

Central Queensland Coal Project

ii – Executive Summary

Environmental Impact Statement



Central Queensland Coal Project
ii Executive Summary

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1 Introduction

CDM Smith Australia (CDM Smith), on behalf of Central Queensland Coal Proprietary Limited (Central Queensland Coal) and Fairway Coal Proprietary Limited (Fairway Coal) (the joint Proponents), has prepared this draft Environmental Impact Statement (EIS) for the Central Queensland Coal Project (the Project). As Central Queensland Coal is the senior proponent, Central Queensland Coal is referred to throughout the EIS. The Project is located in the Styx Basin, approximately 130 km northwest of Rockhampton in Central Queensland (Figure 1).

The EIS has been prepared under the *Environmental Protection Act 1994* (EP Act) in support of an application for an Environmental Authority (EA), Mining Lease (ML) and approval under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The Project will be assessed under the bilateral agreement between the Queensland and Australian Governments. If approved, the Project will provide opportunities for employment and businesses, and generate government and export revenues.

This Executive Summary provides an overview of the Project, the EIS process and the key findings of the social, economic and environmental impact assessment. The readers should refer to the chapters for further details of the Project.

1.1 The Proponent

Central Queensland Coal and Fairway Coal (the joint Proponents) are private companies and subsidiaries of Waratah Coal Pty Ltd (Waratah Coal), a fully owned subsidiary of Mineralogy Pty Ltd. Mineralogy Pty Ltd and its associated entities have over 25 years' experience developing, funding and managing a range of major resource projects. Fairway Coal owns Mineral Development Licence (MDL) 468 on which the Project is proposed to be developed.

The parent company, Waratah Coal is head quartered in Brisbane, Queensland. Waratah Coal holds extensive mining concessions within the rich mineral basins of Laura, Bowen, Galilee, Surat, Moreton, Maryborough, Nymboida and the Northern Territory, in addition to the Styx Basin. Waratah Coal has been operating for over 10 years and has formed major international alliances in China and domestically during this time. Central Queensland Coal and Fairway Coal will develop and operate the Project.

1.2 Project Need, Benefits and Opportunities

The Project proposes to efficiently extract the substantial undeveloped coal resources within the Project site. The Project site comprises of both coking and thermal coal. Coking and thermal coal are in demand globally to generate steel and electricity. Recent demand for both coking and thermal coal has increased significantly. As an indication, Australia's thermal coal exports are expected to increase by 11% per annum between 2013 and 2017 and Australia's production rates of coking coal are expected to increase at a rate of 2.1% per year until 2020. The current increases in global demand for coal and forecast increases in production support the justification for the Project.

The Project will provide economic benefits to the region, Queensland and Australia. Capital expenditure for the Project is estimated to be \$242.68 million. Operational expenditure over the life of the Project will be approximately \$4,082.5 million. Much of this investment will flow directly into the Central Queensland economy. The Project will require a peak of 200 full time equivalent employment positions during construction and 250 to 500 during operations.

Mining of the coal will generate royalties valued at approximately \$525.26 million over the life of the mine, payable to the Queensland Government.

1.3 Impact Assessment

For each social, economic and environmental issue identified within the EIS, a risk assessment was carried out to judge whether the Project was likely to result in impacts. Mitigation measures were proposed to reduce the risk of impacts, where appropriate. The risk assessment was then repeated with the proposed mitigation measures included to determine the residual risk level. The adopted residual risk levels are as low as reasonably practicable to avoid or minimise the risk of impacts occurring. If risks were still unacceptable then offsets have been proposed to further manage their impact.

1.4 Consultation

Central Queensland Coal has and continues to undertake consultation with neighbouring landholders, local, state and federal governments, community groups and other interested parties as part of the EIS process. Consultation is an integral part of the EIS process. The aim of consultation is to ensure the EIS process is transparent and that issues are identified and rectified in the EIS process. Following the Project's EIS approval, engagement with Project stakeholders and the community will continue for the life of the Project and be delivered through a Stakeholder and Community Engagement Plan. The Plan will remain a dynamic document and will be updated as required throughout the Project's duration.

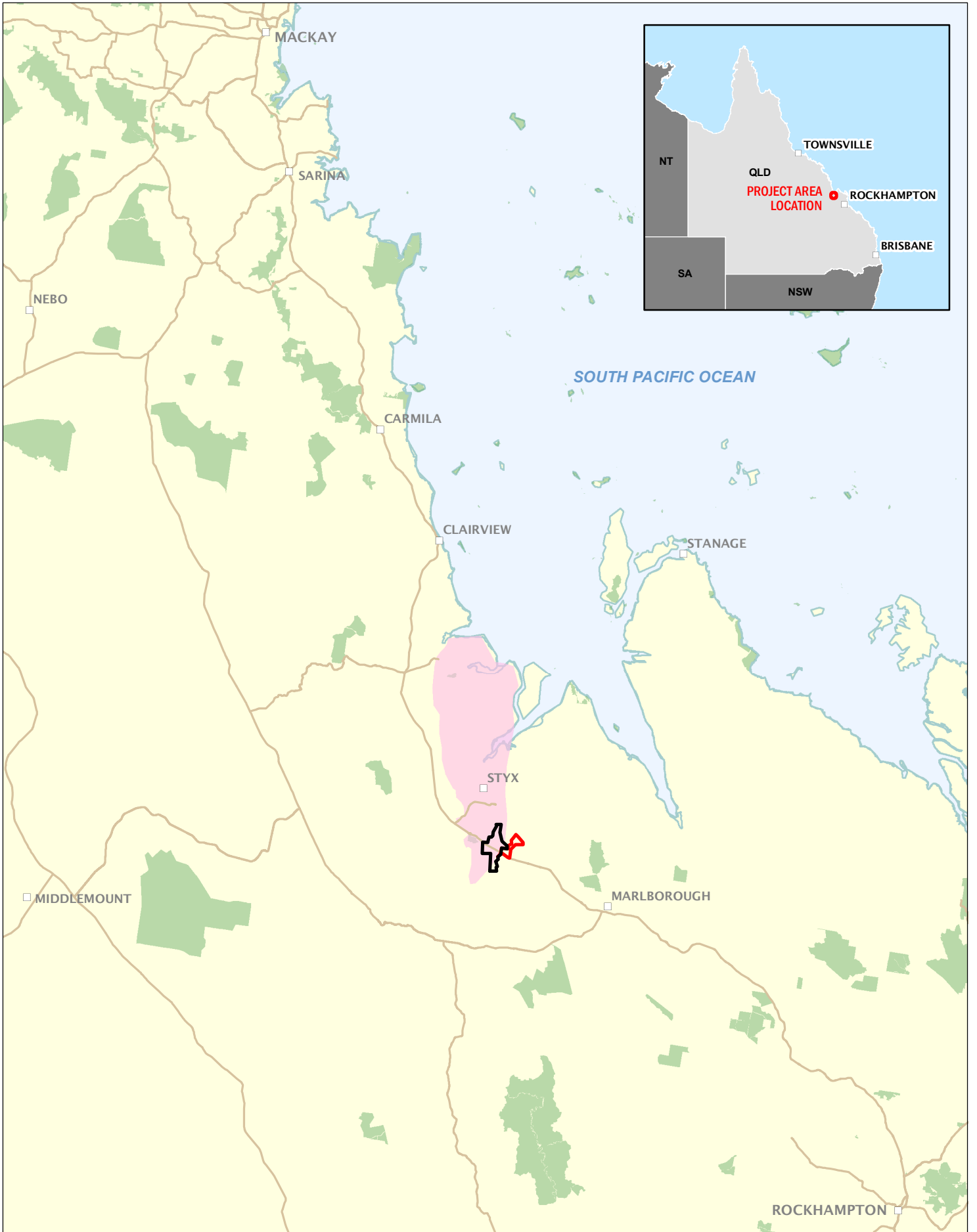


Figure 1
Project location



0 10 20 km

Scale @ A4 1:1,050,000
Date: 11/07/17
Drawn: Gayle B.

