

Alpha Coal Project

# **Coordinator-General's Evaluation Report on the environmental impact statement**

May 2012

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# Synopsis

## Introduction

This Coordinator-General's Evaluation Report is an extensive evaluation of the potential impacts of the Alpha Coal Project (the project). It has been prepared pursuant to section 35 of the *State Development and Public Works Organisation Act 1971* (Qld) (SDPWO Act).

The proponent for the project is Hancock Coal Pty Ltd, Hancock Coal Infrastructure Pty Ltd and Hancock Alpha West Pty Ltd (previously Hancock Prospecting Pty Ltd). The project comprises the following components:

- a 30 million tonnes per annum (mtpa) open-cut coal mine in the Galilee Basin
- a standard gauge, single-track, non-electrified, 495-kilometre-long railway line for the purposes of transporting processed coal from the project mine to the Port of Abbot Point near Bowen.

The proposed mine is 130 kilometres (km) south-west of Clermont and approximately 360 km south-west of Mackay. The nearest residential area to the mine is the Township of Alpha, located approximately 50 km south of the project. Access to the proposed mining lease is from the Hobartville Road north of the Capricorn Highway at Alpha. The proposed mine is located within Mining Lease Application (MLA) 70426. The expected life of mine is 30 years, with sufficient resources to potentially extend the project life beyond 30 years.

The mine plan comprises six separate open-cut pits, with a total strike length of 24 km, in a north-to-south direction along the centre of MLA 70426.

At the time of finalising this Evaluation Report, the capital cost for the project was estimated by the proponent to be \$6.4 billion, of which \$3.4 billion is for the mine component and \$3 billion for the rail component. Subject to relevant approvals being granted for the project, the proponent anticipates the construction period to occur between 2013 and 2016. The project is anticipated to create up to 3600 direct jobs during the construction period (1500 mine, 2100 rail) and up to 990 direct jobs during operation (800 mine, 190 rail).

## Rationale and alternatives

The proponent states that the proposed project is aimed to address the widening gap between existing global coal production and worldwide demand by becoming a provider within the world thermal coal market, especially to the growth markets in Asia.

The Galilee Basin and its coal resources are currently undeveloped, and the demand for good quality thermal coal from Australia presents an opportunity to develop this area. The project would be one of the biggest coal mines of its type in Australia.

## Impact assessment process

An initial advice statement (IAS) was lodged with the Coordinator-General on 18 September 2008, and on 24 October 2008 the project was declared a 'significant

project for which an environmental impact statement (EIS) is required' pursuant to section 26(1)(a) of the SDPWO Act.

On 13 January 2009, the project was determined to be a controlled action likely to affect matters of national environmental significance under section 75 of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Under the Bilateral Agreement with the Australian Government, this Evaluation Report will be used by the Commonwealth Minister for Environment to assess the controlled action for the purposes of the EPBC Act.

The final terms of reference (TOR) for the project were issued on 1 June 2009. The EIS for the project was advertised for public comment from 5 November 2009 until 20 December 2010. A supplementary EIS (SEIS) and an addendum to the SEIS were also prepared, which addressed the submissions made on the EIS.

As part of my evaluation of the EIS, I have considered those documents, issues raised in submissions, additional information provided by the proponent, and advice received on a range of key issues from State agencies and the Australian Government Department of Sustainability, Environment, Water, Population and Communities (SEWPaC). My office also contracted RPS Australia East Pty Ltd (RPS) to assist with the hydrological evaluation of the tailings storage facility, waste rock, stream diversions and railway.

I am satisfied the requirements of the SDPWO Act have been fulfilled, and that sufficient information has been provided to enable me to finalise my evaluation of potential impacts of the project.

This Evaluation Report is not an approval in itself: it states, imposes and recommends conditions to apply to relevant approvals that must be obtained for the project to proceed.

The EIS process for this project has not assessed the following key elements of the overall Alpha Coal proposal and are therefore not subject to my specific consideration as part of this Evaluation Report:

- coal port facilities or increased coal shipping
- supply of water and electricity
- quarry sources and supply routes for fill for rail construction
- rail lines beyond the single rail track and nominated passing loop configuration described in the proponent's EIS documentation.

Impact assessment processes for those key elements are being or will be conducted separately and subsequent government approvals for those elements may or may not be granted.

While the Queensland Government has a very clear policy preference that only one multi-user corridor be developed to service the infrastructure needs of the Galilee Basin connecting to coastal ports, this Evaluation Report represents an assessment only of the Hancock rail proposal on its own merits, similar to the way any infrastructure proposal would be evaluated under section 25 of the SDPWO Act.

## **General impacts common to both the mine and rail components**

### *Social and economic environment*

The project will generate a number of short and long-term social and economic benefits, including direct and indirect employment opportunities and increased industry output through the demand for goods and services.

The Queensland Government requires proponents to develop a social impact management plan (SIMP) for new or expanding major resource development projects which require an EIS to be prepared under either the *Environmental Protection Act 1994* (EP Act) or the SDPWO Act; or projects for which the Department of Environment and Heritage Protection (DEHP) has given approval to a proponent to voluntarily prepare an EIS.

The proponent has made a number of commitments to mitigate potential social and economic impacts and maximise social and economic opportunities of the project, which have been included in the SIMP.

The proponent has completed a comprehensive social impact assessment during the EIS process and lodged a draft SIMP. I consider that the draft SIMP is largely satisfactory, but will require some further refinement and additional information before final approval by me. In response to the considerable feedback received from stakeholders throughout the EIS and SEIS consultation process, the SIMP action plans focus on issues such as landholder management, workforce management, local housing, community development, cumulative social impact management, Indigenous participation and local employment and business outcomes.

There is an opportunity for the project to provide a significant economic and social development opportunity for local communities and contribute to future employment and training for Indigenous people and local people.

The proponent will develop a local industry participation plan to ensure contractors provide full, fair and reasonable opportunity to local suppliers and specialist sub-contractors when tendering for equipment or services supplied to the project.

The proponent will establish or participate in the proposed Galilee Basin Cumulative Social Impact Assessment Roundtable to identify and assess cumulative social impacts. Key deliverables of the roundtable will be to implement a Galilee Basin Cumulative Social Impact Study and Galilee Basin Social Infrastructure Plan. The purpose of the cumulative social impact study will be to assess cumulative social impacts for relevant issues such as, but not limited to population, workforce, accommodation, health and housing and use of community infrastructure and services. The social infrastructure plan will determine short-, medium- and long-term strategies for delivering social infrastructure initiatives through partnerships between industry, communities, and governments.

A Galilee Basin SIMP Community Consultative Committee will be established to respond to social impact and management strategies, and to oversee the implementation of the SIMP.

### *Transport and traffic*

The EIS investigated potential impacts on principal state-controlled roads and local roads within the project area.

The initial traffic analysis concluded that the net increase in traffic generated by the project during the peak construction period would not have a significant negative impact on the level of service or surface condition of existing roads. Nonetheless, I have required that further traffic and transport analysis is required to address submitter concerns regarding road safety and transport efficiency, road surface and traffic, impact and demand for emergency services response.

The proponent has committed to reviewing and updating its traffic analysis and accompanying road impact assessment (RIA), road-use management plan (RMP) and traffic management plan (TMP) when additional and more certain trip generation and traffic volume information would be available. The requirement for a RIA, RMP, TMP and traffic mitigation measures have been specified in this Evaluation Report.

Based on the mitigation measures provided in this report and the approvals required for the project under the *Transport Infrastructure Act 1994* (for state-controlled roads) and Regional Council's local planning scheme (for local roads), I am satisfied that impacts to traffic and transport can be managed and are acceptable.

### *Matters of national environmental significance*

This Evaluation Report provides a review of the extent to which material supplied by the proponent as part of the EIS process addresses the actual or likely impacts of the project on each of the matters protected by controlling provisions under the EPBC Act.

I am satisfied the EIS process conducted for the project adequately meets the requirements for impact assessment in accordance with the provisions of Part 4 of the SDPWO Act and Part 13 of the State Development and Public Works Organisation Regulation 2010, as specified in Schedule 1 (Item 2, Class 2) of the Bilateral Agreement.

### **Mine-specific environmental impacts**

The key mine-specific environmental impacts considered in this report are briefly set out below. Further detail can be found in Section 5 (mine).

### *Ecology and offsets*

While no state-listed threatened flora species were identified on or adjacent to the mine, the mine site contains suitable habitat for four species based on their habitat preferences and known geographical distribution ranges. Construction activities associated with the development of the mine site may impact upon potential habitat for these threatened species. In addition, construction and ongoing maintenance activities will impact upon protected native plants on site. Two state-listed threatened fauna species were recorded on the mine site, namely the vulnerable squatter pigeon and near-threatened Little-pied bat. Activities associated with the construction and operation of the mine are likely to disturb some habitat for these species. However, this is unlikely to significantly impact upon the long-term viability of these species or their

geographical distributional range due to the broad extent of that habitat available in the local region.

The proponent has committed to providing environmental offsets for the unavoidable loss of vegetation and biodiversity as a result of the project, in accordance with state and Commonwealth offset policies. The proponent has prepared a draft biodiversity offset strategy to satisfy the various offset requirements of the project.

I have concluded that it is unlikely that significant adverse impacts on the majority of state-listed threatened flora and fauna species would occur, and that the mitigation measures proposed for each of the project components would be adequate to reduce net adverse impacts to those listed threatened species to an acceptable level.

### *Tailings storage facility*

I have considered potential impacts on groundwater of the tailings storage facility (TSF) near the eastern margin of the proposed mine area on an outcrop of the Colinlea sandstone.

The addendum to the SEIS indicated there is limited recharge potential to the underlying Colinlea Sandstone aquifers. Furthermore, the mine environmental authority (EA) conditions and the environmental management (EM) plan will ensure that the TSF will be designed based on good engineering practice and constructed accordingly, thus the potential impacts of artificial recharge with poor quality TSF seepage should be mitigated. The reduction in recharge will only affect the shallow perched groundwater resources directly within the TSF footprints. These groundwater resources are considered to have limited environmental values.

The Out-of-Pit TSF Geotechnical Assessment report concluded that based on the results of this investigation and a review of data previously collected, the TSF site is considered suitable for storing tailings as proposed in the EIS.

The proponent and DEHP agree that further investigation and detailed design needs to be undertaken before a design plan for the TSF can be submitted for assessment.

I am satisfied with the assessment of risks to groundwater and the mitigation measures proposed to minimise those risks and that the proposed use of lining materials and operation procedures will result in minimal potential for leakage.

### *Groundwater*

Mining will occur below the regional water table and it will be necessary to dewater the mine, which has the potential to impact on:

- groundwater levels
- groundwater flow direction
- groundwater chemistry
- recharge and discharge mechanisms.

The proponent has committed to:

- project design to ensure the minimum possible impacts on the groundwater resource

- mitigate any adverse effects that may occur such as changes to water quality in both groundwater and surface water resources
- compliance with the terms of any water licence conditions issued by DEHP
- establish an integrated groundwater and surface water monitoring program
- the determination and of approval by DEHP of water quality and trigger levels before the commencement of mine operations.

The proponent has made a commitment to ‘make-good’ affected groundwater supplies and I have recommended conditions for the enforcement of this through the provisions of the *Water Act 2000*.

No connection has been identified between the aquifers affected by the mine and the Great Artesian Basin (GAB). Despite this, more detailed work needs to be undertaken on groundwater modelling, and in particular, on the cumulative impacts of the Galilee mines on groundwater. I have included a number of conditions in this Evaluation Report that will be imposed on any approval for the project to ensure that the groundwater model is revised, that the source of recharge to groundwater is identified and that any impacts on the GAB are identified.

The proponent will be required to undertake periodic audits of its groundwater model, and re-calibrate and re-predict future impacts during the mining phase of the project.

Given the size of the mine there will be impacts on groundwater, but I am satisfied that there are suitable conditions in this Evaluation Report to mitigate and monitor the impacts on the surrounding groundwater.

#### *Surface water diversions*

The mine is located adjacent to Lagoon Creek which is high in the headwaters of the Burdekin River Basin. Lagoon Creek flows to Sandy Creek, Belyando River, Suttor River, and joins the main Burdekin River channel several hundred kilometres north of the Mine site. Five key streams within the project area have been identified as ‘defined watercourses’. The existing watercourses in the project area are highly ephemeral and do not sustain persistent flow, and the existing beneficial uses of surface water resources around the project area are limited.

The diversion of watercourses for Lagoon Creek, Sandy Creek, and Spring Creek will be required to gain unimpeded access to coal reserves that would otherwise be inaccessible due to the risk of flooding. To supplement the stream diversion channels, flood protection levee banks will be required to protect the mine from flooding. All of the physical works extents of the proposed stream diversions will be contained within the MLA 70426 boundary.

The flood levee banks are nominally designed at concept stage to provide protection up to the 3000 year ARI flood level. The nominal level of flood protection equates to a one per cent probability of an extreme flood overtopping the levee bank for the 30-year mine life. I have been made aware by DEHP and landholders of concerns about flooding impacts that would extend off lease due to changes to the catchments as a result of the diversions or other infrastructure. The SEIS response indicated that there could be increases in flood levels off the mining lease.

To ensure that there are no impacts of stream diversions off the mining lease, I have recommended a condition that, during the detailed design phase of the project, the proponent must consider flood heights off lease.

Both DEHP and the proponent agree that further investigation needs to be undertaken as part of the detailed design of the diversion structures. A more comprehensive assessment of the diversions will be undertaken as part of the water licence process under the Water Act. Any application that is submitted will be assessed on its merits and in accordance with the criteria under that Act. The former DERM reiterated that the proposed diversions must not impact on the stability and performance of existing watercourses upstream or downstream.

I am satisfied that the proposed diversions can proceed subject to conditions that will reduce the risks of serious erosion. The proponent must submit information and reports that meet these conditions as part of an application for a water licence under the provisions of the *Water Act 2000*. The water licence can then be conditioned according to the outcome of that investigation.

The former DERM expressed concern about the extent of currently proposed mining activities surrounding the Alpha Mine including the Kevin's Corner and Galilee Coal projects. The cumulative impact of these three projects on the existing natural resources, including watercourses and diversions, should be examined. The proponent should investigate how the cumulative impact of its proposed diversions and mining activities impacts on adjacent mining projects. To ensure that the cumulative impacts of stream diversions are fully assessed, I have set conditions that address the cumulative impact of stream diversions.

I have concluded that there is sufficient protection in place to ensure that the impacts on the ephemeral streams on and off the mining lease will be mitigated and managed through the conditions contained within this report and through the provisions of the Water Act.

### **Rail-specific environmental impacts**

The key rail-specific environmental impacts considered in this report are briefly set out below. Further detail can be found in Section 7 (rail).

#### *Ecology and offsets*

For the rail, four state-listed threatened fauna species were recorded on site during the field surveys, including the endangered Troughton's sheath-tail bat (probable), vulnerable squatter pigeon and near-threatened little-pied bat and cotton pygmy-goose. Activities associated with the construction and operation of the rail alignment are expected to disturb some habitat for these species. However, this is unlikely to significantly impact upon the long-term viability of these species or their geographical distributional range due to the broad extent of habitat available in the local region and the mobility of these species.

No state-significant threatened aquatic flora species are known in the Burdekin Catchment. One state significant threatened aquatic fauna species, the estuarine crocodile, is known to the Burdekin Catchment and may utilise habitat in association with the Caley Valley Wetlands and Bowen, Bogie and potentially the Elliot Rivers.

#### **Synopsis**

#### **Alpha Coal Project**

#### **Coordinator-General's Evaluation Report on the environmental impact statement**

Several declared marine plants were identified on site in association with the Caley Valley Wetlands.

The proponent has committed to providing an environmental offset for the unavoidable, non-mitigated loss of vegetation and biodiversity as a result of the project, in accordance with State and Commonwealth offset policies. A biodiversity offset strategy has been prepared to satisfy the various offset policies relevant to the project.

I conclude that it is unlikely that significant adverse impacts on the majority of state-listed threatened flora and fauna species would occur, and that the mitigation measures proposed for each of the project components would be adequate to reduce potential adverse impacts to those listed threatened species to an acceptable level.

### *Impacts of rail loop on Caley Valley Wetlands*

The Caley Valley Wetland is approximately 5150 hectares (ha) in area and is located adjacent to the Abbot Point Coal Terminal, 21 km north northwest of Bowen. The wetland system comprises a mix of permanent estuarine waters, intertidal mud and sand flats, mangroves, saltmarshes, freshwater marshes and freshwater impoundments. This wetland environment was significantly altered from its natural state by the construction of a series of levees several decades ago by the then land owner. The site is important for waterbirds and migratory species. The wetland experiences distinct seasonal changes, with wet-season filling driving a freshwater system that provides habitat for a number of species. The drying out period (during the dry season) creates a more saline environment, and restricts freshwater areas to pools that may persist depending on the duration of the dry season. The proposed project railway loop intersects 14.5 ha of the Caley Valley Wetlands.

The construction of the rail loop and management of terrestrial areas adjacent to the wetland will be required to limit direct and indirect impacts to the aquatic ecosystem. Construction is proposed to occur over approximately two years with activities occurring throughout the year, 24 hours a day, seven days a week. The rail loop that bisects the wetland is proposed to be constructed upon a rock and earth bund for the majority of the loop. A bottom dump station will be established on the entrance to the loop and a wash bay will be established following the dump station. Two areas of the rail loop will be laid upon culverts such that water flows into/out of the area enclosed by the rail loop are maintained.

The Caley Valley Wetlands are a wetlands of high ecological significance in a catchment for the Great Barrier Reef. The proposed rail loop has the potential to significantly impact on the values of the wetlands both directly, through location of the rail line in the wetlands, and indirectly through changes in water quality resulting from changes in freshwater and tidal hydrology, and release of contaminants to the wetland during and after construction.

Maintaining the current hydrology of the wetlands is critical to maintaining salinity gradients, to prevent drying and subsequent oxidation of acid sulfate soils, and to maintain natural wet and dry cycling, all of which affect the flora and fauna assemblages and ultimately the value of the wetlands to shorebirds (including migratory shorebirds).

Commenting on the EIS, SEWPaC noted that the proponent needs to address the impacts of the project on the values of the World Heritage Area to which the wetlands are connected.

This Evaluation Report sets conditions to ensure that offsets for the wetlands affected by the project must be determined using the ecological equivalence methodology as detailed within the Biodiversity Offsets Policy October 2011. An offset proposal must be developed by the proponent and approved by DEHP prior to any construction within the Caley Valley Wetlands.

I conclude that, until final design plans are concluded and submitted to the State Development Area (SDA) branch of my office for material change of use (MCU) approval, it is not possible to address all the impacts of the rail loop on the wetlands. I have instructed that both trestle and bund construction methods be examined and that all impacts be assessed when this is submitted in order that proper mitigation controls are put in place. I have included a number of conditions in this Evaluation Report to ensure impacts are mitigated.

#### *Impact of rail on surface water and flooding*

The proposed project rail line traverses the Logan Creek/Brown Creek floodplain system, a catchment area of approximately 2600 square km forming a significant portion of the Suttor Sub-Basin (18 000 square km) in the Burdekin River Catchment. The terrain is predominantly flat with significant flood plains. Land use is dominated by grazing on natural pastures. The landscape is semi-arid with predominantly ephemeral streams (that typically flow during the wet season between December and April). The EIS stated that the construction and the subsequent presence and operation of the project is likely to impact natural stream levels and may cause local erosion (scouring).

One of the primary concerns of landholders from the EIS and during the consultation process was related to the change in duration of inundation due to the development of the project rail alignment.

In mid-2011, the former Coordinator-General advised the proponent that the EIS evaluation did not adequately assess the effect of the rail line and associated waterway crossings on overland flow and flood waters, and that a detailed hydraulic/hydrologic model of each waterway crossing and the broader impact of the rail line was required.

Subsequently, the proponent undertook a detailed floodplain study of the impact of construction of the project railway on creek/river systems along the alignment and this was submitted as part of the addendum to the SEIS. The addendum reports indicate that the proposed cross drainage for the single-track railway can meet the modified drainage design criteria required for the proposed rail corridor.

In general, it appears that proposed cross drainage provisions for the floodplain areas are acceptable, based on the results of the modelling, although this needs to be confirmed by a more detailed review of the proposed cross drainage structures and the modelling results closer to the detailed design stage.

I consider that the railway cross-drainage can be designed to meet the required criteria such as afflux, culvert velocity, inundation duration and extent as outlined in the conditions on those matters specified in this report.

## Conclusion

I consider that the environmental impact assessment requirements of the SDPWO Act for the project have been satisfactorily fulfilled and that sufficient information has been provided to enable a proper evaluation of the potential impacts attributable to the project.

I conclude there would be significant local, state, regional and national economic benefits to be derived from the project and that any adverse environmental or social impacts can be acceptably avoided, minimised, mitigated and/or offset through the implementation of the measures and commitments outlined in the EIS documentation provided by the proponent. Conditions and recommendations proposed in this report have been formulated in order to further manage impacts to social, environmental and economic values through Management Plans, Environmental Authorities and Development Permits.

Accordingly, I recommend approval of the project, as described in this Evaluation Report, subject to the conditions and recommendations set out in Appendices 1 to 4 of this report.

This report will now be provided to the Australian Government Minister for the Environment, pursuant to section 36(2) of the SDPWO Regulation and the Bilateral Agreement between the State of Queensland and the Australian Government to enable a decision on approval of the controlled action for this project pursuant to section 133 of the EPBC Act.

Following this report, the proponent will be required to obtain a number of State and local government approvals, including for environmentally relevant activities, a granting of an environmental authority for a Mining Lease, operational works approvals for clearing native vegetation and waterway barriers, and an MCU for work undertaken within the SDA at Abbot Point.

A copy of this report will be provided to the proponent, nominated entities with responsibilities for compliance with imposed conditions and other relevant advisory agencies and will be made publicly available on the Coordinator-General website at: [www.deedi.qld.gov.au/cg/alpha-coal-project.html](http://www.deedi.qld.gov.au/cg/alpha-coal-project.html)



Barry Broe  
Coordinator-General

24 May 2012

# 1. Introduction

This Coordinator-General's report evaluates the environmental impact statement (EIS) jointly prepared by Hancock Coal Pty Ltd, Hancock Coal Infrastructure Pty Ltd and Hancock Alpha West Pty Ltd (the proponent) (previously Hancock Prospecting Pty Ltd for the Alpha Coal Project (the project)).

The key components of the project are:

- a 30 million tonnes per annum (mtpa), open-cut thermal coal mine in the Galilee Basin in Queensland
- a rail line approximately 495 kilometres long to enable export of product coal, via transport to the Port of Abbot Point.

This report represents the conclusion of the Queensland Government's impact assessment process. For information on the EIS process, including details of the organisations and individuals who commented on the proponent's EIS, refer to Section 3 of this report (page 13).

This report includes an assessment and conclusion about the environmental effects of the project and the proposed mitigation measures. The report evaluates the environmental impact statement (EIS) for the project, the issues raised in submissions, the supplementary EIS (SEIS), the addendum to the SEIS, and the advice received from state and local government agencies and the Australian Government Department of Sustainability, Environment, Water, Population and Communities (SEWPaC). The report does not record all matters identified and subsequently settled during the EIS process—it concentrates on the substantive environmental effects and related matters identified during the EIS process.

In addition to advice from advisory agencies, the then Coordinator-General contracted RPS Australia East Pty Ltd (RPS) to assist in the evaluation of the tailings storage facility, waste rock, stream diversions and railway crossings/flooding.

Pursuant to section 35A of the SDPWO Act, this report lapses four years from the execution date of this report by the Coordinator-General, unless the project substantially starts construction within this four-year period.

## **2. About the project**

### **2.1. The proponent**

The proponents for the project are by Hancock Coal Pty Ltd (HCPL), Hancock Coal Infrastructure Pty Ltd (HCIPL) and Hancock Alpha West Pty Ltd (the proponent).

When declared, the project proponent was Hancock Prospecting Pty Ltd (HPPL). HPPL is an Australian company that has engaged in mineral resources exploration and development for over 50 years, with capability encompassing iron ore, thermal coal, uranium, molybdenum, lead, zinc, gold, diamonds and petroleum. The company has a long-standing interest in developing the Galilee Basin, having held substantial coal tenements and conducted investigations in the Alpha region since the 1970s.

In September 2011 the company GVK Coal Developers (Singapore) Pte Limited (GVKCDPL) acquired from HPPL a 79 per cent interest in the Alpha Coal Project—Mine (via Hancock Coal Pty Ltd and Hancock Alpha West Pty Ltd, with 21 per cent ownership of both companies remaining with HPPL) and a 100 per cent interest in the Alpha Coal Project—Rail (via Hancock Coal Infrastructure Pty Ltd).

### **2.2. Project description**

The proposed Alpha Coal Project is a 30 mtpa product open-cut thermal coal mine to target the C and D seams in the Upper Permian (Bandanna Formation) coal measures of the Galilee Basin, Queensland, Australia.

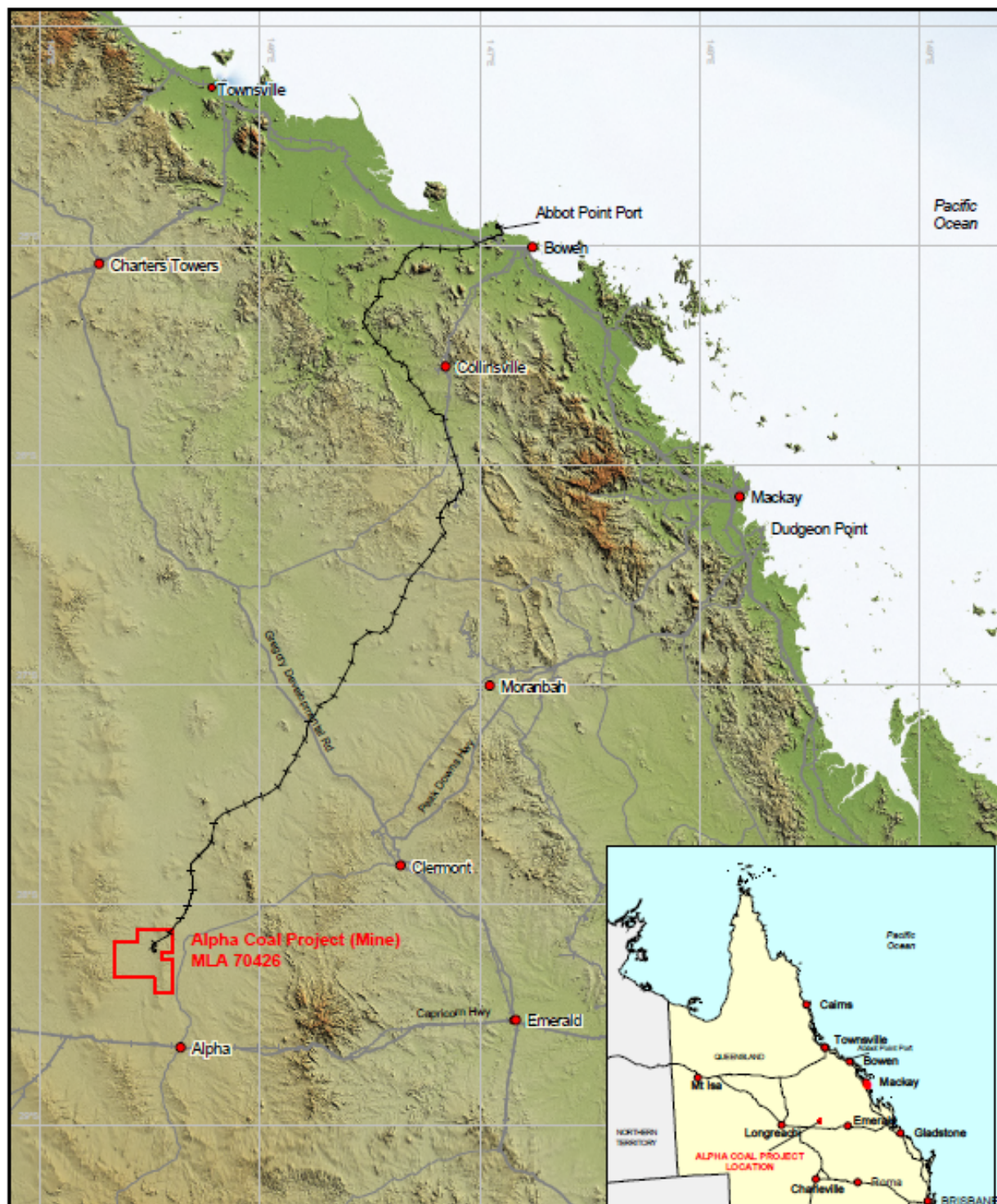
The coal mine component of the project will be supported by the development of a privately owned and operated standard gauge, single-track, non-electrified, 495-kilometre-long railway line for the purposes of transporting coal from the proposed Alpha Coal Mine to the Port of Abbot Point near Bowen for export.

#### **2.2.1. Location**

The proposed mine is located on Mining Lease Application (MLA) 70426 in Central Queensland, within the Barcaldine Regional Council area. The mine site is approximately 50 kilometres north of the Alpha township.

The proposed rail line connects the Alpha Coal Mine to the Port of Abbot Point, traversing the Barcaldine, Isaac and Whitsunday Regional Council areas.

Figure 2.1 shows the location of both components. Further details for each project component can be found in section 2.2.2 (page 5).



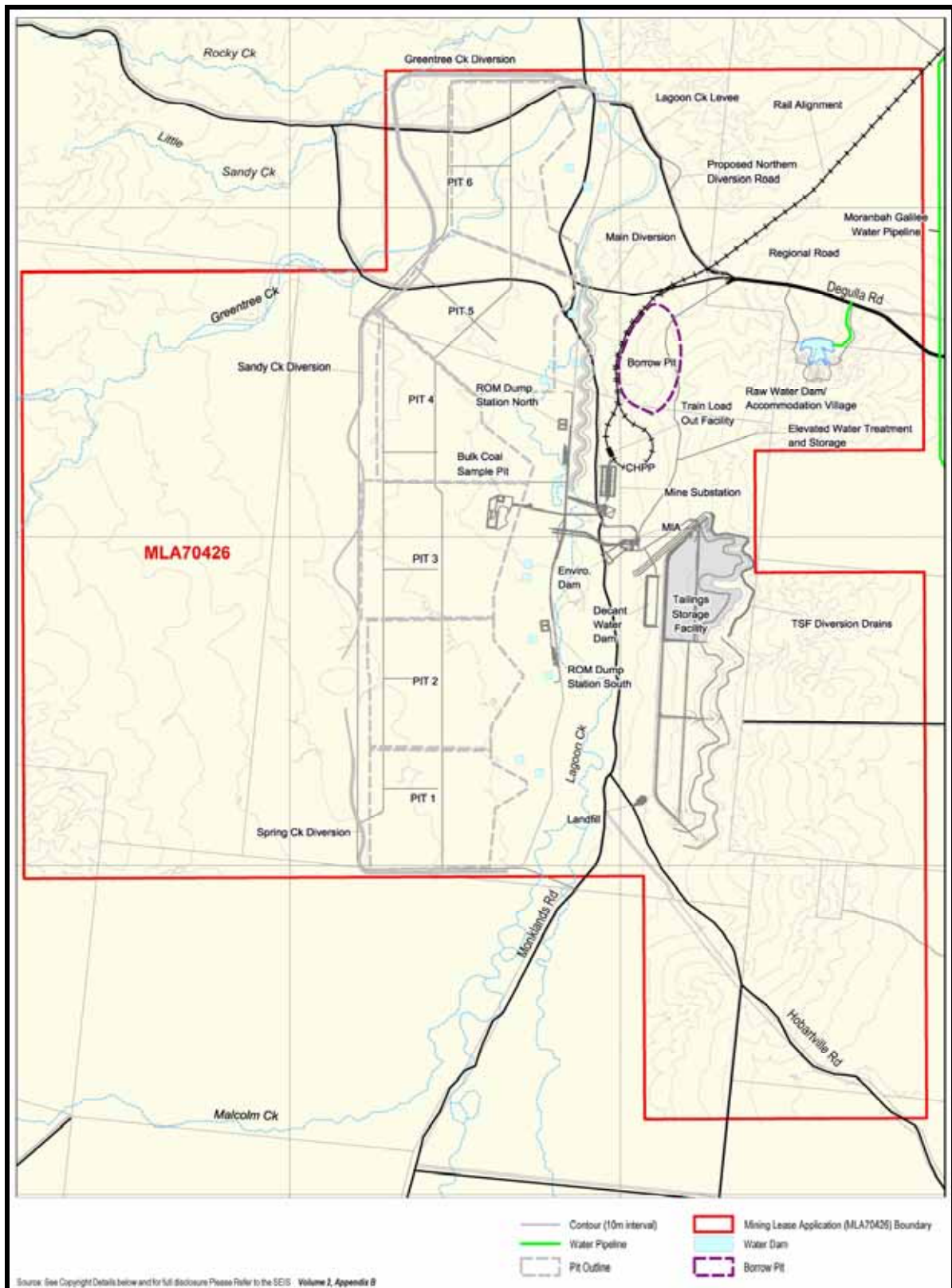
**Figure 2.1** Proposed location of the Alpha Coal Mine and associated railway line

### **2.2.2. Project components—mine**

The coal mine will be a new open-cut thermal coal mine located within MLA 70426 (refer to Figure 2.2). MLA 70426 is over Exploration Permit for Coal (EPC) 1210 and Mineral Development Licence (MDL) 333. The open-cut coal mine is proposed to produce 30 mtpa of thermal coal for the export market for the scheduled life-of-mine (LOM) of 30 years.

The coal mine component of the project is to comprise six open-cut pits, with a total strike length of approximately 24 kilometres across MLA 70426. The overburden will be removed by truck and shovel, dragline and in-pit crushing and conveying (IPCC) methods. The overburden will initially be stockpiled in out-of-pit spoil placement areas and then used to backfill the open-cut pits. The coal will be mined by excavators and transported by truck. Raw coal will pass through one of two run-of-mine (ROM) facilities where it will be reduced in size for further processing at the coal handling and preparation plant (CHPP).

Sized raw coal will be transferred from the ROM facilities via conveyors to the multi-module CHPP, where it will be washed. All coal mined and placed through the ROMs will be processed to produce a 9.5 per cent ash export thermal product. A tailings storage facility (TSF) is required for the fine rejects (referred to as 'tailings') for at least the first five years of operation after which an in-pit option is being explored. The coarse rejects from the CHPP will be placed in designated locations within the open-cut pit (as backfill).



**Figure 2.2 Alpha Coal Project (mine) project layout**  
(extracted from SEIS Appendix C, figure C-3)

### 2.2.3. Project components—Rail

The proposed project includes the development of a standard gauge, 495-kilometre railway line for transporting coal from the mine to the Port of Abbot Point for export, and associated coal unloading facilities. The rail component of the project comprises a single-track, non-electrified rail corridor extending between the mine and Abbot Point and includes eight passing loops, maintenance sidings, signalling, a marshalling yard, a balloon loop at the mine and at the port, and accommodation facilities at selected locations along the corridor.

The proposed rail line will enable export of 60 mtpa of thermal coal over a lifetime of 30 years from the mine component of this project (and the adjoining Kevin's Corner project). The EIS assessment and this Evaluation Report only addresses impacts of the construction and operation of a rail line with capacity of 60 mtpa the Galilee Basin and the Abbot Point Coal Export Terminal.

The project is one of a number of major projects proposed for the currently undeveloped Galilee Basin. Other projects include the Kevin's Corner project (30 mtpa), the Galilee Coal (Northern Export Facility) project (40 mtpa), the South Galilee Coal project (SGCP) (up to 20 mtpa) and the Carmichael Coal Mine project (60 mtpa). During the evaluation of this project the issue of potentially co-locating rail lines and other corridors, and road crossing and rail crossing structures has been raised.

Concerns have been raised by land owners about the impact during times of flood if the line is duplicated at a later date, as many of the flood mitigation structures proposed for this project would have to be upgraded or replaced on the original line in order to connect and operate with additional lines. Any duplication of the proposed rail line would require a full assessment process.

The State Government's desire is to minimise the impacts of infrastructure connecting the Galilee Basin to coastal ports. The Government has a clear policy position on the development of infrastructure required to serve the needs of the Galilee Basin. The preference is to have one multi-user corridor and this has been communicated to the proponents.

Any future change to the proposed project, such as the construction of additional passing loops to the single line track and selective partial duplication, is beyond the current project scope as assessed in the EIS and supplementary material, and would be subject to further assessment.

The EIS outlined how the proponent has undertaken to make the track available to third party users under a Voluntary Undertaking pursuant to the *Trade Practices Act 1974* (refer EIS, Volume 3, Section 1.5.1). In the first instance the single rail line proposed for this project will contain eight passing loops each approximately five km long to transport 60 million tonnes per annum. I note that the Drainage Engineering Report provided in the SEIS (refer Volume 2, Appendix Y) considered the impacts of the project on the basis of the single line only.

If duplication of the single line proposed within this project is to be undertaken, further assessment will be necessary, and new modelling of flood impacts would be required.

## **2.2.4. Port facility component related to this project**

When declared, the IAS for the project made reference to the assessment and approval of coal handling and export facilities at the Port of Abbot Point. The proponent has since advised that assessment and approval of the port component is being undertaken via a separate process, as outlined below. As a result, this evaluation report does not include assessment of the port facilities associated with the mine and rail components.

The assessment provided within the EIS documentation for this project (including the EIS, SEIS and Addendum to SEIS) includes assessment of mine and rail project components including the rail loop at Abbot Point, up to the point of unloading of coal wagons in Abbot Point.

The existing Abbot Point Coal Terminal managed by North Queensland Bulk Ports (NQBP), referred to as T1 or X50, comprises a rail in-loading facility, coal handling and stockpile areas, and a single trestle jetty and conveyor connected to a berth and ship loader, located 2.75 kilometres off shore.

NQBP identified the need to expand the existing coal export terminal capacity at Abbot Point to 110 mtpa and developed plans to facilitate the development of two additional separate tranches of coal terminal capacity. These tranches are termed the T2 (previously X80) and T3 (previously X110) projects.

In 2008, a referral was lodged with SEWPaC (EPBC 2008/4468) and the X110 coal terminal expansion proposal was designated as a controlled action under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) (EPBC Act). Preliminary documentation was prepared by NQBP and issued by the Australian Government for public review on 23 November 2009.

In late 2009, NQBP initiated an expression of interest process to identify potential developers for the X110 project, awarding preferred developer status for new coal export terminal facilities to Hancock Coal Infrastructure Pty Limited (HCIPL) and BHP Billiton, splitting the X110 site between the parties and allocating the re-named Terminal 3 (T3) to HCIPL and Terminal 2 (T2) to BHP Billiton.

The Framework Agreement which guides the T3 development process was signed formally by NQBP and Hancock in early 2012, having been considered and endorsed by shareholding ministers. The agreement includes a preference for two offshore berths and includes 60 mtpa of stockpile capacity near the existing coal terminal (T1).

The proponent requested that assessment of T3 continue under the existing referral lodged for X110. Accordingly, the referral transfer has been confirmed in notifications by NQBP and HCIPL pursuant to section 156F (1) of the EPBC Act. HCIPL has subsequently submitted to SEWPaC a variation to the proposal made under section 156B of the EPBC Act (EPBC: 2008/4468), for the former X110 development, which was accepted on 8 August 2011.

The X110 project (now T3) was declared a significant project not requiring an EIS under the SDPWO Act, as published in the Queensland Government Gazette on 28 November 2008. Part of the T3 footprint is located on Strategic Port Land; however, as the proposed land use is consistent with the Port of Abbot Point Land Use Plan<sup>1</sup> further development approval under this land use plan is not required. Part of the T3 footprint is also located on land contained within the Abbot Point State Development Area (SDA) and as such, will require a material change of use (MCU) under the Abbot Point SDA Development Scheme. The proposed use is consistent with allowed uses in the SDA.

### **2.2.5. Development stages**

The construction phase for the mine and associated rail is envisaged by the proponent to take nominally 48 and 30 months, respectively.

The life of mine (LOM) for the mine is 30 years, commencing in 2016, and the rail component is also expected to become operational in 2016. The LOM considered for this EIS is 30 years; however, it is possible that there will be sufficient resources to potentially extend the project life beyond 30 years. Any extension of mining activities would be subject to further assessment and approval in the future.

### **2.2.6. Dependencies and relationships with other projects**

The project is dependent on a range of additional key services and facilities for effective implementation. Those additional services and facilities include the following projects that are currently the subject of separate environmental approvals:

- the proposed Connors River Dam and Moranbah to Galilee Basin Pipeline projects proposed by SunWater, providing water to the mine component and other Galilee Basin projects
- the high voltage power transmission line proposed by Powerlink (termed the Galilee Basin Transmission Project), which would provide power to the mine site and other Galilee Basin projects. Powerlink is proposing the development of a new 275 kilovolt transmission line from its existing Lilyvale Substation (near Emerald) to a new substation near Alpha.

Proposed projects that link directly with the Alpha Coal Project are:

- The proposed Kevin's Corner project: This coal mine project adjoins the northern boundary of the Alpha Coal Project mine footprint, and is proposed by an associated proponent, Hancock Galilee Pty Ltd. The rail line component of the Alpha Coal Project is also proposed to be used by the adjoining Kevin's Corner Project to transport product coal to Abbot Point, which fully uses the 60 mtpa capacity of the currently proposed and assessed rail line.

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<sup>1</sup> North Queensland Bulk Ports Corporation Limited, 2010, Port of Abbot Point Land Use Plan, North Queensland Bulk Ports Corporation Limited, Brisbane, viewed 23 May 2012, <<http://www.nqbp.com.au/publications/PortofAbbotPointLandUsePlan.pdf>>

- Abbot Point Coal Terminal X110 Expansion Project (also known as Terminal 2 (T3): Hancock Coal Infrastructure Pty Ltd is the preferred developer for the onshore T3 coal terminal, through which the coal produced and transported by the Alpha Coal project will be transferred to offshore shipping berths.
- Galilee Coal Project. Waratah Coal Pty Ltd proposes to develop a new coal mine in the Galilee Basin adjacent to the Alpha site (to the south) to supply thermal coal to overseas customers.
- South Galilee Coal Project (a joint venture between AMCI (Alpha) Pty Ltd (AMCI) and Alpha Coal Pty Ltd, a subsidiary of Bandanna Energy Limited). The proponents propose to develop a new coal mine in the Galilee Basin, south of the Alpha project, to supply thermal coal to overseas customers.

### **2.2.7. Project changes**

Following the release of the EIS in late 2010, updates were made to the geological model whereby a more detailed understanding of the geological stratigraphy, coal reserves, and coal quality of the proposed mine area became known. The improved geological model and further development of the coal processing design improved predicted coal yield by approximately 4 per cent. The mining method presented in the EIS was a conventional dragline and truck-shovel pre-strip operation with coal haulage by bottom-dump coal haulers. Following further review of the proposed mining methods, two IPCC systems were included in the revised mine plan presented in the SEIS. By introducing IPCC and reducing mine waste, the mining operation at its peak will require 65 fewer 360-tonne rear-dump trucks to haul overburden material.

The use of IPCC results in reduced requirements for mobile mining equipment, such as excavators and trucks, which in turn will mean less diesel/consumable consumption during the mining process. Predictions of greenhouse gas emissions from diesel were reduced by approximately 56 per cent. One of the largest contributors to potential dust impacts at the mine site is wheel-generated dust. By utilising the IPCC, the numbers of trucks and vehicle kilometres travelled (VKT) are reduced. Total Suspended Particulate (TSP) emissions are expected to reduce from approximately 390 599 tonnes to approximately 262 348 tonnes, and emissions of PM<sup>10</sup>, from approximately 96 040 tonnes to approximately 64 506 tonnes. This corresponds to a reduction of approximately 33 per cent for both particle fractions over the life of the mine. Furthermore, IPCC systems have dust control mitigation measures, particularly at the crushing points, to mitigate dust generation; and noise impacts will also be reduced.

The EIS proposed a total mine strike length of approximately 24 kilometres to be divided into four pit areas with 11 ramps utilised for mining. In the SEIS, the number of pits has increased from 4 to 6 and ramps reduced from 11 to 6. The main rationale for the change in the number of pits and ramps was to increase mining efficiency through better facilitating the mining methods described above.

The disadvantage of increasing the number of pits is that it will result in more resource sterilisation. The changes in the mine plan will also result in additional ramps that will result in a larger final void at the end of the 30-year mine life than was predicted in the EIS. Assuming the final void remains as it is currently predicted at the end of mining

(i.e. no slope changes or partial backfilling), there would be an increase in final void area of approximately 17 per cent between the EIS and the SEIS.

## 2.3. Project rationale

The project is aimed at assisting in filling the widening gap between existing global coal production and worldwide demand by becoming a provider within the world thermal coal market, especially to the growth markets in Asia. Coal continues to have a major role in both social and economic development worldwide. The objectives of the project are to:

- obtain optimal production and sales from the available resources
- design, construct, and operate a mine and railway line, comprising health, safety, environment and community standards and indicators, and comply with legislation and industry best practice
- use existing, proven strategies and industry best practice to minimise impacts on the environment and the communities associated with the project.

Coal resources in the Galilee Basin are currently undeveloped. The global demand for good quality thermal coal presents an opportunity to develop this area.

The project meets Queensland Government objectives in realising the timely development of the Galilee Basin while ensuring the community benefits and environmental objectives are supported, therefore contributing to a four pillar economy.

Overarching project-wide benefits include:

- employment for construction, operation, and other indirect employment benefits, including (as presented in Appendix A of the Addendum to the Supplementary EIS):
  - approximately 3600 jobs predicted during construction (1500 mine, 2100 rail) including contractors
  - approximately 990 jobs predicted during operational (800 mine, 190 rail) including contractors
  - indirect employment benefits
- significant export income
- local and state economic benefits
- improved infrastructure into the region, including upgrades to roads and airport, and introduction of additional power and water supplies to the region
- significant State and government taxes and royalties.

## 3. Impact assessment process

### 3.1. Overview

This section of the report details the steps involved in the project's EIS assessment process. Table 3.1 shows the key steps in this project's EIS process.

**Table 3.1 Overview of EIS process**

Date	Process
18 September 2008	Final initial advice statement and request for project declaration received
24 October 2008	Project declared 'significant project' by Coordinator-General
13 January 2009	Australian Government determined project is a 'controlled action'
7 February 2009	Submission period on draft terms of reference (TOR) commenced
9 March 2009	Submission period on draft TOR closed
1 June 2009	TOR finalised
24 September 2010	EIS provided to Coordinator-General for evaluation
5 November 2010	EIS released for public and agency comment (6-week period)
20 December 2010	Submission period on EIS closed
11 April 2010	Supplementary information provided to Coordinator-General for evaluation
5 September 2011	Supplementary project information available for public and agency comment (4-week period)
3 October 2011	Submission period on supplementary project information closed
21 November 2011	Addendum to supplementary information available for public and agency comment (4-week period)
19 December 2011	Submission period on Addendum supplementary information closed

For a detailed explanation of the general EIS process, refer to [www.projects.industry.qld.gov.au](http://www.projects.industry.qld.gov.au)

In evaluating the project, I have considered the following:

- initial advice statement (IAS)
- EIS
- issues raised in submissions relating to the EIS
- supplementary information (SEIS)
- addendum to SEIS
- technical reports
- agency advice on the EIS, SEIS and addendum to the SEIS from:
  - Department of Environment and Resource Management (DERM) (now the Department of Environment and Heritage Protection—DEHP)

- Department of Transport and Main Roads (TMR)
- Queensland Health
- Barcaldine Regional Council (BRC)
- Department of Employment, Economic Development and Innovation (DEEDI)
- Queensland Police Service (QPS)
- Department of Communities
- Department of Community Safety (DCS)
- Department of Infrastructure and Planning (DIP).<sup>2</sup>
- comments and properly made submissions<sup>3</sup> from members of the public.

## 3.2. Significant project declaration

The Coordinator-General declared this project to be a ‘significant project’ under section 26(1)(a) of the Queensland *State Development and Public Works Organisation Act 1971* (SDPWO Act) on 24 October 2008. This declaration initiated the statutory environmental impact evaluation procedure of Part 4 of the Act, which requires the proponent to prepare an EIS for the project.

## 3.3. Controlled action

On 13 January 2009 the Commonwealth Minister for Sustainability, Environment, Water, Population and Communities (Commonwealth Environment Minister) determined that the project is a ‘controlled action’<sup>4</sup> under the EPBC Act. The relevant controlling provisions under the EPBC Act are:

- sections 12 and 15(a) world heritage properties
- sections 15B and 15(c) national heritage places
- sections 18 and 18(a) listed threatened species and ecological communities
- sections 20 and 20(a) migratory species protected under international agreements.

A bilateral agreement exists between the Australian and Queensland governments that allows the Queensland Government to conduct the EIS assessment process to meet the needs of both jurisdictions. Section 11 of this report lists each controlling provision under the EPBC Act and explains the extent to which the Queensland Government EIS process addresses the potential impacts of the project on the matters covered by each provision.

The Commonwealth Environment Minister will use the information in Section 11 to assess the project under the EPBC Act.

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<sup>2</sup> Following the EIS submission process for the project, the names of several Queensland Government agencies changed. For more information, refer to the Glossary on page 385 of this report.

<sup>3</sup> For a definition of a ‘properly made submission’, refer to the Glossary on page 385 of this report.

<sup>4</sup> For a definition of ‘controlled action’, refer to the Glossary on page 385 of this report.

### 3.4. Terms of reference

The draft TOR was released for public and advisory agency comment from 7 February 2009 until 9 March 2009.

Twenty-two submissions were received on the draft TOR; eighteen from advisory agencies, three from non-government organisations and one from a private submitter.

### 3.5. Review of the EIS

The EIS, prepared by the proponent, was released for public and advisory agency comment from 5 November 2010 until 20 December 2010. The Coordinator-General allowed some late submissions to be received, as some people were unable to access the EIS due to the floods that occurred in Central Queensland at the time.

Forty-three submissions were received on the EIS. Table 3.2 summarises the number of public and agency submissions on the EIS. For an assessment of the environmental impacts of this project, refer to later sections of this report

**Table 3.2 Public and agency comments received on the EIS**

Agency	No. submissions	Issue
<b>Queensland Government</b> <ul style="list-style-type: none"> <li>• Department of Communities</li> <li>• Department of Community Safety</li> <li>• Department Employment, Economic Development and Innovation</li> <li>• Department Environment and Resource Management</li> <li>• Department of Infrastructure and Planning</li> <li>• Department of Transport and Main Roads</li> <li>• QH</li> <li>• QPS</li> </ul>	9	<ul style="list-style-type: none"> <li>• Air quality</li> <li>• economic impacts</li> <li>• EMP</li> <li>• employment</li> <li>• erosion and sediment control (rail corridor)</li> <li>• flooding and safety</li> <li>• flora and fauna</li> <li>• geochemistry of waste rock</li> <li>• geology</li> <li>• groundwater</li> <li>• impact on APSDA, including wetlands,</li> <li>• offsets</li> <li>• pest control</li> <li>• rail/road crossings</li> <li>• rehabilitation</li> <li>• road impacts</li> <li>• road-use management plan</li> <li>• safety and security.</li> <li>• social</li> <li>• surface water (including stream diversions)</li> <li>• traffic management</li> <li>• tailing storage facility</li> <li>• surface waterway impacts.</li> </ul>

Agency	No. submissions	Issue
<b>Australian Government</b> <ul style="list-style-type: none"> <li>• Department of Sustainability, Environment, Water, Population and Communities</li> </ul>	<b>1</b>	Matters of National Environmental Significance
<b>Local government</b> <ul style="list-style-type: none"> <li>• Barcaldine Regional Council</li> <li>• Blackall-Tambo Regional Council</li> <li>• Central Highlands Regional Council</li> <li>• Isaac Regional Council</li> <li>• Whitsunday Regional Council</li> </ul>	<b>5</b>	<ul style="list-style-type: none"> <li>• Flooding</li> <li>• groundwater</li> <li>• infrastructure</li> <li>• other environmental impacts</li> <li>• rehabilitation</li> <li>• rail impacts</li> <li>• road impacts</li> <li>• social</li> <li>• surface water.</li> </ul>
<b>Private organisations/ community groups</b> <ul style="list-style-type: none"> <li>• QR National Network Services</li> <li>• Capricorn Conservation Council</li> <li>• CFMEU</li> <li>• Environmental Defenders Office of North Queensland</li> <li>• Bimblebox Nature Refuge</li> <li>• QCoal Pty Ltd</li> <li>• AMCI</li> <li>• Mackay Conservation Group</li> </ul>	<b>8</b>	<ul style="list-style-type: none"> <li>• Biodiversity</li> <li>• cumulative impacts</li> <li>• flooding along rail corridor</li> <li>• flora and fauna</li> <li>• geological and soil assessment</li> <li>• GHG emissions</li> <li>• interface with existing railways</li> <li>• rail alignment and capacity</li> <li>• road improvements</li> <li>• social</li> <li>• sterilisation of coal resources</li> <li>• third party rail access</li> <li>• traffic.</li> </ul>
<b>Private individuals</b>	<b>20</b>	<ul style="list-style-type: none"> <li>• Dust</li> <li>• erosion</li> <li>• flooding</li> <li>• groundwater</li> <li>• road impacts</li> <li>• stream diversions</li> <li>• surface water</li> <li>• weed control.</li> </ul>
<b>TOTAL</b>	<b>43</b>	

## 3.6. Supplementary information

The Coordinator-General requested in 2011 that the proponent submit supplementary information to address public and agency comments on the EIS. The Supplementary EIS (SEIS) prepared for the proponent was provided to advisory agencies and submitters on the EIS for comment from 5 September 2011 to 3 October 2011; fourteen submissions were received (refer Table 3.3). The SEIS was also available online.

Table 3.3 summarises submissions from advisory agencies and EIS submitters on the supplementary information provided by the proponent. For an assessment of the project's key issues and potential impacts, refer to later sections of this report.

**Table 3.3 Submissions received on supplementary project information**

Agency	No. submissions	Issue
<b>Queensland Government</b> <ul style="list-style-type: none"> <li>• TMR</li> <li>• Queensland Health</li> <li>• DEEDI</li> <li>• Queensland Police Service</li> <li>• Dept of Communities</li> <li>• DERM</li> <li>• Dept of Community Safety</li> </ul>	<b>9</b>	<ul style="list-style-type: none"> <li>• Acid sulfate soils</li> <li>• air emissions</li> <li>• coal dust</li> <li>• emergency management</li> <li>• employment</li> <li>• flooding</li> <li>• groundwater</li> <li>• hazard and risk.</li> <li>• over dimensional vehicles</li> <li>• offsets</li> <li>• regional employment</li> <li>• road safety</li> <li>• security</li> <li>• social</li> <li>• stream diversions</li> <li>• surface water flows</li> <li>• traffic impact assessment</li> <li>• tailing storage facility</li> </ul>
<b>Australian Government</b> <ul style="list-style-type: none"> <li>• Department of Sustainability, Environment, Water, Population and Communities</li> </ul>	<b>1</b>	Matters of National Environmental Significance
<b>Local government</b> <ul style="list-style-type: none"> <li>• Barcaldine RC</li> </ul>	<b>1</b>	<ul style="list-style-type: none"> <li>• Social</li> <li>• infrastructure</li> <li>• infrastructure upgrades</li> <li>• rehabilitation</li> <li>• groundwater</li> <li>• surface water</li> <li>• flooding.</li> </ul>
<b>Private organisations/ community groups</b> <ul style="list-style-type: none"> <li>• Capricorn Conservation Council</li> </ul>	<b>1</b>	<ul style="list-style-type: none"> <li>• Stream diversion</li> </ul>

Agency	No. submissions	Issue
Private individuals	2	<ul style="list-style-type: none"> <li>• impact of rail on livestock</li> <li>• fencing along road corridors</li> <li>• flooding along rail corridor</li> <li>• road/rail crossings</li> </ul>
<b>TOTAL</b>	<b>14</b>	

### 3.7. Addendum to supplementary information

Following the release of the SEIS and consideration of submissions received, the then Coordinator-General also requested the proponent prepare an addendum to the SEIS. This was provided to Queensland Government agencies for comment. Table 3.4 summarises the issues raised in submissions by advisory agencies.

**Table 3.4 Submissions received from Queensland Government agencies on the addendum to the supplementary project information**

Agency	No. submissions	Issue
<b>Queensland Government</b> <ul style="list-style-type: none"> <li>• TMR</li> <li>• Queensland Health</li> <li>• DERM</li> <li>• Dept of Community Safety</li> </ul>	4	<ul style="list-style-type: none"> <li>• Effects of rail on existing rail infrastructure and road reserve</li> <li>• air quality</li> <li>• social impacts</li> <li>• stock routes</li> <li>• rail loop at Abbot Point</li> <li>• tailing storage facility</li> </ul>

## 4. Project approvals—mine

The SDPWO Act establishes the framework for environmental assessment of declared significant projects in Queensland and coordinates the relevant state and local development assessment jurisdictions for the project. The environmental impact assessment is undertaken in accordance with the provisions of Part 4 of the SDPWO Act and evaluation of the EIS is pursuant to section 35 of the Act.

### 4.1. Local approvals

The Alpha Coal Project (Mine) site is wholly located within the Barcaldine Regional Council (BRC) area. The BRC was formed on 15 March 2008 following the amalgamation of the shires of Aramac, Barcaldine and Jericho. The mine site is located within the former Jericho Shire Council area. Under the transitional arrangements for the amalgamated councils, the planning schemes for the former shires remain applicable in assessing development until a new regional council planning scheme comes into effect.

In the case of the mine, the Jericho Shire Planning Scheme remains the planning scheme against which any applicable assessable development would be assessed off the mining lease.

All aspects of development of a mining activity for which an environmental authority (EA) (mining lease) applies are exempt from assessment against a local government planning scheme under the Sustainable Planning Act 2009 (SPA).

Notwithstanding the approval of the EAs for the project, BRC has raised several issues concerning the construction and operation of the mine that may impact upon local government infrastructure and services.

In particular, development approvals may be required from the BRC for any development off the mining lease that is not subject to section 319 of the MRA or Schedule 10 of SPA. For example, this may include any worker accommodation off the ML and, potentially, other forms of support infrastructure located off the ML, such as water pipelines, construction camps, residential accommodation and other supporting infrastructure such as water treatment and waste disposal facilities.

### 4.2. State approvals

The state-based planning and approvals framework applicable to the development of the mine is primarily established by the:

- *Mineral Resources Act 1989* (MRA), which regulates mining tenures
- *Environmental Protection Act 1994* (EP Act), which regulates environmentally relevant activities (ERAs) and environmental authorities (EAs) for mining and petroleum activities
- SPA, which regulates development off the mining lease areas.

Chapter 1 of the EIS and SEIS listed the anticipated approvals for the project. These approvals are also summarised in Table 4.1 and Table 4.2 of this report (pp. 22–23).

#### **4.2.1. Mining leases**

Mining and associated mining activities undertaken as part of the project will be carried out within MLA 70426.

Before mining commences, a mining lease must be granted by the Governor-in-Council pursuant to the MRA. This process is subsequent to the issue of the EA for mining activities pursuant to the EP Act.

#### **4.2.2. Environmental authority**

Under the EP Act, an EA is required to carry out ‘mining activities’ as defined under section 147 of that Act. The project would involve the following types of mining activities:

- mining under the MRA
- processing mined materials
- activities directly associated with, or facilitating or supporting, the mining and processing activities
- rehabilitation and/or remediation
- actions taken to prevent environmental harm.

DERM (now DEHP) has provided draft EA conditions and suggested recommendations for the mining activities on the proposed mining leases that are included in Appendix 1 and Appendix 3 of this report respectively and are referred to, where relevant, in the subsections of Section 5 of this report.

Under the EP Act, an environmental management plan (EM plan) must be submitted to the administering authority (DEHP) with the application for an EA. Approval of the EA and, therefore approval of the EM plan, is in accordance with the EP Act.

For the purpose of approvals required for the project, the EM plans for the EAs for mining activities (required under the EP Act) are distinguished from the other environmental management plans (EMPs) for construction and operation of all other components of the project that are not subject to the EAs.

Certain developments on the ML areas, that would otherwise be assessed against a local government planning scheme under SPA, would require a development permit to be directly obtained from the relevant assessment manager. For the project, these include:

- waterway barrier works—*Fisheries Act 1994* (Fisheries Act)
- watercourse diversions—*Water Act 2000* (Water Act)
- harvesting of water or interception of overland flow—Water Act
- taking or interfering with artesian or sub artesian water (i.e. construction of groundwater bores)—Water Act.

Should relocation of a road or stock route be required, permits would be required from the Department of Natural Resources and Mines (DNRM, formerly DERM) under the *Land Act 1994* for the closure and opening of a road.

In consultation with DNRM, conditions are stated, under section 49 of the SDPWO Act, contained in Appendix 1 of this report, that are to be included in the EA. A copy of this report will be provided to the Minister administering the EP Act.

#### **4.2.3. Environmentally relevant activities**

Under the EP Act, a development permit issued by DEHP is required to carry out an ERA. As mentioned in Section 4.2.2 above (Environmental authority), the provisions of the EA (mining activities) also provide authority for any ERAs under the EP Act that occur on the mining leases.

As discussed in the SEIS (Volume 1, Chapter 1), the proponent is also required to submit applications for ERAs that fall outside of the ML areas and EA.

#### **4.2.4. Other state approvals**

Other approvals may be required for project activities, for all components of the project, off the mining lease that are not related to the EA (mining lease) or development approval by local councils. These include the following:

- development permits:
  - development permit for waterway barrier works (off ML) under SPA and the Fisheries Act
  - taking or interfering with artesian or sub artesian water (i.e. construction of groundwater bore) (off ML) under SPA and the Water Act
  - harvesting of water or interception of overland flow—Water Act.
- other approvals (non-development):
  - Licence to interfere with stream flow (stream diversion) under the Water Act (a development approval is also required for the stream works)
  - riverine protection permits under the Water Act
  - permits for destroying flora and fauna protected by the *Nature Conservation Act 1992* (NCA)
  - permits for clearing protected plants under the Nature Conservation (Wildlife) Regulation 2006
  - beneficial re-use approval under Part 6A Environmental Protection (Waste Management) Regulation 2000
  - cultural heritage management plan (CHMP) under the *Aboriginal Cultural Heritage Act 2003* (ACH Act)
  - permit to work in or interfere with a state-controlled road under the *Transport Infrastructure Act 1994* (TIA).

Under section 87 of the ACH Act, a CHMP must be developed and approved where an EIS is required for a project. Furthermore, under section 88 of the ACH Act, the CHMP must be developed and approved prior to obtaining the EA, unless the EA contains

conditions requiring that an approved CHMP be in place before any activity occurs that could cause harm to Indigenous cultural heritage.

Tables 4.1 and 4.2 outline the state and local government approvals required for the project, including the development approvals mentioned above, together with certain other licences, permits and approvals identified during the EIS that are required for this project under other legislation.

### 4.3. Australian Government approvals

The project was declared by the Commonwealth Minister to be a controlled action pursuant to section 75 of the EPBC Act in January 2009, and the EIS process has been undertaken in accordance with the requirements of the bilateral agreement between the Queensland and Australian governments.

Therefore, subsequent to this report, the controlled action will be considered for approval under section 133 of the EPBC Act once the Commonwealth Minister has received this evaluation report prepared under section 35 of the SDPWO Act.

The Commonwealth Environment Minister will use the information in this report to make a decision under the EPBC Act as to whether the project should proceed, and if so, apply conditions to the approval necessary to limit the impact on MNES.

### 4.4. Summary of approvals required for the project

The project EIS and SEIS documents were prepared to provide the appropriate regulatory bodies with adequate information to assess the potential environmental, social and economic impacts of the project. To this end, approvals sought after the Coordinator-General's report are provided in Table 4.1.

**Table 4.1 Approvals sought by the proponent directly from the Coordinator General's report for the project**

Area	Approval sought
Coal mine	Mining Lease under MRA Environmental Authority under EP Act, including ERAs related to the mining activity

It is recognised that the project will require a range of additional approvals in order to proceed to construction and operation. Those approvals will be the subject of separate future applications and are expected to include, but not be limited to, those listed in Table 4.2

**Table 4.2 Subsequent approvals required for the Alpha Coal Project—coal mine**

Item	Legislation	Relevant approval	Status
Open new roads and stock routes	<i>Sustainable Planning Act 2009</i>	Reconfiguration of a Lot (RoL)	Off-tenure, location and details to be confirmed
Close on-tenure roads and stock routes	<i>Land Act 1994 and Land Protection (Pest and Stock Route Management) Act 2002</i>	Close roads and stock routes where on-tenure	On-tenure, location and details to be confirmed
Approval to undertake works and ancillary works on a state-controlled road	<i>Transport Infrastructure Act 1994</i>	Roadworks	Off-tenure, locations and details to be determined
Approval to make an alteration or improvement to a local government road	<i>Local Government Act 2009</i>	Roadworks	Off-tenure, locations and details to be determined
Approval for on site sewage treatment plant	<i>Plumbing and Drainage Act 2002</i>	Approval for on site sewage treatment plant	On-tenure, locations and details to be determined.
Licences required for referable and hazardous dams	<i>Water Act 2000</i>	Referable and hazardous dam applications	Locations and details to be confirmed.
Taking or interfering with water	<i>Water Act 2000</i>	Taking or Interfering with water	Location and details to be confirmed.
Licensing for bores, taking water for groundwater monitoring, dewatering and compensatory water supply	<i>Water Act 2000</i>	Taking and interfering with groundwater	On- and off-tenure as required, locations and details to be confirmed.
Riverine Protection Permit	<i>Water Act 2000</i>	Riverine Protection Permit	On- and off-tenure, locations and details to be determined
Clearing Permit of Least Concern Plants	<i>Nature Conservation Act 1992</i>	Protected Plant Permit	Location and details to be confirmed.
Mapping of Assessable Remnant Vegetation	<i>Vegetation Management Act 1999</i>	Property Map of Assessable Vegetation (PMAV)	Location and details to be confirmed.
Clearing Protected Plants	Nature Conservation (Wildlife Management) Regulation 2006	Species Management Program (SPM) and/or Damage Mitigation Permit	Location and details to be confirmed.

Item	Legislation	Relevant approval	Status
Clearing of Native Plants	<i>Vegetation Management Act 1999</i>	Clearing of Native Vegetation and High Value Regrowth	Location and details to be confirmed.
Clearing of Native Plants	<i>Vegetation Management Act 1999</i>	Clearing of Regional Ecosystems	Location and details to be confirmed.
Clearing of Native Plants	<i>Vegetation Management Act 1999</i>	Clearing of Essential Habitat Communities	Location and details to be confirmed.

## 5. Environmental impacts—mine

This section outlines the major environmental effects<sup>5</sup> of the coal mine component identified in the EIS, supplementary project information, addendum to the supplementary project information, submissions on the EIS and comments from advisory agencies and other stakeholders. This section includes a discussion and conclusion on the environmental effects and, where relevant, conditions or recommendations to address environmental impacts.

### 5.1. Terrestrial ecology impacts and offsets

#### 5.1.1. Overview

This section provides an assessment of terrestrial ecological values that may be affected by the mine component of the project, including MNES values where they correspond with state matters. For further discussion on MNES affected by the mine component of the project, see Section 11 of this report.

Specific components of the assessment of terrestrial ecology matters are considered separately under the headings:

- flora
- vegetation communities
- fauna
- weeds and pest animals
- offsets.

The mine site lies wholly within the Desert Uplands Bioregion. It is not located within or adjacent to any essential or important habitat area for state-listed threatened species, conservation park, declared fish habitat area, wilderness area, aquatic reserve, heritage or historic area, or area of cultural significance relating to biodiversity and scientific reserves. It lies approximately 10 kilometres south-east of Cudmore National Park and 8 kilometres south-south-east of Cudmore Resource Reserve. A nature refuge established in 2001 is also located approximately 6.5 kilometres south of the mine site.

This site lies within the upper Burdekin River catchment in the Belyando-Suttor sub-catchment. Watercourses on site are ephemeral, flowing in periods of high rainfall and the wet season. Several waterholes, oxbow lakes and dams on site, generally associated with the Sandy Creek and Lagoon Creek systems, may provide permanent water throughout the year. The EIS noted that the riparian habitat is in good condition across much of the project site but grazing pressures have caused bank erosion and siltation in some of the more accessible areas. Most stream beds are comprised of highly permeable coarse sands; however, some smaller watercourses exhibit deeper waterholes that provide a source of water into the dry season.

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<sup>5</sup> For a definition of 'environmental effects', refer to the Glossary on page 385 of this report.

As part of the EIS and SEIS, desktop research, field surveys and potential habitat modelling/mapping were undertaken to document the existing flora and fauna habitat values associated with the mine and rail components of the project, to assess the risks to flora and fauna, to identify any significant ecological constraints to development and recommend mitigation measures.

In the EIS, Volume 2: Coal Mine, Section 9 Terrestrial Ecology, Table 9-12 summarised vegetation communities identified on the project site, each regional ecosystem (RE) conservational status, and whether proposed mine open-cut pits or infrastructure is planned within each community. The terrestrial ecological assessment involved:

- a literature and database review to identify potential and known flora and fauna values within the project site and on adjacent lands
- field surveys across wet and dry seasons to capture seasonal variations in flora and fauna assemblages and map the extent and distribution of state significant flora and fauna values on site
- the preparation of a report outlining these values, potential impacts of the proposed project on these values and proposed mitigation measures to minimise these impacts
- the preparation of a draft biodiversity offsets strategy detailing the approach to offsets in accordance with state and Australian Government offset policies.

Field survey methodology and representative site selection were refined through consultation with DERM (now DEHP).

Eight site visits of the project site and surrounding tenements were undertaken between June 2008 and June 2010 by the proponent's consultants to conduct flora and fauna surveys. Flora study sites were located in areas representative of the project's vegetation types and involved collecting a detailed floristic inventory of the dominant and associated woody plants within each vegetation community. Fauna study sites were located in areas representative of the project's vegetation and habitat types and a range of trapping and survey techniques were employed including, but not limited to, pitfall trapping, Elliott trapping, habitat searching, avian observation, Anabat recording and spotlighting.

