

RM2	- All contamination is remediated or removed from site in accordance with relevant legislation - A contaminated land survey is carried out by a suitably qualified person confirming the land does not present an unacceptable risk to proposed future land uses or the environment
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7.1.2 Flooding

PRCP Guideline (Section 3.6.1)

Section 3.4 of this guideline requires flood plain modelling for the purpose of voids located within a flood plain being rehabilitated to a stable condition. In addition to this, the applicant must also assess the flooding susceptibility and influence across the site. If flooding is a consideration, develop a hydrologic model of the catchment and a hydraulic model of the proposed mining area. Knowledge of flooding is integral to the rehabilitation planning process, including the placement and design of mine domains.

The activities will result in negligible change to final landform from the original topography.

An assessment of flood susceptibility has been used to inform a risk-based approach to determine basis for this flood assessment.

In addition to the final landform described above, the assessment of flood susceptibility identified the following:

- Centurion North MLs do not interact with the potential flood hazard area (Queensland Globe, 2025), as illustrated in **Figure 2-7**;
- The activities do not require diversion or interruption of creeks or streams; and
- There are no fourth order or higher streams present on the Centurion North Study Area.

Based on the above, the final landform will not adversely alter pre-mining flows and the identified risk associated with flooding is low (see **Section 8**), therefore further flood modelling is not required.

Relationship with PRCP Schedule

The final post-mining landform will not alter pre-mining water flows. The risk of flooding after closure has been deemed low.

	The information in this section is not relevant to the Rehabilitation Areas and Rehabilitation Milestones in the Centurion North PRCP Schedule					
RA1						
RM1	RM2	RM3	RM4	RM5	RM6	RM7

The following **Milestone Criteria** will demonstrate achievement of the Rehabilitation Milestones:

RM3	Landform is reshaped to be free-draining with slopes $\leq 5\%$ and consistent with the surrounding topography
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7.1.3 Waste characterisation

Not relevant to the Rehabilitation Areas or Milestones for Centurion North.

7.1.4 Soil and capping material

PRCP Guideline (Section 3.6.1)

The rehabilitation and management methodology should include that soil assessment activities are supplemented by additional surveys conducted at appropriate intervals to assess soil resources in planned disturbance areas. In addition to the assessment of soils, the proposed rehabilitation methodologies in the rehabilitation planning part must also address topsoil management. Topsoil management must ensure sufficient topsoil quantity and quality is available to support the proposed PMLU. The available soil resources and capping material should be assessed prior to the commencement of operations.

7.1.4.1 Topsoil stripping

Areas for disturbance that will require stripping of topsoil for re-use in rehabilitation include drill pads for exploration activities, early works, ancillary infrastructure, and access tracks. Specific recommendations for topsoil stripping at Centurion North are summarised in **Table 7-1**. However, as topsoils stripping activities at Centurion North are limited to surface disturbance areas, it is unlikely that significant topsoil stockpiles will be required, and topsoil volumes have not been calculated. Topsoils will be stockpiled at each individual drill pad and replaced after drilling is completed.

Table 7-1 Recommended topsoil stripping depths and stockpile heights for Centurion North

Soil	Soil concept	Recommendations
Vertosol	Soils with high clay content, and when dry, crack to a considerable depth	Typical: 200 mm Maximum stockpile height: 2 m
Dermosol	Texture contrast soils with moderately to strongly structured usually clayey B2 horizons	Typical: 200 mm Maximum stockpile height: 2 m
Kandosol	Very deep (>3m) clay-rich soils	Typical: 500 mm Maximum stockpile height: 2 m
Sodosol	Texture contrast soils, with clayey sodic subsoils and dispersive properties	Typical: 100 mm Maximum stockpile height: 2 m These soils occupy a small portion of the site – stripping should be avoided in favour of deeper stripping on other, better soils

7.1.4.2 Topsoil management

Topsoil stockpiles will have a maximum height of 2 m to reduce soil degradation, as per Condition F4 of the EA.

Compaction of topsoil will be minimised where possible by avoiding the use of machinery, such as graders or watercarts, on stockpiles. All stockpiles shall remain in a free-draining location to avoid long-term soil saturation. The stockpile surface will be left in a coarsely textured condition to promote infiltration and aeration and to minimise erosion until vegetation is established. Where necessary, silt fences or vegetation (from clearing operations) will be installed around topsoil stockpiles as a form of erosion and sediment control.

7.1.4.3 Topsoil application

Topsoil will be replaced where needed to achieve the PMLU of cattle grazing. All the stockpiled topsoil will be used as part of the rehabilitation activities. The following measures will be considered when applying topsoil during rehabilitation:

- Spread topsoil at an average thickness of 200 mm. Re-spreading on the contour will aid runoff control and increase moisture retention for subsequent plant growth;
- Level topsoil to an even surface and avoid a compacted or over-smooth finish;
- Rip across the contour in preparation for sowing – this will leave the soil surface in a roughened condition creating a 'key' between the soil and underlying material; and
- Minimise vehicle traffic entering the area once topsoil is spread.

7.1.4.4 Amelioration requirements

The parameters provided in **Table 7-2** are critical nutrient sufficiency ranges for pasture plant nutrition in Queensland (Hazelton & Murphy, 2007; Baker & Eldershaw, 1993; Hall, 2008). These ranges are designed for rehabilitation to a PMLU of cattle grazing, to promote establishment of pasture species to support >50% surface cover. Topsoil characterisation results detailed in **Section 2.2.6** indicate the stockpiled Vertosol and Dermosol soils may have potential to be dispersive. An assessment of the stockpiled soil characteristics will be completed by an appropriately qualified person to determine amelioration requirements to meet the ranges in **Table 7-2**. It is noted that topsoil will be replaced at drill pads following completion of drilling and hence it may not be necessary to ameliorate the topsoil.

Based on these parameters, amelioration products and application rates will be determined prior to rehabilitation surface preparation commencing. These products could include fertilisers, biosolids and physical amendments such as gypsum.

Table 7-2 Recommended sufficiency levels for rehabilitation materials at Centurion North

Parameter	Unit	Ranges	Parameter	Unit	Ranges
pH _{water}	N/A	6.0 - 8.0	Ca/Mg ratio	N/A	>4
pH _{chloride}	N/A	5.0 – 8.0	Ca	cmol/kg	5 – 10
EC _{water}	dS/m	<0.9	Ca	%	65 - 80
EC _{sat}	dS/m	<4	Mg	cmol/kg	1 – 3
Chloride	mg/kg	<300	Mg	%	10 - 15
Organic carbon	%	1 - 3	K	cmol/kg	0.3 – 0.7
N nitrate	mg/kg	>10	K	%	1 - 5
N ammonia	mg/kg	N/A	Na	cmol/kg	0.3 – 0.7
P	mg/kg	8 - >20	Na	%	0 - 1
S	mg/kg	>10	Zn	mg/kg	0.5 – 5
CEC	cmol/kg	>12	Cu	mg/kg	0.3 – 5
ESP	%	<6	Fe	mg/kg	2 – 100
			Mn	mg/kg	2 – 50
			B	mg/kg	1 – 2
			Mo	mg/kg	2

Relationship with PRCP Schedule

The soil survey and topsoil management methodologies ensure that there is suitable quantity and quality of growth media available to support a PMLU of cattle grazing.

The information in this section is relevant to the following highlighted
Rehabilitation Areas and **Rehabilitation Milestones Reference** in the PRCP Schedule

RA1	RM2						
RM1	RM2	RM3	RM4	RM5	RM6	RM7	RM8

The following **Milestone Criteria** will demonstrate achievement of the Rehabilitation Milestones:

- | | |
|-----|--|
| RM4 | <ul style="list-style-type: none"> Topsoil is placed an average thickness of 200 mm An assessment of soil and growth media characteristics is completed by an appropriately qualified person, and amelioration and other treatments required identified Ameliorant and physical treatments are applied as identified, if required for RA1 |
|-----|--|

7.1.5 Landform design

PRCP Guideline (Section 3.6.1)

The final landform design must be based on the proposed PMLUs and NUMAs and demonstrate that the land will be safe and structurally stable.

Landform design considers both the landform structures such as the void and dumps, but also the landform development and reshape of all relevant activity areas after removal of infrastructure and wastes, and prior to placement of topsoil.

The following activities at Centurion North have negligible impact on the pre-mining landform:

- Exploration activities including construction and operation of the approved pilot CSG exploration;
- Early works activities and exploration activities (proposed) including drilling and operation of vertical and lateral SIS wells, gas risers, service boreholes, other boreholes and a bleeder shaft;
- Installation of laydown area;
- Disturbance for future goaf drainage lines;
- Clearing for access roads and tracks;
- Construction of gate roads; and
- Completion of UIS gas drainage.

7.1.5.1 Landform structures

All relevant activities detailed in **Section 2.1** are considered as landform structures for the purposes of determining the landform design (**Table 7-3**).

Table 7-3 Landform structures for Centurion North

Landform structure	Area extent on the surface (ha)	Landform design and rehabilitation
Exploration activities, early works and ancillary infrastructure (RA1)		
Exploration activities, early works and ancillary infrastructure	234	• Area will be reshaped to be free-draining and blend in with surrounding topography

Removal of infrastructure (**Section 7.5**) and contaminated land assessment requirements (**Section 7.5.2**) will be completed where required, prior to reshaping of the final landform. After reshaping of the final landform, topsoil is spread over the areas and revegetated.

7.1.5.2 Erosion assessment

The majority of the site is undisturbed with only minimal variance in the final landform from the pre-mining landform for 7.2% of the total site area. The final landform design is approximately 0.6 m above pre-mining landform in this area with low slope angles. Soil will also be assessed and amended to promote establishment of pasture species and limit dispersion potential (**Section 7.1.4.4**). The landform erosion risk is therefore low and further erosion assessments are not a requirement for Centurion North.

7.1.5.3 Slope profile design

Individual exploration drill pads will have maximum slopes of 5%, similar to the natural topography.

7.1.5.4 Hydrological and hydrogeological assessments

The majority of the site will remain undisturbed. Hydrological and hydrogeological risks associated with the activities have therefore been evaluated as low, and are unlikely to impact on the final landform.

7.1.5.5 Waste placement strategy

There are no specific requirements.

7.1.5.6 Specific landform requirements

There are no specific requirements.

7.1.5.7 Monitoring of control measures

No control measures, such as liners or seepage collection systems, will be used on-site.

7.1.5.8 Long-term landform stability

The majority of the site is undisturbed Topsoil will be replaced over the disturbed area and revegetated with a pasture seed mix to re-establish a land use of cattle grazing. The landform erosion risk therefore has been assessed as low and modelling of long-term stability is not required.

7.1.5.9 Quality assurance / quality control

The proposed actions referenced in **Table 7-7** are the key controls that will be put in place to manage the landform risks associated with achieving the PMLU. Quality assurance and quality control activities are built into all necessary execution and verification activities of these controls. Monitoring and reporting processes verify controls and ensure that controls are executed effectively (refer to **Section 8**).

7.1.5.10 Trial methodology

As the landform design is low risk, no trial methodology is proposed.

Relationship with PRCP Schedule

The activities result in only minor disturbance and minor changes in the final landform from the pre-mining topography.

The information in this section is relevant to the following highlighted
Rehabilitation Areas and **Rehabilitation Milestones Reference** in the PRCP Schedule

RA1

RM1

RM2

RM3

RM4

RM5

RM6

RM7

The following **Milestone Criteria** will demonstrate achievement of the Rehabilitation Milestones:

- RM3
- Landform is reshaped to be free-draining with slopes $\leq 5\%$ and consistent with the surrounding topography.

7.1.6 Cover design

PRCP Guideline (Section 3.6.1)

A cover design is required for the surface treatment of a mine landform or other waste material. Hence, the cover system design must be appropriate for the type(s) of waste the project will generate and reflect a risk-based approach. Where waste has the potential for Acid and Metalliferous Drainage (AMD), neutral mine drainage or saline mine drainage, an appropriate cover system must be designed.

The cover design should include:

- Identification and specification of the objectives of the cover system;
- A detailed description of the design including the thickness of each layer;
- A detailed description of construction methodology including any proposed staging of the cover system;
- A quantitative assessment that identifies the location and quantity of proposed capping material available on-site; and
- Proposed QA/QC for the construction of the cover system including the timely implementation of corrective actions where deviations from the design are identified.

This is not applicable to activities on the Centurion North MLs.

Relationship with PRCP Schedule

There is no environmental risk associated with any material remaining on-site and potential contaminants; therefore no cover designs are required.

7.1.7 Water Management

PRCP Guideline (Section 3.6.1)

The rehabilitation planning part must include a description of the following:

- A description of the contaminants that pose a risk to environmental values of the receiving environment;
- Source, pathway and fate of contaminants that have the potential to impact environmental values;
- Infiltration and seepage intervention and collection controls;
- Surface water diversions and long-term management requirements;
- Dewatering requirements;
- Ongoing water management and reduction requirements (i.e. treatment).

Water management will be undertaken to minimise the potential for release of contaminants to the surrounding environment. With regard to the exploration activities, early works and ancillary infrastructure on the Centurion North MLs, there is negligible risk to receiving waters. At drill pads, small sumps may be used for temporary storage of water during drilling. These will be removed following completion of drilling activities and rehabilitated as part of the drill pad rehabilitation.

7.1.8 Revegetation

PRCP Guideline (Section 3.6.1)

The revegetation plan must propose activities that will establish self-sustaining vegetation communities that are appropriate for the intended PMLU (e.g. natural ecosystems, grazing, forestry and some agricultural and other land uses). Revegetation should, therefore, not only establish a ground cover, but also, in some domains, establish associated fauna habitat and other ecological services.

The rehabilitation planning part must include details of the site preparation required for rehabilitation activities.

7.1.8.1 Revegetation objectives

The PRCP Schedule requires all areas disturbed by mining activities to be rehabilitated to a stable condition suitable for cattle grazing. The required objectives and acceptance criteria for a PMLU of cattle grazing at Wards Well (and hence Centurion North) are listed in the PRCP Schedule.