Legend

- ML 80187
- ML 700022
- Styx Coal Basin

DATA SOURCE
QLD Spatial Catalogue (QSpatial), 2017
Geoscience Australia, 2017



2 Regulatory Framework

2.1 Key Project Approvals and EIS Process

The key Project approvals are presented in Table 2-1. These approvals are required prior to the construction of the Project.

Table 2-1 Key Project approvals

Approval	Legislation	Administering Authority	Background
Environmental Authority	<i>Environmental Protection Act 1994</i>	Department of Environment and Heritage Protection (EHP)	An application was made by Central Queensland Coal to the EHP on 16 December 2016, under section 71 of the EP Act, for the preparation of a voluntary EIS. The application was approved on 27 January 2017 and EHP's decision notice accepting the application to prepare a voluntary EIS was signed and forwarded to Central Queensland Coal. The final Terms of Reference for the EIS was issued to Central Queensland Coal on 4 August 2017 for the preparation of the EIS.
EPBC Act Approval	<i>Environment Protection and Biodiversity Conservation Act 1999 (Cth)</i>	Department of the Environment and Energy (DotEE)	On 3 February 2017, DotEE deemed the Project to be a controlled action under the EPBC Act. The EIS will be carried out under the assessment bilateral agreement between the Commonwealth and the State of Queensland, which allows DotEE, to rely on the State EIS process for the assessment of Project impacts on Matters of National Environmental Significance (MNES).
Mining Lease	<i>Mineral Resources Act 1989</i>	Department of Natural Resources and Mines	Central Queensland Coal currently holds ML80187 which contains the mine pits, MIA and various ancillary infrastructure. A second ML (700022) has also been lodged to the DNRM under the MR Act, for the transport corridor ML area and for an additional area to accommodate the product coal conveyor under the Bruce Highway and future mine expansion.

This EIS is being undertaken under the statutory process set out within Chapter 3 of the EP Act. The EIS process and the EA and ML approval processes are presented in Figure 2.

The EIS process under the EP Act has a number of stages and decision milestones. The main steps involved in obtaining approval for the Project (including the EIS preparation and approval process) are outlined below.

Step 1 – Preliminary Planning

A number of investigations were undertaken as part of the preliminary planning phase. These assessments included exploration of resource and initial mine planning, assessments of environmental values [EVs] including flora and fauna, assessments of surface and subsurface water features and investigations into locations of surrounding sensitive receptors. This assisted to identify environmentally sensitive areas (ESA), develop targeted EIS field studies, select appropriate locations for mining infrastructure and establish the occurrence of the targeted resource.

Step 2 – Community and Government Consultation

Throughout the EIS process, community and State Government consultation has been ongoing and will continue throughout the duration of the Project. The Social Impact Assessment (SIA) utilised results of research conducted previously in the Livingstone Shire area and the broader region, along

with submissions received from the draft terms of reference [ToR] and results of various consultation processes conducted by government agencies and other proponents. Further discussion on the activities and outcomes of community consultation and how the information from consultation was considered in the EIS process are provided in Section 1.7.

Step 3 – Initial Advice Statement and Terms of Reference

On 18 December 2016, Central Queensland Coal submitted an application to undertake a voluntary EIS under the EP Act to the Department of Environment and Heritage Protection [EHP] which was subsequently approved on 27 January 2017. The draft ToR for the EIS was prepared under the EP Act and placed on public exhibition, together with the Initial Advice Statement (IAS). The final ToR for the Project was issued by EHP on 4 August 2017 and this EIS has been prepared in accordance with the final ToR. To simplify assessment against the Project's final ToR, a cross-referencing checklist of each aspect has been included in this EIS (see final ToR cross-reference tables at the end of each chapter).

Step 4 – EIS Preparation

This EIS was prepared to address the final ToR and relevant technical guidelines for an EA application. Preparation of the EIS followed the completion of baseline technical assessments, consideration of engineering, planning, operational requirements (which determined the ultimate level of potential impacts) and measures required to mitigate those impacts. Baseline site surveys of soils, surface water, groundwater, ecology, cultural heritage and noise were completed during the development of the EIS. Impact assessments were undertaken by a multi-disciplinary team of qualified technical specialists from a range of organisations.

Step 5 – Submission and Release of the EIS

Upon submission of the EIS, EHP have a 20 business day review period to determine whether the EIS can proceed to public submission. Once approved for public release, the public and government agencies have a minimum of 30 business days to provide comment.

Step 6 – Proponent Response

EIS submissions will be collated and forwarded by EHP to Central Queensland Coal for consideration. Central Queensland Coal will analyse the issues and level of concerns and provide EHP with appropriate responses to the submissions. Depending on issues raised during the submission process, Central Queensland Coal may be required to prepare a supplementary EIS report addressing the comments.

Step 7 – Assessment under the EP Act

Following Central Queensland Coal's response, EHP will assess the EIS and produce an EIS assessment report. This report will outline the adequacy of the EIS in assessing the final ToR, determine if impacts have been appropriately mitigated or avoided and recommend if the Project should proceed subject to any conditions. The EIS process is complete once the assessment report is provided to Central Queensland Coal.

This report, as well as documentation for the above steps will be available on the EHP website: <http://www.ehp.qld.gov.au/management/impact-assessment/eis-processes/styx-coal-project.html>.

Step 8 – Decision of Environmental Authority

Central Queensland Coal intends to apply for a site-specific EA to authorise the Project. The EA application will be evaluated by EHP once the EIS process is completed in Step 7 above. Based on the information provided in the EIS, EHP will prepare a draft EA for the Project. Copies of the draft EA will be provided by EHP to any person that made a submission on the EIS during Step 5 above. The submitters must then decide whether the final EIS and the draft EA resolve their concerns. If no submitters elect to object to the draft EA then EHP will grant the EA at the same time the MLA applications are granted. If, however, submitters elect to object to the draft EA, those objections will be heard in the Land Court. It is noted that an Environmental Management (EM) Plan is no longer a requirement of an EA following the amendments to the EP Act because of the *Environmental Protection (Greentape Reduction) and Other Legislation Amendment Act 2012*. Notwithstanding, the EIS still presents the information required to inform a decision about the Project's EA application despite no EM Plan being included. Draft EA conditions proposed by Central Queensland Coal are included in Chapter 23 – Draft EA Conditions as a starting point for the negotiation of the Project's approval conditions.

2.1.1 Accredited Process for Controlled Actions

The Project was identified as having the potential to impact on matters of national environmental significance [MNES] and was referred to the federal Department of Environment and Energy [DotEE]. The Project was deemed to be a controlled action requiring approval under the EPBC Act on 22 December 2016 (EPBC ref 2016/7851).

In accordance with DotEE's guidelines for the preparation of the draft EIS for the Project, a stand-alone chapter has been prepared and assessed as part of approval under the EPBC Act. The assessment bilateral process allows for the assessment of impacts on MNES to be undertaken as part of the State EIS process, with input from the DotEE throughout. DotEE will issue a separate approval for the Project which outlines the required conditions to mitigate any impacts to MNES following completion of Step 7 above.