Some submissions on the EIS raised issues in relation to terrestrial ecology. Each of these submissions and how the SEIS responded to the issues raised have been considered. Issues that warranted additional information in order to adequately evaluate the project included:

- impacts to vegetation communities at the regional scale
- weed and animal pest management
- offsets for impacts that cannot be avoided or mitigated through proponent environmental management measures.

The proponent's response to these issues and my conclusions are set out in the following sub-sections.

## 5.1.2. Flora

### Issues

Sixty-three threatened flora species listed under the NCA were identified by database searches as known or potentially occurring within the wider study area.

A total of 418 flora species were identified on and adjacent to the project site. No threatened flora species listed under the NCA, or other species of conservation significance at the state level, were identified on the project's mine site.

Habitat modelling for all state-listed threatened flora species was undertaken as part of the SEIS to further refine the probability of these species occurring and identify potential habitat areas within or adjacent to the project site.

No essential or important habitat areas were identified on the project's mine site. The proponent determined that the project will not impact upon state-listed threatened flora species or any essential or important habitat area for these species. All native plants identified on the project site are considered protected plants under the NCA.

No threatened flora species listed under the NCA or essential or important habitat for these species (as defined by the former DERM) were identified on site during the field surveys. The project site does contain potential habitat for four NCA-listed threatened flora species. The absence of known populations for three of these species within or adjacent to the project site suggests that it is unlikely that any clearing of these potential habitats will significantly impact upon the long-term viability and geographical distribution of these species.

One NCA-listed species—the near threatened *Desmodium macrocarpum*—is known to occur in a nature refuge approximately 6.5 kilometres south of the mine site. Although it is considered likely to occur on site, it was not observed during field survey efforts.

The EIS stated that, due to the absence of state-listed threatened flora species on site, the project will not significantly impact on any state-listed threatened flora species or their essential habitat. However, the project will impact upon native flora species in general. Potential impacts on flora species include:

- loss of approximately 22 500 hectares of land across the site due to mining activities that will reduce the available habitat for native flora species
- a loss of habitat connectivity across the mine infrastructure and pit areas
- decrease in the extent and distribution of certain flora species, particularly those which have restrictive soil niches
- edge effects, which may result in changes to microclimatic conditions thereby reducing plant health and increasing susceptibility to disease
- increase in the introduction and/or spread of weed seeds/propagules on footwear, machinery, vehicles and materials for mine operation and construction.

The terrestrial ecology subsection of the draft EMP for the mine site (Appendix P of the EIS; Volume 2, Appendix V of the SEIS) outlined mitigation measures to minimise the potential impacts of the project on flora values on, and adjacent to, the mine site.

These measures include but are not limited to preparing and implementing a:

- vegetation clearing plan
- weed management plan, which includes:
  - annual survey for weeds of special management concern
  - implementing weed spraying programs prior to preparing and implementing management plans for vegetation clearing, revegetation/rehabilitation and weeds
- rehabilitation plan for disturbed areas, which includes:
  - planting endemic, native species to manage erosion and sediment control
  - installing logs, dead trees and stumps onto the rehabilitated site to provide roosting, feeding and nesting sites for local fauna
  - linking vegetation remnants and maintenance and monitoring programs.

Impacts to native flora are largely unavoidable given the scale and nature of the project. As such, land-based vegetation offsets are proposed to counteract the residual adverse impacts to biodiversity of flora species. The proponent's approach to vegetation offsets for the mine site is dealt with in section 5.1.6 of this report.

### **Coordinator-General's conclusions**

While no state-listed threatened flora species were identified on, or immediately adjacent to, the project site during the field surveys, the site contains suitable habitat for four threatened species based on their habitat preferences and known geographical distribution ranges. Construction activities associated with the development of the mine site may impact upon potential habitat for these threatened species. In addition, construction and ongoing maintenance activities could impact on protected native plants on site.

Where clearing is necessary for mine construction and operations, and requires the removal or disturbance of protected plants on site, the clearing must be undertaken in such a way as to minimise disturbance to these species. Rehabilitation of disturbed areas not required for ongoing operations should be employed to minimise adverse impacts to these species. Where rehabilitation does not fully mitigate adverse impacts to protected plants on site, offsets will be required that accord with the Queensland Biodiversity Offsets Policy 2011. I have imposed a condition (refer Appendix 2, Part D, Condition 1), which requires the provision of offsets for the permanent loss of vegetation on site to ensure no net loss of biodiversity at the regional scale.

In addition, in accordance with the NCA, approval from DNPRSR must also be obtained where construction and/or operation of the project is likely to disturb Type A restricted plants as defined under the Act. The project must also apply for a class exemption to clear least concern plants on site under the NCA (refer Appendix 3, Part D, Recommendation 1).

With the implementation of mitigation measures contained within the draft EMP (Volume 2, Appendix P of the EIS; Volume 2, Appendix V of the SEIS), the revised EMP being prepared for the proponent's application for an EA and compliance with conditions to be included in the EA, I am satisfied that impacts to protected plants and threatened flora species on site will be acceptable. Impacts that cannot be avoided or mitigated will be offset.

### 5.1.3. Vegetation communities

#### Issues

Twelve vegetation communities are present within the project site, including fourteen Regional Ecosystems (REs) as defined under the VMA. For completeness, it is noted that vegetation communities present within the project site are not the same as any threatened ecological communities listed under the EPBC Act. Table 5.1 describes these communities and their conservation status under the VMA.

**Table 5.1 Vegetation communities present within the project site**

Vegetation community	RE/ ecological community	Status*	
		VM	BD
Fringing Riparian Woodland	11.3.2	OC	OC
	10.3.14	LC	OC
	11.5.3	LC	NC
Poplar Box Open Woodland	10.3.27a	LC	OC
	10.5.12	LC	NC
Gidgee Open Woodland	10.3.4	LC	OC
Brigalow Open Woodland	10.3.3	LC	NC
Thozet's Box Open Woodland	10.7.5	LC	OC
Silver-leaved Ironbark Open Woodland	10.3.28	LC	NC
	10.5.5a	LC	NC
Silver-leaved Ironbark/Poplar Box Mixed Woodland	10.5.5a	LC	NC
	10.5.12	LC	NC
White Cypress Pine Woodland	11.5.5b	LC	NC
Weeping Bottlebrush Heath	10.7.7	LC	NC
Lancewood Woodland	10.7.3	LC	NC
Queensland Yellowjacket Low Woodland	10.5.1	LC	NC
Non-remnant Grassland	n/a	n/a	n/a

\*Status: VM (vegetation management status under the VMA): OC = Of Concern, LC = Least Concern; BD (Biodiversity Status defined by the Queensland Department of Environment and Resource Management): OC = Of Concern, NC = No Concern at Present.

Table 5.2 summarises the extent in Queensland of REs identified on site and how they are represented in Queensland's protected reserves. Of the REs present on site, one is listed as 'of concern' under the VMA and approximately 8.5 per cent of the total extent of this RE is held in protected reserves.

**Table 5.2 Extent of regional ecosystems identified on site in Queensland and represented in protected reserves in Queensland**

Vegetation community	RE code	Total extent in Qld (ha)	Total extent in reserves in Qld (ha)
Fringing Riparian Woodland	11.3.2	528 081	45 087 (8.5%)
	10.3.14	172 863	4143 (2.4%)
	11.5.3	420 485	11 346 (2.7%)
Poplar Box Open Woodland	10.3.27a	75 438	1576 (2.1%)
	10.5.12	143 581	835 (0.6%)
Gidgee Open Woodland	10.3.4	80 997	4425 (5.5%)
Brigalow Open Woodland	10.3.3	43 317	196 (0.5%)
Thozet's Box Open Woodland	10.7.5	25 836	1030 (4.0%)
Silver-Leaved Ironbark Open Woodland	10.3.28	469 288	1099 (0.2%)
	10.5.5a	750 833	2440 (0.3%)
Silver-leaved Ironbark/Poplar Box Mixed Woodland	10.5.5a	750 833	2440 (0.3%)
	10.5.12	143 581	835 (0.6%)
White Cypress Pine Woodland	11.5.5b	134 826	40 812 (30.3%)
Weeping Bottlebrush Heath	10.7.7	32 594	3416 (10.5%)
Lancewood Woodland	10.7.3	102 390	6500 (6.4%)
Queensland Yellowjacket Low Woodland	10.5.1	885 184	16 133 (1.8%)

Several vegetation communities on site have been identified as having special environmental value including:

- the Fringing Riparian Woodland, which offers refuge for fauna by providing water, shade and mature, hollow-bearing tree species
- vegetative communities that exhibit a high diversity of floral structure (in particular the Fringing Riparian Woodland, Silver-leaved Ironbark Woodland, Weeping Bottlebrush Heath and Queensland Yellowjacket Low Open Woodland) add value to the regional integrity of each community
- landscapes such as floodplains (in particular the Poplar Box Open Woodland, RE 10.3.27), skeletal hills (represented by the Lancewood Woodland, RE 10.7.3) and tertiary sand plains (best represented by the Queensland Yellowjacket Low Open Woodland, RE 10.5.1), which are intact and devoid of degradation by grazing
- the relatively intact patches of Poplar Box Open Woodland, Gidgee Open Woodland, Fringing Riparian Woodland and Thozet's Box Open Woodland, which are listed as 'of concern' under DERM's Biodiversity Status and have the potential to contribute to the overall preservation of threatened ecosystems.

One RE within the Poplar Box Open Woodland (10.3.27a) is listed as 'of concern' under DERM's Biodiversity Status. The proponent states that the overall condition of this RE on the project site has been reduced by cattle grazing and weed invasion.

Based on the proposed disturbance plans for the project and current infrastructure, 575.7 hectares of clearing within this RE is proposed.

The Gidgee Open Woodland (10.3.4) is listed as 'of concern' throughout Queensland under DERM's Biodiversity Status due to total grazing pressures—in particular pasture degradation and significant loss of groundcover. This community is within the proposed disturbance footprint and approximately 160.4 hectares is proposed to be cleared.

The Fringing Riparian Woodland (10.3.14) is listed as 'of concern' throughout Queensland under DERM's Biodiversity Status. Access tracks, diversion drains and dams are planned to intersect this vegetation community, with a total area of 417.8 hectares to be cleared. Assuming erosion control and mitigation strategies are in place, the proponent considers that the project is unlikely to affect the health of this community at a regional scale.

The most south-easterly water course within the project contained of two additional REs. One of these, RE 11.3.2, is listed as 'of concern' under both the VMA and DERM's Biodiversity Status. Based on the proposed mine plans for the project, the proponent considers that there is unlikely to be any disturbance within this community.

The Thozet's Box Open Woodland (10.7.5) is listed as 'of concern' under DERM's Biodiversity Status. Based on the proposed mine plans for the project, the proponent considers that there is unlikely to be any disturbance within this community.

In the EIS, the following conclusions were made for the mine's terrestrial ecology impact assessment.

- environmentally sensitive areas (ESAs)—no ESAs, essential or important habitat have been identified on the project site
- wetlands—the nearest wetlands to the project site (Coongie Lakes and the Shoalwater and Corio Bays Area) are not anticipated to be impacted by project activities
- EPBC Act listed species and habitats—no listed species were actually identified on the project site, apart from the squatter pigeon (southern) (*Geophaps scripta scripta*)
- no EPBC Act listed habitats and no DERM recognised REs are present on, or surrounding the project site
- Nature Conservation (Wildlife) Regulation listed species—none of the potential listed species were actually identified
- NCA protected areas—no protected areas were identified within or adjacent to the site
- terrestrial flora communities—12 distinct vegetation communities were identified on the project site and 11 of these communities were classed as remnant vegetation
- of the 418 flora species identified, none are listed under State or Commonwealth legislation as species of conservation significance.

The areas subject to the greatest disturbance on the project site are a section of Lagoon Creek, where mine infrastructure is proposed; the area associated with the tailings storage facility; the alignment of Lagoon Creek diversion; and the land proposed for the open-cut pit.

Vegetation communities directly affected by the project are the Brigalow Open Woodland (RE 10.3.3), Silver-leaved Ironbark Open Woodland (RE 10.3.28 and RE 10.5.5a), Poplar Box Open Woodland (RE 10.3.27a and RE 10.5.12), Silver-leaved Ironbark and Poplar Box Mixed Woodland (RE 10.5.5/10.5.12), White Cypress Pine Woodland (11.5.5b), Gidgee Open Woodland (RE 10.3.4), Fringing Riparian Woodland (RE 10.3.14), Weeping Bottlebrush Heath (RE 10.7.7), Lancewood Woodland (RE 10.7.3), Queensland Yellowjacket Low Open Woodland (RE 10.5.1) and Non-remnant Grassland.

The total surface area of disturbance is approximately 22 500 hectares, with a 50-metre buffer surrounding mine infrastructure and a 30-metre buffer for roads on either side of the centre line.

Edge effects resulting from the proposed works could include the establishment of weeds, alteration to microclimatic conditions (such as greater light intensity, more wind penetration, lower humidity) and a reduction in plant health through loss of photosynthetic potential (as a result of plants being covered by dust generated from vehicle movement on unsealed tracks). In the absence of appropriate control measures, the project has the potential to cause edge effects, particularly with reference to the introduction and/or spread of weed species throughout the project site.

Earthmoving activity, particularly along watercourses, can promote weed invasion and may increase sedimentation in riparian woodlands downstream of the mine. Higher levels of erosion can lead to a loss of morphological diversity in streams, which in turn reduces habitat quality and may result in biodiversity losses in affected areas. Any importation of seeds, as well as the use of earthmoving equipment in conjunction with land disturbance, will provide an opportunity for introducing invasive weed species, until native species become established. If invasive weeds were to establish at the project site, these may compete against the establishment of native vegetation.

Refinements to mining methods and equipment and the overall design of the proposed mine have resulted in a reduction in the original proposed clearing extent of vegetation communities on site. Table 5.3 outlines the current and proposed clearing extents of vegetation communities/REs within the project site.

**Table 5.3 Proposed clearing extents of vegetation communities within the project site**

Vegetation community	RE code	Status*		Extent of clearing on site (ha)
		VM	BD	
Fringing Riparian Woodland	11.3.2	OC	OC	0.0
	10.3.14	LC	OC	417.8
	11.5.3	LC	NC	0.0
Poplar Box Open Woodland	10.3.27a	LC	OC	575.7
	10.5.12	LC	NC	570.9
Gidgee Open Woodland	10.3.4	LC	OC	160.4
Brigalow Open Woodland	10.3.3	LC	NC	1576.8
Thozet's Box Open Woodland	10.7.5	LC	OC	0.0
Silver-leaved Ironbark Open Woodland	10.3.28	LC	NC	7534.5
	10.5.5a	LC	NC	
Silver-leaved Ironbark/Poplar Box Mixed Woodland	10.5.5a	LC	NC	969.3
	10.5.12	LC	NC	
White Cypress Pine Woodland	11.5.5b	LC	NC	112.0
Weeping Bottlebrush Heath	10.7.7	LC	NC	1011.0
Lancewood Woodland	10.7.3	LC	NC	380.4
Queensland Yellowjacket Low Woodland	10.5.1	LC	NC	174.0
Non-remnant Grassland	n/a	n/a	NC	9017.2

\*VM Status (vegetation management status under the VMA): OC = Of Concern, LC = Least Concern; BD Status (Biodiversity Status under DERM): OC = Of Concern, NC = No Concern at Present.

The proponent has stated that vegetation clearing will be limited to that which is necessary for the construction and operation of the mine site. The terrestrial ecology subsection of the EMP (Volume 2, Appendix P of the EIS; Volume 2, Appendix V of the SEIS) outlines a range of mitigation measures to minimise the potential impacts of the project on vegetation communities on, and adjacent to, the mine site. These measures include, but are not limited to:

- preparing and implementing a vegetation clearing plan, including identifying and managing ESAs (such as remnant vegetation, which may form habitat for threatened species) and rehabilitated areas designated as part of an offset requirement, and establishing reference flora monitoring sites
- preparing and implementing a weed management plan, which includes:
  - an annual survey for weeds of special management concern
  - implementing weed spraying programs prior to preparing and implementing management plans for vegetation clearing, revegetation/rehabilitation and weeds
  - eradicating weeds of special management concern from the site in accordance with best management practices from state and local government agencies
  - promoting weed management awareness by including weed issues, pictures and procedures in the project's site induction program

- preparing and implementing a rehabilitation plan for disturbed areas that includes:
  - plantings to manage erosion and sediment control
  - installing logs, dead trees and stumps onto the rehabilitated site to provide roosting, feeding and nesting sites for local fauna
  - linking vegetation remnants and maintenance and monitoring programs.
  - using the most appropriate endemic species for the landscape elements of the site, for rehabilitation/re-vegetation works
  - selecting species through habitat matching based on communities present on site, to ensure rehabilitation success
  - seeding to use a broad mixture of species to promote a high diversity and recovery rate
- preparing a soil management plan outlining measures to retain and stockpile topsoil, standard dust suppression techniques to minimise flora damage and create contoured landforms to resemble original regional topography where possible
- providing offsets where there is residual loss or degradation of vegetation, habitat or land use upon mine decommissioning. Compensation in the form of further habitat rehabilitation, compensatory habitat, land rehabilitation and contribution to research or offsets will be employed.

### **Coordinator-General's conclusion**

The project is designed to limit clearing to the extent necessary for the mining activity and associated infrastructure and has avoided remnant vegetation where practicable. Nonetheless, the project is expected to result in unavoidable impacts to vegetation, including loss of remnant and riparian vegetation and connectivity to offsite vegetation communities.

Through the EA conditions and the statutory approval for the EM plan, management plans for vegetation, soil and weeds, these impacts on vegetation on and adjacent to the project site should be minimised, and ongoing monitoring programs should ensure the long-term success of these measures.

By implementing the mitigation measures contained within the draft EMP (Volume 2, Appendix P of the EIS; Volume 2, Appendix V of the SEIS), the revised EMP being prepared for the application for EA, and conditions to be included in the EA and proponent commitments listed in Appendix 5 of this report, I am satisfied that impacts to vegetation on site can be adequately managed. Impacts that cannot be avoided or mitigated will be offset.

## **5.1.4. Fauna**

### **Issues**

Fifty-two threatened fauna species listed under the NCA were identified by database searches as known or potentially occurring within the wider study area.

A total of 160 vertebrate fauna species were identified on the project site during the assessment including 27 reptiles, 94 birds, 30 mammals and 9 amphibians. Of these,

two are listed as threatened under the NCA including the vulnerable squatter pigeon (*Geophaps scripta scripta*) and near-threatened little-pied bat (*Chalinolobus picatus*).

Habitat modelling for all state-listed threatened fauna species was undertaken as part of the SEIS to refine the probability of these species occurring or being impacted upon and identify potential habitat areas within or adjacent to the project site.

The squatter pigeon was recorded within a non-remnant grassland community on site and extensive areas of suitable habitat are also present on site.

Several fauna environmental values were identified on site as follows:

- Suitable habitat is located on the project site for threatened species. Fallen timber within the Brigalow Open Woodland and Gidgee Open Woodland has the potential to provide a distinct microhabitat for certain fauna, including the listed yakka skink (*Egernia rugosa*) and Brigalow scaly foot (*Paradelma orientalis*). A permanent water source with open woodland and surrounding grassland has the potential to provide habitat for the Endangered Black-throated Finch (*Poephila cincta cincta*).
- Small and medium-sized mammals are well represented on the project site. The abundance of these species is low, which is normal due to the decline in this weight range, following the introduction of pest fauna.
- The avian species recorded on the project site are mostly typical woodland birds, and represent a healthy population and diversity of species within the region.

The EIS concluded the following:

- terrestrial fauna communities—a total of 167 vertebrate fauna species were identified on the project site during the wet and dry season fauna surveys. Fauna species listed under State and Commonwealth legislation include the squatter pigeon and little-pied bat (*Chalinolobus picatus*)
- twenty-five avian species listed as migratory and/or marine under the EPBC Act were observed during the survey periods; however, it is unlikely the project will have a significant impact on the regional populations of these species.

Mining activities will disturb some squatter pigeon habitat; however, the proponent considers this is unlikely to significantly impact upon the regional population of this species due to the broad extent of habitat available in the local region. The project is also unlikely to have a significant impact upon the regional population of the little-pied bat due to the large regional extent of suitable foraging habitat available for this species.

The construction of mine infrastructure has the potential to affect fauna populations through habitat loss, population isolation, edge and barrier effects and an increase in mortality from mine activities and increased traffic in road use. The development of mine infrastructure will involve landscape modification procedures through vegetation clearing, a recognised threatening process that can affect different taxa in differing ways.

Potential impacts on fauna as a result of the proposed works at the project site include:

- land clearing and mining activities may reduce the available breeding and foraging habitat for native fauna species

- increased risk of fauna mortality resulting from vehicle strike and the destruction of tree hollows
- vegetation clearing will result in a localised reduction in the amount of roost and nesting sites, microhabitats and potential foraging areas for many fauna species. This would add population pressure (such as competition for roost sites, mates and food resources) to resident bats in these adjacent areas and may potentially lead to decreased population viability
- increased habitat fragmentation and loss of connectivity from roadways and other mine infrastructure. Species most vulnerable to barrier effects are habitat specific fauna and low mobility species (where even a small reduction in movements can reduce genetic continuity within a population, hence reducing the effective population size)
- low mobility species using the project site have the potential to become genetically isolated. This occurs when individuals from a population within one fragment are unable to interbreed with individuals from populations in adjoining fragments
- an increase in noise, vibration and dust associated with the construction and operational phases of the project may lead to the displacement of native species from their current home ranges
- an increase of introduced fauna species identified as using the project site may occur, including the cane toad
- mine-related infrastructure, such as sediment dams, may be accessible to fauna and may be additional water sources.

The proponent has committed to undertake measures to minimise harm to affected fauna communities including.

- delineate and maintain borders of proposed disturbance areas particularly along riverine areas and avoid vegetation clearing in Lagoon Creek to maintain habitat connectivity, except where required for mining operations
- establish movement corridors for small, terrestrial fauna species
- care will be taken to minimise harm to affected fauna communities by employing environmental staff to inspect the vegetation to be disturbed, prior to clearing, in order to determine whether or not any fauna are present. If fauna are present, they should be given the opportunity to move on before vegetation clearing occurs. Clearance from environmental staff will be obtained prior to disturbance in any area
- hollow logs and hollow bearing trees will be cleared of wildlife by a licensed wildlife spotter, and wherever possible these logs and trees should be stockpiled for use in rehabilitation activities or otherwise carefully placed in adjoining bushland
- trees with large raptor nests will not be cleared unless necessary for safety, operational and maintenance reasons
- preparation of a soil management plan outlining measures to retain and stockpile topsoil, standard dust suppression techniques to minimise flora damage and create contoured landforms to resemble original regional topography where possible
- personnel will be made aware through the project induction program and care will be taken to ensure the squatter pigeon is not impacted by vehicle or plant mortality, and

that squatter pigeon nests, eggs or young, if located, be translocated by qualified personnel to a suitable nearby habitat

- personnel will be made aware through the project induction program, and care will be taken, to ensure the little-pied bat is not impacted by the project by engaging fauna spotters, experienced with relocating bats, to conduct thorough searches of the site, staggered vegetation clearing to allow bats to move on and construction of artificial roost sites to supplement roost sites removed or disturbed during the construction and operation of the project
- preparation of a feral animal control plan targeting animal pests of special management concern.

### **Coordinator-General's conclusion**

Two state-listed threatened fauna species were recorded on site during the field surveys including the vulnerable squatter pigeon and near-threatened little-pied bat. Activities associated with the construction and operation of the mine will disturb some habitat for these species; however, I accept that this is unlikely to significantly impact upon the long-term viability of these species or their geographical distributional range due to the broad extent of habitat available in the local region.

The project site also supports suitable habitat for additional state-listed threatened fauna species; however, this habitat is not considered essential and critical to these species due to their known distributional ranges, extent of suitable habitat in the region and absence of known populations on site. Vegetation clearing associated with the project will impact upon fauna habitat on site through the removal of shelter, food and/or nesting resources, interruption to movement corridors which can lead to reduced viability of fauna populations and possible injury and mortality.

Measures outlined in the terrestrial ecology subsections of the draft EMP (Volume 2, Appendix P of the EIS; and Volume 2, Appendix V of the SEIS) and revised EMP to accompany the application for an EA will help in mitigating these impacts to native fauna and fauna habitats on site. EA conditions set by DEHP will ensure the effective implementation of the EMP and establish fauna monitoring, auditing and reporting programs.

In accordance with the NCA, approval from the Department of National Parks, Sport, Recreation and Racing must also be obtained where construction and/or operation of the project is likely to disturb the breeding places of protected fauna (as defined under the NCA).

Where rehabilitation does not fully mitigate adverse impacts to the habitats of protected fauna on site, offsets will be required in accordance with the Queensland Biodiversity Offsets Policy 2011.<sup>6</sup> I have imposed a condition (refer Appendix 2, Part D, Condition 1), which requires the provision of offsets for the permanent loss fauna habitat on site to ensure no net loss of biodiversity at the regional scale. These offsets will assist in

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<sup>6</sup> Department of Environment and Resource Management, Queensland Biodiversity Offsets Policy, Version 1, Department of Environment and Resource Management, Brisbane, 2011, viewed 14 May 2012, <[www.derm.qld.gov.au/environmental\\_management/environmental-offsets/pdf/biodiversity-offset-policy.pdf](http://www.derm.qld.gov.au/environmental_management/environmental-offsets/pdf/biodiversity-offset-policy.pdf)>.

enhancing potential habitat areas for threatened fauna species through pest management, and rehabilitation of land through replanting endemic species. Such offsets will also enhance connectivity on site to adjacent bushland areas, further facilitating the long-term viability of threatened fauna species.

With the implementation of the above mitigation measures and offsets, I am satisfied impacts to protected fauna and threatened fauna species on site will be acceptable.

### **5.1.5. Weeds and pest animals**

#### **Issues**

Three declared plants of Queensland were identified within the project site including the common pest pear (*Opuntia stricta*), velvet tree pear (*O. tomentosa*) and parkinsonia (*Parkinsonia aculeata*). All species are considered Class 2 declared plants, which are defined as pests that are established in Queensland and have, or could have, an adverse, economic, environmental or social impact.

Five Class 2 declared pest animals of Queensland were recorded on site during the field surveys including the feral cat (*Felis catus*), feral pig (*Sus scrofa*), European rabbit (*Oryctolagus cuniculus*), feral goat (*Capra hircus*) and dingo/wild dog (*Canis familiaris dingo*).

Mining activities associated with the project during the construction and operational phases have the potential to introduce and spread weed seeds and propagules via footwear, machinery, vehicles and materials. Weed infestations have the potential to impact upon native vegetation through increasing competition for light, space and nutrients, and increase fire fuel hazard loads. They also have the potential to impact on native fauna by impeding access to watering holes, or causing injury or death through consumption; and could also impact the productivity of surrounding agriculture and grazing lands.

The EIS determined that construction activities associated with the mine site are unlikely to significantly increase the distribution or abundance of vertebrate pests, as these species will lose habitat. However, wild dogs and dingoes may be attracted to work sites where food and scraps are available. Operational works are not expected to increase the presence or distribution of pest animals on site.

The proponent has accepted that the EMP prepared to accompany the application for an EA for the mine site will include a weed management plan to mitigate the potential impacts of weeds on native vegetation on site. This plan will include annual surveys for weeds of special management concern, weed spraying programs and rehabilitation works.

A feral pest control program will be prepared, included in the EMP and implemented to manage pest animals on site and will include fencing and trapping controls in combination with current land management practices.

#### **Coordinator-General's conclusions**

Several declared plants and pest animals were observed on site and have the potential to impact native biodiversity on site and the productivity of land adjacent to the site.

Construction and operational activities associated with the development of the mine site could facilitate the introduction and/or spread of weeds and to a lesser extent, pest animals on site.

Construction and operational activities associated with the mine site can be undertaken in such a way to minimise the introduction and spread of weeds and pest animals in accordance with the weed management plan and feral pest control program.

By implementing the mitigation measures contained within the EMP (Volume 2, Appendix P of the EIS; Volume 2, Appendix V of the SEIS), and commitments made by the proponent in Appendix 5 of this report, I am satisfied that impacts associated with weeds and animal pests on site can be adequately managed.

### **5.1.6. Offsets**

The proponent has committed to provide a suite of environmental offsets for the unavoidable, non-mitigated loss of vegetation and biodiversity as a result of the mine component of the project, in accordance with State and Australian Government offset policies. As such, the proponent has prepared a draft Biodiversity Offset Strategy, which when finalised, will satisfy the various offset policies relevant to the project.

The offset policies considered for the mine component were:

- Biodiversity Offset Policy Version 1<sup>6</sup> (the extent to which this policy applies to the mine site is at the discretion of the Coordinator-General)
- Fish Habitat Management Operational Policy FHMOP 005<sup>7</sup>
- Draft EPBC Act Environmental Offsets Policy (2007).

The two state offset policies are components of the overarching Queensland Government Environmental Offsets Policy (QGEOP).<sup>8</sup>

The Queensland Biodiversity Offsets Policy (QBOP) establishes the requirements for providing an offset to impacts to state significant biodiversity values (SSBV) that cannot be avoided. The objective of the policy is to ensure that there is no net loss of biodiversity. In line with the offset principles outlined in the QGEOP, the proponent must demonstrate that all reasonable attempts have been made to first avoid and then mitigate impacts to protected matters before an offset will be considered.

The QBOP outlines several offset pathways for sourcing and securing offsets. They include land-based offsets, such as direct offsets and offset transfers. Offset payments to DERM are also available under this policy. Indirect offsets can also be provided where the majority of the offset requirement is met by direct offsets. SSBVs requiring offset under the QBOP include a wide range of habitat features and characteristics. Under the QBOP any actions which impact SSBV require an offset.

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<sup>7</sup> Department of Primary Industries, Fish Habitat Management Operational Policy FHMOP 005: Mitigation and Compensation for Works or Activities Causing Marine Fish Habitat Loss, Department of Primary Industries, Brisbane, 2002, viewed 14 May 2012, <[http://www.dpi.qld.gov.au/documents/Fisheries\\_Habitats/FHMOP005-Fish-Hab-Management.pdf](http://www.dpi.qld.gov.au/documents/Fisheries_Habitats/FHMOP005-Fish-Hab-Management.pdf)>.

<sup>8</sup> Environmental Protection Agency, Queensland Government Environmental Offsets Policy, Environmental Protection Agency, Brisbane, 2008, viewed 14 May 2012, <<http://www.derm.qld.gov.au/register/p02501aa.pdf>>.

A draft Biodiversity Offset Strategy (draft strategy) was first included in Appendix X of the SEIS in response to residual ecological impacts and submissions on the EIS. An updated version was provided to the Coordinator-General on 13 April 2012. The draft strategy includes:

- how offset policies will apply (Chapter 2)
- the type and number of environmental values required to be offset (Chapter 4)
- the ratio to be applied for offset (Chapter 5)
- the means by which offsets will be secured and supplied (chapters 3, 6–8).

In the SEIS (Appendix X, Section 3.4.1) the proponent listed several remaining tasks that are either currently being undertaken or are yet to be undertaken as part of the offset process for the project. In summary, such items include:

- further refining the threatened species habitat modelling undertaken as part of the EPBC reports (SEIS, Appendix FA and FB), including field validation of models and incorporating additional field data, to determine actual impact to MNES (rather than potential impact for impact assessment purposes)
- identifying large-scale strategic offset sites (properties of several thousand hectares that might be suitable as a strategic offset for the project)
- developing rehabilitation strategies to link areas of high ecological value in the landscape (to offset fragmentation effects on regional corridors)
- developing supporting strategies including wider scale MNES research in the Galilee Basin and monitoring plans to assist with mitigating long-term MNES and biodiversity threats
- identifying opportunities for ameliorating direct and indirect impacts arising from habitat fragmentation in both project specific and regional contexts
- identifying suitable offset areas over the properties where preliminary analysis has been undertaken (ongoing)
- field assessment of identified offset areas to determine the suitability offset extent and condition of vegetation
- negotiating and liaising with landholders to secure required offsets
- preparing biodiversity offset management plan(s) to ensure the long-term viability of offset areas, including but not limited to:
  - pest and weed management
  - fencing for livestock exclusion
  - fire management
  - rehabilitation and planting
  - monitoring and maintenance activities.
- liaising with regulatory bodies and landowners to finalise contractual arrangements and covenants.

The proponent is continuing to work with the Commonwealth and State agencies, and other affected and interested stakeholders, in the finalisation of the Offset Strategy to obtain final approval.

While the SEIS included a draft Biodiversity Offset Strategy (Appendix X) it did not propose any specific offsets for the loss of mine vegetation and habitats. DERM submitted that, under the QGEOP, the Coordinator-General may propose offsets where specific-issue offset policies are triggered. On the mine site, the Biodiversity Offset Policy is triggered.

The revised draft strategy remains indicative, and subject to ongoing refinement by the proponent, and verification and agreement with the relevant state and Australian Government departments. Other contingencies may also influence the final offsets package provided, for example, DEHP finalising the proposed Galilee Basin Strategic Offset Strategy. At the time of writing this report, departments had not completed their analysis and review of the most recent version of the draft strategy and had not provided me with relevant comments and advice.

The draft strategy prepared by the proponent identifies several key offset principles, and aims to:

- ensure strategic, viable offsets are legally secured and managed
- secure larger offset sites containing many offset values required rather than a large number of small sites
- secure offsets that are well connected and adjacent to existing areas of remnant and/or protected native vegetation
- protect and maintain state biodiversity corridors, where possible
- ensure offsets are located as close as possible to the impact sites (i.e. close to mine operations)
- protect a mixture of remnant and non-remnant vegetation to satisfy the multiple offset policies and jurisdictions that apply to the project
- undertake management of offset sites consistent with an offset management plan to restore functioning ecosystems in areas of non-remnant vegetation and/or maintain functioning regional ecosystems where remnant vegetation is protected.

In order to satisfy the above objectives, and the policies relevant to the project, a preferred offset approach has been identified by the proponent. The approach utilises a series of offset options in a cascading order of preference (refer to Figure 5.1), and involves the following offset options:

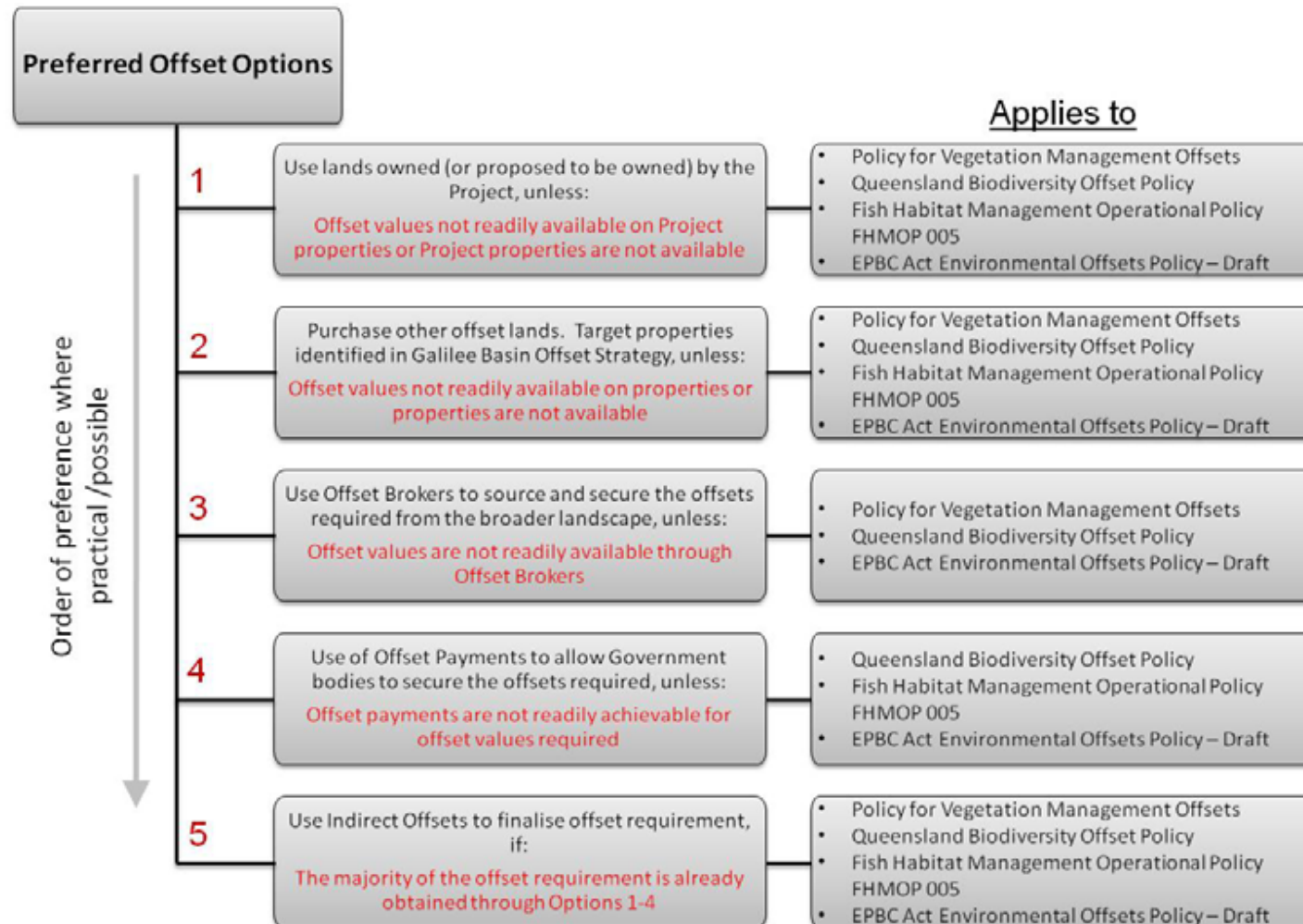
- (1) Use of lands owned (or proposed to be owned) by the proponent. These lands are situated surrounding the project footprint and provide many values consistent with those required to offset the residual impacts of the project.
- (2) Purchase other offset properties. This option includes the direct targeting of properties identified in the DEHP's draft Galilee Biodiversity Offset Strategy.
- (3) Use of offset brokers (such as Ecofund and Earth Trade) to source and secure the required offsets from the broader landscape on behalf of the proponent. It is anticipated the offset brokers will be commissioned for difficult to obtain offset types, or those offset types not available on the proponent's properties. An offset broker may be used to secure an offset through a third party, or through an offset transfer.

- (4) Use of offset payments to allow government bodies to secure the offsets required for the project. This option would include significant consultation and negotiation with the relevant government departments should this option be required.
- (5) Use of indirect offsets, should the options above leave a residual component to be offset.

All direct offsets (either sourced through the proponent or an offset broker) will need to be secured using a legally binding mechanism. The mechanisms adopted to secure offsets will ultimately depend upon the approval of relevant Government departments, landholders or parties with an interest in the offset properties. It is noted that the legal protections available for offset properties are limited by the legal protection mechanisms available under Queensland law and agreement by the relevant parties. The management of established offsets is secured once legally binding mechanisms are registered on the land. These management obligations will be transferred to landholders once legal binding mechanisms are established.

Following the procurement of the direct offsets, the proponent has committed to developing an offset management plan for each site, which will provide extensive details on the management actions required at each site, an estimate of management costs and an outline of the monitoring and reporting requirements associated with each offset site.

The future land use potential and the current tenure (including mining lease areas), of any lands provided as a direct offset under the preferred offset approach will be taken into account by the proponent and regulatory agencies when determining the suitability of these lands for offset.



**Figure 5.1 Proponent's preferred offset options**

## Proponent's offset commitments

In addition to the proposed offset approach, the proponent has committed to a timeline to deliver the offsets required for the project. Following the finalisation of the draft strategy, the proponent will refine the vegetation mapping, species habitat models and project footprint. Field surveys of the impact site would include pre-clearance and species prescription surveys, as well as an assessment of ecological equivalence. The results of the field surveys will confirm the extent of the impacts, and the requirement for associated offsets.

Following this additional work, the proponent committed to preparing a biodiversity offset package for review by the Coordinator-General and relevant State and Australian Government agencies. The package would provide the proposed mixture of offset mechanisms to be utilised, including the identification of offset sites, and where other offset measures will be utilised. The proponent envisages that the proposed offset package would include a mix of remnant and non-remnant vegetation to satisfy the multiple offset policies that are applicable to the project. The provision of remnant vegetation is likely to be utilised predominantly to fulfil offset requirements under the EPBC Act. Whereas non-remnant vegetation, is likely to be predominantly utilised to provide offsets under state requirements. Offsets approved by the relevant government departments would then be delivered by the proponent. Where possible, the offsets being delivered will satisfy the offset requirements for both the state and Commonwealth concurrently.

## Staging of offsets proposed by proponent

As the impacts of the project will occur over approximately 30 years, the proponent has proposed a staged delivery of offset lands over the life of the mine. It is proposed that the staging of offsets occurs over set increments that reflect the clearing and operational cycles of the mine and rail projects. The timeframes recommended are contained in Table 5.4.

**Table 5.4 Staged offset requirements**

Stage	Years of operation	Offsets delivered per stage
1	1–5	All rail related offsets Stage 1 mine related offsets (yrs 1–5)
2	5–10	Stage 2 mine related offsets (yrs 5–10)
3	10–20	Stage 3 mine related offsets (yrs 10–20)
4	20–30	Stage 4 mine related offsets (yrs 20–30)

## Indicative offsets

Within the draft strategy, the proponent has described the impacts requiring offsets under each policy, and has committed to further refining the impacts of the project based on:

- the finalisation of the project footprint, including the final mine plan and decisions on the placement of ancillary infrastructure

- completion of field validation and targeted species surveys to confirm the vegetation and species habitat present within the project footprint.

Any changes to the footprint, or distribution of habitat and species, will influence the impacts recorded in the draft strategy, and ultimately the offsets required by the project.

The proponent has aimed to meet the offset requirements under state and Commonwealth offset policies concurrently. That is, if habitat types for several species or communities are similar, and can be obtained within the same offset area, the proponent will attempt to align offsets in order to achieve this outcome. Where offset requirements and habitats are not similar, separate offset areas and types will be secured. The impacts calculated for the project in many cases overlap (i.e. habitat mapped for several species may overlap, or habitat and impacted REs may also overlap). As impacts (and associated offset requirements) overlap, so too will habitat within offset properties. Therefore one offset area may provide offsets for several values being offset.

Taking into consideration the above points, the final offsets secured for the project could be lower than the sum of all indicative offset liabilities listed in the draft strategy, and will depend on the combination of values secured at offset sites.

The proponent has calculated an indicative offset liability (IOL) figure based on the impacts reported herein. The size of the offset required for the project is generally determined by offset ratios applied to the area of residual impacts associated with the project. Due to the various jurisdictions and policies applicable to the project, offset ratios have been determined for the project using different methods, dependent on the policy that applies. The offset ratio used to calculate the IOL for each table is stated below.

### State offset requirements

The proponent has recognised that offsets under the QBOP and the Policy for Vegetation Management Offsets (PVMO) require an assessment of ecological equivalence, and that the result of the assessment determines the size of the offset required to fully offset the residual impacts of the project. As the ecological equivalence assessments are yet to be completed for either impact or offset sites, offset ratios under the QBOP and PVMO cannot yet be finalised. In lieu of ecological equivalence calculations, the IOL for matters protected under the overarching Queensland Government Environmental Offsets Policy (2009) and its specific-issue-offsets policies has been calculated assuming a 4:1 offset-to-impact ratio, unless a specific offset ratio is stated in the policies.

### Threatened flora offsets

One near threatened species *Desmodium macrocarpum* (Large-podded Tick-trefoil) is considered by the proponent to be likely impacted by the mine component of the project.

The impacts to high potential and low potential habitat for this species are described in Table 5.5. The IOL calculations assume an offset of 3:1 in accordance with the QBOP for near threatened state protected flora.

**Table 5.5 State protected flora impacts and IOL (mine)**

Species name	Common name	NCA status	Impact area—HPH* (ha)	Impact area—LPH** (ha)	Indicative HPH offset liability (ha)	Indicative LPH offset liability (ha)
Desmodium macrocarpum	Large-podded Tick-trefoil	NT	5465.2	1464.1	16 395.6	4392.3

\*HPH = High Potential Habitat, \*\*LPH = Low Potential Habitat

### Threatened fauna offsets

Three near threatened fauna species are likely to be impacted as a result of the project. *Chalinolobus picatus* (little-pied bat) has been recorded within the mine footprint. *Nettapus coromandelianus* (cotton pygmy-goose) was recorded within the rail alignment only, while *Ephippiorhynchus asiaticus* (black-necked stork) is considered likely to occur. As with the threatened flora species, species listed under both State and Commonwealth legislation will be considered under Commonwealth offset requirements (Section 11.13).

The habitat impacted for each species is described in Table 5.6. As ecological equivalence assessments are yet to be completed, the IOL for each species has been calculated using an assumed 4:1 ratio.

**Table 5.6 State protected fauna impacts and IOL (mine)**

Species name	Common name	NCA status	Impact area—HPH* (ha)	Impact area—LPH** (ha)	Indicative HPH offset liability (ha)	Indicative LPH offset liability (ha)
Chalinolobus picatus	Little-pied bat	NT	9589.5	2160.9	38 358.0	8643.6
Ephippiorhynchus asiaticus	Black-necked Stork	NT	3.8	0.05	15.2	0.2
Nettapus coromandelianus	Cotton Pygmy-goose	NT				

### Regional ecosystem offsets

One RE over an area of 112 hectares will be impacted by the mine and will require an offset under the QBOP (refer to Table 5.7). As an ecological equivalence assessment has not been completed, an offset ratio of 4:1 is assumed.

**Table 5.7 Regional ecosystem impacts and IOL (mine)**

RE name	RE description	BVG	Impact area (ha)	Indicative offset liability (ha)	VM Act status
11.5.5b*	<i>Callitris glaucophylla</i> , <i>Eucalyptus melanophloia</i> , <i>Eucalyptus populnea</i> +/- <i>Corymbia tessellaris</i> woodlands	20a	112.0	448.0	LC (Threshold)

### Other performance requirements and state significant biodiversity value offsets

A number of other performance requirements and state significant biodiversity values require offset under state legislation. These include watercourse and connectivity vegetation, and other values such as essential habitat. Impacts to each of these matters will be offset using a 4:1 offset ratio. Again, this offset ratio will require confirmation through an ecological equivalence assessment. The impact areas and the associated IOLs are presented for each matter below.

#### Watercourse offsets

Table 5.89 outlines the impacts to watercourses and the IOL from the proposed mine (1191.9 hectares).

**Table 5.8 Watercourse impacts and IOL (mine)**

Stream order	Impact area (ha)	IOL (ha)
1	156.7	626.8
2	83.6	334.4
3	234.5	938
4	5.7	22.8
5+	711.4	2,845.6
Total	1,191.9	4,767.6

#### Connectivity offsets

A total of 5466 hectares of connectivity will be impacted as a result of the proposed mine. The IOL for connectivity is 21 864 hectares.

### Commonwealth offset requirements

The proponent has committed to providing offsets for MNES under the draft EPBC Act Environmental Offsets Policy (2007) (EOP). It is noted that land-based offsets proposed under the EOP can only be legally secured through mechanisms available under Queensland law. Offsets are therefore limited by the nature of the legal protection mechanisms available in Queensland and need to be agreed by the relevant parties. These offsets are addressed in Section 11.13 of this report.

### **Proponent's ability to secure the offsets necessary**

The proponent has explored a number of offset options to determine and confirm that offsets required under state and Commonwealth policies can be achieved. While analysis was conducted only to a desktop level, and requires field confirmation, the proponent is confident that all offsets required for the project are available in the region surrounding the project footprint.

The proponent initially investigated the values of seven properties which are owned (or currently being purchased) by the proponent. Three properties are located close to the mine and four are located along the rail alignment.

The environmental values of each property were compared to the offset values required. The outcomes of the desktop assessment concluded that many of the values required were available within the proponent's properties. Further work is now required to confirm the availability of each property to offset the impacts of the project.

For difficult to find offsets, or for those values not present on HCPL properties, Ecofund was engaged to review the offset availability in the surrounding region. The analysis conducted by Ecofund indicates that potential offsets are available to acquit all residual offsets requirements for the project.

### **Coordinator-General's conclusions**

Where rehabilitation does not fully mitigate adverse impacts to biodiversity on site, offsets will be required in accordance with the Queensland Biodiversity Offsets Policy 2011<sup>9</sup> I have imposed a condition (refer Appendix 2, Part D, Condition 1), which requires the provision of offsets for the permanent loss of biodiversity on site to ensure no net loss of biodiversity at the regional scale.

With the implementation of proponent commitments and the finalisation of the Alpha Biodiversity Offsets Strategy (BOS) I am satisfied that any residual ecological impacts of the mine component of this project will be acceptable.

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<sup>9</sup> Department of Environment and Resource Management, Queensland Biodiversity Offsets Policy, Version 1, Department of Environment and Resource Management, Brisbane, 2011, viewed 14 May 2012, <[www.derm.qld.gov.au/environmental\\_management/environmental-offsets/pdf/biodiversity-offset-policy.pdf](http://www.derm.qld.gov.au/environmental_management/environmental-offsets/pdf/biodiversity-offset-policy.pdf)>.

## 5.2. Aquatic ecology

### 5.2.1. Issues

This section provides an assessment of aquatic flora and fauna values that may be affected by the mine component of the project. For further discussion on specific MNES aquatic values affected by the mine component of the project, see Section 11 of this Evaluation Report.

The project site lies within the Burdekin Catchment which encompasses the Burdekin River and its tributaries north from Greenvale and south to Alpha, and coastal catchments between Giru and Bowen. The site lies within the sub-catchment of Belyando-Suttor River which extends from south of Alpha, north to the Belyando Crossing.

The project site does not lie within or adjacent to any declared fish habitat area, wilderness area, conservation park or aquatic reserve.

A detailed assessment of the state significant aquatic ecological values of the coal mine site was provided in the EIS (Volume 2, Section 10: Aquatic Ecology and Stygofauna).

The aquatic ecological assessment involved a literature and database review to identify species of conservation significance known from the region and field surveys employing standard methodologies to determine the composition of aquatic flora and fauna species inhabiting the project site, aquatic ecosystem function and physical integrity of aquatic environments. Findings of this review and surveys were used to determine the extent of state significant aquatic flora and fauna values on or adjacent to the project site that may be impacted upon by the project and develop appropriate management measures to mitigate these impacts.

Forty-two sites were assessed across two field surveys undertaken in March 2009 and March 2010 to assess the aquatic flora and fauna values on site, and surveys targeting stygofauna were conducted in March, April and June 2010.

Lagoon Creek flows in a northerly direction the entire length of the site, with the tributaries of Sandy Creek, Rocky Creek, and Well Creek entering it in the northern section. Wetlands currently mapped on site are not considered state significant environmentally sensitive areas. The larger creeks, specifically Lagoon Creek and Sandy Creek, are vegetated with River Red Gum (*Eucalyptus camaldulensis*) riparian woodland. Smaller creeks and drainage lines are typically vegetated with the same RE species as the surrounding areas (woodlands, grasslands, brigalow community, etc.). Riparian vegetation corridor width was noted to be generally narrow, and of reduced structure in association with drainage lines and smaller creeks.

Seventy aquatic flora species and 26 vertebrate fauna species (including 1 mammal, 1 reptile, 12 birds, 5 amphibians and 7 fishes) were recorded on site during the field surveys, including 5 non-native weeds and two pest animals.

No NCA-listed threatened aquatic flora species or aquatic flora species listed under the EPBC Act were recorded on or adjacent to the mine site during the field surveys. Two

Class 2 declared plants of Queensland—velvet tree pear (*Opuntia tomentosa*) and parkinsonia (*Parkinsonia aculeata*)—and one Class 2 declared animal pest in Queensland—the feral pig—was recorded on site in riparian environments. All native aquatic flora and fauna species on site are considered least concern under the NCA.

Water samples were taken where surface water was present and compared to the Australia and New Zealand Environment and Conservation Council (ANZECC) Guidelines. Macro-invertebrate sampling of waterbodies was undertaken to give a broad scale measure of stream health. Vertebrates were assessed with trapping, spotlighting, and drag netting conducted, as well as incidental fauna observations. Habitat assessments were performed at selected sites using a modified version of the Australian River Assessment System (AUSRIVAS) protocols developed by the Department of Natural Resources and Mines.

Given the ephemeral nature of the aquatic environment, surveys were timed to coincide when habitat condition, flow volume and pool volumes were considered to be at their peak, immediately after the wet season. Surveys were conducted during consecutive years to allow for variation in climatic conditions. A range of morphologies and aquatic habitat types were targeted, including ephemeral creeks and drainage lines, in addition to palustrine wetlands and lacustrine wetlands. Study sites were selected according to perceived ecological complexity, potential species diversity, habitat availability, habitat distinctiveness and/or the potential to for species of conservation significance to inhabit the area.

Water quality analysis on and surrounding the project site showed that contaminant levels exceed the ANZECC trigger values for livestock drinking water guidelines (beef cattle). Aquatic health surveys across the project site indicated high salinity and nutrient levels, which are likely a result of numerous factors including the ephemeral nature of the broader catchment and disturbances by cattle grazing. The macro-invertebrate faunal composition was found to be dominated by predatory taxa. All but one habitat assessment site fell into the moderate erosion category and are characterised by high erosion potential, lack of stable in-stream habitat and/or limited riparian vegetation present. Overall, a lagoon/palustrine wetland on site had the greatest species richness and health despite extensive cattle grazing surrounding this area.

Potential impacts to aquatic flora and fauna within the project site include:

- loss of available habitat from land clearing and mining activities
- loss of habitat connectivity across the mine and habitat fragmentation
- disruption to aquatic fauna breeding and feeding regimes through noise, vibration and dust associated with the construction and operation phases on the project
- introduction and/or spread of weeds during earthworks
- increased sedimentation in riparian woodlands downstream of the mine as a result of earthworks. This may lead to an increase in erosion and subsequent morphological diversity in streams, reduction in habitat quality and overall biodiversity loss
- increase in feral animal numbers leading to increased competition for feed and shelter resources and predation

- environmental harm associated with potential spills of chemicals and hydrocarbons to waterways.

Stygofauna surveys were undertaken in accordance with the methodology outlined by the Western Australia Environmental Protection Authority. No stygofauna—subterranean aquatic fauna species found in groundwater—were recorded in groundwater samples on site; however, a single cyclopoid copepod, *Macrocylops albidus*, was collected from a bore on a plain between two river branches outside the project boundary in March 2010. The absence of a significant population of stygofauna, either on or adjacent to the project site, means that no stygofaunal environmental values have been identified; although the groundwater quality data acquired indicate that the local groundwater conditions could support communities of stygofauna.

Since coal-bearing horizons have mainly been investigated for the presence of stygofaunal communities, there is a possibility that stygofauna may exist in other geological horizons (e.g. alluvial) on or adjacent to the project site. Any additional groundwater monitoring bores that are installed in non-coal bearing horizons will be sampled for the presence of stygofauna in order to confirm or reject the current view that significant populations of stygofauna are not present.

One of the waterways, Lagoon Creek, will need to be partly diverted early in the life of the mine as it limits the placement of infrastructure and the early development of steady-state dumping operations (see Section 5.8 of this report). The planned diversion of Lagoon Creek is around 300 metres wide, and extends for approximately 9.6 kilometres. The diversion could result in additional impacts on the environmental values of the aquatic flora and fauna, including:

- clearing of riparian vegetation may result in:
  - erosion and sedimentation-related impacts, especially in the early years after the diversion prior to re-establishment of foliage
  - fragmentation of a valuable wildlife corridor, which, while not a major issue for mobile species (birds, bats), can be detrimental for the smaller terrestrial species
- works occurring in the creek during and immediately following periods of flow may impede fish movements.

Changes in groundwater flow rates and levels in the vicinity of stygofauna populations are the main impacts that mining activities would have on stygofaunal communities. However, since no significant populations of stygofauna have been identified on or indeed adjacent to the project site, no impacts upon stygofauna are anticipated by the proponent to occur as a result of the proposed project activities.

To mitigate and reduce environmental harm to aquatic ecology, the proponent has committed to develop and implement an aquatic fauna monitoring program that will include corrective actions to address any exceedences. This program will include annual sampling for aquatic fauna species following significant rainfall events, documentation of diversity and abundance of aquatic fauna species, water quality analysis and identification of sensitive species and habitat areas that can be used as indicators of stream health.

Vegetation clearing will be undertaken in accordance with the vegetation clearing plan as discussed in this report and a weed management plan will also be implemented to minimise weed spread on site. These will be included in the final EMP being developed for the mine site and will be regulated through the EA for the mine.

The EIS stated that the creek diversion will be designed to mimic the natural materials and geometry of Lagoon Creek as much as possible. To help mitigate and reduce potential environmental harm associated with the creek diversion, the following measures will be actioned:

- clearing of riparian vegetation for the proposed creek diversion will be conducted in a staged manner, to allow fauna to migrate to adjacent habitat areas
- works to divert Lagoon Creek will be conducted when minimal (if any) water is present (preferably during the dry season) so as to reduce impacts to fish movements
- the creek diversion rehabilitation will be monitored to ensure the vegetation is stable and self-sustaining.

The following strategies (which will be regulated through the EA for the mine) will be implemented to help reduce potential environmental harm to the network of watercourses and aquatic environments on the project site and throughout the broader catchment:

- mine and process water will be contained within a closed-loop system and recycled. Contaminated mine water or process water will only be discharged from the project site into the environment in accordance with the limited circumstances set out in the EA
- sediment traps will be designed and installed downstream of all land disturbances (such as water storage dams) in order to remove sediment from storm water that flows over such land disturbances
- a water quality, sediment quality and aquatic-fauna monitoring program will be initiated and continued throughout the project life. This program will ensure the early detection and recording of project impacts upon local surface water courses, thereby allowing mitigation strategies to be altered or developed. The water quality monitoring program will include the following components:
  - establishment of surface water monitoring points in Lagoon Creek upstream of the project site. Sampling will undertaken immediately following first flow in the wet season and at a pre-determined calendar date during the dry season
  - data from these sources will provide background water quality levels for comparison with downstream values
  - sampling of Lagoon Creek, downstream of potential disturbances. The downstream results will be compared with those produced for upstream locations (which lie outside the impact area and the proposed creek diversion workings)
  - sampling of a variety of physico-chemical parameters that may be affected by mining activities such as heavy metals, dissolved oxygen, sedimentation, salinity etc.

- if the quality of water leaving the project site deteriorates and is found to exceed background water-quality trigger values, then the proponent will investigate the cause of such deterioration and report the results to the administrative authority.

The proponent considers that impact mitigation measures are not necessary for stygofauna. Nonetheless, as part of the EMP, a groundwater monitoring program will be implemented (and regulated through the EA) and stygofauna if present, will be monitored to identify if the project will have an impact on these species.

## **5.2.2. Coordinator-General conclusions**

I have considered the stakeholder submissions which raised aquatic ecology matters, and how supplementary material provided by the proponent responded to the issues raised. Issues that warranted additional information in order to adequately evaluate the project included:

- impacts of creek diversions
- sediment control and erosion impacts
- water quality guidelines and survey methodology
- cumulative impacts.

No state-significant threatened aquatic flora or fauna species were recorded on site and the site does not lie within any essential or important habitat for these species. Native aquatic flora species on site are considered least concern under the NCA and I have recommended a condition to obtain a class exemption from DERM to clear these plants. In accordance with the NCA, approval from DNPRSR must also be obtained where construction and/or operation of the project is likely to disturb the breeding places of native fauna (as defined under the NCA). This recommendation is discussed in Section 5.1.2 of this report.

The project will require approval under the EP Act through DEHP issuing an EA. The EA will contain conditions to limit impacts on the aquatic environment based on commitments to be finalised in the EMP for the mine. In addition, approval from DNRM will be required under the Water Act to clear riparian vegetation and for the engineering design of creek diversions.

Based on the mitigation measures provided in the EIS and SEIS and the preparation and implementation of management plans for soil, water, vegetation clearing and weeds as components of the EMP, I am satisfied that impacts relevant to aquatic ecosystems can be effectively managed and the residual impacts would be acceptable. I am satisfied that the project's impacts on aquatic ecosystems are unlikely to be significant, provided that proposed mitigation measures are implemented. Refer also to Section 5.8 of this report.

I am aware of other mining proposals in the vicinity of the project that could impact on the water quality of the Belyando River catchment, and subsequently the Burdekin River. To address the cumulative impacts of these mines, it is appropriate to establish a basin-wide water quality monitoring and reporting program to which each proponent would contribute; however, the EA for each mine can only apply to mining activities on the mining lease.

To address the potential cumulative impacts on surface water quality in the Galilee Basin off the mine site, I have imposed a condition for this project that will be similarly imposed for other mines in the area (refer Appendix 2, Part B, Condition 1).

I am aware of the interest in the cumulative impacts on surface water quality in the Galilee by the Independent Expert Scientific Committee on Coal Seam Gas and Coal Mining. The committee has been established by agreement between the Australian and Queensland governments, and will provide advice to both governments on the impact of major mining proposals on water resources.<sup>10</sup>

No significant stygofauna populations were recorded on site; however, the site may contain groundwater habitats suitable for these species. With the implementation of a monitoring program and mitigation measures outlined in the EIS and SEIS, I am satisfied that impacts to stygofauna as a result of the project are unlikely.

With the implementation of mitigation measures contained within the EMP (Volume 2, Appendix P of the EIS; Volume 2, Appendix V of the SEIS), the revised EMP to accompany the application for an EA, proponent commitments (refer Appendix 5 of this report), and the above condition I am satisfied impacts to aquatic flora and fauna species on site will be minimised and the residual risks acceptable.

## 5.3. Topsoil use for rehabilitation

### 5.3.1. Overview

The proponent estimated the volume of soil material to be used for rehabilitation in Table 3 on page 6 of Appendix W of the SEIS.

In its review of the soils data, DERM advised that the figures provided in the SEIS are an underestimate of the volume of soil material that may be used. Sub-surface material that has favourable physio-chemical properties for plant growth had not been recommended for stripping in the material provided by the proponent. DERM advised:

- The Britt soil management unit has a proposed stripping depth of 400 millimetres. The soil chemistry results indicate that soil material between the depths of 400 and 900 millimetres is suitable for use as secondary media in the rehabilitation process.
- The Titus soil mapping unit has a proposed stripping depth of 500 millimetres. The soil descriptions indicate there are no physiochemical restrictions to plant growth throughout the profile, except for the occurrence of red spherical aggregate at depth in some areas. In many areas, surface and sub-surface stripping is suitable to depths in excess of one metre.
- The Garret soil mapping unit has a proposed stripping depth of 200 millimetres. Poor fertility is not regarded as a limiting factor for plant growth media. Sub-surface stripping of this soil type should be conducted to 1500 millimetres depth.

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<sup>10</sup> See [www.environment.gov.au/coal-seam-gas-mining/index.html](http://www.environment.gov.au/coal-seam-gas-mining/index.html) and [www.environment.gov.au/coal-seam-gas-mining/project-advice.html](http://www.environment.gov.au/coal-seam-gas-mining/project-advice.html)

- The Nelson soil management unit has a proposed stripping depth of 300 millimetres. There are no physiochemical restrictions to plant growth below 300 millimetres. Sub-surface stripping of this soil type should be conducted to 1500 millimetres depth.

The proponent should note that topsoil and subsoil stripping may be critical for effective rehabilitation to native woodland as part of the broad landscape corridor strategy.

### **5.3.2. Coordinator-General's conclusions**

In response to DERM's advice and to maximise the amount of topsoil available for rehabilitation, I have made a recommendation (Recommendation 25(a), Schedule 6, Part A Appendix 3) that topsoil be managed in such a way to maximise topsoil available for rehabilitation requirement.

The soil stripping depths (as discussed for Appendix W of the SEIS) will also need to be amended within the revised Environmental Management Plan to accompany the application for an EA.

## **5.4. Discharge into surface waters**

### **5.4.1. Issues**

A large scale open-cut mine such as that proposed by the proponent for the Alpha Project, has the potential to release contaminants into surrounding water ways through

- release of contaminated tailings from the Tailings Storage Facility or environmental dams holding water recovered from the mine pit or run-off from other contaminated areas (eg workshops, fuel storage, chemical storage)
- release of sediment from sediment ponds designed and located to intercept sediment from storm water running off overburden piles and other disturbed surfaces.

The proponent in the EIS and SEIS described the layout of the site and provided an indicative design as to how clean water, storm water and contaminated water would be managed on the mining lease to prevent the release of contaminated water that might impact significantly on water quality.

In its report to the Coordinator-General, RPS expressed concerns about the conclusion in the SEIS (Appendix L) relating to the mine water balance that in a ninetieth per centile wet year, no discharge of contaminated water to Lagoon Creek will occur. The water modelling used a number of assumptions that were questioned by RPS, notably:

- the 20 per cent settling zone within sediment ponds may not be sufficient
- sediment pond capacities do not exceed ten per cent AEP 24-hour storm volume
- demand for dust suppression is assumed to continue in all weathers—in wet conditions, actual demand is likely to be lower and will increase pond volumes.

RPS advised that the sensitivity of the model outputs to these factors is unknown on the basis of the results presented by the proponent, but all could increase the risk of overflow of contaminated water to the creek. A more important omission is the lack of

analysis of discharge risks under different event scenarios. The ninetieth per centile wet year modelled as worst case corresponds to an annual rainfall of less than 800 millimetres. Annual rainfall of up to 1400 millimetres has been recorded. Similarly, short-term rainfall intensities may result in discharge in some circumstances.

DERM advised that, in regard to proposals regarding site water management, sediment ponds need to be designed to effectively settle out the target suspended material, with detention times and path being particularly important. Environmental dams would need to be designed to contain a volume of water to meet all wet weather contingencies as well as commitments to monitor and pump water as required. Volumes for environmental dams (and feasible locations) have yet to be specified—a critical matter for overall feasibility of the project.

DERM noted that in light of the multiple mines proposed for the Galilee Basin, it would be preferable to establish a regional surface water monitoring and reporting program similar to that operating in the Bowen Basin.

In response, the proponent advised that development of a detailed Water Management Plan during the detailed design phase of the mine would resolve the issues raised through revision of the site water balance model and review of the mine site water management system.

#### **5.4.2. Coordinator-General's conclusions**

I note that DERM will provide conditions in its EA for pit dewatering, emergency releases from ponds and the detailed content of a water management plan that would prevent significant impacts arising from the release of contaminated water.

Stated conditions relating to the management of water on site are included in Appendix 1, Schedule 2 with additional recommendations provided in Appendix 3, Part A, Schedule 3.

To prevent the cumulative impacts of water release from multiple mines in the Galilee region from affecting surface water quality, I have imposed a condition at Appendix 2, Part B, Condition 1 requiring the proponent to contribute to any regional wide surface water monitoring and reporting regime that would be established by the administering authority.

### **5.5. Infrastructure impacts off mine site**

#### **5.5.1. Overview**

Barcaldine Regional Council (BRC) raised a number of general infrastructure concerns relating to the mine development in submissions on the EIS and SEIS. Although the proponent proposes a predominantly fly-in-fly-out (FIFO) workforce, a mine the size of Alpha is likely to lead to an increase in population in the township of Alpha both during the construction and operational phases of the project. This increase in population will place additional pressures on BRC and its infrastructure. Some of the infrastructure needs council referred to was:

- the Alpha Aerodrome needs major work to lengthen to 2300 metres and widen to 45 metres plus a new security terminal building, lighting and parking
- a new access road to the mine sites—the ‘Saltbush Road’ development has been identified by council as the most workable solution. Also, other road upgrades and maintenance requirements need to be addressed
- the township of Alpha will need an updated sewerage system if there is any further major development in Alpha; the neighbouring township of Jericho may require the installation of a sewerage system if they develop further. It is essential that adequate planning is undertaken and that infrastructure is provided to service the directly employed mine workforce and the ancillary service providers associated with the mine and its operations
- the township of Alpha will require an additional source of water and the water treatment plant may need upgrading. A permanent ongoing water supply is required for bulk water security as potable water and for irrigation, as the current mining application has the potential to temporarily or permanently alter the groundwater table, which provides some water supply security during drought and supplements town water. It is essential that a long-term water security plan is reached and the terms agreed by all parties
- the township of Alpha will require an upgraded electricity supply.

BRC has also raised other potential impacts on existing infrastructure, including increased demand:

- on existing health services necessitating hospital upgrades, the establishment of an ambulance service and ideally a resident doctor in Alpha
- on law enforcement, necessitating an upgrade/relocation of the current police station
- on existing schools, necessitating upgrades to facilities
- for community/recreational infrastructure, requiring upgrades of sporting facilities e.g. swimming pool, sports oval etc.
- on the existing fire service presently serviced by Rural Fire Brigade, requiring upgrade of town fire service resources
- for waste disposal, requiring an upgrade of current waste disposal area/landfill or development of a viable long-term alternative.

### **5.5.2. Coordinator-General’s conclusions**

The expected project impacts on existing infrastructure servicing BRC have not yet been adequately addressed. More detailed work on background data is required to make a thorough assessment of impacts and an assessment of the potential mitigation measures. I have therefore imposed a condition relating to infrastructure agreements for local infrastructure impacts within BRC (refer to Appendix 2, Part A, Condition 2).

Some matters for inclusion in the infrastructure agreement are also conditioned with regard to social matters (refer Appendix 2, Part C ,Condition 6, Condition 9 and Condition 11)

## 5.6. Tailings storage facility

### 5.6.1. Overview

The proponent proposes to construct a tailings storage facility (TSF) near the eastern margin of the proposed mine area on an outcrop of the Colinlea sandstone, which contains a significant water supply aquifer used by local landholders.

The Alpha project TSF will be designed to receive and store approximately 74 million tonnes of tailings over the nominal mine life of 30 years. The tailings would be pumped to the out-of-pit TSF as slurry with a consistency of 30 per cent solids by mass. The tailings would settle and become dense with approximately 20 per cent of the water being collected in a decant system for re-use in the CHPP. It is assumed that an additional 10 per cent of the slurry water will be lost to evaporation. The TSF has been designed in stages to allow for the TSF development over the life of the mine. The cumulative storage capacity at the end of 30 years is 155 000 000 cubic metres.