Cattle grazing can be achieved with the materials available for rehabilitation. **Section 7.1.4** discusses the types of topsoils at Centurion North as they relate to a post-mining land use of cattle grazing. **Section 4.1** further discusses land suitability requirements for cattle grazing (**Table 4-2**).

Based on the final landform, the topsoil materials available for rehabilitation and the pre-mining land use suitability assessment, a PMLU of cattle grazing is able to be achieved through revegetation activities associated with pasture seeding and additional soil amelioration if required.

7.1.8.2 Revegetation species and seed mixes for cattle grazing PMLU

As per the current approved PRCP Schedule P-PRCP-100669070_V3, there were no requirements listed in the EA for inclusion of any species of conservation significance or fauna habitat and/or use of analogue sites for the purpose of a PMLU of cattle grazing. Nonetheless, the species mix for revegetating pastures for a PMLU of cattle grazing at Centurion North has been developed based on selecting a combination of both native and exotic pasture grasses listed as perennial, productive and palatable (3P grasses) - these are suited to the topsoils at Centurion North and have either been previously recorded at Centurion north or have been recorded within up to 30 km in the surrounding environment. Importantly, Queensland Bluegrass (*Dichanthium sericeum*), Black Spear grass (*Heteropogon contortus*) and native Mitchell grass species (*Astrebla* spp.) that dominate the surrounding natural grasslands, have been included in the seed mix. In addition, exotic pasture species occurring in the surrounding environment have also been included to provide a representative mixed native/exotic grazing pasture to support a PMLU of cattle grazing.

Table 7-4 lists the revegetation pasture species and recommended sowing rates for a PMLU of cattle grazing at Centurion North. Species availability may fluctuate from year to year and unavailable species would be substituted with other species listed in this table. All pasture seed mixes would include 5 kg/ha of Shirohie millet (*Echinochloa esculenta*) or similar as a cover crop for soil protection, i.e. minimisation of erosion.

No sowing or use of Leucaena is proposed at Centurion North, and Leucaena detected anywhere on the rehabilitation areas will be required to be controlled in accordance with weed management activities.

Table 7-4 Recommended species list and sowing rates for a mixed native/exotic pasture for sustainable beef cattle grazing on Centurion North soils during rehabilitation

Common name	Scientific name	Sowing rate (kg/ha)	Comment
Queensland Bluegrass	<i>Dichanthium sericeum</i>	6	3P grass
Buffel grass	<i>Cenchrus ciliaris</i> *	4 ^c	3P grass
Stylo ^s	<i>Stylosanthes scabra</i> *	2	Legume requires specific rhizobium inoculum strain CB1650
Black spear grass	<i>Heteropogon contortus</i>	5	3P grass
Mitchell grasses	Bull Mitchell grass (<i>Astrebla squarrosa</i>), Curly Mitchell grass (<i>Astrebla lappacea</i>) and Hoop Mitchell Grass (<i>Astrebla elymoides</i>)	3	3P grass
Shirohie millet**	<i>Echinochloa esculenta</i> *	5	Cover crop for soil protection
Total		25	

Notes *exotic species, ^c assumes seed is coated, if not coated, use half prescribed rate, ^s must be sown within 28 days of inoculation, ** or similar cover crop species

In addition to the grazing species mix, the following conservation significant flora species will be sown to promote the growth of threatened flora species and to habitat for threatened fauna species:

- King bluegrass (*Dichanthium queenslandicum*);
- Finger panic (*Digitaria porrecta*);
- Brown's Box (*Eucalyptus brownii*);
- River Red Gum (*Eucalyptus camaldulensis*);
- Narro-leaved Ironbark (*Eucalyptus crebra*);
- Mountain Coolibah (*Eucalyptus orgadophila*); and
- Forest Red Gum (*Eucalyptus tereticornis*).

The eucalyptus species are Locally Important Koala Tree (LIKT) species that have been identified in the study area (E2M, 2025a).

The composition of the seed mix used during rehabilitation will consider the surrounding regional ecosystem, land use, the environment (i.e. availability of water), and local seed availability. As a guide, the inclusion of LIKT species in the seed mix should be considered according to the following landscapes:

- Large central woodland areas - *Eucalyptus crebra* and *Eucalyptus brownii*;
- Riparian areas – *Eucalyptus camaldulensis* and *Eucalyptus tereticornis*; and
- Open basalt hills - *Eucalyptus orgadophila*.

7.1.8.3 Establishing and managing revegetation

Both the native and exotic pasture species selected are cognisant of grazing best management practices. A good condition pasture will have a high percentage of 3P grasses and a high frequency of legumes and a low number of weeds.

Pasture seed mixes will be targeted for planting between September and March. Seed quality will be ascertained prior to planting to ensure highest potential for seed strike and vegetation establishment. A friable or crumbly seed bed will be created by ripping on contour followed by direct planting of seed using agricultural equipment. Surface ripping may not be required in all disturbance areas where a suitable seed bed already exists e.g. exploration access tracks and seismic grid lines. As detailed in **Section 7.1.4.4**, amelioration products and application rates will be determined prior to rehabilitation surface preparation commencing.

The rehabilitation planning and revegetation process is based on sowing preferred 3P pasture species aligned to the associated rehabilitation soils and land topography. As mentioned in **Section 3**, the ongoing assessment of pasture condition - after the revegetation process, is used to assess the condition of the pasture and guide ongoing maintenance and management of pastures on rehabilitated lands (further detail on monitoring is provided in **Section 9**).

Scientific evidence supports groundcover (referring to anything in contact with the soil surface such as rocks, stones, sticks, leaves, grass and hay), including vegetation, as a surrogate for erosion risk in coal mine rehabilitation, with 50% being a conservative target for most slope gradients (less than 20% slope gradient) (So *et al.*, 1998; Loch, 2000; Carroll & Tucker, 2000; Carroll *et al.*, 2000). For these reasons, rehabilitation must achieve and maintain a groundcover greater than 50% to adequately mitigate erosion risk and prevent land degradation.

7.1.8.4 Topsoil

There is sufficient topsoil on-site to respread over the disturbed areas. Topsoil treatments and depth for rehabilitation are detailed in **Section 7.1.4**.

Relationship with PRCP Schedule

Vegetation species to be used will be suitable for soil type and support a post-mining land use of cattle grazing.

	The information in this section is relevant to the following highlighted Rehabilitation Areas and Rehabilitation Milestones in the PRCP Schedule:					
RA1						
RM1	RM2	RM3	RM4	RM5	RM6	RM7

The following **Milestone Criteria** will demonstrate achievement of the Rehabilitation Milestones:

RM5	- Completed seeding in accordance with recommended pasture mix (grasses, cover crop and legumes), and seeding rates (up to 25 kg/ha). - Conservation significant flora species and LIKT species added to the pasture mix with consideration of the surrounding regional ecosystems, land use, the environment, and local seed availability.
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The following Milestone Criteria will demonstrate achievement of the Rehabilitation Milestones:	
RM6	- Pasture condition rating ≤ 3, based on the Pasture Condition Assessment Table as per Stocktake: Balancing Supply and Demand (https://futurebeef.com.au/workshops/sustainable-grazing/stocktake-balancing-supply-demand/), as provided in Table 9-6, including: - Preferred pasture species (3P grasses) diversity ≥ 2 species - Preferred pasture (3P grasses) % DM yield $\geq 10\%$ - Annual grass DM yield % $< 70\%$ - Undesirable grasses and other weeds % DM yield $< 80\%$ - Crown cover (3P grasses) – at worst, moderate to low density and some plants dead
RM7	- Groundcover $> 50\%$ - Land suitability class ≤ 3, or not different from pre-mining class if ≥ 4. The assessment is to be conducted by an appropriately qualified person and completed in accordance with LSA Framework for Open-Cut Coal Mine Rehabilitation 2018 (A rule-set for land suitability assessment of sustainable beef cattle grazing on land rehabilitated after open-cut coal mining in the Bowen Basin Queensland) unless otherwise agreed in writing between the administering authority and the environmental authority holder. - Fore RM7(e) if the land suitability class is assessed as not different from pre-mining class if ≥ 4 for all or a portion of a rehabilitation area, an assessment of reference sites must be carried out to determine if the limitation/s resulting in the class of ≥ 4 is consistent with that of reference sites. - Certification by an appropriately qualified person that pasture meets a pasture condition rating ≤ 3, based on the Pasture Condition Assessment Table as per Stocktake: Balancing Supply and Demand (https://futurebeef.com.au/workshops/sustainable-grazing/stocktake-balancing-supply-demand/), as provided in Table 9-6. - All subsidence impacts are remediated.

7.2 Tailings storage facility

PRCP Guideline (Section 3.6.2)

The tailings require characterisation to determine the geochemistry, rheology and geotechnical parameters that influence the rehabilitation or management strategies and the capacity of the site to support revegetation.

The design for a TSF must include relevant elements:

- Lining of TSF (i.e. embankments and base of structure);
- Leak detection systems;
- Cellular design of TSF;
- Seepage collection systems;
- Design storage allowance;
- Spillway location; and
- Designing TSF for progressive rehabilitation.

Relationship with PRCP Schedule

No tailings storage facilities are proposed on Centurion North MLs.

7.3 Voids

PRCP Guideline (Section 3.6.3)

The information requirements of this domain are dependent on the nature of the proposed PMLU or NUMA for the void. For mine sites with voids, the rehabilitation planning part must include a void closure plan, which includes options for minimising final void area and volume; final void dimensions; pit wall geotechnical and geochemical stability, final slope angles, void hydrology, groundwater modelling, water balance and predicted long-term water quality.

A geotechnical report should focus on how the void will achieve post-closure slopes that will exhibit stability characteristics consistent with the planning and design of the post-closure mine void.

If floodwaters are likely to move over backfilled material, an assessment of the hydraulic properties must be conducted to assess whether instability may occur.

The rehabilitation and management strategies in the plan must include the supervision, verification and auditing of engineering works carried out to achieve the post-closure void landform, to ensure construction is consistent with the geotechnical design.

The rehabilitation and management strategy must also include confirmation that the post-closure landform demonstrates the level of stability as specified by the design.

Relevance to Centurion North

No final voids are proposed on Centurion North.

7.3.1 Mining final void

No final void remains.

7.3.2 Final void dimensions

No final void remains.

7.3.3 Final void wall stability

No final void remains.

7.3.4 Final void wall angles

No final void remains.

7.3.5 Void hydrology

No final void remains.

7.3.6 Design plan

No final void remains.

7.3.7 Rehabilitation and management strategies

No final void remains.

7.4 Underground mining

PRCP Guideline (Section 3.6.4)

For underground mining operations, the rehabilitation planning part must include:

- A geotechnical study;
- An assessment of groundwater interactions and potential lowering of groundwater levels;
- The development of a hydrogeological conceptual model;
- Subsidence analysis and modelling and a subsidence vegetation/habitat impact assessment;
- Consideration of how potential entries to underground workings will be sealed (i.e. through some form of capping or back filling);
- How surface ponding and cracking will be mitigated; and
- Identification of post-closure stabilisation of underground workings in order to manage the potential for unplanned surface subsidence and unplanned ground collapse such as sinkholes and pot holing.

7.4.1 Underground Mining

The proposed exploration works and early works to support future longwall extraction, the subject of the current EA Amendment application, includes the construction of gate roads and completion of UIS Gas Drainage. The location of gate roads is illustrated in **Figure 2-4**. The construction of the gate roads and UIS gas drainage will be accessed from the existing CCM underground roadway network from ML 6949. All waste products generated from underground activities will be managed and co-disposed with waste generated from the CCM in accordance with the CCM Waste Management Procedure.

A subsidence assessment for the development of underground gate roads was completed by SCT (SCT, 2025; **Appendix 9**) and outlined the stability of the underground workings and the prediction of subsidence occurring. It is noted that this subsidence assessment was completed for five gate road design, which has since been reduced to four gate roads (removal of TG103/MG102).

Four (4) underground gate roads (TG104/MG103, TG105/MG104, TG106/MG105, and TG107/MG106) will be constructed to enable safe and efficient transport of personnel, equipment and extracted materials. The gate roads are designed to advance the development of the mine by establishing the first three longwall mining panels while the subsequent mining processes undergo an EIS level assessment.

The gate roads will be constructed using single pass continuous miners to a width of 5.4 m and a ceiling height of 3.6 m. Gate roads will be constructed at depths of approximately 210 m to 620 m, with solid coal pillar widths ranging from 58 m to 75.5 m. Gate roads will be two heading and a future sub-mains will be formed to proposed northern area longwall panels.

Roof and rib (sidewall) support (e.g. bolts, mesh and/or shotcrete) will be installed progressively to ensure adequate strata reinforcement. Services such as ventilation systems, conveyor systems, power cables, water pipes, compressed air lines and communication systems will then be installed to ensure the safety of personnel, control of contaminants, conveyance of coal and movement of equipment. Underground roadways are constructed such that they remain stable for the life of the mine and will become unserviceable following extraction of an adjacent longwall panel or if abandoned for a significant time.

7.4.2 Subsidence Predictions and Impacts

Low levels of subsidence as a result of construction of gate roads are expected, associated with elastic compression of pillars following roadway development. The estimated surface subsidence is expected to range from 15 mm to 45 mm for the four gate roads assessed based on the depth range (**Table 7-5**). A ± 20 mm subsidence tolerance should be applied to these subsidence estimates. Calculations of subsidence were made based on empirical pillar calculations and tributary area method (SCT, 2025).

Table 7-5 Estimated surface subsidence caused by development of proposed gate roads using maximum and minimum depths (inbye ends) (SCT, 2025)

Location	Pillar widths (m)	Minimum depth (m)	Subsidence (mm)	Maximum depth (m)	Subsidence (mm)
TG104/MG103	58	210	15	480	41
TG105/MG104	65	220	16	540	43
TG106/MG105	71	260	20	580	44
TG107/MG106	75.5	320	25	620	45

While estimated subsidence outcomes could be modified by overburden mechanisms of the Tertiary strata (as discussed further in SCT, 2025), subsidence values currently predicted for the four gate roads are likely to be within the guidance published by the Independent Expert Steering Committee (2015), which states that seasonal variation can be as high as 50 mm or more due to changes in moisture content.