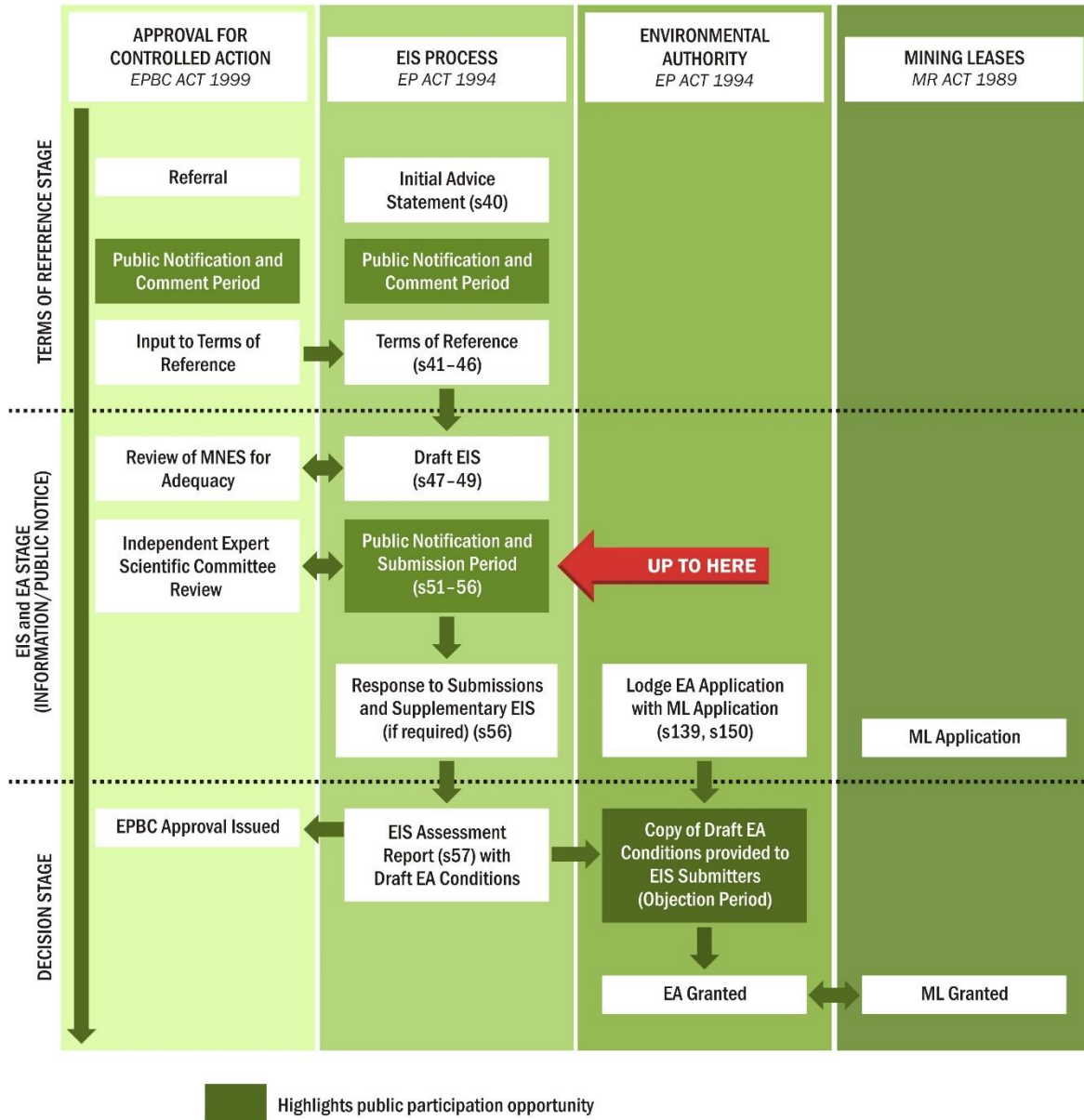


Figure 2 – EIS and approvals process

3 Project Description

3.1 Overview

The Project comprises of three open-cut pits (on mining lease (ML) 80187) where mining of semi-soft coking coal (SSCC) and high grade thermal coal (HGTC) will occur. Support infrastructure will also be built including a train loadout facility (TLF), a haul road to truck coal from the mine to the TLF (on ML700022) and two coal handling and preparation plants (CHPPs). The mine is expected to be in operation for approximately 20 years and produce up to 10 Million tonnes per annum (Mtpa) of Run of Mine (ROM) coal. Further details of the mining operations are provided below.

3.1.1 Open Cut Mining

Three open-cut pits will be developed and mined sequentially (Open Cut 1, 2 and 4) (Figure 3). There is no Open Cut 3 under consideration as part of this Environmental Impact Statement (EIS). The first open-cut pit, Open Cut 2, will be developed on the north eastern side of the Bruce Highway and will be operational for 12 years. The second open-cut pit, Open Cut 1, will be developed on the south western side of the Bruce Highway and will be operational between years 10 and 16. The third open-cut pit, Open Cut 4, will be operational for two years being Year 11 and 12. The disturbance area associated with all three pits is approximately 710.8 hectares (ha). The disturbance area of all three pits and the associated infrastructure is approximately 1,160 ha.

Blasting will be required to break and fragment the overburden and interburden horizons in each of the three open cuts. Coal mining will be undertaken using a fleet consisting of excavators, front end loaders and trucks to mine the coal seams, with the coal hauled to the CHPP for beneficiation. Interburden waste between the main coal seams is then blasted and this waste is mined by the excavators and hauled by trucks to waste rock dumps in the previous strips. The next coal seam is mined in the block, with the coal mining and parting operation planned to be performed in a series of sections along the pit.

Other open-cut mining methods that improve resource recovery may also be considered as the Project's feasibility studies continue.

3.1.2 Coal Processing

The ROM coal will be hauled to one of the CHPPs for beneficiation. The first CHPP will be established to support operations at Open Cut 2 and Open Cut 4 and the second CHPP will support Open Cut 1. There the coal will be crushed to reduce its physical size. It will then undergo a series of physical treatment and separation processes to remove unwanted sediment and rock extracted with the coal.

3.1.3 Coal Haulage and Train Loading

From the north-eastern side of the Bruce Highway, product coal will be transported by truck along the haul road for approximately 4.5 km to the TLF. At the TLF, product coal will be stockpiled and loaded onto trains via a new rail loop connecting to the Queensland Rail North Coast Line. A conveyor is proposed to transfer product coal from Open Cut 1, under the Bruce Highway at an existing bridge crossing to the product stockpiles on the northern side of the Bruce Highway.