The groundwater investigations that accompanied the EIS indicated that the proposed TSF would be located on part of the recharge intake areas for the Colinlea sandstone. This raises concerns about the depletion of the aquifer recharge area and the risk of contaminant entry to the aquifer. The groundwater reports also identified that:

- the Colinlea sandstone contains a significant, regional sandstone aquifer, used extensively by a number of landholders for their water supply
- there is a possibility that water holes in Lagoon Creek may be connected to groundwater in the Colinlea sandstone
- there is a risk of contaminated water migrating from the TSF into groundwater
- the risk of poor quality artificial recharge occurring as a result of the TSF, acid mine drainage and salinity impacts on surface and groundwater (refer EIS Volume 2 Appendix 16)
- the final coverage area of the TSF was likely to be 19 square kilometres of the 175-square-kilometre catchment, which is a significant footprint on the potential recharge intake area for this aquifer from this single mine
- groundwater migration patterns could mean that, over time, the aquifer could become polluted by contaminated water from the mine.

### 5.6.2. Stakeholder comments

In its advice, the former DERM indicated that the recharge areas for the Colinlea sandstones must be protected and that this is a high priority for the agency. The groundwater reports overlooked the long timelines involved in the movement of groundwater. The aquifer in question is a confined aquifer; water movement and recharge mechanisms occur very slowly over long timelines. The very slow movement of groundwater in these aquifers means that potential problems may not become apparent for years or decades, i.e. they may not occur until after mining ceases and may continue for decades afterwards. Permanent and long-term mitigation measures are thus required to be put in place and these will require maintenance and an operations budget.

In its advice to the then Coordinator-General, RPS Australia recommended that the proponent needed to establish groundwater characteristics and details of TSF seepage control and of rejects management.

In the EIS, the rationale for the proposed location of the TSF is outlined (Appendix J2 section 3.1). DERM requested that the proponent present a review of the design strategy for the proposed TSF with particular regard to the recharge and contamination risk mitigation actions that would be implemented. It was recommended that the proponent demonstrate the technical and economic feasibility (or otherwise) of:

- locating the TSF at a site that does not impact on the recharge areas for the Colinlea sandstone, or
- designing a TSF that will not impact on the recharge areas for the Colinlea sandstone, e.g. a TSF design that contains contaminants and protects local groundwater by adopting measures such as linings, internal under drainage and management of drainage waters
- in-pit tailings disposal after a suitable mine development period.

In its submission on the addendum to the SEIS, DERM advised that Section 6.2 of Appendix C stated that the proposed design of the TSF was for a fully lined impoundment to limit the potential for leakage from the facility. Section 6.2.1 further stated that seepage from the TSF would be minimised by implementing mitigation measures, including the use of a liner system to reduce seepage from the TSF to groundwater. Section 6.2.2 of the report stated that a liner system may be required in areas where sandy soils are encountered to limit seepage of tailings water into the foundation soils/rock and reduce the potential impact to groundwater and the Lagoon Creek alluvial area. Generally, test drilling below and adjacent to the TSF site had found little water, although water was found in conglomerate within the tertiary formation, to the west of the northern section of the proposed TSF; and that seepage management would be required to limit the potential for TSF seepage to enter these more permeable and transmissive zones.

Despite these statements in the SEIS, DERM noted that other parts of the report indicated that some of the proposed measures may not be implemented.

Further to its submission on the addendum, DERM referred to discussions with the proponent concerning a proposal to use in-pit disposal as an alternative to a larger TSF. DERM has previously identified that there has been little or no assessment or comment during the EIS process on the impacts on groundwater of this proposal.

### **5.6.3. Proponent's response**

In the SEIS, the proponent agreed that an in-depth evaluation is still required to accurately assess the impacts. Due to drilling delays, this information was not available to include in the SEIS. However the proponent committed to undertaking the necessary hydrogeological studies to fully assess the TSF impacts and made this available as an addendum to the SEIS.

Included in the addendum to the SEIS were two reports: The 'Out-of-Pit Tailings Storage Facility: Hydrogeological Assessment' (Appendix C) and 'Out-of-Pit Tailings Storage Facility: Geotechnical Assessment' (Appendix D).

The hydrogeological assessment report concluded that the TSF would be designed based on good engineering practice and constructed accordingly—thus the risk of artificial recharge with poor quality TSF seepage will not be significant. The reduction in recharge would only affect the shallow perched groundwater resources located within the Quaternary and Tertiary sediments directly within the footprints. These groundwater resources are considered to have limited environmental values, except for possible vegetation communities, due to groundwater quality and limited abstraction potential.

In summary, the 'Out-of-Pit Tailings Storage Facility: Hydrogeological Assessment' indicated:

- limited recharge potential to the underlying Colinlea sandstone aquifers due to the thick clay-rich tertiary cover, thin discontinuous Colinlea Sandstone aquifers, thick unsaturated zone (even though the site was subject to prolonged high rainfall events during 2010/2011), and no Colinlea sandstone rock outcrop or shallow sub-crop. This coincides with the conceptualisation, borne from the groundwater flow patterns recorded on site, from south-west to north-east, that groundwater recharge predominantly occurs to south west along the Great Dividing Range
- drilling results and blow-out yields recorded during rotary-air-percussion within the proposed TSF footprint indicate aquitards and units of limited groundwater potential. The shallow groundwater resources (perched water tables) that could potentially be impacted by the proposed TSF have limited sustainable yields, limited effective storage, and contain poor quality groundwater
- discrete zones of alteration, resulting in enhanced groundwater potential, occur to the west of the northern portion of the proposed TSF footprint. These groundwater resources can be protected through the use of lining and seepage control measures down gradient of the proposed TSF
- the TSF footprint is underlain by tertiary age saprolite and laterite (tertiary weathering of Colinlea Sandstone sediments) and Joe Joe Group sediments that are shown from drilling to be hydraulically tight and to have very low groundwater potential.

The 'Out-of-Pit Tailings Storage Facility: Geotechnical Assessment' report concluded that, based on the results of this investigation and a review of data previously collected, the TSF site is considered suitable for storing tailings as proposed in the EIS. This conclusion assumes that the TSF will be designed based on good engineering practice and constructed accordingly.

The geotechnical assessment report considered it highly unlikely that well-developed Lagoon Creek palaeochannels or extensive former drainage pathways are present beneath the proposed TSF footprint. Slight horizontal migration of tailings liquor through superficial alluvial or low density residual soils (if any) can be expected during the life of the mine; however, the construction of an engineered cut-off trench that intercepts the soil/weathered rock interface (where liquor may accumulate over time) would mitigate the risk of contamination into Lagoon Creek to acceptable levels.

The report also stated that due to the low groundwater level and low hydraulic conductivity measured during in situ falling head and packer testing, the residual soil and weathered sandstone in the floor of the TSF footprint appeared to be sufficiently impermeable to limit significant vertical migration of tailings liquor into the groundwater table. Given the relatively low permeability of these materials, it is expected that the TSF can be designed to mitigate adverse impacts to the regional groundwater system. To the extent prudent engineering and best practice are adopted during design and construction, the addendum concluded that no adverse effect to groundwater quality is expected. Therefore, there is no need for an impermeable blanket/liner. The Addendum report recommended that at the time of construction a groundwater monitoring program comprising a series of piezometers be established to regularly assess the groundwater depth and quality around the perimeter of the proposed TSF.

DERM stated that Appendix D and Appendix C of the addendum to the SEIS seemed to be contradictory in regard to TSF seepage management. Compaction of the final exposed sub-grade within the footprint of the TSF storage area was recommended and would be expected to further mitigate downward migration of tailings liquor.

Since providing the SEIS and SEIS addendum documents, the proponent has committed to:

- line the TSF with an engineered clay liner and install drainage controls to avoid seepage
- investigate the technical and economic viability of disposing the coal process fine tailings within the mining pits, and if confirmed that it is a greater viability than the TSF, change the tailings storage location from the TSF to in-pit location within the first five years of mining operation.

If an in-pit tailings storage solution is progressed, a full assessment of all the impacts would be required to ensure that the environment is protected, especially the groundwater system/s.

#### **5.6.4. Coordinator-General conclusions**

I acknowledge the issues raised by DERM concerning the TSF facility. I am satisfied that the proponent has undertaken satisfactory investigations as outlined in the addendum to the SEIS; however, I note that more work will need to be completed during the detailed design phase of the project. By implementing the stated EA conditions in Appendix 1, recommended EA conditions in Appendix 3, Part A, and an additional recommendation regarding assessment required to determine lining of TSF cells (refer Appendix 3, Part D, Recommendation 3(a)) I am satisfied that the potential impacts of the TSF will be mitigated.

In relation to the future disposal of tailings into the mine pit, I have made a recommendation which specifies that a detailed assessment is undertaken prior to any in pit disposal plan being considered by relevant authorities (Appendix 3, Part D, Recommendation 4).

## 5.7. Groundwater

The EIS outlined how mining will occur below the regional water table and that it will be necessary to dewater the mine (i.e. remove groundwater) in advance of operations to allow mining to occur safely to the intended depth. Mine dewatering will be required for geotechnical reasons (i.e. to depressurise behind the pit walls and below the floor of the mine, to prevent slope failure and floor heave) and for operational reasons (to prevent uncontrolled inflows to the mine, which would result in wet digging, equipment wear, and potential safety issues). A combination of pumping from external dewatering bores and in-pit sumps is likely to be required.

Mine dewatering has the potential to impact on:

- Groundwater levels;
- Groundwater flow direction;
- Groundwater chemistry; and,
- Recharge and discharge mechanisms.

### 5.7.1. Groundwater modelling

#### Stakeholder comments

After their assessment of the EIS, RPS (consultants engaged by the Coordinator-General) provided advice that the proponent had only undertaken preliminary groundwater modelling for the mine component of the project and that more comprehensive modelling would be required.

Revised modelling of the mining component was included in Appendix N of the SEIS. The proponent used a numerical regional groundwater model based on the finite element software FEFLOW. RPS advised that the revised model involved a number of simplifying assumptions that limited the reliability of the predictions (e.g. including no recharge, uniform pre-mining groundwater levels across the modelled area, constant heads at the modelled area boundaries, and unchanged hydraulic properties throughout the mining phase). Post-mining simulation of the development of pit void lakes had been undertaken but this was subject to the same limitations as for the mining phase modelling, and had not been based on a detailed understanding of mine sequencing and impacts.

A submission from the former DERM also expressed similar concerns with aspects of the revised groundwater modelling report. In addition, DERM questioned the source of recharge and the direction of groundwater flows, and recommended that the impacts of the project on the groundwater resource be more fully investigated.

DERM also submitted that the initial groundwater investigations, especially in an area where there has been no previous long term monitoring of groundwater behaviour and little base data, would only be a starting point and ongoing investigations would be required for the life of the project to refine the original groundwater model and impacts of the project on groundwater.

As a result of this advice and the limitations with the groundwater modelling provided in the EIS and SEIS documents, the proponent was requested to undertake more advanced modelling.

### **Proponent's response**

In March 2012, the proponent submitted the Groundwater Modelling Report-Alpha Coal Project (Hancock Coal Pty Ltd, 28 March 2012). For this report, a MODHMS model was constructed and calibrated (utilizing a specialist groundwater modelling company MTNA) to undertake a predictive groundwater assessment. Predictive simulation was conducted for both open-cut and underground mining across both the Alpha and Kevin's Corner coal projects during the proposed active mining period up until the end of 2043. In summary this report concluded that the mine would have no impact on the Great Artesian Basin (GAB), there would be 18 neighbouring bores within the projected 1 and 5 m drawdown contours for the target D coal seam at the end of mining, there would be minimal drawdown to the east of the mine footprint and there would be no projected impacts on aquifers below the registered northern springs during or post mining.

The proponent's revised draft EM plan, to be further revised for inclusion with the formal application for an environmental authority, included commitments to install additional monitoring bores adjacent to proposed mine infrastructure at least 6 months prior to construction. The proponent also has made a commitment to make-good affected groundwater supplies, including field checking of current water supply bores (refer Appendix 5).

### **Coordinator-General's conclusions**

The March 2012 groundwater report was provided to SEWPaC and DERM with no significant omissions identified by those agencies. Further analysis of the Australian Government's interest in groundwater matters can be found in Section 11 of this report.

DERM has advised that with the built in protection mechanisms within the mine plan for the resource and proposed mitigation of ongoing impacts, approval for the project (i.e mine dewatering) could be adequately conditioned.

I have noted the commitments by the proponent to mitigation and monitoring set out in Appendix 7 and that these commitments will be conditioned in the environmental authority under the EP Act and approvals under the *Water Act 2000*.

I have noted that the revised groundwater model provides a comprehensive predictive analysis of the groundwater impacts arising from both the Alpha and adjacent Kevin's Corner mines over the life of these projects. Nevertheless, I have recommended a condition requiring periodic post-audits of the groundwater model, and re-calibration and re-prediction of future impacts during the mining phase of the project. These should be undertaken initially at a minimum of 3-yearly intervals, and then at 5-yearly intervals throughout the mining phase of the project. The condition is in Appendix 3, Part B.

To ensure that the information contained within the revised groundwater model is available for the assessment of future mining projects in the region and that cumulative

impacts are addressed, I have imposed a further condition at Appendix 2, Part B that requires the proponent to contribute groundwater information and funding to any government agency coordinated cumulative study. DNRM and DEHP will be jointly responsible for these conditions.

## **5.7.2. Groundwater security**

### **Stakeholder comments**

The Barcaldine Regional Council (BRC) raised the issue of water security for the BRC local government area and the potentially affected properties from impacts from the mine operations. BRC was concerned that the proponent had given no real guarantee or assurance as to long term security of water. BRC stated that reliance on undefined 'alternative water supplies' or make-good options was not a suitable response when groundwater is relied upon as a potable and stock watering source in a region which is susceptible to sustained periods without rain and extended droughts. The BRC considered that groundwater impacts need to be managed and mitigated through other means, primarily avoidance (where possible) and reinstatement.

The former DERM in their submission stated that the EIS did not specify proposed mitigation measures for the impacts of the project on groundwater, and the EIS failed to recognise that any water licence issued for dewatering would contain "make good" provisions to ensure that all impacts on landholder water supplies are rectified. DERM noted in their submission on the addendum to the SEIS that in an earlier supplied summary of pumping data from the Alpha test pit, the proponent had stated that;

"The data suggests that mining will locally dewater the groundwater resource, and that there will be little or no recharge to replenish "mined" groundwater. This has implications for long-term sustainable yields for mine use, and for local groundwater users with bores constructed within the D-E sandstone or stratigraphically higher sediments."

In response, DERM recommended that a Groundwater Monitoring Program be developed to include sections dealing with the mitigation, monitoring and assessment of groundwater. In particular the Program should contain the following:

- A commitment that the project will be designed based on the precautionary principle to ensure least possible impacts on the groundwater resource
- A commitment to mitigate any adverse effects that may occur such as changes to water quality in both groundwater and surface water resources
- A commitment by the proponent to enter into landholder agreements, before mining commences, with any landholder who is predicted to be adversely affected by the project
- Landholder agreements must provide for a long term and equal alternative water supplies, or other agreed rectification methods, that are able to continue to supply water or equivalents after mining operations ceases.
- Details on how the proponent will comply with the terms of any water license in regards to the rectification of an affected water supply

- A commitment to establish a groundwater and surface water monitoring program to monitor the impacts of the mine on groundwater and any connected surface water.
- Establishment of trigger levels for water level and water quality parameters which will be used to determine if an adverse impact has occurred on the groundwater resource;
- The trigger levels to be determined by the proponent before the commencement of mine operations and submitted to the administering authority for approval.

DERM advised that should the project be approved and a water licence be granted for the necessary dewatering discussed above, then DNRM officers would want to see any groundwater collected during this process to be beneficially used, i.e for a mine water supply. The impacts of the take of this water would be regulated by the mine dewatering licence.

However if the mine wanted to drill additional bores for the purpose of providing a water supply for the mine, then an additional water licence would be required. DNRM would require an additional groundwater investigation to be undertaken to assess the impacts of this additional take and any water licence granted would be conditioned with the same terms as the dewatering licence (see Appendix 3, Part B).

### **Proponent's response**

The EIS stated that mitigation measures, including landholder agreements and groundwater monitoring measures would be specified in a yet to be developed Groundwater Environmental Monitoring Program.

In the SEIS the proponent outlined the following commitments:

- A commitment that the project will be designed to ensure least possible impacts on the groundwater resource
- A commitment to mitigate any adverse effects that may occur such as changes to water quality in both groundwater and surface water resources
- Compliance with the terms of any water license conditions
- A commitment to establish an integrated groundwater and surface water monitoring program
- The trigger levels will be determined by the proponent before the commencement of mine operations and submitted to the administering authority for approval.

The proponent has made a commitment to make-good affected groundwater supplies. In Volume 2 Appendix V of the SEIS, the proponent stated that the company would develop alternate water supply agreements with landholders who could potentially be impacted by mine dewatering. Landholders who have groundwater supplies that are materially impacted by the operation, to a degree where groundwater is not able to be used for its pre-mining beneficial use (in terms of quality and/or quantity) would be provided with an alternate water supply of comparable yield and quality.

Controls would also be implemented to prevent seepage and to manage seepage should it occur from contaminated mine operational areas. Potential seepage from water and waste storage facilities would be monitored using down-gradient groundwater monitoring bores.

In the event of groundwater impact from contaminated seepage being identified, mitigation measures would include:

- Investigation of the integrity of the containment systems and potential areas/sources of seepage;
- Removal of the source of contamination and/or repair to the containment system, as required; and/or
- Installation of systems to intercept groundwater (e.g. interception trenches or bores).

Mine infrastructure, in particular the proposed TSF, will be designed and constructed in such a way that it does not adversely impact on the groundwater resources, in particular:

- Ensuring that there is the potential for leakage is minimise by the selection of the optimum lining materials and operating procedures.
- Prevents shallow seepage migration into any connected surface water systems.

### **Coordinator-General's conclusions**

More detailed work is needed to fully address the issue of groundwater security for current users of groundwater. The proponent's commitment to "*make good*" must be fully detailed in the next stage of the project assessment. is to be achieved. The "*make good*" provisions will be addressed in detail in conditions attached to any approval for a licence under the *Water Act 2000*. Nevertheless, to ensure that local landholders are compensated for any impacts caused by mine dewatering, I have recommended a condition that specifies that implications for current users of groundwater and make good provisions be fully addressed prior to the commencement of mining activities (Appendix 3, Part B). DNRM will be the agency responsible for this recommendation.

The SEIS states that the project's water supply would be obtained from groundwater in the early years of mine construction and operation until an external supply is available from a third party water supplier. There does not seem to have been adequate hydraulic testing and modelling to confirm that sufficient groundwater supply is available for this purpose.

However, conditions that deal with the interception and use of groundwater and the availability of groundwater for use by the proponent would be included in a water licence issued under the *Water Act 2000*. Conditions attached to the licence would cover regular monitoring, data assessment and preparation of annual reports.

The former DERM provided me with a set of standard conditions that would be imposed on licences issued for the interception and use of groundwater and for completeness I have included these in my recommended conditions for the mine at Appendix 3, Part B.

### **5.7.3. Great Artesian Basin (GAB) impacts**

In its advice to me, RPS stated that the source and mechanism of recharge of the GAB needed to be resolved in order to eliminate any potential inconsistency. RPS advised that some attempt has been made to assess the potential impact of the project on the GAB, through sensitivity modelling. However, without proper representation of

recharge, this was of limited reliability. SEWPaC also sought further information from the proponent as to potential for the mine to impact on the GAB.

The former DERM also supported the view that the source of groundwater recharge needed to be clearly identified; however it did not share the concerns of RPS that the project had the potential to impact on the GAB aquifers. DERM advised that the mine footprint does not extend far enough west to intercept any GAB aquifers; therefore any impacts could only be from water draining from GAB aquifers (the clematis sandstone) into the aquifers of the Colinlea sandstones and bandanna formation. This would require a reduction in head in the Colinlea sandstone significant enough to induce the transfer of water from the clematis through the Rewan formation and into the Colinlea sandstone. However the Rewan formation is recognised as a significant aquitard and does not contain any useable aquifers. Section N.3.3 of appendix N in the SEIS v4 confirmed that the Rewan has a very low permeability.

The revised Groundwater Modelling Report (March 2012) referred to above provided detailed analysis of the aquifers in the vicinity of the mine; supporting the original conclusion that the mine would have no impact on the GAB.

### **Coordinator-General's conclusions**

I am satisfied with the advice from DERM and the information provided in the revised Groundwater Modelling Report that the Alpha mine would not pose any threat to the GAB aquifers. However I have agreed with DERM and SEWPaC advice that it will be necessary to monitor and gather further data to identify groundwater behaviour. Imposed conditions relating to monitoring and reporting of cumulative impacts at Appendix 2, Part B and recommended conditions at Appendix 3, Part B will satisfy this advice.

#### **5.7.4. Other groundwater impacts**

SEWPaC raised concerns about the potential impact of the mine on groundwater that could lead to the dewatering of aquifers providing water to vegetation and fauna habitat, particularly species and communities that are MNES.

Advice from RPS stated that monitoring of dewatering of the Alpha Test Pit, constructed to access a bulk coal sample for testing overseas, indicated that only limited water inflow rates are likely from the overburden and the coal measures above the D seam, and that the major water inflows are likely to be derived from the D-E sandstone underlying the D seam, and deeper units. As such, there is unlikely to be any significant impact on surface aquifers providing water to flora and fauna outside the immediate area of mine impact.

The revised Groundwater Modelling Report (March 2012) referred to above provided detailed analysis of the aquifers in the vicinity of the mine; and supported the conclusion that the mine would have limited impact on the surface aquifers providing water to fauna and flora.

Further information on this issue can be found in Section 5.2 (Aquatic Fauna) and Section 11 (MNES).

### **Coordinator-General's conclusions**

I am satisfied that the additional modelling undertaken by the proponent, particularly with the advantage of monitoring data from the pre-mining test pit, has not identified a significant likelihood of impacts on surface aquifers outside the immediate mine footprint. Conditions and recommendations relating to further monitoring and reporting of this issue can be found in Appendix 2 and Appendix 3.

#### **5.7.5. Groundwater monitoring**

The proponent has already established a network of groundwater monitoring bores within and around the existing bulk sample pit, proposed open-cut and the out-of-pit Tailings Storage Facility areas. A baseline monitoring program involving both water quality and groundwater levels has been commenced, and is described in the EIS and SEIS documents.

The former DERM forecast that conditions for the proponent to monitor groundwater, particularly water quality would be included in the project's EA.. The EA conditions would include the requirement to undertake a minimum 12-month baseline monitoring program to determine per-mining groundwater conditions. A further EA condition would requires the proponent to develop appropriate trigger values for a range of groundwater quality parameters.

However, RPS advised that other conditions should address, subject to development (prior to commencement of mining) of a satisfactory numerical model, the calibration of the model and testing of the reliability of impact prediction both during and after mining. In its submission to the Coordinator-General, DERM supported this RPS recommendation.

The revised Groundwater Modelling Report (March 2012) referred to above provides a sound basis for predicting impacts during and following the completion of mining. The proponent has committed to regular review and re-calibration of the model using data collected during the life of the project. The proponent emphasises that the model includes the neighbouring Kevin's Corner project as well as the Alpha Coal mine.

### **Coordinator-General's conclusions**

The requirement to monitor, assess and report is part of the standard terms that DNRM will include on any water licence for mine dewatering or for use of groundwater for operational purposes. I consider that the conditions recommended for attachment to the water licence at Appendix 3, Part B, along with the conditions stated for the EA at Appendix 1, and recommended at Appendix 3, Part A should be sufficient to address the concerns raised by RPS and DERM.

SEWPaC also indicated that they would like to see a regional groundwater modelling program undertaken, similar to that undertaken in the Surat Basin for the coal seam gas industry. DERM has advised similarly. I have therefore imposed a condition at Appendix 2, Part B that will require the proponent to cooperative with other proponents and government agencies in developing a Galilee Basin regional groundwater model and contribute data and funding for its ongoing development and maintenance.

I am satisfied that although the mine will have impacts on groundwater, particularly in the immediate vicinity of the disturbed area, the proponent has made commitments and will be conditioned to ensure that these impacts will be mitigated. I note that the issue of groundwater impacts and the taking of water for mine supply in the initial years will be addressed in conditions attached to a licence under the Water Act 2000, and that groundwater quality will be maintained through conditions attached to the EA under the EP Act.

## **5.8. Surface water diversions and flood protection**

### **5.8.1. Overview**

The Project is located adjacent to Lagoon Creek which is high in the headwaters of the Burdekin Basin. Lagoon Creek flows to Sandy Creek, Belyando River, Suttor River, and eventually joins the main Burdekin River channel several hundred kilometres north of the project site. Five key streams within the project area have been identified as defined watercourses (as defined under section 5 of the Water Act 2000). The defined watercourses are Rocky Creek, Little Sandy Creek, Sandy Creek (also known as Greentree Creek), Spring Creek and Lagoon Creek. The EIS stated that as the existing watercourses in the project area are highly ephemeral and do not sustain persistent flow, the beneficial uses of surface water resources around the project area are limited.

In the EIS, the flood inundation map for the 1,000 year ARI flood showed that the floodplain corridor for this magnitude of rainfall would be approximately 2 to 3 km wide. The flooding would be widespread and shallow with the maximum flood depths typically less than 5m above the channel bed. The flood profiles show that there is approximately 20 metre difference in flood levels between the southern and northern extents of the proposed mine lease area.

In the EIS, the proponent outlined that the project design for surface water management was at a concept to preliminary design stage and built upon the pre-feasibility study mine plan prepared by the proponent. Concept designs for surface water management would need to be further developed during detailed design to obtain the statutory approvals required after EIS approval or to meet the conditions of the project's EA. These approvals include operational works approvals for stream diversions under the *Water Act 2000*. Certified designs for flood protection levees (as regulated structures), and hazardous dams would be required to be completed as conditions of the EA.

As part of the process for developing the detailed design for surface water management infrastructure, further investigations would need to be undertaken, particularly to assess geotechnical conditions at the various infrastructure locations and suitability of materials for construction.

Although the detailed Project design for surface water management was not finalised, the proponent considered that the design was sufficiently defined to facilitate impact assessment and identify mitigation measures required to protect surface water and associated environmental values. The philosophy adopted was to ensure that concept

definition of the surface water management works and operations were sufficient to demonstrate that environmental impacts could be managed and the required works could be integrated into the project.

## **Diversions**

The diversion of defined watercourses for Lagoon Creek, Sandy Creek, and Spring Creek would be required for the project to gain unimpeded access to coal reserves that would otherwise be inaccessible due to the risk of flooding. To supplement the stream diversion channels, flood protection levee banks would be required to protect the mine from flooding and these were discussed in Section 11.5.6. of the EIS.

The Lagoon Creek diversion would be a 9 km diversion that will join the existing Lagoon Creek channel at both upstream and downstream ends.

The Sandy Creek diversion would start approximately 12 km upstream of the existing confluence with Lagoon Creek, flow north and then east around the proposed mine pits to re-join the existing Sandy Creek approximately 400 m upstream of the existing Sandy Creek confluence with Lagoon Creek. The Sandy Creek diversion flood channel length would be approximately 13.4 km (some 1.6 km longer than the existing Sandy Creek reach).

The Spring Creek diversion would start approximately 8 km upstream of the existing confluence with Lagoon Creek, and flow south and the east around the proposed mine pits to join Lagoon Creek at a new confluence location approximately 1 km inside the southern lease boundary. The length of the flood channel for Spring Creek diversion would be 10 km (approximately 2 km longer than the existing Spring Creek reach from the diversion off-take to Lagoon Creek).

All of the physical works extents of the proposed stream diversions would be contained within the MLA 70426 boundary.

## **Flood levees**

Flood protection levee banks are proposed to protect the mine open-cut and overburden dump areas from floods in Lagoon, Sandy and Spring Creeks. The proposed extent of flood protection levee banks are presented on Figure 11-3, Volume 2, Section 11 of the EIS. A flood levee bank would be required on the western side of Lagoon Creek for the majority length of the mine. For the Sandy Creek diversion a flood levee bank would be required along the eastern side of the diversion flood corridor for the section of diversion that flows north, and on both sides of the diversion flood corridor for the section that flows east to Lagoon Creek. For the Spring Creek diversion, a flood levee bank would be required on the eastern side of the diversion flood corridor for the section of diversion that flows south, and on both sides of the diversion flood corridor for the section that flows east to Lagoon Creek.

The flood levee banks are nominally designed at concept stage to provide protection up to the 3000 year ARI flood level. The nominal level of flood protection equates to a 1 per cent probability of an extreme flood overtopping the levee bank for the 30 year mine life. Subject to further geotechnical investigation regarding the suitability of materials, it is proposed that the flood protection levee banks will be constructed using

benign mine overburden materials and excess spoil from the stream diversion excavations. Materials quality and compatibility with practical construction methods will be a key factor in levee bank design. Slope stability, flood velocities and the risks of piping failure (i.e. internal erosion either through the embankment or beneath the levee foundation) will be assessed and mitigated in the detail design. The levee embankment alignments may also need to vary slightly from the concept alignments depending on the conditions encountered during detailed design geotechnical investigations and for finalising the stream diversion designs.

## **5.8.2. Stakeholder comments**

### **Diversions**

In response to the EIS and SEIS, RPS provided advice regarding:

- Floodplain constriction of Lagoon Creek
  - Would need to be designed to minimise channel erosion: the SEIS revised design had reduced flow velocities in the diverted reach.
  - Channel excavation may expose dispersive/sodic soils and in some locations and may risk channel and overbank erosion
  - Identification of high risk locations and appropriate treatment should be achieved in the design phase.
- Aquatic ecology of creek and wetlands affected by diversion
  - No basis for impact assessment had been provided in the EIS and SEIS.
  - Although impacts are unlikely to be more than locally significant, design and management arrangements need to be informed by specific impacts, particularly if cumulative effects of adjacent mining projects are to be mitigated.
- Stability of low flow channel
  - The low flow channel had been redesigned between the EIS and SEIS.
  - Detailed design would need to evaluate hydraulics under a range of flows to determine how the low flow channel will behave geomorphically. This may also have implications for aquatic ecology.

The proponent was requested to supply the following information:

- A modified version of the mine project layout showing any surface water or geomorphic features of note – wetlands, ponds/dams, anabranches and major instream pools, etc.
- Maps of each creek showing the chainages—pre and post diversion.
- A soils or erosion potential map—superimposed on the chainage maps
- A map of the ARI 2yr and 50 year inundation areas for all three diversions (pre and post diversion).
- Pre and post diversion graphs of Lagoon Creek stream power, shear stress and flow velocity against chainage for the Q2 and Q50 events
- A plan and typical cross sections of the high and low flow channels for the Lagoon creek diversion

RPS determined that Volume 2 Appendix J (Stream morphology technical report) of the SEIS demonstrates that the creek diversions are generally within ACARP guidelines for 2 Year ARI. The exception is the 9.6km Lagoon Creek diversion, in which maximum Shear Stress exceeds the relevant guideline by 50 per cent. However, the remaining 15km of undiverted reaches of Lagoon Creek, within the MLA boundary appeared to be significantly affected by the diversions, with spot velocities increasing at one site in the upper reach from 0.8m/s to 1.4m/s and in the lower reach from 0.25m/s to 1.4m/s. These figures are at the upper limit of ACARP guidelines for vegetated streams and above the limit for unvegetated streams. More importantly, they represent a substantial increase in velocities in a natural channel which has mobile bed sediments and sparsely vegetated, unstable banks in many areas.

At 50 year ARI, spot velocities show substantial increases over current within the diversion and downstream, with an increase from 2 to 2.5m/s at one point downstream. Sheer stress predictions generally were in line with current conditions, with one spike in the Lagoon Creek diversion. Stream power data for the base case were not presented, but a number of spikes occurred downstream of the Spring Creek confluence, with one maximum at 400W/m<sup>2</sup> and two maxima around 200 W/m<sup>2</sup>. These stream powers are above or close to limits beyond which significant erosion could occur. If applied to the diverted reach, engineering stabilisation would be required as part of design/construction.

It should be noted that the critical limits for these hydraulic parameters are a function of channel morphology, soils, vegetation and flow duration. In the undiverted reaches, Appendix J of the SEIS described all of these except flow duration. The longer the flow duration, the lower the critical value of the parameter and hence the higher the risk of erosion.

RPS expressed some doubt about the reliability of the stream power graphs in the EIS and SEIS documentation, but these spikes indicated high to very high risk zones in parts of the undiverted reaches. This is complicated by the fact that some of the affected reaches are downstream of the MLA boundary.

The former DERM also stated that the proponent did not provide relevant information addressing the expected increases in hydraulic parameters (from the existing case) on Lagoon Creek downstream of its confluence with the proposed Spring Creek diversion. The potential mitigation measures would need to extend beyond localised areas of higher stability concerns to a more comprehensive review.

Both RPS and DERM expressed the same concerns over the conflicting and at times, contradictory nature of the potential hydraulic conditions of the proposed diversions and indeed, their potential impact on the existing downstream hydraulic conditions of all watercourses. Any impact from diversions upstream and downstream on the diverted watercourse should be minimal if at all. RPS recommended that reaches within the ML and downstream by up to 5km should be assessed for baseline geomorphic conditions. DERM recommended that this assessment be extended to upstream of the diversion confluence by a similar length.

The former DERM advised that it would be desirable to minimise the use of large extents of rock armouring in the diversion works to ensure that appropriate substrate conditions could be provided to maximise success of rehabilitation of the channel banks and natural characteristics of the creek banks.

### **Flood levees**

In February 2012, DERM advised that for purposes of potential hydraulic impacts of diversions, only flow events out to AEP 1 in 50 need to be assessed. Where diversions operate in conjunction with levees, those levees need to be demonstrated to be robust in operation—in particular, to be able to survive erosion to their design AEP which is typically rarer than AEP 1 in 1,000.

As RPS has indicated for the construction of diversion channels, unacceptably high average energy dissipations are predicted—particularly in the un-diverted channels downstream during flow events at and more frequent than AEP 1 in 50. Notably these relate to average stream velocities around 2 metres per second. DERM commented that figures of average velocity of 2 to 2.5 metres per second are cited in some publications as acceptable over well-grassed surfaces. However, DERM is concerned that where erodible soils are involved, grass coverage would be difficult to establish. Stability will not be achieved beyond 1.5 metres per second without engineered protection.

### **Cumulative impacts**

DERM in their submission to the Coordinator-General commented that the current extent of mining activities surrounding the Alpha Mine includes the Hancock Coal Kevin's Corner and Waratah Galilee Coal Projects. The cumulative impact of these three projects on the existing natural resources including watercourses and diversions should be examined. The proponents should be asked to investigate how the cumulative impact of their proposed diversions and mining activities impacts on adjacent mining projects.

### **Fishways**

Fisheries Queensland (formerly part of DEEDI), whilst acknowledging that works authorised under the *Mineral Resources Act 1989* within the Mining Lease are not required to obtain an approval under the Sustainable Planning Act 2009, was concerned that any waterway barriers inside or outside of the Mining Lease have the potential to impact upon fish movement and waterway habitats with ramifications to the fisheries resources of the region. With this in mind and regardless of the statutory need for waterway barrier works applications or approvals, Fisheries requested the Coordinator-General include conditions that require the proponent to provide for fish passage within any waterway works, stream crossings or waterway diversions and minimise and mitigate any impacts upon waterway habitats.

### 5.8.3. Proponent's response

#### Diversions

The proponent provided a comprehensive assessment of diversion impacts in Section E of the addendum to the SEIS, Stream Morphology Technical Report.

The upper limits design criteria are detailed in Table 6.6 of this addendum report. Table 6.6 and the graphs contained in Appendix B of the report, demonstrated that generally the design parameter values for the 2 year ARI event are below the ACARP guidelines. This is due to the small flows and relatively high roughness. Spiking of values may occur due to tributary inflows into the system. The 50 year ARI parameters demonstrated high values due to the high flow volumes and channel shape. Increased roughness of the channel and introduction of localised water holes would improve the hydraulic parameters in the channel and provide long term channel equilibrium. Although some values are above the ACARP guidelines, the proponent argued that they are still well below the existing channel parameter values, and therefore under the reference reach design approach, still acceptable.

In their submission on Appendix E, Stream Morphology Technical Report of the addendum to the SEIS, DERM stated that while Table 6.6 has been updated, the values within the table varied, in some cases substantially, from the table that had previously been provided within the SEIS. They recommended that this difference would need to be further investigated during the detailed design of the diversions through the application process under the Water Act 2000.

In relation to rock armouring, the proponent has responded that the use of rock armouring would be minimised where possible through detailed design by optimising the diversion layout and geometry including combination of detailed design geometry of the active channel, meandering, and broader flood channel. The geotechnical investigations required for detailed design would be an important factor as part of this process. Localised areas of rock armouring may be required to provide bank protection at key locations where channel migration poses unacceptable risk to significant infrastructure or poses risk to destabilise the diversion channels. Should rock armouring be needed, it is proposed to use sandstone selected from mine overburden materials which is non-acid forming and has low potential to produce saline leachate. The rock armouring would be placed as a mixture of topsoil and rock and seeded to allow vegetation to establish and eventually take over as the primary means of erosion protection as the sandstone breaks down due to weathering.

The proponent argued that the establishment of riparian vegetation would be a key component of all waterway diversions. Riparian vegetation plays an integral role in creating and maintaining the stability of newly constructed channels. Further assessment of riparian vegetation would be undertaken as part of the detailed design to provide a basis for developing a detailed revegetation plan. Revegetation would include the use of a mix of indigenous groundcover, shrubs and tree over-storey species. The potential need or benefit of installing large woody debris for additional habitat would also be investigated as part of detailed design.

Further geotechnical investigation for detailed design of the diversions would also be important to finalise bank and excavation surface treatments. The majority of the diversion works would involve excavation and would be likely in some areas to intercept clay subsurface materials which have been identified to be dispersive. Treatments would be required to ensure that dispersive soils are not left exposed on the diversion bed, bank, or floodplain surfaces. The two options treat the dispersive clays are in-situ gypsum treatment (to reduce dispersion potential) or to cap the dispersive soils with non-dispersive soils and or rock.

### **Flood levees**

In the SEIS, Hancock stated that in accordance with DERM comments and independent (C&R Consultants) flood risk analysis, the floodplain has been widened, providing more storage and conveyance through the diversion/constrained channel.

This notwithstanding, the proponent forecast that there would be impacts due to the diversion of Lagoon Creek or the redistribution of flows around the mine pits, particularly as the Mining Lease Application (MLA) 70426 boundary is immediately upstream and downstream of the mine works and the existing flood plain through the site is very wide in places. The proponent stated that the detailed design would aim to minimise impacts as much as reasonably possible, with any impacts being minor in nature and of short duration.

### **Water structures bridging report**

In early May 2012, Hancock Coal prepared a report, *Alpha Coal Project Mine Water Structures Bridging Report*, Parsons Brinckerhoff Australia Pty Ltd, dated 27 April 2012, that recompiled flooding, stream morphology, water management and water balance technical reports from previous EIS, SEIS and SEIS Addendum documents. The Bridging Report was provided to DEHP and DNRM as a response to the issues discussed above. The report was also meant to provide DEHP with additional information to allow the finalisation of conditions for the EA relating to the design and location of regulated structures such as flood protection levees, the tailings dam and environmental dams.

On 22 May 2012, DEHP provided summary advice on the assessment of the Bridging Report and subsequent negotiations with the proponent on matters that still need to be addressed. At the time of writing this Evaluation Report, these negotiations has not been finalised and the proponent had agreed to provide further information in response to requests from DEHP.

Outstanding matters to be finalised include:

- Stability calculations for the end walls of the mine pit
- Location and design of the drainage pipe for the TSF
- Stability of the proposed flood levees in relation to unconsolidated surface sediments and underlying sandstone
- Contingency plans for watercourse diversions and flood levees should monitoring identify departures from expected engineering behaviour of the structures, including a commitment to implement appropriate measures to avoid environmental harm

- Design of sediment dams to include contingency arrangements and commitments for water treatment and release that will need to be put in place to avoid emergency release of poor quality water to the environment
- Review of hydraulic modelling outputs for watercourse diversions that currently identify hydraulic conditions greater than DNRM guideline values for a considerable length of the proposed Spring Creek diversion, including redesign of the diversions as necessary.

In relation to the design of watercourse diversions, the proponent has provided a written commitment to DEHP and DNRM to adopt mitigation measures that will ensure that:

- Channel hydraulic parameters will be similar or less than those found within comparable existing channels, or as those guideline parameters set in the DERM manual for creek diversions, whichever the greater.
- To achieve this, one or more of the following mitigation measures will be adopted (Refer Section 5.4 of the Bridging Report):
  - Adjust gradient (flatter or steeper as required)
  - Increased meandering
  - Increase roughness with vegetation (Primary objective)
  - Increase roughness with rock
  - Increase roughness with (dumped timber features (like fallen trees)
  - Increase roughness using timber piles
  - Include pools to break acceleration and absorb energy
- The current hydraulic model assumes a fixed bed where the creek is sandy, while in practice the channel bed will be moveable creating ripples and dissipating energy.
- Post construction monitoring will be carried out to monitor and where necessary correct channel behaviour to ensure the long term channel establishes itself and maintains equilibrium similar to the existing natural channels (Refer Chapter 6 of Bridging Report).

Based on the information provided to date, DEHP and DNRM officers are confident that the Sandy and Lagoon Creek Diversions will become stable in the long term but are still concerned about the long-term stability of the Spring Creek Diversion.

DEHP and DNRM officers will continue to liaise with the proponent regarding the proposed designs for the watercourse diversions including the ability to revegetate the diversion corridors to achieve the modelled roughness values adopted within the hydraulic models for long-term riparian vegetation conditions.

## **Fisheries**

The proponent made the following commitment:

Hancock Coal will provide fish passages, using appropriate design standards, as part of the development of waterway diversions, crossings and relevant works. Hancock Coal will consult with Fisheries Queensland on the design of the fish passages during the detailed design phase of the project.

## 5.8.4. Coordinator-General's conclusions

### Diversions

There will be some impact due to the diversion of Lagoon Creek or the redistribution of flows around the mine pits, particularly as the Mining Lease Application (MLA) 70426 boundary is immediately upstream and downstream of the mine works. The objective of the detailed design phase will be to minimise impacts as much as reasonably possible, with any impacts being minor in nature and of short duration.

I note that the proponent has provided further detailed information on waterway diversions and flood levees to the relevant administering agencies, in the form of a Water Structures Bridging Report, that should assist the finalisation of conditions for both the EA and Water Act approvals.

In order to reduce the risk of serious erosion, I have made a recommendation that requires the proponent to submit information and reports as part of an application for a water licence under the provisions of the *Water Act 2000* (see Appendix 3, Part C, Recommendation 2). Detailed designs will be required to meet the standards of departmental guidelines and the criteria of the Water Act. The water licence could then be conditioned according to the outcome of that investigation. This recommendation includes a component that will ensure that the cumulative impacts of stream diversions are fully assessed.

### Flood levees

The flood levee banks are nominally designed at concept stage to provide protection up to the 3000 year ARI flood level. The nominal level of flood protection equates to a 1 per cent probability of an extreme flood overtopping the levee bank for the 30 year mine life. Subject to further geotechnical investigation regarding the suitability of materials, it is proposed that the flood protection levee banks will be constructed using benign mine overburden materials and excess spoil from the stream diversion excavations. Materials quality and compatibility with practical construction methods will be a key factor in levee bank design. Slope stability, flood velocities and the risks of piping failure (i.e. internal erosion either through the embankment or beneath the levee foundation) will be assessed and mitigated in the detail design. The levee embankment alignments may also need to vary slightly from the concept alignments depending on the conditions encountered during detailed design geotechnical investigations and for finalising the stream diversion designs.

The proponent must demonstrate prior to issue of the EA that the location of flood levees are feasible relative to setbacks from pits and watercourses, and erosion protection is provided for levees to the relevant AEPs for operations and on conclusion of the project. Where diversions operate in conjunction with levees, those levees need to be demonstrated to be robust in operation—in particular able to survive erosion to their design AEP.

I note that following the provision to DEHP and DNRM of the proponent's Water Structures Bridging Report, further consultations have resolved many of these departments' concerns as discussed above. Nevertheless I have been advised that there are still some critical matters that will need resolution before an EA could be

issued. I have therefore imposed a condition at Appendix 2, Part F requiring the proponent to submit further information to DEHP before a draft EA can be completed for the project.

I am concerned that the preliminary design developed for the waterway diversions and flood protection levies could lead to flooding impacts beyond the boundary of the proposed mining lease. I am advised that this matter is being addressed in more detail in ongoing discussions between the proponent, DEHP and DNRM and need to be finalised in the next project phase.

Given the proposed infrastructure within the MLA could cause changes to the flood heights off lease, when detailed design is undertaken the proponent should adopt the proposed limits on the increase in flood level (afflux) beyond the lease set out in the SEIS. I have included these in a recommended condition relating to the maximum afflux off the mine site that should not be exceeded during the life of the project (see Appendix 3, Part C).

To address the impacts of stream diversions and flood levees off lease, I have included references to this matter in my recommended conditions relating to the detailed design work and information to be provided in any application for operational works approval under the Water Act (see Appendix 3, Part C). I nominate DNRM as the responsible agency for these conditions.

## **5.9. Mine waste management and storage**

### **5.9.1. Issues**

The proposed on-site landfill must accommodate waste generation from mining activities and the attendant workforce during three primary phases of the project: mine construction, operation and closure/decommissioning. An estimate of the waste generation and landfill waste disposal capacity for those stages is presented in Table 16-3 of the EIS (Volume 2, Section 16).

The total estimated capacity of the landfill is approximately 1.3 million cubic metres, which will be filled with waste and soil over a 30-year period. Landfill construction would occur in stages, every three to five years, giving adequate capacity to manage waste disposal over significant time without unduly exposing the landfill lining features to the environment and potentially causing damage and deterioration. The construction process systematically installs the liner and drainage layers, and integrates subsequent cell construction with previous/adjacent cell construction.

The landfill operations are expected to be similar to a municipal landfill serving a small town, with the addition of mining generated non-regulated waste.

In their response to the EIS, DERM expressed concerns on how leachate from the on-site landfill will be effectively managed. Leachate is to be managed by collection and treatment within a wetland system, with treated leachate reused for on-site mining purposes e.g. dust suppression.

The former DERM expressed concerns over whether the proposed system for managing leachate would be environmentally effective due to the following issues:

- no water balance had been provided to gauge what volume of leachate would be generated
- there were no predictions of leachate quality
- given lack of knowledge of leachate volume and contaminant concentrations, there did not seem to be any understanding of pollutant loadings being directed to the wetlands (e.g. hydraulic loads and detention times, organic loads, nutrient loads) and whether the wetland is reasonably likely to perform its expected treatment function
- while wetlands are typically used for reducing organic matter (e.g. biochemical oxygen demand) and nutrients (e.g. nitrogen, phosphorus), landfill leachate is also often characterised by acidity (low pH) and elevated metal concentrations. There is uncertainty that these contaminants would be effectively treated by the wetland to a level that enables environmentally sustainable re-use of the water
- there was no water quality specification for leachate re-use e.g. dust suppression, so it is uncertain whether this would be environmentally appropriate or may just lead to transfer of contaminants in leachate into the general environment where they may cause environmental harm e.g. contaminate stormwater
- post-closure care of landfills that have accepted putrescible waste must occur for a significant period after closure of the facility e.g. decades. This is expected to be much greater than the two years mentioned in section 16.2.5.1 of the EIS. In this time, leachate would still be generated due to rainfall infiltration into the waste mass. However, there is a concern that post-mining, there will not be a use for the treated water and hence the long-term fate of this waste stream is uncertain.

DERM advised that information should be provided about a water balance for the landfill, taking account of the proposed higher infiltration cover system. The information on likely leachate volumes from the water balance, together with estimates of likely leachate quality and recognised treatment system design information (e.g. loadings, detention times) should be used to predict treated leachate quality for contaminants likely to be present e.g. organic matter, nutrients, metals, pH. The expected quality of the treated effluent should be compared to the water quality specifications for the intended re-use.

DERM advised that the proponent must explain how leachate will be treated and managed to avoid discharge to the environment in the period of post-closure care, which may last several decades.

In the SEIS, the proponent stated that discharge to the environment (outside the closed system of the landfill) would only occur after verification that the post-treatment quality of the leachate meets relevant discharge criteria (e.g. similar to discharge for treated grey water for irrigation). Appropriate guidelines would be developed for the design of the treatment system and discharges for appropriate uses (dust control, irrigation of vegetation, open discharge to the environment, etc.) These discharge limits would dictate the ultimate means of discharge.

The SEIS also stated that at this conceptual design stage, no formal estimate of leachate volume has been completed. As the design develops, a detailed water balance model would assess relevant aspects of the water cycle, including rainfall,

evapo-transpiration, leachate management, surface water management, subsurface migration, water quality (pre- and post-treatment) and other relevant factors of water cycle management. Time-dependent iterations would illustrate the change in the balance through the operational life of the landfill and through its post-closure care period.

The proponent has committed to construct and operate the site landfill in accordance with the accepted guidelines and the project's EA conditions (refer Appendix 5).

### **5.9.2. Coordinator-General conclusions**

Conditions covering waste management disposal will be included in the DERM EA conditions, refer Appendix 1, Schedule 3 and Appendix 3, Part A, Schedule 5 of this report. Under these conditions, the proponent must develop and implement a waste management plan which details how waste will be effectively and appropriately managed.

I am satisfied that appropriate regulations and EA conditions will be in place to manage mine waste and storage.

## **5.10. Waste rock classification**

### **5.10.1. Issues**

In Appendix J of the EIS, a geochemical assessment of materials from the project was undertaken. Tests were conducted to determine potential for:

- release of salinity
- generation of acid and metalliferous drainage (AMD)
- dispersivity.

Samples of overburden, raw coal and coal tailings were tested.

The open pit will cover an area of approximately 24 kilometres by 7 kilometres and the total mined overburden volume is expected to exceed over 16 billion tonnes over a 30-year mine life—that is, approximately 530 million tonnes per year. In addition to the overburden, coal reject material will be generated by the project. Coal reject material is segregated into two categories—coarse reject and tailings.

Samples were selected to represent material categorised according to:

- lithology
- state of weathering (fresh or weathered)
- location in relation to a coal seam (e.g. coal, roof and floor, overburden/interburden, tailings).

It was concluded that, as a portion of the total mass of waste, the lithology groups were Rem 63 per cent, Clay and Soil 24 per cent, Sand and Gravel 10 per cent and Carbonaceous was 3 per cent. The report concluded that the majority of overburden could be managed as non-acid forming material.

The EIS concluded that, as a portion of the total mass of waste, the lithology groups were Rem 63 per cent, Clay and Soil 24 per cent, Sand and Gravel 10 per cent and Carbonaceous was 3 per cent. The report concluded that the majority of overburden could be managed as non-acid forming material.

Appendix J of the EIS further concluded that:

- saline run-off/leachate is likely to be released from some waste rock materials
- the majority of the waste rock is non-acid forming (NAF) but 11 per cent is potential acid forming (PAF)
- specific lithologies (e.g. carbonaceous material) are likely to be PAF
- coarse rejects and tailings are PAF
- some waste materials are clayey and dispersive
- it was not known if PAF materials would be identifiable on the work face or if simple tests are available to identify the PAF materials.
- the carbonaceous material would be readily identifiable.

In its submission on the EIS, DERM required more information relevant to geochemical characterisation of waste rock, and to a lesser extent coarse rejects and tailings, in a way that comprehensively demonstrates how the risk of acid and saline drainage can be mitigated. Mismanagement of wastes (such as waste rock, tailings, rejects) can cause ongoing environmental harm via stormwater contamination and poor rehabilitation outcomes.

DERM advised that there was a limited number of drill holes (35) and samples (277) used in the studies presented in the EIS and a failure to better correlate these holes and samples with other data, especially considering that there were 484 drill holes from which coal samples were taken for coal quality testing.

DERM noted that Appendix J stated that many of the drill holes in their database were not lithologically logged; therefore the quantities of various waste rock materials has been derived from geostatistical models rather than detailed geological data. A geostatistical approach was used to extrapolate geochemical characteristics between the widely spaced sample points across the project area and this has led to a level of 'generalisation' in the conclusions drawn.

The report contained in the EIS concludes that the sample density (spacing between sample points) is likely to be deficient for some geochemical parameters, at least in the north-south aspect. Uncertainty is also introduced by the fact that sample intervals do not appear to represent complete drill sections (although this is not explained).

Overall, the Appendix J conclusions, while they may prove to be ultimately accurate, were considered by DERM to be not verified by the data presented.

- saline run-off/leachate is likely to be released from some waste rock materials
- the majority of the waste rock is non-acid forming (NAF) but 11 per cent is potential acid forming (PAF)
- specific lithologies (e.g. carbonaceous material) are likely to be PAF
- coarse rejects and tailings are PAF
- some waste materials are clayey and dispersive

- it is not known if PAF materials will be identifiable on the work face or if simple tests are available to identify the PAF materials. It is recognised though that the carbonaceous material is readily identifiable.

Although the suggestion in the EIS is that the NAF and PAF materials can be co-disposed, either in pit or out of pit, without significant risk of acid leachate generation, this was not conclusively demonstrated by the data presented. The report acknowledged that additional geochemistry work would be needed, including additional sampling. It is likely that selective mining of PAF units and their safe burial within NAF materials in the pit would be required to lessen the risk of contaminated runoff/leachate from waste rock piles.

In its EIS submission, DERM requested the proponent undertake more work to detail commitments to the following management of overburden disposal:

- all material must be progressively characterised during disposal for net acid producing potential (NAPP) and key contaminants
- characterisation should be undertaken at a nominated minimum rate of regularly spaced samples per 500 000 tonnes of waste material
- records must be kept of the spoil disposal to indicate locations and characteristics of materials stored in the landform
- where the acid producing potential of material indicates that the material is PAF, further kinetic testing at a nominated sampling rate should be conducted to establish oxidation rates, potential reaction products and effectiveness of control strategies
- maximum duration of surface exposure of potentially acid producing material to oxidising conditions is one month.

In the SEIS (Appendix S, Section 3.5.2), the proponent committed to complete an infill drilling program for the project to increase the drill-hole density in the north-south direction. The additional drill holes would be cored from surface and designated solely for geochemical sampling, such that competing sampling interests (such as geotechnical and coal quality) did not result in incomplete drill sections being available for geochemical testing, as occurred for the EIS.

In the SEIS, the proponent committed to the following:

- overburden material would be progressively geochemically characterised in advance of mining using data from drilling and sampling programs described in Volume 2, Appendix S, Section 3.5.2 of the SEIS
- drill-hole spacing and drill-hole sampling intensity would be as described in Volume 2, Appendix S, Section 3.5.2 of the SEIS, on the basis of the overall risk the materials pose to the environment and the outcomes of the geostatistical modelling undertaken in the EIS. This approach is sufficient to address any existing uncertainties associated with the geochemical characteristics and the distribution of the various overburden materials at the project
- records of the overburden disposal would be kept to indicate locations and characteristics of materials stored in the final landform

- where the acid producing potential of material indicates that the material is PAF, further kinetic testing at an appropriate sampling rate will be conducted to establish oxidation rates, potential reaction products and effectiveness of control strategies
- the maximum duration of surface exposure of potentially acid producing material to oxidising conditions is four weeks.

The revised draft EM plan (SEIS Volume 2, Appendix V, Section 3.6.12) addressed the SEIS information presented above and provided relevant commitments to overburden management.

In its advice to the Coordinator-General, RPS Australia confirmed the following:

- additional waste rock characterisation work has confirmed that the majority of the waste rock will present a very low risk of acid mine drainage (AMD)
- highest AMD risk is with coal seams, roof, floor and parting materials and coarse rejects and to a lesser extent tailings materials; AMD risk can be diminished by treating with a fast acting alkaline material and short-term exposure through rapid capping with a low permeability waste rock
- tertiary clay overburden materials present a high erosion risk through high salinity, dispersive characteristics and must not be used in the final capping of the WRD
- tailings management is likely to present a moderate AMD and saline drainage risk
- washed coal presents a low AMD and salinity risk; however, raw coal presents a low/moderate risk. Further kinetic leachate testing is recommended to confirm coal and tailings predictions.

### **5.10.2. Coordinator-General conclusions**

In general terms, I accept that waste rock characterisation deficiencies identified in the EIS have been rectified in the SEIS (discussed in the SEIS Volume 2 Appendix S—Coal Mine Interim Geochemical Report) and that the proposed conceptual acidic drainage management strategies are appropriate. A high priority for design and management of the mine is the presence of dispersive and sodic materials in some overburden types (e.g. tertiary clays), which are a particular issue for landform stability. This has been recognised during the EIS process and will be subject to EA conditions that have yet to be developed by DEHP.

While some geochemical testing is still in progress (e.g. tailings and C Seam waste kinetic testing), the proponent's proposed management of waste rock and tailings materials has been agreed to and adequately identified in commitments proposed by the proponent at Appendix 5.

I am satisfied that waste rock characterisation can be adequately addressed through the mine EA conditions and the commitments made by the proponent as discussed above.

## 5.11. Air quality

### 5.11.1. Overview

Air emissions from the mine component of the project are generated primarily from activities that include the use of explosives, and the handling and transporting of overburden and coal. The main pollutant of concern is dust and to a lesser extent emissions associated with blasting and the combustion of diesel fuel in mobile equipment.

The emissions and impact of dust from mine-related activities are characterised as:

- total suspended particulates (TSP)
- particulate matter less than 10 micrometres ( $\mu\text{m}$ ) in diameter ( $\text{PM}_{10}$ )
- particulate matter less than 2.5  $\mu\text{m}$  in diameter ( $\text{PM}_{2.5}$ )
- deposition of dust particles.

These pollutants of concern have been considered in the air quality assessment for the mine component.

The EIS, Volume 2, Section 13, identified legislation and guidelines that establish acceptable levels of emissions to meet nationally agreed ambient air quality standards. Air quality is regulated under the EP Act, the Environmental Protection Regulation 2008 (EP Regulation) and the Environmental Protection (Air) Policy 2008 (EPP (Air)), which came into effect on 1 January 2009.

The EPP (Air) identifies upper limits for air particulate (dust) pollutants based on exposures that may potentially impact on human health. Finer particles  $\text{PM}_{10}$  and  $\text{PM}_{2.5}$  are of greater concern to human health. The EPP (Air) objectives set five allowable exceedences per annum of 50, taking into consideration background  $\text{PM}_{10}$  concentrations of airborne particulate matter with a diameter less than  $10\mu\text{m}$  ( $\text{PM}_{10}$ ). The  $\text{PM}_{2.5}$  objective for 24 hours is  $25\text{ }\mu\text{g}/\text{m}^3$  with an annual objective of  $8\text{ }\mu\text{g}/\text{m}^3$  (refer to Table 5.9).

As noted in the EIS (Volume 2, Section 6), the region surrounding the project is predominantly rural in character supporting cattle grazing and some crop farming. Therefore, dust emission sources in the surrounding region would generally consist of agricultural activities such as pastoral processes, cultivation and harvesting.

The EIS identified potential air quality impacts during project phases including:

- construction phase:
  - clearing of vegetation
  - infrastructure construction (processing area, haul roads etc)
  - construction of the box cut
  - transport of materials to site
  - on-site quarrying activities
- operational phase:
  - graders

- scrapers
- dozers operating on overburden, interburden and coal
- blasting
- front-end loading of material to trucks
- truck dumping of material
- loading and unloading of stockpiles
- draglines
- transport of material (overburden, coal, rejects)
- conveyance of coal to:
  - ROM
  - CHPP
- the product stockpiling area
- the train load-out
- rehabilitation
- transfer points.

The EIS detailed the dust control mitigation measures that would be implemented on site. These consist of a mixture of engineering controls (e.g. partial enclosure of conveyors) and operational controls (e.g. watering of haul roads and stockpiles). The descriptions of control measures to be used for the project have been matched to estimates of the control efficiency, as described in the National Pollutant Inventory manual, for inclusion in modelling.

### 5.11.2. Stakeholder comments

For this project, DERM recommended in its submission on the SEIS a dust deposition goal of 120 µg/m<sup>2</sup> per day based on the annoyance threshold applied in the coal mining areas of the NSW Hunter Valley (see Table 5.9).

**Table 5.9 Summary of project goals for particulate matter**

Pollutant	Averaging period	Objective or goal	Jurisdiction
Total suspended particulates	Annual (over a 1 year averaging rate)	90 µg/m <sup>3</sup>	EPP (Air)
PM <sub>10</sub>	24-hour	50 µg/m <sup>3</sup> (five exceedences allowed per year)	EPP (Air)
PM <sub>2.5</sub>	24-hour	25 µg/m <sup>3</sup>	EPP (Air)
	Annual	8 µg/m <sup>3</sup>	EPP (Air)
Dust deposition	Monthly (based on monthly average)	120 mg/m <sup>2</sup> /day	DERM

Several local residents raised concerns about air quality in its submissions on the EIS, including potential impacts of soil and coal dust on rural residences with a potential to affect human health, farm animal health, and production efficiency.

### **Monitoring background air quality and air quality predictions and targets**

The EIS (Volume 2, Chapter 13) outlined how site-specific dust deposition monitoring was conducted at four locations during 2009. Data for approximately 12 months was made available for the assessment.

Dispersion modelling was used to assess the likelihood of adverse air quality impacts at sensitive receptor locations surrounding the mine. Air quality impacts resulting from emissions of dust from mine-related activities under typical and worst case conditions were considered. Results from the dispersion modelling were analysed at discrete receptor locations in the vicinity of the mine. Based on information provided by the proponent, impacts during construction are anticipated to be significantly less than that during operation of the mine.

The EIS reported on ground level predictions of particulate matter fractions  $PM_{10}$  and  $PM_{2.5}$  in excess of the EPP (Air) standards for the 24-hour averaging period. These exceedences were predicted at sensitive receptors to the north, east and south of the site. The frequency of exceedences was predicted to range between five and thirty per cent of all days in the year throughout the life of the mine.

#### **5.11.3. Proponent's response**

Updates to the mine plan were applied to the EIS emissions inventory and a new inventory was developed for the SEIS. The changes to the project description with the potential to impact upon dust generation were as follows:

- introducing IPCC, to reduce wheel-generated dust from unpaved roads
- mine layout changes due to updates to geological model, and modifying mining methods, to reduce dust from draglines, excavators and shovels
- increasing the proposed use of land bridges included in the mine layout to reduce wheel-generated dust from unpaved roads and dust from dragline rehandle
- introducing two new pits in addition to the four modelled in the EIS
- relocating the accommodation village.

In addition to changes to the layout and emissions inventory, observed meteorological data from Emerald Bureau of Meteorology station was incorporated into the Air Pollution Model (meteorological) model and the size of the meteorological grid was increased to enable prediction of dispersion plumes over a larger area.

Incorporating these changes into the emissions inventory and dispersion modelling reduced the overall predicted dust generation from the mine in the new SEIS inventory. However, these reductions were offset by the discovery that wind speed-dependent emission sources had been underestimated in the EIS model.

Modelling outputs presented in the SEIS predicted ground level  $PM_{10}$  and  $PM_{2.5}$  were in excess of the EPP (Air) standards for the 24-hour averaging period. As in the EIS, these exceedences were predicted at sensitive receptors to the north, east and south of the mine site. The frequency of exceedences was predicted to range between five and forty per cent of all days in the year throughout the life of the mine with receptors to the south and north still worst affected.

Following a further revision of the air quality assessment for inclusion in the addendum to the SEIS, advisory agencies requested that the progression of this issue be presented in a single publication.

In response to the agency requests, and as part of the proponent's ongoing development of its technical assessments, the mine air quality assessment was again revised and provided to the then Coordinator-General on 29 March 2012 (Report, *Alpha Coal Mine Project Air Quality Assessment—Model Refinements (post consultation update)*, 28 March 2012 (URS Australia Pty Ltd))

For the development of the final air quality report, additional data relating to the moisture content of overburden and coal became available. A conceptual model of moisture content was therefore developed.

A review of the emissions inventory identified an over-estimation of overburden haulage emissions. In the refined model, these emissions were reduced as follows:

- reducing the overburden material transported by haul road as a result of the introduction of IPCC
- reducing the overburden material transported by haul road to account for the overburden material removed by dragline (this was double counted in the SEIS inventory).

The total trucked overburden waste in the SEIS was therefore significantly reduced in the refined model inventory. In years 10–30 this reduction is by approximately 50 per cent in comparison to the SEIS inventory.

For 24-hour average  $PM_{10}$ , the study has shown that in Year 5, both the SEIS and model refinement  $50 \mu g/m^3$  contours extend outside MLA 70426. It has been shown that in the SEIS, exceedences were predicted at all ten sensitive receptors. The final 'post-consultation' report showed that although the number of exceedence days is reduced, exceedences are still predicted at the Forrester and Kia Ora Homesteads for the life of the mine. If the EPP (Air) objective exceedence allowance of five days is considered, it is predicted that exceedences will be removed from most other receptors almost entirely for the life of the mine.

The 24-hour and annual average  $PM_{2.5}$  footprints are reduced in all directions in the refined model. No exceedences of the EPP (Air) objectives are predicted and therefore no mitigation on the grounds of exceedence of either  $PM_{2.5}$  EPP (Air) objective is required.

This final 'post-consultation' report included external peer review of all emissions sources, modelling methodology and new information that became available since the previous versions of the mine air quality assessment. This report provided the following information:

- a summary description of the evolution of the predictive modelling assessment through the EIS, SEIS and addendum to the SEIS, including key changes made to the methodology and the model results
- a summary of the key changes made to the modelling assessment and how these interact with operational procedures at the mine

- detailed technical description and justification for the changes made to the assessment
- a description of the key issues raised by DEEDI, DERM and Queensland Health
- the provision of clarifications and supplementary information requested by DEEDI, DERM and Queensland Health.

The technical elements of the final report have been used to inform further development of relevant sections of the EM plan for the mine, including air quality monitoring and mitigation measures.

It should be noted that the accommodation village was removed as a sensitive receptor in the refined model assessment, as human exposure at this location will be regulated under the *Coal Mining Health and Safety Act 1999* (Qld).

Furthermore, the Spring Creek Homestead was introduced to the assessment after it was determined to be inhabited on an infrequent basis. However, predictions made at the nearest model grid point were used to represent exposure at this location because it was not included as a specific location in the EIS, SEIS or refined model. The grid point chosen is approximately 550 metres closer to the mine than the Spring Creek Homestead. This represents a conservative approach as model predictions are likely to be higher at this grid point location than at the homestead.

### Cumulative impacts

Other mines are also proposed within the Galilee Basin. Therefore, a quantitative assessment of cumulative impacts should be done in order to accurately estimate the possible cumulative impact on the regional air quality.

Such an assessment has not been undertaken for the Alpha Coal Mine Project due to:

- varying timing for other coal mine projects' assessments and approvals likely to follow this project
- varying mine plans and proportions of open-cut and underground mining operations
- difficulties in obtaining or estimating data for other proposed projects for input to a quantitative model.

A qualitative assessment was included in the final 'post-consultation' report provided by the proponent to the then Coordinator-General, concluding that the Galilee Basin is characterised by a low population density as a result of the low yield nature of its pastoral and grazing land. Therefore, cumulative impacts of air pollution would impact on a small population in the basin.

#### 5.11.4. Coordinator-General's conclusions

I conclude that the proponent must take all possible actions to ensure that the EPP (Air) guidelines are met at sensitive receptor locations. The mitigation actions required to control dust emissions will be implemented through the EM plan, which the proponent will develop and submit for approval to the administering authority responsible for the EP Act, prior to receiving consent to commence mining operations. The EM plan is supplemented by a series of internal, non-statutory operational

procedures which the proponent will follow to meet commitments made (refer Appendix 5).

The project will be subject to EA conditions imposed by the administering authority under the EP Act at Appendix 1.

I am satisfied that through the implementation of the proponent's commitments and compliance with the EA air quality conditions, impacts of the project on air quality and sensitive receptors can be managed within acceptable limits.

## 5.12. Greenhouse gas emissions

### 5.12.1. Issues

A number of the submissions on the EIS were of the view that it did not sufficiently identify the amount of greenhouse gas (GHG) emissions the proposed project will produce overall, or the associated effects of those emissions on the Great Barrier Reef and listed threatened species, communities and migratory species.

The proponent is required to report on greenhouse gas (GHG) emissions under the provisions of the *National Greenhouse and Energy Reporting Act 2008* (Cwlth) (NGER Act). The NGER Act prescribes an accounting methodology and requires publication of results.

Under the NGER Act, boundaries have been established to assist in determining emissions attributable to a project. In terms of emissions boundaries, three scopes have been identified:

- Scope 1 (also referred to as direct) emissions are GHG emissions which occur as a direct result of activities at a facility. They are emissions over which the entity has a high level of control.
- Scope 2 (also referred to as energy indirect) emissions cover GHG emissions from the generation of purchased electricity, steam, heating or cooling consumed by a facility. Scope 2 emissions are indirect emissions that entities can easily measure and significantly influence through energy efficiency measures.
- Scope 3 covers all indirect emissions that are not included in Scope 2. They are a consequence of the activities of the facility, but occur at sources or facilities not owned or controlled by the entity. NGER legislation does not cover reporting of Scope 3 emissions.

In response to submitters' concerns, the proponent's position was that the NGER does not require the project to report its Scope 3 emissions. This is on the basis that in the legislation, the emissions generated by burning coal to produce electricity (the project's Scope 3 emissions) are assigned to the end user and become their Scope 2 emissions. As such, the use of the coal within Australia will be captured by the national greenhouse gas accounting system. If the annual Scope 3 emissions as a result of the mine were to be calculated and reported against the national greenhouse accounting system, it would be effectively be double counting because these emissions are already represented.