7.4.2.1 Surface Impacts from Underground Activities

The surface above the underground area does not contain any significant drainage lines. However, the underground activities will be located below remnant or high value regrowth vegetation (refer **Figure 2-13**):

- 11.5.15 – Semi-evergreen vine thicket on Cainozoic sand plains and/or remnant surfaces; and
- 11.5.16 – *Acacia harpophylla* open forest in depressions on Cainozoic sand plains and remnant surfaces.

In addition, the underground activities will be located below various approved and proposed surface infrastructure, as outlined in **Section 2.1.3**.

Due to the low levels of subsidence and associated strains and tilts as a result of gate road construction, adverse surface effects such as surface ponding and surface cracking are considered to be unlikely. In addition, the generation of only elastic compression of the strata also indicates that sub-surface cracking above the proposed underground area is not expected.

7.4.2.2 Groundwater Impacts from Underground Activities

As discussed in **Section 7.1.1**, it is noted that groundwater in the Centurion North MLs and surrounds has already been impacted by existing / past mining activities, particularly relating to the adjacent CCM in ML 6949. Further groundwater impacts are likely to occur due to the construction of the proposed underground gate roads and proposed future longwall panels.

All groundwater impacts from the above approved and proposed activities will be confirmed during the next stage of this PRCP.

7.4.3 Post-Closure Geotechnical Stability of Underground Workings

The proposed gate roads will be constructed with roof and rib support, and therefore the gate roads will remain geotechnically stable in the long-term.

However, in the scenario that future longwall panels will be extracted in the vicinity of the gate roads and the area will be sealed off after longwall extraction, the long-term stability of the gate roads is unknown. Further assessment of the long-term stability for this scenario will be completed as part of the next version of this PRCP, which will include consideration of proposed longwall extraction.

7.4.4 Portals

As access to the Centurion North MLs will be provided from the existing CCM underground roadway network from ML 6949, all closure procedures will be undertaken as part of the CCM procedures and PRCP.

Relationship with PRCP Schedule

The final post-mining landform will be remediated from any subsidence impacts as a result of the proposed underground activities, as required. The risk of subsidence impacts occurring has been deemed as unlikely.

7.5 Built infrastructure

PRCP Guideline (Section 3.6.5)

The administering authority's expectation of rehabilitation relating to built infrastructure is that it will be decommissioned, demolished, salvaged and/or disposed of unless it is being formally retained by the landholder to achieve an appropriate PMLU.

The rehabilitation planning part must include:

- Identification of infrastructure that will be decommissioned and the methods for decommissioning;
- A description of infrastructure that will remain post rehabilitation and the identification of ongoing maintenance requirements; and
- Evidence of agreement for any infrastructure that will have ownership transferred.

7.5.1 Decommissioning, demolition and removal

Currently, there are no agreements in place for retention of infrastructure by a post mining land owner / holder, but these may be sought in the future if the infrastructure may benefit the post-mining land use.

The infrastructure associated with the mining activities (**Table 7-6**) will be decommissioned and removed from site prior to surrender except where agreed in writing by the post-mining landowner/holder. It is anticipated that future EA amendments will be sought for further exploration programs and mining operations and some mining infrastructure may be required beyond the current activities. This will be incorporated in any future amendments of the PRC plan and PRCP Schedule. Further detail on the rehabilitation stages after decommissioning of the infrastructure, such as landform reshape, surface preparation, revegetation and monitoring are covered in the relevant sections.

On-site infrastructure, used solely for grazing purposes (i.e. not related to mining), such as water tanks, property water pipelines, windmills, water troughs, feed troughs and dams will remain to support the post-mining land use.

Table 7-6 Infrastructure associated with the Centurion North activities

Infrastructure	
Exploration activities, early works and ancillary infrastructure	• Service boreholes, gas risers, and other boreholes • SIS wells • Bleeder shaft • Laydown area

7.5.1.1 Boreholes

Boreholes will be closed and rehabilitated generally in accordance with the requirements set out in Conditions B24 to B31 of the *Eligibility criteria and standard conditions for exploration and mineral development projects* (ESR/2016/1985) (Queensland Government, 2016) and will address the requirements and conditions of the existing EA.

In general, the closure and rehabilitation process for sampling boreholes will typically be as follows:

- Demobilisation of drill rig and support equipment;
- Backfill of sump with spoil / topsoil placed next to the sump;
- Backfill chip drill hole with excess chips;
- Remove any materials and wastes from site, including reclaiming gravel base materials;
- Monitor and manage any weed infestation; and
- Remove any temporary erosion and sediment controls following drilling.

7.5.1.2 Access Tracks and Drill Pads

Access tracks will generally be closed and rehabilitated generally in accordance with the requirements set out in Conditions B24 to B31 of the *Eligibility criteria and standard conditions for exploration and mineral development projects* (ESR/2016/1985) (Queensland Government, 2016) and will address the requirements and conditions of the existing EA. There may be instances where access tracks are retained, in agreement with land title holders, to provide for ongoing access.

The access tracks, laydown area and drill pads (relevant to SIS wells, service boreholes, gas risers and bleeder shaft) will be rehabilitated through the following methodologies:

- Borehole casings removed or cut below the surface, and holes backfilled and grouted;
- Bleeder shaft surface infrastructure removed, shaft filled with ballast and concrete, and capped with a concrete shaft cap;
- Remove any materials and wastes from site, including reclaiming gravel base materials;
- Windrows and drains will be pushed and deep ripped;

- Topsoil placement, amelioration and seeding with pasture grasses and trees; and
- Where there is an increased risk of sedimentation, rock armour will be applied.

The extent of rehabilitation activities will be subject to agreement with landholders who may choose to retain infrastructure deemed beneficial.

7.5.2 Contaminated land assessment

In accordance with the EA conditions C12, F1, F2 and F3, spillage of any wastes, contaminants or other materials must be cleaned up as quickly as practicable, stored in accordance with relevant standards and handled in a way that prevents environmental harm. Although contamination at Centurion North is unlikely, a contaminated land assessment will be completed on exploration drill pads where a risk of contamination may have occurred.

The assessment, if required, will include a Preliminary Site Investigation (PSI) prior to the completion of the activities, to identify if any areas require further Detailed Site Investigation (DSI). The investigations will be undertaken in accordance with the National Environment Protection (Assessment of Site Contamination) Measure (NEPC, 1999) or equivalent in place at the time of investigation. Where the PSI identifies a requirement for further investigation a targeted DSI will be undertaken to confirm and characterise areas of concern. If contamination is identified, the potential risks will be assessed and, where required, remediation will be undertaken and/or a site management plan developed.

A contaminated land survey will be undertaken to confirm that no contamination unsuitable for the post-mining land use is present.

Relationship with PRCP Schedule

The EA requires all infrastructure constructed for the activities, must be removed from the site prior to surrender and any spills and releases to be cleaned up and the area remediated.

The information in this section is relevant to the following highlighted Rehabilitation Areas and Rehabilitation Milestones in the PRCP Schedule:						
RA1						
RM1	RM2	RM3	RM4	RM5	RM6	RM7

The following **Milestone Criteria** will demonstrate achievement of the Rehabilitation Milestones:

RM1	• All services disconnected • All built and service infrastructure demolished and removed (except where agreed in writing by the post-mining landowner/holder) • All concrete, bitumen and aggregate removed • All waste and rubbish removed • All gas risers / boreholes / bleeder shaft / SIS wells decommissioned
RM2	• All contamination is remediated or removed from site in accordance with relevant legislation • A contaminated land survey is carried out by a suitably qualified person confirming the land does not present an unacceptable risk to proposed future land uses or the environment

7.6 Summary of key rehabilitation and management practices

Figure 7-2 summarises the Centurion North rehabilitation milestones. Exploration activities and early works activities will be rehabilitated progressively throughout the timeline of exploration activities.

In support of this figure, **Table 7-7** further details the key rehabilitation activities for RA1 at Centurion North. The rehabilitation activities drive achievement of the Centurion North rehabilitation milestones and inform the associated PRCP Schedule.

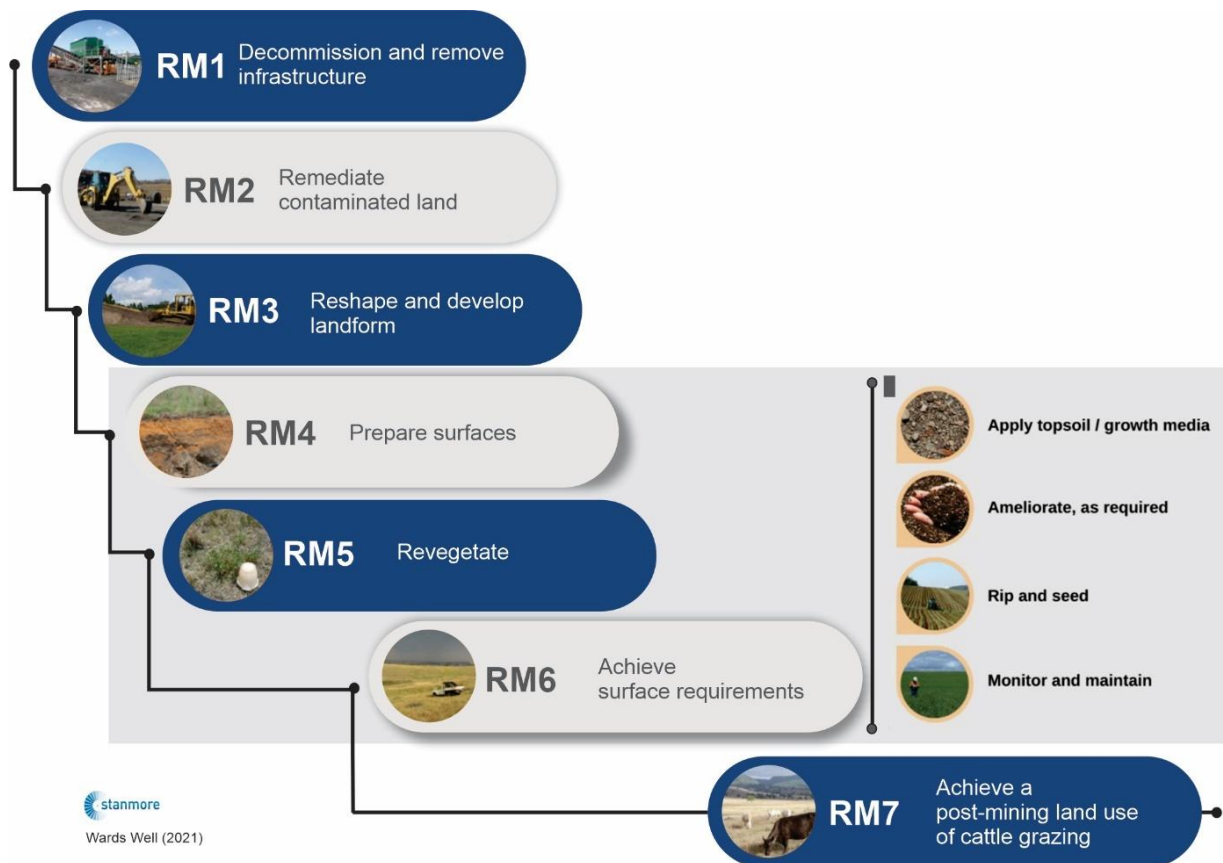


Figure 7-2 Summary of key rehabilitation and management practices for Centurion North

Table 7-7 Key rehabilitation activities identified to drive achievement of Centurion North’s rehabilitation milestones

Rehabilitation area	Relevant activities	Area (ha)	Rehabilitation activities (to drive achievement of Rehabilitation Milestones)	Rehabilitation timing	Rehabilitation milestones
RA1	Exploration activities, early works and ancillary infrastructure	234	• Dismantle infrastructure; • Decommission drill holes: • Assess if the drill hole needs to be sealed by an appropriately qualified person, and seal if required • Backfill drill cuttings into the hole or sump • Cut collar below ground level • Remove rubbish • Undertake assessment for contaminated land and remediate if required • Reshape the landform to be free-draining and blend to merge in with the surrounding topography • Spread all topsoil stripped from the area back over the area • Rip across contour • Seed • Undertake monitoring and maintenance to demonstrate achievement of a cattle grazing PMLU	• Rehabilitation will be completed progressively as drilling is completed • Seeding of all legacy drill holes and tracks (unless required for future access) to be completed by 2026 • Seeding of all new impact areas to be completed by 2041	RM1 RM2 RM3 RM4 RM5 RM6 RM7

8. RISK ASSESSMENT

Legislative Requirement

In accordance with section 126C(1)(f) of the EP Act, the rehabilitation planning part of the PRC plan must identify the risks of a stable condition for land described as a post-mining land use not being achieved, and how the applicant intends to manage or minimise the risks.

8.1 Identifying, assessing and treating risks

PRCP Guideline (Section 3.7)

As per section 126C(1)(j) of the EP Act, the administering authority considers it necessary for the proposed PRC plan to contain a risk assessment of all proposed NUMAs. The risk assessment must be carried out to identify the risks of the NUMA causing environmental harm and not being safe and structurally stable and detail how the applicant intends to manage and minimise the identified risks.

The AS ISO 31000:2018 Risk Management – Guidelines (Standards Australia, 2018) describes risk assessment as the overall process of risk identification, risk analysis, risk evaluation and risk treatment. Each of these aspects must be included in the risk assessment in the rehabilitation planning part.

Information requirements in this section apply to all applicants whether or not they are an existing EA holder. Existing holders may have the required information available from previously submitted plans/reports/applications that, if still valid, can be used in the PRC plan.

8.1.1 Risk methodology

A risk-based approach to the Centurion North PRC planning has been undertaken (**Figure 8-1**).