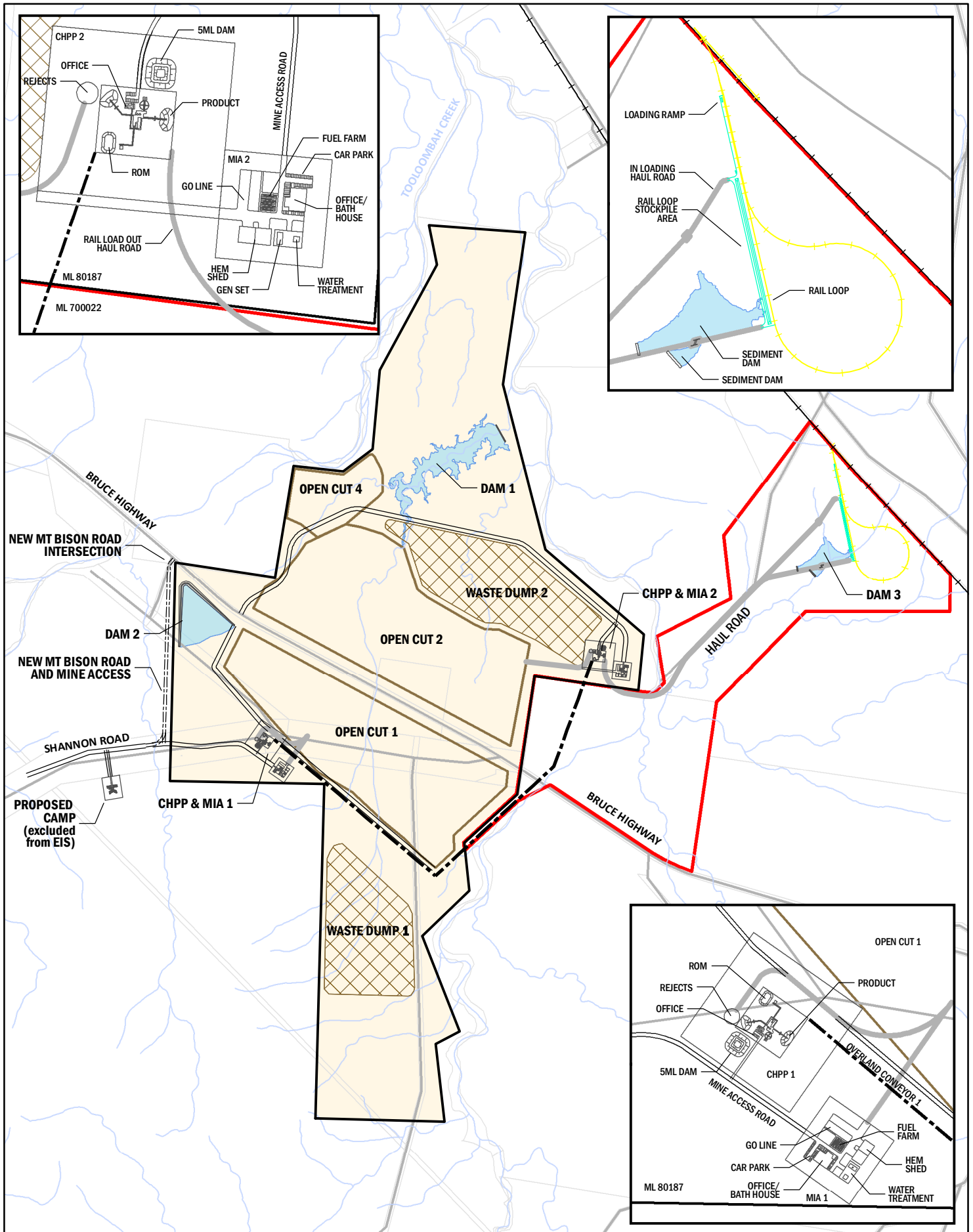


Figure 3
Mine arrangement



0 0.5 1 km

Scale @ A4 1:55,000
Date: 21/07/17
Drawn: Gayle B.

Legend

- ML 80187
- ML 700022
- Open-cut Mine Pit
- Dam Catchment
- Waste Dump Area
- Overland Conveyor
- Haul roads
- Rail Loadout Facility
- Rail Loop
- Proposed mine infrastructure
- Watercourse
- North Coast Rail Line
- Main road
- Cadastral boundary

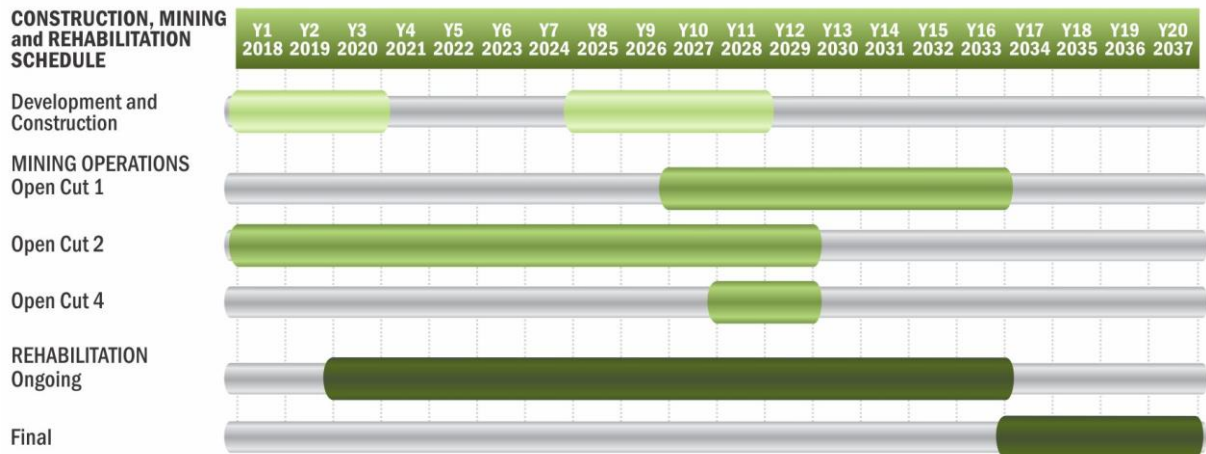
DATA SOURCE
QLD Open Source Data, 2017
Esri Basemaps



3.2 Development Schedule and Construction

Construction of Open Cut 2, CHPP, the haul road, the TLF and associated mine infrastructure located on the north-eastern side of the Bruce Highway is planned to commence simultaneously in Year one. Construction works will comprise: site preparation, managed vegetation and topsoil removal, topsoil stockpiling, earthworks, civil works, and building of structures and plant. An indicative development schedule is shown in Figure 4.

Figure 4 – Indicative Project development schedule



3.3 Workforce

The Project will employ a peak workforce of approximately 200 people during construction and between 250 to 500 during operation, with the workforce reducing to approximately 50 during decommissioning. It is expected that the majority of the workforce will be ‘Drive in, Drive out’, augmented by a local workforce. The nearest town to the Project is Ogmoo, located approximately 10 km to the north of the Project. Marlborough, another nearby town, is located approximately 25 km to the southeast. Workers will be accommodated at existing accommodation in the Marlborough, Ogmoo and St Lawrence region. Where these local and regional towns are not able to service the personnel, an accommodation camp will be developed outside the ML on the Mamelon property. The proposed accommodation camp is outside the scope of this EIS.

3.4 Water Requirements

Mining operations will require 3.76 megalitres of water per day. This consists of the demand generated by the coal processing and the requirements for potable water, sewage, dust suppression and washdown. This water requirement will be supplied from harvesting on-lease stormwater runoff, mine affected water from pit dewatering activities, water reuse within the CHPP and from flood harvesting from Tooloombah Creek. Fire water supply provisions are incorporated into the raw water dam storage capacity.

3.5 Alternatives and Justification

As part of the EIS process, alternative Project layouts and mining methods were compared to determine the optimal concept design. The following alternatives were considered:

- **Not developing the Project:** this option was discounted because the benefits of the Project would not be realised if the development did not occur;
- **Different locations for the mine workings:** the proposed mine area boundary is defined by the location of the targeted coal seams and existing geological conditions. Two options were considered for the layout of the mine infrastructure area;
- **Different locations for the transport corridor and TLF:** different haulage routes and TLF options were initially considered, as presented in the Project's Initial Advice Statement. The preliminary study involved five different options. Three preferred options were then selected based on their shorter distance, lower earthwork volumes, similar requirements for vegetation clearance and impacted areas of mapped environmental values and number of affected landholders. Site surveys were then used to identify the option presented in the EIS;
- **Different mining methodologies:** underground longwall and open-cut pit mining were compared for their suitability. The key mine design parameters included: percentage recovery, annual production volumes, value per tonne of ROM and the mining design limitations of each mining method. These were compared using a margin ranking process to identify the most suitable method for the site. Given the mining operation will target up to 10 seams of coal in a relatively shallow environment open-cut mining has been selected; and
- **Different rejects and tailings management methods:** Two main options were assessed for the management of the reject fines from the CHPP. The use of tailings (fines suspended in waste water) storage dams and the avoidance of tailings storages through the implementation of paste thickeners and filter pressing technology. The preferred method is to truck all coarse reject and dewatered fine reject material to in-pit and out of pit overburden waste areas. The process is most in line with ESD principles identified in cleaner production, including water reclamation, maximising density of tailings, avoiding storages and reusing for mine backfill thereby eliminating the risks of failures.