The EIS addressed mine GHG emissions and climate change in Volume 2, Section 14. In addition to the initiatives outlined in the EMP regarding reducing and reporting on GHG emissions, the proponent committed to preparing an energy conservation and GHG management plan to ensure all sources of emissions are identified and emission levels are quantified during engineering and design. The objectives of the energy conservation and GHG management plan are to:

- reduce GHG emissions associated with the project and all relevant emissions sources
- incorporate energy efficiency initiatives into project design, engineering, construction and operation
- integrate GHG management and energy efficiency initiatives into business decision-making at all stages of the project
- provide consistent and accurate reports on GHG emission levels in compliance with relevant legislation.

Emissions of CSG are a significant component of the GHG footprint. The exploration drilling program plans to conduct gas testing to better quantify emissions factors and CSG emissions from coal. Strategies for CSG capture and use will be developed based on these results and will be considered for implementation during the detailed design phase of the project.

### **5.12.2. Coordinator-General's conclusions**

To mitigate the GHG emissions for both the construction and operation phases of the project, I have recommended that the draft EMP plan be amended to meet statutory requirements prior to the issue of any Draft EA (refer to Appendix 3, Part A, Schedule 1, Recommendation 1). I am satisfied that the proponent's commitments and finalisation of the EM plan will satisfactorily mitigate GHG emissions for the life of the project.

## **5.13. Cultural heritage**

### **5.13.1. Issues**

All Indigenous cultural heritage in Queensland is protected under the *Aboriginal Cultural Heritage Act 2003* (Qld) (ACH Act). To comply with the duty of care provision under section 23 of the ACH Act, proponents of projects which require an EIS are required to prepare a recognised cultural heritage management plan (CHMP) which provides for the management of Indigenous cultural heritage.

The Commonwealth *Native Title Act 1993* provides for Indigenous land use agreements (ILUAs) between native title holders or claimants and other interested parties about how land and waters in the area covered by the agreement will be used and managed in the future. DERM advises it strongly supports these agreements, as ILUAs provide a framework for resolving native title issues through negotiation rather than costly and time consuming litigation.

Indigenous cultural heritage for the mine was addressed in Volume 2, Sections 18 of the EIS. Non-Indigenous cultural heritage for the mine was addressed in Volume 2, Sections 19 of the EIS.

It is noted that, as required under the ACH Act, the proponent has developed a CHMP in consultation with the Wangan & Jagalingou People (QUD85/04), the Jangga People (QUD6230/98) and the Birri People (QUD6244/98), who are the only registered native title claimants over the MLA areas.

It is also noted that there will be some impacts on both Indigenous and non-Indigenous cultural heritage as a result of the project. It is also noted that the non-Indigenous cultural heritage affected by the project is of low significance though nevertheless important, and archival recording is being undertaken with the cooperation of the local community.

The EIS found that there were eleven non-Indigenous cultural heritage sites identified at the mine site. These sites can be considered temporally and thematically within three categories:

- (a) five sites directly associated with the late nineteenth-century coach route network
- (b) two sites indirectly associated with the late nineteenth-century coach route network and one likely to be associated with the late nineteenth-century and early twentieth-century stock route network
- (c) four sites relating to twentieth-century pastoral activity and improvements, with no identified association with the coach route network.

No sites of historical mining heritage were located during the field survey.

Potential impacts on cultural heritage sites would generally be in the nature of removing the ground surface, disturbing the sub-surface, clearing vegetation related to the mine's expansion and developing associated infrastructure, and the consequent destruction and/or removal of the structures/features that form the non-Indigenous cultural heritage of the area.

In its submission on the EIS, DERM stated that the existence of non-Indigenous cultural heritage values and places has been established in the study area, as has the potential for further places of heritage significance to exist.

### **5.13.2. Coordinator-General conclusions**

Based on the mitigation measures provided in the draft EMP and registered CHMP and the legislative requirements of the ACH Act and Native Title Act, I am satisfied the impacts to Indigenous and non-Indigenous cultural heritage would be minimal

I am also satisfied that the EM plan and agreed ILUA satisfy the duty of care requirements under the ACH Act, and will ensure adequate identification and management of cultural heritage places and objects between the proponent and the relevant Aboriginal people as custodians of their cultural heritage.

## 5.14. Transport

### 5.14.1. Overview

The EIS (Volume 2, Section 17) stated that the construction phase of the project is anticipated to occur over a 24-month period to first coal production, with the peak traffic generation occurring in 2013. During this peak period there are expected to be approximately 1060 employees working on site, with the majority of the workforce completing 12-hour shifts (7:00 am to 7:00 pm) on a 10-day on, 4-day off roster.

Delivery of materials and equipment and consumables is expected to occur seven days a week over a 10-hour period daily.

It is proposed that the mine workforce will be predominantly FIFO and sourced from key regional centres throughout Queensland. The Project will also offer DIDO opportunities for some local residents and BIBO opportunities from regional centres. FIFO workers will be collected from the Alpha aerodrome by bus and taken directly to site at the commencement of their roster and return to the airport by bus on completion of their roster.

The proponent intends to house the majority of its non-resident construction and operational workforces in the Alpha Village site (located on the project's mining lease).

The movement of employees from the accommodation village to the mine site has not been included in this EIS assessment as this occurs entirely within the mining lease area (private roads) and will be regulated under workplace health and safety laws.

As part of the project, it is proposed that the existing Hobartville Road within the MLA area (MLA 70426) will be closed to public traffic; and relevant bypasses will be constructed to facilitate traffic flow around the project site. Proposed road closures and bypasses were shown in Figure 17-1 of the EIS as part of the site layout.

The proponent provided data showing the predicted traffic generated as a result of the construction of the project. The data is based on the current status of the design. Traffic volumes were preliminary estimates.

The generated traffic from the project during its operational phase is primarily attributed to delivery of consumables and replacement equipment, waste removal, and employee transport.

Coal produced by the mine will be transported off site via rail and hence will not generate any additional traffic on the road network.

For the traffic impact assessment it was assumed that all traffic generated by the project will use the existing road network.

A number of factors will influence the decision of which roads to utilise to access the site. Major considerations include:

- road assessment, monitoring, maintenance and upgrade requirements
- travel time
- road safety
- council and TMR approval requirements.

It is assumed that all materials and equipment will be delivered to the site via major highways to the local area. Within the local area, routes will be based on the most direct link available as travel time is often the predominant factor driving transportation of bulk cargo.

### 5.14.2. Issues

An initial assessment was conducted to identify any impacts that the project will have on the pavement design life of affected roads, in accordance with the *Guidelines for the Assessment of Road Impacts of Development*.<sup>11</sup>

Due to a lack of available data, the pavement assessment was based only on site observations and the limited information available at the time of assessment.

The initial assessment shows that the roads on which the project traffic will have an impact on the pavement design life are:

- Clermont–Alpha Road
- Hobartville Road
- Degulla Road.

All roads were assessed against their existing condition as of July 2010.

The road network has been assessed from a traffic performance perspective at both midblock (road links) and intersection locations according to the requirements in the *Guidelines for the Assessment of Road Impacts of Development*.<sup>11</sup>

According to the guidelines, the following roads required assessment due to the project contributing to an increase in traffic volumes of greater than five per cent (when compared with existing volumes):

- Clermont–Alpha Road
- Hobartville Road
- Degulla Road
- Capricorn Highway between Alpha and Gemfields.

In addition, the following intersections were also assessed:

- Clermont–Alpha Road and Capricorn Highway
- Capricorn Highway and Gregory Highway.

Based on previous discussions, assessment has taken place for the 2017 operational phase scenario, as this presents the worst-case scenario for traffic impacts, and therefore all other scenarios will have no greater impact than the results discussed under the worst-case scenario.

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<sup>11</sup> Department of Main Roads, *Guidelines for Assessment of Road Impacts of Development*, Department of Main Roads, Brisbane, 2006, viewed 24 February 2012, <[http://www.tmr.qld.gov.au/~media/ace67ef2-b6c3-46a3-91a7-39f790c309fe/garid\\_guidelines\\_200406.pdf](http://www.tmr.qld.gov.au/~media/ace67ef2-b6c3-46a3-91a7-39f790c309fe/garid_guidelines_200406.pdf)>.

The EIS concluded that in line with the predicted road network performance, pavement design life and general safety assessment, the following mitigation measures are proposed by the proponent for the project:

- construction of required bypasses due to the closure of Hobartville Road to the standards required by TMR
- construction of temporary and permanent site access intersections to the standards required by TMR
- implementation of FIFO and BIBO programs to minimise traffic volumes generated by employees travelling to and from the project site
- development of a transport management plan to manage risks associated with transport for the construction and operational phases of the project
- development of a road maintenance program in conjunction with TMR and BRC considering a number of influential factors on pavement design life for Clermont–Alpha Road, Hobartville Road and Degulla Road
- implementation of planning and permit requirements, including the construction of any capacity upgrades to road infrastructure as required by over-dimensional vehicle movements.

The SEIS (Volume 2, Appendix U) evaluated the traffic impacts of the project on the existing road network and recommended appropriate mitigation measures for any critical impacts identified. The following tasks were completed as part of this assessment:

- site inspection of the road network between Mackay and the project site, between Gladstone and the project site, as well as the local road network surrounding the project site
- review of existing traffic volume data provided by TMR for the roads identified as part of potential transport routes for the development
- report on historic crash statistics on the relevant road network
- collation of projected traffic generation data provided by the proponent and assignment of this traffic data to potential transport routes
- estimation of future background traffic growth on the relevant road network without influence from the project.

The SEIS concluded that the proposed project will generate additional traffic volumes on the existing road network in the region around Alpha, Emerald and Clermont in Central Queensland. The impact of this additional traffic volume on the performance of the road network, the pavement design life and other safety concerns were assessed.

Based on the assessment completed, the SEIS concluded that the predicted impacts of the project on the performance of both road links and intersections are not significant and most do not require mitigation by the proponent. The SEIS acknowledged that proposed works for closures to Hobartville Road and the construction of temporary and permanent site access intersections on Degulla Road will be required as part of this project.

In the analysis for the 2013 PM peak hour for the Capricorn Highway/Gregory Highway intersection, the results show that the intersection will operate outside TMR's standard Degree of Saturation (DOS) (the ratio of arrival (demand) flow rate to capacity during a given flow period) performance criteria of 0.8 once construction traffic generated from the project is considered in the analysis. However, the impact from construction traffic is temporary in nature, and the intersection is anticipated to operate above 0.8 during the project life, without influence from the project, shortly after 2013. As such, the reduced performance of this intersection is mainly due to the background growth applied to the existing traffic. The SEIS concluded that this intersection will be beyond its capacity regardless of the influence of this project and therefore upgrade works and improvements should be the responsibility of DTMR.

The assessment shows that the project will have an impact on the pavement design life and/or ongoing maintenance of the Clermont–Alpha Road and Degulla Road as per the recommendations from the pavement impact assessment in Volume 2, Appendix U, Section 5.

The SEIS noted that these recommended mitigation measures may change due to the influence of the cumulative impacts of other proposed developments in the surrounding region.

In responding to the submissions by the Queensland Police Service and TMR, the proponent provided the following responses:

- the proponent will construct a rail bridge at the project (rail) intersection with the state-controlled Collinsville-Elphinstone Road.
- no over-dimensional vehicles will be using the road network to access the mine site during the operational phase of the project
- Alpha–Clermont road will be upgraded by the proponent between the Alpha community and the project site. There will be a project policy of no vehicles being permitted to access the site from Clermont (unless further upgrades are undertaken)
- no physical road upgrades are proposed on the Clermont–Alpha Road between Degulla Road and Clermont. The only activities that are proposed are ongoing maintenance of the existing road and shoulders. All physical road upgrades are proposed for Degulla Road (between Clermont–Alpha Road and the site access) and Clermont–Alpha Road (between Degulla Road and Alpha township).
- No heavy vehicles or over-dimensioned vehicles will be permitted to use Clermont–Alpha Road between Degulla Road and Clermont and must access the site via the Gregory and Capricorn Highways.

Since the release of the SEIS, the proponent has stated its intention to use the present unused Alpha railway line to move materials to the mine site for construction. Once mine production commences, the proponent will use its railway to transport all materials to the mine by rail. This will lessen the impacts on the road network. TMR advised the proponent to update their road-use management plan (RUMP) to reflect this change once it is instigated. This would mean that the impacts outlined by the proponent in the EIS, whereby all consumables were to be transported by trucks, would be considerably less if the rail option is utilised.

Since the release of the EIS, TMR have acknowledged that, with several other Galilee mines under development, the transport of fuel to the mines has become a major issue. It is the view of TMR that all the Galilee mines should arrange to transport fuel (and other consumables) via rail and not road. Police also have expressed concerns about the increase of fuel tankers on roads. The proponent has stated that they are investigating the logistics of transporting fuel requirements of the mine by rail.

The proponent has also committed to review and update the following documents as the project progresses the detailed design closer to the commencement of construction activities for the mine:

- RIA (road impact assessment)
- RMP (road use management plan)
- TMP (traffic management plan).

### **5.14.3. Coordinator-General conclusions**

I believe that the EIS process has adequately investigated and addressed the impacts of the project on the local and state-controlled road networks during both construction and operation, including public and mine-site safety and efficiency, intersection performance and pavement impacts.

Whilst the EIS process concluded that the impact of the project on roads will not be significant and that most roads will not require mitigation by the proponent I do have reservations that the impact on some roads or sections of roads may exceed what was determined during the EIS process.

I have concluded that as the project moves closer to the commencement of construction further analysis of traffic movements will be required so that road network and safety issues are identified and managed appropriately in consultation with TMR and Regional Councils.

There are some areas in the EIS and SEIS that I believe require further assessment in order to determine the appropriate degree of mitigation measures that will be required to be implemented. I have been advised by TMR that there are a number of issues where they cannot agree fully with the conclusions and or assumptions reached by the proponent in the EIS process.

To ensure the satisfactory management of transport and traffic issues, I require the proponent to continue to liaise with TMR and the Regional Councils to guarantee the completion of the Infrastructure Agreements, road impact assessments, road management plans and traffic management plans for approval by state and local government authorities as required.

The recognised form of analysis of road impacts and management that TMR follows, that I consider appropriate, includes the following elements:

- A road impact assessment according to the TMR document Guidelines for Assessment of Road impacts of Development (2006)
- Preparation of an RMP based on this assessment in accordance with TMR's *Guide to Preparing a Road Use Management Plan*

- Conclusion of infrastructure agreements with TMR and Regional Councils on road upgradings, maintenance or construction of road infrastructure which reflects the outcomes of the RIA and RMPs.
- Preparation of a TMP to specify the actions taken to manage traffic planning and safety on the road network as a result of the project transport tasks and infrastructure provision.

I consider that this process needs to be followed to update all such draft assessments and plans that have been presented in the EIS process. Final designs and project implementation should provide further detail that must be taken into account in the road network analysis.

To give effect to my conclusions above on road impact analysis and developing management plans and infrastructure upgrading, I nominate three conditions at Appendix 2, Part E.

## **6. Environmental management plans—mine**

### **6.1. Overview**

A draft environmental management plan (EM plan) for the mine component of the project has been prepared by the proponent and is contained in Volume 5, Appendix P of the EIS and Volume 2, Appendix V of the SEIS, prepared in accordance with section 203 of the EP Act.

The EM plan becomes the key reference documents that convert the undertakings and recommendations of the environmental studies into actions and commitments to be followed by the designers, construction operators and subcontractors of the proposed project. The plans specify:

- proposed environmental management strategies, actions and procedures to be implemented to mitigate adverse and enhance beneficial environmental and social impacts
- monitoring, reporting and auditing requirements
- the entity responsible for implementing proposed actions
- proposed timing
- corrective actions if monitoring indicates that performance requirements have not been met.

The plans will be further refined and expanded after this report is finalised, during the detailed design phase of the project and through ongoing consultation with the relevant regulatory and advisory agencies.

Effective implementation of the plans will satisfy the commitments made by the proponent in the EIS, supplementary project information, and in correspondence with members of the public and advisory agencies; and will ensure environmental impacts of the project are managed.

### **6.2. Coordinator-General's conclusion**

I recommend that the proponent to submit to the administering authority for the EP Act an EM plan that meets the requirements of section 203 of the EP Act (Appendix 3, Part A, Recommendation 1.

## 7. Project approvals—rail

The Coordinator-General has declared this rail project to be a significant project under section 26(1) of the SDPWO Act. The SDPWO Act establishes the framework for environmental assessment of declared significant projects in Queensland and coordinates the relevant state and local development assessment jurisdictions for the project. The environmental impact assessment is undertaken in accordance with the provisions of Part 4 of the SDPWO Act and evaluation of the EIS is pursuant to section 35 of the Act.

### 7.1. Local approvals

From a regional perspective, the majority of the project lies within the Whitsunday Hinterland and Mackay (WHAM) region, with a small area lying within the Central West (CW) Region at the Alpha Township.

In terms of approvals there are three applicable regulatory frameworks for the rail project being the:

- ML and EA for those aspects of the rail project within the ML
- relevant local government planning scheme areas
- Abbot Point SDA (APSDA).

The project corridor will cross the Barcaldine, Isaac and Whitsunday Regional councils, in addition to the APSDA as follows:

- Alpha Coal Mine (chainage 0) to chainage 45 kilometres along the alignment lies within the BRC
- chainage 45 kilometres to approximately chainage 282.5 kilometres of the alignment lies within the Isaac Regional Council area
- chainage 282.5 kilometres to approximately chainage 490 kilometres of the alignment lies within the Whitsunday Regional Council
- chainage 490 kilometres to the Abbot Point load out loop lies within the APSDA.

To the extent the rail project falls within the mining lease, they will be dealt with under the EA as relevant. Off the mining lease, notwithstanding the approval of the EAs for the project, development approvals would be required from the relevant local governments for any development off the mining lease that is not subject to section 319 of the MRA or Schedule 10 of SPA.

For example, in addition to the development of the rail line itself, this may include any worker accommodation off the ML and, potentially, other forms of support infrastructure located off the ML, such as water pipelines, construction camps, accommodation facility, residential accommodation and other supporting infrastructure such as water treatment and waste disposal facilities.

The aspects of the rail project within the APSDA will be subject to approvals under the APSDA Development Scheme.

In the EIS the proponent indicated that as railway facilities are included as types of community infrastructure as listed in the Sustainable Planning Regulation 2009, Schedule 2, they will be seeking a Ministerial community infrastructure designation under Chapter 5 of the Sustainable Planning Act 2009.

Under a community infrastructure designation those development aspects of the project included within the designation will not require approval under any local government planning scheme. However, any state regulatory instruments relating to development still applies.

## 7.2. State approvals

In the event that the rail project is assessed under the respective local government planning schemes then various state approvals will also be required (refer Table 7.2).

In addition, the APSDA Development Scheme, under which aspects of the rail project will require approval, is administered by the Coordinator-General.

In the EIS (Volume 1, section 1, p. 1-15) the proponent stated that railway facilities are included as types of community infrastructure as listed in the Sustainable Planning Regulation 2009 (Schedule 2) and that accordingly, the proponent will seek community infrastructure designation (CID) for the project on completion of the EIS.

For CID to be granted by the relevant Minister, the land for the project must undergo thorough environmental assessment, including public consultation, and also take full account of issues raised in the public consultation. If the project is granted CID, it will not require approval under any local government planning scheme or need to meet any scheme requirements. However, state-level legislation and regulatory requirements continue to apply, e.g. building and environmental management legislation. See section 7 of this report for a discussion on rail corridor issues, including sediment and erosion management.

The relevant CID provisions under SPA are not applicable to a ML under the MRA; therefore, any consideration of a CID is limited to the rail project areas within the respective local government areas and the APSDA.

The key advantages of pursuing a CID in these areas is that it provides a useful mechanism for consolidating all the development assessment requirements for the project rather than requiring the rail corridor go through all three separate local government planning scheme requirements. This has the potential to triple the procedural requirements and to cause conflicts in assessment and approval requirements.

I would not support the use of the CID mechanism in the APSDA because the state government, by declaring a SDA, has designated the land use of the area and prepared a development scheme that regulates development in that specific Abbot Point port area.

Therefore, I would not support an application for a CID relating to that part of the rail project within the APSDA.

During the CID process (SPA Chapter 5), the relevant local governments will be consulted and have the opportunity to provide submissions stating their interests with any such designation.

If the proponent does request a Ministerial designation for community infrastructure for all or part of the project and the relevant Minister then pursues the CID, under a CID I may recommend requirements for inclusion in the designation under the Sustainable Planning Act, section 202(a). Should a CID designation proceed, I have provided recommendations and conditions for the project approval (refer Appendix 4, Part A).

### **Administering authorities for rail approvals**

There are no provisions in the EP Act that provide for DEHP to have a direct regulatory role in environmental management of the construction and operation of a rail line. Railway line construction is not an environmentally relevant activity (ERA) and DEHP is therefore not required to issue an approval for the project rail line. However, some aspects of the rail construction and associated camps are ERAs (such as sewage treatment, concrete batching) and can be regulated through development approval (DA) conditions provided under the EP Act.

At the request of the Office of the Coordinator-General, the former DERM provided advice on suitable environmental management conditions for construction of a rail line between the mining lease application area and the proposed port facilities at Abbot Point.

DEHP has recommended that environmental management of construction of a rail line for the Alpha project should be in line with that outlined in Section 8.8 of this report.

## **7.3. Australian Government approvals**

The project was declared by the Commonwealth Minister to be a controlled action pursuant to section 75 of the EPBC Act in January 2009, and the EIS process has been undertaken in accordance with the requirements of the bilateral agreement between the Queensland and Australian governments.

Therefore, subsequent to this report, the controlled action will be considered for approval under section 133 of the EPBC Act once the Commonwealth Environment Minister has received this evaluation report prepared under section 35 of the SDPWO Act.

The Commonwealth Environment Minister will use the information in this report to make a decision under the EPBC Act as to whether the project should proceed, and if so, apply conditions to the approval necessary to limit the impact on MNES.

## 7.4. Summary of approvals required for the project

The EIS and SEIS documents were prepared to provide the appropriate regulatory bodies with adequate information to assess the potential environmental, social and economic impacts of the project. To this end, approvals required after the Coordinator-General's report are provided in Table 7.1.

**Table 7.1 Approvals sought by the proponent directly from the Coordinator General's report for the project**

Area	Approval sought
Coal mine	Mine Lease under MRA Environmental Authority under EP Act, including ERAs related to the mining activity
Railway corridor	Ministerial Community Infrastructure Designation under SPA

The project will require a range of additional approvals to proceed to construction and operation. Those approvals will be the subject of separate future applications and are expected to include, but not be limited to, those listed in Table 7.2.

**Table 7.2 Future approvals required for the Alpha Coal Project—rail line**

Item	Legislation	Relevant approval	Status
Rail infrastructure	<i>State Development and Public Works Organisation Act 1971</i>	MCU within APSDA	Location confirmed with indicative design provided.
(1) Construction Camp—Salisbury Plains Camp	<i>Sustainable Planning Act 2009</i>	MCU under Bowen Shire Planning Scheme 2006.	Location confirmed with indicative design provided.
(2) Construction Camp—Collinsville Camp	<i>Sustainable Planning Act 2009</i>	MCU under Bowen Shire Planning Scheme 2006.	Location confirmed with indicative design provided.
(3) Construction Camp—Wollombi Camp	<i>Sustainable Planning Act 2009</i>	MCU under Belyando Shire Planning Scheme 2008.	Location confirmed with indicative design provided.
(4) Construction Camp—Gregory Development Road	<i>Sustainable Planning Act 2009</i>	MCU under Belyando Shire Planning Scheme 2008.	Location confirmed with indicative design provided.
Rollingstock Maintenance Facility	<i>Sustainable Planning Act 2009</i>	MCU under Bowen Shire Planning Scheme 2006.	Location confirmed with indicative design provided.

Item	Legislation	Relevant approval	Status
Hard Rock Quarry	<i>Sustainable Planning Act 2009</i>	MCU under relevant Shire Planning Scheme.	Location and details to be confirmed.
Operational Works	<i>Sustainable Planning Act 2009</i>	Roadwork, Filling and Excavation under relevant Shire Planning Scheme	Location and details to be confirmed.
Environmental Relevant Activity (ERA) 8	<i>Environmental Protection Act 1994</i>	ERA 8—Chemical Storage	Location and details to be confirmed.
Environmental Relevant Activity (ERA) 16	<i>Environmental Protection Act 1994</i>	ERA 16—Extractive and Screening Activities	Location and details to be confirmed.
Environmental Relevant Activity (ERA) 17	<i>Environmental Protection Act 1994</i>	ERA 17—Abrasive Blasting	Location and details to be confirmed.
Environmental Relevant Activity (ERA) 18	<i>Environmental Protection Act 1994</i>	ERA 18—Boiler making or Engineering	Location and details to be confirmed.
Environmental Relevant Activity (ERA) 21	<i>Environmental Protection Act 1994</i>	ERA 21—Motor Vehicle Workshop Operation	Location and details to be confirmed.
Environmental Relevant Activity (ERA) 38	<i>Sustainable Planning Act 2009</i>	ERA 38—Surface Coating	Location and details to be confirmed.
Environmental Relevant Activity (ERA) 43	<i>Sustainable Planning Act 2009</i>	ERA 43—Concrete Batching	Location and details to be confirmed.
Environmental Relevant Activity (ERA) 50	<i>Sustainable Planning Act 2009</i>	ERA 50—Bulk Material Handling	Location and details to be confirmed.
Clearing Permit of Least Concern Plants	<i>Nature Conservation Act 1992</i>	Protected Plant Permit	Location and details to be confirmed.
Mapping of Assessable Remnant Vegetation.	<i>Vegetation Management Act 1999</i>	Property Map of Assessable Vegetation (PMAV)	Location and details to be confirmed.
Clearing Protected Plants	Nature Conservation (Wildlife Management) Regulation 2006	Species Management Program and/or Damage Mitigation Permit	Location and details to be confirmed.
Vegetation Offsets	<i>Vegetation Management Act 1999</i>	Vegetation Offset investigations involving Bio-condition surveys	Location and details to be confirmed.
Operational Works—Clearing of Native Plants	<i>Vegetation Management Act 1999</i>	Clearing of Native Vegetation and High Value Regrowth	Location and details to be confirmed.

Item	Legislation	Relevant approval	Status
Operational Works— Clearing of Native Plants	<i>Vegetation Management Act 1999</i>	Clearing of Regional Ecosystems	Location and details to be confirmed.
Operational Works— Clearing of Native Plants	<i>Vegetation Management Act 1999</i>	Clearing of Essential Habitat Communities	Location and details to be confirmed.
Operational Works	Coastal Protection and Management Regulation 2003	Tidal Works—onshore	Location and details to be confirmed.
Operational Works	<i>Water Act 2000</i>	Taking or Interfering with Water	Location and details to be confirmed.
Operational Works	<i>Water Act 2000</i>	Riverine Protection Permit	Location and details to be confirmed.
Operational Works	<i>Water Act 2000</i>	Quarrying in a Watercourse or Lake	Location and details to be confirmed.
Operational Works	<i>Fisheries Act 1994</i>	Removal, Destruction, or Damage to Marine Plants—onshore	Location and details to be confirmed.
Operational Works	<i>Fisheries Act 1994</i>	Waterway Barrier Works	Location and details to be confirmed.
Subdivision of Land	<i>Sustainable Planning Act 2009</i>	RoL under relevant Shire Planning Scheme.	Location and details to be confirmed.
Quarry Material	<i>Forestry Act 1959</i>	Quarry Material Sales Permit.	Location and details to be confirmed.
Timber	<i>Forestry Act 1959</i>	Timber sales	Location and details to be confirmed

## 8. Environmental impacts—rail

### 8.1. Terrestrial ecology impacts and offsets

#### 8.1.1. Overview

This section provides an assessment of terrestrial ecological values that may be affected by the 495-kilometre-long rail component of the project. For further discussion on terrestrial MNES affected by the rail component of the project, see Section 11 of this report.

Specific components of the assessment of terrestrial ecology matters are considered separately under the headings:

- Terrestrial flora
- Vegetation communities
- Terrestrial fauna species
- Weeds and pest animals
- Offsets.

The rail alignment lies within the Brigalow Belt and Desert Upland bioregions. It is not located within or adjacent to conservation park, declared fish habitat area, wilderness area, aquatic reserve, heritage or historic area or area of cultural significance relating to biodiversity and scientific reserves.

The Brigalow Belt bioregion is characterised by high biodiversity values, supporting numerous threatened ecological communities and fauna and flora species. Land within this bioregion has been significantly cleared and modified for agriculture and grazing purposes. The Desert Uplands bioregion has also been significantly modified and cleared for grazing purposes.

The proponent has stated that much of the project site has been extensively grazed by cattle. Impacts attributable to grazing are evident in the form of vegetation clearing, introduction of exotic pasture grasses and consequent displacement of native grasses and herbs, reduced ground cover, soil erosion, soil compaction and erosion of creek banks. These impacts are readily apparent in the dry season, particularly around dams and waterways. In addition to these impacts, grazing has resulted in reduced recruitment of native vegetation, preventing regeneration of woodland habitat previously cleared for pasture.

Four major Central Queensland river systems are crossed—the Bogie River, the Bowen River, the Suttor River and the Belyando River, all of which are located in the greater Burdekin River catchment.

Additional land uses within the catchment include sugar and horticulture cropping, aquaculture and mining. Mining and mine-related infrastructure is evident throughout the surrounding landscape. Water infrastructure is also a significant industry with twelve major dams and weirs occurring throughout the catchment.

In the EIS Volume 3, Railway Corridor (Table 9-9, p. 9-29), it was stated that the proposed rail alignment passes through a range of ecological communities located on generally level to undulating landforms, including 68 REs and 1538 hectares of mapped remnant vegetation. There was little discussion in the EIS as to why this area could not be reduced by alternative alignment of the line.

A detailed assessment of terrestrial ecological values of the rail infrastructure is provided in Volume 6, Section F: Terrestrial Ecology of the EIS.

The terrestrial ecological assessment involved a literature and database review to identify potential and known flora and fauna values within the project site and on adjacent lands; field surveys across wet and dry seasons to capture seasonal variations in flora and fauna assemblages and map the extent and distribution of state significant flora and fauna values on site; and the preparation of a report outlining these values, potential impacts of the proposed project on these values and proposed mitigation measures to minimise these impacts. Field methods and site selection were refined through consultation with DERM.

Fifteen broad vegetation communities and twelve terrestrial habitat types were identified by the proponent within the study area.

Flora surveys were undertaken at 19 comprehensive and 75 rapid assessment sites and fauna surveys were undertaken at 16 comprehensive and 75 rapid assessment sites. Dry season surveys were undertaken between November and December 2009 and wet season surveys were undertaken in April 2010 (up to one kilometre on either side of the rail alignment was assessed).

Flora study sites were located in areas representative of the project's vegetation types and involved collecting a detailed floristic inventory of the dominant and associated woody plants within each vegetation community. Fauna study sites were located in areas representative of the project's vegetation and habitat types and a range of trapping and survey techniques were employed.

I have considered the comments of submitters who raised concerns on terrestrial ecology matters, and how the SEIS responded to the issues raised. Issues that warranted additional information in order for me to adequately evaluate the issues included:

- weed and animal pest management
- impacts to fauna specifically mortality and breeding disruption
- wetlands and management thereof
- impacts of dust emissions
- marine plant offsets
- adequacy of surveys.

## **8.1.2. Terrestrial flora**

### **Issues**

Twenty-six threatened flora species listed under the NCA were identified by database searches as known or potentially occurring within the wider study area. Three hundred

and sixty-seven flora species were identified on and adjacent to the project site, including 33 introduced species and two state-listed threatened species. The vulnerable *Eucalyptus raveretiana* was recorded along the Elliot River in eucalypt fringing woodland and the near-threatened *Bonamia dietrichiana* was observed in vine thickets at the foot of Mount Roundback. The rail alignment also transects a mapped area of essential habitat for *B. dietrichiana* and an area of *Croton magneticus* essential habitat is present within two kilometres of the rail alignment.

No other essential or important habitat areas for state-listed threatened flora species were identified within the project site. The project site may however, support suitable habitat for an additional four state-listed threatened species.

The vulnerable *E. raveretiana* was recorded upstream of the rail alignment along the Elliot River. This species is a dominant component of the fringing riparian open forest that lines this river and the EIS considered it is highly likely that the species will also be present at the rail alignment's river crossing.

The near-threatened *B. dietrichiana* was recorded in very low densities within ironbark woodlands at the foot of Mount Roundback and is likely to be present throughout the dense vegetation around this mountain.

The EIS also stated that the project site also contains potential habitat for four other NCA-listed threatened flora species, though the absence of known populations of three of these species within or adjacent to the project site suggests that it is unlikely that any clearing of these habitats will significantly impact upon the long-term viability and geographical distribution of these species.

One NCA-listed species, the vulnerable *Croton magneticus*, has been recorded within two kilometres of the rail alignment and is considered likely to occur on site due to the proximity of these populations and presence of suitable habitat on site.

The project will impact upon *E. raveretiana* and *B. dietrichiana* populations; however, the extent of habitat in the region and presence of large populations that extend well outside the footprint of the rail alignment suggest that the project will not significantly impact upon the long-term viability of these species.

Marine plants were recorded in association with mangrove and tidal saltmarsh areas in the Caley Valley wetland region of the rail alignment. Marine plants are protected under the Fisheries Act.

Marine plants will be cleared during construction and maintenance activities associated with the operation of the rail alignment in the Caley Valley wetlands. Marine plants identified on site are common in the region and any clearing associated with the rail alignment is not expected to significantly impact upon their long-term viability in the region.

The project will also impact upon flora species in general through:

- a decrease in the extent and distribution of certain flora species, particularly those which have restrictive soil niches
- edge effects which may result in changes to microclimatic conditions thereby reducing plant health and increasing susceptibility to disease

- an increase in the introduction and/or spread of weed (particularly parthenium) seeds/propagules on footwear, machinery, vehicles and materials for mine operation and construction.

The SEIS outlined a range of mitigation measures to minimise the potential impacts of the project on flora values on and adjacent to the rail alignment (Volume 2, Appendices AA, AC and AG). These measures include, but are not limited to preparing and implementing an overall environmental management plan for the rail which would include:

- vegetation clearing plan
- weed management plan, which includes:
  - an annual survey for weeds of special management concern
  - implementing weed spraying programs prior to preparing and implementing management plans for vegetation clearing, revegetation/rehabilitation and weeds
- rehabilitation plan for disturbed areas that includes:
  - planting endemic, native species to manage erosion and sediment control
  - installing logs, dead trees and stumps onto the rehabilitated site to provide roosting, feeding and nesting sites for local fauna
  - linking vegetation remnants and maintenance and monitoring programs.

Mitigation measures to threatened species populations and habitat include:

- avoiding impacts wherever possible through careful mapping and clear delineation of threatened species populations
- relocating infrastructure wherever possible to avoid such populations and individuals and restricting access to ground within the drip line of threatened species
- translocating and redistributing populations that cannot be avoided to prescribed offset areas to ensure there is no net loss in the total population of those species.

The proponent has committed to providing offsets for impacts that cannot be avoided or mitigated to ensure that there is no net loss in significant flora values in the region.

### **Coordinator-General's conclusion**

Two state-listed threatened flora species were identified on or adjacent to the project site during the field surveys and the project site contains suitable habitat for an additional four species based on their habitat preferences and known geographical distribution ranges. Construction activities associated with the development of the mine site may impact upon known populations and potential habitat for threatened flora species. In addition, construction and ongoing maintenance activities will impact upon protected native plants on site.

Where clearing requires protected plants to be removed or disturbed, it must be undertaken in such a way as to avoid or minimise disturbance to these species. Where avoidance is not practicable, translocation or rehabilitation efforts should be employed to minimise adverse impacts to these species. Proponent commitments to mitigate impacts on protected flora are in Appendix 5.

Vegetation and habitat offsets have been considered by the proponent to ameliorate the potential impacts of the proposed development on terrestrial ecology. I acknowledge that these offsets will be implemented in accordance with government offset policies, with the majority being provided under the Queensland Vegetation Management Offsets Policy 2007. I note that these offsets will assist in enhancing potential habitat areas for threatened flora species through weed and pest management, fire management and rehabilitation of land through replanting endemic species. Such offsets will also enhance connectivity of the site with adjacent bushland areas, further facilitating the long-term viability of threatened flora species through improved dispersal and movement of genetic material. Offsets for the rail alignment are detailed later in this section.

By implementing mitigation measures contained within the EMP, and compliance with conditions recommended for the construction of the railway (Appendix 4) I am satisfied impacts to protected plants and threatened flora species on site will be acceptable.

### **8.1.3. Vegetation communities**

#### **Issues**

Thirteen vegetation communities were identified within the project site, including 73 REs as defined under the VMA. For completeness, vegetation communities analogous with threatened ecological communities listed under the EPBC Act have been identified. Approximately 60 per cent of the total project footprint lies within remnant vegetation.

The proposed alignment transects several vegetation communities including endangered and of-concern REs, and REs at risk of falling into a higher conservation status (i.e. 'at threshold' REs) with a total disturbance area of approximately 1435 hectares.

Edge effects resulting from the proposed works can include the establishment of weeds, alteration to microclimatic conditions (such as greater light intensity, more wind penetration, lower humidity) and a reduction in plant health through loss of photosynthetic potential (as a result of plants being covered by dust generated from vehicle movement on unsealed tracks). In the absence of appropriate control measures, the project has the potential to cause impacts in relation to edge effects, particularly with reference to the introduction and/or spread of weed species throughout the project site.

Earthmoving activity, particularly along watercourses, can promote weed invasion and may increase sedimentation in riparian woodlands downstream. Higher levels of erosion can lead to a loss of morphological diversity in streams, which in turn reduces habitat quality and may result in biodiversity losses in affected areas. Any importation of seeds as well as the use of earthmoving equipment in conjunction with land disturbance will provide an opportunity for the introduction of invasive weed species, until native species become established. If invasive weeds were to establish at the project site, these may compete against the establishment of native vegetation.

Refinements to the rail alignment have reduced the proposed clearing extent of vegetation communities on site.

The proponent has stated that vegetation clearing will be limited to that which is necessary for the construction and operation of the rail alignment. The draft EMP for the rail alignment outlined a range of mitigation measures to minimise the potential impacts of the project on vegetation communities on and adjacent to the rail alignment. These measures include but are not limited to:

- preparing and implementing a vegetation clearing plan, which includes identifying and managing environmentally sensitive areas such as remnant vegetation which may form habitat for threatened species and rehabilitated areas designated as part of an offset requirement and establishment of reference flora monitoring sites
- preparing and implementing a weed and pest management plan, with mitigation strategies including:
  - annual survey for weeds of special management concern
  - implementing weed spraying programs prior to preparing and implementing management plans for vegetation clearing, revegetation/rehabilitation and weeds
  - eradicating weeds of special management concern from the site in accordance with best management practices from state and local government agencies
  - promoting weed management awareness by including weed issues, pictures and procedures into the project's site induction program
- preparing and implementing a rehabilitation plan for disturbed areas that includes:
  - plantings to manage erosion and sediment
  - installing logs, dead trees and stumps onto the rehabilitated site to provide roosting, feeding and nesting sites for local fauna
  - linking vegetation remnants and maintenance and monitoring programs
  - using the most appropriate endemic species for the landscape elements of the site for the rehabilitation/re-vegetation works of the project
  - selecting species through habitat matching, based on communities present on site to ensure rehabilitation success
  - seeding to utilise a broad mixture of species to promote a high diversity and recovery rate
- preparing a fire management plan
- preparing an erosion and sediment management and control plan outlining measures to retain and stockpile topsoil, standard dust suppression techniques to minimise flora damage and create contoured landforms to resemble original regional topography where possible
- vegetation offsets to counteract the clearing of endangered and of-concern REs, loss of connectivity between remnant vegetation areas, wetlands, watercourses and essential habitat areas.

An offset strategy will be prepared in accordance with relevant state offset policies (vegetation and biodiversity) and offsets to be offered will be ecologically equivalent to the area being cleared. The strategy will outline the methodology to identify potential offset areas as well as measures to legally secure these areas (e.g. under a nature

refuge agreement). Offsets are a legislative requirement and are addressed in the offsets section of this report (see Section 8.1.6 of this report).

### **Coordinator-General's conclusion**

During construction of the railway, the impact of vegetation clearing must be mitigated and managed appropriately. Where clearing of remnant vegetation for the railway line affects a portion of an in-tact area of remnant vegetation, the uncleared remnant vegetation should be of sufficient size and configuration to ensure that the remaining vegetation results in a functioning ecosystem. The clearing should be located so that connectivity is maintained between the affected patch of remnant vegetation and adjacent patches.

The project is designed to limit clearing only to the extent necessary and has avoided remnant vegetation where possible. Nonetheless, the project will result in unavoidable impacts to vegetation including loss of remnant and riparian vegetation and connectivity to vegetation.

Actions from management plans for vegetation, soil and weeds within the overarching EMP will mitigate these impacts on vegetation—on and adjacent to the project site—and ongoing monitoring programs will lead to actions that will ensure the long-term success of these measures. Where these plans cannot adequately minimise these impacts, offsets are proposed to ensure there is no net loss in vegetation communities in the region.

By implementing the mitigation measures contained within the EMP for the rail line (Volume 6, Appendix 26 of the EIS; updated in Volume 2, Appendix AC of SEIS), amendments to the EMP discussed in Section 9 of this report, and through the recommended conditions for construction of the railway contained in Appendix 4 (Part A, Condition 15), I am satisfied that impacts to vegetation on site can be adequately managed.

## **8.1.4. Terrestrial fauna species**

### **Issues**

Twenty-seven threatened fauna species listed under the NCA were identified by database searches as known or potentially occurring within the wider study area. Two hundred and twenty vertebrate fauna species were identified on the project site during the assessment, including 35 reptiles, 131 birds, 41 mammals (including 6 non-native) and 13 amphibians (including 1 non-native). Of these, four are listed as threatened under the NCA including the endangered Troughton's sheath-tail bat, vulnerable squatter pigeon and near-threatened little-pied bat and cotton pygmy-goose.

The squatter pigeon was observed regularly across the rail alignment while the cotton pygmy-goose was recorded at the Star of Hope Dam during the dry season. The little-pied bat and Troughton's sheath-tail bat were recorded via Anabat detectors with recordings considered definite and probable respectively.

The project site may also support suitable habitat for an additional eight state-listed threatened fauna species (including one mammal, four birds and three reptiles) based on their known distribution and habitat values present on site.

The project site contains extensive areas of suitable habitat for the squatter pigeon from grasslands to grassy woodland habitats whilst permanent ponds and dams within and adjacent to the rail alignment may provide suitable habitat for the cotton pygmy-goose. In addition, eucalypt woodland and forests on site provide habitat value for the little-pied bat, while riparian vegetation fringing watercourses may provide some foraging value to the Troughton's sheath-tail bat.

Twelve terrestrial habitat types are present within the project area including grasslands; sparse regrowth; mature woodland with variable shrub and understorey; mixed low woodland; melaleuca dominated shrubland; coastal wetlands; sparse woodland and grassland on cracking clay soils; open woodland with grassy understorey; woodland and open forest fringing watercourses; and eucalypt woodland on rocky rises.

Direct mortality of livestock and native wildlife can occur during the construction and operational phases of the project through clearing of vegetation, or collision with trains and maintenance vehicles. Construction and operational activities along the rail corridor will cause temporary and localised increases in noise, vibration and light disturbance. During the period of construction, there is expected to be localised disturbance to wildlife behaviours and dynamics (i.e. foraging, breeding and nesting) adjacent to the construction footprint.

Increased lighting may also subject some native species to higher levels of predation. Impacts of light, noise and vibration disturbance can be reduced by locating the project and associated infrastructure away from sensitive habitats during the design period.

The project alignment and associated access tracks and fencing infrastructure can act as a linear barrier to local and regional fauna movement, fragment remaining habitat patches and restrict access to water sources.

More specifically, potential impacts to known threatened fauna species populations on site include:

- for the squatter pigeon:
  - potential direct mortality of a small number of individuals
  - reduced movement within remaining habitats bisected by the project
  - indirect impacts as a result of habitat displacement from vegetation clearing such as increased competition for food resources, predation and loss of preferred riparian habitats
- for the cotton pygmy-goose:
  - potential loss and degradation of permanent water sources that provide habitat and feeding resources particularly when water resources are limited during the dry season
- for the little-pied bat:
  - potential direct mortality of a small number of individuals when clearing occurs
  - loss of roosting sites.

The EIS stated that measures will be implemented to minimise and mitigate impacts to native fauna include:

- fauna spotter is on site prior to and during all vegetation removal to identify, capture and relocate fauna, including conservation significant species
- developing a fauna species relocation plan particularly for threatened species
- erecting temporary fencing around the construction zone, in accordance with an approved site management plan, to exclude mobile animals
- open pits are covered or contain fauna ramps (e.g. log ramps or wooden planks) to provide a potential means of escape for trapped fauna
- check work areas for trapped fauna before work commences each day
- educate employees of environmental responsibilities during inductions
- enforce on-site speed limits to restrict the incidence of wildlife road kill
- use of appropriate lighting in work and related project areas and employ directional lighting with protective guards
- plant and equipment is to be regularly serviced and maintained to minimise machinery noise
- limit construction near sensitive areas (i.e. near wetland environments during the wet season)
- revegetate and rehabilitate disturbed areas (methods of rehabilitating cleared areas are discussed in Volume 3, Section 25 of the EIS)
- fencing the rail corridor as necessary and progressively to restrict livestock and wildlife access. Fencing will be stout and well-constructed of durable materials, however the use of barbed wire will be avoided if possible
- incorporate fauna underpasses within important habitat areas along the rail corridor and provide appropriate fencing and revegetation to encourage use by fauna species
- monitoring fauna strike and mortality during construction and some periods of operation
- minimise disturbance to wildlife corridors such as riparian vegetation corridors.

Specific measures to minimise impacts to state-listed threatened fauna species include:

- reduce the width of the transport corridor within ephemeral creek habitats
- construct alternative dry season water resources such as dams
- ensure a fauna spotter is located on site during all vegetation removal to identify, capture and relocate fauna from within areas of vegetation as they are cleared
- develop a management plan to monitor potential changes in hydrology and water quality
- design culverts with an area of dry passage within gilgaied landscapes to allow uninterrupted surface flows and allow small fauna such as frogs and snakes dry passage to cross beneath the project.

## Coordinator-General conclusions

Four state-listed threatened fauna species were recorded on site during the field surveys, including the endangered Troughton's sheath-tail bat (probable), vulnerable squatter pigeon and near-threatened little-pied bat and cotton pygmy-goose. Activities associated with the construction and operation of the rail alignment will disturb some habitat for these species; however, this is unlikely to significantly impact upon the long-term viability of these species or their geographical distributional range due to the broad extent of habitat available in the local region and mobility of these species.

The project site also supports suitable habitat for up to eight additional state-listed threatened fauna species; however, this habitat is not considered essential and critical to these species due to their known distributional ranges, extent of suitable habitat in the region and absence of known populations on site. Vegetation clearing associated with the project will impact upon fauna habitat on site through the removal of shelter, food and/or nesting resources and interruption to movement corridors, which can lead to reduced viability of fauna populations and possible injury and mortality.

Measures outlined in the EIS and SEIS will aid in mitigating these impacts to native fauna and fauna habitats on site. I have recommended a condition (refer Appendix 4, Part A, Condition 3) to ensure the effective implementation of the EMP and establishment of monitoring, auditing and reporting programs and overall compliance.

In accordance with the NCA, approval from DNPRSR must also be obtained where construction and/or operation of the project is likely to disturb the breeding places of protected fauna (as defined under the NCA).

I also recommend a condition which requires the provision of offsets for the permanent loss of protected fauna habitat on site (refer Appendix 4, Part A, Condition 15 of this report). These offsets will assist in enhancing potential habitat areas for threatened fauna species through pest management, and rehabilitation of land through replanting endemic species. Such offsets will also enhance connectivity on site to adjacent bushland areas, further facilitating the long-term viability of threatened fauna species.

By implementing the mitigation measures contained within the EIS and SEIS, amendments to the EMP discussed in Section 9 of this report, and through the recommended conditions for construction of the railway contained in Appendix 4 (Part A, Condition 15), I am satisfied that impacts to vegetation on site can be adequately managed.

### 8.1.5. Weeds and pest animals

#### Issues

Eight declared plants of Queensland were identified within the project site including the harrisia cactus (*Harrisia* spp.), parthenium (*Parthenium hysterophorus*), rubber vine (*Cryptostegia grandiflora*), chinee apple (*Ziziphus mauritiana*), common pest pear (*Opuntia stricta*), velvet tree pear (*O. tomentosa*), parkinsonia (*Parkinsonia aculeata*) and lantana (*Lantana camara*). All species except for lantana (Class 3) are considered Class 2 declared plants and these plants are considered established in Queensland and have, or could have, an adverse, economic, environmental or social impact.

Four Class 2 declared pest animals of Queensland were recorded on site during the field surveys including the feral cat (*Felis catus*), feral pig (*Sus scrofa*), European rabbit (*Oryctolagus cuniculus*) and dingo/wild dog (*Canis familiaris dingo*).

Clearing activities associated with the project during the construction and operational phases have the potential to introduce and spread weed seeds and propagules via footwear, machinery, vehicles and materials. Weed infestations have the potential to impact upon native vegetation through increasing competition for light, space and nutrients and increase fire fuel hazard loads. They also have the potential to impact upon native fauna by impeding access to watering holes, or causing injury or death through consumption; and may also impact the productivity of surrounding agriculture and grazing lands.

The EIS concluded that construction activities associated with the rail alignment are unlikely to significantly increase the distribution or abundance of vertebrate pests as these species will lose habitat. However, wild dogs and dingoes may be attracted to work sites where food and scraps are available. Operational works are not expected to increase the presence or distribution of pest animals on site.

In addition to the EM plan, a weed management plan (Volume 2, Appendix AG of the SEIS) will be prepared and implemented to mitigate the potential impacts of weeds on native vegetation on site. This plan will include annual surveys for weeds of special management concern, weed spraying programs and rehabilitation works.

A pest management plan will be developed to minimise the impact of weed and pest species on the study area ecosystems. This will include a regular monitoring program of feral species and management measures to be employed to control feral species within the project footprint.

### **Coordinator-General's conclusion**

Several declared plants and pest animals were observed on site and have the potential to impact native biodiversity on site and the productivity of land adjacent to the site. Construction and operational activities associated with the development of the rail alignment may facilitate the introduction and/or spread of weeds and to a lesser extent, pest animals on site.

Construction and operational activities associated with the rail alignment should be undertaken in such a way to minimise the introduction and spread of weeds and pest animals in accordance with the weed management plan and pest management plan.

By implementing the mitigation measures contained within the SEIS, and updates to the EM plan as conditioned (refer Appendix 4, Part A, Condition 3) I am satisfied that impacts associated with weeds and animal pests on site can be adequately managed.

## **8.1.6. Offsets**

### **Issues**

The proponent has committed to providing a suite of environmental offsets for the unavoidable, non-mitigated loss of vegetation and biodiversity as a result of the rail and rail loop component of the project at Abbot Point, in accordance with State and

Australian Government offset policies. As such, the proponent has prepared a draft Biodiversity Offset Strategy, which when finalised, will satisfy the various offset policies relevant to the project. The offset policies considered for the rail component are:

- Policy for Vegetation Management Offsets (PVMO)<sup>12</sup>
- Queensland Biodiversity Offset Policy Version 1 (QBOP) (the extent to which this policy applies to the mine site is at the discretion of the Coordinator-General)<sup>13</sup>
- Fish Habitat Management Operational Policy FHMOP 005<sup>14</sup>
- EPBC Act Draft Environmental Offsets Policy (2007).

The state-based offset policies are components of the overarching Queensland Government Environmental Offsets Policy (QGEOP).<sup>15</sup>

A draft Biodiversity Offset Strategy (draft strategy) was first included in Appendix X of the SEIS and an updated version of the draft was provided on 13 April 2012. The draft strategy includes:

- how offset policies will apply (Chapter 2)
- the type and number of environmental values required to be offset (Chapter 4)
- the ratio to be applied for offset (Chapter 5)
- the means by which offsets will be secured and supplied (chapters 3, 6–8).

In the SEIS, Appendix X, Section 3.4.1, the proponent listed a number of remaining tasks that are either currently being undertaken or are yet to be undertaken as part of the offset process for the project. In summary, such items include:

- further refinement of the threatened species habitat modelling that was undertaken as part of the EPBC reports (SEIS, Appendices FA and FB), including field validation of models, incorporation of additional field data, to determine actual impact to MNES (rather than potential impact for impact assessment purposes)
- identification of large-scale strategic offset sites (properties of several thousand hectares that might be suitable as a strategic offset for the project)
- development of rehabilitation strategies to link areas of high ecological value in the landscape (to offset fragmentation effects on regional corridors)
- development of supporting strategies including wider scale MNES research in the Galilee Basin and monitoring plans to assist with mitigating long-term MNES and biodiversity threats

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<sup>12</sup> Department of Environment and Resource Management, Policy for Vegetation Management Offsets, version 3, Department of Environment and Resource Management, Brisbane, 2011, viewed 24 February 2012, <[http://www.derm.qld.gov.au/environmental\\_management/environmental-offsets/pdf/policy-for-vegetation-management-offsets.pdf](http://www.derm.qld.gov.au/environmental_management/environmental-offsets/pdf/policy-for-vegetation-management-offsets.pdf)>.

<sup>13</sup> Department of Environment and Resource Management, Queensland Biodiversity Offset Policy (version 1), Department of Environment and Resource Management, Brisbane, 2011, viewed 24 February 2012, <[http://www.derm.qld.gov.au/environmental\\_management/environmental-offsets/pdf/biodiversity-offset-policy.pdf](http://www.derm.qld.gov.au/environmental_management/environmental-offsets/pdf/biodiversity-offset-policy.pdf)>.

<sup>14</sup> Department of Primary Industries, Fish Habitat Management Operational Policy FHMOP 005: Mitigation and Compensation for Works or Activities Causing Marine Fish Habitat Loss, Department of Primary Industries, Brisbane, 2002, viewed 24 February 2012, <[http://www.dpi.qld.gov.au/documents/Fisheries\\_Habitats/FHMOP005-Fish-Hab-Management.pdf](http://www.dpi.qld.gov.au/documents/Fisheries_Habitats/FHMOP005-Fish-Hab-Management.pdf)>

<sup>15</sup> Environmental Protection Agency, Queensland Government Environmental Offsets Policy, Environmental Protection Agency, Brisbane, 2008, viewed 3 August 2011, <<http://www.derm.qld.gov.au/register/p02501aa.pdf>>.

- identifying opportunities for ameliorating direct and indirect impacts arising from habitat fragmentation in both project specific and regional contexts
- identification of suitable offset areas over the properties where preliminary analysis has been undertaken (ongoing)
- field assessment of identified offset areas to determine the suitability offset extent and condition of vegetation
- landholder liaison and negotiation to secure required offsets
- preparation of biodiversity offset management plan(s) to ensure the long-term viability of offset areas; including but not limited to:
  - pest and weed management
  - fencing for livestock exclusion
  - fire management
  - rehabilitation and planting
  - monitoring and maintenance activities
- liaison with regulatory bodies and landowners to finalise contractual arrangements and covenants.

The proponent has continued to work with the Commonwealth and State agencies, and other affected and interested stakeholders, to finalise and obtain formal approval of the strategy.

While the EIS included a draft Biodiversity Offsets Policy, it did not provide specific offsets for the loss of vegetation and fauna habitat. DERM submitted that, under the QGEOP, the Coordinator-General can propose offsets where specific-issue offset policies are triggered, and that offsets would be mandatory if the VMA is triggered.

In the SEIS, the proponent expanded on an offset strategy in Appendix X. The Terrestrial Ecology Report (GHD, 2010) identified that the project would impact 68 REs comprising approximately 1538 hectares of remnant vegetation.

In its submission on the SEIS, the former DERM made a number of comments relating to offsets, RE mapping and fauna surveys related to the railway corridor.

Firstly, the former DERM outlined that the proponent's Vegetation Offsets Strategy was preliminary in nature. It advised that more specific details on proposed offsets, and whether it is possible to obtain and secure the offsets, was required before development could be approved.

DERM further advised that the SEIS did not include sufficient information in Volume 2, Appendix X, to determine what offsets would be required to meet the requirements of the VMA. This is because the SEIS did not include details of how the proposed clearing meets the performance requirements of the Regional Vegetation Management Code for Brigalow Belt and New England Bioregions and Regional Vegetation Management Code for Western Bioregions Version 2.0, dated 6 November 2009.

Table 1 in Appendix X of the SEIS summarised the vegetation clearing offsets required. The offset strategy (and SEIS) did not include specific details of what vegetation (with the exception of regional ecosystem maps) will be cleared and what offsets are required to meet each performance requirement of the Regional Vegetation

Management Codes. For example, the corridor vegetation in Table 1 may or may not relate to the vegetation that is required to be offset to meet the connectivity performance requirement.

DERM also noted that Volume 2, Appendix AJ, Table AJ-5 of the SEIS stated that the clearing of 1322 hectares of least-concern RE vegetation would not require offsets. However, DERM pointed out that this is incorrect as there would be a requirement to offset the clearing of least concern to meet the connectivity performance requirement of the Regional Vegetation Management Codes.

DERM stated that the proponent must demonstrate in any operational works application that the offsets meet the requirements of Part S of the Regional Vegetation Management Code for Brigalow Belt and New England Bioregions and Regional Vegetation Management Code for Western Bioregions Version 2.0, dated 6 November 2009. The proponent must also provide detailed information about whether offset areas have been identified and are available.

DERM also stated that the updated Terrestrial Ecology report includes maps on current RE mapping and amended RE mapping. The current maps show what amendments are proposed for the RE mapping, but site-specific data demonstrating why the amendments are proposed were not included.

It is DERM's view that the proponent should submit a property map of assessable vegetation (PMAV) to have the RE maps amended prior to submitting any operational works application. The description and map on the vegetation communities on the mine and rail line project sites do not accord with the VMA REs and remnant vegetation mapping.

The revised draft strategy remains indicative, is subject to ongoing refinement by the proponent, and to verification and agreement with the relevant state and Australian Government departments. Other contingencies may also influence the final offsets package provided, for example, finalisation by DEHP of the proposed Galilee Basin Strategic Offset Strategy. At the time of writing this report, departments had not completed their analysis and review of the most recent version of the draft strategy and had not provided me with relevant comments and advice.

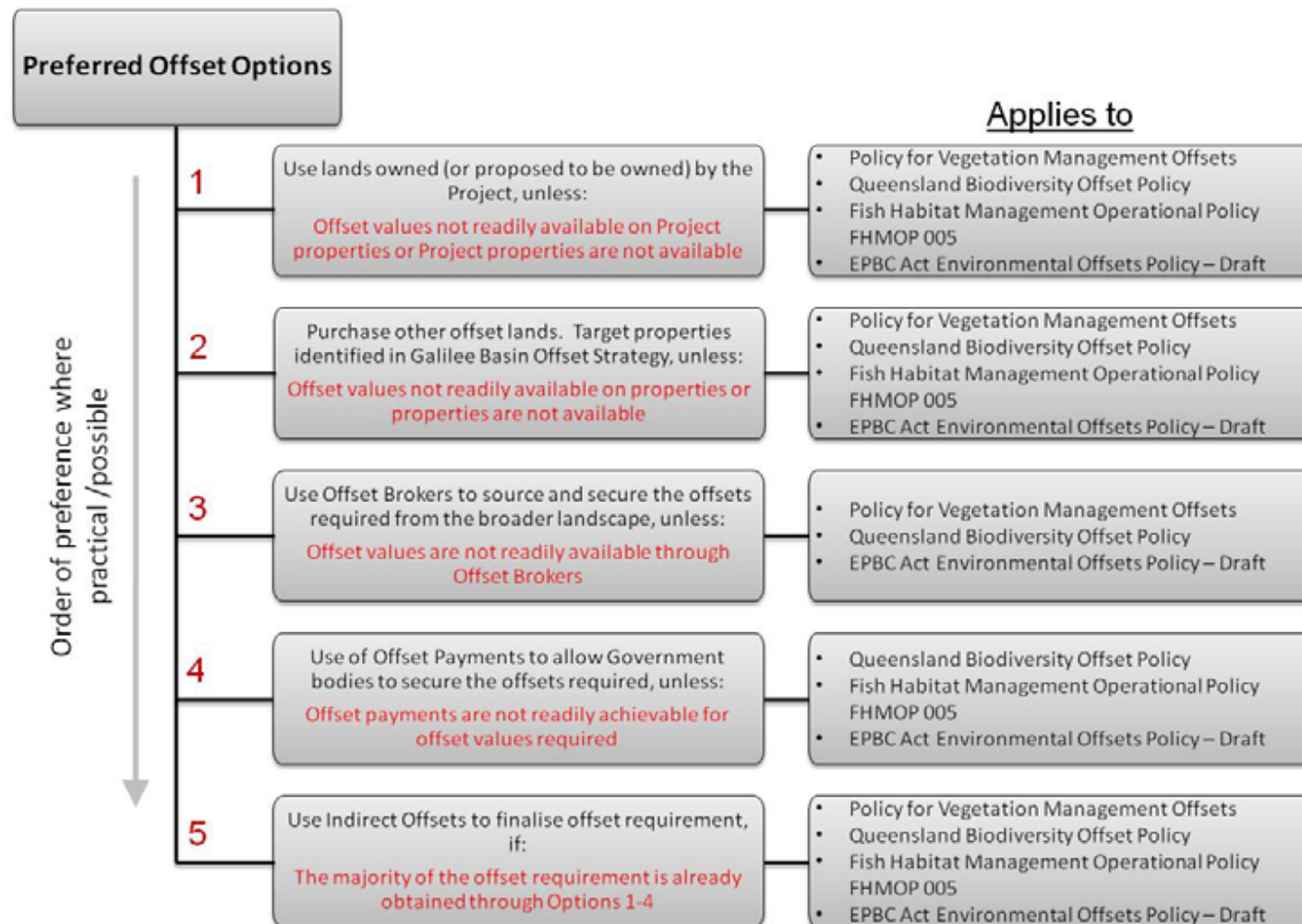
The draft strategy prepared by the proponent identifies several key offset principles, and aims to:

- ensure strategic, viable offsets are legally secured and managed
- secure larger offset sites containing many offset values required rather than a large number of small sites
- secure offsets that are well connected and adjacent to existing areas of remnant and/or protected native vegetation
- protect and maintain state biodiversity corridors, where possible
- ensure offsets are located as close as possible to the impact sites (i.e. close to the rail alignment)
- protect a mixture of remnant and non-remnant vegetation to satisfy the multiple offset policies and jurisdictions that apply to the project

- undertake management of offset sites consistent with an offset management plan to restore functioning ecosystems in areas of non-remnant vegetation and/or maintain functioning regional ecosystems where remnant vegetation is protected.

In order to satisfy the above objectives, and the policies relevant to the project, a preferred offset approach has been identified by the proponent. The approach utilises a series of offset options in a cascading order of preference (Figure 8.1), and involves the following offset options:

- (1) Use of lands owned (or proposed to be owned) by the proponent. These lands are situated surrounding the project footprint and provide many values consistent with those required to offset the residual impacts of the project.
- (2) Purchase other offset properties. This option includes the direct targeting of properties identified in the DEHP's draft Galilee Biodiversity Offset Strategy.
- (3) Use of offset brokers (such as Ecofund and Earth Trade) to source and secure the required offsets from the broader landscape on behalf of the proponent. It is anticipated the offset brokers will be commissioned for difficult to obtain offset types, or those offset types not available on the proponent's properties. An offset broker may be used to secure an offset through a third party, or through an offset transfer.
- (4) Use of offset payments to allow government bodies to secure the offsets required for the project. This option would include significant consultation and negotiation with the relevant government departments should this option be required.
- (5) Use of indirect offsets should the options above leave a residual component to be offset.



**Figure 8.1 Proponent's preferred offset options**

All direct offsets (either sourced through the proponent or an offset broker) will need to be secured using a legally binding mechanism. The mechanisms adopted to secure offsets will ultimately depend upon the approval of relevant government departments, landholders or parties with an interest in the offset properties. It is noted that the legal protections available for offset properties are limited by the legal protection mechanisms available under Queensland law and agreement by the relevant parties. The management of established offsets is secured once legally binding mechanisms are registered on the land. These management obligations will be transferred to landholders once legal binding mechanisms are established.

Following the procurement of the direct offsets, the proponent has committed to developing an offset management plan for each site, which will provide extensive details on the management actions required at each site, an estimate of management costs and an outline of the monitoring and reporting requirements associated with each offset site.

The future land use potential and the current tenure (including mining tenures), of any lands provided as a direct offset under the preferred offset approach will be taken into account by the proponent and regulatory agencies when determining the suitability of these lands for offset.

### **Offset timeline**

In addition to the proposed offset approach, the proponent has committed to a timeline to deliver the offsets required for the project. Following the finalisation of the draft strategy, the proponent will refine the vegetation mapping, species habitat models and project footprint. Field surveys of the impact site would include pre-clearance and species prescription surveys, as well as an assessment of ecological equivalence. The results of the field surveys will confirm the extent of the impacts, and the requirement for associated offsets.

Following this additional work, the proponent has committed to preparing a biodiversity offset package for review by the Coordinator-General and relevant State and Australian Government agencies. The package would provide the proposed mixture of offset mechanisms to be utilised, including the identification of offset sites, and where other offset measures will be utilised. The proponent envisages that the proposed offset package would include a mix of remnant and non-remnant vegetation to satisfy the multiple offset policies that are applicable to the project. The provision of remnant vegetation is likely to be utilised predominantly to fulfil offset requirements under the EPBC Act, whereas non-remnant vegetation is likely to be predominantly utilised to provide offsets under State requirements. Offsets approved by the relevant government departments would then be delivered by the proponent. Where possible, the offsets being delivered will satisfy the offset requirements for both state and Commonwealth concurrently.

While the proponent has committed to a staged approach to the delivery of offsets for the mine site over the 30-year life of the mine, rail-related offsets will be delivered in the first few years of construction and early operation.

## Indicative offsets

Within the draft strategy, the proponent has described the impacts requiring offsets under each policy. The proponent has committed to further refining the impacts of the project based on:

- finalising the project footprint, including a final rail alignment and decisions on the placement of ancillary infrastructure
- completing field validation and targeted species surveys to confirm the vegetation and species habitat present within the project footprint.

Any changes to the footprint, or distribution of habitat and species, will influence the impacts recorded in the draft strategy, and ultimately the offsets required by the project.

The proponent has aimed to meet the offset requirements under state and Commonwealth offset policies concurrently. That is, if habitat types for several species or communities are similar, and can be obtained within the same offset area, the proponent will attempt to align offsets in order to achieve this outcome. Where offset requirements and habitats are not similar, separate offset areas and types will be secured. The impacts calculated for the project in many cases overlap (i.e. habitat mapped for several species may overlap, or habitat and impacted REs may also overlap). As impacts (and associated offset requirements) overlap, so too will habitat within offset properties. Therefore one offset area may provide offsets for several values being offset.

Taking into consideration the above points, the final offsets secured for the project may be significantly lower than the sum of all indicative offset liabilities listed in the draft strategy, and will depend on the combination of values secured at offset sites.

The proponent has calculated an IOL figure based on the impacts reported herein. The size of the offset required for the project is generally determined by offset ratios applied to the area of residual impacts associated with the project. Due to the various jurisdictions and policies applicable to the project, offset ratios have been determined for the project using different methods, dependent on the policy that applies. The offset ratio used to calculate the IOL for each table is stated below.

## State offset requirements

The proponent has recognised that offsets under the QBOP and the PVMO require an assessment of ecological equivalence, and that the result of the assessment determines the size of the offset required to fully offset the residual impacts of the project. As the ecological equivalence assessments are yet to be completed for either impact or offset sites, offset ratios under the QBOP and PVMO cannot be finalised. In lieu of ecological equivalence calculations, the IOL for matters protected under the QGEOP and its specific-issue-offsets policies has been calculated assuming a 4:1 offset-to-impact ratio, unless a specific offset ratio is stated in the policies.

## Threatened flora offsets

One near threatened species, *Bonamia dietrichiana* (Dietrich's morning glory), was confirmed present within the rail alignment, with an additional near threatened species

*Desmodium macrocarpum* (large-podded tick-trefoil) considered likely to be impacted by both the mine and rail components of the project.

The impacts to high potential and low potential habitat for each species are described in Table 8.1. The IOL for each species is also provided. The IOL calculations assume an offset of 3:1 in accordance with the QBOP for near threatened state protected flora.

**Table 8.1 State protected flora impacts and IOL (rail)**

Species name	Common name	NC Act status	Impact area—HPH* (ha)	Impact area—LPH** (ha)	Indicative HPH offset liability (ha)	Indicative LPH offset liability (ha)
<i>Bonamia dietrichiana</i>	Dietrich's morning glory	NT	10.3	0.02	30.9	0.06
<i>Desmodium macrocarpum</i>	Large-podded tick-trefoil	NT	425.3	373.9	1275.9	1121.7

\*HPH = High Potential Habitat, \*\*LPH = Low Potential Habitat

### Threatened fauna offsets

Three near-threatened fauna species are likely to be impacted as a result of the project. *Chalinolobus picatus* (little-pied bat) has been recorded within both the rail alignment and the mine footprint. *Nettapus coromandelianus* (cotton pygmy-goose) was recorded within the rail alignment only, while *Ephippiorhynchus asiaticus* (black-necked stork) is considered likely to occur. As with the threatened flora species, species listed under both State and Commonwealth legislation will be considered under Commonwealth offset requirements (refer Section 11.13).

The habitat impacted for each species is described in Table 8.2. As ecological equivalence assessments are yet to be completed, the IOL for each species has been calculated using an assumed 4:1 ratio.