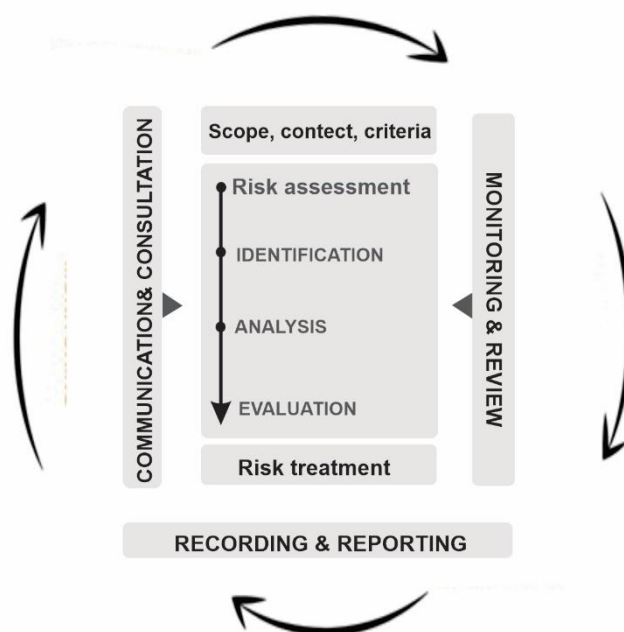


Figure 8-1 ISO 3100-compliant risk-based approach followed for the Centurion North PRCP

8.2 Risk identification

The risk event - a stable condition for land described as a post-mining land use not being achieved, was assessed per ISO 31000 methodology described in **Figure 8-1** above (the full risk assessment is included in **Appendix 10**), where stable condition is defined as per section 111A of the EP Act:

- The land is safe and structurally stable;
- There is no environmental harm being caused by anything on or in the land; and
- The land can sustain a PMLU.

For Centurion North the PMLU being assessed is cattle grazing as per the PRCP Schedule.

A number of scenarios were identified in the risk identification process related to a stable condition for the land described as the PLMU not being achieved:

- Landform failure;
- Alteration of hydrogeological conditions;
- Alteration of surface water systems;
- Alteration of flood hydrology;
- Insufficient, inadequate or inappropriate soil and capping material required for rehabilitation activities;
- Inadequate and/or inappropriate revegetation;
- Stability failure of underground mine workings; and
- Deterioration of built infrastructure conditions.

8.2.1 Risk analysis, evaluation and relevant treatments

The table included in **Appendix 10** provides the full detail of risk analysis, risk evaluation and risk treatment for these scenarios. Worst case outcomes were assessed for each scenario, preventative and mitigating controls identified and from there a residual risk rating was calculated. The applied likelihood and severity tables, as well as the outcomes of the residual risk rating (RRR) heat map ratings matrix are provided in **Figure 8-2**.

LIKELIHOOD TABLE			
Uncertainty	Frequency	Likelihood Factor	Guidance
Highly Likely	Likely to occur within a 1 year period.	3	Event is expected to occur > 80% of the time during a 5 year planning cycle.
Likely	Likely to occur within a 1 - 5 year period.	1	Event is expected to occur 60% to 80% of the time during a 5 year planning cycle.
Probable	Likely to occur within a 5 - 20 year period.	0.3	Event is expected to occur 30% to 60% of the time during a 5 year planning cycle.
Unlikely	Likely to occur within a 20 - 50 year period.	0.1	Event is expected to occur 10% to 30% of the time during a 5 year planning cycle.
Highly Unlikely	Not likely to occur within a 50 year period.	0.03	Event is expected to occur < 10% of the time during a 5 year planning cycle.

SEVERITY TABLE		
Severity Level	Descriptor	Severity Factor
5	Severe impact to the environment and where recovery of ecosystem function takes 10 years or more;	1000
4	Serious impact to the environment, where recovery of ecosystem function takes between 3 and up to 10 years or	300
3	Substantial impact to the environment, where recovery of ecosystem function takes between 1 and up to 3 years	100
2	Measureable but limited impact to the environment, where recovery of ecosystem function takes less than 1 year	30
1	Minor, temporary impact to the environment, where the ecosystem recovers with little intervention	10

				Severity level	S1	S2	S3	S4	S5
				Severity Factor	10	30	100	300	1000
Likelihood	Likelihood	Likelihood Factor	Timeframe	Residual Risk Calculation (with controls in place and effective)					
	Highly Likely	3	Within 1 year	30	90	300	900	3000	
	Likely	1	Within 1-5 years	10	30	100	300	1000	
	Probable	0.3	Within 5-20 years	3	9	30	90	300	
	Unlikely	0.1	Within 20-50 years	1	3	10	30	100	
	Highly Unlikely	0.03	Within 50 years	0.3	0.9	3	9	30	

Figure 8-2 Likelihood and severity tables, with resulting residual risk rating (RRR) heat map

With controls in place and implemented effectively, the RRR for the identified risk scenarios of this risk event is deemed to be low (RRR of 3 or lower).

The risk treatments for each scenario that are necessary for achieving a stable condition for the land described as the PLMU are shown below in **Table 8-1**.

Table 8-1 Necessary risk treatments identified to achieve a stable condition for the PMLU

Aspect	Risk treatment
Risk event: Landform failure	
Reasons for selecting treatment option	- Method will achieve a stable condition. - Final landform is similar to pre-mining landform.
Responsibility for plan: - Approval - Implementation	- EA Holder. - Exploration team.
Proposed actions	- Minimise height and slope gradients of landform structures. - Landform to be free-draining and blended in with surrounding topography. - Surface cover including vegetation to provide erosion resistance.
Resource requirements	- Landform design. - Available material inventory. - Equipment capabilities. - Survey/LiDAR. - Rehabilitation monitoring data.
Performance measures and constraints	Tracking against milestone criteria.
Reporting and monitoring requirements	- Analysis of final landform against design. - Rehabilitation monitoring.
Risk timing and scheduling	From commencement of rehabilitation to final achievement of PMLU.
Risk event: Alteration of hydrogeological conditions	

Aspect	Risk treatment
Reasons for selecting treatment option	• AMD issues not identified. • Hydrogeological conceptual model indicates low potential for impacts to groundwater quality, groundwater use or for long-term changes to hydrogeological condition.
Responsibility for plan: • Approval • Implementation	• EA Holder. • Exploration team.
Proposed actions	• All imported hazardous materials are to be stored and used in accordance with the requirements of EA. • At the completion of operations, all imported hazardous materials and infrastructure that have the potential to release contaminants to groundwater will be removed from site. • Groundwater and ecosystem monitoring to be undertaken in accordance with EA conditions. • Assessment of groundwater through development of conceptual models by suitably qualified persons to assess the potential for groundwater impacts associated with approved activities.
Resource requirements	• Not applicable.
Performance measures and constraints	• Tracking against milestone criteria.
Reporting and monitoring requirements	• Rehabilitation monitoring. • Reporting under existing EA requirements.
Risk timing and scheduling	• From commencement of rehabilitation to final achievement of PMLU.
Risk event: Alteration of surface water systems	
Reasons for selecting treatment option	• AMD issues not identified. • No alteration of the alignment of drainage lines or creeks.
Responsibility for plan: • Approval • Implementation	• EA Holder. • Exploration team.
Proposed actions	• All imported hazardous materials and to be stored and used in accordance with EA conditions. • Surface water monitoring to be undertaken opportunistically when sufficient water is available in the ephemeral creeks and in accordance with EA conditions. • Monitoring of surrounding ecosystems will be undertaken in accordance with EA conditions. • Rehabilitation of disturbed areas will be undertaken after the completion of operations.

Aspect	Risk treatment
Resource requirements	Not applicable.
Performance measures and constraints	Tracking against milestone criteria and WQO.
Reporting and monitoring requirements	- Monitoring when surface water flows are available. - Reporting under existing EA requirements.
Risk timing and scheduling	From commencement of rehabilitation to final achievement of PMLU.
Risk event: Alteration of flood hydrology	
Reasons for selecting treatment option	No alteration of the alignment of drainage lines or creeks.
Responsibility for plan: - Approval - Implementation	- EA Holder. - Exploration team.
Proposed actions	- Assessment of flooding risks evaluated prior to commencement of operations. Note assessment has confirmed low risk. - Final landforms are to be located, designed and constructed to minimise impact to flooding regimes and to withstand reasonably assessed flooding risks. - Monitoring of surrounding ecosystems to be undertaken in accordance with EA conditions.
Resource requirements	Not applicable.
Performance measures and constraints	Tracking against milestone criteria.
Reporting and monitoring requirements	- Rehabilitation monitoring. - Reporting under existing EA requirements.
Risk timing and scheduling	From commencement of rehabilitation to final achievement of PMLU.
Risk event: Insufficient, inadequate or inappropriate soil and capping material required for rehabilitation activities	
Reasons for selecting treatment option	Enables utilisation of site resources for greatest chance of stable condition being achieved.
Responsibility for plan: - Approval - Implementation	- EA Holder. - Exploration team.

Aspect	Risk treatment
Proposed actions	• Undertake rehabilitation planning and preparation in accordance with the specific requirements for soil, seed and management for a cattle grazing PMLU. • Management of topsoil stripping and application during rehabilitation. • Topsoil assessment by an appropriately qualified person to determine if ameliorant and fertiliser requirements are required. • Ameliorants and fertilisers applied, if required.
Resource requirements	• Topsoil inventory. • Survey/LiDAR. • Topsoil assessment. • Rehabilitation monitoring data.
Performance measures and constraints	• Tracking against milestone criteria.
Reporting and monitoring requirements	• Topsoil assessment. • Rehabilitation monitoring.
Risk timing and scheduling	• From planning of soil stripping to final achievement of PMLU.
Risk event: Inadequate and/or inappropriate revegetation	
Reasons for selecting treatment option	• Proposed seed mix has worked successfully in cattle grazing PMLU rehabilitation at other sites.
Responsibility for plan: • Approval • Implementation	• EA Holder. • Exploration team.
Proposed actions	• Management of topsoil stripping and application during rehabilitation. • Topsoil assessment by an appropriately qualified person to determine if ameliorant and fertiliser requirements for planned seed mix are required. • Ameliorants and fertilisers applied, if required. • Management of seed selection and quality. • Plant at optimal time of year.
Resource requirements	• Topsoil inventory. • Topsoil assessment. • Rehabilitation monitoring data.
Performance measures and constraints	• Tracking against milestone criteria.
Reporting and monitoring requirements	• Rehabilitation monitoring.
Risk timing and scheduling	• From planning of soil stripping to final achievement of PMLU.

Aspect	Risk treatment
Risk event: Stability failure of underground mine workings	
Reasons for selecting treatment option	- Subsidence modelling indicates predicted subsidence likely to be within the range of natural variability. - Gate roads are designed to be long-term stable.
Responsibility for plan: - Approval - Implementation	EA Holder
Proposed actions	Underground design to consider geotechnical issues and include stability analysis and subsidence modelling.
Resource requirements	- Survey/LiDAR. - Rehabilitation monitoring data
Performance measures and constraints	Tracking against milestone criteria.
Reporting and monitoring requirements	- Rehabilitation monitoring. - Subsidence monitoring and annual reporting.
Risk timing and scheduling	From commencement of gate road extraction to final achievement of PMLU.
Risk event: Deterioration of built infrastructure land conditions	
Reasons for selecting treatment option	Minimise or prevent contamination.
Responsibility for plan: - Approval - Implementation	- EA Holder. - Exploration team.
Proposed actions	- Clean up and remediate contamination during operational period. - Undertake PSI contaminated land assessment post-mining to identify any areas requiring further DSI. - Remediate any contamination. - A contaminated land survey is carried out by a suitably qualified person confirming no contamination.
Resource requirements	- Infrastructure inventory. - Contaminated land assessments. - Final contaminated land survey. - Rehabilitation monitoring data.
Performance measures and constraints	Tracking against milestone criteria.
Reporting and monitoring requirements	- Contaminated land assessments. - Final contaminated land survey. - Rehabilitation monitoring.

Aspect	Risk treatment
Risk timing and scheduling	From the commencement of all activities to final achievement of PMLU.

Due to the limited disturbance area and minimum elevation of the final landform, the rehabilitation outcomes are considered low-risk and no rehabilitation trials will be conducted.

9. MONITORING AND MAINTENANCE

To demonstrate achievement of the RMs, as they relate to achieving a PMLU of cattle grazing, a combination of the following approaches will be used (**Table 9-1**):

- Rehabilitation reporting requirements (RM1 to RM5); and
- Ongoing rehabilitation monitoring (RM6 and RM7), comprising desktop and field-based assessments and associated reporting (**Figure 9-1**).

Table 9-1 Rehabilitation milestones with relevant reporting requirements

Milestone reference	Rehabilitation milestone	Milestone criteria	Reporting requirements
RM1	Infrastructure decommissioning and removal	a) All services disconnected. b) All built and service infrastructure demolished and removed. c) All concrete, bitumen and aggregate removed. d) All waste and rubbish removed. e) All gas risers / boreholes / bleeder shaft / SIS wells decommissioned.	• Undertake visual inspections. • Document inspections.
RM2	Remediation of contaminated land	a) All contamination is remediated or removed from site in accordance with relevant legislation. b) A contaminated land survey is carried out by a suitably qualified person confirming the land does not present an unacceptable risk to proposed future land uses or the environment.	• Documentation by a suitably qualified person confirming the land does not present an unacceptable risk to proposed future land uses or the environment.
RM3	Landform development and reshaping	a) Landform is reshaped to be free-draining with slopes $\leq 5\%$ and consistent with the surrounding topography.	• Survey/LiDAR of landform. • Analyse final landform against design.
RM4	Surface preparation	a) Topsoil is placed with an average thickness of 200 mm. b) An assessment of soil and growth media characteristics is completed by an appropriately qualified person and amelioration and other treatments required identified. c) Ameliorant and physical treatments are applied as identified.	• Survey/LiDAR of surface and extent after topsoil is placed. • Document topsoil depth. • Document soil assessment. • Document soil ameliorants and physical treatments applied.