3.6 Overview of Existing Environment

The Project is located in a rural area with very few homesteads nearby. The closest homestead to the mining operations is the TSC Res 1 homestead located approximately 1.9 km northwest of the mine area boundary, and is the closest dwelling to the Project. There are no homesteads within the proposed ML boundaries; however, there are a number of farm dams and bores used for stock watering, access tracks and fences along the paddock boundaries.

Existing land uses in the area comprise mainly of cattle grazing on improved pasture with limited areas of native remnant vegetation. Remaining vegetation is generally confined to rockier hilly areas, linear strips of roadside vegetation, riparian vegetation and relatively small isolated remnants. Clearing over the past 150 years has resulted in a highly-fragmented landscape with remnant vegetation patches separated by large expanses of cleared land. The land within the Project area can be described as gently undulating.

The Styx Basin is relatively undeveloped, except for two small scale, government owned mines that were in operation from 1919 to 1963. The Ogmore and Bowman collieries, located close to the north

and northeast of ML80187 respectively, produced small quantities of low quality coal, for use in steam trains and other boiler requirements.

The Project area contains Strategic Cropping Land. Strategic Cropping Land is land that is, or is likely to be, highly suitable for cropping because of a combination of the land's soil, climate and landscape features. The location of the Project activities does not impact any mapped Strategic Cropping Land. The land surrounding the Project area is predominately used for cattle grazing. The closest protected area is the Tooloombah Creek Conservation Park which is located approximately 1 km to the east. The Project area consists of several wetlands of varying size. Most these have been artificially created ('turkey nest' dams and dammed creek lines). Two wetlands mapped as matters of state environmental significance (MSES) are located in the western portion of ML80187.

The Project mine area is located on the Mamelon property, the TLF is located on the Strathmuir property and a small section of the haul road is located on the Brussels property. Access to the Project will be from the Bruce Highway which divides the Project. The Project is situated within the lower catchments of Tooloombah Creek and Deep Creek, which are sub-catchments within the Styx River catchment.

4 Climate

The climate assessment of the region identified that the Project area experiences a tropical climate which is characterised by high variability rainfall, evaporation and temperature. The Project region experiences warmer summer months and cooler winter months with the majority of rainfall occurring in the warmer months between December and March. This is typical of the tropical Queensland climate. Relative humidity in the region is generally higher in the mornings and in summer. The primary wind direction is from the southeast and east and is greater in the summer months and in the mornings.

Natural or induced climate related hazards such as severe storms, cyclones, floods, bushfires and droughts are likely to occur and pose risks which require management. Landslides and earthquakes are not considered likely to pose any risks to the Project. Climate change predictions show a certain anticipated increase of severe climate events, particularly drought, floods and storms.

The Project has proactively considered climate change adaptation measures in the design and operation to ensure the mine can minimise high risk impacts from these events which have potential to cause significant damage and impacts on the Project. The residual risk, the risk after mitigation measures have been implemented, for all climate related impacts is low to medium. Medium risk scores relate to the damage or destruction of mine infrastructure and the pump out of mine pit waters which may result in the release of potentially hazardous wastes to the environment; however, releases during high flows will dilute impacts.

Central Queensland Coal is committed to undertaking a cooperative approach with government and other industry and sectors to address adaptation to climate change.

5 Land

The Project will occupy land that is presently used for cattle grazing for both fattening and breeding of stock. There are no occupied homesteads within the proposed mining lease boundaries but there are two unformed farm access tracks, two windmills, two dams, two vacant homesteads and farming infrastructure and fence lines along paddock boundaries. No other infrastructure such as water, power, telecommunications or gas pipelines are present.

The only designated ESA that will be directly affected are areas of endangered remnant vegetation. There are no National Parks, nature refuges or declared catchments within the Project area, or registered areas of existing contaminated land.

Soils within the Project area have a low erosion potential although some soils within parts of the transport corridor and TLF have a higher erosion risk. Soil types include clay soils with a relatively high fertility.

In terms of agriculture, the soils provide moderate quality grazing pastures with some areas of good quality grazing land over vertosols in the north of the Project area. No areas of mapped Strategic Cropping Land will be disturbed by the Project.

Physical impacts to the land will include land clearing and topsoil removal for the open-cut pits, mine waste rock dumps, water storage dams, and other surface infrastructure including the haul road and TLF.

Measures to minimise these impacts include:

- Provision of alternative stock watering supplies until dams and bores are reinstated;
- Remediation of paddock fencing;
- Sensitive clearance, handling and storage of topsoils;
- Establishing appropriate soil erosion and sediment controls;
- Ripping of soils and access tracks cracked by subsidence; and
- Progressive rehabilitation of disturbed land to allow today's land uses to continue after the completion of mining.

5.1 Visual Amenity

The Project is likely to be visible from three homesteads (Oakdean, Brussels and Neerim-2) and the Bruce Highway. The visual impact assessment presented in the EIS did not account for vegetation. Vegetation has the potential to screen the visibility of the Project. Appropriately designed and located night lighting for the Project will minimise the risk of sky-glow impacts regionally; however, there is anticipated to be some light spill that will be evident during the night. In addition, an analysis has been undertaken to assess the impact the Project is likely to have on people travelling along the Bruce Highway and local road network surrounding the Project. The topography and existing vegetation in the area is unlikely to provide a natural screen, and as such mining operations will be visible from the road.

6 Traffic and Transport

The proposed Project access route will include the eastern and western access routes off the Bruce Highway. The eastern access will be utilised from year 2018 whilst the western and eastern access will be utilised during peak operations in year 12 (2029).

The operational phase of the Project will generate most traffic with the total movements during peak operations (year 12) equating to approximately five heavy vehicle movements in and five heavy vehicle movements out per hour at both the eastern and western access off the Bruce Highway. It is anticipated that 50% of the traffic will use the eastern access and 50% will use the western access during peak operations.

It is not anticipated that the Project will result in significant traffic delays because of construction and operation.

Short term delays will be associated with the construction of the Project and upgrading of the road network. These delays are short and will improve the safety of the roads.

Analysis of potential pavement impacts predict impacts of less than 5% on the Bruce Highway for the entirety of the Project operation.

The Project's workforce will be expected to drive to and from the Project site at the commencement and end of their roster. Central Queensland Coal will manage risks associated with driver fatigue and safety.

7 Waste Management

Waste will be generated throughout the construction, operation and decommissioning phases of the Project and have the potential to impact the existing environmental values and human health.

For general and recyclable waste, it is estimated that a total volume of 151 tonnes per annum of solid waste will require offsite disposal and 127 tonnes per annum of solid waste can be recycled during the construction period. Annually during the operational period 383 tonnes of solid waste will require disposal and 317 tonnes of solid waste can be recycled. This will be removed from site by a licensed contractor and Central Queensland Coal will work with the contractor to adopt sustainable reuse and the reprocessing of marketed recyclable wastes. The closest local municipal landfill is located at Rockhampton. The RRC has confirmed the current annual and long-term capacities of the landfill can receive general waste for the duration of operations. Cumulative impacts are anticipated to be low and within current capacity of the existing landfill operations.

Regulated wastes produced include sewage sludge, oils and chemical waste which will also be stored in designated areas and segregated in clearly labelled containers. This will be removed by the licensed contractor and oils recycled using the new Gladstone lube oil recycling plant.