**Table 8.2 State protected fauna impacts and IOL (rail)**

Species name	Common name	NC Act status	Impact area—HPH* (ha)	Impact area—LPH** (ha)	Indicative HPH offset liability (ha)	Indicative LPH offset liability (ha)
<i>Chalinolobus picatus</i>	Little-pied bat	NT	853.7	624.9	3,414.8	2,499.6
<i>Ephippiorhynchus asiaticus</i>	Black-necked Stork	NT	26.4	7.3	105.6	29.2
<i>Nettapus coromandelianus</i>	Cotton Pygmy-goose	NT				

## Regional ecosystem offsets

The REs impacted by the proposed railway, and requiring offsets under the PVMO and QBOP, are presented in Table 8.3. The vegetation to be impacted is comprised of nine endangered REs (95 hectares), 16 of-concern REs (84.2 hectares) and four threshold REs (12.5 hectares).

**Table 8.3 RE impacts and IOL (rail)**

RE name	RE description	BVG	Impact area (ha)	IOL (ha)	VM Act status
11.3.1	<i>Acacia harpophylla</i> and/or <i>Casuarina cristata</i> open-forest on alluvial plains	25a	5.7	22.8	E
11.4.8	<i>Eucalyptus cambageana</i> woodland to open forest with <i>Acacia harpophylla</i> or <i>A. argyrodendron</i> on Cainozoic clay plains	25a	57.3	229.2	E
11.4.9	<i>Acacia harpophylla</i> shrubby open forest to woodland with <i>Terminalia oblongata</i> on Cainozoic clay plains	25a	23.6	94.4	E
11.5.16	<i>Acacia harpophylla</i> and/or <i>Casuarina cristata</i> open forest in depressions on Cainozoic sand plains/remnant surfaces	25a	0.3	1.2	E
11.9.1	<i>Acacia harpophylla</i> - <i>Eucalyptus cambageana</i> open forest to woodland on fine-grained sedimentary rocks	25a	2.6	10.4	E
11.9.5	<i>Acacia harpophylla</i> and/or <i>Casuarina cristata</i> open forest on fine-grained sedimentary rocks	25a	0.1	0.4	E
11.12.21	<i>Acacia harpophylla</i> open forest on igneous rocks. Colluvial lower slopes	25a	0.8	3.2	E
11.3.21	<i>Dichanthium sericeum</i> and/or <i>Astrelba spp.</i> grassland on alluvial plains. Cracking clay soils	30a	0.1	0.4	E
11.9.12	<i>Dichanthium sericeum</i> grassland with clumps of <i>Acacia harpophylla</i> on fine-grained sedimentary rocks	30b	4.8	19.2	E
11.3.3	<i>Eucalyptus coolabah</i> woodland on alluvial plains	16c	14.9	59.6	OC
11.3.4	<i>Eucalyptus tereticornis</i> and/or <i>Eucalyptus spp.</i> tall woodland on alluvial plains	16c	6.2	24.8	OC

RE name	RE description	BVG	Impact area (ha)	IOL (ha)	VM Act status
11.3.2	<i>Eucalyptus populnea</i> woodland on alluvial plains	17a	19.9	79.6	OC
11.4.2	<i>Eucalyptus</i> spp. and/or <i>Corymbia</i> spp. grassy or shrubby woodland on Cainozoic clay plains	17a	1.0	4	OC
11.11.10	<i>Eucalyptus melanophloia</i> woodland on deformed and metamorphosed sediments and interbedded volcanics	17b	0.1	0.4	OC
11.5.10	<i>Melaleuca tamariscina</i> shrubland on Cainozoic sand plains/remnant surfaces	21b	6.1	24.4	OC
11.11.13	<i>Acacia harpophylla</i> or <i>A. argyrodendron</i> , <i>Terminalia oblongata</i> low open forest on deformed and metamorphosed sediments and interbedded volcanics	25a	4.8	19.2	OC
11.9.10	<i>Acacia harpophylla</i> , <i>Eucalyptus populnea</i> open forest on fine-grained sedimentary rocks	25a	0.8	3.2	OC
11.3.33	<i>Eremophila mitchellii</i> open woodland on alluvial plains	26a	7.9	31.6	OC
11.4.5	<i>Acacia argyrodendron</i> woodland on Cainozoic clay plains	26a	0.4	1.6	OC
11.4.6	<i>Acacia cambagei</i> woodland on Cainozoic clay plains	26a	1.6	6.4	OC
11.3.34	<i>Acacia tephрина</i> woodland on alluvial plains	27a	3.5	14	OC
11.3.13	<i>Grevillea striata</i> on coastal alluvial plains	27c	0.2	0.8	OC
11.8.11	<i>Dichanthium sericeum</i> grassland on Cainozoic igneous rocks	30b	8.2	32.8	OC
11.2.3	Microphyll vine forest (beach scrub) on sandy beach ridges	3b	10.3	41.2	OC
11.12.10	<i>Corymbia clarksoniana</i> woodland on igneous rocks	9c	2.1	8.4	OC
11.4.11	<i>Dichanthium sericeum</i> , <i>Astrebla</i> spp. and patchy <i>Acacia harpophylla</i> , <i>Eucalyptus coolabah</i> on Cainozoic clay plains	30b	7.4	29.6	OC (Threshold)

RE name	RE description	BVG	Impact area (ha)	IOL (ha)	VM Act status
11.5.5	<i>Eucalyptus melanophloia</i> , <i>Callitris glaucophylla</i> woodland on Cainozoic sand plains/remnant surfaces. Deep red sands	17b	2.5	10	LC (Threshold)
11.3.5	<i>Acacia cambagei</i> woodland on alluvial plains	26a	3.6	14.4	LC (Threshold)
11.5.15	Semi-evergreen vine thicket on Cainozoic sand plains/remnant surfaces	7a	1.3	5.2	LC (Threshold)
<b>Total</b>			<b>198.1</b>	<b>792.4</b>	<b>N/A</b>

### Other performance requirements and state-significant biodiversity value offsets

A number of other performance requirements and state-significant biodiversity values require an offset under state legislation. These include wetland, watercourse and connectivity vegetation, and other values such as essential habitat. Impacts to each of these matters will be offset using a 4:1 offset ratio. Again, this offset ratio will require confirmation through an ecological equivalence assessment. The impact areas and the associated IOLs are presented for each matter below.

#### Wetland offsets

Table 8.4 outlines the impacts and associated IOL resulting from the proposed railway, which occur at the northern rail loop for the proposed railway, within the Caley Valley wetlands. The impacted wetland is considered 'significant' under the Brigalow Belt Regional Vegetation Management Code.

This wetland is also covered by State Planning Policy 4/11 (SPP 4/11), being a protected wetland of high ecological significance in Great Barrier Reef catchments. SPP 4/11 states that any impacts are to be offset consistent with the QBOP. However, due to the impacts of the rail line already being offset consistent with the PVMO, an additional offset under the QBOP is not proposed by the proponent.

**Table 8.4 Wetland impacts and IOL (rail)**

Feature name	Impact area (ha)	IOL (ha)
Significant wetland vegetation	16.3	65.2

#### Watercourse offsets

Table 8.5 outlines the impacts to watercourses, and the IOL, from the proposed railway (133.2 hectares).

**Table 8.5 Watercourse impacts and IOL (rail)**

Stream order	Impact area (ha)	IOL (ha)
1	44.6	178.4
2	27.8	111.2
3	22.4	89.6
4	17.4	69.6
5+	20.9	83.6
Total	133.2	532.8

### Connectivity offsets

A total of 395.9 hectares of connectivity will be impacted as a result of the proposed railway (Table 8.6).

**Table 8.6 Connectivity impacts and IOL (rail)**

Feature name	Impact area (ha)	IOL (ha)
Connectivity	395.9	1583.6

### Essential habitat offsets

The proposed railway impacts on 4.2 hectares of essential habitat for the *Denisonia maculate* (ornamental snake) and 9.7 hectares for *Bonamia dietrichiana* (Dietrich's morning glory). The IOL for each impact is presented in Table 8.7.

**Table 8.7 Essential habitat impacts (rail)**

Species name	Impact area (ha)	IOL (ha)
Ornamental snake	4.2	16.8
<i>Bonamia dietrichiana</i>	9.7	38.8
Total	13.9	55.6

### Marine habitat offsets

The proponent proposes to offset impacts to 2.4 hectares of marine habitat from the proposed railway using a 4:1 offset ratio. The impacts require offsetting under the FHMOP. The impacts, and IOL, are summarised in Table 8.8.

**Table 8.8 Marine habitat impacts (rail)**

Feature name	Impact area (ha)	IOL (ha)
Marine plants	2.4	9.6

### Commonwealth offset requirements

Offsets to MNES will be provided under the EPBC Act Environmental Offsets Policy (2007) (EOP). It is noted that land-based offsets proposed under the EOP can only be legally secured through mechanisms available under Queensland law. Offsets are therefore limited by the nature of the legal protection mechanisms available in Queensland and agreement by the relevant parties.

Detailed consideration of Commonwealth offset requirements can be found in Section 11.13 of this report.

### **Proponent's ability to secure the offsets necessary**

The proponent has explored a number of offset options to determine and confirm that offsets required under state and Commonwealth policies can be achieved. While analysis was conducted only to a desktop level, and requires field confirmation, the proponent is confident that all offsets required for the project are available in the region surrounding the project footprint.

The proponent initially investigated the values of seven properties which are owned (or currently being purchased) by the proponent. Three properties are located close to the mine and four are located along the rail alignment.

The environmental values of each property were compared to the offset values required. The outcomes of the desktop assessment concluded that many of the values required were available within the proponent's properties. Further work is now required to confirm the availability of each property to offset the impacts of the project.

For difficult to find offsets, or for those values not present on HCPL properties, Ecofund were engaged to conduct a review of the offset availability in the surrounding region. The analysis conducted by Ecofund indicates that potential offsets are available to acquit all residual offsets requirements for the project.

### **Coordinator-General conclusions**

With the implementation of proponent commitments and the recommendation relating to steps required to be taken by the proponent to meet the legislative VMA offset requirements (Appendix 4, Part A, Condition 15) I am satisfied that residual ecological impacts of the rail component of this project will be able to be offset adequately.

## **8.2. Aquatic ecology**

### **8.2.1. Issues**

A detailed assessment of the aquatic ecological values of the rail alignment is provided in Volume 3, Section 10: Aquatic Ecology of the EIS. This assessment involved a literature and database review to identify species of conservation significance known from the region and field surveys employing standard methodologies to determine the composition of aquatic flora and fauna species inhabiting the project site, aquatic ecosystem function and physical integrity of aquatic environments. Findings of this review and surveys were used to determine the extent of state-significant aquatic flora and fauna values on or adjacent to the project site that may be impacted upon by the project and develop appropriate management measures to mitigate these impacts.

Twenty-two sites were assessed across one field survey undertaken in April 2010 to assess the aquatic flora and fauna values on site. No stygofauna surveys were undertaken as part of this study. Additional surveys were undertaken in February 2011 of the aquatic environment in the Caley Valley Wetland area in response to issues raised in the SEIS.

Water samples were taken where surface water was present. The results of surface water were compared to the ANZECC Guidelines and the Queensland Water Quality Guidelines. Macro-invertebrate sampling of waterbodies was undertaken, giving a broad scale measure of stream health. Vertebrates were assessed, with trapping, spotlighting, and drag netting conducted, as well as incidental fauna observations. Habitat assessments were performed at selected sites using a modified version of the AUSRIVAS protocols.

Declared fish habitat areas were identified in the wider study area; however, no fish habitat areas lie within or adjacent to the rail alignment. Aquatic habitats within the project site include estuarine, riverine (creeks and rivers) and lacustrine/palustrine habitats. The majority of these habitats have relatively low environmental value although those that contain permanent water are considered locally important. State-significant aquatic habitats are present in association with the Caley Valley Wetlands at Abbot Point (also considered nationally important) and larger riverine habitats along Suttor River, Mistake Creek and Table Mountain Creek.

The Elliot and Bogie Rivers are considered to contain a particularly low abundance of microhabitats. Macrophytes were low in abundance throughout the river habitats along the rail alignment and were dominated by semi-aquatic emergent species growing on the channel margins.

The proposed alignment of the rail loop at the Port of Abbot Point will cross estuarine habitat within the Caley Valley Wetland. The rail corridor will be primarily constructed on an embankment with two sections of elevated structures located to maintain wetland flows.

The rail alignment lies within the Burdekin Catchment, which provides a range of habitats for generalist flora and fauna species. No state-significant threatened fish, turtle or flora species are known or likely to occur within the Burdekin catchment.

The Estuarine Crocodile (*Crocodylus porosus*) is listed as vulnerable under the NCA and is known to the Burdekin catchment. Potential habitat is present within the rail alignment in association with the Caley Valley Wetland near Abbot Point and the large permanent pool habitats in the Bowen, Bogie and potentially the Elliot rivers. The platypus (*Ornithorhynchus anatinus*) is also considered state significant (listed as special least concern under the NCA) and may potential utilise permanently inundated waterbodies associated with the Bowen and Suttor rivers within the Burdekin catchment.

Macroinvertebrate diversity and community composition within the Burdekin catchment is characteristic of river systems with highly variable and unpredictable environmental conditions. Within these systems, the macroinvertebrate diversity is relatively low and communities are dominated by generalist species with few pollution-sensitive taxa.

Declared marine plants under the Fisheries Act are located within the estuarine habitats of the Caley Valley wetlands and include salt couch (*Sporobolus virginicus*) and weeping paperbark (*Melaleuca leucadendra*).

The extent of aquatic habitat loss at each riverine habitat within the project footprint is dependent upon the crossing infrastructure incorporated into the design. The direct

loss of aquatic habitat at bridge crossing locations will generally be limited to a small area of riparian habitat for the rail footprint and small area of in-stream habitats and at the locations of the pylons. At these crossings, the infrastructure will be rail only, i.e. no road crossings. Additional habitat may be temporarily lost or damaged during the construction process; however, this impact will be restricted to the minimal amount necessary and habitat features (e.g. channel morphology etc) will be restored at the completion of construction. The loss of riparian and in-stream habitat at these locations will result in the permanent loss of foraging and sheltering habitat for aquatic fauna, though the impact will be localised and is not considered to impact upon species diversity and abundance outside the project footprint.

The ecological consequence of this habitat loss will increase where culvert crossings result in the loss of permanent pool habitat. Permanent pool habitat is considered locally important habitat for flora and fauna species and is relatively limited throughout the study area. The ecological consequence of permanent pool habitat loss may include a local reduction in species abundance and diversity within the immediate area. Loss of permanent pool habitat could potentially occur at a small number of crossings (e.g. Mistake Creek) depending upon the location of the final alignment.

Construction of the rail corridor may result in the loss or disturbance of potential habitat for and direct mortality of native fauna species including the state significant estuarine crocodile, particularly within isolated pool habitats where the abundance of fauna species is expected to be high. Fauna mortality may impact upon the local abundance of these species; however, it is not expected to reduce diversity if managed appropriately.

The EIS identified that general impacts to aquatic flora and fauna species include:

- loss of available habitat from land clearing
- loss of habitat connectivity and habitat fragmentation
- disruption to aquatic fauna breeding and feeding regimes through noise, vibration and dust associated with the construction and operation phases on the project
- introduction and/or spread of weeds during earthworks
- increased sedimentation in riparian woodlands as a result of earthworks. This may lead to an increase in erosion and subsequent morphological diversity in streams, reduction in habitat quality and overall biodiversity loss
- increase in feral animal numbers leading to increased competition for feed and shelter resources and predation
- environmental harm associated with potential spills of chemicals and hydrocarbons to waterways.

The EIS outlined mitigation measures proposed to reduce the potential impacts of the project on aquatic ecosystems include:

- minimising the loss of aquatic habitat in the design phase by locating the rail corridor in areas that have been previously cleared or degraded by past land use practices
- minimising the loss of remnant brigalow (*Acacia harpophylla*) forest and woodland which support unique gilgais habitat
- minimising the loss of nationally important Caley Valley Wetland habitat

- bridging aquatic habitats as per the design criteria defined in Volume 3, Section 11 of the EIS
- clearly identifying the extent of vegetation clearing and earthworks on construction plans and in the field. The extent of construction is to be restricted to the minimal amount necessary in all aquatic habitat locations
- locating any additional construction areas and construction sites, such as site offices, soil stockpiles, machinery/equipment storages and construction camps within existing cleared areas and away from aquatic habitats
- when unavoidable clearing of marine plants occurs in the estuarine habitat, offsets will be required.

A rehabilitation plan is also proposed to reinstate areas cleared for construction but not required for the operation of the rail alignment (e.g. stockpile areas).

Mitigation measures to reduce impacts to native aquatic flora and fauna species include:

- restrict construction within aquatic habitats during the wet season where possible
- engage a fauna spotter prior to and during vegetation removal to identify, capture and relocate fauna from the construction area
- prepare and implement an aquatic fauna species relocation plan that describes relocation methodology for aquatic species
- enforce on-site speed limits and erect temporary bunding around construction areas
- educate employees of environmental responsibilities during inductions
- develop a fauna mortality register to determine the location and frequency of mortality and types of species most susceptible to enable additional mitigation measures to be implemented where necessary.

Both vegetation clearing and weed management will form part of the amended EM plan, as required within in Appendix 4 (Part A, Condition 3)

By implementing the mitigation measures contained within the EIS and SEIS, amendments to the EMP discussed in Section 9 of this report, and through the recommended conditions for construction of the railway contained in Appendix 4 (Part A, Condition 15), I am satisfied impacts to vegetation on site can be adequately managed.

## **8.2.2. Coordinator-General's conclusion**

Based on the mitigation measures provided in the EIS and SEIS and the preparation and implementation of management plans for soil, water, vegetation clearing and weeds, I am satisfied that impacts relevant to aquatic ecosystems can be effectively managed and that the residual risks are acceptable. I have imposed a condition (refer Appendix 4, Part A, Condition 1) to ensure the proponent's commitments (as specified in Appendix 5) are implemented.

No state-significant threatened aquatic flora species are known to the Burdekin catchment. One state-significant threatened aquatic fauna species, the estuarine crocodile, is known in the Burdekin catchment and may utilise habitat in association

with the Caley Valley Wetlands and Bowen, Bogie and potentially the Elliot rivers. Several declared marine plants were identified on site in association with the Caley Valley Wetlands.

Native flora species on site are considered least concern under the NCA and I have recommended a condition (refer Appendix 4, Part C, Schedule 2, Recommendation 11) to obtain approval from DNPRSR, in accordance with the NCA, where the construction and/or operation of the project is likely to disturb the breeding places of native fauna (as defined under the NCA) or require the removal of native flora.

I have also recommended a condition (refer Appendix 4, Part C, Schedule 1, Recommendation 7), to obtain approval to remove or disturb declared marine plants.

By implementing the mitigation measures contained within the EIS and SEIS, including an aquatic fauna relocation plan, rehabilitation plan, dust and erosion management plans, weed management plan and vegetation clearing plan, the EMP and other conditions, I am satisfied impacts to aquatic flora and fauna species on site will be acceptable and the residual risks minimised.

## **8.3. Watercourse crossings and surface water impacts)**

### **8.3.1. Issues**

The project corridor will intercept with a number of major and minor creeks and drainage lines, generally moving in an east to west direction. A preliminary assessment of the types of drainage structures required for the project to provide a 1 in 50 year flood immunity to the top of rail formation for major drainage lines and a 1 in 20 year flood immunity to the top of rail formation for minor drainage lines has been completed by the proponent as part of the preliminary design phase. Different sizes and numbers of culverts will be used to accommodate the majority of drainage lines along the alignment. In some areas bridges will be constructed. As the project is still within the preliminary design phase, detailed information is not available on stormwater drainage systems for construction and operation phases.

Fisheries (formerly DEEDI) raised concerns about the impact of construction activities on in-stream and floodplain hydrology. The EIS suggested that temporary flow diversions may be required during construction activities. The design of the flow diversions should be consistent with the requirements of the *Fisheries Act 1994* and provide for fish passage and protection of aquatic waterway fish habitat.

Fisheries also pointed out that approvals are required under the *Fisheries Act 1994* for any operational works approvals for the removal, destruction or damage of marine plants, and the construction or raising of waterway barrier works.

The EIS estimated that approximately  $11 \times 10^9$  litres of water will be required for construction of the railway. The EIS did not specify where this water will be sourced and stated that a hydrology investigation will be undertaken as part of the detail design to define water source locations.

### **8.3.2. Coordinator-General's conclusions**

The proponent's intention to obtain water licences and approvals after this report is issued, once detailed design work and modelling has been undertaken is noted. The following regulatory measures apply:

Activities in a water course that interfere with the flow of water by diversion or impoundment require a water licence under the *Water Act 2000* and a development approval under the *Sustainable Planning Act 2009* to authorise the construction of a diversion channel.

Crossings located outside the mining lease that do not interfere with the flow of water will require a riverine protection permit unless the proponent is the owner of the land, in which case the activity can be carried out in accordance with departmental guideline '*Guideline- activities in a watercourse, lake or spring carried out by a land owner*'.

To ensure that all approvals for any take of water are in place before construction commences the proponent must liaise with and obtain relevant approvals from DNRM as per imposed Condition 9 (refer Appendix 4, Part A) prior to construction.

Likewise, the proponent must obtain approvals under the Fisheries Act relating to waterway barriers and any impacts that may occur during the construction of creek crossings, as per imposed Condition 10 (refer Appendix 4, Part A), prior to construction.

## **8.4. Stock routes and fauna movement**

### **8.4.1. Issues**

The former DERM (now DEHP) advised that the Alpha to Abbot Point rail line has 13 stock route rail line interfaces. In September 2010, the DERM Stock Route Management Unit attended a meeting with a number of Isaac Regional Council and Hancock representatives in which stock route requirements at each individual interface were negotiated and agreed upon.

A number of submissions were received during the EIS process about fauna passage across the rail corridor. The proposed rail corridor width with distances of 60m or more is a challenge for designing such lengthy fauna passage mechanisms. The former DERM advised that they have no relevant guideline to assist with this issue.

Potential impacts on existing stock routes can be mitigated through the detailed design process for the rail infrastructure corridor alignment, by providing grade separated crossings and realigning or replacing existing corridors of a similar width and topography. Consequently, the proponent will consult with DEHP regarding the final design of stock route crossings to ensure uninterrupted flow of stock across the rail infrastructure corridor alignment both during construction and operation of the project.

### **8.4.2. Coordinator-General's conclusions**

Given these comments, I am making a recommendation that ensures the proponent manages the impacts on stock routes in accordance with local landholder and local government requirements, and building on the negotiated outcomes already made.

I consider that there should be measures put in place to assist in the movement of fauna across the rail corridor. In order that the proponent addresses the issue of fauna passage I make a recommendation to inform the subsequent approval processes with respect to terrestrial and aquatic fauna movement.

These recommendations on stock routes and fauna movements are contained in Appendix 4, Part A, Condition 11 and Appendix 4, Part A, Condition 12.

## **8.5. Quarrying/extractive materials**

### **8.5.1. Issues**

As outlined in Section 2 of Volume 3 of the EIS, the project requires access to very large quantities of quarry material, including ballast. The proponent proposes to principally obtain this quarry material from three key sources:

- from surplus material generated during their actual cut and fill operational works
- from a series of 'borrow pits' or quarries (possibly up to 70 in total) along the proposed rail line corridor
- from three specifically established hard rock quarries appropriately located at the Alpha end of the proposed rail line, around the middle of the proposed rail line and at the Abbot Point end of the proposed rail line.

Ballast is planned to be quarried from three proposed locations for the project:

- a northern quarry near chainage 486 km (Mt Roundback)
- a mid-section quarry near chainage 314 km (Weetalaba)
- a southern quarry near chainage 20km (Surbiton Hill).

DEHP Forest Products is responsible for the administration and sale of State-owned terrestrial quarry material under the provisions of the *Forestry Act 1959*.

As the majority of the proposed 'borrow pits' and the hard rock quarries required for the project are expected to be located on State-owned land where the ownership of the quarry material is reserved to the State, DEHP Forest Products is currently responding to applications from the proponent for permits to search for quarry material.

DEHP Forest Products is still considering the proponent's applications for permits to search for quarry material at its various proposed 'borrow pit' locations along the proposed rail line corridor and at the proposed hard rock quarry site at Weetalaba.

However, it is noted that any hard rock quarry identified will need to appropriately address a range of planning, approval, operational and environmental issues prior to any quarrying operations commencing.

Removal of quarry material from the rail corridor, in addition to operational works, also may require authorisation under the *Forestry Act 1959*.

Given the limited depth (possibly limited to 0.5 to 1.0 metre) of the proposed 'borrow pit' quarry material (quartzite type gravel) that extensive areas (in the order of 50 to 100 hectares in area) at each proposed 'borrow pit' location could be needed to be quarried to source the required quantities of quarry material. This proposed quarrying will adversely impact the subsequent grazing values of the affected areas and there is likely to be strong landholder opposition.

The number of potential borrow pits and quarry sites being investigated as part of the project will be updated by the proponent to show areas that will be needed for the project and the volume of material expected to be 'borrowed' from each area.

At the time of writing this report it is understood that the proposed northern hard rock quarry at Mt Roundback will not be required by the proponent as it currently considers that existing hard rock quarries in the Abbot Port area should be able to provide its ballast and other hard rock quarry material needs for the northern section of the proposed rail line and for its coal terminal works at Abbot Port.

### **8.5.2. Coordinator-General's conclusions**

The opening of borrow pits and quarry sites will be an ongoing exercise depending on corridor design and location of adequate resources, which will require more detailed work during the detailed design phase of the project. Considering that the regulatory process of approvals for these sites is a regular function of DEHP, I recommend that the proponent liaises closely with DEHP to obtain all necessary approvals to provide any quarry material required for the construction of the railway.

## **8.6. Rail corridor dust issues**

### **8.6.1. Issues**

There were a number of submissions received from landowners and TMR about coal dust emissions along the rail corridor. Risk to both human and animal health and impacts to the nearby environment from coal dust escaping from train wagons was raised in the EIS and it was stated that potential sources of air emissions from the operation phase of the project include:

- exhaust emissions from diesel powered locomotive engines
- fugitive coal dust emissions from uncovered coal wagons in transit.

The EIS stated (Volume 3, Section 13, Table 13 5) that in all averaging periods and in all distances from the track, the predicted peak in-air concentrations from the combined locomotive emissions and fugitive coal dust emissions were well below the EPP (Air) criteria at 10 metres from the centre line of the project track. The EIS concluded that during the worst case scenario (the locomotive exhaust together with full coal wagons) and background concentrations included, it can be demonstrated that within 10 metres from the project corridor all predicted concentrations are compliant with the EPP (Air) criteria.

Nevertheless landholders and other near the corridor submitted that they regarded coal dust lift off from the exposed coal surface as a serious environmental and animal health and management issue. The proponent indicated that it is currently undertaking a study to investigate the best approach to address and minimise coal dust emissions, including how wagon shape and design, wagon covers and spray treatments (water sprays or polymer) can reduce coal dust emissions. This study is also seeking to understand other sources of dust and coal contamination.

It is also noted that in addition to environmental drivers, there are economic ones related to coal loss, possible fuel savings and reduced maintenance which will support the recommendations and outcomes from these investigations.

In its submission, TMR outlined that due to significant community and government concerns about impact of coal dust emissions on communities in Central Queensland, in 2007 the former DERM directed that QR Limited (QR) undertake an environmental evaluation of the impact of coal dust from trains in Central Queensland. The evaluation found that the environmental impact of coal dust emissions was significant, and recommended a range of new and increased coal dust management measures for the QR National rail network.

Following completion of the environmental evaluation, QR National has developed and is now implementing a comprehensive Coal Dust Management Plan (CDMP) across the QR National coal rail network. The CDMP was developed in consultation with coal miners, other rail operators and coal terminal operators, and was approved by the former DERM.

The flagship initiative contained in the CDMP involves implementing veneering systems at coal mine sites across Central Queensland. Veneering involves applying an industrial strength surfactant or binding agent sprayed onto the loaded coal wagon surface. This treatment has been trialled at a number of coal mines across Queensland and has been shown to reduce coal dust emissions by at least 85 per cent.

QR National is currently implementing the CDMP and will complete the installation of veneering systems at 47 coalmines in Central Queensland by the end of 2013. The development of such systems has triggered the installation of similar veneering systems in coal rail systems around the world including in USA, South Africa, Canada, Portugal and Spain.

TMR also summarised that coal veneering systems can:

- reduce dust deposition on the track by more than 85 per cent
- reduce PM10 emissions by up to 90 per cent (the fine particle fraction less than 10 micrometres in diameter) which has the highest impact on human health
- reduce ballast cleaning costs by over 50 per cent, by doubling the length of the ballast cleaning cycle
- improve safe rail operations, reduce derailments and reduce the need for speed restrictions in wet weather
- reduce the risk of major system disruptions via derailments and speed restrictions
- improve overall coal exports by 1.02 mtpa.

### **8.6.2. Coordinator-General's conclusions**

To minimise the environmental impacts associated with coal dust it is essential that a veneering system be implemented for the project.

In order to enhance the operational and overall economic performance of the project and to minimise the broader environmental impacts of the rail operations, I have imposed a condition (refer Appendix 4, Part A, Condition 13) requiring that the proponent develop a coal dust management system that should include a veneer to all rail wagons loaded with coal.

The conditions are to be attached to the approval for the operation of the railway and use of the railway and should be brought to the attention of the relevant agencies (TMR and DEHP) responsible for any subsequent approvals required to transport coal from the mine to the port of Abbot Point.

## **8.7. Landowner issues**

### **8.7.1. Issues**

Landowners raised a number of issues relating to the construction of the Alpha railway line including:

- safety of families, employees, and stock
- potential impacts on cattle and machinery movement within properties
- access to paddocks, water, fire fighting, fence maintenance
- disruption from construction workers and activities
- train operations causing dust, accidents or noise
- weed management
- coordination of the rail construction work program between landholders, Hancock and or its contractors.

Note that the above issues are in addition to concerns over flooding impacts referred to in Section 8.12 of this report.

All of these impacts could alter the way properties would be managed by the landholders during and after construction of the railway. Landholders are generally expecting both adequate compensation and reconstruction of infrastructure, such as fencing and roadways, to enable the properties to continue operation as viable rural enterprises.

The proponent is managing these expectations by negotiating with each property holder on the compensation and facilities to be provided as part of the corridor acquisition process.

### **8.7.2. Coordinator-General's conclusion**

A transparent and fair landholder access program must be implemented by the proponent who is seeking to sequester a corridor of land across or beside a rural landholding.

To ensure proponent does address the above impacts, I consider that this objective can be reinforced by a condition that requires impacts on farming operations to be well managed, refer to Appendix 4, Part A, Condition 14(a).

## 8.8. Rail loop within the Abbot Point State Development Area

### 8.8.1. Issues

The Caley Valley Wetland is approximately 5150 ha in area and is located adjacent to the Abbot Point Coal Terminal, 21 km north north-west of Bowen. The wetland system comprises a mix of permanent estuarine waters, intertidal mud and sand flats, mangroves, saltmarshes, freshwater marshes and freshwater impoundments and provides a good example of wetlands on a tropical prograding coast. The site is important for waterbirds and migratory species. I have been informed anecdotally that the character of the wetland was altered by human intervention in 1952 when a series of levees were constructed, in order to change the aquatic environment to more of a fresh water wetland. The wetland experiences distinct seasonal changes, with wet-season filling driving a freshwater system that provides habitat for a number of species. The drying out period (during the dry season) creates a more saline environment, and restricts freshwater areas to pools that may persist depending on the duration of the dry season. Extensive grazing occurs across the wetland complex and the adjacent Abbot Point Coal Terminal is considered a disturbance to the site. The proposed Alpha Coal railway loop intersects 16.3 hectares of the Caley Valley Wetlands, shown in Figure 8.2 below.

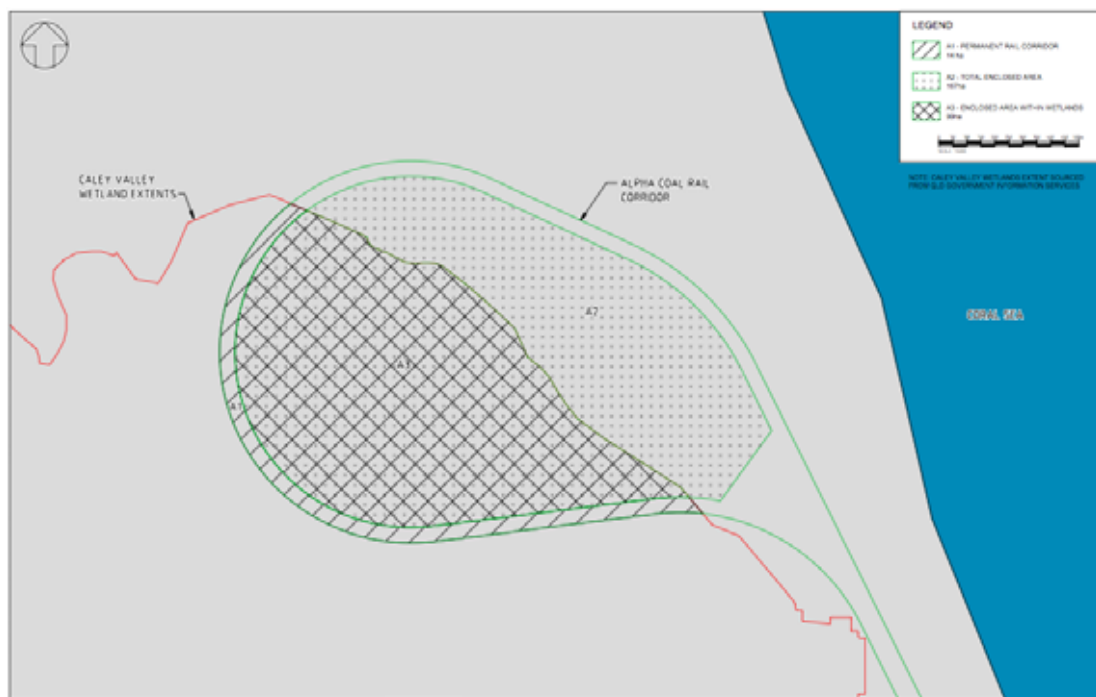


Figure 8.2 Footprint of rail loop over Caley Valley Wetlands

The construction of the rail loop and management of terrestrial areas adjacent to the wetland will be undertaken to limit direct and indirect impacts to the aquatic ecosystem, in that disturbance will be specifically limited only the rail corridor itself as shown above. Construction is proposed to occur over approximately two years with activities occurring throughout the year, 24 hours a day and seven days a week. It is anticipated that the rail loop that bisects the wetland will be constructed upon a rock and earth bund for the majority of the loop. A bottom dump station will be established on the entrance to the loop and a wash bay will be established following dump station. Two areas of the rail loop will be laid upon culverts such that any waterflows into/out of the area enclosed by the rail loop are maintained.

To achieve this the construction phase of the project broadly includes the establishment of a rock base for the footprint in areas subject to water inundation involving:

- dumping of aggregate for the loop footprint
- compaction and rock settlement period
- establishment of culvert structures
- construction of earth fill on rock base and installation of service road and rail line top side
- infrastructure
- installation of a washdown bay outside of the wetlands
- excavation of cavity and construction of other associated infrastructure for dump station outside of the wetlands.

In its submission to the EIS, the former DERM stated that Policy 2.8.2 of the State Coastal Management Plan – Queensland's Coastal Policy provides that further loss or degradation of coastal wetlands is to be avoided and impacts on coastal wetlands prevented, minimised or mitigated.

The Caley Valley Wetland is a wetland of high ecological significance in a Great Barrier Reef catchment. Temporary State Planning Policy 1/10 Protecting Wetlands of High Ecological Significance in Great Barrier Reef Catchments provides:

Development in or adjacent to wetlands of high ecological significance in Great Barrier Reef catchments is planned, designed, constructed and operated to minimise or prevent the loss or degradation of the wetlands and their values, or enhances these values.

The proposed rail loop has the potential to impact on the values of the Caley Valley Wetlands both directly, through location of the rail line in the wetlands, and indirectly through changes in water quality resulting from changes in freshwater and tidal hydrology, and release of contaminants (sediment, coal, liquid hydrocarbons) to the wetland during and after construction.

## Hydrology

Since the rail loop will provide a barrier to hydraulic flows both inside and around the rail loop, the former DERM commented that the mitigation measures proposed by the proponent need to further take into account the change in hydrodynamics. Confining

the entire flow to two culverts may impact on a wide area by changing flow directions, velocity and deposition patterns.

The rail loop infrastructure intersects approximately 16.3 hectares of wetland area (based on the former DERM's wetland mapping layer 2011), which includes both permanent and temporary disturbance. The wetland is highly dynamic and retracts during drier months. During drier months the wetland extent contracts and entire rail loop will not be in standing water.

DERM sought commitments to protection of the hydrology and water quality in the wetlands at all times during and after construction through appropriate design, construction methodology and ongoing management. These hydrology issues can be managed by a further review of hydrological modelling of the proposed culverts.

### **Environmental management plan**

Once design is finalised, and before works commence within the tidal area, a detailed EMP is required for the construction and operation of the rail loop within the SDA, including the Caley Valley Wetlands. This EMP should contain an Erosion and Sediment Control Management Plan and a Water Management Plan, and a Construction Rehabilitation Plan. Since detailed acid sulfate soils (ASS) exist in the area, development of a full ASS management plan should take place in appropriate areas subject to excavation or disturbance during construction of the rail line, consistent with State Planning Policy 2/02 Guideline: Acid Sulfate Soils.

### **Ecological disturbance**

Fisheries Queensland indicated that a development approval under the *Fisheries Act 1994* will be required for operational works that is the removal, destruction or damage of marine plants associated with the rail loop construction works at the Port of Abbot Point. The loss of fisheries productivity as a result of the project shall be offset as required under the Fisheries Queensland operational policy FHMOP005 *Mitigation and compensation for activities and works causing marine fish habitat loss: Departmental Procedures*.

Likewise, DEHP will require offsets to the disturbance of wetland and other sensitive vegetation and ecosystems, in accordance with the Queensland Government's Biodiversity Offsets Policy, April 2012.

### **Development approval application**

Proposed use of land in an SDA requires a material change of use (MCU) application to the Coordinator-General, in accordance with the SDPWO Act. Such an application must present details of the finalised project, its environmental protection measures, and consideration of how the proposed development is consistent with the provisions of the Development Scheme for the Abbot Point SDA. It must include a statement of the mitigation measures to be undertaken through presentation of EMPs for construction and operation of the project on land within the SDA.

In response to issues raised regarding the Caley Valley Wetlands the proponent has advised:

- Mitigation and management measures have been developed using Australian and Queensland standards, guidelines and policies where relevant and these have been identified.
- In accordance with the hydrodynamic modelling of the wetland, preliminary designs have provision for two sections of the rail loop to be laid upon a series of culverts such that water flows into/out of the area enclosed by the rail loop are maintained. Indicatively each section will consist of a series of approximately 20 box culverts (1.5 m × 0.9 m) sized to facilitate water flows and fauna movement. The final sizing, configuration and features may vary during the detailed design phase and in accordance with further consultation with Queensland Fisheries and DEHP.
- Construction of the rail loop will disturb approximately 16.3 ha of palustrine wetland area (includes both permanent and temporary disturbance). Of this area approximately 3.7 ha is temporary disturbance during construction and will not be permanently removed. The habitat within the footprint provides foraging and breeding habitat for fish, reptiles and birds, including EPBC listed migratory/marine bird species. The north-eastern section of the rail loop will be constructed within existing cleared areas of land adjacent to the Abbot Point Road, with the aim of minimising the habitat loss and/or damage of additional wetland habitat during the construction process.
- The proposed design that has been evaluated encompasses a corridor of 59 metres wide during construction, and 55 metres wide in operation. This will cover an area of 167 hectares as a corridor, but retain the undisturbed nature of the wetlands enclosed in the loop. As noted above, some 16.3 hectares of this corridor will encompass wetland area, the remainder being outside wetlands.
- A Caley Valley Wetlands Draft Environmental Management Plan has been prepared and reviewed as part of the EIS process.
- Bird communities have been known to coexist with industrial land uses, including previous observations of birds adapted to the current disturbances at the Abbot Point Coal Terminal (numbers of species nesting and utilising the sediment ponds adjacent to the existing port facilities).
- A number of mitigation measures have been proposed in the Draft EMP to reduce the likelihood of habitat loss risk. The design proposed has considered environmental impacts and will provide the functional delivery of the rail infrastructure with the smallest disturbance (temporary and permanent) footprint. During the final detailed design and construction phases of the project, any reduction in the project footprint will be incorporated where possible. Notwithstanding, the project will result in a footprint that will result in a loss of aquatic habitat and offsets will be required.
- The Offset Strategy for the project (refer to Volume 2, Appendix X of the SEIS) and the proponent's Biodiversity Offsets Strategy will take into account all impacts unable to be mitigated, including the area of wetland habitat to be offset. This strategy will be finalised in consultation with regulatory agencies to meet legislative requirements.
- Environmental risks associated with project construction and operation were identified and classified into one of four risk categories (high, medium, low and very

low), as described in the SEIS, in Section 2.5 of Volume 2, Appendix A1. This risk assessment approach remains consistent with the assessment undertaken for the Freshwater Aquatic Flora and Fauna Report (GHD 2010a).

- Following implementation of mitigation measures all construction phase risks were reduced to medium or low risk, and all operational impacts were reduced to a medium risk or lower.

### **8.8.2. Coordinator-General's conclusions**

I note that the design has been finalised to the extent that a proposed corridor of known width has been delineated for the rail loop, some of which will intersect with the Caley Valley Wetlands. This design must be further refined prior to construction so I have determined that this can best be undertaken in the context of applications for approvals to the DEHP in respect of approval for the EMP, the Coordinator-General in respect of development in a SDA, and to Fisheries in respect of disturbance of fish habitat and marine plants.

Nevertheless, I have analysed what I consider to be the limits on the corridor width and extent that must not be exceeded and have nominated a specific recommendation for these matters. This recommendation also includes specific measures to minimise coal dust deposition in the vicinity of the wetlands, by nominating wheel washing of unloaded wagons and operation of trains in the rail loop to avoid loaded wagons travelling through the wetlands part of the loop in normal operations.

I am therefore providing a recommendation on these courses of action which appears in Appendix 4, Part C, Schedule 1, Recommendation 1.

As noted above, when the application for MCU in the Abbot Point SDA is lodged, certain environmental management information is required to accompany the application. This ranges from ASS information, and an EMP incorporating several plans to manage specific topics relevant to the rail project in the sensitive Caley Valley Wetland environment. The range of this material is specified in Appendix 4, Part C, Schedule 1, recommendations 2, 3 and 4.

In particular, the issue of the hydrology of flows into and out of the rail loop should be studied as part of the final design process. I have determined that this will be done by a comparative analysis report comparing the proposed culvert solution with a trestle approach. To be specific about the MCU information requirements, I nominate the extent of information in Appendix 4, Part C, Schedule 1, Recommendation 5.

I note that biodiversity offsets will be required in respect of clearance of an amount of vegetation and species within the construction footprint of the rail loop. In order that these biodiversity issues are properly addressed and that proper surveys are undertaken, I have made a recommendation which specifies that offsets for the wetlands affected by the project must be determined using the ecological equivalence methodology as detailed within the Biodiversity Offsets Policy April 2012. An offset proposal must be developed for approval by DEHP prior to any construction within the Caley Valley wetlands. This is contained in Appendix 4, Part C, Schedule 1, Recommendation 6.

In addition marine ecological disturbance, including that to fisheries values, must also be quantified, approved, and offset, and I have nominated Recommendation 7 (within Appendix 4, Part C, Schedule 1), to specify that this be undertaken in the context of the rail project's impacts on the Caley Valley wetlands.

With this suite of recommendations I believe that appropriate measures will be put in place to allow full and final assessment of impacts of the rail loop in the environment of the Abbot Point SDA.

## **8.9. Rail line at St Aubins and Beresford (flora and fauna impacts)**

### **8.9.1. Issues**

The rail corridor alignment is proposed to traverse Lots 1RU89 (St. Aubins) and Lot 5 RU81 (Beresford). This area has been assessed under the State's Biodiversity Planning Assessment as a state significant remnant of RE 11.5.3 – the largest in the Northern Brigalow Belt bioregion and as such provides irreplaceable habitat to a range of woodland fauna species.

No flora or fauna surveys were conducted for the EIS specifically on this section of the rail line. Hence it is not clear whether the rail corridor impacts on this RE.

The former DERM requested the proponent address the above information and if the rail line could be routed to avoid this area. Alternatively, the nature conservation values of this area would need to be surveyed and described and an impact mitigation plan submitted for the area as part of the EMP. Mitigation in this case should also include offsets.

The proponent stated in the SEIS that additional ecological field work was to be scheduled; however, due to poor weather conditions and restrictions on site access they are yet to occur. The proponent advised that results and impact assessments from this fieldwork will be provided within an updated Terrestrial Ecology Report (SEIS Volume 2, Appendix AE) and Aquatic Ecology Report and will be submitted to DEHP for consideration and assessment. However, at the time of writing, no details regarding specific timing were available. The proponent advised in September 2011 that this additional ecological field work cannot be undertaken for this property as the landholder has continued to restrict land access to undertake such surveys. Hancock is working with the landowner, land agents and staff of my office to facilitate safe access through these premises in accordance with the applicable provisions of the SDPWO Act relevant to this project. Until this matter is satisfactorily resolved, survey work cannot proceed. In the meantime, the proponent is continuing to obtain further information relevant to this property, including better aerial photography, which will be used to assist with the field investigations. Once the property has been surveyed an impact mitigation plan will be developed and provided to DEHP prior to commencement of any construction works.

### 8.9.2. Coordinator-General conclusions

While the impacts of the rail line passing through Lots 1RU89 (St. Aubins) and Lot 5 RU81 (Beresford) cannot be fully assessed at this stage, it is apparent that investigations are needed to achieve this. Nevertheless, I believe that a condition is needed to ensure that a proper assessment will take place prior to construction in order that DEHP can ensure that any impacts will be mitigated through route re-alignment and/or offsets. The Queensland Biodiversity Offsets Policy has been developed to increase the long-term protection and viability of the State's biodiversity where residual impacts from a development on an area possessing State significant biodiversity values cannot be avoided.

In order that a proper survey is undertaken prior to construction of a rail line passing through Lots 1RU89 (St. Aubins) and Lot 5 RU81 (Beresford) I nominate a condition that requires the proponent to undertake a thorough investigation and assessment and an impact mitigation plan prior to construction commencing. I nominate DEHP as the responsible agency for this condition. The condition appears in Appendix 4, Part A, Condition 15.

## 8.10. Rail line traversing identified dam site

A restricted area under the Minerals Resources Regulation 2003, RA8, was created to preserve an identified dam site for future development when required. RA8 preserves one of several dam sites that have been previously identified and investigated to some extent. It is a site in the vicinity of Eaglefield at AMTD 244.0 km on the Suttor River. A stream gauging station has been installed, operated and maintained by DEHP at Eaglefield since August 1967.

Restricted areas created under the Minerals Resources Regulation are defined in terms of blocks and sub-blocks and it would appear that the upper limit of the ponded area planned is about AMTD 267.0 km on the Suttor River and that water would be ponded up Suttor Creek to about 5 km above the Boundary Creek Junction.

DEHP advised that the Queensland Government is committed to identifying and preserving dam sites that may be required for future development and DEHP is responsible for preserving those sites in accordance with action 2.4 of the *Queensland Water Plan 2005–2010* and under the Minerals Resources Regulation.

... Sites need to be protected from incompatible land uses that would hinder their suitability for water storage. These activities include construction, intensive land use, and activities that affect water quality ...

In the recent past DEHP has dealt with several Exploration Permits for Coal (EPC), Exploration Permits for Minerals (EPM) and a Minerals Development Licence (MDL) that encroach on RA8.

DEHP recommended that the rail corridor be located so that it does not encroach within a five-metre vertical buffer of the ponded area of the proposed Suttor River dam site preserved by RA8.

### **8.10.1. Coordinator-General conclusions**

Further discussions between DEHP and the former DEEDI (now DNRM) determined that this potential dam site is not of high priority and there are no plans to develop this water resource in the foreseeable future. I therefore accept that the rail alignment can pass through this area on the condition that—should the rail line need to be relocated at some time in the future as a result of construction of the RA8 Dam—the proponent will contribute to the full costs of relocation.

I am satisfied that there is only a low risk that this site will be required for a future dam. Through the provision of a condition I expect that the impacts of a rail line through this area will be mitigated and if it is required to be re-aligned at a future date then it will be done at no cost to the State.

Therefore I impose a condition to be attached to the approval for the construction and operation of the railway and I bring this to the attention of the relevant agencies (TMR, DEHP and DNRM) responsible for any subsequent approvals required to reroute the rail line around RA8. This condition appears in Appendix 4, Part A, Condition 16.

## **8.11. Rail line sterilisation of coal resources**

### **8.11.1. Issues**

The EIS outlined that the rail alignment passes over geological units that contain known coal reserves and are prospective for coal, mineral, petroleum, extractive (construction materials) and geothermal energy resources. As such, construction of the project over these resources may result in sterilisation of these resources. To minimise this impact, the alignment has been examined and adjusted (with over 200 route modelling exercises in addition to on the ground considerations).

The extraction of geothermal and petroleum resources is highly unlikely to be affected by narrow linear infrastructure since the point of extraction (i.e. through wells) is flexible and extraction can be accomplished with minimal surface effects (subsidence may be a risk in some locations). Consequently impacts on these resources are not examined further.

Similarly, sterilisation of mineral (other than coal) and extractive resources has been avoided by previously undertaken minor relocations of the rail alignment (prior to declaration on 2 July 2010).

Total avoidance of extensive planar, shallow-dipping coal beds is more problematic and the optimal alignment may be over lower quality coked or faulted coal or where the coal is deep and uneconomic or only able to be mined by underground methods. In such cases it is possible to avoid impacts on surface infrastructure in the mid- to long-term future. Furthermore, it may even be possible to find alternative approaches to retrieve coal that becomes economic in the future.

In its submission on the EIS, the former DEEDI advised that although resource sterilisation was addressed there was no reference to publicly available drilling data and information on QDEX. A coal producer, QCoal, in its submission stated that the proponent had not adequately considered the economic impacts to existing or

proposed coal mining activities in the northern Bowen Basin. They also stated that the EIS did not appear to avoid existing mining tenures as a factor in selecting the preferred railway corridor.

### **8.11.2. Coordinator-General conclusions**

In the SEIS (Appendix AH) the proponent addressed the issue of sterilisation in detail through a paper prepared by an independent consultant, Salva Resources. The report stated that the proponent, when selecting their preferred route, incorporated measures into the process to minimise the risk of resource sterilisation from the outset. Avoidance of advanced mining tenures such as mining leases and mineral development licences were key criteria of the rail alignment design. The report outlined how the main risk is for the sterilisation of coal resources where the rail corridor passes through the northern Bowen Basin between the 262000 meter chainage mark and the 364000 meter chainage mark. Within this section of the corridor, the corridor traverses alongside the existing Newlands-Abbot Point QR rail line between 297000 and the 339000 meter chainage marks. A review of the available drilling data along this section indicates only limited potential for the sterilization of coal resources. In addition the existence of the parallel QR line already places constraints on the development of coal resources if any were found to exist. On the southern section of this Bowen Basin traverse, the Hancock IFS corridor follows the proposed Northern Missing Link (NML) between the 276000 and the 297000 metre chainage marks. This section of the corridor has been the subject of an independent coal sterilisation review by the QR feasibility study of this project (*Queensland Rail Northern Missing Link: Coordinator-General's Report*, October 2006).

My view is that this rail alignment will reduce the impact of resource sterilisation. It is impossible to completely avoid this issue; however, the proponent has now taken resources on board to limit the impact to a satisfactory level. Therefore, I have not provided any conditions on this issue.

## **8.12. Impacts on surface water movement and flooding**

### **8.12.1. Issues**

Following the EIS, submissions on the EIS and following advice provided by RPS, the proponent was required to undertake a further detailed hydraulic/hydrologic model of each waterway crossing and the broader impact of the rail line during this impact assessment stage as there was no assessment of the likely impacts of the rail line and waterway crossings. In addition to this, historic flooding was assessed at a sub-catchment scale.

The significance of the issue of overland flow and flood impacts was severely underestimated as evidenced by the risk register summarised in Section 24 Table 24.7 of the EIS. This register classifies flooding as an insignificant risk and recommends a stormwater management plan as the control.

The line passes through the Burdekin River Basin which is the subject of a Water Resources Plan. The plan deals with overland flow water, and specifically regulates the taking of overland flow water.

The Suttor Sub-Basin in the Burdekin River Catchment covers an area of approximately 18 000 square kilometres. The terrain is predominantly flat with significant low-land flood plains and the land-use is dominated by grazing on natural pastures. The landscape is semi-arid with predominantly ephemeral streams typically flowing during the wet season between December and April.

The former DERM advised that it does not have responsibility for any flooding issues resulting from the construction and operation of the rail line. The former Coordinator-General received a number of submissions from landowners raising the issue of flooding and the effect of this on paddocks, pastures and salinity.

The EIS stated that no environmental flow culverts are required where the rail embankment is less than 1.2 metres high. In areas where the land gradient is very low, this could create significant re-direction of overland flows, affect downstream landholders who harvest overland flow, and cause erosion problems.

The EIS proposed afflux (or the depth of flood waters above the ground surface) from the rail line was to be limited to 1.5 metres. The former Coordinator-General concluded that the proposed magnitude of afflux seemed excessive and has the potential to cause significant upstream impacts, significant changes to overland flow directions, high velocities through the culverts, potential erosion problems downstream of the culverts, and very high potential for wash-out of the embankment when overtopped.

The outlet velocity from culverts was proposed in the EIS to be limited to five metres per second. This velocity implies a high afflux and will require significant downstream rock erosion protection.

Impacts from flood inundation were not initially assessed in the EIS. Flood impacts were partially assessed for waterway crossings, but this did not include assessment of inundation risk upstream of the crossings or of the embankment itself. A concern of landholders is that a longer duration of inundation will be caused by the rail line.

Sodic soils were not assessed for waterway crossings. These dispersive soils are likely to have a significant environmental impact if not managed appropriately. For more detail, refer section 8.15.

After a number of meetings between the proponent, staff representing the Coordinator-General and RPS (the consultant engaged to advise the Coordinator-General) it was determined that acceptable levels of afflux and outlet velocities would require conditioning.

Comments were made by the former DERM on the rail line in relation to impacts on overland flow and the provisions of the *Water Resource (Burdekin Basin) Plan 2007* (Burdekin Basin WRP). The construction of any storage that takes overland flow will need to accord with the Burdekin Basin WRP.

At the request of the former Coordinator-General, the proponent undertook a detailed floodplain study of the impact of construction of the Alpha Coal Railway on creek/river

systems along the alignment and this was submitted as part of the addendum to the SEIS.

The revised detailed floodplain modelling analysis was designed by the proponent to achieve a maximum afflux of 0.5 metres. The revised design incorporated sufficient cross-drainage infrastructure to minimise impacts to existing flow paths and to meet the following modified drainage design criteria:

- no major increases in the area of inundation extent
- inundation duration of not more than three days on valued pasture land
- a range of maximum velocities not exceeding 1.2 times existing velocities at bridge outlets, and 2.5 metres per second at culvert outlets for normal soils and 1.5 metres per second for erodible soils
- maximum afflux: maximum 0.5 metres—normally (unless justifiable)
  - maximum 0.2 metres—around critical infrastructure
  - maximum 0.1 metres—around dwellings.

RPS advised that across the majority of the floodplain, the modelling had shown that a maximum afflux of 0.3 metres was achievable. However, the proponent provided further detailed technical information which showed that setting this lower limit across all parts of the floodplain was not practical and would not provide a benefit through reduction in impacts commensurate with the additional cost of drainage to achieve this reduction. I have accepted this advice, and set the 0.3 metre afflux as an aspirational target while recognising that 0.5 metres is a more appropriate upper limit.

In addition, I have provided a conditional mechanism that allows the proponent to reach agreement with administering authorities and landholders to vary afflux limits in limited circumstances.

The flood plain modelling analysis described the hydrologic and hydraulic modelling carried out in the following floodplain areas:

- Logan Creek/Brown Creek
- Suttor River/Eaglefield Creek
- Belyando River/Native Companion Creek
- Mistake Creek
- Midere Creek/Piebald Creek
- Diamond Creek/Myra Creek/Nibbereena.

Results of this modelling were provided in the SEIS addendum (Appendices F and G), and information packs containing the results of the modelling were supplied to impacted landholders along the route. The SEIS addendum report indicated that the proposed cross drainage would meet the modified drainage design criteria listed above, although this would need to be confirmed by a more detailed review of the proposed cross drainage structures and the modelling results during the design stage.

The findings from this detailed floodplain study were presented to specific landowners who have an interest in and/or are influenced by the proposed rail alignment.

A number of landowners arranged for an independent consultant to audit the modelling which was undertaken on the behalf of the proponent. The former Coordinator-General subsequently received a number of comments from landowners and in summary the main points raised in these submissions were:

- concerns about stock reaching high ground in times of flood (the rail line will block access to the high ground)
- overtopping of the rail line in times of large flooding could have unknown impacts on surrounding lands
- if inundation times increased above three days, this would not be acceptable to farmers, as it will affect grass growth
- some landowners expressed concern that some lakes that fill now in flood time will not fill post-rail construction, depriving their property of stock water
- the maintenance of these culvert pipes to ensure clear flows is an issue that is yet to be addressed and one that will prove difficult during the wet season
- how any duplication of the railway will be addressed and investigated if a duplication is required sometime in the future to transport coal for third party users
- landowners want to see detailed design before they will sign off on any railway line passing through their property
- most landowners advised that it would be difficult to accept the validity of the hydraulic modelling for their properties unless the model reproduces known historical performance. If there are apparent errors then any conclusions drawn from the analysis will be considered tainted.

The total land area that is in question is approximately five per cent of the total rail alignment and to undertake ground proofing and re-run the model would be an expensive and time-consuming exercise. The need to review and re-run the flood models where it does not replicate historical data during their detailed design phase has been discussed.

### **8.12.2. Coordinator-General conclusions**

As outlined above the proponent followed a number of steps in doing further work on the impacts of the railway in times of flooding, and investigating issues that presented concerns for landowners.

It appears that both stakeholders and expert consultants generally accept the range of drainage design criteria that have been developed and which would be used with the modelling to develop cross drainage structures and placement for the rail formation.

However I note that landholders are uncertain about some of the outcomes, unless the model is further developed to ensure that it does replicate historical performance. I note there have been discussions with the proponent regarding further flood model validation work in the course of its detailed design process for the project.

I have conditioned that the proponent must undertake further modelling during the detail design phase for this project and present this to all the affected landowners. This appears as Condition 17 in Appendix 4, Part A.

As mentioned above, the former DERM referred to the provisions of the Burdekin Basin WRP. This plan refers to maintaining the natural variability of flows in floodplains and also maintaining flood flows. However, while the natural variation may be an ideal situation, it is clear that the rail formation embankment may change this in certain places. In order to minimise the departure from natural results, I am satisfied that the design criteria outlined above would be effective in achieving this, and therefore should be used in the design and construction of the railway.

I therefore impose a condition outlining all the criteria the proponent must meet in order that the impacts on landowners and infrastructure will be at acceptable levels (Appendix 4, Part A, Condition 18(a)).

Nevertheless, I recognise that there may be situations where these design criteria may be adjusted, either in more sensitive areas, or in low risk situations. Accordingly I nominate two conditions in Appendix 4, Part A, Condition 18(c).

I also need to receive from the proponent a revised detailed flood design report for the railway after detailed design to ensure that these design parameters have achieved the desired result. Refer to Appendix 4, Part A, Condition 18(d).

If a significant flood event occurs, I believe that the community needs to be satisfied that any damage is investigated and adverse impacts assessed and rectified. In order to provide security that this response is forthcoming, I seek provision of a financial bond from the proponent to audit these actions and to cover rectification and/or compensation. Accordingly I provide a condition at Appendix 4, Part A, Condition 19.

While most of the above discussion is concerned with general flood impacts on pastoral and natural lands and improvements, some specific mention needs to be made of the potential for effects on road infrastructure. I have therefore made a recommendation that the proponent must provide TMR and local authorities with information on any impacts that the railway will have on road infrastructure and road corridors. This appears in Appendix 4, Part A, Condition 20.

## **8.13. Transport impacts during construction**

### **8.13.1. Issues**

The proposed rail alignment from the mine to Abbot Point traverses the Barcaldine Regional Council in the Central West Region, and Isaac and Whitsunday Regional Councils in the Mackay/Whitsunday Region of Queensland.

The project area encompasses several nationally and regionally significant transport routes. Roads under the state-controlled network that serve as key transport routes in the study area are listed in Table 8.9 below.

**Table 8.9 Key roads in the study area**

Road ID	Road name	Classification
10K	Bruce Highway (Bowen-Ayr)	National
88B	Bowen Developmental Road (Collinsville – Belyando Crossing)	District
98A	Gregory Developmental Road (Clermont-Belyando Crossing)	State Strategic Road
82A	Suttor Developmental Road (Nebo-Mount Coolon)	Regional Road
5307	Collinsvale Elphinstone Road	District
33A	Peak Downs Highway (Clermont – Nebo)	State Strategic Road
33B	Peak Downs Highway (Nebo – Mackay)	State Strategic Road
16A	Capricorn Highway (Rockhampton – Duaringa)	State Strategic Road
16B	Capricorn Highway (Duaringa– Emerald)	State Strategic Road
16C	Capricorn Highway (Emerald – Alpha)	State Strategic Road
552	Clermont – Alpha Road	Regional Road

The construction period for the rail project will cover approximately 36 months and covers mobilisation, materials delivery, camp construction, and project demobilisation. During this period, tasks would include delivering and relocating earthmoving and track-laying equipment, building modules, bridge and culvert materials, and track materials such as ballast and rails. The transport schedule is fairly continuous over the 36 months, heavily loaded in the first 18-month period, but also continuing at high levels for a further 12 months.

Six transport corridors will be used from the coastal cities (Bowen, Mackay and to a lesser extent Rockhampton), five of which will have approximately equal loads, with the sixth having double the number of heavy vehicle movements. Over the three years of rail corridor construction, 43 000 movements would be involved and the heaviest increases will be taken by the Peak Downs Highway, which is used by two of the above corridors. This highway will therefore have an additional 18 000 movements over the 36-month construction period. This is estimated to yield a maximum increase of 56 heavy vehicles per day on the highway.

Another road segment which will carry a large duty (perhaps half of the traffic increases experienced on the Peak Downs Highway) will be the Cerito and Collinsville–Elphinstone Roads, because they lead to the large central construction depot and Construction Camp at Wollombi.

TMR has indicated that the above increases are generally less than five per cent of the existing traffic flow on the road, which in a strict application of the TMR *Guidelines for the Assessment of Road Impacts of Development* (April 2006), does not reach the threshold for deciding whether the traffic has a significant effect on the road system. However, TMR has advised that in the case of the Peak Downs Highway, there are significant parts of this road where the traffic count, including rail project traffic, is at a high level (within 40–50 per cent of the carrying capacity of the road) and service levels are already at the two lowest ratings. This tends to indicate that further examination of

the transport impacts needs to occur at detailed design stage, to ensure that when more information is available, transport tasks can be redirected to provide lower impacts on critical road infrastructure.

There are some road segments (Clermont to Alpha and Bowen Developmental Road) where the increase is above the five-per-cent nominal trigger point, but the EIS indicated that these are segments where the existing traffic is very low, and the increased traffic count would generally be less than 350 vehicles per day, well within the capacity of the road system in that location. However it is not clear that a full analysis of the impact of heavy vehicle loadings on such low trafficked roads has been completed fully. TMR and regional councils equally have sought analysis that can determine whether upgrading or maintenance programs are required during the three-year construction period. It is to be noted that many regional roads are unsealed and sometimes will have to provide final links to the corridor from major roads.

TMR also pointed out that a more complete capacity analysis is required on several rural intersections, so that the project can address safety issues associated with additional heavy vehicle turning movements. This is particularly important on rural road networks with low but unexpected heavy vehicle usage, especially as the analysis indicates that such movements will occur for the three-year construction period.

Access to the road network from construction sites, the camps and depot locations is governed by the *Transport Infrastructure Act 1994* (Qld), and designs and permits must be obtained for works to access state-controlled road corridors. Similar principles apply to access to local roads.

Information was provided regarding vehicle movements related to the workforce travel to and from the four construction camps, both daily to worksites and at roster changes as workers are transported to relevant airports. Such movements have been included in the traffic numbers considered above, and involves bus transport to worksites and airports, rather than smaller vehicles.

Other factors of interest to local government, transport, and police service authorities are the issues of:

- road safety from the increased level of vehicle traffic, and intersection movements
- community awareness of construction and transport activities
- traffic management arrangements, lane closures, speed limits
- transport driver behaviour and fatigue management.

These issues may be recognised as factors covered by a traffic management plan.

TMR is not in a position to fund the safety improvements that may be required, nor would it be likely that this funding could be made available to undertake the immediate works necessary to ensure the ongoing safety and efficiency of the state-controlled road network for the proposal to proceed with the construction phase. Therefore, once further information is available on the final design of the project, the proponent is required to undertake a review of the road impact assessment and provide an updated assessment which clearly identifies any necessary safety improvements works, rehabilitation and maintenance costs to mitigate the impacts of project traffic prior to undertaking any construction works.

Finally, concerns were expressed by TMR as to the accuracy of estimated traffic volumes stated in the EIS and SEIS. In its examination of the traffic assumptions by the proponent for the project, TMR indicated that the numbers are significantly lower than actual counts taken from five comparable mines in the Bowen Basin. While the construction of the rail line is a different activity, TMR wished to emphasise that assumptions for the rail project need to be correct to ensure that the conclusions made in the road impact assessment are appropriate. Once additional information is available on the final design of the project, the proponent must review and update the traffic generation assumptions and analysis.

TMR has indicated its availability to continue liaising with the proponent and its consultants to discuss and resolve these issues in a timely manner.

The proponent came to the following conclusions concerning its analysis of the road impacts and the capacity of the network to accommodate them:

- the existing road conditions are generally considered satisfactory to accommodate the additional number and type of vehicles to be generated by the construction works
- the assessment of the additional traffic demand, as a consequence of the construction works, indicate that it would be modest when distributed on the surrounding road network and would not result in any major adverse effects on the operational performance or capacity and have minimal impact on the current network operations
- the additional traffic demand, as a consequence of the proposed construction works is not likely to have a significant effect on the pavement conditions and if damage results during the construction, a contribution to improvement works will be made by the proponent.

The proponent indicated that its main transport management action will be to prepare and implement a traffic management plan during the design detail phase. This is to be developed in consultation with TMR, police and local authorities. Where necessary, site-specific local plans will be prepared and all plans may be updated or amended to suit emerging situations.

An important mitigation measure relating to construction traffic impacts is the implementation of a community information and awareness program, to ensure that local residents are fully aware of the construction activities. The awareness program will identify communication protocols for community feedback on issues relating to construction vehicle driver behaviour and construction-related matters.

The proponent is willing to take other initiatives with TMR to address mitigation measures for roads where there is greater than five per cent increase in traffic levels, and develop a range of warning notices and communication protocols to public road users and project transport operators. Where possible, the internal corridor and dedicated haulage roads may be used to minimise access to public roads.

### 8.13.2. Coordinator-General's conclusions

While the proponent's analysis indicated that transport demands on the road network are modest, and notionally within the capacity of most roads, it is evident that there are concerns from the state and local road authorities that there may be areas where pressures might occur on the road system. They identify these items as vehicle movement assumptions, intersection analysis, and traffic impacts on the Peak Downs Highway and unsealed rural roads.

I agree that these matters need further analysis to ensure that the road network and road safety issues are managed to the benefit of all road users, and the network does not deteriorate unduly. I note that the construction period of three years is a significant time, and that traffic movements are therefore not of a transitory nature, even though once the rail system is in operation, impact on roads will be minimal.

The recognised form of analysis of road impacts and management that TMR follows is the process having the following elements:

- a road impact assessment according to the TMR document *Guidelines for Assessment of Road impacts of Development (2006)*
- preparation of a road-use management plan based on this assessment in accordance with TMR's *Guide to Preparing a Road Use Management Plan*
- conclusion of infrastructure agreements with TMR and regional councils on road upgrades, maintenance or construction of road infrastructure which reflects the outcomes of the road impact assessment and road-use management plans.
- preparation of a traffic management plan to specify the actions taken to manage traffic planning and safety on the road network as a result of the project transport tasks and infrastructure provision.

I consider that this process needs to be followed to update all such draft assessments and plans that have been presented in the EIS process, because I find that final designs and project implementation will likely yield further detail that must be taken into account in the road network analysis. I recommend that the above matters identified by state and local road authorities including vehicle movement assumptions, intersection analysis, traffic impacts on the Peak Downs Highway and unsealed local roads, should be items of particular attention in updating the road assessment and preparing plans.

I am aware that there may be overlaps in road traffic movements which will be serving the construction of the Alpha Mine itself, and other potential mine and railway projects in the region. I therefore also recommend that the traffic generation from the Alpha mine construction and other mine/rail projects, to the extent that they overlap in time and location with the three year Alpha rail project, be clearly taken into account in the process I have specified above in determining impacts and management plans for the Alpha rail project.

To give effect to my conclusions above on road impact analysis and developing management plans and infrastructure upgrading, I nominate three conditions (refer Appendix 4, Part A, conditions 21, 22 and 23) and two recommendations (refer Appendix 4, Part C, Schedule 2, recommendations 8 and 9).

## 8.14. Road rail crossings

### 8.14.1. Issues

The proposed railway line is expected to intersect the state-controlled road network and the local road network. The railway line will cross six state-controlled roads with grade-separated intersections, while the crossing with the Bowen Development Road was proposed with an at-grade level crossing (refer Table 8.10).