Milestone reference	Rehabilitation milestone	Milestone criteria	Reporting requirements
RM5	Revegetation (cattle grazing)	a) Completed seeding in accordance with recommended pasture mix (grasses, cover crop and legumes), and seeding rates (up to 25kg/ha). b) Conservation significant flora species and LIKT species added to the pasture mix with consideration of the surrounding regional ecosystems, land use, the environment, and local seed availability.	Document seed mix, planting rates and areas.
RM6	Achievement of surface requirements (cattle grazing)	a) Pasture condition rating ≤ 3, including: - Preferred pasture species (3P grasses) diversity ≥ 2 species; - Preferred pasture (3P grasses) % DM yield $\geq 10\%$; - Annual grass DM yield % $< 70\%$; - Undesirable grasses and other weeds % DM yield $< 80\%$; and - Crown cover (3P grasses) – at worst, moderate to low density and some plants dead.	Undertake rehabilitation monitoring as per Section 9.
RM7	Achievement of post-mining land use to a stable condition (cattle grazing)	a) A hazard assessment has been completed by an appropriately qualified person to confirm safety hazards in rehabilitation are not significantly different to surrounding unmined landscapes subject to the same land use. b) Groundcover $> 50\%$. c) Rainfall runoff from the area is not significantly different to upstream values for the following: pH, EC and turbidity. d) Land suitability class ≤ 3, or not different from pre-mining class if ≥ 4. The assessment is to be conducted by an appropriately qualified person in accordance with LSA Framework for Open-Cut Coal Mine Rehabilitation 2018 (A rule-set for land suitability assessment of sustainable beef cattle grazing on land rehabilitated after open-cut coal mining in the Bowen Basin Queensland) unless otherwise agreed in writing between the administering authority and the environmental authority holder. For RM7(f), if the land suitability class is assessed as not different from pre-mining class if ≥ 4 for all or a portion of a rehabilitation area, an assessment of reference sites must be carried out to determine if the limitation/s	Undertake rehabilitation monitoring as per Section 9.

Milestone reference	Rehabilitation milestone	Milestone criteria	Reporting requirements
		resulting in the class of ≥ 4 is consistent with that of reference sites. e) Certification by an appropriately qualified person that pasture meets a pasture condition rating ≤ 3. f) All subsidence impacts are remediated.	

9.1.1 Analogue sites and grazing PMLU monitoring

Monitoring of analogue or reference sites is not a requirement of the current EA and is not included in the Centurion North rehabilitation monitoring program (unless identified as being required as per RM7(f) (**Table 9-1**)).

Monitoring of cattle grazing will be assessed against:

- The pasture condition criteria for RM6 and RM7(g) (**Table 9-1**), which is based on standard methods for assessing pasture condition consistent with industry guidelines (Future Beef, 2025); and
- The land suitability assessment based on the grazing rule-set criteria for RM7(f) (**Table 9-1**).

9.1.2 Rehabilitation monitoring phases

Permanent monitoring plots will be established at the start of the rehabilitation monitoring program. These same plots will also be assessed at the same location during all subsequent phases of the ongoing rehabilitation monitoring.

This rehabilitation monitoring program has been designed to demonstrate achievement of surface requirements (RM6) and post-mining land use to a stable condition (RM7); and follows a phased approach to ensure greater accuracy and efficiency in data collection and analysis. There are three main phases to the rehabilitation monitoring program including 'initial', 'minor', and 'major', as illustrated in **Figure 9-1**. Opportunistic monitoring is also conducted in addition to each monitoring phase (**Figure 9-1**).

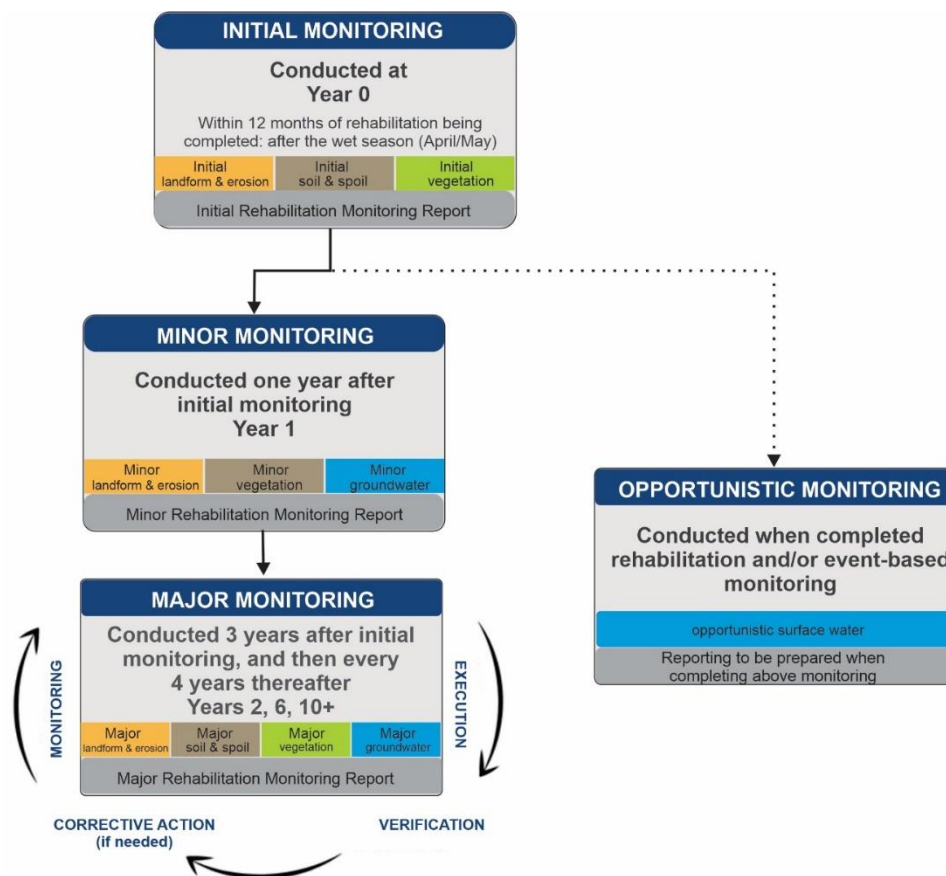


Figure 9-1 Flow diagram of the Centurion North rehabilitation monitoring program

The ongoing and consistent phased approach of the monitoring program ensures that there is continual monitoring of the rehabilitation parameters against the milestone criteria up to the point of the surrender of the EA. **Table 9-2** describes how the monitoring schedule progresses over the PRCP period during the phases of monitoring, and includes the parameters monitored during each phase. This allows assessment of the performance and trajectory of the rehabilitation against milestone criteria and accounts for the influence of seasonal variations and extreme weather events over time.

Table 9-2 Rehabilitation parameters measured during rehabilitation monitoring phases

Rehabilitation parameters	Rehabilitation				
	Year 0	Year 1	Year 2	Year 6	Year 10+
Landform stability	Initial	Minor	Major	Major	Major
Erosion	Initial	Minor	Major	Major	Major
Soil and spoil	Initial	-	Major	Major	Major
Groundcover	Initial	Minor	Major	Major	Major
Invasive plants	Initial	Minor	Major	Major	Major

Rehabilitation parameters	Rehabilitation				
	Year 0	Year 1	Year 2	Year 6	Year 10+
Pasture species Richness	Initial	Minor	Major	Major	Major
Pasture yield and quality	-	-	Major	Major	Major
Pasture condition	-	-	Major	Major	Major
Grazing Land Suitability Assessment	-	-	-	Major	Major

9.2 Initial monitoring method

Initial monitoring will be undertaken at newly established rehabilitation monitoring sites to categorise the site, develop baseline data and identify any risks to rehabilitation success.

Early detection and rectification of drainage and run-off issues can prevent more widespread erosion issues that can lead to rehabilitation failure.

The following aspects of rehabilitation will be assessed during initial monitoring:

- Landform and erosion;
- Soils and spoils; and
- Vegetation.

9.2.1 Desktop monitoring

Prior to commencing any field monitoring work, LiDAR data and aerial imagery will be used to:

- Develop a Digital Elevation Slope Model to assess the landform design;
- Identify potential erosion areas for field validation; and
- Plan the locations to establish permanent, fixed monitoring plots using the following criteria:
 - Representative of rehabilitation slope and PMLU; and
 - Accessibility (vehicle access preferred).

9.2.2 Field monitoring

Field monitoring will be undertaken at the permanent, fixed plot field monitoring sites established as part of the initial desktop monitoring.

9.2.2.1 Landform and erosion

Field based landform and erosion monitoring will focus on assessing initial areas of erosion identified through the desktop assessment.

Whilst the rehabilitated landforms at Centurion North are not complex and the risks associated with instability and erosion are low, provisions for field-based erosion monitoring have been included in the program for any potential areas of erosion identified during desktop analysis.

The field survey involves establishing an erosion monitoring transect by running a 50 m tape perpendicular to the slope and across the erosional activity identified during the LiDAR analysis.

9.2.2.2 Soil and spoil

Surface sampling of topsoil refers to the layer at 0 – 10 centimetres (cm); and sub-surface sampling of underlying spoils refers to layers at 10 – 30 cm, 30 – 60 cm and 90 – 100 cm.

Data acquired from soil and spoil monitoring will be analysed by an appropriately qualified person and consider the grazing ruleset. This will be used to establish initial characteristics of the rehabilitated soil profile for trend analysis of these fixed points over time.

The soil and spoil analysis parameters are provided in **Table 9-3**.

Table 9-3 Soil and soil analysis parameters for monitoring programs

Category	Analyte	Purpose of analyte	Depth		Monitoring phase	
			Surface	Sub-surface	Initial	Major
Acidity / alkalinity	pH	Identify anomalies that may affect plant growth and sustainability.	ü	ü	ü	ü
Salinity	EC	Identify leaching profile. High salinity can lead to poor vegetation germination and establishment, reduced plant growth and vigour.	ü	ü	ü	ü
	Chloride	Identify leaching profile. High chloride can lead to poor vegetation germination and establishment, reduced plant growth and vigour.	ü	ü	ü	ü
Exchangeable cations	CEC	Major factor in soil fertility. Controls soil stability, nutrient availability and buffers soil's chemical properties.	ü	ü	ü	ü
	Exchangeable cations	Exchangeable Calcium is linked to soil stability. High levels of exchangeable Magnesium can cause clay dispersion, instability when wet and hard setting.	ü	ü	ü	ü
	Exchangeable Sodium Percentage (ESP)	ESP is a measure of the dominance of sodium ions on the soil's cation exchange complex. Sodicity in soils can lead to slaking and dispersion which impact soil structure and stability.	ü	ü	ü	ü

Category	Analyte	Purpose of analyte	Depth		Monitoring phase	
			Surface	Sub-surface	Initial	Major
Organic matter	Organic carbon	An indicator of soil nutrient stores and a contributor to improvements in soil structure. Changes through time in organic carbon are a key indicator of rehabilitation success.	ü	-	ü	ü
Major elements	Total Nitrogen	Indicator of soil nutrient store and is also a major plant nutrient.	ü	-	ü	ü
	Extractable Phosphorous (Colwell method)	Indicator of Phosphorous readily available to plants.	ü	-	ü	ü
	Total Phosphorous	Indicator of total store of Phosphorous, some of which is readily available. Key indicator of potential for long-term success or failure of rehabilitation.	ü	-	ü	ü
	Potassium	Important plant nutrient.	ü	-	ü	ü
	Total Sulphur	Indicator of potential for development of Acid Metalliferous Drainage.	ü	-	ü	ü
	Sulphate	Important plant nutrient, and can be an indicator of development of Acid and Metalliferous Drainage.	ü	-	ü	ü
	Calcium	Important plant nutrient.	ü	-	ü	ü
	Magnesium	Important plant nutrient.	ü	-	ü	ü
Trace elements	Manganese	Trace element with minor importance for vegetation success.	ü	-	ü	ü
	Iron	Trace element with minor importance for vegetation success.	ü	-	ü	ü
	Zinc	Trace element important for vegetation success.	ü	-	ü	ü
	Copper	Trace element important for vegetation success.	ü	-	ü	ü
Metals	For example: Se, Zn, and Hg	Metals that have been identified as occurring at elevated levels during material characterisation analysis should be tested during monitoring.	ü	ü	ü	ü

Category	Analyte	Purpose of analyte	Depth		Monitoring phase	
			Surface	Sub-surface	Initial	Major
Physical parameters	Particle size (PSA)	Soil texture strongly affects water entry and storage. Soil texture will impact erosion and vegetation success, and should be considered when planning species mixes for planting.	ü	ü	ü	-
	Emerson aggregate test	Indicator of clay dispersion. Should be interpreted in conjunction with ESP and EC data.	ü	ü	ü	-
Field analysis	Soil profile characteristics	Horizon depths, Field colour, Field texture, Structure, Root density and depth, Soil plant available water capacity.	ü	ü	ü	-

9.2.2.3 Vegetation

As initial monitoring is conducted within 12 months of rehabilitation being completed, vegetation establishment is expected to be limited. Initial vegetation monitoring consists of identifying germinants present at the time of monitoring to species level, where possible, to assess the relative germination success rates of each species in the rehabilitation seed mix.

9.2.2.4 Groundwater

Groundwater monitoring will include ongoing monitoring of the existing groundwater monitoring network. The groundwater monitoring network will be reviewed to ensure sufficient monitoring bores to assess up-gradient potential source areas and down gradient areas. This monitoring network will be used for the collection of post-mining groundwater data and to provide information that will allow for the assessment of future trends of key groundwater indicators.

9.3 Minor monitoring methods

The minor monitoring methodology has been designed to maintain a replicable record of rehabilitation condition, and to quickly identify and resolve issues.

In addition to the existing permanent fixed monitoring points, any new erosion areas that are identified through desktop and field analysis will also be included in the already established monitoring activities. The following aspects will be assessed during the minor monitoring:

- Landform and erosion; and
- Vegetation.

9.3.1 Desktop monitoring

Prior to commencing any field monitoring work, LiDAR data and aerial imagery will be used to:

- Update the Digital Elevation Slope Model;
- Identify new areas of potential sedimentation and/or ponding; and
- Identify new areas of erosion for field validation.