Waste management and mitigation measures put forward in this assessment reduce the impacts resulting from uncontrolled releases via methods such as bunding, containing and segregating potentially hazardous and odorous wastes. Management measures also aim to reduce pressures on existing land fill locations via implementing the waste management hierarchy (avoid, reduce, reuse, recycle, recover, treat and dispose).

8 Waste Rock and Rejects

The waste rock material and coal expected to be exposed, handled and processed by the mine have been characterised as having a low capacity to be potentially acid forming and moderate saline drainage potential. The waste rock has the potential to be highly sodic. There is some potential for leachate from extracted waste rock and tailings to enter local waterways and degrade water quality. The leaching of mine water into waterways can result in negative impact on aquatic organisms, changes in water quality which can in turn affect water availability for humans, and livestock.

Waste rock management will occur as part of the overall mine plan (known as the Plan of Operations). The proposed disposal method for waste rock is to initially truck rejects to an out-of-pit dump area during the development phase of each open cut. This area would be graded and compacted to ensure no internal pooling of water and to minimise the infiltration into soils within the disposal area. The cells will be bunded around its perimeter to capture and divert water away from the cells and to contain water within it.

A single final void will remain after completion of mining at Open Cut 1. For this EIS a retained void in Open Cut 4 is also assessed. Optimisation of the mine plan is being progressed and there is potentially an option within the mine plan for Open Cut 4 to be backfilled such that no void will remain. Further mine planning and scheduling work is required to confirm the removal of the void in Open Cut 4, and once completed, the EIS will require updating during the Supplementary EIS stage to reflect this potential significant reduction in ex-pit waste and associated changes in final landform. Consequently, the waste volumes and final landform described in this EIS should be considered as the worst-case scenario.

As operations progress through the open cuts, the area behind the working face will receive the waste rock where it will be permanently disposed of to fill the void. Surplus material will remain in the out-of-pit waste dump. The siting of the out-of-pit dump areas has accounted for sensitive site receptors, surface and groundwater drainage impacts, proximity to the CHPPs and health and safety risks. These factors will continue to be considered during detailed design of the dumps. In terms of environmental risk, overburden, interburden and potential coal reject materials tested to date are expected to have a very high potential for dispersion (erosion).

9 Surface Water

The Project is wholly contained within the Styx River Basin, which is comprised of Styx River, Waverley and St Lawrence Creeks. The Project is bordered by two watercourses as defined under the Water Act, namely Tooloombah Creek and Deep Creek. These creeks meet at a confluence downstream of the Project area to form the Styx River. Three un-named surface water features drain the Project area into Deep Creek, along the eastern boundary of the ML. The most distinct drainage feature is the 2nd order stream that runs through Open Cut 1 in a northeast direction passing under the Bruce Highway and finally discharging to Deep Creek to the northwest of MIA 2. This drainage feature is impounded by two existing farm dams, one of which is located within the proposed Open Cut 1 pit shell. The upper catchment of this 2nd order stream will be diverted towards Deep Creek as a clean water diversion around the proposed mine pits. The middle portions of the drainage feature will be mined out as the pits progress.

There are three unnamed surface water features that drain the western section of the Project area into Tooloombah Creek. These features are not clearly defined and are classified as 1st order drainage features.

There are four existing farm dams of varying size within the Project area, all dams are located adjacent to the Bruce Highway. These dams are predominantly used for stock water, are highly disturbed and do not support vegetation communities. There is also catchment contouring within the Mamelon property to the south of the Bruce Highway for capturing and storing overland runoff and preventing erosion. Existing contour bunds will be upgraded to environment dams that capture runoff from overburden stockpiles and remove sediment prior to discharge to Deep Creek.

The ephemeral watercourses and wetlands (including farm dams) within the Project area and surrounding region are classified as moderately disturbed, with the background water quality reflecting that the land is largely given over to grazing.

Intermittent flooding is a natural feature of the landscape, reflected in the predominance of ephemeral watercourses. Flood modelling identified that the CHPP 1 and MIA 1 will be outside of the area of flood risk and CHPP 2 and MIA 2 are within the flood risk, with water ponding on the pad surface. During the PMF AEP event a maximum water depth of 0.99 m was recorded on the pad; this is within the existing surface elevation raised by between 1.0-2.5 m.

Impacts on surface water resources assessed within the EIS include:

- Reduced water availability to existing users;
- Increased local flood risk;
- Subsidence of watercourses and farm dams; and
- Changes to stream flows and water quality.

To avoid impacts on the availability of surface water in the area, water will be reused and recycled during operations to reduce overall water demand.

The Project drainage system has been designed to divert clean water flows around working areas. The drainage system will also capture rainfall, groundwater from the mine workings, and any accidental spills or leaks to reduce the risks to water quality in the area. Any releases of water from the site will be in accordance with Queensland water quality standards and water quality will be monitored.

10 Groundwater

Apart from alluvial aquifers associated with major watercourses, the Styx River Basin is typified by low permeability coal measures and basement rocks. In low elevation areas, the water table is hosted by alluvial and colluvial deposits, but in higher elevation areas the water table is hosted by fractured and weathered rocks.

In elevated areas, groundwater flow is driven by recharge from rainfall, whilst in lower lying elevations associated with drainages there may be localised recharge to alluvial aquifers during stream flow events. The water table slopes toward the major drainage lines and ultimately toward the ocean. Based on available data, the depth to water table across the Basin is typically in the range 2 to 15 m. Most groundwater discharge likely occurs by evaporation from topographic lows, particularly along the surface drainage network where there is an expression of surface water or where the water table occurs at depths less than around 2 m, as well as by evapotranspiration by riparian vegetation that can access groundwater within their root zones.

Several third-party bores are also located within the Styx River Basin, most of which appear to source water from alluvial aquifers, one of these bores is located close to the Project property boundary. In general, groundwater salinity is suitable for most livestock but is unsuitable for potable use without treatment. A bore census undertaken in 2017 suggests that the wells are used for stock water supply, and there may be small-scale irrigation development around 16 km downstream of the proposed mine.

Potential impacts on groundwater assessed include:

- Reduced groundwater availability;
- Changes to groundwater quality;
- Changes to surface water and groundwater interactions; and
- Changes to natural groundwater discharges.

It can also be expected that aquatic Groundwater Dependent Ecosystems will occur near to the Project. Groundwater Dependent Ecosystems surveys have been undertaken in the broader study area and these surveys identified that stygofauna (aquifer fauna) exist within alluvial aquifers associated with the major watercourses.

Despite these predictions, Central Queensland Coal commits to responsible resource recovering, including mitigation of unacceptable potential impacts on groundwater and connected systems. This will include, for example, the provision of alternate water supply, deepening or relocating bores to areas outside impact areas, or providing new pumps to extract deeper groundwater.

If any ecological impacts occur because of changes to natural groundwater discharges Central Queensland Coal will provide environmental flows to supplement local shallow water table levels. Strict handling, use and storage controls will reduce the risks of pollution affecting groundwater quality.

11 Rehabilitation and Decommissioning

Over the Project's life 1,160 ha of land will be disturbed in total. All disturbed areas will be rehabilitated and maintained as mining progresses rather than at the end of the mine's life. Infrastructure areas will be decommissioned, dismantled and removed only once mining operations are complete.

The objective of rehabilitation is to return the land to cattle grazing or revegetate areas of remnant vegetation, thus closely mirroring the existing land use. Central Queensland Coal will demonstrate that the land is safe to humans and wildlife, non-polluting and geotechnical stable before relinquishing the mining tenement at the end of the mine's life.