**Table 8.10 Key roads crossed by the rail corridor**

Road ID	Road Name	Classification	Crossing
10K	Bruce Highway (Bowen–Ayr)	National	Rail-over-road
88B	Bowen Development Road (Collinsville–Belyando Crossing)	District	Level Crossing
98A	Gregory Developmental Road (Clermont–Belyando Crossing)	State Strategic Road	Road-over-rail
82A	Suttor Developmental Road (Nebo–Mount Coolon)	Regional Road	Road-over-rail
5309	Kilcummin Diamond Downs Road	District	Road-over-rail
5307	Collinsville Elphinstone Road	District	Rail-over-road
	Cerito Development Road	Regional Road	Road-over-rail

The railway line will have public crossings at fourteen local roads and at-grade railway crossings are proposed at these locations. The at-grade crossing locations are proposed to be flashing light crossings. Of the fourteen local at-grade crossings of public roads, one is within the Barcaldine Regional Council area, seven are within the Isaac Regional Council area, and the remaining six are in the Whitsunday Regional Council area. Some of these will be combined road and stock route crossings.

In its submission on the SEIS, TMR expressed concern that the proponent has provided inconsistent information regarding the road-rail interfaces with the state-controlled Bowen Developmental Road (BDR). The original EIS shows the BDR as a road-over-rail crossing (Volume 3, Section 17, Figure 17 – 1 Sheet 9 of 14); however, in the SEIS (Appendix AB, Section 2, Table 2) shows the BDR interface as an at-grade crossing.

TMR had previously outlined in comments on the EIS that grade-separated intersections are required for all new road/rail interfaces on state-controlled roads. The proponent has provided no justification as to why a change to the road/rail interface on the BDR has been made. TMR's view is that the proponent commit to the BDR road-over-rail interface originally proposed and additionally commit to providing grade-separated crossings at all new road/rail interfaces with state-controlled roads, and that these be made conditions of project approval.

The proponent has dealt with this particular issue on grade separating their rail at the BDR, and the impact it will have on the QR Northern Missing Link rail. The proponent's response is that at this location the rail line is in close proximity to the existing QR Northern Missing Link rail line, which is served by a level crossing on the BDR. The

proponent asserts that grade separating the crossing of the road for this rail line could raise a safety concern because cars coming off a grade-separated (road-over-rail) bridge will suddenly meet the at-grade Northern Missing Link railway crossing. Thus it is proposed by the proponent that two coordinated level crossings would be a more controllable and safer solution.

### **8.14.2. Coordinator-General's conclusions**

When the former Coordinator-General finalised his assessment of the QR Northern Missing Link project, the assessment report referred to two situations of crossings of roads by rail lines. These situations were (a) the BDR, and (b) the Suttor Development Road.

In the case of the BDR, this was crossed by the Newlands – Abbot Point existing rail line, which took all additional train traffic from the new Northern Missing Link line, and would eventually reach at least 29 one-kilometre-long trains per day. The existing road traffic was at a level of at least 500 vehicles per day. An immediate upgrading of all six of the level crossings on this road was seen as difficult to justify for two reasons:

- (a) this road and rail crossing situation had existed for some years and road users had experience dealing with it
- (b) increases in rail and road traffic will be gradual over a number of years.

There existed at the time, and still exists, a Memorandum of Understanding (MOU) (between the Local Government Association, Main Roads, Queensland Rail and Queensland Transport) with respect to the Management and Funding Responsibility for Level Crossing Safety. This specifies the institutional responsibilities of rail and road authorities to consult and negotiate on road-rail level crossing infrastructure for an outcome on a case-by-case basis, generally for existing installations.

Hence the Coordinator-General stated in the Northern Missing Link CG Report (October 2006):

... I recommend the following requirement for managing the downstream effects of the Northern Missing Link on existing level crossings on the Newlands – Abbott Point rail line along the Bowen Developmental Road and other local roads, be attached to the Community Infrastructure Designation for the rail corridor:

Condition 10 of the QR Northern Missing Link CG Report states:

QR shall undertake biennial reviews, together with QT, DMR and the Bowen Shire Council, of the impact of rail and road traffic increases at crossings along the Bowen Developmental Road and other local roads, based on the provisions of the Memorandum of Understanding with respect to the Management and Funding Responsibility for Level Crossing Safety (24 Oct 2003) or any subsequent document addressing this matter. The first such review shall be conducted within 12 months of the commencement of operations on the Northern Missing Link rail line.

This 12-month period after commencement of operations is due in late 2012 or early 2013. Hence, a review of the BDR level crossings is due for assessment in the near future. It is likely that this review could at some stage, either this time, or in the next biennial review, be obliged to take special account of the emerging situation where the

BDR crosses two rail lines in close proximity—the existing Northern Missing Link, and the proposed Alpha rail project. In such a case I consider that the assessment, envisaged under the MOU, could come to the conclusion that a safety case could be made for grade separation to apply to both lines.

In the case of the Suttor Development Road, the Coordinator-General's Report for the Northern Missing Link set a condition, in part, as follows:

Condition 7

QR shall enter into an infrastructure agreement with DMR to construct the road/rail crossing of the Suttor Developmental Road in accordance with the following stage provisions:

...

Stage 3

QR shall design and construct a grade-separated crossing (road over rail bridge) for the Suttor Developmental Road within 18 months of any of the following:

- a. rail traffic at the crossing is contracted to exceed 12 million tonnes per annum;
- b. annual average daily traffic count on the road exceeds 500 vehicles per day; or
- c. written notification by DMR to QR that funding is committed for an upgrading of that road to bitumen standard over its full length and that road construction will be undertaken within 18 months of the notification.

This indicated that the rail/road intersection would be at level initially whilst volumes were low. However, the condition required that a grade-separated crossing be undertaken at a future time when predetermined rail and road traffic conditions are experienced or rail and road upgrades are commissioned. The volume for this rail corridor is reaching the predicted maximum tonnages in its first year of operation, that is 2012. The respective trigger points were:

- 12 million tonnes per annum coal transport (10–12 trains per day)
- traffic exceeding 500 vehicles per day
- a road upgrading to bitumen standard

All these criteria are met or exceeded in the case of the Alpha Rail crossing of the BDR. The rail project will quickly achieve 12 mtpa coal transport (with only one mine of capacity 30 mtpa); traffic on BDR at this point is between 750–1000 vehicles per day, (as indicated in the SEIS), and the road is of a bitumen standard.

I therefore conclude that a grade-separated crossing of the BDR by the Alpha Rail line, is warranted, and that the adjacent crossing of the BDR by the Northern Missing Link Newlands – Abbot Point rail should also be upgraded to a grade-separated crossing. These grade-separated bridges (road-over-rail) should be coordinated in their execution between the rail infrastructure owners and TMR.

Hence together with the proponent's current commitment to six other grade-separated crossings, and fourteen level crossings of regional and local roads, I have conditioned to give effect to both grade-separated and level crossings at specific road crossings (refer Appendix 4, Part A, Condition 24).

I conclude that where the BDR is crossed by both rail lines, a coordinated approach be taken to the design and construction of a grade-separated crossing, and I therefore address all parties via Appendix 4, Part C, Schedule 2).

## 8.15. Soil survey, erosion, sediment control and acid sulfate soils

### 8.15.1. Issues

Areas of steep and long slopes are at risk of erosion and landslides under wet weather conditions. The construction and operation of the railway will result in a range of changes to the landscape that will increase the risk of erosion, these include:

- clearing of vegetative cover
- changes in topography, drainage patterns and localised concentration of storm water flows both due to construction of access tracks and rail corridor
- excavation and stockpiling of material
- construction during high rainfall, particularly erosive rainfall events
- constructing through areas with high soil erodibility risks
- constructing in areas of high risk slope gradient and length.

Sediments that are entrained in water runoff have the potential to collect in the surface waters and estuary. The coarser soil particles such as sands and silts will deposit as the velocity of water slows down, whilst the suspended clays will remain in suspension until the water becomes still or mixes with saline waters.

In its submission on the SEIS, the former DERM advised that the proposed methodology for the soil survey of the railway corridor is of an acceptable standard; however, it further commented that the EIS failed to specify the environmental performance for stormwater discharge to be achieved in respect of sediment and erosion management.

The EIS advised that an Erosion and Sediment Control Plan (See Volume 3 Railway Corridor, page 5-32) will be developed and implemented for the railway line part of the project. Whilst implementing such a plan is a reasonable approach to dealing with the erosion and sediment control issues, the EIS failed to specify the performance standards to be met by the plan.

These should include standards achievable with best practice environmental management e.g. maximum 20 mg/L suspended solids as recommended by the guideline *Soil Erosion and Sediment Control – Engineering Guidelines for Queensland Construction Site June 1996*.<sup>16</sup> Also, salinity and turbidity levels of the discharges should not create exceedences of water quality objectives for salinity and turbidity as mentioned in the *Australian Guidelines for Water Quality Monitoring and Reporting*, or

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<sup>16</sup> Institute of Engineers, Australia, Queensland Division, *Soil Erosion and Sediment Control – Engineering Guidelines for Queensland Construction Sites June 1996*, Institute of Engineers, 1996.

more ideally, based on local reference data obtained in accordance with the *Queensland Water Quality Guidelines 2009*.<sup>17</sup>

In areas where ASS may be disturbed, either by excavation of dropping groundwater elevations, appropriate release limits for dissolved iron, aluminium, pH would need to be met. These limits should be based on the degree of ecosystem protection relevant for affected waters e.g. high ecological value, moderately disturbed etc.

The proponent responded to these concerns in the SEIS by outlining that the management framework for stormwater discharge criteria has been specified within the erosion and sediment control criteria attached in Volume 2, Appendix AD of the SEIS. This document will inform the preparation of detailed erosion and sediment control management plans for construction.

Surface water and groundwater impacts associated with ASS have been addressed within an ASS framework attached in Volume 2, Appendix Z of the SEIS. This document will inform the preparation of a detailed ASS management plan that will be required during the design phase of the project, prior to construction and included with relevant development applications.

### **8.15.2. Coordinator-General's conclusions**

I agree with the matters raised by the former DERM and in order to ensure there are no impacts associated with ASS, I have imposed a condition (Appendix 4, Part A, Condition 7) that is to be attached to the approval for the operation of the railway and any subsequent approvals required to transport coal from the mine to Abbot Point. The proponent must prepare to the satisfaction of the agency administering State Planning Policy 2/02 and implement an ASS management plan for the railway consistent with the relevant technical guidelines for ASS.

In addition, I have imposed conditions requiring that prior to the commencement of any construction the proponent must:

- conduct a soil survey to the satisfaction of DERM for the rail corridor as per the proposed methodology outlined in Volume 2, Appendix AL of the SEIS, and amend the EM plan to take account of this. DERM is nominated as the agency responsible for this recommended condition (Appendix 4, Part A, Condition 6)
- prepare an Erosion and Sediment Control Plan to prevent adverse impacts on natural waters or adjacent lands, and include the plan in the amended EM plan.

I am satisfied that during the detailed design phase the preparation of detailed erosion and sediment control management plans for construction along with ASS condition as

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<sup>17</sup> Department of Environment and Resource Management, *Queensland Water Quality Guidelines 2009*, Department of Environment and Resource Management, Brisbane, 2009, viewed 22 May 2012, <[http://www.derm.qld.gov.au/environmental\\_management/water/queensland\\_water\\_quality\\_guidelines/queensland\\_water\\_quality\\_guidelines\\_2009.html](http://www.derm.qld.gov.au/environmental_management/water/queensland_water_quality_guidelines/queensland_water_quality_guidelines_2009.html)>.  
Australian and New Zealand Environment and Conservation Council and Agriculture and Resource Management Council of Australia and New Zealand, *Australian Guidelines for Water Quality Monitoring and Reporting*, Australian and New Zealand Environment and Conservation Council and Agriculture and Resource Management Council of Australia and New Zealand, 2000, viewed 22 May 2012 <[http://www.daff.gov.au/oldmincos/publications/australian\\_guidelines\\_for\\_water\\_quality\\_monitoring\\_and\\_reporting](http://www.daff.gov.au/oldmincos/publications/australian_guidelines_for_water_quality_monitoring_and_reporting)>.

outlined above and also in Section 8.8, Rail loop within the Abbot Point State Development Area will be sufficient to mitigate impacts caused by erosion, sediment and any ASS generation.

## 8.16. Cultural heritage

### 8.16.1. Issues

All Indigenous cultural heritage in Queensland is protected under the *Aboriginal Cultural Heritage Act 2003* (Qld) (ACH Act). To comply with the duty of care provision under section 23 of the ACH Act, proponents of projects which require an EIS are required to prepare a recognised cultural heritage management plan (CHMP) which provides for the management of Indigenous cultural heritage.

The Commonwealth *Native Title Act 1993* provides for Indigenous land use agreements (ILUAs) between native title holders or claimants and other interested parties about how land and waters in the area covered by the agreement will be used and managed in the future. DERM advises it strongly supports these agreements, as ILUAs provide a framework for resolving native title issues through negotiation rather than costly and time consuming litigation.

Indigenous cultural heritage for the rail was addressed in Volume 3 Section 18 of the EIS. Non-Indigenous cultural heritage was addressed for the rail in Volume 3 Section 19 of the EIS.

It is noted that there will be some impacts on both Indigenous and non-Indigenous cultural heritage as a result of the project. It is also noted that the non-Indigenous cultural heritage affected by the project is of low significance though nevertheless important, and archival recording is being undertaken with the cooperation of the local community.

It is noted that, as required under the *Aboriginal Cultural Heritage Act 2003*, the proponent has developed a CHMP in consultation with the Wangan & Jagalingou People (QUD85/04), the Jangga People (QUD6230/98) and the Birri People (QUD6244/98) who are the only registered native title claimants along the rail corridor.

In its submission on the EIS, the former DERM submitted that the existence of cultural heritage values and places has been established in the study area, as has the potential for further places of heritage significance to exist. No field survey has been conducted outside the mine area (e.g. in the rail corridor) to identify and locate known or potential places. For example, the old Bowen Downs Road is significant at a state level. Any features of the Old Bowen Downs Road in the vicinity of the rail corridor should be identified, accurately recorded and appropriate mitigation measures put in place. DERM asked that the SEIS detail a systematic field survey of the project areas (rail) as conducted by a suitably qualified professional to identify non-Indigenous cultural heritage. A report of the findings of field survey was requested in the SEIS, including detailed recording of identified sites and their relationship to the project footprint, site impacts and proposed mitigation measures. Mitigation measures should also be reflected in the project EMP.

The proponent replied to this submission by stating that a program for systematic field survey of the project areas (rail) has been commissioned and is underway by Converge Heritage + Community (a suitably qualified professional to identify non-Indigenous cultural heritage). The fieldwork was expected for completion during the SEIS, but was delayed by weather events and resulting access, however detailed research and consultation with landowners has been completed for the entire study area in the interim.

On completion of the survey, a report of the findings of field survey will be presented, including detailed recording of identified sites and their relationship to the project area, potential for further sites to exist and the potential for site impacts and proposed mitigation measures. If required, mitigation measures (in addition to those currently provided in the current EMP, SEIS Volume 2, Appendix AC) will be reflected in the updated Project EM plan.

For the proposed railway corridor only a desktop assessment on non-Indigenous cultural heritage matters has been undertaken. This assessment has identified three places of heritage significance:

- Strathmore Homestead is listed on the Queensland heritage Register and the former Bowen Shire Council register
- Old Bowen Downs Road is listed on the Register of the National Estate and Queensland National register and
- Suttor Creek Aboriginal Camp was identified within the study area as a potential cultural heritage site.

No historic mining leases were identified within or in close proximity to the study area. The proposed rail corridor does not impact upon any of the three identified sites.

## **8.16.2. Coordinator-General's conclusions**

I am satisfied the draft EM plan and agreed ILUA satisfy the duty of care requirements under the ACH Act, and will ensure adequate identification and management of cultural heritage places and objects between the proponent and the relevant Aboriginal people as custodians of their cultural heritage.

Based on the mitigation measures provided in the draft EMP and registered CHMP and the legislative requirements of the ACH Act and Native Title Act, I am satisfied impacts to Indigenous cultural heritage will be minimal.

Based on the mitigation measures provided in the draft EM plan and the requirements of the Queensland Heritage Act, I am satisfied impacts to non-Indigenous cultural heritage will be minimal.

## **8.17. Greenhouse gas emissions**

### **8.17.1. Issues**

The EIS addressed greenhouse gas (GHG) emissions and climate change in Volume 3 Section 14 (rail). The proponent committed to preparing an energy conservation and

GHG management plan to ensure all that all sources of emissions are identified and emissions levels are quantified during engineering and design. The objectives of the energy conservation and GHG management plan will be to:

- reduce GHG emissions associated with the project and all relevant emissions sources
- incorporate energy efficiency initiatives into project design, engineering, construction and operation
- integrate GHG management and energy efficiency initiatives into business decision-making at all stages of the project
- provide consistent and accurate reports on GHG emission levels in compliance with relevant legislation.

Emissions of CSG are a significant component of the GHG footprint. The exploration drilling program plans to conduct gas testing to better quantify emissions factors and CSG emissions from coal. Strategies for CSG capture and use will be developed based on these results and will be considered for implementation during the detailed design phase of the project.

### **8.17.2. Coordinator-General conclusions**

To mitigate the carbon footprint for both the construction and operation phases of the project, a condition has been imposed that requires the proponent to develop and implement a GHG Reduction Management Plan in relation to Scope 1 and Scope 2 emissions of the project (refer Appendix 4, Part A, Condition 4).

## **9. Environmental management plans—rail**

A draft EMP for the rail component of the project has been prepared by the proponent and is contained in Volume 3, Section 26 of the EIS and Volume 2 Section AC of the SEIS.

The draft EMP sets out the project commitments to avoid or minimise potential environmental impacts as identified in the EIS and SEIS during both construction and operational phases of the project, including identification of environmental aspects to be managed and how environmental values may be protected and enhanced.

The draft EMP has been developed on the understanding that detailed EMPs for construction and operation are to be prepared by the entity constructing and/or operating the rail line and reviewed by the relevant administering entities.

The EM plans will become the key reference documents that convert the undertakings and recommendations of the environmental studies into actions and commitments to be followed by the designers, construction operators and subcontractors of the proposed project. The plans specify:

- proposed environmental management strategies, actions and procedures to be implemented to mitigate adverse and enhance beneficial environmental and social impacts
- monitoring, reporting and auditing requirements
- the entity responsible for implementing proposed actions
- proposed timing
- corrective actions if monitoring indicates that performance requirements have not been met.

The content of the EM plan will be further refined and expanded following finalisation of the CG Report, during the detailed design phase of the project and through ongoing consultation with the relevant regulatory and advisory agencies.

The draft EMP currently includes control strategies and measures for the following matters:

- air quality
- surface water
- groundwater
- noise and vibration
- erosion and sediment control
- aquatic ecology
- terrestrial ecology
- waste management
- land management
- cultural heritage.

### **9.1.1. Coordinator-General's conclusions**

I have required the proponent to submit to the administering authority and DEHP for approval (Appendix 4, Part A, Condition 3) the following:

- a construction EMP
- an operational EMP.

In addition, I have also conditioned the proponent to report, through third party compliance auditing to the DEHP, on the implementation of the CEMP and OEMP, including construction and operations phase reporting (Appendix 4, Part A, Condition 1).

## **10. Social and economic impacts—mine and rail**

### **10.1. Overview**

A social impact assessment (SIA) for the project was conducted by the proponent in relation to the following major project components:

- Alpha Coal (Mine) Project comprising an open cut thermal coal mine to be developed approximately 50km north of the township of Alpha in Central Queensland; and
- Alpha Coal (Rail) Project comprising 495 kilometres of standard gauge rail line and associated infrastructure.

The local study area focused on the landholders who will be impacted by the project; and the regional study area focused on Barcaldine, Isaac and Whitsunday Regional Council Local Government Areas.

The construction phase for the mine is anticipated to take 48 months and for the rail approximately 30 months. Subject to relevant approvals being granted for the project, the proponent anticipates the construction period to occur between 2013 and 2016. The life of mine (LOM) is 30 years; however, it is possible that there will be sufficient resources to potentially extend the project life beyond 30 years.

It is estimated that the project will create approximately 1,500 mine construction jobs and 2,100 rail construction jobs. In the operational phase of the project there will be approximately 800 mine operational jobs and approximately 190 railway operational job opportunities (including contractors), along with some flow-on (indirect) employment opportunities for the region, refer to Volume 2, Section 20 and Volume 3, Section 20 of the EIS for details.

#### **10.1.1. Project components**

##### **Alpha Coal Project (Mine)**

It is estimated that the mine construction workforce will build to a peak of approximately 1,500 with up to 1,000 workers rostered on at any given time. It is proposed that construction workers will generally work a 21 days on, seven days off roster. Programmed shifts will be ten to 11 hours' duration, daytime only. Night-time shifts may be required on occasions. Consideration is being given to split shifts for each of the major construction workforces.

It is proposed that operational employment will commence with an initial team of 300 workers in year one, and increase to 800 workers at the start of coal operations. Personnel associated with coal mining operations are expected to peak at 770 on-site at any time around year four. From year seven, approximately 600 operational workers will be on the mine site at any one time. It is proposed that operational staff will be rostered seven days on, seven days off.

It is proposed that the mine workforce will be predominantly FIFO and sourced from key regional centres throughout Queensland. The Project will also offer DIDO opportunities for some local residents and BIBO opportunities from regional centres. FIFO workers will be collected from the Alpha aerodrome by bus and taken directly to site at the commencement of their roster and return to the airport by bus on completion of their roster.

The proponent intends to house the majority of its non-resident construction and operational workforces in the Alpha Village site (located on the Project's mining lease). The same location, and mostly the same buildings and infrastructure are proposed for the construction and operational phases of the Project ie. the construction accommodation village will become the operations accommodation village. A planned and staged approach is proposed to gradually build, commission, and refurbish the accommodation village to suit the changing requirements through the Project. The Alpha Village site will include a temporary village that will house approximately 500 rail construction workers. This part of the Alpha Village site will be demobilised when no longer required for construction activities.

### **Alpha Coal Project (Rail)**

The majority of the Rail Project lies within the Whitsunday Hinterland and Mackay region, with a small area lying within the Central West Region at the Alpha Township. The rail corridor traverses the following regional councils:

- Barcaldine Regional Council
- Isaac Regional Council
- Whitsunday Regional Council

The rail project will have substantial workforce and accommodation requirements during the construction phase as the construction workforce for the rail is estimated to peak at 2100. At this stage, there is limited information available on the skills or demographic status of the proposed construction workforce. This information will become more detailed during tendering stage and when the construction contractors have been commissioned.

Once the rail is constructed, this will enable further expansion of the project and require further workforce from the region. Regional towns such as Alpha, Barcaldine, Emerald and Clermont and surrounding communities can potentially benefit from increased employment opportunities, and the establishment of support service industries and training development.

The estimated operational rail workforce is not substantial. It is expected to employ approximately 190 people during the operational phase, mostly in operations and maintenance roles. Most of these roles will be based at or near Bowen in the Whitsunday Shire and it is expected that there will be significant support business associated with the running of the project which will be sourced from this region. In the operational phase, Hancock's rail workforce will live in Bowen although train crews will sleep at the site village when they drive a train out.

Rail construction activities will require five accommodation villages, located in the following Shires:

- Alpha Mine Camp (Jericho Shire)
- Salisbury Plains Camp (Bowen Shire)
- Collinsville Camp (Bowen Shire)
- Wollombi Camp (Belyando Shire)
- Gregory Development Road (Belyando Shire)

Each accommodation village will have capacity for accommodating up to 500 personnel. One of the temporary accommodation villages will be at the Alpha Village site, suitable for conversion to a permanent village for mining operations (referred to in the previous section). The other four temporary accommodation villages will be equally spaced along the rail alignment to minimise travel for the construction personnel. Each of the camps will require a Development Application to be lodged and approved by the relevant Regional Councils prior to construction.

The proponent advises that the accommodation villages will be fully self-contained including the provision of en-suited air conditioned individual rooms with communal kitchen, dining room, crib room, gymnasium, recreation rooms, tavern, and outdoor landscaped recreational areas. The villages will have their own power generators, water treatment plants and sewerage treatment plants. On-site medical services will be available at these locations.

### **10.1.2. Government policy**

#### **Social impact management plan**

The Queensland Government requires proponents to develop a social impact management plan (SIMP) for new/expanding major resource development projects which require an environmental impact statement (EIS) to be prepared under either the Queensland *Environment Protection Act 1994* or the SDPWO Act; or projects for which the Department of Environment and Heritage Protection has given approval to a proponent to voluntarily prepare an EIS.

*A Guideline to preparing a social impact management plan 2010, DIP* is available to assist proponents with the development of SIMPs.

#### **FIFO workforces and regional funding**

The use of FIFO workforces in the Queensland mining industry has increased in the last few decades. There has been significant public interest recently, particularly with the Australian Government's Parliamentary inquiry into the impact of FIFO workers in regional communities.

Feedback from resource communities, industry and local governments indicates that there are two critical issues relating to non-residential workers:

- the impact of workforces comprising large proportions of FIFO workers on the sustainability of towns near resource projects; and
- providing accommodation for FIFO and other workers who want to live locally; and the effects on housing affordability and availability.

The rapid growth currently being experienced or anticipated in regions such as the Surat, Galilee and Bowen Basins, is placing significant additional demands on services and infrastructure in resource towns and they are struggling to keep pace.

New mining and energy development projects rely on local communities for social infrastructure and services that include policing, emergency services, medical, allied health and welfare, education, and family support services. Although many services and their related infrastructure is the normal responsibility of government, there is often a service gap in funding where rapid growth in demand for these community services will outpace their planning and budgeted funding allocations.

There are two main reasons for this. Firstly, government services and infrastructure are traditionally distributed according to resident population. As FIFO workers are non-resident workers they are not counted in the National Census of Population and Housing conducted by the ABS or ABS inter-censal estimates of the resident population of local government areas. This issue contributes to the under-estimation of growth funding requirements for social infrastructure and services in resource communities and regions.

Secondly, funding for government services is generally based on five-yearly census data, and experience demonstrates that the supply of quality services can struggle to keep pace with the demand caused by the rapid growth such as that seen in the resource sector. This service planning issue is particularly pertinent to the FIFO issue where service provision is required in two locations to support a worker's permanent place of residence and their temporary work location.

The lack of nationally consistent data to enable accurate quantification of the FIFO population also hampers government service planning, the establishment of which can have a long lead in time. In addition, the fluctuation in workforce size associated with different project stages (e.g. construction versus operation) requires the development of flexible models of service provision that can accommodate peaks but do not invest in services and infrastructure that are not required in the long term. It is for this reason that the OESR measures changes in the population of key resource areas of the state.

The Queensland Government is developing the Royalties for the Regions initiative that will provide funding for improved social infrastructure in regional Queensland. Until the social infrastructure priorities across the regions are identified and funding allocated, project proponents should have some responsibility to contribute to the capacity of local services and infrastructure to respond adequately to the increased demand.

Accordingly, it is expected that resource project proponents will incorporate specific measures in their SIMP to assist the state to mitigate social impacts from the increased pressure of construction and operational workforces on social infrastructure and service provision.

These mitigation measures should also include strategies that facilitate the provision of affordable housing for low to moderate income earners. Such measures are often most needed to address situations where the market is unable to respond adequately and some form of facilitation is needed, such as short-term capital injections and local capacity building for non-government organisations and local governments to strengthen the local community's ability to anticipate and respond to change.

In order to address emerging FIFO impacts, the SIMP requires proponents to include housing and workforce accommodation strategies. Housing impacts are discussed further in Section 10.12.3.

### **10.1.3. Alpha Coal draft SIMP**

The Alpha Coal SIMP provides the mechanism to monitor the social impacts of both the mine and rail projects and to facilitate engagement with stakeholders including state and local government agencies, and the community to develop solutions. The draft SIMP comprises:

- Part A – Alpha Coal Mine Social Impact Management Plan; and
- Part B – Alpha Coal Infrastructure: Rail Social Impact Management Plan

The mine component of the draft SIMP (Part A) outlines social mitigation strategies and measures for the related social impacts for the Life of the Mine including decommissioning.

The rail component (Part B) outlines social mitigation strategies and measures for the related rail social impacts, acknowledging the greatest social impacts will be in the pre-construction and construction phases as the estimated operational workforce for the rail is not substantial.

In addition to identifying the impacts from the SIA (as discussed below in section 10.2), the draft SIMP includes Statements of Intent that will be delivered through a range of action plans. These action plans will continue to be refined through engagement with stakeholders and will be adapted to address cumulative social impacts if other proposed projects planned for the region are approved and proceed.

The draft SIMP contains ten draft action plans:

- Landholder management
- Workforce management
- Local housing
- Community and stakeholder engagement
- Good neighbour policy
- Community development
- Local employment policy
- Local industry participation
- Indigenous participation; and
- Cumulative social impact management

The proponent is currently developing these action plans with various government agencies and regional councils.

### **Coordinator-General's conclusion**

I note that the proponent has prepared a draft SIMP with mitigation and management strategies and action plans described above.

I note the proponent has committed to developing the action plans with key stakeholders and local service providers to address social impacts.

The proponent's draft SIMP requires further work to achieve the standard that I will require for my eventual approval for the project to ensure that the social and cumulative impacts identified during the EIS process are addressed effectively.

I will require additional development of the SIMP performance measures so that mitigation strategies can be monitored effectively and reported on as required. This is a necessary compliance requirement to satisfy the ongoing reporting, review and auditing required for SIMPs.

I will require the proponent to consolidate the action plans in the final SIMP, based on discussions that have occurred with the Office of the Coordinator General in relation to such plans as the Workforce Management Plan, Indigenous Participation Plan, and the Local Housing Strategy.

I will require the proponent undertake further work on the draft SIMP, followed by further stakeholder engagement. The final SIMP will need to be submitted for approval within six months of the project receiving a final investment decision to proceed.

I will require all the social and cumulative impacts and associated conditions contained in this report to be addressed in the final SIMP.

To ensure the proponent adequately mitigates and manages the potential social and cumulative impacts identified in the SIA; and demonstrates that consideration has been given to the concerns raised in the EIS and SEIS submissions, I impose Condition 1 (Appendix 2, Part C).

#### **10.1.4. Community engagement and dispute resolution**

##### **Community and Stakeholder engagement Plan**

The proponent has developed a Community and Stakeholder Engagement Plan that guides community consultation. The plan aims to ensure stakeholder and community participation occurs throughout the life of the project to define issues, identify opportunities and inform relevant aspects of project activity

##### **Proponent's proposed dispute resolution mechanisms**

The proponent's draft SIMP outlines that complaints, enquiries and comments relating to the Project will be monitored to improve interactions with community members and stakeholders and to support proactive communication activities.

The dispute resolution process will be provided on Hancock's website once the project moves into the construction phase. One 1800 number will be provided for all members of the community to report incidents or issues relating to project activities safety, health and environmental amenity or harm. If the issue is an emergency, the proponent will transfer the call to the Triple Zero service. For other issues, the proponent will forward to the appropriate team for follow up.

## Landholder management plan

The Alpha Coal Project Landholder Management Plan provides a framework for regular interaction with landholders through one-to-one discussions, community consultation sessions and a variety of community tools. Landholders are those property owners with a 'direct interface' with the Project. Direct interface could mean the property is directly on the mining lease, or outside the lease (for eg, a property might be needed for access purposes on adjacent land).

Service standards associated with responding to complaints, enquiries and comments have been established by Hancock and will require the contractor to communicate details directly to the proponent.

## Coordinator-General's conclusion

I support a comprehensive approach to community engagement. I believe that this can best be achieved through a clear and inclusive commitment to community engagement and, therefore impose Condition 2 in Appendix 2, Part C in relation to the Community and Stakeholder Engagement Plan.

I impose Condition 2(b) in relation to the Landholder Management Plan and Dispute Resolution mechanisms, to ensure regular interaction with landholders and other stakeholders is available throughout the life of the project.

## 10.2. Potential social impacts—mine

### 10.2.1. Issues

The draft Alpha Coal SIMP (dated 23 January 2012), Table Appendix A-1 *Impacts from the Alpha Coal Project Social Impact Assessment* provides information on a range of issues that were rated as having potential social impacts, both positive and negative.

While a summary of these issues is provided below, further analysis of these issues and details of the proponent's specific contributions to manage the issues are dealt with in the latter stages of this report. I will deal with social cumulative issues in Section 10.8.

### Lifestyle and community values

The EIS identified that local residents want the region to retain its overall rural identity while encouraging economic expansion to ensure the long term sustainability of existing communities. Some residents have expressed concern about the transition from a quiet rural community to a resource community, particularly given the influx of the large construction and operational workforces into the area. The scale of the cumulative projects and uncertainty about the timing of projects is also a concern. The SIA has specifically identified the following impacts:

- Profile changing from agriculture to mining
- Potential lifestyle changes as a result of increased wages leading to greater income disparity in the community
- Change in social networks

The proponent will develop a range of plans and policies to respond to these community concerns; and to ensure new workers interact appropriately with the community. These include a Community and Stakeholder Engagement Plan, Community Health and Safety Plan, Workers Code of Conduct, Fitness for Work Management Plan and Landholder Management Plan. Further details of these plans are provided throughout this report.

### **Housing availability and affordability**

The proponent asserts that the direct impact of the project on the Alpha housing market will be low given the majority of workers for the Alpha mine will be either flown or bussed into the site and accommodated at a site-based mining village.

Nonetheless the proponent has noted that any increased demand for housing arising from the project may increase the rental and purchase costs of housing in Alpha. The proponent proposes that housing impacts will be mitigated through the development of a Local Housing Strategy that will:

- Research and monitor activities to assess demand for different accommodation types in Alpha and surrounds
- Develop options to deliver strategies against the findings of housing studies in close consultation with Council and government officers
- Enable a portion of the workforce to be housed within local communities if necessary.

A detailed analysis of housing impacts is provided in Section 10.12.3.

### **Road safety**

The SIA identified that the use of local roads by heavy vehicles carrying construction equipment will impose road safety risks and additional project related traffic will cause some disruption to resident's lifestyles. The proponent has evaluated these impacts as high and has specifically identified the following impacts:

- Increased potential for accidents because of more traffic
- Increased potential for vehicle accidents due to driver fatigue
- Safety and maintenance issues associated with increased use of the Capricorn Highway
- Increased access from the Alpha-Clermont Road

The proponent has indicated it will identify road infrastructure improvements and implement a road safety awareness program for project personnel and local residents. An education program will be developed for schools on road safety matters. It should be noted that road maintenance and upgrade requirements are dealt with in other sections of this report.

### **Community services and social infrastructure**

The proponent will contribute to social outcomes including improved livelihoods and community amenity in project-impacted communities and will adopt a strategic approach through:

- Effective management of physical environmental impacts
- Effective management of potential adverse social impacts
- Provision of support for local development opportunities

To this end, the proponent has made a commitment to a Community Development Fund jointly managed with Barcaldine Regional Council. This fund has the potential to support projects aimed at enhancing the character and amenity of the region.

The proponent has also committed to a Community Infrastructure Fund to be established and to funding being provided to priority areas such as social health and wellbeing; education and training; environment; and economic development. The proponent has also indicated it will keep the community informed of project developments by providing regular updates through their Community and Stakeholder Engagement Plan.

### **Local and Indigenous employment and training**

The development of the Alpha mine presents the local community with an opportunity to develop local workforce skills and to diversify employment to include mining. The proponent has specifically identified the following opportunities:

- Increased employment
- Employment diversification
- New people in the area to bring skills for other industries

The proponent will support community efforts to broaden the skills base and is developing a Workforce Management Plan to guide its recruitment and training options. The Workforce Management Plan is discussed further in Section 10.5 of this report.

The proponent has committed to developing an Indigenous Participation Plan to support the training and employment of Indigenous people. Further details of the Indigenous Participation Plan are provided in Section 10.6 of this report.

Native title agreements are in place for the Wangan and Jagalingou people, the Jangga people and the Birri people. The agreements will provide opportunities for:

- Training and employment opportunities.
- Apprenticeships and traineeships
- Business development and contracting opportunities.

### **Local and regional businesses**

The proponent expects the project to provide a significant economic and social development opportunity for local communities and Australian industry.

The proponent is currently developing a Local Industry Participation Plan (LIPP) in cooperation with DSDIP and ICN Queensland. The proponent states contractors will be required to provide full, fair and reasonable opportunity to local suppliers and specialist sub-contractors when tendering for equipment or services supplied. Section 10.7 provides further detail on the LIPP.

### **10.2.2. Coordinator-General's conclusion**

I note that the social impact assessment for the project (mine) has highlighted several social impacts. I will consider them further as I deal with other issues in this report.

## **10.3. Potential social impacts—rail**

### **10.3.1. Issues**

The draft Alpha Coal SIMP, Section 4 Part B Tables 4.3—4.12 identifies the key social impacts and associated monitoring measures for the rail project. A summary is provided below.

#### **Impacts on property owners and land use**

The proponent has identified a number of negative impacts on landholders who may be directly impacted by the acquisition of land for the rail corridor. Landholders have expressed concerns regarding impacts to their properties including potential decreases in the value of the land and in the productivity of their grazing enterprise.

The proponent has identified that the Project alignment will cross approximately 37 landholdings. The proponent will assure landholder safety through the provision of crossings either over or under the rail corridor. This will enable the continued safe and efficient use of properties. Liaison between the proponent and each landholder is continuing in order to reach voluntary compensation agreements or alternative mitigation measures.

As discussed in Section 6.1.3.1, the proponent will implement a Landholder Management Plan including on-going consultation with landholders during corridor planning; provision of legal or property management advice during the corridor planning and acquisition process; and a complaints/grievance process that includes provision for independent review on a case by case basis. The SIMP also states that regular one-on-one discussions between the proponent and landholders will occur.

#### **Lifestyle disruption**

The proponent anticipates that concerns may arise regarding increased traffic, disruption to visual outlook, noise generation and personal security and safety issues for residents in proximity to the five temporary worker accommodation villages.

To address these concerns, the proponent proposes to implement Camp Management Plans including a Code of Conduct for worker accommodation village residents and a worker accommodation village Environmental Management Plan (EMP). The proponent will also implement a Road Safety Plan including road infrastructure improvements where required and a road safety awareness program for project personnel and local residents. Affected landholders and residents will be consulted in the development of these plans as per the Alpha Coal Project Community and Stakeholder Engagement Plan.

### **Temporary land-use disruption**

The SIA has indicated landholders may be further disrupted as access to land may be required outside of the immediate area of the rail corridor, for activities associated with rail line construction. The proponent has evaluated this impact to be of medium significance.

To address this impact, the proponent will require the contractor to develop a Construction Management Plan (CMP) that includes property specific measures (including property infrastructure enhancements) to minimise disruption and ensure safety prior to the granting of site access and commencement of construction. Engagement with individual landholders will continue to be undertaken through the Landholder Management Plan.

### **Indigenous cultural heritage**

The proponent has identified that ground disturbance during construction may inadvertently impact on cultural heritage sites, not observable during ground surveys. The proponent has advised it will provide cultural heritage awareness training for construction crews, and ensure compliance with the protocols in the Cultural Heritage Management Plan.

### **Employment opportunity**

The proponent states its Local Employment Policy will be reflected in the contract with the rail construction contractor. The contractor will be required to report on the measures and outcomes that it has taken to implement the policy in its workforce recruitment. The proponent advises it will support the training and employment of Indigenous people through its support for the Indigenous Employment Program. Further details of the Workforce Management Plan are in Section 10.5.

### **Landholder property infrastructure enhancement**

Property infrastructure improvements agreed to as part of the corridor acquisition negotiations will be included in the rail construction contractor's scope of works. Landholders may be able to secure property infrastructure enhancements if their property has been disrupted through works.

Landholders will need to meet certain criteria to demonstrate the property has been disrupted. The criteria will be detailed in a Construction Management Plan that will also include property specific measures to minimise disruption to landholders.

### **Loss of residential amenity**

There is a possibility that some residents will experience a loss of amenity due to noise, visual impact, and frequency of train movements from the rail corridor. This impact has been rated as of medium significance.

Mitigation measures will include the implementation of a Train Operations Environmental Management Plan that will include noise attenuation as a key objective. Landholders will be provided with access to grievance procedures and offered

environmental amenity remedial improvements (e.g. noise insulation, air conditioning) through the Landholder Management Plan.

### **Landholder safety**

The proponent will assure landholder safety through the provision of crossings either over or under the rail corridor. This will enable landholders to continue to access and maintain their land. To address the risks associated with the potential for unauthorised access to the corridor, the proponent will implement a Landholder Rail Corridor Access Procedure as part of the Train Operations Environmental Management Plan.

### **10.3.2. Coordinator-General's conclusion**

I note that the social impact assessment for the project (mine) has highlighted several social impacts.

I have conditioned the Landholder Management Plan in Condition 2(b) to ensure landholders affected by the rail project are managed fairly and appropriately.

In relation to workforce behaviour, particularly for employees and contractors residing in the accommodation villages, I deal with Camp Management Plans, Fitness for Work Plans, Workers Codes of Conduct and Environmental Management Plan in Section 10.13.1.

## **10.4. Stakeholder comments**

The key issues raised by stakeholders in response to the Social Impact Assessment sections of the EIS and subsequent SEIS include the issues below.

### **10.4.1. Demographics**

- potential impacts on the region's rural community identity due to population increase, and changes in the male-female ratio, age composition, and family structures that affect community characteristics
- changing demographics of the population, with the continued and expanded use of contract employees for FIFO, BIBO and DIDO employment
- the need for a study of any demographic changes to determine the future needs of the region, particularly if other proposed projects in the area are approved and contribute to substantial cumulative social impacts.

### **10.4.2. Housing impacts**

- general impacts on the local accommodation and housing market including the availability and supply of affordable housing
- impacts on housing affordability and availability in FIFO source towns
- increased demands on short term accommodation in Alpha
- access to affordable housing for non-resource workers required to service the region
- the need to monitor housing impacts for the project areas.

### **10.4.3. Workforce accommodation**

- the location of the construction camps will increase the need for policing requirements within the region to address community safety issues
- worker housing for employees who choose to live locally
- cumulative impacts associated with the potential for large increases in construction workers if other proposed large coal mining projects proceed
- cumulative impacts associated with road safety, traffic management, and potential social issues such as drug and alcohol misuse and domestic violence
- provisions to be implemented to ensure the overall safety of workers within the workers camps and mine facility while on and off shift on site – need to have a Code of Conduct, Out of Hours Behaviour policy etc.

### **10.4.4. Employment and economics**

- a recruitment strategy is required to enhance local/ employment and economic development, consistent with the draft Central West Regional Plan
- local businesses and non-mining industries not able to retain skilled workers due to the wage differences between local/regional sectors
- goods and services should be purchased locally to provide financial benefits to local and surrounding businesses as well as the opportunity for business growth/expansion
- need for employment strategies and support programs that maximise employment opportunities for disadvantaged job-seekers, under-employed people, people with disabilities, women and Indigenous people, including support for job preparation and training.

### **10.4.5. Workforce and training**

- the need for a workforce management plan to be developed to maximise the regional economic benefits from the construction and operation of the mine and associated infrastructure
- the need for Indigenous participation including employment and training opportunities
- lack of information on the proponent's strategy to recruit overseas workers, prior to ensuring local employment has been maximised.

### **10.4.6. Social Infrastructure and community services**

- cumulative impacts of multiple projects on social services across the Central West region arising from the population increase from direct and indirect construction and operational workforce
- requirement for additional police resources, including the need for staffing increases to the region, new accommodation for new staff, specialist resources and other equipment needs
- requirement for additional medical services, particularly in Alpha.

#### **10.4.7. Traffic, health and safety**

- the increase in non resident worker populations may increase demand for disaster response, but provide little opportunity to increase membership of volunteer services (SES, rural fire), putting extra pressure on existing services
- management of incidents and complaints regarding traffic and transport movements
- increased traffic, potential fatigue management and deterioration of road surface impacting on road safety
- increased impacts on the air quality, noise and vibrations on workers on site, residents within towns and near the rail line.

#### **10.4.8. Coordinator-General's conclusion**

I note the concerns raised in the stakeholder submissions in relation to the potential social impacts associated with both components of this project, during construction and for the life of the project.

I note the following consistent themes:

- Cumulative impacts of multiple projects will place pressure on service delivery across the Central West region and potentially beyond
- Demographic changes need to be analysed to determine the future needs of the region, particularly if all planned projects go ahead
- The housing market needs to be monitored in line with demographic changes to assess impacts on affordability and availability
- Local and regional employment, training and economic development is a key contributor to the region's sustainability
- There is considerable opportunity for Indigenous participation, including employment and training opportunities
- Population increases from direct and indirect construction and operational workforces will place considerable pressure on social infrastructure and community services
- Impacts on QPS will be considerable due to traffic and transport movements, road safety, and community safety issues

While I will consider these issues further in the latter stages of this report, it is important to note that during the EIS and SEIS submission process, agencies such as DETE, ATSI and Multicultural Affairs; and Skills Qld consistently raised issues in relation to the project's Workforce Management Plan, Indigenous Participation Plan and Local and Industry Participation Plan (LIPP).

As these plans are central to ensuring employment strategies are maximised and local business growth and expansion in the region is considered, I will address each issue individually below.

## 10.5. Workforce Management Plan

The need for employment strategies and support programs that maximise employment opportunities for local disadvantaged jobseekers, unemployed people and Indigenous people was raised throughout the EIS and SEIS submissions and consultations.

Barcaldine Regional Council, Isaac Regional Council and Blackall-Tambo Regional Council requested that the region be considered as a potential training venue to provide training for mining staff as well as train local residents including young people.

Skills Qld and the former Department of Employment and Economic Development and Innovation's submission to the EIS stated that the Department will assist the proponent to maximise employment opportunities for local people, including local retrenched workers and Indigenous people through the Skilling Queenslanders for Work initiative.

The proponent has submitted a draft Workforce Management Plan that provides a preliminary assessment of the workforce skills required for the project. The proponent states that as part of its recruitment strategy, where possible, Hancock and its contractors will focus on creating sustainable local economic development opportunities consistent with the desires of the community. In support of this business objective, local residents will be encouraged to apply for construction and operational roles.

The Workforce Management Plan states that labour will be drawn in the first instance from within Australia, with a particular focus on local, regional, state and national labour markets. The project will target South East Queensland and regional Queensland coastal areas including Cairns, Townsville, Wide Bay Burnett, Sunshine Coast, Brisbane and Gold Coast.

Where possible, the local area (Alpha, Emerald, Bowen and surrounding communities) will be a major focus, subject to suitable skills being available. To a lesser degree, Hancock will also seek Indigenous FIFO job seekers from other Queensland regional centres (eg. Mackay, Rockhampton and Townsville) from which existing mining operations have already heavily drawn, and also Brisbane.

Labour attraction and retention strategies will include:

- Developing a database for Expressions of Interest
- Early contractor involvement processes to assess access to labour
- Attendance at trade fairs
- Mass recruitment techniques
- Assessment centres
- Group training schemes for apprenticeships, traineeships, cadetships
- Job redesign including an ability to undertake roles off-site, job sharing and part-time employment

The Workforce Management Plan states international workers may complement labour sourced from within Australia and Hancock Coal will submit an Enterprise Migration Agreement (EMA) to the Australian Government if necessary. The proponent states

that guest workers may fill positions that are identified as having skills shortages in Australia.

The Workforce Management Plan also includes a commitment to a Training and Apprenticeship Strategy. Two-year traineeships will be offered in:

- Coal mining
- Rail above ground operations
- Rail below ground maintenance
- Port operations
- Civil earthworks
- Logistics including warehousing and transport
- Business administration
- Hospitality

Apprenticeships will be offered in:

- Heavy diesel fitting
- Electrical
- Mechanical
- Electronics

The proponent states that it will investigate partnering opportunities for community based organisations to assist with the implementation of the various apprenticeship and trainee schemes. Further details of the strategy will be developed after financial close of the project and will include Alpha Coal, the various contracting companies, service providers and the community.

The proponent has also committed to consulting with the Office of the Coordinator-General and relevant government agencies to develop and finalise appropriate workforce management targets.

The proponent has commitment to working with the government, education facilities and industry training providers such as Construction Skills Queensland, Queensland Minerals and Energy Academy, and Skills Qld to encourage local up skilling and employment opportunities and to establish links with local schools.

In addition, the proponent has advised it will collaborate with relevant stakeholders to assist with the development of programs to assist people who have traditionally remained out of the labour market due to a lack of opportunities to participate eg. people who are unemployed, women and mature aged people.

Indigenous employment opportunities are outlined in a separate Indigenous Participation Plan (see Section 10.6).

### **10.5.1. Coordinator-General's conclusion**

I note that during the EIS and SEIS process, potential social impacts were raised in regard to local employment and training including local employment, and in particular the need for employment strategies and support programs that maximise employment

opportunities for unemployed people, local disadvantaged jobseekers and Indigenous people from across Queensland.

I impose Condition 3 in Appendix 2, Part C that requires the proponent to include specific details of the Workforce Management Plan; and local and state-wide employment and training strategies in the final version of the SIMP, following relevant stakeholder engagement.

I recommend the Workforce Management Plan is updated to address the social and cultural impacts that overseas recruitment may have on the host community. In particular, the proponent's commitment to assisting migrant workers and families integrate into the community and the support that could be offered to these workers (such as accessibility to English language classes etc).

## 10.6. Indigenous Participation Plan

The proponent has submitted a draft Indigenous Participation Plan that states the proponent is committed to employing Indigenous people during construction and throughout operations either directly through the proponent, or through its contractors. The proponent advises it will provide work experience and training that will provide Indigenous people with the skills required for employment in the resources industry.

Native title agreements are in place for the Wangan and Jagalingou people, the Jangga people and the Birri people. The agreements will provide opportunities for:

- Training and employment opportunities.
- Apprenticeships and traineeships
- Business development and contracting opportunities.

The proponent has advised it will establish and participate in an Indigenous Participation Liaison Committee comprising representation of the Native Title holders upon financial close. This committee will provide oversight for the Native Title agreements as well as further develop, refine and target the strategies in the Indigenous Participation Plan.

The proponent states it will work with the local Indigenous communities to build skills, competence and programs that enhance opportunities through education, training, development and employment.

Strategies under the Indigenous Participation Plan include:

- Setting of achievable long-term employment/contracting and retention targets that reflect local and regional demographics of Hancock's operations
- Setting of achievable long-term employment/contracting and retention targets that incorporate opportunities for Indigenous FIFO workers
- Ensuring sufficient numbers of skilled Indigenous people are available for employment opportunities as these arise
- Developing a targeted, integrated approach to construction and operations positions being available to job ready Indigenous prospective employees
- Undertaking cross-cultural training and awareness for all employees and contractors

- In partnership with established education and training providers, develop and implement pre-vocational training and job ready education programs
- Developing and implementing appropriate trainee and apprenticeship opportunities
- Developing and implementing strategies that are focused on long-term retention of both skilled and unskilled Indigenous people either as direct employees or via contractors including where practical, flexible policies of engagement to enhance retention.

The proponent has committed to consulting with the Office of the Coordinator-General and relevant government agencies to develop and finalise appropriate Indigenous participation targets.

#### **10.6.1. Coordinator-General's conclusion**

I note that during the EIS and SEIS process, potential social impacts were raised in regard to local employment and training, and in particular the need for employment strategies and support programs that maximise employment opportunities for Indigenous people.

I impose Condition 4 in Appendix 2, Part C that requires the proponent to include specific details of the Indigenous Participation Plan; and the Native Title Liaison Committee in the final version of the SIMP, following relevant stakeholder engagement.

### **10.7. Local Industry Participation Plan**

The proponent expects to provide a significant economic and social development opportunity for local communities and Australian industry.

The proponent is currently developing a Local Industry Participation Plan in cooperation with DSDIP and ICN Queensland. The proponent states contractors will be required to provide full, fair and reasonable opportunity to local suppliers and specialist sub-contractors when tendering for equipment or services supplied.

The Local Industry Participation Plan will:

- Assess local suppliers that may be invited to tender for services for the project
- Provide mechanisms for the provision of project information to local industry in an equitable and timely manner, including in-region project briefings for the procurement of contract services
- Outline appropriate design and procurement strategies to provide equitable access to local industry; and
- Provide mechanisms for performance measurement, reporting and feedback in relation to local procurement.

The proponent will also ensure that all contractors comply with the LIPP in order to promote ongoing training and Indigenous employment.

### **10.7.1. Coordinator-General's conclusion**

I recommend the proponent's Local Industry and Participation Plan be finalised in consultation with DSDIP and ICN Queensland.

The plan will aim to ensure local industry is given full, fair and reasonable opportunity to tender for infrastructure and resource based project work.

I provide this as Recommendation 5 in Appendix 3, Part D.

## **10.8. Social cumulative impacts of the project**

One of the most consistent themes that emerged during consultation was the issue of cumulative impacts of multiple projects, potentially placing pressure on service delivery across the Central West region and beyond.

The agency submissions received in the EIS and SEIS stages raised the following concerns in relation to cumulative impacts:

- changing demographic profile of the region
- workforce accommodation
- increased traffic and road safety issues
- housing availability and affordability in the region
- low income workers not associated with mining companies are faced with increasing rents and low availability of affordable housing
- lack of data to make an assessment of impacts and potential mitigation measures
- total cumulative mining workforce of all Galilee Basin proponents needs consideration
- cumulative impacts associated with road safety, traffic management, and potential social issues such as drug and alcohol and domestic violence
- increased demand on recreational facilities
- impacts on community values, character and lifestyle due to potential negative social impacts including quality of life.

The Queensland Police Service (QPS) EIS submission notes that QPS does not have sufficient resources in the area to cope with the enforcement and proactive strategies that will be required to address the regional growth, while still maintaining services outside mine activities. Further issues relating to QPS service delivery are included in Section 10.13.2.

The Department of Housing and Public Works in its SEIS submission strongly supports consideration of impacts, on long-term residents not employed in the mining industry and potential private rental market impacts during the pre-construction, construction and operational phases.

Barcaldine Regional Council's (BRC) SEIS submission stated that:

Barcaldine note the desired regional outcome for Strong Communities is to retain the sense of identity in the region's rural and remote communities, and support and

encourage healthy and viable rural enterprise that enhances the interdependence and liveability of these communities.

The BRC identifies that key elements to support the Strong Communities goal are to seek support and funding to progress:

- a statistical review of cumulative impacts, population growth and other drivers;
- a short term infrastructure needs review and implementation plan including identification of key stakeholders including mining proponents to develop a plan to meet growth prior to construction; and
- a Regional Development Plan which would address the requirements of the region in the longer term including the Life of the Mine, and address cumulative impacts.

The Alpha Coal Project EIS Cumulative Impact Assessment concluded that:

- the mine and the rail aspects of the Alpha Coal Project are expected to have varying potential cumulative impacts on the environmental, economic and social values within their sphere of influence
- the potential cumulative impacts resultant from the mine are expected to be predominantly localised around the mine site and will be over the life of the project
- the rail on the other hand is expected to have its largest potential impacts during the construction period
- these potential impacts are not definitive as they are dependant on continued operation of existing projects and the approval and development of new mines and infrastructure.

Section 11 of the draft Hancock Coal SIMP states that:

- the Alpha Coal Project and the Kevin's Corner Coal Project are likely to be first projects in the Galilee Basin and increase the likelihood of other projects proceeding
- associated cumulative impacts are likely to occur from mine and rail related physical infrastructure activities (water supply, power, roads, communication, serviced land development ) and from population increases putting pressure on social infrastructure (health, education, recreation and family support services and facilities)
- Hancock Coal attributes any population increases as likely to be from other projects given their workforce accommodation policies as well as the proximity of the Waratah and South Galilee projects to the Alpha community
- these projects (eg the South Galilee Coal Project and the Waratah Coal Project) will form the basis of the cumulative social assessment
- Alpha Coal Mine SIMP is designed so that it can act as a foundation document for assessing the cumulative impacts of the Kevin's Corner Coal Project, if it eventuates, and any other project within the region that can result in cumulative impacts on project stakeholders.

### **10.8.1. Coordinator-General's conclusion**

I consider the combined population growth from multiple projects proposed in the Galilee Basin will place pressure on the demand for the existing social infrastructure and result in more social impacts across the region.

These combined impacts are significant for two main reasons. Firstly, they cannot be understood or managed by focussing on the activities of an individual project or development. Secondly, because cumulative impacts result from the activities of multiple actors, coordination between different proponents can deliver the best overall outcome.

If the construction and development of the Alpha Coal Project proceeds ahead of other proposed projects in the Galilee Basin, it will have a foundational influence on the future social and economic development of the region.

## **10.9. Galilee Basin CSIA Roundtable**

I have been advised that the concept of establishing an overarching cumulative social impact assessment group has been discussed with the proponent. The proponent has advised that there is strong merit in developing a Galilee Basin Cumulative Social Impact Assessment (CSIA) Roundtable and would participate in such a group.

The proposed GB CSIA Roundtable will have a specific focus on the identification and assessment of cumulative social impacts, mitigation and management strategies; and initiatives that require a collaborative approach by state and local government and the resource industry.

It is expected that the GB CSIA Roundtable will initially comprise proponents operating or intending to operate in the Galilee Basin who have been declared a 'significant project' by the Coordinator General. As other projects in the Galilee Basin emerge, the GB CSIA Roundtable will need to review its membership.

Two of the key deliverables of the GB CSIA Roundtable will be to implement a Galilee Basin Cumulative Social Impact Study and Galilee Basin Social Infrastructure Plan.

See Section 10.10 for further details of the Galilee Basin Cumulative Social Impact Study and Galilee Basin Social Infrastructure Plan.

### **10.9.1. Coordinator-General's conclusion**

I consider there is merit in a Galilee Basin CSIA Roundtable as the key consultative mechanism to address ongoing cumulative social impacts arising from the potential construction and operation of Galilee resource projects.

I believe the proponent should take a leadership role in the establishment of the group, if the project is to reach financial close and announce commencement of construction. This arrangement must be discussed and negotiated with other Galilee Basin project proponents, and councils, and discussed with the Coordinator-General.

The proponent should develop the terms of reference and membership to reflect the broad geographic area covered by the Project's social impacts in consultation with other proponents and key stakeholders.

I consider that identifying cumulative impacts and developing mitigation measures for new projects is the responsibility of industry in partnership with local and state governments and community sector stakeholders.

In order to ensure that the cumulative impacts associated with the emerging development, all new Galilee Basin project proponents will be required to establish, or participate in the Galilee Basin CSIA Roundtable, (see Appendix 2, Part C, Condition 5).

## **10.10. Galilee Basin Social Impact Study and Social Infrastructure Plan**

The Galilee Basin Cumulative Social Impact Study and Galilee Basin Social Infrastructure Plan are anticipated to be the key mechanisms to address priority social infrastructure needs and requirements in the Basin.

The purpose of the Galilee Basin Cumulative Social Impact Study will be to assess cumulative social impacts for relevant issues such as, but not limited to population, workforce, accommodation, health and housing and use of community infrastructure and services.

The Galilee Basin Social Infrastructure Plan will determine short, medium and long term strategies for the delivery of social infrastructure initiatives through partnerships between industry, communities, and governments.

It is evident throughout the responses to the EIS and SEIS process that there is an immediate need to provide assistance to Alpha to improve aspects such as the water and power supply, upgrading the sewerage system, releasing residential and industrial land and improving telecommunications.

Alpha has a limited housing market and will require this initial development to allow it to benefit from any potential growth resulting from the development of the mines in the area.

In the medium to longer term, social infrastructure priorities as determined by the Galilee Basin Cumulative Social Impact Study will guide the deliverables under the Galilee Basin Social Infrastructure Plan. I envisage this to be a collaborative process between regional councils, project proponents, the local community, State government agencies and service providers.

I have been advised that the proponent has provided in principle support for contributing financially to a development plan for Alpha, and I expect that other project proponents will contribute funding, if their planned projects proceed. The Alpha development plan will aim to improve the water and power supply, upgrade the sewerage system, release residential and industrial land and improve telecommunications, and other aspects.

### **10.10.1. Coordinator-General's conclusion**

I consider it essential that the Galilee Basin project proponents fully participate in the implementation of the Galilee Basin Cumulative Social Impact Study and Galilee Basin Social Infrastructure Plan.

I believe the proponent should provide financial contributions to the development and implementation of the Galilee Basin Social Infrastructure Plan in which industry funds are pooled to 1) mitigate the social impacts of major project developments in the Galilee Basin; 2) contribute to the development of and implementation of the Alpha development plan; and 3) implement the GB Social Infrastructure Implementation Plan through a priority social infrastructure schedule, as determined by the Galilee Basin Cumulative Social Impact Study.

The geographic scope of the Galilee Basin Cumulative Social Impact Study will determine the geographic area to be covered by the Galilee Basin Social Infrastructure Plan. The terms of reference for the Study and the plan are required under Condition 6 to be submitted to the Coordinator General for approval.

I expect all proponents to commit as reasonable and appropriate to on-going investment in social infrastructure in the Galilee Basin as long-term members of the community.

To ensure that all new Galilee Basin projects will be required to participate in the Galilee Basin Cumulative Social Impact Study and Galilee Basin Social Infrastructure Plan, I impose Condition 6 (Appendix 2, Part C).

## **10.11. Galilee Basin SIMP Community Consultative Committee (GBSCCC)**

The proponent has established the Hancock Consultative Committee (HCC) to identify, discuss and provide advice on significant regional and local development issues; and participate in the development, implementation and review of the SIMP.

I have been advised that the proponent has extended the initial commitment to the HCC to participate in a GBSCCC that will respond to social impact and management strategies identified throughout the EIS and SEIS process, and to provide oversight of the implementation of the SIMP.

### **10.11.1. Coordinator-General's conclusion**

It is apparent from the EIS and SEIS that the establishment of monitoring, reporting and governance arrangements with community stakeholders is required to assess the combined impacts of the mine and rail components of the Project. It is evident the governance arrangements need to align with the broad geographic area covered by the Project.

I commend the proponent for establishing the HCC and for beginning to develop the action plans necessary for mitigation and management of the SIMP, with key stakeholders.

I conclude that the resourcing of a GBSCCC is necessary to demonstrate the proponent's commitment to the community engagement process that is required to successfully maintain working relationships with key stakeholders, regional and Shire Councils, and importantly the local communities most affected by the Project.

I consider it essential that the Galilee Basin project proponents fully participate in the GBSCCC.

I set conditions with respect to establishing and maintaining the SCCC in Condition 7 (Appendix 2, Part C).

## **10.12. Proponent-specific measures for managing social impacts**

I consider that a coordinated approach which promotes collaboration between the proponent, all levels of government and local communities is best to assist affected local communities plan and fund the provision of the social infrastructure required to address future growth.

I propose an Alpha Coal Project social infrastructure and service delivery strategy made up of four integrated components. The components are:

- Proposed deliverables outlined in the proponent's commitment register
- Community Projects Fund; and the Community Infrastructure Fund
- The Galilee Basin Cumulative Social Impact Study; and the Galilee Basin Social Infrastructure Plan (as per Section 10.5.2)
- Specific contributions to manage social impacts e.g. housing contributions

### **10.12.1. Proponent commitments**

The proponent published a commitments register through the project SEIS (Vol 2 2011 Appendix D. Social commitments are listed in D 1.20). Following the SEIS, the proponent has provided me with an update commitments list, which can be found at Appendix 5.

### **Coordinator-General's conclusion**

I conclude that the proponent should provide a revised statement of social commitments in relation to the potential social impacts. I consider it appropriate that the proponent includes the link between the relevant commitment and the relevant social impacts that it will address.

I note the list of commitments and will require a revised up to date copy to be provided with the final SIMP submitted for approval.

Therefore, a condition is imposed to address the finalisation of the commitments register in Condition 8 (Appendix 2, Part C).

### 10.12.2. Community Projects Fund

The proponent has provided some details of its Community Projects Fund in Section 2.4.2 of the draft SIMP however it does not specify the level of the investment committed at this stage.

#### Community Development Fund

The proponent has indicated the Community Development Fund will contribute to social outcomes and local amenity in project-impacted communities. The Fund will be jointly managed with the BRC and will be available to contribute to social infrastructure priorities identified by the community through the BRC. The engagement process undertaken through the SIA highlighted the likely priority areas as:

- Social, Health and Wellbeing
  - develop youth and community capacity and leadership
  - improve access to community and health services
  - improve the cohesiveness of the community and the strength of community networks and institutions.
- Education and Training
  - facilitate skills development
  - support the generation of local employment and business opportunities
  - develop the capacity of vulnerable and marginalised groups.
- Environment
  - promote the awareness of the environmental assets of the region
  - implement activities that enhance the environmental qualities of the region.
- Economic
  - regional procurement support
  - regional small and medium sized enterprise support and development
  - regional employment support
  - initiatives that support the economic development of the region.

#### Community Infrastructure Fund

The proponent has also committed to a Community Infrastructure Fund to provide opportunities for capital investment into facilities and infrastructure that are of strategic importance to the development of the region, such as:

- supporting and/or contributing to improvements to social infrastructure (e.g. schools, housing);
- projects that improve the amenity and liveability of the local area; and
- physical infrastructure upgrades/contributions to upgrades.

The draft SIMP states that details of the fund are being developed in consultation with key stakeholders.

### **Coordinator-General's conclusion**

I note Hancock Coal has committed to a Community Development Fund and Community Infrastructure Fund which will outline investment strategies to contribute to social infrastructure and capital investment in physical infrastructure. The level of investment is not specified in the draft SIMP as details are currently being developed as part of the SIMP stakeholder engagement process.

I acknowledge the proponent's financial and corporate commitment to the Community Development Fund and Community Infrastructure Fund as presented in the SIMP.

I will require that the level of investment for the funds is reflected in the final SIMP when submitted for approval. Based on this information, I have imposed Condition 9 (Appendix 2, Part C).

### **10.12.3. Housing contributions**

The proponent's intention is to house the majority of its workers in an on-site accommodation village for the mine project, and in temporary accommodation villages along the rail line during construction.

As discussed in Section 10.5, the proponent will provide further information and data on employee numbers after the project reaches financial close and when major contractors are appointed.

The proponent has advised it does not plan to provide housing for workers who choose to live locally outside the on-site accommodation villages, which means there is limited choice for workers who decide to base themselves in the region.

The draft SIMP includes a Local Housing Strategy that commits to monitoring impacts over time of rentals, house prices and housing availability to inform strategy development.

The Strategy does not provide information on how many direct staff employees are likely to reside in Alpha and the surrounding areas, nor address housing for FIFO workers who may indicate a preference to live locally with or without their families after an initial period of FIFO contract employment.

The Department of Housing and Public Works in its SEIS submission recommends the proposed Local Housing Strategy also include a number of alternative housing options for workers who choose to move to towns closer to the Alpha project. The Department also states that the proponent should contribute to the provision of adequate affordable housing to create a greater diversity of housing choice in the region.

In its SEIS submission, Barcaldine Regional Council state that mining and other industries need to work with and assist government and local communities to address accommodation issues created by development. The Council states there is a requirement for a regionally based plan focusing on existing town centres for provision of accommodation as the currently proposed on-site workforce is considered an 'isolated development'.

## Coordinator-General's conclusion

In order to mitigate the combined effects of pressure on housing demand of all projects happening close to the same timeframe, I believe it is important for each proponent to proactively accept responsibility for mitigating a significant part of their potential impact on housing supply.

While I understand the proponent's intention to house the majority of project workers on-site, I believe it is realistic to expect some demographic groups (eg. married workers with young families) to favour local accommodation rather than FIFO arrangements, and many skilled and long-term resource workers will transition in and out of this demographic group over time. It is also realistic to expect that a certain proportion of workers, (particularly contractors) will seek to settle in the region to take up job opportunities from the Project. This will contribute to competition for private rental accommodation in and around Alpha unless Hancock provides new dwellings for these employees.

Project proponents need to recognise that, no matter how effective their strategies might be, there will still be movement in the market resulting from construction activity and resultant pressure brought to bear on some people with fixed incomes.

Therefore, in addition to steps taken to satisfy their own workers' housing needs including contractors and sub-contractors who move to the region,, proponents must commit to supporting organisations that provide housing support services to those people adversely affected in the housing market by economic development.

I consider that this supply should be new stock to increase capacity of existing stock, rather than corporate leasing or purchase of existing properties. The construction demand for housing is temporary, and requiring permanent housing stock may result in surplus stock at the end of construction. However I am not proposing a target is applied to the construction of houses, but that careful monitoring and review will ensure a suitable amount of workers' homes and affordable housing is constructed, without negatively affecting the housing market in the longer term.

I conclude that the Local Housing Strategy as described in the draft SIMP does not provide sufficient detail to quantify the impacts of the Alpha Coal Project on the housing market in Alpha or surrounding areas, especially with respect to non-resident workers. Therefore, I impose Condition 10 (Appendix 2, Part C).

This condition is imposed to ensure the proponent further develops accommodation and housing mitigation and management strategies for inclusion in the Alpha Coal SIMP, including strategies for continued monitoring to assess the change in demand over time.

In order to mitigate the cumulative effects of pressure on housing demand if the planned projects proceed, I believe it important for each proponent to proactively take responsibility for their own Project specific impacts; as well as contributing to the mitigation of the combined impacts arising from all projects (that is where the combined impacts are greater than or different to the sum of the individual project impact).

## 10.13. Community services

### 10.13.1. Community medical and health services

The EIS Social Section 20.5.1.5 states:

- There are emergency hospitals in Alpha and Barcaldine
- There is no permanent doctor located in Alpha
- There is no Queensland Ambulance Service (QAS) station in Alpha, the area is serviced by a hospital ambulance attended by a volunteer driver and nurse. There is a QAS stationed in Barcaldine (pers. comm., 2010).

The lack of a permanent doctor; and QAS ambulance service in Alpha were listed as two of the things residents disliked most about living in the area. While there is a hospital, patients can only be admitted when there is a doctor on duty.

There are other health care facilities in Alpha including Home and Community Care (HACC), Royal Flying Doctor Service (RFDS) coverage, a visiting doctor, a hospital and now also a private pharmacy and a Patient Transport Service that provides subsidised transport to other centres for patients.

There are two organisations in the Barcaldine Regional Council area dedicated to providing health and community support services to Aboriginal and Torres Strait Island people, both are located in Barcaldine—Aboriginal and Islander Health Team and Central West Aboriginal Corporation.