9.3.2 Field monitoring

9.3.2.1 Landform and erosion

For erosion areas identified through the desktop assessment as well as the existing permanent fixed monitoring plots, the following data is recorded:

- Coordinates of erosion point;
- Photo details - coordinates and direction of photos;
- Estimated topsoil coverage of the surrounding rehabilitated area;
- Type of erosional process identified (i.e. sheet erosion, rill erosion, gully erosion, tunnel erosion);
- Evaluation of the severity of the erosion based on previous photographs or knowledge of the area;
- Estimated size of erosional form (using a tape measure to record width and depth); and
- State of erosion (McDonald *et al.*, 2009) (**Table 9-4**).

Table 9-4 States of erosion

State of erosion	Description
Active	One or both of the following conditions apply: • Evidence of sediment movement; and • Sides and/or floors of erosion form are relatively bare of vegetation.
Partly stabilised	Evidence of some active erosion and some evidence of stabilisation
Stabilised	One or both of the following conditions apply: • No evidence of sediment movement; and • Sides and/or floors of erosion form are revegetated

9.3.2.2 Soils and spoil

Soils and spoils baseline sampling is undertaken during the initial phase (refer to **Section 9.2.2**) and then compared to baseline again during the major monitoring phases (refer to **Section 9.4**). It is not included in the minor monitoring phase. Only surface conditions are considered in the minor monitoring.

9.3.2.3 Vegetation

Minor monitoring shall be undertaken at the fixed plots established during initial phases of monitoring. The following vegetation parameters are monitored:

- Groundcover;
- Invasive plants; and
- Pasture species richness.

9.4 Major monitoring methods

The major monitoring methodology has been designed to provide a detailed assessment of rehabilitation performance. In addition to the existing permanent fixed monitoring points, any new erosion areas that are identified through desktop and field analysis will also be included in monitoring activities. Its purpose is to identify any risks to rehabilitation success and to evaluate the progress of rehabilitation towards milestone criteria and the PMLU of cattle grazing.

The following aspects of rehabilitation will be assessed during major monitoring:

- Landform and erosion;
- Soil and spoil;
- Vegetation (including pasture condition); and
- Grazing Land Suitability Assessment.

9.4.1 Desktop monitoring

Prior to commencing any field monitoring work, a desktop review is to be undertaken including:

- Review of previous rehabilitation monitoring reports to understand historic conditions;
- Update the Digital Elevation Slope Model to compare against previous models and detect any changes in landform over time (e.g. settlement/subsidence); and
- Identify new areas of erosion for field validation.

9.4.2 Field monitoring

9.4.2.1 Landform and erosion

Field based landform and erosion monitoring will focus on assessing erosion at the existing permanent fixed monitoring plots as well as areas identified through the desktop assessment.

9.4.2.2 Soil and spoil

Soil and spoil data acquired from major monitoring is shown in **Table 9-4** and will be analysed by an appropriately qualified person and consider the grazing rule-set (refer **Table 4-2**). This data will provide an indication of performance of these parameters at fixed monitoring points over time. Evaluation of rehabilitation performance will consider soil and spoil data to inform trend to achieving milestone criteria or remediation action if required.

9.4.2.3 Vegetation

Ongoing major vegetation monitoring is to take place at the permanently, fixed field monitoring plots established during the initial phase. Vegetation monitoring includes assessment of the following parameters:

- Groundcover;
- Invasive plants;
- Pasture species richness; and
- Pasture condition.

Pasture condition (yield and quality as well as species richness)

The pasture analysis includes an assessment of pasture species richness, yield and quality, and pasture condition. Pasture yield is assessed using percentage dry matter (DM) yield for preferred pasture species as well as the proportion of DM yield for other intermediate species, annual grasses, undesirable grasses and weeds. Pasture condition is assessed by measuring the percentage DM yield, health and diversity of preferred pasture species. Preferred pasture species are identified as perennial grasses that are productive and palatable (3P grasses) to stock. A list of common preferred, other intermediate and undesirable pasture species is provided in **Table 9-5**.

An overall assessment of pasture condition is undertaken at the first major monitoring assessment at year 2, and every four years thereafter. This initially allows at least two seasons after seeding for pasture species to establish.

Table 9-5 Preferred, intermediate and undesirable pasture species

Preferred species		Other intermediate species		Other undesirable species	
Scientific name	Common name	Scientific name	Common name	Scientific name	Common name
<i>Cenchrus ciliaris</i>	Buffel Grass	<i>Bothriochloa decipiens</i>	Pitted Bluegrass	<i>Aristida spp.</i>	Wire Grasses
<i>Heteropogon contortus</i>	Black Spear Grass	<i>Cynodon dactylon</i>	Green Couch	<i>Sporobolus spp.</i>	Native Rat's Tail Grasses
<i>Dichanthium sericeum</i>	Queensland Bluegrass	<i>Panicum decompositum</i>	Native millet	<i>Chloris divaricata</i>	Slender Chloris
<i>Astrebla squarrosa</i> , <i>A. appacea</i> , <i>A. elymoides</i>	Bull Mitchell Curly Mitchell Hoop Mitchell	<i>Cymbopogon refractus</i>	Barbwire Grass		

Pasture monitoring is undertaken within three quadrats at each of the existing monitoring sites. Pasture is removed from the quadrat by cutting vegetation to approximately 50 mm in height and weighing in the field. It is important to record total sample weight for the quadrat and then separate the sample into preferred pasture species (3P grasses), other pasture species, annual grasses, undesirable grass species and weeds. These are all weighed separately to collect data on initial weight and determine the overall percentage DM yield. Results of each plot are averaged to attain an overall pasture condition rating score for each site.

Pasture condition rating criteria is listed in **Table 9-6**. Importantly the pasture condition can be assessed at any time pasture species area identifiable, preferably post wet season. The pasture is assessed against the milestone criteria for pasture condition listed in RM6 and RM7(g) (**Table 9-1**) which is based on standard methods for assessing pasture condition consistent with industry guidelines.

Table 9-6 Pasture condition assessment table (criteria to assign pasture rankings)

Condition rating	Condition indicators				
	Preferred pasture species		Annual grass % DM yield	Undesirable grasses and other weeds % DM Yield	Preferred pasture species diversity
	% DM yield	Crown cover			
1	> 80 %	Dense and plants healthy	< 20 %	< 20 %	> 5 species
2	60 – 80 %	High to moderate density and some plants unhealthy	20 – 40 %	20 – 30 %	3 – 5 species
3	10 – 60 %	Moderate to low density and some plants dead	40 – 70 %	30 – 80 %	2 – 3 Species
4	< 10 %	Sparse and many plants dead	> 70 %	> 80 %	0 or 1 species

9.4.2.4 Grazing land suitability assessment

An assessment of land suitability, based on the grazing ruleset, is undertaken to demonstrate achievement of RM7(f) for a PMLU of cattle grazing, at the following monitoring times:

- During major monitoring in Year 6 (second time major monitoring is undertaken) to allow time for vegetation to establish; and
- Each scheduled major monitoring from Year 10+ until the rehabilitation succeeds in meeting the milestone criteria.

Refer to **Section 4.1** for more details on the land suitability methodology for the grazing ruleset for a PMLU of cattle grazing.

9.5 Achieving monitoring across the PRCP Schedule

For final rehabilitation, it is planned that RM6 – achievement of surface requirements for cattle grazing (pasture condition rating of ≤ 3) - is possible within a 10-year timeframe from revegetation. There are a number of factors which can influence the successful establishment of pastures on post-mined land including soils and landform, soil management and amelioration, species selection, sowing rates, and sowing timing plus rainfall. The revegetation plan has considered these elements, and allows a period up to 10 years to achieve RM6 for seasonal rainfall variation to successfully establish a pasture suitable for a PMLU of cattle grazing at Centurion North. For seismic areas requiring return to native vegetation, 5 years will be sufficient to achieve RM6. This is due to minimal disturbance from seismic activities, allowing vegetation to regenerate from the existing root ball as solid will not be disturbed for the majority of seismic activities.

Achievement of post-mining land use to a stable condition for cattle grazing (RM7), is planned within a 15-year timeframe from revegetation. Achieving RM7 relies on successfully achieving RM6 within 10 years, accounting for seasonal variation of rainfall. An additional 5 years has been allowed for achievement of RM7 to demonstrate the ongoing sustainability of the PMLU for cattle grazing through additional rehabilitation monitoring data associated with landform, erosion, soils, vegetation, pastures, and surface water (**Section 9.2**).

9.6 Maintenance

Maintenance will be implemented when monitoring identifies issues with the rehabilitation, or milestone criteria are not being met. In order to select the most appropriate remedial actions, the likely cause would be assessed. Contributing factors may be related to:

- Climatic conditions (i.e. droughts);
- Unexpected subsidence impacts;
- Weed presence;
- Poor drainage design;
- Insufficient vegetation cover;
- Influence of adjacent land use; and/or
- Soil type.

Required rehabilitation actions are to be entered into a work management system for actioning.

In the event that unexpected subsidence impacts are observed, the following maintenance actions would be completed (where required):

- If subsidence occurs, development and reshaping is completed to achieve a free-draining landform;
- If erosion occurs as a result of subsidence, remediate any eroded landforms; and
- Where remediation has occurred as a result of subsidence impacts, the following is completed:
 - Topsoil is placed, as required; and
 - Seeding is completed in accordance with the recommended pasture seed mix and seeding rates.

9.7 Data analysis and reporting

Rehabilitation monitoring data will be collected and analysed by appropriately qualified and experienced persons and assessed against the milestone criteria. The data will be analysed to identify changes and trends, as well as map the trajectory of rehabilitation to identify whether it is on track to achieve the rehabilitation milestones or requires remedial actions or maintenance.

The rehabilitation data will be stored and processed within internal geospatial and document management systems.

9.8 Quality assurance and quality control

The quality assurance and quality control (QA/QC) process to be followed as part of Centurion North ongoing rehabilitation monitoring is illustrated in **Figure 9-2**. The process provides for initial execution of the rehabilitation in accordance with the rehabilitation measures, followed by verification of how this execution was undertaken (again, according to these measures). Based on the verification outcomes, allowance is made for implementation of corrective action and/or maintenance, as needed.

The rehabilitated areas as well as corrected and/or maintenance areas then undergo further rehabilitation monitoring, and subsequent execution of the rehabilitation measures.

This process allows for a repetitive execution-verification-monitoring QA/QC approach, to ensure rehabilitation areas progress on a trajectory towards achievement of milestone criteria and eventual certification.

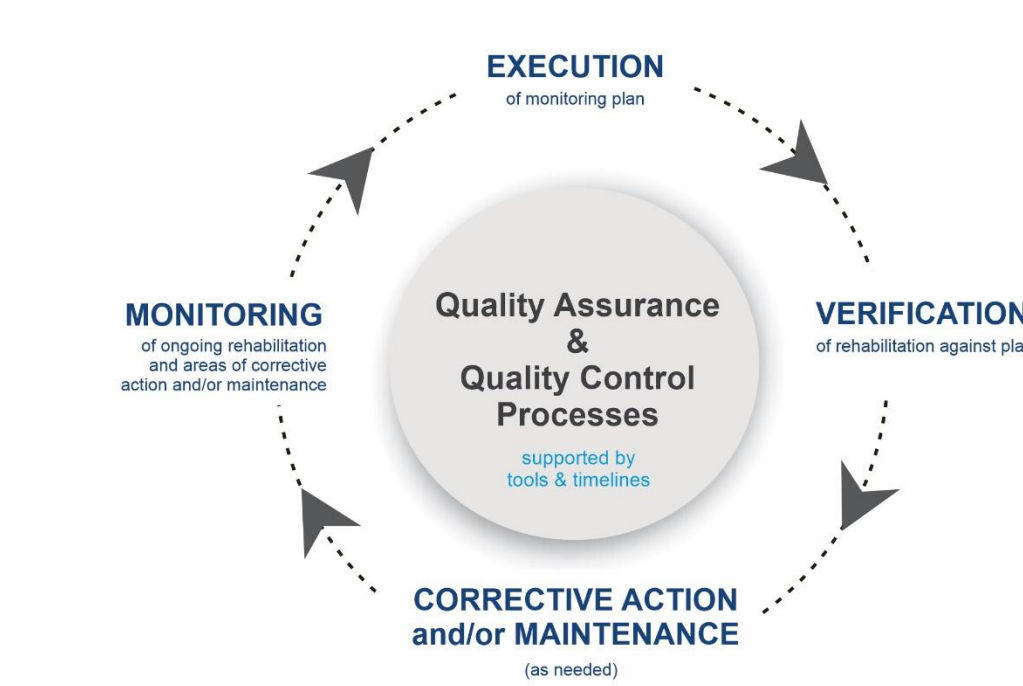


Figure 9-2 **Quality assurance/quality control process to be followed for ongoing rehabilitation monitoring at Centurion North**

Relationship with PRCP Schedule

The rehabilitation monitoring program is designed to track rehabilitation performance over time to identify compliance to milestone criteria and ensure continuous improvement in rehabilitation methodologies.

10. SECTION B: PRCP SCHEDULE

Legislative Requirement

In accordance with section 126D(1) of the EP Act, the PRCP Schedule in the PRC Plan must:

- describe the area of each resource tenure either a post-mining land use or non-use management area, and
- for each post-mining land use state:
 - i. each rehabilitation milestone required to achieve a stable condition, and
 - ii. when each rehabilitation milestone is to be achieved, and
- for each non-use management area state:
 - i. each management milestone, and
 - ii. when each management milestone is to be achieved, and
- include maps showing the land mentioned in (a), (b) and (c).

10.1 Final site design

The final site design for Centurion North, including maximum disturbance, tenure boundaries, and the PMLU is shown in **Figure 10-1**. It is noted that the Centurion North MLs do not interact with the potential flood hazard area (Queensland Globe, 2025), as illustrated in **Figure 2-7**.