12 Air Quality and Greenhouse Gases

Air quality within the existing environment is relatively good and typical of rural areas. The closest homestead to the mining operations is the TSC Res 1 homestead located approximately 1.9 km northwest of the mine area boundary, and is the closest dwelling to the Project. The predominant wind directions are from the north northeast or southeast, depending on the season.

Air quality standards will not be exceeded at any homestead, or any other sensitive location. Model results show that the highest predicted pollutant concentrations from the construction of the Project are predicted to occur at the Tooloombah Creek Service Station, TSC Res 1 and TSC Res 2; however, these concentrations are all below the relevant criteria.

Mitigation to further control potential air emissions will include:

- Preparation and implementation of an Air Quality Management Plan prior to commencing construction activities on site;
- Monitoring in the event of a complaint;
- Engineering control measures;
- Dust suppression measures;
- Rehabilitation of exposed surfaces; and
- Operational procedures.

12.1 Greenhouse Gases

The Project will unavoidably generate greenhouse gases through the consumption of electricity, extracting coal and diesel combustion. Equipment usage was calculated to be the largest contributor to greenhouse gas release.

The maximum annual greenhouse gas emissions rate is estimated at 480 kilo tonnes of carbon dioxide equivalent. Carbon dioxide equivalent is the amount of carbon dioxide that would have the same warming effect as the mixture of the three greenhouse gases emitted by the Project individually. The Project's emissions amount to 0.09% of Australia's total greenhouse gas emissions and 0.32% of Queensland's total greenhouse gas emissions.

Central Queensland Coal will implement a Greenhouse Gas Abatement Strategy to avoid and minimise greenhouse gas emissions over the life of the Project. Compensation for actual emissions will also be provided, as appropriate.

13 Noise and Vibration

The noise environment near the Project can be characterised as 'very rural', with only mild sources of activity noise, mostly local activity at dwellings and plant and machinery used for agriculture and livestock. The Bruce Highway cuts through the proposed ML area and the North Coast Rail Line is located approximately 1.5 km from the northern boundary of the proposed ML area. These are likely to have an influence on the acoustic environment; however, traffic is intermittent on both road and rail. Environmental noise (wildlife, flora, wind) is the predominant noise.

Noise emissions assessed by the EIS include:

- Construction works;
- Operational activities during the peak production year (year 12); and
- Blasting.

Noise levels for construction and operation are predicted to exceed the noise criteria at the nearest receptors and thus noise mitigation is required. Noise impacts will be managed through a Noise Management Plan and for blasting outside of Model Mining Conditions [MMC] stipulations, a Blast Management Plan. A complaints procedure will allow for all complaints regarding the Project's noise to be documented, investigated and reported, with corrective actions provided as appropriate. The main noise reduction measure during operations is the replacement of CAT793D trucks with CAT793 XQ haul trucks leading up to achieving peak production of 10 Mtpa.

The Noise Management Plan will be developed in consultation and engagement with potentially affected receptors to achieve alternative arrangements

Blasting impacts are anticipated to comply with blasting criteria with appropriate stemming.

14 Terrestrial Ecology and Matters of National Environmental Significance

The Project is located largely within the Marlborough Plains subregion of the Brigalow Belt South bioregion. A small portion in the south of the mine area lies within the adjacent Nebo-Connors Range subregion. The Project area is representative of the wider region and landscape with over 78% of the Project area cleared and currently mapped as non-remnant. Remnant vegetation within the Project area is largely confined to the south and western portions of the mine area. The TLF and haul road lie entirely in cleared lands excepting a linear riparian strip of vegetation associated with Deep Creek.

Vegetation is composed of 10 RE types situated on five landforms: alluvial river and creek flats; Cainozoic clay plains; Cainozoic sand plains / remnant surfaces; coarse-grained sedimentary rocks; moderately to strongly deformed and metamorphosed sediments and interbedded volcanics; reflecting the underlying geology and position in the landscape. Field verification of REs within the Project area identified inconsistencies in current RE mapping, relating to RE composition and polygon size. The majority of remnant vegetation within the ML comprises communities listed as Of Concern and Least Concern under the *Vegetation Management Act 1999* [VM Act].

No listed flora species were observed during the field assessments and no species identified as occurring in the wider area during desktop searches was identified as having a high likelihood of occurring within the Project area.

Listed fauna species observed in the Project area include Koala, Greater Glider and Squatter Pigeon (all listed as Vulnerable under the NC and EPBC Act) and several bird species listed as Migratory (EPBC Act) and Special Least Concern (NC Act). Suitable habitat for Koala occurs within the mine area (where the species was identified) and along the haul road and adjacent riparian communities associated with Deep Creek and Tooloombah Creek. Suitable gilgai habitat for Ornamental Snake (listed as Vulnerable under the NC Act and EPBC Act), identified in remnant Brigalow habitat to the west of the Project area, also occurs in cleared lands north of the Bruce Highway.

The Project will require unavoidable significant impacts to ecological matters of State and Commonwealth significance including: remnant vegetation listed as Of Concern and Endangered under the VM Act and / or considered as a TEC under the EPBC Act; habitat for listed species (Koala and Ornamental Snake); and watercourse remnant vegetation. Significant impacts will be a result of clearing for mining infrastructure, open cut pits and environmental dams. The total extent of these impacts has been calculated to be 131.46 ha and will be the subject of the Project Offsets Delivery Plan.

The mitigation measures proposed as part of the Project will minimise additional indirect impacts to terrestrial fauna and flora communities within and surrounding the Project area from construction and operational activities. These measures include fauna crossing infrastructure to minimise fauna traffic collisions along the haul road and a detailed ecological monitoring program to monitor the health of vegetation communities adjacent to the Project for indirect impacts such as dust and surface water contamination. With control measures in place indirect impacts to fauna and flora are not expected to be significant.

15 Aquatic Ecology

Aquatic habitats sampled in the area appear to be in good condition when surveyed during flow events despite the impact of cattle grazing in the wider area. Riparian cover along Tooloombah Creek and Deep Creek is largely continuous. Water quality across the catchment recorded generally high values of nutrients including ammonia, nitrogen and phosphorus. Deep Creek was recorded as having significant turbidity levels in some survey areas during no flow conditions. Macroinvertebrate assemblages within survey sites were diverse and representative of healthy aquatic systems when creeks were flowing.

No listed aquatic flora was recorded during the surveys. Observations during wet and dry season surveys across the wider area recorded several sedge / wetland plants associated with ephemeral wetlands including Swamp Lily, *Eleocharis blakeana* and *Juncus polyanthemus*. A total of 28 fish species were recorded during site surveys which included the Styx River. The species recorded are generally typical of what would be expected to occur in a Central Queensland coastal catchment. There are no records of introduced species from either desktop information or field surveys indicating the catchment may be relatively free of introduced fish taxa.

Two threatened aquatic species are known or likely to occur in the waters adjacent to the Project. Southern Snapping Turtle (listed as Endangered – NC Act; Critically Endangered - EPBC Act) was recorded at a site in Deep Creek. It is expected to occur in low densities due to the ephemeral nature of creeks in the area. Anecdotal evidence indicates that Estuarine Crocodile (listed as Vulnerable – NC Act; Migratory - EPBC Act) occurs in the Styx River and Deep Creek.

Stygofauna communities were recorded during a comprehensive (seasonal) study sampling from groundwater bores located within the mine lease boundary and the wider area. Five species were identified to the north of the Project. Only a single species was located on the eastern boundary of the mine lease. This species was found within the predicted groundwater drawdown impact area resulting from mine activities. It is considered highly unlikely this species is restricted to the relatively small area of Project groundwater impact. Therefore, no stygofaunal species is considered restricted to the potential impact area and there will be no significant impacts.