Throughout the EIS and SEIS process, Queensland Health has requested that the proponent contribute to the following:

- Monitoring of road safety accidents and any increased emergencies to Emerald or Rockhampton. Any eventual impacts may require upgrades of hospital facilities in Emerald and/or Rockhampton
- Monitoring of demand for Alpha hospital given any future population growth; and close liaison with Queensland Health to inform future needs planning with potential capital contribution by the proponent
- Further discussion with the Queensland Ambulance Service regarding paramedics and ambulance provision
- Provide employees with access to socially responsible and healthy activities outside work hours in order to decrease the likelihood of disruption to nearby residents and towns
- Queensland Health also advised the Alpha community would benefit from a shared doctor arrangement that would enable the Alpha community to share the doctor from the mine's on-site medical clinic.

The proponent has committed to funding paramedics and the provision of an ambulance for Alpha.

The proponent's SIMP states it will develop Memoranda of Understanding with key service providers such as Queensland Health to define the circumstances and

protocols for accessing assistance from mine-based resources, and investigate the option of offering medical treatment to landholders and local communities.

Hancock Coal also proposes to implement a Fitness for Work Management Plan and Camp Management Plans including a Code of Conduct for worker accommodation village residents and a worker accommodation village Environmental Management Plan (EMP).

### **Coordinator-General's conclusion**

I note the concerns raised in the EIS and SEIS submissions from Queensland Health, in relation to monitoring of the demand for services; and in relation to Hancock's employees and contractors' workforce behaviour.

I commend the proponent for committing to working with Queensland Health in relation to accessing assistance from mine-based resources, and for developing behaviour protocols for Hancock Coal employees and contractors.

Based on this information, I have imposed conditions 11 and 12 (Appendix 2, Part C).

### **10.13.2. Police and emergency services**

As part of the EIS and SEIS process, QPS identified requirements for additional police resources, including staffing increases in Alpha. QPS anticipates the need for:

- a joint station in Alpha (with emergency services)
- an administration worker for the station, preferably employed from the local area
- two staff houses plus two police officers for Alpha
- one police vehicle for highway patrol in Alpha (road safety and calls for service)
- communications support (potentially combined with emergency services)
- two police escort vehicles to escort oversized loads in the Longreach district
- education and training programs for social issues such as domestic violence and drug and alcohol management.

In its SEIS submission, QPS welcomes the proponent's identification of QPS and other emergency service providers as key stakeholders in the ongoing consultation process.

In particular, QPS advises there are a limited number of escort vehicles in the Central Region and there will not be enough vehicles to escort the additional oversized loads associated with the Alpha Coal Project.

If this is the case, QPS will need to use operational vehicles for escort vehicles and this will have the potential to compromise core business activities like road safety and calls for service.

While the proponent has advised it will pay according to the QPS schedules for escort vehicles, this only takes into account the existing pool of escort vehicles and does not consider the additional vehicles required for the increase in oversized loads from the Alpha Coal Project.

For this reason, I have imposed Condition 13 (Appendix 2, Part C) which requires the proponent to consult with QPS regarding potential impacts on police service provision

and to make a financial contribution towards mitigating these impacts throughout the region.

QPS requires consultation in relation to the development of Emergency Management Plans and Disaster Management Plans to ensure appropriate notification and management protocols are in place.

QPS also requires involvement in the development of traffic management plans and requires protocols included for QPS notification of relevant on site traffic incidents.

The proponent has committed to actively involving QPS in the development of the Traffic Management Plan; and exploring road safety programs in conjunction with local police and emergency service providers. The mine site will also have an Emergency Management Plan as part of a Health and Safety Management Plan.

The Department of Community Safety notes in its SEIS submission that it is understood the proponent will comply where necessary with relevant Queensland statutory legislation and will implement safety and health management systems so as to mitigate hazard and risk.

The proponent has committed to consulting with relevant emergency service providers in relation to implementing safety and health management systems. For example, Hancock will consult with local emergency providers in the development of the Emergency Management Plan and on going implementation. The proponent has committed to having regard to statutory requirements, roles and responsibilities for emergency service providers in relation to disaster management and response, and management and response to other incidents.

The proponent will also implement a Road Safety Plan including road infrastructure improvements where required and a road safety awareness program for project personnel and local residents. Affected landholders and residents will be consulted in the development of these plans as per the Alpha Coal Project Community and Stakeholder Engagement Plan.

### **Coordinator-General's conclusion**

I note the concerns raised in the EIS and SEIS submissions by QPS in relation to anticipated increased demand on QPS resourcing in Alpha.

Based on this information, I impose Condition 13 (Appendix 2, Part C) in relation to police and emergency services delivery.

# 11. Matters of national environmental significance

## 11.1. Introduction

This section of the report addresses those sections of Part 5 of the State Development and Public Works Organisation Regulation 1999 that deal with the requirements of the report to address Australian Government matters for proposals:

- declared as a significant project for which an EIS is required
- for which the Australian Government has accredited assessment of the relevant impacts pursuant to the Queensland *State Development and Public Works Organisation Act 1971* (SDPWO Act)
- for which EIS assessment has been undertaken in accordance with the Bilateral Agreement between the Commonwealth and the State of Queensland relating to environmental assessment.

This section provides an evaluation of the potential impacts of the project on ‘matters of national environmental significance’ (MNES) determined by the Australian Government to be controlling provisions under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) (EPBC Act).

The impacts of the project on MNES are also included as components of the evaluation of ecological and water quality issues generally in respective sections of this report. For example, terrestrial ecology matters—covering both state and nationally significant matters—are addressed in sections 5.1 and 8.1 of this report for the mine and rail project components respectively.

## 11.2. Controlling provisions

On 11 December 2008, the project was referred to the then Commonwealth Minister for Environment, Heritage and Arts (now the Commonwealth Minister for Sustainability, Environment, Water, Population and Communities—hereafter referred to as the Commonwealth Environment Minister) for assessment under the EPBC Act. The EPBC Act establishes an Australian Government process for assessment and approval of proposed actions that are likely to have a significant impact on MNES, Commonwealth land, or actions undertaken by the Australian Government.

On 13 January 2009, the delegate of the Commonwealth Environment Minister determined the project to be a ‘controlled action’ pursuant to section 75 of the EPBC Act. The relevant controlling provisions for the project were determined as:

- Section 18 and 18A—Listed threatened species and ecological communities
- Section 12 and 15A—World Heritage areas
- Section 15B and 15C—National Heritage places
- Section 20 and 20A—Listed migratory species

Under the terms of the bilateral agreement, the Alpha project EIS was required to address both State and Australian Government matters. The controlled actions may be considered for approval under section 133 of the EPBC Act once the Commonwealth Environment Minister has received this Evaluation Report.

### 11.3. Assessment process

Potential impacts to MNES have been assessed throughout the EIS process for the project. The process largely assessed the impacts of the mine and rail components of the project separately. These were reported in:

- EIS:
  - Volume 4 Appendix C, EPBC Report
  - Volume 2, Coal Mine, Section 9 Terrestrial Ecology, Section 10 Aquatic Ecology and Stygofauna
  - Volume 3 Rail Corridor, Section 9 Terrestrial Ecology, Section 10 Aquatic Ecology
- Supplementary EIS (SEIS):
  - Volume 2 Appendix AM Coal Mine Aquatic Ecology
  - Volume 2 Appendix X Railway Corridor—Offset Strategy
  - Volume 2 Appendix AA Railway Corridor—Species Management Plan
  - Volume 2 Appendix AE Railway Corridor—Updated Terrestrial Ecology Report
  - Volume 2 Appendix A1 Railway Corridor—Caley Valley Wetland Freshwater Aquatic Flora and Fauna Assessment for the Rail Loop
  - Volume 2 Appendix FA EPBC Report—Mine
  - Volume 2 Appendix FB EPBC Report—Rail.

During the latter stages of the EIS process, additional work was undertaken to bring together previous work and better understand, analyse and synthesise the potential impacts of the whole project on MNES. This work has been documented in a stand-alone report dated 19 April 2012 entitled ‘Eco Logical Australia April 2012 *Alpha Coal Project EPBC Act report* prepared for Hancock Coal’ (referred to herein as ‘the EPBC Act report’).

In addition to this supplementary document, a revised draft offset strategy dated 13 April 2012 entitled ‘Eco Logical Australia 2012 *Alpha Coal Project Biodiversity Offset Strategy* prepared for Hancock Coal Pty Ltd (HCPL)’ was assessed in relation to proposed biodiversity offset requirements for residual impacts on MNES that could not be avoided or mitigated.

The evaluation of potential impacts on MNES presented in this section of this Evaluation Report is based on the information contained in the EIS, SEIS and these two most recent documents. However, at the time of writing this report, I had not received detailed comments or advice from either SEWPaC or state agencies on the EPBC Act report or the revised draft Biodiversity Offsets Strategy. SEWPaC has provided some preliminary comments which I have taken into account.

## 11.4. Occurrence of MNES

A broad list of MNES with the potential to occur within the project region was generated by the proponent through:

- a search of protected matters using SEWPaC's online Protected Matters Search Tool (PMST)
- searches of Queensland-based databases for records of threatened species within the region
- discussions with flora and fauna ecologists with field experience in the local area.

The MNES included in this broad list were then assessed by the proponent to determine their likelihood of occurrence within the project area. This assessment took into account:

- results of field surveys and any existing data for the region more broadly
- the habitat requirements and known distribution of species and ecological communities
- professional judgement from the relevant project ecologists.

The 'likelihood of occurrence' assessment categorised MNES into five categories as follows:

Known =	the species or ecological community was or has been observed on the site
Likely =	a medium to high probability that a species or ecological community occurs on the site
Potentially occurring =	suitable habitat for a species or ecological community occurs on the site, but there is insufficient information to categorise the species or ecological community as likely to occur, or unlikely to occur
Unlikely to occur =	a very low to low probability that a species or ecological community occurs on the site
Not occurring =	habitat on the site and in the vicinity is unsuitable for the species or ecological community

The results of the assessment are summarised in the tables below in relation to listed threatened species, ecological communities and listed migratory species.

### 11.4.1. Listed threatened species, ecological communities and migratory species

Table 11.1 Flora

Scientific name	Common name	EPBC listing status	Likelihood of occurrence
<i>Acacia ramiflora</i>		Vulnerable	Unlikely
<i>Aristida granitica</i>		Endangered	Unlikely
<i>Cadellia pentastylis</i>	Ooline	Vulnerable	Unlikely
<i>Cajanus mareebensis</i>		Endangered	Not occurring
<i>Corymbia clandestina</i>		Vulnerable	Unlikely
<i>Croton magneticus</i>		Vulnerable	Potentially occurring
<i>Cycas opiolitica</i>		Endangered	Not occurring
<i>Dichanthium queenslandicum</i>	King Blue-grass	Vulnerable	Likely
<i>Dichanthium setosum</i>		Vulnerable	Likely
<i>Digitaria porrecta</i>	Finger Panic Grass	Endangered	Potentially occurring
<i>Eucalyptus raveretiana</i>	Black Ironbox	Vulnerable	Known
<i>Leucopogon cuspidatus</i>		Vulnerable	Unlikely
<i>Omphalea celata</i>		Vulnerable	Unlikely
<i>Macrozamia platyrhachis</i>		Endangered	Unlikely
<i>Macrozamia fearnsidei</i>		Vulnerable	Unlikely
<i>Marsdenia brevifolia</i>		Vulnerable	Unlikely
<i>Lepidium hyssopifolium</i>		Endangered	Unlikely
<i>Commersonia argentea</i>		Vulnerable	Unlikely
<i>Bertya opposens</i>		Vulnerable	Unlikely
<i>Daviesia discolour</i>		Unlikely	Unlikely
<i>Haloragis exalata</i> subsp. <i>Velutina</i>		Vulnerable	Unlikely
<i>Logania diffusa</i>		Vulnerable	Unlikely
<i>Acacia grandiflora</i>		Vulnerable	Unlikely
<i>Acacia pubifolia</i>		Vulnerable	Unlikely
<i>Homoranthus decumbens</i>		Vulnerable	Unlikely

Scientific name	Common name	EPBC listing status	Likelihood of occurrence
<i>Polianthion minutiflorum</i>		Vulnerable	Unlikely
<i>Thesium australe</i>		Vulnerable	Unlikely
<i>Phaius australis</i>		Endangered	Unlikely
<i>Anthraxon hispidus</i>		Vulnerable	Unlikely
<i>Aristida annua</i>		Vulnerable	Unlikely
<i>Ozothamnus eriocephalus</i>		Vulnerable	Potentially occurring
<i>Polianthion minutiflorum</i>		Vulnerable	Unlikely
<i>Taeniophyllum muelleri</i>	Minute orchid, ribbon-root orchid	Vulnerable	Potentially occurring

**Table 11.2 Birds**

Scientific name	Common name	EPBC listing status	Likelihood of occurrence
<i>Erythrotriorchis radiatus</i>	Red goshawk	Vulnerable	Potentially occurring
<i>Fregetta grallaria grallaria</i>	White-bellied storm-petrel (Tasman Sea), white-bellied storm-petrel (Australasian)	Vulnerable	Unlikely
<i>Geophaps scripta scripta</i>	Squatter pigeon	Vulnerable	Known
<i>Neochmia ruficauda ruficauda</i>	Star finch	Endangered	Unlikely
<i>Anthochaera phrygia</i>	Regent honeyeater	Endangered	Unlikely
<i>Lathamus discolor</i>	Swift parrot	Endangered	Unlikely
<i>Turnix melanogaster</i>	Black-breasted button quail	Vulnerable	Unlikely
<i>Pedionomus toquatus</i>	Plains wanderer	Vulnerable	Unlikely
<i>Neochmia phaeton phaeton</i>	Crimson finch	Endangered	Unlikely
<i>Poephila cincta cincta</i>	Black-throated finch	Endangered	Likely
<i>Rostratula australis</i>	Australian painted snipe	Vulnerable Migratory	Likely

**Table 11.3 Mammals**

Scientific name	Common name	EPBC listing status	Likelihood of occurrence
<i>Balaenoptera musculus</i>	Blue whale	Endangered	Not occurring
<i>Dasyurus hallucatus</i>	Northern quoll	Endangered	Potentially occurring
<i>Megaptera novaeangliae</i>	Humpback whale	Vulnerable	Not occurring
<i>Nyctophilus timoriensis</i> (South-eastern form)	Greater long-eared bat, south-eastern long-eared bat	Vulnerable	Potentially occurring
<i>Pteropus conspicillatus</i>	Spectacled flying-fox	Vulnerable	Not occurring
<i>Rhinolophus philippinensis</i> (large form)	Greater large-eared horseshoe bat	Endangered	Not occurring
<i>Chalinolobus dwyeri</i>	Large-eared pied bat	Vulnerable	Unlikely
<i>Xeromys myoides</i>	Water mouse, false water rat	Vulnerable	Unlikely
<i>Sminthopsis douglasi</i>	Julia Creek dunnart	Endangered	Not occurring
<i>Lasiiorhinus krefftii</i>	Northern hairy-nosed wombat	Endangered	Unlikely
<i>Dasyurus maculatus maculatus</i>	Spotted-tailed quoll	Endangered	Unlikely
<i>Dasyurus geoffroii geoffroii</i>	Western quoll	Vulnerable	Unlikely
<i>Onychogalea fraenata</i>	Bridled nailtail wallaby	Endangered	Unlikely
<i>Bettongia tropica</i>	Northern bettong	Endangered	Not occurring

**Table 11.4 Reptiles**

Scientific name	Common name	EPBC listing status	Likelihood of occurrence
<i>Caretta caretta</i>	Loggerhead turtle	Endangered	Not occurring
<i>Chelonia mydas</i>	Green turtle	Vulnerable	Not occurring
<i>Delma labialis</i>	Striped-tailed delma, Single-striped delma	Vulnerable	Potentially occurring
<i>Denisonia maculata</i>	Ornamental snake	Vulnerable	Known
<i>Dermochelys coriacea</i>	Leatherback turtle	Endangered	Not occurring
<i>Egernia rugosa</i>	Yakka skink	Vulnerable	Likely
<i>Eretmochelys imbricata</i>	Hawksbill turtle	Vulnerable	Not occurring
<i>Furina dunmalli</i>	Dunmall's snake	Vulnerable	Potentially occurring

Scientific name	Common name	EPBC listing status	Likelihood of occurrence
<i>Lepidochelys olivacea</i>	Olive ridley turtle, Pacific ridley turtle	Endangered	Not occurring
<i>Lerista allanae</i>	Allan's lerista, retro slider	Endangered	Potentially occurring
<i>Lerista vittata</i>	Mount Cooper striped lerista	Vulnerable	Unlikely
<i>Delma torquate</i>	Collared delma	Vulnerable	Unlikely
<i>Natator depressus</i>	Flatback turtle	Vulnerable	Not occurring
<i>Paradelma orientalis</i>	Brigalow scaly-foot	Vulnerable	Likely
<i>Rheodytes leukops</i>	Fitzroy River turtle, Fitzroy tortoise, Fitzroy turtle	Vulnerable	Not occurring

**Table 11.5 Sharks**

Scientific name	Common name	EPBC listing status	Likelihood of occurrence
<i>Pristis zijsron</i>	Green sawfish, Dindagubba, narrowsnout sawfish	Vulnerable	Not occurring
<i>Rhincodon typus</i>	Whale shark	Vulnerable	Not occurring

**Table 11.6 Threatened ecological communities**

Name	EPBC listing status	Likelihood of occurrence
Brigalow ( <i>Acacia harpophylla</i> dominant and co-dominant)	Endangered	Known
Natural Grasslands of the Queensland Central Highlands and the northern Fitzroy Basin	Endangered	Known
Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions	Endangered	Known
The community of native species dependent on natural discharge of groundwater from the Great Artesian Basin	Endangered	Not occurring
Weeping Myall Woodlands	Endangered	Not occurring

## 11.4.2. Listed migratory species

**Table 11.7** Migratory shorebirds

Scientific name	Common name	EPBC listing status	Likelihood of occurrence
<i>Actitis hypoleucos</i>	Common sandpiper	Migratory	Likely
<i>Calidris acuminata</i>	Sharp-tailed sandpiper	Migratory	Likely
<i>Calidris ruficollis</i>	Red-necked stint	Migratory	Likely
<i>Charadrius veredus</i>	Oriental plover	Migratory	Likely
<i>Gallinago hardwickii</i>	Latham's snipe	Migratory	Likely
<i>Numenius madagascariensis</i>	Eastern curlew	Migratory	Likely
<i>Numenius minutus</i>	Little curlew	Migratory	Likely
<i>Numenius phaeopus</i>	Whimbrel	Migratory	Likely
<i>Pulialis fulva</i>	Golden plover	Migratory	Likely
<i>Tringa brevipes</i>	Grey-tailed tattler	Migratory	Likely
<i>Tringa incana</i>	Wandering tattler	Migratory	Likely
<i>Tringa nebularia</i>	Common greenshank	Migratory	Likely
<i>Tringa stagnatilis</i>	Marsh sandpiper	Migratory	Likely

**Table 11.8** Migratory marine birds

Scientific name	Common name	EPBC listing status	Likelihood of occurrence
<i>Apus pacificus</i>	Fork-tailed Swift	Migratory	Likely
<i>Ardea alba</i>	Great Egret, White Egret	Migratory	Known
<i>Ardea ibis</i>	Cattle Egret	Migratory	Likely
<i>Sterna albifrons</i>	Little Tern	Migratory	Unlikely

**Table 11.9** Migratory terrestrial birds

Scientific name	Common name	EPBC listing status	Likelihood of occurrence
<i>Haliaeetus leucogaster</i>	White-bellied sea eagle	Migratory	Likely
<i>Hirundapus caudacutus</i>	White-throated needletail	Migratory	Potentially occurring
<i>Hirundo rustica</i>	Barn swallow	Migratory	Potentially occurring

Scientific name	Common name	EPBC listing status	Likelihood of occurrence
<i>Merops ornatus</i>	Rainbow bee-eater	Migratory	Known
<i>Monarcha melanopsis</i>	Black-faced monarch	Migratory	Potentially occurring
<i>Monarcha trivirgatus</i>	Spectacled monarch	Migratory	Potentially occurring
<i>Myiagra cyanoleuca</i>	Satin flycatcher	Migratory	Likely
<i>Falco hypoleucos</i>	Grey falcon	Migratory	Unlikely
<i>Tadorna radjah</i>	Radjah shelduck	Migratory	Unlikely
<i>Lophoictinia isura</i>	Square-tailed kit	Migratory	Unlikely

**Table 11.10 Migratory wetland species(excluding migratory shorebirds and migratory marine birds)**

Scientific name	Common name	EPBC listing status	Likelihood of occurrence
<i>Rostratula australis</i>	Australian painted snipe	Migratory Vulnerable	Likely

**Table 11.11 Migratory marine species**

Scientific name	Common name	EPBC listing status	Likelihood of occurrence
<i>Balaenoptera edeni</i>	Bryde's whale	Migratory	Not occurring
<i>Balaenoptera musculus</i>	Blue whale	Migratory Endangered	Not occurring
<i>Caretta caretta</i>	Loggerhead turtle	Migratory Endangered	Not occurring
<i>Chelonia mydas</i>	Green turtle	Migratory Vulnerable	Not occurring
<i>Crocodylus porosus</i>	Salt-water crocodile, estuarine crocodile	Migratory	Potentially occurring
<i>Dermochelys coriacea</i>	Leatherback turtle, leathery turtle, luth	Migratory Endangered	Not occurring
<i>Dugong dugon</i>	Dugong	Migratory	Not occurring
<i>Eretmochelys imbricata</i>	Hawksbill turtle	Migratory Vulnerable	Not occurring
<i>Lamna nasus</i>	Porbeagle, mackerel shark	Migratory	Not occurring
<i>Lepidochelys olivacea</i>	Olive ridley turtle, Pacific ridley turtle	Migratory Endangered	Unlikely
<i>Megaptera novaeangliae</i>	Humpback whale	Migratory Vulnerable	Unlikely

Scientific name	Common name	EPBC listing status	Likelihood of occurrence
<i>Natator depressus</i>	Flatback turtle	Migratory Vulnerable	Not occurring
<i>Orcaella brevirostris</i>	Irrawaddy dolphin	Migratory	Not occurring
<i>Orcinus orca</i>	Killer whale, orca	Migratory	Not occurring
<i>Rhincodon typus</i>	Whale shark	Migratory Vulnerable	Not occurring
<i>Sousa chinensis</i>	Indo-Pacific humpback dolphin	Migratory	Not occurring

## 11.5. Potential impacts

The potential impacts of the project's construction and operation activities on threatened species are summarised below. The construction of the mine and rail and associated infrastructure has the potential to affect fauna populations through broad-scale vegetation clearing and habitat loss, population isolation, edge and barrier effects, and an increase in mortality from mine and rail activities and increased traffic and road use.

More specifically, the following potential impacts may result from the proposed works at the mine and rail construction sites:

- land clearing and mining activities may reduce the available breeding and foraging habitat
- increased risk of mortality resulting from vehicle strike and the destruction of tree hollows
- disruption of species behaviour
- increased habitat fragmentation and loss of connectivity across the mine infrastructure and pit areas
- diversion of creeks could reduce the extent of riparian habitats and contribute to habitat fragmentation
- an increase in noise, vibration and dust associated with the construction and operational phases of the project may lead to the displacement of species from their current home ranges
- changes in flow patterns accompanied with an increased risk of erosion on site and sedimentation in riparian woodlands downstream of the proposed mine site leading to a loss of morphological diversity in streams, adversely affecting habitat quality that may result in biodiversity loss in affected areas
- an increase of introduced fauna species may occur, including the cane toad, feral pig, European rabbit, house mouse and feral goat
- mine-related infrastructure, such as sediment dams, may be accessible to fauna and may be additional water sources, altering the ecological balance
- vegetation clearing will result in a localised reduction in the amount of roost and nesting sites, microhabitats and potential foraging areas for many fauna species,

adding to population pressure (such as competition for roost sites, mates and food resources) and may potentially lead to decreased population viability

- in the long term certain species, including the southern squatter pigeon, may benefit by rehabilitation of disturbed areas with native species, providing grassland habitat which is not dominated by introduced buffel grass.

## **11.6. Assessment approach for threatened species and ecological communities**

The impact assessment presented in the EIS documentation and the EPBC Act report was based on the proposed rail alignment as of September 2010 (approximately 495 kilometres in length and 60 metres wide), and the proposed mine site footprint, as shown in Figure 2.2 (page 6 of this report).

The EPBC Act report presented a detailed assessment of those species or ecological communities determined to have a 'known', 'likely' or 'potentially occurring' likelihood of occurrence. The assessment was informed through field surveys, high resolution aerial photograph interpretation and potential habitat modelling for threatened species. The field surveys were conducted in accordance with the requirements of the EIS terms of reference. Eight site visits to conduct flora assessments across the mine study area and surrounding areas were undertaken between June 2008 and June 2010. Flora and fauna surveys were conducted to obtain ecological information relevant to the project and to ground-truth results from the desktop assessments. Details are provided in the EPBC Act report.

The results of the mine site surveys were provided in Volume 5 Appendix E1 to the Alpha Rail EIS.

Due to weather and access constraints, field surveys of the rail alignment were less comprehensive compared with the mine site. The results of these surveys were provided in Volume 6 Appendix F2 of the Rail EIS. In order to improve the accuracy of regional ecosystem (RE) mapping within areas of the rail alignment which could not be accessed, high resolution (1:10 000) aerial photographs were analysed.

SEWPaC has advised that the level of survey effort applied to the project, given its scale, do not meet the department's survey guidelines. Therefore modelling and compensation (offset) proposals must adopt an appropriate response to the resulting risks.

### **11.6.1. Threatened species potential habitat modelling**

Potential habitat modelling for threatened species was undertaken to provide landscape context and supplement species survey data—particularly relevant where there was restricted access along the rail alignment. Data used in the modelling and modelling methodology was detailed in the EPBC Act report.

The first stage of potential habitat modelling was completed for the SEIS and was undertaken for all species identified as 'known', 'likely' or 'potentially occurring'. This

modelling was then refined for the EPBC Act report and only applied to species identified as 'known' or 'likely'. These included:

- black-throated finch (likely)
- king blue grass (likely)
- black ironbox (known)
- *Dicanthium setosum* (likely)
- ornamental snake (known)
- yakka skink (likely)
- Brigalow scaly-foot (likely).

Although known to occur within the mine site and rail alignment, potential habitat modelling was not undertaken for the squatter pigeon because the species' habitat preferences were not found to correlate well with the key data sources used in the modelling.

Potential habitat modelling was also not undertaken as part of the refinement for 'potentially occurring' species. Species identified as 'potentially occurring' tend to have core distributions and areas of preferred habitat outside of the project area. As such, there was limited information available to inform the criteria used to predict suitable habitat features within the project landscape. The EPBC Act report concluded that a predictive habitat modelling approach for these species was not appropriate, as it was not able to realistically reflect the species' potential use of habitat in the area.

### **11.6.2. Connectivity analysis**

The species habitat modelling was also used as a tool to understand broad connectivity values within the landscape for threatened fauna species. A reduction in connectivity for threatened species has the potential to further increase impacts. For this reason, the EPBC Act report sought to understand the presence and potential loss of this function to determine the overall impact on the species from the project.

The methodology used in the connectivity analysis included an assessment of the:

- connectivity potential of remnant habitat throughout the region surrounding the project
- likely impact on this habitat from the proposed project footprint (both the mine and rail components).

The methodology focused on the identification of potential connectivity on a species by species basis. Two data inputs were used:

- species habitat models described above which identify areas of 'high potential habitat' and 'low potential habitat'
- DERM State Corridor Mapping completed for the Biodiversity Planning Assessment process for the Brigalow Belt North and Desert Uplands bioregions.

### 11.6.3. Limitations

The EPBC Act report acknowledged there were limitations in the level of information used to inform the impact assessment of MNES. This particularly related to survey effort and extent along areas of the rail alignment where access was constrained.

The EPBC Act report identified the key potential areas of risk in relation to this issue:

- (1) The possibility that the maximum extent and location of potential habitat and impacts to threatened species are not identified (i.e. the assessment information is not conservative enough and impacts could be greater than expected).
- (2) Conversely, the possibility that potentially important areas for threatened species are not identified (i.e. the assessment information is too conservative and does not focus on core areas for a species that could be impacted).

The proponent's impact assessment was deliberately conservative (i.e. the extent of impacts are likely to be over-estimated), with reported impacts representing worst case scenarios. The EPBC Act report concluded that the combined use of survey information, high resolution aerial photography and use of experts in generating the species habitat models adequately addresses the risks to enable informed decision-making under the EPBC Act.

SEWPaC have advised of a concern that extrapolation of habitat quality for aerial photographs may prove to be unreliable, particularly in relation to the importance of understorey composition to species such as the Squatter Pigeon and Ornamental Snake.

Acknowledging that there is some level of on-ground detail yet to be obtained, the EPBC Act report proposed a post-approvals process relating to key species (those identified as 'known' or 'likely' to occur) to ensure that any residual uncertainty is removed and the outcomes for MNES—in terms of avoidance, mitigation and offsets—are as accurate as possible in reflecting on-ground impacts.

## 11.7. Threatened flora

### 11.7.1. Identified flora species

The EPBC Act report identified seven flora species considered to be 'known', 'likely' or 'potentially occurring'. The flora species identified as 'potentially occurring' included:

- *Croton magneticus*
- finger panic grass, *Digitaria porrecta*
- *Ozothamnus eriocephalus*
- minute orchid, *Taeniophyllum muelleri*.

The EPBC Act report concluded that the areas of potentially suitable habitat for these species within the mine site and rail alignment were marginal, with a low risk that the project would lead to significant impacts. The reasoning for this generally related to two key factors:

- (a) the mine site and rail alignment is located outside of their known core distributions and key populations
- (b) the areas of potentially suitable habitat within the mine site and/or rail alignment are limited.

The EPBC Act report analysed these issues on a species basis. The results of this analysis are summarised in the table below.

**Table 11.12 'Potentially occurring' flora species analysis**

Species	Issues considered when analysing risk	Outcome
<i>Croton magneticus</i>	Species grows in deciduous vine thickets on soils derived from sandstone, granite or acid agglomerate substrates. Sizeable known populations are located outside of the project area with populations protected throughout its range.  Suitable habitat within the project area is limited—confined to upland areas to the north of the rail within patches of Semi-evergreen Vine Thicket. The project does not pass through any high quality habitat areas.	Low risk of significant impacts.
Finger panic grass	Species usually occurs in grasslands on extensive basaltic plains, and in undulating woodlands and open forests with an underlying basaltic geology.  The species' distribution occurs within four disjunct areas from NSW to Queensland. The project area contains limited suitable habitat. This distribution falls outside and to the south of the project area with the majority (75%) of individuals occurring within NSW.	Low risk of significant impacts.
<i>Ozothamnus eriocephalus</i>	Species primarily grows on rocky escarpments, slopes and creek gullies in closed rainforest margins and open eucalypt forest. Known from five areas within its distribution along the central coast of Queensland, all of which are outside of the project area and three are protected within National Parks.  Potentially suitable habitat for this species exists within the northern part of the rail alignment and is very limited.	Low risk of significant impacts.
Minute Orchid	The species is understood to form colonies inhabiting shaded gullies and lower slopes in closed forests. Its range extends from the Bellinger River to Far North Queensland where it is restricted to the coast and coastal ranges in areas from sea level to 250 m altitude and has been recorded at only 75 sites.  Potentially suitable habitat for this species exists within the terminus of the rail alignment and is very limited. The project will not impact on known sites.	Low risk of significant impacts.

The EPBC Act report concluded that there is a low risk of significant impacts to any of the four flora species identified as 'potentially occurring' as described above, due to the presence of only marginal potential habitat within the mine site and rail alignment.

The EPBC Act report identified three flora species as either 'known' or 'likely' to occur within the mine site or rail alignment, including:

- *Eucalyptus raveretiana*, which is known to occur towards the northern end of the rail alignment
- king bluegrass, *Dichanthium queenslandicum*, which has been identified as likely to occur within suitable habitat areas across the mine site and rail alignment
- *Dichanthium setosum*, which has been identified as likely to occur within suitable habitat areas across the mine site and rail alignment.

### ***Eucalyptus raveretiana***

This species, which is a medium-sized eucalypt, grows along water courses and occasionally on river flats and open woodland. It is listed as vulnerable under the EPBC Act.

The species was recorded during field surveys along the banks of the Elliot River, towards the northern part of the rail alignment. At this location, *E. raveretiana* was a dominant component of the fringing riparian vegetation. The extent of this occurrence or number of individuals was not reported. However, the EIS indicated that, as one of the dominant species along the river, the occurrence would likely extend for at least four kilometres.

Potential habitat modelling was undertaken for *E. raveretiana* as part of the EPBC Act report to understand the extent of potential habitat within the project footprint and more broadly across the landscape. The modelling identified around 29 hectares of high potential habitat and 2 hectares of low potential habitat for *E. raveretiana* within the rail alignment. There is no potential habitat within the mine site. Based on the modelling, this combined area represents around 0.45 per cent of potential habitat within the region.

The EPBC Act report identified the following issues relevant to *E. raveretiana*:

- Construction of the proposed railway is likely to lead to the loss of some individuals of *E. raveretiana* along the banks of the Elliot River. The survey site where this species was observed is around four kilometres upstream of the rail alignment; however, as it was one of the dominant species along the river, the report concluded that it is highly likely the species will be present at the location of the current crossing point, which could not be accessed at the time of surveys.
- The species is a medium sized eucalypt which occurs as one of the dominant species in the canopy layer. Given the combination of survey effort and analysis of high resolution aerial photographs, the report concluded that there would be a low risk of impacts to any occurrences of the species outside the construction zone.
- The proponent will seek to mitigate impacts to river water quality as a result of point-source pollution from sedimentation and run-off as part of the implementation of the general sediment and erosion control measures.
- Introduction of weeds. The species is particularly threatened by rubber vine, *Cryptostegia grandiflora*.

The proponent has committed to implementing the following measures to specifically address impacts to *E. raveretiana*:

- The removal of individual *E. raveretiana* will be avoided through micro-alignment wherever possible.
- Where removal of trees cannot be avoided, seeds from *E. raveretiana* trees will be collected prior to clearing for either redistribution in adjacent areas, for addition to the seed stock of a suitable conservation group, or to supplement rehabilitation efforts in approved offset areas.
- As part of the standard weed control measures, a particular focus will be placed on the control of rubber vine where the alignment crosses known or high potential habitat for *E. raveretiana*.

The EPBC Act report concluded that the residual impacts to this species as a result of the project are unlikely to be significant for the following reasons:

- the occurrence of *E. raveretiana* is not considered to be important or notable at the species level as it is within its existing known distribution (i.e. not on the edge of its range) and there is nothing atypical about the habitat in which it has been located
- habitat modelling for *E. raveretiana* has provided an understanding of the extent of potential habitat within the project area and local region. Impacts estimated using this model are likely to be conservative
- given the level of survey effort and aerial photograph interpretation for this species, it is considered unlikely for it to occur in additional areas within the proposed railway. However, as a precautionary approach, a set of post-approval targeted surveys will be undertaken to ensure that additional occurrences are identified and appropriate avoidance and offset measures implemented.

In order to provide a net positive outcome for this species, the proponent has committed to the provision of biodiversity offsets specific to this species. Details of these offsets are outlined in Section 11.13 of this report. I expect that surveys for this species will be conducted during the detailed design phase for the rail line (refer Appendix 4, Condition 15)

### ***Dichanthium queenslandicum***

*D. queenslandicum*, or king bluegrass, is a perennial bluegrass species, which is known to occur as a component of Natural grasslands of the Queensland Central Highlands and the northern Fitzroy Basin (Natural Grasslands TEC)—an endangered ecological community listed under the EPBC Act.

The species was recorded as part of field surveys of the mine site or rail alignment. However, there are a number of records within the region of the rail alignment.

Potential habitat modelling was undertaken for *D. queenslandicum* as part of the EPBC Act report to understand the extent of potential habitat within the project footprint and more broadly across the landscape. The modelling identified around 89 hectares of high potential habitat and 33 hectares of low potential habitat for *D. queenslandicum* within the rail alignment. Based on the modelling, this combined area represents around 0.12 per cent of potential habitat within the region. There is no potential habitat within the mine site, which has been confirmed by field surveys.

The following issues were discussed as part of the impact analysis for *D. queenslandicum* in the EPBC Act report:

- There will be no loss of known records. The report recognises that targeted surveys within all areas of potential habitat along the rail alignment have not been undertaken. As a result, there is some potential that the area supports an important population or habitat for the species.
- Habitat modelling for *D. queenslandicum* has provided an understanding of the extent of potential habitat within the project area and local region. Impacts estimated using this model are likely to be conservative.
- Areas of potentially important habitat may occur within the railway; however, these areas will only be subject to localised and linear impacts which are unlikely to substantially reduce the extent of habitat within the landscape. A set of post-approval investigations proposed for the species is expected to identify and address impacts to any potentially important areas along the railway and respond appropriately through avoidance and offsets.

The EPBC Act report acknowledged that residual impacts will occur to *D. queenslandicum* as a result of the project. In order to provide a net positive outcome for this species, the proponent has committed to provide biodiversity offsets specific to this species. Details of these offsets are outlined in Section 11.13 of this report.

### ***Dichanthium setosum***

*D. setosum* is another perennial bluegrass species. However, this species is known to occur within a broad range of habitats, including non-remnant and disturbed areas. It is widespread in a number of central Queensland pastoral districts.

The species has not been recorded as part of field surveys of the mine site or rail alignment. However, there are a number of records within the region.

Potential habitat modelling was undertaken for *D. setosum* as part of the EPBC Act report to understand the extent of potential habitat within the project footprint and more broadly across the landscape. For *D. setosum*, the modelling identified around:

- 217 hectares of high potential habitat within the rail alignment
- no areas of high potential habitat within the mine site
- 2326 hectares of low potential habitat within the rail alignment
- 8632 hectares of low potential habitat within the mine site.

The following issues were discussed in the EPBC Act report:

- There will be no loss of known records. The predicted loss of high and low potential habitat represents approximately 0.23 per cent of similar potential habitat within the region.
- Habitat modelling for *D. setosum* has provided an understanding of the extent of potential habitat within the project area and local region. Impacts estimated using this model are likely to be conservative.
- Areas of potentially important habitat may occur within the railway; however, these areas will only be subject to localised and linear impacts which are unlikely to

substantially reduce the extent of habitat within the landscape. A set of post-approval investigations proposed for the species is expected to identify and address impacts to any potentially important areas along the railway and respond appropriately through avoidance and offsets.

The EPBC Act report acknowledges that residual impacts will occur to *D. setosum* as a result of the project. In order to provide a net positive outcome for this species, the proponent has committed to provide biodiversity offsets specific to this species. Details of these offsets are outlined in Section 11.13 of this report.

### **11.7.2. Potential impacts and mitigation**

The proponent stated that the early design and layout of the mine and rail infrastructure will maximise the use of existing cleared or degraded areas wherever practicable. However, the scale of the project, particularly the open-cut mine operations, means that substantial areas of vegetation and potential habitat will be cleared.

Vegetated areas adjacent to active construction and operation zones may become affected by dust generated by earthworks, vehicle movements along dirt roads and the extraction and transport of coal. Excessive dust on the leaves of plants could impact negatively on vegetation; for instance, through suppressed growth or the deposition of volatile contaminants. The proponent has committed to a range of mechanisms to manage dust impacts to below project air quality goals, which relate to standards designed for human health and are considered to be below the threshold for any likely adverse impacts on surrounding vegetation.

The construction and operation phases have the potential to alter surface flows and/or impact water quality. These may impact species or habitat dependent on these water sources. Vegetated areas adjacent to project construction and operation have the potential to be adversely impacted by 'edge effects'. 'Edge effects' may include the introduction of weeds and pest species into adjoining vegetation, increased risk of fire to adjoining vegetation and point source pollution from sedimentation and run-off.

Specific measures to mitigate these potential impacts on MNES were not detailed in the EPBC Act report. However, the proponent has committed to implement a suite of mitigation measures to address the range of potential project impacts on vegetation in general. These have been outlined in the EPBC Act report as they relate broadly to MNES.

The proponent has stated that native vegetation removal will be conducted only after:

- the areas to be cleared have been clearly delineated and identified to equipment operators and supervisors
- weed control measures, such as vehicle wash-downs, have been implemented to prevent the spread of weed species along riparian corridors
- appropriate erosion and sediment-control structures are in place
- clearance from environmental staff has been obtained.

On the mine site, proponent commitments to manage vegetation impacts will be incorporated in the statutory environmental management plan (EM plan) to be submitted to the Queensland Department of Environment and Heritage Protection

(DEHP) under the *Environmental Protection Act 1994* (Qld) (EP Act). The EM plan must be submitted to DEHP with the application for an environmental authority (EA) for mining activity. Approval of the EA and therefore approval of the EM plan is in accordance with section 193 of the EP Act. Refer to Section 6 of this report.

The proponent has committed to implement mitigation strategies related to vegetation clearing for the rail alignment, which will be incorporated into two management plans, the construction environmental management plan (CEMP) and the operational environmental management plan (OEMP) (refer section 9). These plans will include:

- a weed and pest management plan, to be developed for implementation throughout the construction phase, and during rehabilitation activity
- an erosion and sedimentation control management plan, incorporating water quality monitoring (adequate baseline information will be required) to monitor composition and condition of the important water sources with respect to potential pollution or contamination due to deposition of particulate matter in the water body and surrounds
- a threatened species and ecological communities management plan
- a rehabilitation plan, for disturbed areas post-construction.

In addition the rail EMP will include the following proponent initiatives:

- a fauna mortality register will be kept and maintained to determine the location, frequency of mortality, and types of species most susceptible to enable further modifications to fauna conservation mechanisms to be made where necessary
- a weed audit of up to 20 per cent of the project footprint, at high risk locations, to be conducted after the project footprint has been marked out, and preferably at a time when annual weeds can be recognised
- a post-construction weed audit of the project footprint should be undertaken at the end of the first wet season following completion.

A full list of proponent mitigation commitments is in Appendix 5. I have recommended conditions to be applied to the rail component of the project at Appendix 4 including the conduct of detailed biodiversity survey to be undertaken prior to the commencement of construction.

### **11.7.3. Flora species investigations post approval**

The following post-approval prescriptions are proposed for *E. raveretiana*, *D. queenslandicum* and *D. setosum*.

**Table 11.13 Flora species investigations post approval**

Species	Investigations	Outcome
<i>Eucalyptus raveretiana</i>	<ul style="list-style-type: none"> <li>• Undertake targeted surveys within all areas of potential habitat along the rail alignment.</li> <li>• If additional occurrences of the species are recorded: <ul style="list-style-type: none"> <li>– seek to avoid any additional impacts through micro-alignment, if possible</li> <li>– where trees cannot be avoided, seeds will be collected prior to clearing for either redistribution or addition to seed stock of a suitable conservation area, or supplement rehabilitation efforts in approved offset areas.</li> </ul> </li> <li>• Map the results of targeted surveys.</li> <li>• Where mapped habitat categories or extent changes, update the species specific offset calculations.</li> </ul>	Important areas will be avoided and/or species specific offset outcome updated following targeted surveys.
<i>D. queenslandicum</i> <i>D. setosum</i>	<ul style="list-style-type: none"> <li>• Through consultation with relevant species expert, develop and document a methodology for rapid on-ground habitat assessment to map areas of: <ul style="list-style-type: none"> <li>– confirmed habitat</li> <li>– high potential habitat</li> <li>– moderate potential habitat</li> <li>– low potential habitat</li> <li>– not suitable habitat.</li> </ul> </li> <li>• Undertake rapid habitat assessment within all areas of potential habitat along the rail alignment.</li> <li>• Map the outcomes of the rapid habitat assessment.</li> <li>• Where, 'confirmed' and 'high potential' habitat is mapped, undertake targeted surveys within these areas.</li> <li>• If the species is recorded, apply the following: <ul style="list-style-type: none"> <li>– seek to avoid impacts to individuals through micro-alignment of the rail, if possible, or</li> <li>– transplant individuals into areas of suitable habitat, if appropriate.</li> </ul> </li> <li>• Where mapped habitat categories or extent changes, update the species specific offset calculations.</li> </ul>	Following rapid assessment and targeted survey (if relevant), important areas will be avoided and/or species specific offset updated to more accurately reflect impacts to on-ground habitat types.

#### 11.7.4. Conclusion—threatened flora

I have reviewed the EIS and associated documentation, including the EPBC Act report, and conclude that the proponent has adequately assessed the impacts of the project on threatened flora MNES as far as can be expected given the extent of surveys undertaken. I note the proponent has made a number of commitments to avoid and mitigate impacts on vegetation in general that would apply equally to threatened flora, as well as proposing additional investigations and mitigation measures to apply after project approval.

I have recommended conditions to be applied to the construction and operation of the mine site (Appendix 1) and rail line (Appendix 4) to enforce the proponent's commitments that should minimise the impacts on threatened flora. Proponent proposals to offset likely residual impacts are discussed in Section 11.13 of this report.

### 11.8. Threatened fauna

#### 11.8.1. Identified fauna species

The EPBC Act report identified twelve fauna species considered to be 'known', 'likely' or 'potentially occurring'. The seven fauna species identified as 'potentially occurring' included:

- northern quoll
- greater long-eared bat
- striped-tailed delma
- Dunmall's snake
- retro slider
- Australian painted snipe
- red goshawk.

The EPBC Act report concluded that the areas of potentially suitable habitat for these 'potentially occurring' species within the mine site and rail alignment were marginal, with a low risk that the project would lead to significant impacts. This assessment is summarised in the table below.

**Table 11.14 'Potentially occurring' fauna species analysis**

Species	Issues considered when analysing risk	Outcome
Northern quoll	Species found in a variety of treed habitats, particularly in broken, rocky country and open eucalypt forest near the coast.  Unlikely to occur at the mine site with potential habitat only within northern areas of the rail alignment. The species prefers habitats associated with rocky woodland vegetations found on hill slopes. This habitat is not likely to be impacted.	Low risk of significant impacts

Species	Issues considered when analysing risk	Outcome
Greater long-eared bat	<p>Species occurs in a range of inland woodland vegetation types, including box, ironbark, cypress pine woodlands.</p> <p>The species has a limited and scattered distribution that is restricted around the Murray-Darling Basin. More commonly recorded in the Brigalow Belt South and Nandewar bioregions in north-eastern NSW, well outside the project area. It has been recorded as far north as the Expedition Range and Dawson River areas, which occur 300–400 km south-east of the project area.</p> <p>Potential habitat may occur within the central section of the rail alignment. Only a small proportion of potential habitat will be impacted. Given the mobility of the species, this linear impact is unlikely to reduce the availability of habitat to the extent that the species may decline.</p>	Low risk of significant impacts
Striped-tailed delma	<p>Species habitat includes two very dissimilar land forms; coastal sandy dunes and rocky hill slopes; and generally prefers areas with thick ground cover especially Spinifex, Spear Grass, Kangaroo Grass, Razor Grasses and Saw Sedges.</p> <p>Mapped areas of known/likely occurrence are concentrated on a relatively thin coastal strip between Mackay and Cardwell with a maximum inland extent of 120 km which overlaps with the north-eastern extent of the rail alignment. Only limited suitable habitat occurs within the alignment. Important populations occur in the Townsville and Cairns regions, well outside the project area.</p>	Low risk of significant impacts
Dunmall's snake	<p>Preferred habitat for the species is remnant Brigalow forest and woodland with fallen timber and ground litter, growing on cracking clay soils and clay loam soils.</p> <p>The species is confined to the Brigalow Belt bioregion of south-eastern Qld and north-eastern NSW. The range extends from Clermont (&gt;500 km to the south-east of the proposed mine) and near Rockhampton in the north to the NSW border in the south. Most records are from the Darling Downs area of south-east Qld, well outside the project area.</p> <p>Species is considered unlikely to occur at the mine site. Potential habitat may occur within the rail alignment, although no historical records within the rail region.</p>	Low risk of significant impacts
Retro slider	<p>Species predominantly recorded from the black soils of the Brigalow Belt at Clermont, Logan Downs Station and Retro Station. Cultivation and grazing are thought to have contributed to species' decline.</p> <p>The project is broadly within species' potential distribution. Active searches in areas of likely habitat did not observe the species and extensive grazing and agriculture make it less likely to occur. The project will not impact on any known populations.</p>	Low risk of significant impacts

Species	Issues considered when analysing risk	Outcome
Australian painted snipe	<p>The Australian painted snipe is a highly mobile species with a broad distribution throughout much of Australia. While no individuals were recorded during surveys, suitable habitat exists within the project area amongst a variety of vegetation types and in association with wetlands and dams.</p> <p>Surveys undertaken as part of the EIS did not record the Australian Painted Snipe. However, recent work commissioned to inform the proposed cumulative impact assessment at Abbot Point indicates that the Australian painted snipe may utilise the Caley Valley Wetland on an occasional basis.</p> <p>Potential impacts to this species within the Caley Valley Wetland relate to the loss of 16.3 ha of potential habitat; and degradation of additional areas of potential habitat due to potential changes in water quality and indirect impacts associated with noise, light and dust.</p> <p>It is acknowledged that further work will be required during the detailed design phase of the rail loop to assess the potential impact of the rail loop on this species.</p>	<p>An acceptable outcome will be delivered for the species through:</p> <ul style="list-style-type: none"> <li>• implementation of a broad suite of measures to avoid, mitigate and manage indirect impacts</li> <li>• provision of a land based offset at a 5:1 ratio to compensate for direct impacts</li> <li>• provision of an additional 100 ha of habitat or equivalent financial contribution to the implementation of the Caley Valley Wetland EMP.</li> </ul>
Red goshawk	<p>The core distribution and location of the majority of records for the red goshawk occur in coastal and sub-coastal areas. These areas are primarily associated with the northern portion of the rail alignment. Impacts to areas of potentially suitable habitat will be limited—particularly given the proposed railway has sought to avoid clearing in the vicinity of permanent water bodies.</p> <p>There is one historical record of the red goshawk within proximity of the proposed railway as it crosses the Belyando River approximately 50 km north-west of the mine. The reliability, age and precision of this record could not be verified and surveys undertaken within the vicinity did not detect the species. While the risk is considered low, to manage against potential impacts to nesting birds if they do occur in this area, the proponent has committed to undertake the following:</p> <ul style="list-style-type: none"> <li>• habitat assessment where the proposed rail alignment traverses the area within the vicinity of the existing record</li> <li>• if identified as potential habitat: <ul style="list-style-type: none"> <li>– avoid clearing the largest trees (where they are 20 m or taller) within the stand of vegetation, if possible</li> <li>– undertake pre-clearance surveys by a suitably qualified ecologist.</li> </ul> </li> </ul>	<p>Low risk of significant impacts.</p>

The EPBC Act report concluded that there is a low risk of significant impacts to any of the seven fauna species identified as 'potentially occurring'. This is largely due to the presence of only marginal potential habitat within the project area. As such, specific measures to mitigate or offset potential impacts to these species were not detailed. However, a suite of mitigation measures will be implemented by the proponent to address the range of potential project impacts. These have been outlined in the EPBC Act report as they relate broadly to MNES.

The EPBC Act report identified five fauna species as either 'known' or 'likely' to occur within the mine site or rail alignment, including:

- black-throated finch, which has been identified as likely to occur within suitable habitat areas across the mine site and rail alignment
- squatter pigeon, which has been observed within both the mine site and rail alignment
- Brigalow scaly-foot, which has been identified as likely to occur within suitable habitat areas across the mine site and rail alignment
- ornamental snake, which has been recorded along the rail alignment
- yakka skink, which has the potential to occur within suitable habitat areas across the mine site and rail alignment.

### **Black-throated finch**

The black-throated finch is a small, largely sedentary and gregarious grass-finch that is listed as endangered under the EPBC Act.

The species was not recorded during field surveys of the mine site or rail alignment. However, there are a number of records within the vicinity.

Potential habitat modelling was undertaken for the black-throated finch as part of the EPBC Act report to understand the extent of potential habitat within the project footprint and more broadly across the landscape. The modelling identified around:

- 778 hectares of high potential habitat within the rail alignment
- 7154 hectares of high potential habitat within the mine site
- 596 hectares of low potential habitat within the rail alignment
- 3150 hectares of low potential habitat within the mine site.

This combined area represents around 0.38 per cent of potential habitat within the region.

The following key issues were discussed in the EPBC Act report as part of the impact analysis for the black-throated finch:

- There will be no loss of confirmed black-throated finch habitat as a result of the project. However, almost 8000 hectares of high potential habitat and 3746 hectares of low potential habitat will be cleared across the mine site and rail alignment.
- The EPBC Act report recognises that targeted surveys within all areas of potential habitat have not been undertaken and as a result, there is a possibility that the species may utilise areas of the development footprint for either foraging or nesting. The risk to the species from the loss of an important area is most pertinent at the

mine site, where large-scale clearing will occur. However, given the survey effort across two years at the mine site within areas of suitable habitat, the EPBC Act report considers there to be a low risk that the mine site is an important area for the species.

- The black-throated finch may utilise habitat within the mine site occasionally or as it is moving through the landscape. To compensate for the loss of potential habitat across the mine site, which may provide a movement corridor for the black-throated finch, the proponent is proposing to provide a one-kilometre-wide wildlife corridor within the vicinity of the mine although not on the mining lease. This corridor will be focused on riparian areas (an important feature for the black-throated finch) and will be managed to ensure an east-west link is maintained in the landscape.
- Along the proposed railway, it is considered that the possibility of an important area occurring is greater compared with the mine, as surveys could not be conducted in all areas that may potentially support the subspecies. However, the consequence to the black-throated finch from loss of habitat along the proposed railway is expected to be less, as impacts are linear and localised and unlikely to substantially reduce the availability of habitat within the regional landscape.
- The proposed railway is unlikely to act as a barrier to movement for the subspecies. This is evidenced by the presence of the subspecies within landscapes already containing linear infrastructure.
- Edge effects, particularly along the railway, have the potential to reduce the availability or quality of potential habitat for the black-throated finch. In particular, the introduction and spread of grasses or weed species such as buffel grass, which have the potential to alter the species composition or seed availability of the black-throated finch's feeding resources. The proponent will implement measures to minimise the impacts of weeds from construction and operation of the rail line.

The EPBC Act report acknowledged there will be residual impacts to the black-throated finch as a result of the project. To provide a net positive outcome for this species, the proponent has committed to provide biodiversity offsets specific to this species. Details of these offsets are outlined in Section 11.13 of this report.

### **Squatter pigeon**

The squatter pigeon is a medium sized ground dwelling pigeon listed as vulnerable under the EPBC Act.

The species is considered to be ubiquitous and relatively abundant throughout the region and was recorded during both the mine and rail surveys. It was recorded along the length of the rail alignment, with a total of 12 individuals observed during the dry season and 14 individuals observed during the wet season. At the mine site, around 30 individuals were observed, all within non-remnant grassland habitat. Both components of the project will lead to the loss of habitat for this species.

Unlike all other threatened species identified as either 'known' or 'likely' to occur, habitat modelling was not undertaken as part of the EPBC Act report for the squatter pigeon. Predictive habitat modelling was not feasible for the squatter pigeon, as it was found not to have a strong association with REs—the key data source used in the modelling. Instead, the species is known to occur across a variety of habitat types with

suitable foraging and nesting habitat widely available in areas adjacent to the project area and the broader region. The species' distribution extends across a range of approximately 440 000 kilometres, from the dry tropics of central Queensland to the south-east of the state.

The EPBC Act report concluded that significant impacts to the regional population of the squatter pigeon are unlikely due to this broad extent of habitat within the region. The rail corridor would result in only linear and localised impacts to habitat. Fragmentation is not expected to be an issue given the species' presence in a landscape which is already fragmented by linear infrastructure.

The proponent proposes to implement habitat clearance mitigation measures for this species including:

- Persons operating vehicles in and adjacent to the project site would be made aware of the presence of this threatened species and the potential for it to be encountered on vehicle tracks, minimising vehicle strike. The behavioural characteristics of this pigeon tends to make it vulnerable to such accidents in that it is known to freeze in an attempt to go unnoticed instead of fleeing like the majority of other birds. This species has commonly been observed on tracks and roadways and in areas of vehicle activity.
- Fauna spotters to conduct a thorough survey of each site before clearing vegetation to determine the location of any squatter pigeon nests. Particular attention will be given to areas of short dry grass, grass tussocks and under bushes and fallen logs. If nests are located, translocation of the eggs/young should be conducted by qualified personnel to a suitable nearby habitat.
- Control of pest species, such as the European rabbit and feral goat in areas known to be foraging habitat; and pests such as the feral cat in areas where the southern squatter pigeon is known to flock.
- Raise awareness of this species through a staff induction program, including photos, descriptions and preferred habitat.

The proponent noted that the existing offset commitments for the project relate to the broad range and geographical spread of habitat areas being impacted by the mine and railway. These will include the protection and management of substantial areas of habitat suitable for the squatter pigeon. SEWPaC have advised that despite the potential range of habitat area, the cumulative impacts of the development of the Galilee Basin will result in significant impacts to this species.

### **Brigalow scaly-foot**

The Brigalow scaly-foot is a legless lizard listed as vulnerable under the EPBC Act.

The species was not recorded during field surveys of the mine site or rail alignment. However, potentially suitable habitat was observed and the species is known to occur within the region.

Potential habitat modelling was undertaken for the Brigalow scaly-foot as part of the EPBC Act report to understand the extent of potential habitat within the project footprint and more broadly across the landscape. The modelling identified around 189 hectares

of high potential habitat and 272 hectares of low potential habitat within the rail alignment.

This combined area represents around 0.35 per cent of potential habitat within the region.

The following key issues were discussed in the EPBC Act report as part of the impact analysis for the Brigalow scaly-foot:

- There will be no loss of confirmed Brigalow scaly-foot habitat as a result of the project.
- Field surveys and potential habitat modelling suggest that the species is unlikely to occur within the mine site. As such, impacts to potential habitat will only be associated with the rail corridor and will be localised and linear in nature.
- The Brigalow scaly-foot is vulnerable to mortality from falling in holes or ditches that may be created during construction of the rail corridor. Within areas of high potential habitat, sizeable holes or ditches will either be fenced off using suitable materials to prevent Brigalow scaly-foot access, or wooden structures placed in the holes or ditches over-night to allow individuals to escape.
- As a nocturnal species, the Brigalow scaly-foot may be more vulnerable to direct mortality from construction work. To manage this risk, the proponent has committed to use a qualified fauna spotter to relocate individuals to suitable shelter sites as part of standard pre-clearance surveys.
- Fragmentation of habitat is a likely issue for this species, particularly where the rail corridor passes through larger remnants of potential habitat. There are seven areas of potential habitat for the Brigalow scaly-foot which may be fragmented by the proposed railway, including five which are considered to have high connectivity potential and two with moderate potential. To minimise disrupting movement within these areas of concern, the proponent has committed to minimise the width of the rail corridor if practicable; and designing the railway to include culverts containing suitable habitat features within these areas to allow passage for the species.
- 'Edge effects' in relation to the rail corridor may impact adversely on the species, particularly the introduction of invasive weed species which can increase the risk of fire and reduce habitat for this species. The proponent has committed to implement a set of weed management measures which the EPBC Act report considers will adequately mitigate this impact.

The EPBC Act report acknowledges that there will be residual impacts to the Brigalow scaly-foot as a result of the project. In order to provide a net positive outcome for this species, the proponent has committed to provide biodiversity offsets specific to this species. Details of these offsets are outlined in Section 11.13 of this report.

### **Ornamental snake**

The ornamental snake is a brown, grey-brown or black snake that preferentially preys on frogs. It is listed as vulnerable under the EPBC Act.

The ornamental snake was observed opportunistically during surveys of the rail alignment and has been recorded on numerous occasions within the region. The

species was not trapped or observed in suitable habitat within the mine site, despite targeted survey efforts.

Potential habitat modelling was undertaken for the ornamental snake as part of the EPBC Act report to understand the extent of potential habitat within the project footprint and more broadly across the landscape. The modelling identified around:

- 251 hectares of high potential habitat within the rail alignment
- 1543 hectares of high potential habitat within the mine site
- 193 hectares of low potential habitat within the rail alignment
- 546 hectares of low potential habitat within the mine site.

This combined area represents around 0.35 per cent of potential habitat within the region.

The following key issues were discussed in the EPBC Act report as part of the impact analysis for the ornamental snake:

- Targeted searches for the species within areas of suitable habitat on the mine site did not record the species. The risk of impacts to an important area for the species on the mine site is therefore low.
- Impacts from the rail alignment to ornamental snake habitat are associated with linear, more localised clearing.
- Fragmentation of habitat is a potential issue for this species across the mine and rail. There are eighteen areas of potential habitat for the ornamental snake which may be fragmented by the proposed railway, including fifteen which are considered to have high connectivity potential and three with moderate potential. To minimise disrupting movement within these areas of concern, the following specific mitigation measures are proposed by the proponent:
  - minimise the width of the rail corridor within ephemeral creek habitats
  - design the rail corridor to include culverts with an area of dry passage within landscapes containing potential habitat, to allow uninterrupted surface flows and dry passage for the species.

To compensate for the loss of potential habitat across the mine site which may provide a movement corridor for the ornamental snake, the proponent is proposing to provide a one-kilometre-wide wildlife corridor within the vicinity of the mine site. This corridor will be focused on riparian areas (which may provide important habitat features for the ornamental snake) and will be managed to ensure an east-west link is maintained in the landscape.

Potential impacts to surface water quality where construction adjoins or crosses water sources may be an issue for the ornamental snake as it preferentially preys on frogs. According to the EPBC Act report, the general measures I have proposed to manage potential impacts to water quality outlined in sections 5.4 and 5.8 (mine) and section 8.3 (rail) of this report address this issue.

'Edge effects' in relation to the rail corridor may impact adversely on the species, particularly the introduction of invasive weed species which can increase the risk of fire and reduce habitat for this species. As outlined in Table 9 (page 46) of the EPBC Act

report, the proponent will implement weed management measures which the EPBC Act report considers will adequately mitigate this impact.

The EPBC Act report acknowledged there are likely to be residual impacts to the ornamental snake as a result of the project. In order to provide a net positive outcome for this species, the proponent has committed to provide biodiversity offsets specific to this species. Details of these offsets are outlined in Section 11.13 of this report.

### **Yakka skink**

The Yakka Skink is a relatively large, thick-tailed lizard listed as vulnerable under the EPBC Act.

The species was not recorded during field surveys of the site or rail alignment. However, potentially suitable habitat was observed and the species is known to occur within the region.

Potential habitat modelling was undertaken for the yakka skink as part of the EPBC Act report to understand the extent of potential habitat within the project footprint and more broadly across the landscape. The modelling identified around:

- 812 hectares of high potential habitat within the rail alignment
- 8152 hectares of high potential habitat within the mine site
- 650 hectares of low potential habitat within the rail alignment
- 1631 hectares of low potential habitat within the mine site.

This combined area represents around 0.36 per cent of potential habitat within the region.

The following key issues were discussed in the EPBC Act report as part of the impact analysis for the yakka skink:

- There will be no loss of confirmed yakka skink habitat as a result of the project. However, a total of 8964 hectares of high potential habitat and 2281 hectares of low potential will be cleared across the mine site and rail alignment.
- Targeted searches for the species within areas of suitable habitat on the mine site did not record the species. The EPBC Act report concluded there is a low probability that the mine site supports the yakka skink, given the species shows high site fidelity and occupied burrows can be identified by scat piles near the entrance. Impacts to potential habitat are therefore mainly associated with the 812 hectares of high potential habitat within the rail corridor and these will be localised and linear in nature.
- The yakka skink utilises microhabitat features such as hollow logs, debris and rocky outcrops; therefore, where there will be direct impacts from construction of the rail, pre-clearance surveys will be used to relocate these features to adjoining habitat if appropriate. The EPBC Act report concluded this measure will reduce the severity of impacts to high potential habitat areas.
- The yakka skink is susceptible to direct mortality from construction work as it tends to shelter in burrows during the hottest parts of the day. To manage this risk, the

proponent has committed to use a qualified fauna spotter to relocate individuals to suitable shelter sites as part of standard pre-clearance surveys.

- Similar to the Brigalow scaly-foot, the yakka skink is also vulnerable to mortality from falling in holes or ditches that may be created during construction of the rail corridor. Within areas of high potential habitat, sizeable holes or ditches will either be fenced off using suitable materials to prevent Yakka Skink access, or wooden structures placed in the holes or ditches to allow individuals to escape.
- Fragmentation of habitat is a likely issue for this species in relation to both the mine and rail. There are thirteen areas of potential habitat for the yakka skink which may be fragmented by the proposed railway, including nine which are considered to have high connectivity potential and four to have moderate potential. To minimise disrupting movement within these areas of concern identified through the connectivity analysis, the proponent has committed to minimise the width of the rail corridor within these areas if practicable; and to design the proposed railway to include culverts containing suitable habitat features within these areas to allow passage for the species.
- To compensate for the loss of potential habitat across the mine site, which may provide a movement corridor for the yakka skink, the proponent is proposing to provide a one-kilometre-wide wildlife corridor within the vicinity of the mine site. This corridor will be managed to ensure an east-west link is maintained in the landscape.

The EPBC Act report acknowledged there will be residual impacts to the yakka skink as a result of the project. In order to provide a net positive outcome for this species, the proponent has committed to provide biodiversity offsets specific to this species. Details of these offsets are outlined in Section 11.13 of this report.

### **11.8.2. Potential impacts and mitigation**

Impacts and mitigation measures relating to the fauna species identified as 'known' or 'likely' to occur have been addressed in the EPBC Act report.

The construction and operation phases have the potential to result in fauna mortality. Primary causes of this may be road strike, barbed wire or smaller species falling into uncovered holes or trenches.

Lighting has the potential to disrupt both nocturnal and diurnal species as it may disrupt light-induced activities. Potential impacts include disorientation from and attraction to artificial light sources.

Potential noise and vibration impacts may occur during construction and operation. Noise is more likely to impact species that use noise as part of their basic behaviour, such as birds and frogs. Species most susceptible to vibration impacts include ground dwelling species such as reptiles and ground nesting birds.

Removal of vegetation and habitat during the construction phase has the potential to reduce connectivity by fragmenting movement corridors. This is particularly relevant to species with low mobility or high site fidelity.

Measures will be taken to minimise harm to affected fauna communities by inspecting the vegetation to be disturbed prior to clearing to ascertain whether any fauna are

present. If fauna is present, it will be given the opportunity to move on naturally before clearing occurs.

A trained ecologist or other suitably qualified environmental field supervisor will precede or accompany clearing crews when clearing significant vegetation, to minimise disturbance to threatened flora and other significant resources.

On the mine site, proponent commitments to manage fauna impacts will be incorporated in the statutory EM plan to be submitted to the DEHP under the EP Act. The EM plan must be submitted to the DEHP with the application for an environmental authority (EA) for mining activity. Approval of the EA and therefore approval of the EM plan is in accordance with section 193 of the EP Act. For conditions related to the EA for this project refer to Appendix 1.

In December 2011, SEWPaC sought additional information from the proponent on the potential impact on MNES fauna species from changes to surface water hydrology arising from the mine construction, particularly from stream diversions. In response, the proponent provided additional information on flood modelling and the proposed design of the diversions. The proponent noted that the diversions would be constructed to the standards set in two recognised publications: the *Central West Water Management and Use Regional Guideline: Watercourse Diversions – Central Queensland Mining Industry*<sup>18</sup> and the *Bowen Basin River Diversions: Design and Rehabilitation Criteria*.<sup>19</sup> These documents provide guidance on the maximum velocities within the diversion at particular rainfall intervals and design features that would lead to the diversion mimicking a natural watercourse. At the time of writing this report, I had not been advised by SEWPaC as to whether its concerns had been satisfied.

Proponent mitigation commitments are presented in Appendix 5. I have recommended conditions to be applied to the project at appendices 1 and 4 to minimise impacts to fauna. I have also reviewed detailed information on surface water hydrology and made recommendations relating to this issue at sections 5.8 and 8.3, and in appendices 3 and 4.

### **11.8.3. Fauna species investigations post approval**

The following post-approval investigations are proposed for the black-throated finch, Brigalow scaly-foot, ornamental snake and yakka skink.

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<sup>18</sup> Queensland Department of Natural Resources and Water, *Central West Water Management and Use Regional Guideline: Watercourse Diversions – Central Queensland Mining Industry*, Department of Natural Resources and Water, Brisbane, 2008.

<sup>19</sup> Australian Coal Association Research Program, *Bowen Basin River Diversions: Design and Rehabilitation Criteria*, Australian Coal Association Research Program, 2002.