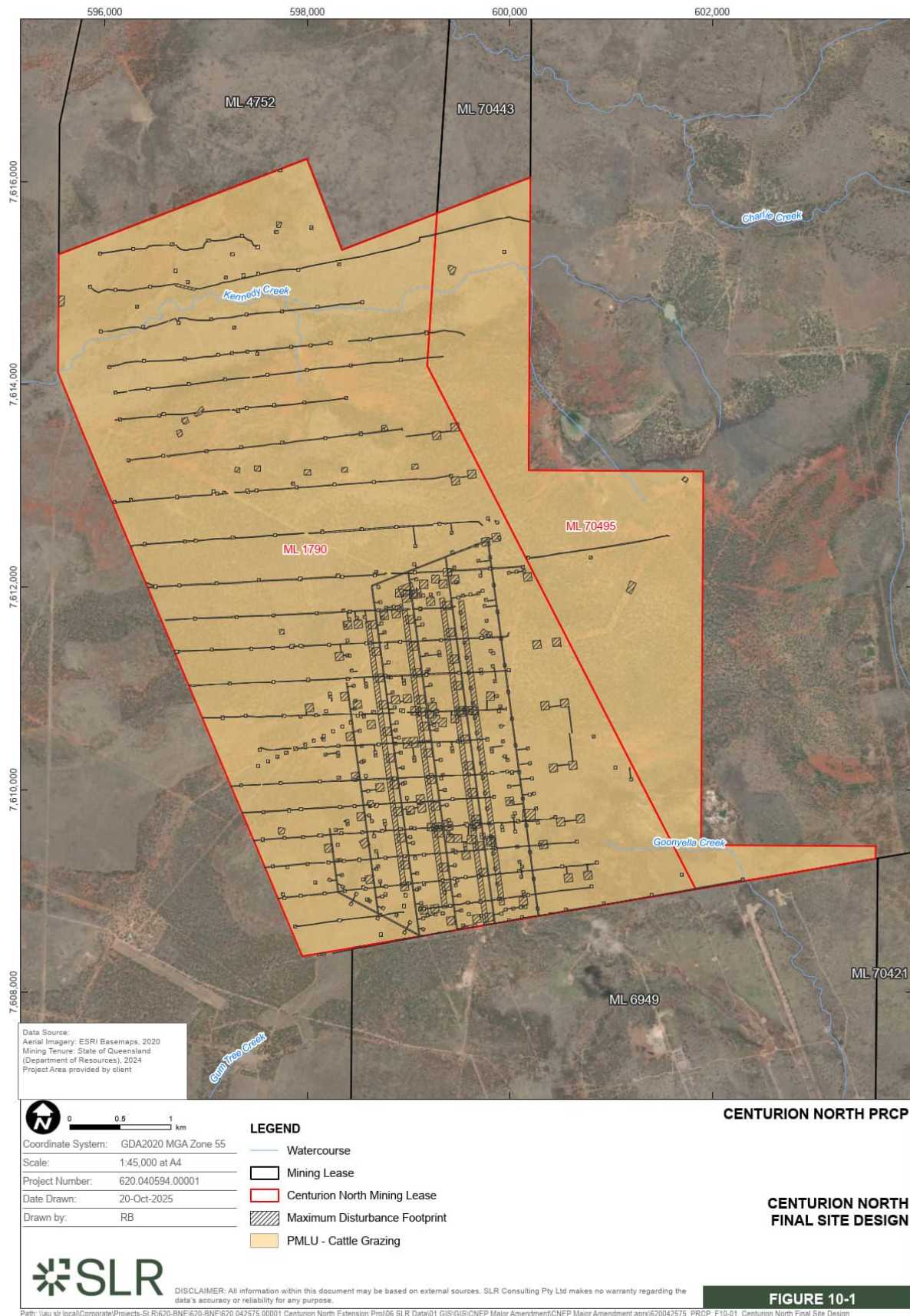


Figure 10-1 Centurion North final site design

10.2 Post-mining land use milestones

The Centurion North rehabilitation areas and relevant rehabilitation milestones are shown in **Table 10-1**. These are illustrated in the reference map provided in **Section 10.4**.

Table 10-1 Centurion North rehabilitation areas and relevant rehabilitation milestones

Rehabilitation area	Relevant activities	PMLU	Relevant rehabilitation milestones
RA1	Exploration activities, early works and ancillary infrastructure	Cattle grazing	RM1 RM2 RM3 RM4 RM5 RM6 RM7

The rehabilitation milestones and milestone criteria for Centurion North are shown in **Table 10-2**.

Table 10-2 Centurion North rehabilitation milestones and milestone criteria

Milestone reference	Rehabilitation milestone	Milestone criteria
RM1	Infrastructure decommissioning and removal	a) All services disconnected. b) All built and service infrastructure demolished and removed (except where agreed in writing by the post-mining land owner/holder). c) All concrete, bitumen and aggregate removed. d) All waste and rubbish removed. e) All gas risers / boreholes / bleeder shaft / SIS wells decommissioned.
RM2	Remediation of contaminated land	a) All contamination is remediated or removed from site in accordance with relevant legislation. b) A contaminated land survey is carried out by a suitably qualified person confirming the land does not present an unacceptable risk to proposed future land uses or the environment.
RM3	Landform development and reshaping	a) Landform is reshaped to be free-draining with slopes $\leq 5\%$ and consistent with the surrounding topography.
RM4	Surface preparation	a) Topsoil is placed at an average thickness of 200 mm. b) An assessment of soil and growth media characteristics is completed by an appropriately qualified person, and amelioration and other treatments required identified. c) Ameliorant and physical treatments are applied as identified in RM4(b), if required for RA1.

Milestone reference	Rehabilitation milestone	Milestone criteria																								
RM5	Revegetation (cattle grazing)	a) Completed seeding in accordance with the recommended pasture mix (grasses, cover crop and legumes) of Table RM5a – Recommended Pasture Mix , and seeding rates (up to 25kg/ha).																								
		b) Conservation significant flora species and LIKT species (provided in Table RM5b – Suggested Conservation Significant Flora Species and LIKT Species) added to the pasture mix with consideration of the surrounding regional ecosystems, land use, the environment, and local seed availability.																								
		Table RM5a – Recommended Pasture Mix																								
		<table><tr><th>Common name</th><th>Scientific name</th><th>Sowing rate (kg/ha)</th></tr><tr><td>Queensland Bluegrass</td><td><i>Dichanthium sericeum</i></td><td>6</td></tr><tr><td>Buffel grass</td><td><i>Cenchrus ciliaris</i></td><td>4</td></tr><tr><td>Stylo</td><td><i>Stylosanthes scabra</i></td><td>2</td></tr><tr><td>Black spear grass</td><td><i>Heteropogon contortus</i></td><td>5</td></tr><tr><td>Mitchell grasses</td><td>Bull Mitchell grass (<i>Astrebla squarrosa</i>), Curly Mitchell grass (<i>Astrebla lappacea</i>) and Hoop Mitchell Grass (<i>Astrebla elymoides</i>)</td><td>3</td></tr><tr><td>Shirohie millet</td><td><i>Echinochloa esculenta</i></td><td>5</td></tr><tr><td></td><td>TOTAL</td><td>25</td></tr></table>	Common name	Scientific name	Sowing rate (kg/ha)	Queensland Bluegrass	<i>Dichanthium sericeum</i>	6	Buffel grass	<i>Cenchrus ciliaris</i>	4	Stylo	<i>Stylosanthes scabra</i>	2	Black spear grass	<i>Heteropogon contortus</i>	5	Mitchell grasses	Bull Mitchell grass (<i>Astrebla squarrosa</i>), Curly Mitchell grass (<i>Astrebla lappacea</i>) and Hoop Mitchell Grass (<i>Astrebla elymoides</i>)	3	Shirohie millet	<i>Echinochloa esculenta</i>	5		TOTAL	25
		Common name	Scientific name	Sowing rate (kg/ha)																						
		Queensland Bluegrass	<i>Dichanthium sericeum</i>	6																						
		Buffel grass	<i>Cenchrus ciliaris</i>	4																						
		Stylo	<i>Stylosanthes scabra</i>	2																						
		Black spear grass	<i>Heteropogon contortus</i>	5																						
		Mitchell grasses	Bull Mitchell grass (<i>Astrebla squarrosa</i>), Curly Mitchell grass (<i>Astrebla lappacea</i>) and Hoop Mitchell Grass (<i>Astrebla elymoides</i>)	3																						
		Shirohie millet	<i>Echinochloa esculenta</i>	5																						
			TOTAL	25																						
		Table RM5b – Suggested Conservation Significant Flora Species and LIKT Species																								
		<table><tr><th>Common name</th><th>Scientific name</th></tr><tr><td>King Bluegrass</td><td><i>Dichanthium queenslandicum</i></td></tr><tr><td>Finger Panic</td><td><i>Digitaria porrecta</i></td></tr><tr><td>Brown’s Box</td><td><i>Eucalyptus brownii</i></td></tr><tr><td>River Red Gum</td><td><i>Eucalyptus camaldulensis</i></td></tr><tr><td>Narrow-leaved Ironbark</td><td><i>Eucalyptus crebra</i></td></tr><tr><td>Mountain Coolibah</td><td><i>Eucalyptus orgadophila</i></td></tr><tr><td>Forest Red Gum</td><td><i>Eucalyptus tereticornis</i></td></tr></table>	Common name	Scientific name	King Bluegrass	<i>Dichanthium queenslandicum</i>	Finger Panic	<i>Digitaria porrecta</i>	Brown’s Box	<i>Eucalyptus brownii</i>	River Red Gum	<i>Eucalyptus camaldulensis</i>	Narrow-leaved Ironbark	<i>Eucalyptus crebra</i>	Mountain Coolibah	<i>Eucalyptus orgadophila</i>	Forest Red Gum	<i>Eucalyptus tereticornis</i>								
		Common name	Scientific name																							
		King Bluegrass	<i>Dichanthium queenslandicum</i>																							
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Mountain Coolibah	<i>Eucalyptus orgadophila</i>																									
Forest Red Gum	<i>Eucalyptus tereticornis</i>																									

Milestone reference	Rehabilitation milestone	Milestone criteria
RM6	Achievement of surface requirements (cattle grazing)	a) Pasture condition rating ≤ 3, based on the Pasture Condition Assessment Table as per Stocktake: Balancing Supply and Demand (https://futurebeef.com.au/workshops/sustainable-grazing/stocktake-balancing-supply-demand/) (FutureBeef, 2025), as provided in Table 9-6, including: • Preferred pasture species (3P grasses¹) diversity ≥ 2 species; • Preferred pasture (3P grasses¹) % DM yield $\geq 10\%$; • Annual grass DM yield % $< 70\%$; • Undesirable grasses and other weeds % DM yield $< 80\%$; and • Crown cover (3P grasses¹) – at worst, moderate to low density and some plants dead. ¹3P grasses: native and naturalised exotic grass species that are perennial, palatable, and productive plants to stock.
RM7	Achievement of post-mining land use to a stable condition (cattle grazing)	a) A hazard assessment has been completed by an appropriately qualified person to confirm safety hazards in rehabilitation are not significantly different to surrounding unmined landscapes subject to the same land use. b) Groundcover² $> 50\%$. c) Rainfall runoff from the area is not significantly different to upstream values for the following: pH, EC and turbidity. d) Land suitability class ≤ 3, or not different from pre-mining class if ≥ 4, as per Table RM7 – Land Suitability Rule-Set (Cattle Grazing). The assessment is to be conducted by an appropriately qualified person and completed in accordance with LSA Framework for Open-Cut Coal Mine Rehabilitation 2018 (A rule-set for land suitability assessment of sustainable beef cattle grazing on land rehabilitated after open-cut coal mining in the Bowen Basin Queensland) unless otherwise agreed in writing between the administering authority and the environmental authority holder. For RM7(f), if the land suitability class is assessed as not different from pre-mining class if ≥ 4 for all or a portion of a rehabilitation area, an assessment of reference sites³ must be carried out to determine if the limitation/s resulting in the class of ≥ 4 is consistent with that of reference sites. e) Certification by an appropriately qualified person that pasture meets a pasture condition rating ≤ 3, based on the Pasture Condition Assessment Table as per Stocktake: Balancing Supply and Demand, as provided in Table 9-6. f) All subsidence impacts are remediated. ²Groundcover: to anything in contact with the soil surface, for example, rocks, stones, sticks, leaves, grass, hay ³Reference site: representative undisturbed grazing land adjacent to the disturbance areas

Milestone reference	Rehabilitation milestone	Milestone criteria							
		Table RM7 – Land Suitability Rule-Set (Cattle Grazing)							
		Suitability class							
		Limitation	Indicator	Units	1	2	3	4	5
		Water availability	PAWC in ERD	mm/0.6d	> 75	75 - 60	< 60 - 45	< 45 - 30	< 30
		Nutrient supply	P in 0.1m	mg / kg	> 20	20 - 14	< 14 - 8	< 8 - 4	< 4
			pH in 0.1m	pH units	7.3 – 6.6	< 6.6 – 6.0 or > 7.3 – 8.0	< 6.0 – 5.5 or > 8.0 – 8.5	< 5.5 – 5.0 or > 8.5 – 9.0	< 5.0 or > 9.0
		Soil physical factors	Surface soil structure	variable	Fine (peds < 10mm)	Coarse (peds > 10mm)	Surface crust	Very hard setting	Massive
		Salinity	EC in ERD	dS/m	< 2	2 - < 4	4 - < 10	10 - < 16	≥ 16
		Rockiness	Fragments on surface	%	< 5	5 - 10	10 - 30	30 - 60	> 60
		Topography (slope)	Gradient, surface	%	< 5	5 - < 10	10 - < 15	15 - < 20	≥ 20
			Vertical interval, surface	m	Nil ripping furrows	Regular ripping furrows < 0.2m	Regular ripping furrows > 0.2 – 0.4m	Regular ripping furrows > 0.4 – 0.6m	Regular ripping furrows > 0.6m
		Water erosion, surface soil	Slope (ESP in 0.1m <6)	%	< 5	5 - 8	> 8 - 12	> 12 - 18	> 18
			Slope (ESP in 0.1m > 6 - < 14)	%	< 3	3 - 6	> 6 - 10	> 10 - 12	> 12
			Slope (ESP in 0.1m > 14)	%	< 1	1 - 2	> 2 - 4	> 4 - 6	> 6
		Sub-soil erosion	ESP at 0.5m	%	< 7	7 - 14	> 14 - 23	> 23 - 34	> 34
		Potentially acid forming materials	pH < 4.5	pH units	Not likely to be present within 5m of surface	Not likely to be present within 3m of surface	Not likely to be present within 2m of surface	Present immediately below root zone (0.9 – 0.6m)	Present within root zone (surface 0.6m)

10.3 Non-use management area milestones

Not applicable to Centurion North as there are no NUMAs.