Predicted groundwater drawdown impacts close to open cut mining activities has the potential to cause long-term impacts to localised habitat for the Southern Snapping Turtle, and (to a lesser extent) Estuarine Crocodile through reduction of water levels in permanent waterholes. Both species will be subject to Significant Species Management Plans.

The mitigation measures proposed as part of the Project will minimise additional indirect impacts to aquatic EVs within and surrounding the Project area from construction and operational activities. These measures include monitoring and management measures under the Receiving Environment Monitoring Program (REMP) and Water Management Plan (WMP), to monitor the health of wetlands, streams and riparian vegetation adjacent to the Project for indirect impacts such as water level reductions (in permanent waterholes), dust and surface water contamination. Management measures will include provisions of replenishment in permanent waterholes should water level reductions be detected. With control measures in place indirect impacts to aquatic EVs and aquatic fauna are not expected to be significant.

16 Biosecurity

The increased movement of people and machinery in the area, storage of wastes and clearing of vegetation may result in the increase in pest and weed species to the region. Site-specific controls that are consistent with Livingstone Shire Council's pest and weed management strategies, will be developed and will mitigate these potential risks by ensuring equipment is free from soil and pests before entering the area. Wastes will be handled and stored in an appropriate manner, to minimise access to pest fauna. During construction and operations, disturbed areas will be progressively rehabilitated and buffers will be created around undisturbed areas of remnant vegetation to minimise the risk of weed incursion.

There is the potential for weeds, pests and to a much lesser likelihood plant disease to be introduced to the area by equipment and machinery brought to site. The risk of the Project activities resulting in the introduction of plant disease is anticipated to be low given national and state regulatory requirements.

The appropriate management of the risks associated with vector borne diseases, including mosquitos, will be addressed in a Mosquito and Biting Insects Management Plan. The objective of management measures is to ensure the public health well-being of the employees and visitors to the site. Management includes a framework for identifying and monitoring mosquito populations as well as outlining procedures for implementing management strategies during the construction and operation phases of the Project.

17 Cultural Heritage

The assessment of Indigenous and non-Indigenous cultural heritage collated site data throughout the Project area from a range of sources including database searches, consultation with relevant Aboriginal parties and field surveys. There are no registered or known significant Indigenous or non-Indigenous sites within the Project area.

The potential historical heritage places identified during the field survey were assessed as being below the threshold for places of either local or state heritage significance. No areas within the Project were identified as having any non-Indigenous archaeological potential.

The closest site listed on a National, State or local register is the Great Barrier Reef World Heritage Area, with the nearest boundary located approximately 8 km to the north of the Project area. With the lack of known non-Indigenous cultural heritage at the site there is a low risk of discovery of unknown sites during construction and operation. Management and mitigation measures will be implemented as a precaution to identify any items and, where necessary, appropriately deal with any discovery in accordance with the *Queensland Heritage Act 1991*.

Central Queensland Coal commits to continue to engage to develop the Project specific Cultural Heritage Management Agreement. This will include pre-clearance surveys where required. Central Queensland Coal aims to promote an understanding of Indigenous cultural heritage in the workplace through employee induction programs and other specific training activities.

18 Social and Economic

A social impact assessment and an economic impact assessment were carried out as part of the EIS. Both assessments considered local and regional communities and economies that could be affected by the Project.

Locally there has been a historical trend in population growth, at least until the time of the last census in 2016. More recently this trend is likely to have reversed due to the cyclical downturn in the resources sector.

The Project has the potential to generate social and economic benefits for the region, state and nation. Economic stimulus is likely to result from the construction and operation of the Project along with increased regional supply chain and employment opportunities.

Whilst the Project will provide social and economic benefits, the Project will also likely result in adverse impacts, including:

- Disruption to community cohesion;
- Increased demand on community services;
- Opportunity cost of the Project in terms of alternative economic uses such as beef cattle grazing;
- Loss of ecosystem services;
- Increased inflationary pressure in regional labour markets;
- Potential for skill shortages;
- Potential for inflationary pressure in local housing, commercial and industrial property markets; and
- Increased burden on local and regional infrastructure.

The adverse impacts listed above will be mitigated via the Social Impact Strategy and where possible goods and services will be sourced locally. To enhance the potential positive impacts of the Project, employment opportunities will be made available to all members of the local and regional communities.

Central Queensland Coal will manage any change in demand on government and community services and facilities caused by the Project through consultation with affected providers.

19 Health and Safety

Assessments were carried out on the risk of the Project's activities to personal health and safety and property. This included an assessment of standard operations and abnormal conditions such as:

- Unpredictable natural events, for example bushfire, landslides and flooding;
- Operational hazards including explosions, fire, dam failure, vehicle collisions; and
- Accidental spills and leaks.

All risks assessed are typical of all open-cut activities. That is, no new or untested processes will be carried out as part of the Project which could present relatively higher risk levels. No extreme risk ratings were identified during the assessment. With the implementation of specific risk management measures and operational procedures, the hazards associated with the Project are not significant.

20 Hazard and Risk

The main hazard and risks arising from a coal mine include natural hazards, coal hazards, major operational hazards, general worksite hazards and hazards associated with dangerous goods transport and storage. The site is relatively free from natural hazards other than flooding which presents a potential risk. Coal poses several hazards from spontaneous combustion and respirable dust risks; the highest risk areas of the Project are the stockpiles and crushing plants. Measures to minimise the risks of spontaneous combustion and dust have been included into the design and operation planning for the site.

A review of Queensland and Australian incident statistics identified the high risk operational hazards which cause the greatest number of incidents and fatalities within coal mines. These hazards and risk will be examined and areas which could pose these hazards will have a prevention and detection system in place to manage the risk to the lowest possible levels. General workplace hazards have also been identified and will be managed through onsite training and the health and safety management system.

A preliminary risk screen was undertaken of all the identified dangerous goods storage and transportation volumes against the NSW SEPP 33 which was adopted as guidance to offsite hazard and risk. None of the stored hazardous materials exceeded the trigger limits and required further assessment or consequence modelling.

Project construction and operational preliminary risk assessment results indicated that the baseline safety and health risk profile varied from low to high. Once mitigation measures and design treatments were applied to the assessed hazards, residual risk scores were reduced. The residual medium risks identified for the Project include:

- Coal hazards such as spontaneous combustion;
- Major operational hazards including: vehicle collisions, exposure to high voltage or contact with electrified wires, toxic atmospheres in confined spaces and entrapment or wall failure. Mining is inherently a higher risk industrial activity and controls and design will minimise these risks as far as possible; and
- General worksite hazards including falling objects, body and heat stress, fatigue, fitness for duty, manual handling, fauna related injury and potential for disease from biting insects.

Overall the risks to community receptors, environmental sensitive receptors and State and local government controlled roads can be considered acceptable. A robust and detailed integrated risk management process and safety plans will be required and implemented to ensure that the hazards and risks onsite are kept as low as practically possible.

21 Key Commitments

The EIS provides many specific commitments about the Project. The table below summarises the key commitments made by Central Queensland Coal.

Central Queensland Coal's major commitments are to:

- **Invest substantial capital to develop the Project;**
- **Maximise resource recovery and minimise land disturbance;**
- **Engage with affected landholders, mine tenure holders and interested parties;**
- **Implement a Cultural Heritage Management Plan with relevant Aboriginal parties;**
- **Support local and regional businesses;**
- **Protect ecologically important vegetation and wildlife, and offset biodiversity impacts;**
- **Avoid impacts on groundwater and surface water caused by the Project;**
- **Rehabilitate land and drainage as mining progresses to its existing condition and use;
and**
- **Continually review and improve the Project's economic, social and environmental performance.**