10.4 Reference maps

The Centurion North reference map showing the rehabilitation areas is shown in **Figure 10-2**.

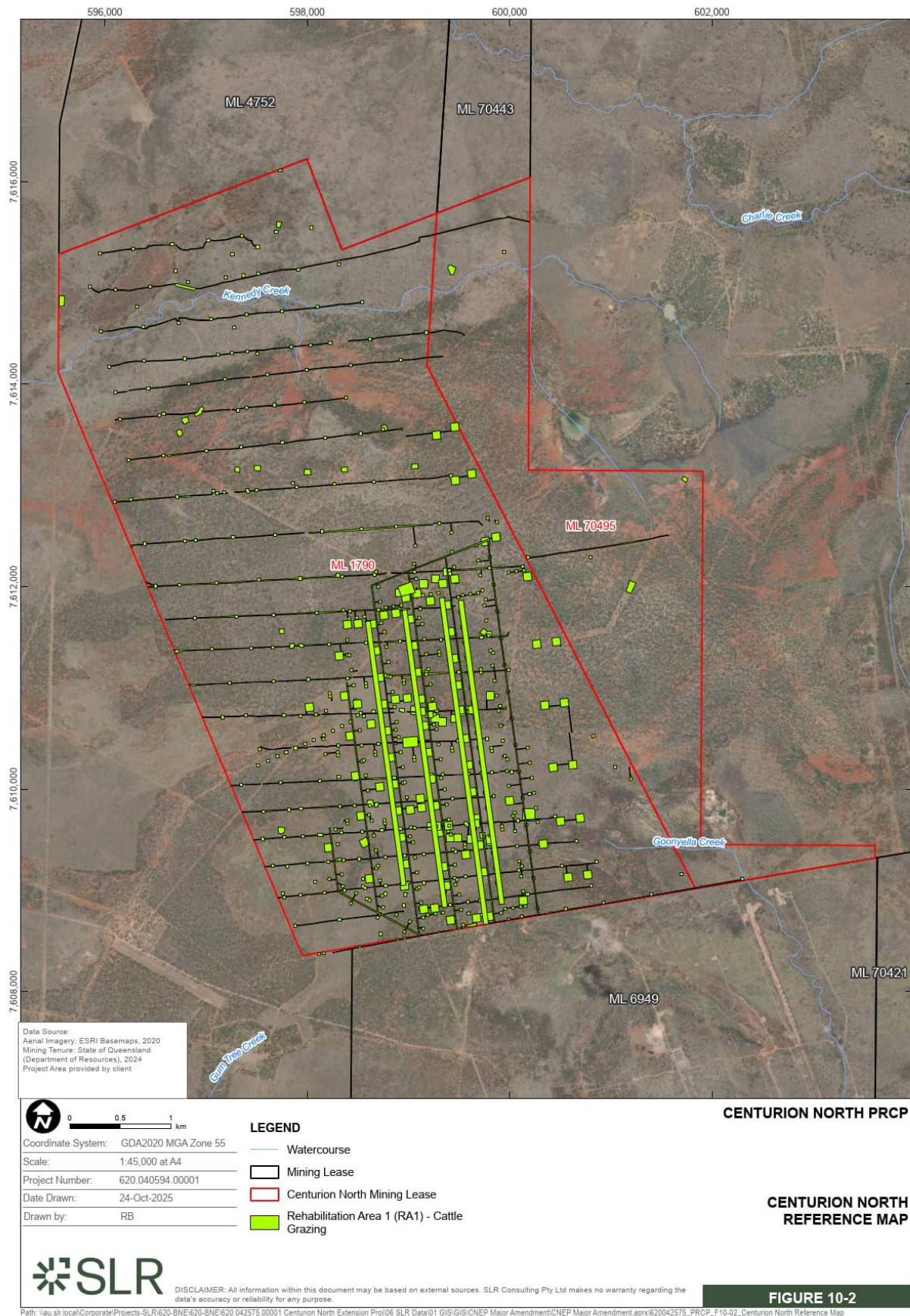


Figure 10-2 Centurion North reference map

10.5 Schedule

The schedule is based on the land being rehabilitated as soon as practicable after the land becomes available, as required under section 126D(4) of the EP Act.

Rehabilitation milestones RM1, RM2, RM3, RM4 and RM5 will be completed in the same time period, while completion of RM6 and RM7 is dependent on varying weather seasonality and undesirable weather periods. Achievement of rehabilitation milestones RM6 and RM7 will be demonstrated prior to the scheduled date if possible.

The proposed PRCP Schedule is provided on the following pages. A word version of the PRCP schedule according to the DETSI template (form ERS/2019/5103) has also been provided in **Appendix 11**.

Rehabilitation area		RA1					
Disturbance description		Exploration activities, early works and ancillary infrastructure					
Total size of rehabilitation area (ha)		234					
Commencement of first milestone RM1		10/12/2021					
PMLU		Cattle grazing					
Date area is available		10/12/21	10/12/33				
Cumulative area available (ha)		19	234				
Milestone completed by	Milestone completed by						
		10/12/26	10/12/36	10/12/38	10/12/41	10/12/48	10/12/53
Milestone Reference	Cumulative area achieved (ha)						
RM1		19	19	234	234		
RM2		19	19	234	234		
RM3		19	19	234	234		
RM4		19	19	234	234		
RM5		19	19	234	234		
RM6			19	19	19	234	
RM7					19	19	234

11. REFERENCES

The following references have been used to support development of the PRC Plan:

Atlas of Living Australia (ALA) (2025): Atlas of Living Australia Occurrence Records. <https://www.ala.org.au/>

Anderson, I.C. (1991): The Development of Formulas for the Estimation of Coal Pillar Strength in Australian Coal Mines. Master of Engineering, the University of New South Wales, School of Mining Engineering.

Australasian Groundwater & Environmental Consultants Pty Ltd (AGE) (2012): Interim Report on Wards Well Environmental Impact Study, Groundwater Assessment, prepared for Sinclair Knight Merz.

Bureau of Meteorology (BoM) (2025a): Monthly Climate Statistics for Moranbah Airport (Station No. 034035) (1972-2025), accessed September 2025.

BoM (2025b): Groundwater Dependent Ecosystem (GDE) Atlas, accessed 2025.

Baker, D. and Eldershaw, V. (1993): Interpreting Soil Analysis for Agricultural Land Use in Queensland, Queensland Department of Primary Industries, Brisbane.

BHP (2021a): Preliminary Site Investigation Wards Well Mine, 10 February 2021.

BHP (2021b): Wards Well PRCP Community Consultation Plan and Stakeholder Register, February 2021.

BHP Coal (August 2020): Guideline for Climate Change Adaptation in Mine Water Planning and Hydrological Assessments – BHP Queensland. Ref. no. CTD-WTR-GLD-001, August 2020.

BHP (2020): Environmental Geochemical Characterisation and Risk Assessment of Mineral Waste, December 2020.

BHP (2020): Wards Well Exploration Adit Subsidence Evaluation, November 2020.

BHP (2020): Progressive Rehabilitation and Closure Plan BMC Wards Well – DES Pre-Notification Memo, 26 April 2020.

BHP (2017): Industry benchmarking of average Queensland approval timeframes (unpublished BHP internal report).

Carroll, C. and Tucker, A. (2000): Effects of pasture cover on soil erosion and water quality on central Queensland coal mine rehabilitation, *Tropical Grasslands*, vol. 34, pp 254-262.

Carroll, C., Merton, L., and Burger, P. (2000): Impact of vegetative cover and slope on runoff, erosion, and water quality for field plots on a range of soil and spoil materials on central Queensland coal mines, *Australian Journal of Soil Research*, vol. 38, pp.313-327.

DCCEEW. (2025): *Geophaps scripta scripta*—Squatter Pigeon (southern) in Species Profile and Threats (SPRAT) Database. http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=64440

Department of Environment and Science (2021): Using monitoring data to assess groundwater quality and potential environmental impacts – Version 2

Department of Natural Resources and Mines, Manufacturing and Regional and Rural Development (DNRMMRRD) (2025): Queensland Groundwater Database, accessed via <https://www.data.qld.gov.au/dataset/groundwater-database-queensland>, accessed 25/9/2025

Department of Environment (DotE) (2015): Appendix A: Supporting information for each of the 14 migratory listed birds. Department of the Environment (DotE).

DSITI (2017): Using monitoring data to assess groundwater quality and potential environmental impacts. Version 1. Department of Science, Information Technology and Innovation (DSITI), Queensland Government, Brisbane.

DSITI & DNRM (2015): Guidelines for agricultural land evaluation in Queensland, second edition, The State of Queensland (prepared by Department of Science, Information Technology and Innovation and Department of Natural Resources and Mines), Brisbane.

E2M (2025a): Centurion Project – Assessment of Matters of State Environmental Significance, 16 October 2025.

E2M (2025b): Centurion Project – Assessment of Matters of National Environmental Significance (draft).

FutureBeef (2025): Stocktake: Balancing Supply and Demand: <https://futurebeef.com.au/workshops/sustainable-grazing/stocktake-balancing-supply-demand/#why-choose-stocktake>

Golder Associate (2020): Wards Well Mine PRCP Hydrogeological Conceptual Model. Ref. No. 20360652-001-R-RevA.

Hazelton, P. and Murphy, B. (2007): Interpreting Soil Test Results, CSIRO Publishing, Melbourne.

Hall, R. (2008): Soil Essentials – Managing your farm’s primary asset, CSIRO Publishing, Melbourne.

Hydrobiology (2025a): Centurion North Project Aquatic MSES Assessment, October 2025.

Hydrobiology (2025b): Centurion North Project Aquatic MNES Assessment, November 2025 (draft)

Independent Expert Steering Committee (2015): Monitoring and Management of Subsidence Induced by Longwall Coal Mining Activity. Report to the Department of the Environment.

Isaac Regional Council (2021): Isaac Regional Planning Scheme, February 2021, available at https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwjWwJ6hv_2PAxU_dUEAHfEvNSIQFnoECBkQAQ&url=https%3A%2F%2Fwww.isaac.qld.gov.au%2Ffiles%2Fassets%2Fpublic%2Fv%2F1%2Fresidents%2Fplanning-and-development%2Fplanning-scheme%2Fplanning_scheme___text_without_mapping.pdf&usg=AOvVaw2wSW-X7hyDpWkxq8DrM9vT&opi=89978449

Loch, R. (2000): Effects of vegetation cover on runoff and erosion under simulated rain and overland flow on a rehabilitated site on the Meandu Mine, Tarong, Queensland, Australian Journal of Soil Research, vol. 38, pp 299-312.

McDonald, R., Isbell, R., Speight, J., Walker, J. and Hopkins, M. (2009): ‘Australian Soil and Land Survey Field Handbook, CSIRO

McKenzie, N., Grundy, M., Webster, R. and Ringrose-Voase, A. (2008): ‘Guidelines for Surveying Soil and Land Resources’, 2nd ed., CSIRO.

National Environment Protection Council (NEPC) (1999): National Environment Protection (Assessment of Site Contamination) Measure (Rev: 2013).

Queensland Department of Environment and Science (2021): Progressive Rehabilitation and Closure Plan Guideline, Queensland Government, Brisbane.

Queensland Department of the Environment, Tourism, Science and Innovation (26 March 2025): Environmental Authority P-EA-100658735.

Queensland Department of Environment and Science (2020): Progressive Rehabilitation and Closure Plan Transition Notice. Ref. EPPR00668513, 30 June 2020.

Queensland Department of Local Government and Planning (2012): Mackay, Isaac and Whitsunday Regional Plan, February 2012, available at [Mackay, Isaac and Whitsunday Regional Plan](#)

Queensland Department of Minerals and Energy (1995): Technical Guidelines for the Environmental Management of Exploration and Mining in Queensland – Land Suitability Assessment Techniques. Environmental Protection Agency, Brisbane.

Queensland Department of Resources (14 July 2021): Special Conditions for Renewal of Mining Lease 1790 and 4752 (references 31503 and 301480).

Queensland Globe (2025): <https://qldglobe.information.qld.gov.au/>, last accessed October 2025.

Queensland Government (2016): Eligibility criteria and standard conditions for exploration and mineral development projects (ESR/2016/1985), Version 2.00, effective 31 March 2016.

SCT (2025): Assessment of Subsidence Due to Development of First Workings in Initial Area of Centurion North Mine, document NGY5910, 4 June 2025.

Short, T. (2020): A rule-set for land suitability assessment of sustainable beef cattle grazing on land rehabilitated after open-cut coal mining in the Bowen Basin, Queensland Highlands Environmental, Emerald.

Sinclair Knight Merz (2012): Wards Well Mine Project: Soil Survey. Version A, ref. no. QE09811, 26 June 2012

So, W., Sheridan, G., Loch, R., Carroll, C., Willgoose, G., Short, M. and Grabski, A. (1998): Post-mining landscape parameters for erosion and water quality control, ACARP Project Numbers C4011 and C5009, Australian Coal Research Limited, Brisbane.

University of New South Wales (1995): UNSW Pillar Design Procedure.

Williams, D.J. (2015): Bulking and Subsequent Self-Weight and Saturation Settlements, and Geotechnical Stability, of Deep Coal Mine Spoil Piles (ACARP C19022).

Willy Weather (2020): www.willyweather.com.au (2012-2020), accessed 2020.

Youngentob, K., Marsh, K., & Skewes, J. (2021): A review of koala habitat assessment criteria and methods. Department of Agriculture, Water and the Environment.

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