**Table 11.15 Fauna species investigations post approval**

Species	Investigations	Outcome
Black-throated finch	<ul style="list-style-type: none"> <li>Through consultation with relevant species experts, develop and document a methodology for rapid on-ground habitat assessment to map areas of: <ul style="list-style-type: none"> <li>confirmed habitat</li> <li>high potential habitat</li> <li>moderate potential habitat</li> <li>low potential habitat</li> <li>not suitable habitat.</li> </ul> </li> <li>Undertake rapid habitat assessment within all areas of potential habitat along the rail alignment.</li> <li>Map the outcomes of the rapid habitat assessment.</li> <li>Where, 'confirmed' and 'high potential' habitat is mapped, undertake targeted surveys within these areas during the appropriate season.</li> <li>If the species is recorded, the area is considered to be important to the subspecies and the following measures applied: <ul style="list-style-type: none"> <li>seek to avoid impacts to known habitat through micro-alignment of the rail, if possible, or</li> <li>if not possible, undertake to improve or enhance (for instance, by removing known threats) habitat contiguous with the area being impacted, and/or</li> <li>contribute towards research into the subspecies within the region.</li> </ul> </li> <li>Where mapped habitat categories change or extent of habitat increases, update the species specific offset commitments.</li> </ul>	<p>Following rapid assessment and targeted survey (if relevant), update species specific offsets to more accurately reflect impacts to on-ground habitat types.</p> <p>Depending on the outcomes of field work, additional indirect offsets relating to habitat enhancement or research may be provided.</p>

Species	Investigations	Outcome
Brigalow scaly-foot Ornamental snake Yakka skink	<ul style="list-style-type: none"> <li>Through consultation with a relevant species experts, develop and document a methodology for rapid on-ground habitat assessment to map areas of: <ul style="list-style-type: none"> <li>confirmed habitat</li> <li>high potential habitat</li> <li>moderate potential habitat</li> <li>low potential habitat</li> <li>not suitable habitat.</li> </ul> </li> <li>Undertake rapid habitat assessment within all areas of potential habitat along the rail alignment.</li> <li>Map the outcomes of the rapid habitat assessment.</li> <li>Where, 'confirmed' and 'high potential' habitat is mapped, undertake targeted surveys within these areas during the appropriate season.</li> <li>If the species is recorded within large areas of contiguous habitat (as defined by a relevant species expert), the area is considered to be important and the following measures applied: <ul style="list-style-type: none"> <li>seek to avoid impacts to known habitat through micro-alignment of the rail, if possible; or</li> <li>if not possible, seek to incorporate culverts into the railway design within the area, which allows for passage of the species; and/or</li> <li>establish a monitoring program to understand and document species' use of the culverts.</li> <li>ensure that individuals and their habitat (where feasible) are relocated to suitable nearby areas using best-practice techniques, if appropriate.</li> </ul> </li> <li>Where mapped habitat categories or extent changes, update the species specific offset in accordance with the offset matrix (outlined in Section 1.1).</li> </ul>	<p>Following rapid assessment and targeted survey (if relevant), update species specific offsets to more accurately reflect impacts to on-ground habitat types.</p> <p>Depending on the outcomes of field work, monitoring of the species use of culverts will be undertaken.</p>

#### 11.8.4. Conclusion—threatened fauna

I have reviewed the EIS and associated documentation, including the EPBC Act report, and conclude the proponent has adequately assessed the impacts of the project on threatened fauna MNES. I note the proponent has made a number of commitments to avoid and mitigate impacts on fauna habitat in general that would apply equally to threatened fauna, and has proposed additional investigations and mitigation measures to apply after project approval.

I have recommended conditions to be applied to the construction and operation of the mine site (refer Appendix 1) and rail line (refer Appendix 4) to enforce the proponent's commitments and which will minimise the impacts on threatened fauna. Proponent proposals to offset likely residual impacts are discussed in Section 11.13 of this report.

## **11.9. Threatened ecological communities**

### **11.9.1. Identified threatened ecological communities**

The EPBC Act report identified that, based on comprehensive vegetation surveys across the mine site, no TECs listed under the EPBC Act were found to occur.

The rail alignment is likely to support three TECs listed under the EPBC Act as follows:

- Approximately 100 hectares of likely Brigalow (*Acacia harpophylla* dominant and co-dominant) (Brigalow TEC). This area represents around 0.1 per cent of the estimated regional distribution of Brigalow TEC.
- Approximately 150 hectares of likely Natural Grasslands of the Queensland Central Highlands and the northern Fitzroy Basin (Natural Grasslands TEC). This area represents approximately 1.2 per cent of the potential regional distribution of the Natural Grasslands TEC.
- Approximately 14 hectares of likely Semi-evergreen Vine Thickets of the Brigalow Belts (north and south) and Nandewar Bioregions (SEVT TEC). This area represents approximately 0.1 per cent of potential SEVT TEC within the region.

Mapping of these TECs along the rail alignment was based on analysis of high-resolution aerial photographs to identify regional ecosystems and field validation where access was possible. The EPBC Act report identified that additional field surveys would be required for Brigalow TEC and Natural Grasslands TEC to confirm that areas mapped as likely habitat contain the necessary understory composition and condition to meet the relevant EPBC Act definition. The EPBC Act report considers the estimates of extent of TECs to be broadly conservative (i.e. the extent is likely to be overestimated).

### **11.9.2. Potential impacts and mitigation**

The EPBC Act report identified the following key issues relevant to TECs along rail alignment:

- direct clearing including:
  - approximately 100 hectares of likely Brigalow TEC
  - approximately 150 hectares of Natural Grasslands TEC
  - approximately 14 hectares of SEVT TEC.
- 'edge effects' where TECs adjoin areas of the rail alignment. Impacts are associated with weed invasion, increased risk of fire and point-source pollution from sedimentation and run-off. The proponent has committed to a range of mitigation measures to address potential adverse impacts associated with 'edge effects'. These are detailed in Appendix 5 of this report.

The EPBC Act report acknowledged there will be residual impacts to these TECs as a result of the project. In order to provide a net positive outcome for these TECs, the proponent has committed to provide like-for-like biodiversity offsets. Details of these offsets are outlined in Section 11.13 of this report.

### 11.9.3. TEC investigations post-approval

The following post-approval prescriptions (Table 11.16) are proposed for Brigalow TEC and Natural Grasslands TEC as both of these contain condition criteria for listing under the EPBC Act.

**Table 11.16 Post approval prescription for Brigalow TEC and Natural Grasslands TEC**

TEC	Prescriptions	Outcome
Brigalow	<ul style="list-style-type: none"> <li>Field validate all areas along the rail alignment identified as likely Regional Ecosystems that correspond to Brigalow TEC.</li> <li>During field validation, obtain the necessary data to define Brigalow TEC condition including: <ul style="list-style-type: none"> <li>patch size, exotic species abundance, structure and age for Regional Ecosystems corresponding with Brigalow TEC.</li> </ul> </li> <li>Update the Brigalow TEC specific offset commitments.</li> </ul>	Brigalow TEC specific offsets maintained or increased based on field validation
Natural Grasslands	<ul style="list-style-type: none"> <li>Field validate all areas along the rail alignment identified as likely Regional Ecosystems that correspond to Natural Grasslands TEC.</li> <li>During field validation, obtain the necessary data to define Natural Grasslands TEC condition including: <ul style="list-style-type: none"> <li>patch size, grass species, tussock cover, woody shrub cover and introduced species abundance for Regional Ecosystems corresponding with Natural Grasslands TEC;</li> </ul> </li> <li>Map the outcome of the field validation.</li> <li>Where areas of Natural Grasslands TEC are found to be in 'best quality' or 'good quality' condition (as per EPBC listing criteria), undertake surveys during the appropriate season to determine the patch size.</li> <li>If large, contiguous patches of Natural Grasslands TEC are found investigate opportunities to provide offsets which enhance Natural Grasslands TEC habitat connectivity.</li> <li>Update the Natural Grasslands TEC specific offsets in accordance with the offset commitments.</li> </ul>	Natural Grasslands TEC specific offsets maintained or increased based on field validation

### 11.9.4. Conclusion—threatened ecological communities

I have reviewed the EIS and associated documentation, including the EPBC Act report, and conclude the proponent has provided an adequate assessment of the impacts of the project on threatened ecological communities MNES. I note that the proponent has made a number of commitments to avoid and mitigate impacts on vegetation in general

that would apply equally to TECs, as well as proposing additional investigations and mitigation measures to apply after project approval.

I have recommended conditions to be applied to the construction and operation of the mine site (refer Appendix 1) and rail line (refer Appendix 4) and to enforce the proponent's commitments, which will minimise the impacts on TECs. Proponent proposals to offset likely residual impacts are discussed in Section 11.13 of this report.

## 11.10. Migratory species

The EPBC Act report identified a number of listed migratory species as being known, likely or having the potential to occur within the project site. These are discussed below in relation to:

- migratory shorebirds
- other migratory species.

A report specifically describing the values of the Caley Valley wetland was prepared by the proponent for the SEIS. The *Caley Valley Wetland Aquatic Flora and Fauna Assessment for Rail Loop* (Volume 2 (Appendix AI) of the SEIS) describes how the identified values of this system (including MNES, most notably EPBC Act listed migratory birds) may be impacted during construction and operations of the rail loop and the northern terminus of the rail study area, and presents a range of management and mitigation strategies to alleviate these impacts.

SEWPaC has advised that the Caley Valley wetland is identified as a component of one of eight major migratory bird flyways in the world.

### 11.10.1. Relevant policies

The key policy document for migratory species is the *Matters of National Environmental Significance: Significant Impact Guidelines 1.1*. This policy outlines the two key concepts for assessing impacts to migratory species:

- important habitat
- ecologically significant proportion of a population.

In addition, the Australian Government has released *Draft significant impact guidelines for 36 migratory shorebird species—EPBC Act policy statement 3.21* and an associated background paper. These documents aim to help proponents understand potential impacts on migratory shorebird species and provide mitigation strategies to reduce those impacts. The background paper provides recommendations about survey requirements for migratory shorebirds.

The proponent has advised that the information provided in these policy documents was used to inform the assessment of potential impacts to listed migratory species in the EPBC Act report.

### 11.10.2. Migratory shorebirds

Migratory shorebirds are relevant to the project within the vicinity of Abbot Point and the terminus of the rail line (rail loop) due to the presence of the Caley Valley wetland, which provides habitat for shorebirds. A description of the wetlands and their history, and data from surveys undertaken by Hancock coal and other proponents, has been included in the EPBC Act report.

Recently, survey work has been commissioned to inform the proposed cumulative impact assessment (CIA) at Abbot Point being undertaken for SEWPaC by a consortium of the North Queensland Bulk Ports Authority, Hancock Coal, Adani and BHP Billiton. Due to the timing of this assessment, the final results of the recent survey work were not available for inclusion in the EPBC Act report. However, it is understood that additional shorebird species have been identified and that the Caley Valley Wetland may meet the criteria for important habitat for shorebirds.

Due to the limited surveys and assessments completed to date, and SEWPaC's policy on migratory shorebird species (policy statement 3.21), the EPBC Act report adopted a conservative approach for the assessment and accepted that the project site within the Caley Valley wetland:

- may provide important habitat for a number of shorebirds
- has the potential to provide roosting and/or foraging habitat for shorebirds.

#### Known, likely or potential migratory shorebirds

According to the EPBC Act report, thirteen migratory shorebird species are considered likely to occur at the project site within the Caley Valley wetland (see Table 11.17).

**Table 11.17 Migratory shorebirds**

Scientific name	Common name	EPBC listing status	Likelihood of occurrence
<i>Actitis hypoleucos</i>	Common Sandpiper	Migratory	Likely
<i>Calidris acuminata</i>	Sharp-tailed Sandpiper	Migratory	Likely
<i>Calidris ruficollis</i>	Red-necked Stint	Migratory	Likely
<i>Charadrius veredus</i>	Oriental Plover	Migratory	Likely
<i>Gallinago hardwickii</i>	Latham's Snipe	Migratory	Likely
<i>Numenius madagascariensis</i>	Eastern Curlew	Migratory	Likely
<i>Numenius minutus</i>	Little Curlew	Migratory	Likely
<i>Numenius phaeopus</i>	Whimbrel	Migratory	Likely
<i>Pulialis fulva</i>	Golden Plover	Migratory	Likely
<i>Tringa brevipes</i>	Grey-tailed Tattler	Migratory	Likely
<i>Tringa incana</i>	Wandering Tattler	Migratory	Likely
<i>Tringa nebularia</i>	Common Greenshank	Migratory	Likely

Scientific name	Common name	EPBC listing status	Likelihood of occurrence
<i>Tringa stagnatilis</i>	Marsh Sandpiper	Migratory	Likely

### Potential impacts and mitigation

The EPBC Act report stated that construction and operation of the rail loop within Abbot Point may have the potential to impact migratory shorebirds through:

- direct loss of potential habitat within Caley Valley wetland
- degradation of additional potential habitat within the wetland due to potential changes in water quality and indirect impacts associated with noise, light and dust.

#### Direct impacts

Based on the conservative assumption about the importance of the habitat within the wetland, the project will result in the loss of 16.3 hectares of potential foraging and/or roosting habitat for shorebirds. This area represents 0.2 per cent of the total wetland area.

The area to be impacted also occurs near to the eastern edge of the wetland meaning there will be minimal fragmentation or isolation of habitat. However, the rail loop will enclose an additional area of wetland of approximately 99 hectares which may be subject to indirect impacts.

#### Indirect impacts and mitigation

The EPBC Act report analyses the various indirect impacts to shorebirds and outlines a set of mitigation measures to minimise their potential effects.

The potential indirect impacts on migratory shorebirds are:

- degradation of water quality from contaminated run-off or disturbance of acid sulfate soils, reducing foraging resources and degrading potential habitat
- changes in wetland hydrology from construction of the rail embankment, restricting or altering the flow of surface water. The proponent states that the potential for this impact to occur is low, as culverts will be installed to maintain flow. Modelling undertaken by the proponent showed that there would not be any significant change in surface water hydrology
- disturbance from noise, activity and light during construction and operation of the rail, disturbing existing shorebirds or dissuading shorebirds from using habitat
- dust from construction and operation of the rail, reducing the quality of nearby wetland areas and potential habitat for shorebirds.

In addition to the mitigation measures outlined in the EPBC Act report (proponent commitments are listed in Appendix 5), the Queensland Government is preparing a Caley Valley Wetland Environmental Management Plan to provide a consistent set of management objectives and actions for the entire wetland. It will provide a framework for protecting the environmental values of the wetland as a whole and will enable the

various proponents at Abbot Point to contribute to a consistent set of management actions.

The proponent has committed to operating consistently within the framework that will be established by the EMP and any additional requirements that are generated through the CIA process for shorebirds.

The EPBC Act report considered that the majority of indirect impacts will be minimised by applying the proposed mitigation measures and that significant degradation in the water quality or hydrology is unlikely. However, it can be expected there will be some residual indirect impacts on adjacent areas of the wetland due largely to disturbance-related impacts.

I have recommended conditions to be applied to the construction and operation of the rail loop at Abbot Point (Appendix 4) to enforce the proponent's commitments and to minimise the impacts on migratory shorebirds. Proponent proposals to offset likely residual impacts are discussed in Section 11.13 of this report.

### **Residual impacts and offsets**

Based on the conservative assessment of direct impacts, the EPBC Act report recommended offsets for the loss of the approximate 16.3 hectares of potential habitat. These are proposed at a ratio of 5:1 for a total offset of approximately 81.5 hectares. The offset strategy, discussed in Chapter 10 of the EPBC Act report, details how this offset will be delivered.

In addition to land-based offsets, the proponent has committed to provide an additional 100 hectares of habitat, or an equivalent financial contribution, to the implementation of the Queensland Government's Caley Valley Wetland EMP. This is proposed in order to compensate for the potential indirect impacts of the construction and operation of the rail loop. A contribution to the implementation of the EMP is considered to be appropriate as ongoing activities associated with the project may marginalise areas of habitat in the immediate vicinity, and it is therefore beneficial to focus a set of conservation efforts within Caley Valley wetland to ensure that habitat remains viable in the long-term.

### **11.10.3. Other migratory species**

A number of other listed migratory species are identified in the EPBC Act report as known, likely or as having the potential to occur within the project site. The report details survey information undertaken and used to identify presence and potential impacts on these species.

### **Known, likely or potential migratory species**

Desktop analysis and the surveys undertaken within the project site have identified 12 listed migratory species (other than the migratory shorebirds referred to above) as being known, likely or having the potential to occur within the vicinity of the mine site and rail alignment. These species are listed in tables 11.18, 11.19, 11.20 and 11.21 below.

**Table 11.18 Migratory marine birds**

Scientific name	Common name	EPBC listing status	Likelihood of occurrence
<i>Apus pacificus</i>	Fork-tailed swift	Migratory	Likely
<i>Ardea alba</i>	Great egret, white egret	Migratory	Known
<i>Ardea ibis</i>	Cattle egret	Migratory	Likely

**Table 11.19 Migratory terrestrial species**

Scientific name	Common name	EPBC listing status	Likelihood of occurrence
<i>Haliaeetus leucogaster</i>	White-bellied sea eagle	Migratory	Likely
<i>Hirundapus caudacutus</i>	White-throated needletail	Migratory	Potentially occurring
<i>Hirundo rustica</i>	Barn swallow	Migratory	Potentially occurring
<i>Merops ornatus</i>	Rainbow bee-eater	Migratory	Known
<i>Monarcha melanopsis</i>	Black-faced monarch	Migratory	Potentially occurring
<i>Monarcha trivirgatus</i>	Spectacled monarch	Migratory	Potentially occurring
<i>Myiagra cyanoleuca</i>	Satin flycatcher	Migratory	Likely

**Table 11.20 Migratory wetland species (excluding migratory shorebirds and migratory marine birds)**

Scientific name	Common name	EPBC listing status	Likelihood of occurrence
<i>Rostratula australis</i>	Australian painted snipe	Migratory Vulnerable	Likely

**Table 11.21 Migratory marine species**

Scientific name	Common name	EPBC listing status	Likelihood of occurrence
<i>Crocodylus porosus</i>	Saltwater crocodile, Estuarine crocodile	Migratory	Potentially occurring

### Potential impacts and mitigation

The EPBC Act report analysed the potential habitat provided by the project site for these species. Each of these migratory species has large natural distributions, is highly mobile and is found in a variety of areas throughout Australia. The report concluded that neither important habitat nor an ecologically significant proportion of any of the species is present within the project area. As a result, significant impacts are considered unlikely.

Despite this, the EPBC Act report stated that the general mitigation and management measures developed for the rail and mine components of the project will assist in minimising any potential impacts to migratory species.

### **Residual impacts and offsets**

The EPBC Act report concluded that offsets are not necessary for these species, given that significant impacts are not expected. However, the report also noted that the offsets to be provided for the project are likely to provide benefits to a range of species including those discussed in this section.

#### **11.10.4. Conclusion—listed migratory species**

I have reviewed the EIS and associated documentation, including the EPBC Act report, and conclude the proponent has comprehensively assessed the impacts of the project on migratory species MNES. I note that the proponent has made a number of commitments to avoid and mitigate impacts on the Caley Valley wetlands and habitats in general that would apply equally to migratory species.

I have recommended conditions to be applied to the construction and operation of the mine site (Appendix 1) and rail line including the rail loop within the Caley Valley Wetlands (Appendix 4) to enforce the proponent's commitments, and to minimise the impacts on migratory species. Proponent proposals to offset likely residual impacts on the Caley Valley Wetlands are discussed in Section 11.13 of this report.

## **11.11. Great Barrier Reef World Heritage Area and National Heritage Place**

The Great Barrier Reef (GBR) is listed as both a World Heritage Area and a National Heritage Place. The values of the GBR under both listings are the same and the two controlling provisions (World and National Heritage) are addressed together by the proponent in the EPBC Act report.

For the sake of brevity, the listed area is referred to as the Great Barrier Reef World Heritage Area (GBRWhA).

There are no other World Heritage Areas or National Heritage Places that are relevant to the project.

### **11.11.1. Overall heritage values**

The GBRWhA is the world's largest World Heritage property extending over 2000 kilometres. The overall values of the GBRWhA are described in the EPBC Act report (refer Table 11.22 for a summary).

**Table 11.22 Summary of the World Heritage values for the GBR**

World Heritage listing criteria	Examples of World Heritage values
Outstanding example representing a major stage of the earth's evolutionary history	<ul style="list-style-type: none"> <li>• 2904 coral reefs covering approximately 20 055 km squared</li> <li>• 300 coral cays and 600 continental islands</li> <li>• Record of sea level changes and the complete history of the reef's evolution are recorded in the reef structure</li> </ul>
Outstanding example representing significant ongoing geological processes, biological evolution and man's interaction with his natural environment	<ul style="list-style-type: none"> <li>• The heterogeneity and interconnectivity of the reef assemblage</li> <li>• Ongoing processes of accretion and erosion of coral reefs, sand banks and coral cays, erosion and deposition processes along the coastline, river deltas and estuaries and continental islands</li> <li>• The diversity of flora and fauna</li> </ul>
Contain unique, rare or superlative natural phenomena, formations or features or areas of exceptional natural beauty	<ul style="list-style-type: none"> <li>• The vast extent of the reef and island systems which produces an unparalleled aerial vista</li> <li>• The rich variety of landscapes and seascapes including rugged mountains with dense and diverse vegetation and adjacent fringing reefs</li> <li>• Migrating whales, dolphins, dugong, whale sharks, sea turtles, seabirds and concentrations of large fish</li> </ul>
Provide habitats where populations of rare or endangered species of plants and animals still survive	<ul style="list-style-type: none"> <li>• Habitats for species of conservation significance within the 77 broad-scale bioregional associations that have been identified for the property</li> <li>• Large areas of ecologically complex inter-reefal and lagoonal benthos</li> <li>• Species of plants and animals of conservation significance</li> </ul>

### 11.11.2. Heritage values relevant to the project (in particular Abbot Point)

The EPBC Act report described the GBRWHA heritage values that are relevant to the project and in particular the context of Abbot Point within the broader area of the GBR. Abbot Point is an existing industrial port that is designated as an SDA with a view to its expansion. The EPBC Act report concluded that the GBRWHA within the vicinity of the port does not contain key elements of the World Heritage Values. For example:

- no reefs, islands or coral communities of exceptional value occur within the area
- the area is not known as an important area for biodiversity within the GBR more broadly
- it is not known as an area of exceptional natural beauty.

The World Heritage Values within the vicinity of Abbot Point are summarised below in Table 11.23.

**Table 11.23 World Heritage values within the vicinity of Abbot Point**

World Heritage listing criteria	World Heritage values within the vicinity of Abbot Point
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World Heritage listing criteria	World Heritage values within the vicinity of Abbot Point
Outstanding example representing a major stage of the earth's evolutionary history	<ul style="list-style-type: none"> <li>• There are no significant extant or extinct coral communities within the vicinity of Abbot Point</li> <li>• The seabed within the vicinity of Abbot Point does not contain any significant geomorphic or physiographic features</li> <li>• The area does not contain any continental islands or cays</li> </ul>
Outstanding example representing significant ongoing geological processes, biological evolution and man's interaction with his natural environment	<ul style="list-style-type: none"> <li>• The benthic environment within the vicinity of Abbot Point (generally soft sediments with seagrass areas) are not unusual in the GBRWHA and do not represent an area of significant ongoing geological processes or biological evolution</li> </ul>
Contain unique, rare or superlative natural phenomena, formations or features or areas of exceptional natural beauty	<ul style="list-style-type: none"> <li>• Abbot Point does not contain any particular features that distinguish it from other coastal areas and it is not known for its exceptional beauty</li> <li>• The area supports an existing port and the project will occur near to an existing railway</li> </ul>
Provide habitats where populations of rare or endangered species of plants and animals still survive	<ul style="list-style-type: none"> <li>• Dugongs have been recorded in moderate numbers and have been observed primarily foraging within seagrass habitat surrounding Abbot Point. A dugong protection area is located 15 km south of the Port.</li> <li>• The Indo-Pacific humpback dolphin (<i>Sousa chinensis</i>) and snubfin dolphin (<i>Orcaella heinsohni</i>) occur in the waters surrounding the Port.</li> <li>• The beaches surrounding Abbot Point are known to support low density nesting for green (<i>Chelonia mydas</i>) and flatback (<i>Natator depressus</i>) turtles. Abundance of turtles peaks during the nesting period between November and February. Turtles also occur in the waters surrounding Abbot Point in varying abundances.</li> <li>• Humpback whales have been observed in the waters off Abbot Point during the seasonal migration period (between July and mid September- October). Some individuals have been observed resting with calves.</li> </ul>

However, as discussed below, the broader values of the reef are relevant to the discussion about potential impacts including the issue of the potential facilitated impacts associated with shipping.

### 11.11.3. Potential impacts and mitigation

While the project occurs wholly outside of the GBR, the project has the potential to indirectly impact World Heritage values through:

- potential impacts to the quality of water entering the reef
- potential impacts to the visual amenity of the reef
- the potential facilitated impacts of increased shipping through the reef.

## Water quality

The majority of the proposed rail is located within the Burdekin Basin catchment with the northern part of the project within the Don River Basin. The alignment intersects with a number of freshwater tributaries and streams that drain into the GBRWHA. These are listed along with their relative sub-catchments in the table below (Table 11.24). In addition to this, a small length of the rail intersects with the Caley Valley Wetland which is partially tidally influenced.

**Table 11.24 Watercourses and sub-catchments intersected by the proposed Alpha Coal railway.**

Catchment/sub-catchment	Major tributaries and streams
Belyando/Suttor sub-catchment	Belyando, Cape, Suttor, and Rollston Rivers Mistake, Diamond and Logan Creeks
Bowen-Broken sub-catchment	Bowen and Broken Rivers, Lower Burdekin River Pelican Creek
Lower Burdekin sub-catchment	Bogie and Burdekin Rivers
Don River catchment	Haughton, Don and Elliot Rivers Majors Creek

The EPBC Act report described how the majority of the project is located within the Belyando (35 000 square kilometres) and Suttor sub-basins that stretch over approximately 18 000 square kilometres of land. The Belyando and Suttor sub-basins represent a dry, variable and typically semi-arid landscape producing markedly seasonal stream flow and contributing comparatively less to the overall discharge from the Burdekin Basin than other sub-basins within the basin. It is common for more than 80 per cent of the annual stream flow of the waterways in the Belyando/Suttor sub-basins to occur between December and April, with no flow between May and November.

All waterways that are crossed by the alignment in this sub-basin go through the Burdekin Falls Dam. The EPBC Act report noted that an important (artificial) factor in the sediment management process of the Belyando–Suttor sub-basin is the Burdekin Falls Dam. The report estimated that 90 per cent of the sediment delivered to the Burdekin Falls Dam is trapped by the dam.

At its northern extent, the proposed rail traverses the Don River catchment, terminating adjacent to the GBRWHA, with a portion of the rail loop occurring within the Caley Valley Wetland. Water flows from the Caley Valley Wetland into the GBRWHA (Curlew Bay) towards the north-west of the wetland. The project is largely removed from this area of water exchange due to the presence of the inner and outer bunds (discussed previously in relation to migratory shorebirds). During the dry season, water flows may also occur from the Caley Valley Wetland to the GBRWHA via Saltwater and Euri Creeks.

The EPBC Act report identified that potential water quality impacts to the GBRWHA may arise from:

- an increase in sediment loads entering the reef due to unmanaged erosion at stream crossings along the rail alignment or construction impacts closer to the

coast, leading to increased turbidity, smothering of benthic habitats and degradation of inshore habitats

- potential coal dust dispersal into the reef through aerial carriage from rail trucks and the rail unloading facility at Abbot Point
- release of contaminants from the mine into the Burdekin River system; detrimental changes to water chemistry could occur leading to degradation of inshore habitats such as seagrasses or benthic communities
- a decrease in water quality entering the reef due to issues such as using chemicals to manage weeds along the rail alignment.

The EPBC Act report included commitments by the proponent to mitigate these potential impacts, primarily as a component of the mitigation measures proposed generally for the construction of the operation of the rail line and mine.

Based on the context of broader land use within the Burdekin catchment (e.g. substantial areas of agriculture), the sediment management function of the Burdekin Falls Dam and the application of the proposed mitigation measures, the EPBC Act report concluded that potential impacts on water quality entering the GBRWHA will be minimal and adequately managed.

### Visual amenity

The rail element of the project, which will occur near the coast, will be built within an existing industrial port and near an existing rail line. The project will be consistent with the current and designated land use. The EPBC Act report therefore concluded that the project will not significantly change or detract from the current visual landscape.

The proponent considers impacts on visual amenity from this project to be minimal.

### Shipping

#### Context

The EPBC Act report discusses impacts on the GBRWHA in the context of a number of development proposals at Abbot Point (including this project and its associated T3 port development) currently being considered by the State and Australian governments. These proposals include:

- T1 (existing)—Adani
- T2 and rail—BHP Billiton
- T3 and rail—HCPL

One of the issues for these proposed projects is the possible increase in shipping numbers through the reef and the potential for facilitated impacts on the GBR World and National Heritage values.

The risks identified in the EPBC Act report associated with shipping include the potential for:

- the introduction of marine pests
- waste disposal within the GBR

- increased ship groundings
- fauna strike
- oil spills
- damage to the benthic environment in anchorage areas.

The EPBC Act report estimated that HCPL's T3 development will lead to an additional 508 vessel movements per year. The Alpha Coal Project will facilitate part of that rise in vessel movements, with the proposed Kevin's Corner mine contributing to the remainder.

The issue of shipping impacts is addressed in detail in the assessment documentation for T3 and is other port developments and will not be discussed further in this report.

#### **Cumulative impact assessment of shipping at Abbot Point**

The EPBC Act report incorporated information about the current CIA that is being conducted at Abbot Point. This is a collaborative process between the proponents at Abbot Point (Adani, BHP Billiton, HCPL and NQBP) that aims to address the potential cumulative impacts of the various proposals, including addressing the key issue of shipping.

The CIA process to assess the potential impacts and necessary mitigation measures relating to shipping includes:

- engagement of an Australian expert in shipping to examine the issues in the GBR (including the various regulatory controls in place) and the potential impacts of increased ship numbers
- consultation with the Australian Government to work through the findings of that work
- incorporation of key outcomes into the CIA report that will be released for public comment
- inclusion of necessary mitigation measures into the processes to regulate shipping (e.g. port controls within Abbot Point).

Given that increased ship numbers is a common issue between all of the proposed developments at Abbot Point, the EPBC Act report outlined the value of a single and coordinated analysis of the issues through the CIA process.

#### **11.11.4. Conclusion—GBRWha**

I have reviewed the EIS and associated documentation, including the EPBC Act report, and concluded that the proponent has provided an adequate assessment of the impacts of the project on the values of the GBRWha and the Great Barrier Reef National Heritage Place. I note the proponent has made a number of commitments to avoid and mitigate impacts to the aquatic environment of the project area that would apply equally to the GBRWha.

I further note that the cumulative impacts of multiple port-related projects at Abbot Point are being addressed through separate assessment processes and through the CIA

process developed cooperatively by project proponents, and the State and Australian governments.

I have recommended conditions to be applied to the construction and operation of the mine site (Appendix 1) and rail line (Appendix 4) to enforce the proponent's commitments and which will minimise and adequately manage the impacts on the GBRWHA. Proponent proposals to offset likely residual impacts are discussed in Section 11.13 of this report.

## **11.12. Ecological communities dependent on groundwater**

The SEIS stated that the impacts of groundwater drawdown on vegetation communities within the project site were regarded as low. There were no identified groundwater-dependent ecosystems located on the project site, and the groundwater piezometric levels associated with usable aquifers are at depths greater than 20 metres and are thus not accessible to the existing vegetation. Information (groundwater level monitoring on site) obtained during construction and operation of a large coal test pit had indicated little or no hydraulic connectivity (linkage) between the piezometric groundwater levels (associated with the underlying confined aquifers) and the ephemeral surface water resources or perched water tables. Thus it was concluded that any reduction in piezometric pressure, resulting in decrease in groundwater levels, due to mine depressurisation will not impact on the vegetation communities.

The proponent found that incidents of isolated perched groundwater, during and immediately after the wet season, were identified within the weathered Tertiary laterite and saprolite and clay-rich Quaternary alluvium where groundwater has been recorded at depths of 0.5 to 1.5 metres below surface. These perched water tables may provide limited water (low sustainable volumes) for local vegetation communities.

Based on the low permeability of the Tertiary laterite and saprolite and the very low gradients, drawdown within the Tertiary units resulting from open-pit mining would be limited, to some 10 to 100 metres around the pits. Any perched water within this zone would report to the open pit. The vegetation in the area immediately adjacent to the mine pit would be disturbed or removed due to the envisaged infrastructure (surface water levees, roads, water and power easements, etc.).

In response to the SEIS, SEWPaC sought further information on the potential impacts to ecological communities that are dependent on groundwater supply, including the potential impact on the Great Artesian Basin (GAB). SEWPaC indicated that advice may be sought on this issue from the Independent Scientific Committee on Coal Seam Gas and Coal Mining, established through an agreement between the Queensland and Australian Governments in February 2012.

In response to this request, the proponent contracted URS Australia Pty Ltd to undertake revised groundwater modelling and produced a report 'Groundwater Modelling Report – Alpha Coal Project, dated 28 March 2012'. The report incorporated groundwater hydrogeological information obtained for the EIS and SEIS, supplemented with completely revised modelling work and covered both the proposed Alpha mine and

the neighbouring Kevin's Corner mine. The report has been peer reviewed by Parsons Brinckerhoff and presented formally to the Coordinator-General and SEWPaC. At the time of writing this evaluation report, SEWPaC had not formally responded to the report or provided any additional advice to me on this issue.

The modelling report confirmed that there would be a lowering of groundwater levels in the vicinity of the mining operation but this would be restricted to deep and confined aquifers. It confirmed that the GAB aquifers are protected from the dewatering by thick low permeable units, the Bandana Formation and the Rewan Group aquitard. This is also the view of the Queensland Government's Department of Natural Resources and Mines (DNRM) (formerly part of the Department of Environment and Resource Management (DERM)).

In addition, the modelling report confirmed that groundwater impacts would be restricted to an area from 10 to 100 metres from the mine with no additional impacts on springs or vegetation communities (including TECs) beyond those caused directly by the open-cut mining operations.

The proponent has agreed to continue and expand their bore baseline monitoring program, to validate the model predictions as data is received and to develop trigger and guideline values for assessing impacts of groundwater drawdown related to mining activities for all identified aquifers, including the perched water table(s). If mine-induced groundwater drawdown is indicated, mitigation through the proponent's 'make-good' commitment will be made, which could include artificial recharge of affected areas with water from alternative water sources.

I am satisfied that information provided in the EIS, SEIS and revised Groundwater Modelling Report shows there is unlikely to be any impact from the project on the GAB and no additional impact on MNES listed species or communities due to groundwater drawdown than that expected from the open-cut mining operation. My recommendations about groundwater management on the mine site are discussed in section 5.7 of this report.

## 11.13. Offsets

The EIS and SEIS noted that environmental offsets for impacts on MNES 'may be used to maintain or enhance the health, diversity and productivity of the environment as it relates to MNES' for impacts that cannot be avoided or mitigated (Volume 4, Appendix C of EIS, Volume 2, Appendix FA of SEIS, Volume 2, Appendix FB of the SEIS).

The proponent has made a number of revisions to the draft Biodiversity Offset Strategy (the draft strategy) provided with the SEIS (Appendix X), to address the objectives of state and Commonwealth legislation and policy requirements for biodiversity offsets, in consultation with relevant agencies. In the SEIS (Appendix 17A), the proponent has committed to finalising and implementing the strategy.

The proponent states that the draft strategy has been prepared as the primary ameliorative measure to minimise the residual impacts of all elements of the project on biodiversity. The draft strategy aims to provide a net improvement in ecological value as a result of the project, including providing protection immediately for an equal or

greater area of similar habitat as that lost through the project. It outlines the proponent's commitment to offset the residual or unavoidable impacts of the project on MNES after mitigation and management measures have been implemented.

The proponent states that offsets secured in accordance with the strategy will comply with the principles set out in the Australian Government's Draft Environmental Offset Policy. Key elements of the offset package that will be delivered through the strategy include:

- multiple offset properties located within the same bioregion as the impacts
- protection on title and in perpetuity through a state-based legal mechanism
- protection of the necessary type and quantum of values to address both State and Australian Government requirements.

For MNES vulnerable and endangered species, the draft strategy proposes ratios of impacted-to-offset areas, which will set the area of land necessary to be acquired to meet the Australian Government's offset requirements. These proposed ratios are set out in the following tables (Table 11.25 and Table 11.26).

**Table 11.25 Proposed MNES offset ratios—vulnerable species**

Impacted habitat	Offset habitat			
	Confirmed	High potential	Moderate potential	Low potential
Confirmed habitat	4:1	6:1		
High potential habitat	2:1	4:1	6:1	
Moderate potential habitat	1:1	2:1	4:1	6:1
Low potential habitat	0.5:1	1:1	2:1	4:1

**Table 11.26 Proposed MNES offset ratios- endangered species**

Impacted habitat	Offset habitat			
	Confirmed	High potential	Moderate potential	Low potential
Confirmed habitat	6:1	8:1		
High potential habitat	4:1	6:1	8:1	
Moderate potential habitat	2:1	4:1	6:1	8:1
Low potential habitat	1:1	2:1	4:1	6:1

The final offset ratios are yet to be agreed and will be finalised in consultation with SEWPaC, DNRm and DEHP for both Australian Government and State Government purposes. SEWPaC has advised that the ratios referred to in Table 11.25 and Table 11.26 are likely to be too low to address the high level of risk associated with the residual/unavoidable impacts of the project. Generally, State and Australian Government vegetation/biodiversity offset policies do not set specific ratios, as the ratio

requirements vary with the characteristics of the particular vegetation to be cleared and the corresponding offsets proposed.

### 11.13.2. Threatened flora offsets

Specific offsets are proposed in the draft strategy to address residual impacts to threatened flora species identified as 'known' or 'likely' to occur within the mine site or rail alignment.

Outlined in Table 11.27 and Table 11.28 are the impact area calculations for each species. Impacts have been divided into areas of high potential habitat (HPH) and low potential habitat (LPH). For each impact type, an indicative offset liability (IOL) has been calculated using the offset matrices provided above.

**Table 11.27 Impacts to EPBC listed threatened flora species and IOL (rail)**

Species name	EPBC status	Impact area—HPH (ha)	Impact area—LPH (ha)	Indicative HPH offset liability (ha)	Indicative LPH offset liability (ha)
<i>Dichanthium queenslandicum</i>	Vulnerable	89.0	32.9	355.8	131.5
<i>Dichanthium setosum</i>	Vulnerable	217.0	2326.0	868.1	9304.0
<i>Eucalyptus raveretiana</i>	Vulnerable	28.9	1.9	115.6	7.6

**Table 11.28 Impacts to EPBC listed threatened flora species and IOL (mine)**

Species name	EPBC status	Impact area—HPH (ha)	Impact area—LPH (ha)	Indicative HPH offset liability (ha)	Indicative LPH offset liability (ha)
<i>Dichanthium setosum</i>	Vulnerable	0	8632.0	0	34 528.0

### 11.13.3. Threatened fauna offsets

Specific offsets are proposed in the draft strategy to address residual impacts to threatened fauna species identified as 'known' or 'likely' to occur within the mine site or rail alignment.

Tables 11.29 and 11.30 present the impact area calculations for each species. Impacts have been divided into areas of HPH and LPH. For each impact type, an IOL has been calculated using the offset matrices provided above.

**Table 11.29 Impacts to EPBC listed threatened fauna species and indicative offset liability (rail)**

Common name	EPBC status	Impact area—HPH (ha)	Impact area—LPH (ha)	Indicative HPH offset liability (ha)	Indicative LPH offset liability (ha)
Ornamental snake	Vulnerable	251.2	192.9	1004.8	771.6

Common name	EPBC status	Impact area—HPH (ha)	Impact area—LPH (ha)	Indicative HPH offset liability (ha)	Indicative LPH offset liability (ha)
Yakka skink	Vulnerable	811.8	649.8	3247.2	2599.2
Brigalow scaly-foot	Vulnerable	189.2	272.0	756.8	1088.0
Black-throated finch	Endangered	778.2	595.9	4669.2	3575.4

**Table 11.30 Impacts to EPBC listed threatened fauna species and IOL (mine)**

Common name	EPBC status	Impact area—HPH (ha)	Impact area—LPH (ha)	Indicative HPH offset liability (ha)	Indicative LPH offset liability (ha)
Ornamental snake	Vulnerable	1,542.7	545.5	6170.8	2182.0
Yakka skink	Vulnerable	8,152.0	1,631.1	32,608	6,524.4
Black-throated finch	Endangered	7,154.1	3,149.8	42,924.6	18,898.8

SEWPaC has advised that the Australian Government will require offsets to be provided of similar habitat quality for these species.

#### **11.13.4. TECs offsets**

Residual impacts to three TECs along the rail alignment will require offsets including:

- Natural Grasslands
- Brigalow
- SEVT.

The proponent proposes to offset impacts to TECs at a 5:1 ratio if offsetting using remnant vegetation, and 8:1 if offsetting using non-remnant (regrowth) vegetation. The higher ratio (8:1) for non-remnant offset areas acknowledges the greater risk associated with offsets where rehabilitation and revegetation is required to ensure the re-establishment of the necessary elements of the community. Impact areas and the associated offset liability for each TEC are provided in Table 11.31.

**Table 11.31 Impacts to EPBC listed TECs and IOL (rail)**

TEC	Impact area (ha)	IOL—remnant vegetation (5:1) (ha)	IOL—non-remnant vegetation (8:1) (ha)
Natural Grasslands	151.0	755.0	1208.0
Brigalow	100.5	502.5	804.0
SEVT	14.2	71.0	112.8
Total	265.7	1328.0	2124.8

### 11.13.5. Migratory species offsets

An area of 16.3 hectares of migratory shorebird habitat is likely to be impacted as a result of the northern rail loop within the Caley Valley wetlands. The draft strategy outlines an estimated offset liability for this impact using a 5:1 offset ratio. This leads to a proposed offset of 81.5 hectares of suitable wetland habitat.

In addition to land-based offsets, the EPBC Act report outlines the proposal for the proponent to provide an additional 100 hectares of wetland habitat or an equivalent financial contribution to the implementation of the Caley Valley Wetland EMP. This has been proposed by the proponent to compensate for the potential indirect impacts of the construction and operation of the rail loop. A contribution to the implementation of the EMP is considered to be appropriate as ongoing activities associated with the project may marginalise areas of habitat in the immediate vicinity, and it is therefore beneficial to focus a set of conservation efforts within Caley Valley Wetland to ensure that habitat remains viable in the long-term.

### 11.13.6. Availability of offsets

The proponent is currently in the process of exploring several offset options available to satisfy the offset requirements for the project. The purpose of these investigations is to determine and confirm the availability of offsets in the broader region, and provide confidence that the project can source, secure and manage the offsets required for the residual impacts of the project. Investigations have been conducted into several options including the use of:

- properties owned (or currently being purchased) by the proponent
- offset brokers to source the required offsets.

The results of the initial assessment in the draft strategy showed that the majority of offsets required for MNES were represented, to an adequate level, within the proponent's properties including:

- Natural Grasslands of the Queensland Central Highlands and the northern Fitzroy Basin
- Brigalow (*Acacia harpophylla* dominant and co-dominant)
- Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions

- *Dichanthium queenslandicum*
- *Dichanthium setosum*
- *Eucalyptus raveretiana*
- yakka skink
- Brigalow scaly-foot.

The proponent's properties do not contain adequate offsets for ornamental snake or black-throated finch. While offsets for impacts on these species are not sufficiently represented within the proponent's properties, further investigation of the surrounding region using species modelling suggests that a large amount of potential habitat for both species is present in the broader area. As such, the proponent states that the offsets for both the ornamental snake and the black-throated finch would be achievable.

SEWPaC has advised me that any proposed off-site offset tenure should be protected in perpetuity to avoid being disturbed in the future, including from future mining activities. There is the potential for the tenure of the proposed offset lands, as identified in the proponent's draft strategy, to be subject to future applications for development under the *Mineral Resources Act 1989* and the *Petroleum and Gas (Production and Safety) Act 2004*, hence affecting their protection status.

An environmental offset would normally be expected to have protection from development in a way that would see the area managed sustainably for an indefinite period. It is desirable that some form of conservation status be secured for the offset lands, as this would provide some protection from development. However, nature refuge agreements under Queensland's *Nature Conservation Act 1992*, a commonly used tenure for offsets, do not provide statutory protection from mining or petroleum development.

It may be some years before the fate of any proposed project-offset lands become known. Should the proponent's offset lands be proposed to be cleared in the future by another holder of underlying mining or petroleum tenures, then that tenure holder would also be required to provide additional offsets as well as that required for that particular clearing. Should this situation arise, it would be appropriate for the situation to be resolved by the relevant stakeholders in accordance with the prevailing statutory and policy requirements at that time.

#### **11.13.7. Offset delivery**

As the impacts of the project are to take place over approximately 30 years, the proponent has proposed a staged delivery of offset lands over the life of the mine. It is proposed that the staging of offsets occurs over set increments that reflect the clearing and operational cycles of the mine and rail projects. The timeframes recommended are contained in Table 11.32.

**Table 11.32 Staged offset requirements**

Stage	Years of operation	Offsets delivered per stage
1	1–5	All rail-related offsets Stage 1 mine related offsets (yrs 1–5)
2	5–10	Stage 2 mine related offsets (yrs 5–10)
3	10–20	Stage 3 mine related offsets (yrs 10–20)
4	20–30	Stage 4 mine related offsets (yrs 20–30)

SEWPaC has advised that the department has reservations about the continued reassessment of the likely impacts and associated offsets through this staged approach after the commencement of project activities.

### **11.13.8. Conclusions—offset**

At the time of writing this report, agreement had not been reached with the State or Commonwealth regulatory agencies on the proponent's approach to offsets and the draft strategy had not been finalised. These regulatory agencies had yet to fully analyse the proponent's most recent draft of the strategy, dated 19 April 2012, complete negotiations with the proponent on offset requirements, or provide advice on the acceptability of the draft strategy to the Coordinator-General. I am particularly aware of SEWPaC's concerns with the level of uncertainty accepted by the proponent in their modelling approach to evaluating species occurrence.

While the proponent has identified areas of MNES listed species habitat and TECs that will require offsetting, these calculations are based on modelling and are likely to be conservative, i.e. overestimate the actual area to be impacted. The proponent is committed to undertaking ground-truthing of these estimates during detailed project design subsequent to the project's approval. Therefore, decisions on the acceptability of offset requirements necessary for approvals will need to be made on the modelled information.

While the proponent has stated in the draft strategy that there are sufficient offset areas potentially available on their own properties or properties identified by an offset broker, this has yet to be confirmed by SEWPaC or the state regulatory agencies.

To reduce the net residual adverse impacts to those threatened species to an acceptable level, I have imposed a condition that requires the proponent to ensure that environmental offsets provide for the habitat requirements of EPBC listed threatened flora and fauna species and threatened ecological communities identified to be adversely impacted by the project (Appendix 2, Part D, Condition 2 and Appendix 4, Part A, Condition 25).

## **11.14. Conclusion—MNES general**

The EIS, SEIS and SEIS addendum documentation failed to adequately address MNES to my satisfaction. However, in mid-April 2012, the proponent provided me with the EPBC Act report and the revised draft Biodiversity Offsets Strategy. These two documents provided me with a more comprehensive review of MNES matters. I note

that analyses of these documents have not been completed SEWPaC or state agencies and negotiations with the proponent on these matters have yet to be completed.

I note the SEIS included strategies to minimise impacts on native flora and fauna that would apply to MNES listed species and TECs. These include:

- Appendix V Mine EM plan:
  - p217—control strategies—for flora and fauna—in this section there are commitments to manage the movement of fauna out of areas prior to disturbance, check fallen logs etc as well as the following plans:
    - p217—weed management plan
    - p218—a site-specific feral animal control plan
- Appendix AA Species management plan for the rail
- Appendix AC Rail EM plan— AC.3.50 Control Strategies
  - P30—Ecological control strategies, including a weed and pest management plan, species and population management plan and fire management plan.
- Appendix AA Railway Corridor—Species Management Program
- This includes mitigation to cover biodiversity generally.

Additionally, commitments have been made by the proponent to develop various management plans for the mine site and rail alignment that will include:

- detailed design of mitigation measures such as fauna underpasses and fencing, placing transportable habitat features such as large logs and boulders in adjacent retained areas provide potential fauna refuge sites
- general impact mitigation
- staff/contractor inductions and ongoing education
- pre-clearing surveys and fauna salvage/translocation
- weed control
- rehabilitation and restitution of adjoining habitat, including collection of native seeds for use in the revegetation of disturbed areas
- weed and pest management
- rehabilitation protocols, including revegetation of areas not required for operations after construction has been completed
- flora and fauna monitoring and reporting programs, including remedial actions.

While these commitments are generally broad in nature, I have set conditions for the mine site and rail line (refer Appendix 2 and Appendix 4) to ensure that they will be met. These conditions will apply to the avoidance and mitigation of impacts on MNES listed species and TECs as they will to fauna, flora and ecological communities in general.

I note that field studies of flora and fauna (including MNES) are incomplete, particularly for significant sections of the rail line. I have required this omission to be addressed by the completion of rail corridor biodiversity field surveys to the satisfaction of DEHP (Appendix 4, Part A, Condition 15)

The commitment by the proponent to finalise and implement a Biodiversity Offset Strategy, in consultation with relevant agencies, has been noted. The strategy will need to address the requirements of State and Commonwealth legislation and policies for offsets. Conditions relating to the finalisation of the strategy are included in Appendix 2 (Part D) and Appendix 4 (Part A, Condition 25).

I note that the Queensland Biodiversity Offsets Policy provides for Australian Government offset requirements to be taken into account in determining the State's biodiversity offset requirements.

I am aware that in accordance with the Commonwealth offset policy, the Commonwealth Minister for Sustainability, Environment, Water, Population and Communities may set his own conditions with respect to avoidance, mitigation and offsetting of the potential impacts to EPBC listed threatened species and communities that occur on the site of the proposed mine, rail corridor and rail loop at Abbot Point.

I have considered the avoidance, mitigation and offset strategies put forward by the proponent in the EIS, SEIS, draft EM plan for the mine site EA, and draft construction and operational EMPs for all project components (subject to finalisation). These strategies (which include offsets for cleared TECs and the habitat of threatened EPBC listed species and ongoing management of threatening processes within offset areas and retained habitats) are considered adequate to manage the potential adverse impacts of the project on MNES.

I consider that the proponent has comprehensively analysed the impact of the project on MNES and that mitigation measures are adequate.

## 12. Conclusion

In undertaking my evaluation of the EIS, I have considered the following:

- the EIS and SEIS prepared for this project
- submissions on the EIS and SEIS
- the addendum to the SEIS material submitted by the proponent
- additional supplementary documents as requested by state agencies for there assessment and as referred to within this evaluation report, including:
  - *Alpha Coal Project Groundwater Modelling Report*, Version 2, March 2012, URS Australia Pty Limited
  - *Alpha Coal Project EPBC Act Report*, Version 1, April 2012, Ecological Australia Pty Limited
  - *Alpha Coal Project Mine Water Structures Bridging Report*, Version B, April 2012, Parson Brinkerhoff Australia Pty Limited
  - *Alpha Coal Project Biodiversity Offset Strategy*, Version 2, May 2012, Ecological Australia Pty Limited
  - *Alpha Coal Project Air Quality Assessment Model Refinements Report*, Version 2, May 2012, URS Australia Pty Limited
  - *Alpha Coal Project Rail Flood Design Conditions Report*, Version 1, May 2012, Calibre Operations Pty Limited

*Note: these additional supplementary documents can be made available upon request*

- advice received from State Agencies and SEWPaC.
- advice received from contractors RPS.

I am satisfied that the requirements of the SDPWO Act have been satisfactorily fulfilled and that sufficient information has been provided to enable the necessary evaluation of potential impacts attributable to the project.

The project is a key component of the opening up of the Galilee Basin coal deposits. The project will support the Kevin's Corner project in the Galilee Basin. It will also bring major associated social and economic benefits to the State.

The Galilee Basin spans an area of over 247 000 square kilometres and is estimated to include over 14 billion tonnes of coal. As such, the proposed rail corridor will be an essential part of accessing the Galilee Basin and facilitating the export of thermal coal and other products. As a result, the proposed railway line will benefit the Central Queensland region, State of Queensland, and the nation.

The environmental assessment commenced at declaration of this project in October and has involved an extensive body of work by the proponent. Further, more detailed work will occur in the detailed design phase of the project.

The various potential impacts, identified in both the EIS and SEIS have been identified and assessed. I consider those impacts to be acceptable and manageable.

Accordingly, I recommend that the project as described in this Evaluation Report, proceed, subject to the conditions and recommendations in Appendix 1, Appendix 2, Appendix 3 and Appendix 4 and the proponent commitments listed in Appendix 5.

Section 11 of this report describes the extent to which the material supplied by the proponent addresses the actual or likely impacts on MNES of each controlled action for the project.

This report includes the following:

- Stated conditions, for the Environmental Authority (Mining Lease) made under the EP Act (refer to Appendix 1)
- Imposed conditions for the mine, made under section 54B the SDPWO Act (refer to Appendix 2);
- My (Coordinator-General) recommendations for the mine, made under section 35(4) the SDPWO Act (refer to Appendix 3);
- stated conditions or imposed conditions for the rail made under section 43 or section 54B of the SDPWO Act, imposed social conditions for the rail and recommendations for the rail (refer Appendix 4);
- a list of proponent commitments (refer to Appendix 5).

Key points to note regarding conditioning presented in Appendices 1–4 include:

- Except where otherwise specifically defined, references to timing of construction works shall be read as excluding 'early works' (defined in Appendix 3, Schedule 11) either outside or inside of the mining lease or rail corridor.
- References to financial contributions to be provided by the proponent or contributions pursuant to infrastructure agreements include only contributions to matters that are impacted by the project and may be subject to the implementation of appropriate cost recovery mechanisms from other relevant proponents.
- Where the proponent and third parties are required to cooperate or enter into agreement, the condition is subject to a requirement for the parties to act reasonably and in good faith.
- Where compliance with a condition is dependent on the agreement or cooperation of a third party and the proponent is unable to comply with the condition due to an act or omission of the third party, compliance with the condition will be determined by the Coordinator-General.
- Where cumulative impact assessment is required by a condition the proponent is only required to assess the impact of other relevant projects which are known to it at the time of assessment.

If there are any inconsistencies between the project (as described in the EIS and supplementary information) and the conditions in this report, the conditions shall prevail. The proponent and its agents, lessees, successors and assignees, as the case may be, must implement the conditions of this report and all commitments presented in the EIS and supplementary project information

Copies of this report will be issued to the following entities:

- the proponent
- The Minister for Environment and Heritage Protection
- The Minister for Transport and Main Roads
- The Department of Environment and Heritage Protection
- The Department of Transport and Main Roads
- The Department of Natural Resources and Mines
- The Department of National Parks, Recreation, Sport and Racing
- Barcaldine Regional Council
- Isaac Regional Council
- Whitsunday Regional Council.

A copy of this report will also be available on the project website at **[www.deedi.qld.gov.au/cg/alpha-coal-project.html](http://www.deedi.qld.gov.au/cg/alpha-coal-project.html)**

## Appendix 1. Stated conditions—mine environmental authority (mining lease)

This appendix includes the Coordinator-General's stated conditions for the draft environmental authority (mining lease) for the Alpha Coal Project under the *Environmental Protection Act 1994* and are stated pursuant to section 49 of the *State Development and Public Works Organisation Act 1971*.

The appendix is structured as follows:

Schedule 1—General

Schedule 2—Water

Schedule 3—Waste

Schedule 4—Community

Schedule 5—Sewage Treatment

Schedule 6—Water Treatment

The administering authority for the *Environmental Protection Act 1994* (EP Act), Department of Environment and Heritage Protection (DEHP), formerly the Department of Environment and Resource Management (DERM), in assessing the Alpha Coal project's Environmental Impact Statement (EIS), Supplementary EIS and Addendum to the Supplementary EIS found that the proposed Environmental Management Plan (EM Plan) for the Environmental Authority (EA) does not yet meet the content requirements of Section 203 of the EP Act. The draft EM Plan provided with the EIS documentation does not provide sufficient information to allow DEHP to finalise its recommendation to me on conditions that could be state for any draft EA.

DEHP has continued to work with the proponent to sufficiently develop the requirements of the EM plan and negotiate remaining EA conditions. These negotiations had not been finalised at the time of this Evaluation Report.

For the purposes of this Evaluation Report, DEHP has provided me with the following for my consideration:

- recommendations on outstanding matters to be addressed and information to be provided by the proponent prior to the issue of any draft EA
- recommendations on the types of matters to be conditioned within any draft EA, including recommended conditions that could be included in the draft EA following further negotiations with the proponent
- draft EA conditions to be stated, which in accordance with Section 210(2)(a) of the EP Act must be included within any draft EA.

I have reviewed and accepted this advice to the extent reflected in appendices 1, 2 and 3.

## **Schedule 1. `General**

### **Condition 1. Financial assurance**

- (a) The environmental authority holder must provide to the administering authority financial assurance for the amount and in the form acceptable to the administering authority in accordance with the most recent edition of the administering authority's Guideline – *Calculating financial assurance for mining projects*, before the proposed mining activities can commence or be varied.
- (b) The amount of financial assurance must be reviewed by the holder of this environmental authority when a plan of operations is amended or replaced or the environmental authority is amended.

### **Condition 2. Coal Extraction**

- (a) The environmental authority holder is approved for a coal extraction rate of up to 45 million tonnes per annum (mtpa) of run-of-mine (ROM) ore in accordance with this environmental authority.

### **Condition 3. Maintenance of measures, plant and equipment**

- (a) The environmental authority holder must:
  - (i) install all measures, plant and equipment necessary to ensure compliance with the conditions of this environmental authority;
  - (ii) maintain such measures, plant and equipment in a proper and efficient condition; and
  - (iii) operate such measures, plant and equipment in a proper and efficient manner.
- (b) No change, replacement or alteration of any plant or equipment is permitted if the change, replacement or alteration increases, or is likely to substantially increase, the risk of unlawful environmental harm caused by the mining activities.

*NOTE: Change in this case does not refer to trivial changes e.g. a larger and stronger item of equipment replaces a small and outdated item of equipment, it takes up a slightly larger area (i.e. creating a larger area of disturbance, covered by the plan of operations).*

### **Condition 4. Monitoring and records**

- (a) Except where specified otherwise in another condition of this authority, all monitoring records or reports required by this environmental authority must be kept for a period of not less than 5 years.
- (b) Upon request from the administering authority, copies of monitoring records and reports must be made available and/or provided to the administering authority's nominated office within 10 business days or by an alternative timeframe agreed between the administering authority and the holder.
- (c) Any management or monitoring plans, systems or programs required to be developed and implemented by a condition of this environmental authority must be reviewed for effectiveness in minimising the likelihood of environmental harm on an annual basis, and amended promptly if required, unless a particular review date and amendment program is specified in the plan, system or program.

**Condition 5. Notification of emergencies, incidents and exceptions**

- (a) The holder of this environmental authority must notify the administering authority by written notification within 24 hours, after becoming aware of any emergency or incident which results in the release of contaminants not in accordance, or reasonably expected to be not in accordance with the conditions of this environmental authority.
- (b) The holder of this environmental authority must notify the administering authority by written notification within 24 hours, after becoming aware of any emergency, incident or information about circumstances which results or may result in environmental harm not in accordance with the conditions of this environmental authority or a contravention of the conditions of this environmental authority.
- (c) Not more than 10 business days following the initial notification of an emergency, incident or information about circumstances which result or may result in environmental harm or the release of contaminants, written advice must be provided to the administering authority in relation to:
  - (i) available results and interpretation of any samples taken and analysed; and
  - (ii) proposed actions to prevent a recurrence of the emergency or incident;
- (d) The notification in Condition 5(a) and Condition 5(b) must include, but not be limited to, the following:
  - (i) The environmental authority number and name of the holder;
  - (ii) The name and telephone number of the designated contact person;
  - (iii) The location of the emergency or incident;
  - (iv) The date and time of the emergency or incident;
  - (v) The time the holder of the environmental authority became aware of the emergency or incident;
  - (vi) Where known:
    - (A) the estimated quantity and type of substances involved in the emergency or incident;
    - (B) the actual or potential cause of the emergency or incident;
    - (C) a description of the nature and effects of the emergency or incident including environmental risks, and any risks to public health or livestock;
  - (vii) Any sampling conducted or proposed, relevant to the emergency or incident;
  - (viii) Immediate actions taken to prevent or mitigate any further environmental harm caused by the emergency or incident; and
  - (ix) What notification of stakeholders who may be affected by the emergency or incident has occurred or is being undertaken.

**Condition 6. Risk management**

- (a) The holder of this environmental authority must develop and implement a risk management system for mining activities which conforms to the Standard for Risk

Management (ISO31000:2009) within three months of the issue of the environmental authority.

*NOTE: Implementation of a risk management system is not a defence against a breach of any other condition of this environmental authority.*

**Condition 7. Emergency response and contingency planning**

- (a) An emergency response/contingency plan must be developed and implemented within the current plan of operations to manage unacceptable risks identified in the risk management system or the associated monitoring.
- (b) The emergency response/contingency plan must address the following matters:
  - (i) response procedures to be implemented to reduce the likelihood of environmental harm arising from incidents of unacceptable risk;
  - (ii) response procedures to minimise the extent and duration of environmental harm by an incident;
  - (iii) the practices and procedures to be employed to restore the environment or mitigate any environmental impact caused;
  - (iv) a description of the resources to be used in response to an incident;
  - (v) the training of staff that will be called upon to respond to incidents;
  - (vi) procedures to investigate the cause of any incidents, including releases, and where necessary, implement remedial actions to reduce the likelihood of recurrence of similar events;
  - (vii) the provision and availability of documented procedures to staff attending any incident to enable them to effectively respond; and
  - (viii) timely and accurate reporting of the circumstance and nature of incidents to the administering authority.

**Condition 8. Third party audit**

- (a) The holder of the environmental authority must nominate an appropriate third party auditor to audit compliance with the conditions of this environmental authority within 1 year of the commencement of this environmental authority, and then at regular intervals not exceeding 3 years.
- (b) The holder must, at its cost, arrange for independent certification by a third party auditor of findings of the audit report required under Condition 8(a).
- (c) Within ninety days of completing the audit, provide a written report to the administering authority detailing any non-compliance issues that were found (if no non-compliance issues were found this should be stated in the report). If non-compliance issues were found the report must also address:
  - (i) actions taken by the holder of this environmental authority to ensure compliance with this environmental authority; and
  - (ii) actions taken to prevent a recurrence of non-compliance.
- (d) Where a condition of this environmental authority requires compliance with a standard published externally to this environmental authority and the standard is amended or changed subsequent to the issues of this environmental authority the holder of this environmental authority must:

- (i) comply with the amended or changed standard within 2 years of the amendment or change being made, unless a different period is specified in the amended standard or relevant legislation; and
- (ii) until compliance with the amended or changed standard is achieved, continue to remain in compliance with the standard that was current immediately prior to the relevant amendment or change.

**Condition 9. Activity**

- (a) Land subject to mining activities, works previously approved under MDL 285, irrespective of its termination; and early works must be rehabilitated to a non polluting, safe, stable and self sustaining landform.
- (b) Contaminants must not be released to the receiving environment unless they are in accordance with the contaminant limits authorised by this environmental authority.
- (c) This environmental authority authorises environmental harm referred to in the conditions. Where a condition or this environmental authority is silent on a matter, the lack of a condition or silence does not authorise environmental harm.

**Schedule 2. Water**

**Condition 10. Water—General**

- (a) Contaminants that will or have the potential to cause serious or material environmental harm must not be released directly or indirectly to any waters except as permitted under the conditions of this environmental authority.

**Condition 11. Notification of Release Event**

- (a) The environmental authority holder must notify the administering authority as soon as practicable and no later than 24 hours after commencing to release mine affected water to the receiving environment.  
Notification must include the submission of written advice to the administering authority of the following information:
  - (i) release commencement date/time;
  - (ii) expected release cessation date/time;
  - (iii) release point/s;
  - (iv) release volume (estimated);
  - (v) receiving water/s including the natural flow rate; and
  - (vi) details (including available data) regarding likely impacts on the receiving water(s).

*NOTE: Notification to the administering authority must be addressed to the Manager and Project Manager of the local administering authority via email or facsimile.*

- (b) The environmental authority holder must notify the administering authority as soon as practicable (nominally within 24 hours after cessation of a release event) of the cessation of a release notified under Condition 11(a) and within 28 days provide the following information in writing:

- (i) release cessation date/time;
- (ii) natural flow volume in receiving water;
- (iii) volume of water released;
- (iv) details regarding the compliance of the release with the conditions of Department Interest: water of this environmental authority (i.e. contamination limits, natural flow, discharge volume);
- (v) all in-situ water quality monitoring results; and
- (vi) any other matters pertinent to the water release event.

*NOTE: Successive or intermittent releases occurring within 24 hours of the cessation of any individual release can be considered part of a single release event and do not require individual notification for the purpose of compliance with Condition 11(a), provided the relevant details of the release are included within the notification provided in accordance with Condition 11(b).*

#### **Condition 12. Water Reuse**

- (a) Mine affected water may be piped or trucked or transferred by some other means that does not contravene the conditions of this environmental authority and deposited into artificial water storage structures, such as farm dams or tanks, or used directly at properties owned by the environmental authority holder for a third party for the purpose of:
  - (i) Supplying stock water subject to compliance with the quality release limits specified in Table A1: Stock water release limits; or
  - (ii) supplying water for construction and/or road maintenance in accordance with the conditions of this environmental authority.

**Table A1: Stock water release limits**

Quality Characteristics	Units	Minimum	Maximum
pH	pH units	6.5	8.5
Electrical Conductivity	µS/cm	N/A	5000

- (b) If the responsibility of mine affected water is given or transferred to another person in accordance with Condition 12(a):
  - (i) the responsibility for the mine affected water must only be given or transferred in accordance with a written agreement (third party agreement); and
  - (ii) the third party agreement must include a commitment from the person utilising the mine affected water to use it in such a way as to prevent environmental harm or public health incidents and the *Environmental Protection Act 1994*, environmental sustainability of the water disposal and protection of environmental values; and
  - (iii) the third party agreement must be signed by both parties to the agreement.
- (c) All determinations of water quality and biological monitoring must be:

- (i) performed by a person or body possessing appropriate experience and qualifications to perform the required measurements;
  - (ii) made in accordance with methods prescribed in the latest edition of the administering authorities Monitoring and Sampling Manual;
  - (iii) collected from the monitoring locations identified within this environmental authority, within 6 hours of each other where access to the monitoring location is practicable;
  - (iv) carried out on representative samples; and
  - (v) analysed at a laboratory accredited (e.g. NATA) for the method of analysis being used.
- (d) The release of any contaminants as permitted by this environmental authority, directly or indirectly to waters, other than internal water management infrastructure that is installed and operated in accordance with a water management plan that complies with conditions of this environmental authority:
- (i) Must not produce any visible discolouration of receiving waters; and
  - (ii) Must not produce any slick or other visible or odourous evidence of oil, grease or petrochemicals nor contain visible floating oil, grease, scum, litter or other objectionable matter.
- (e) The following information must be recorded in relation to all water monitoring required under the conditions of this environmental authority and submitted to the administering authority in the specified format with each annual return:
- (i) the date on which the sample was taken;
  - (ii) the time at which the sample was taken;
  - (iii) the monitoring point at which the sample was taken;
  - (iv) the measured or estimated daily quantity of mine affected water released from all release points;
  - (v) the results of all monitoring and details of any exceedances of the conditions of this environmental authority; and
- (f) water quality monitoring data must be provided to the administering authority in the specified electronic format upon request.

### **Condition 13. Water Management Plan**

- (a) A Water Management Plan must be developed by an appropriately qualified and suitable person and implemented prior to the commencement of mining activities.
- (b) The Water Management Plan must:
  - (i) provide for effective management of actual and potential environmental impacts resulting from water management associated with the mining activity carried out under this environmental authority; and
  - (ii) be developed in accordance with the administering authority's guideline *Preparation of water management plans for mining activities* and include:
    - (A) a study of the source of contaminants;
    - (B) a water balance model for the site;
    - (C) a water management system for the site;

- (D) measures to manage and prevent saline drainage;
  - (E) measures to manage and prevent acid rock drainage;
  - (F) contingency procedures for emergencies; and
  - (G) a program for monitoring and review of the effectiveness of the water management plan.
- (c) The Water Management Plan must be reviewed each calendar year and a report prepared by an appropriately qualified person. The report must:
  - (i) Assess the plan against the requirements under Condition 13(a) and Condition 13(b);
  - (ii) Include recommended actions to ensure actual and potential environmental impacts are effectively managed for the coming year; and
  - (iii) Identify any amendments made to the water management plan following the review.
- (d) The holder of this environmental authority must attach to the review report required by Condition 13(c), a written response to the report and recommended actions, detailing the actions taken or to be taken by the environmental authority holder on stated dates:
  - (i) to ensure compliance with this environmental authority; and
  - (ii) to prevent a recurrence of any non-compliance issues identified.
- (e) The review report required by Condition 13(c) and the written response to the review report required by Condition 13(d) must be submitted to the administering authority with the subsequent annual return under the signature of the appointed signatory for the annual return.
- (f) A copy of the Water Management Plan must be provided to the administering authority on request.

**Condition 14. Saline Drainage**

- (a) The holder of this environmental authority must ensure proper and effective measures are taken to avoid or otherwise minimise the generation and/or release of saline drainage.

**Condition 15. Acid Rock Drainage**

- (a) The holder of this environmental authority must ensure proper and effective measures are taken to avoid or otherwise minimise the generation and/or release of acid rock drainage.

**Condition 16. Stormwater and Water Sediment Controls**

- (a) An Erosion and Sediment Control Plan must be developed by an appropriately qualified person and implemented for all stages of the mining activities on the site to minimise erosion and the release of sediment to receiving waters and contamination of stormwater.
- (b) Stormwater, other than mine affected water, is permitted to be released to waters from:

- (i) erosion and sediment control structures that are installed and operated in accordance with the Erosion and Sediment Control Plan required by Condition 16(a);
- (ii) water management infrastructure that is installed and operated, in accordance with a Water Management Plan that complies with Condition 13, for the purpose of ensuring water does not become mine affected water.
- (c) The maintenance and cleaning of any vehicles, plant or equipment must not be carried out in areas from which contaminants can be released into any receiving waters.

**Condition 17. Groundwater**

- (a) A groundwater monitoring program must be developed and submitted to the administering authority for approval before the commencement of mining activities. The monitoring program must :
  - (i) allow for the compilation of representative groundwater samples from the aquifers identified as potentially affected by mining activities. The geological units monitored include alluvium, Bandanna Formation, Colinlea Sandstone, Clematis Sandstone, Rewan Formation, and Joe Joe Formation;
  - (ii) include at least twelve sampling events, no more than two months apart over a two year period, to determine background groundwater quality;
  - (iii) obtain background groundwater quality in hydraulically isolated background bore(s), and
  - (iv) allow for the identification of natural groundwater level trends, hydrochemical trigger levels, and contaminant limits.
- (b) In addition to Condition 17(a) groundwater quality and levels must be monitored at the locations and frequencies specified in Table A2: Groundwater monitoring network locations and frequency.

**Table A2: Groundwater monitoring network locations and frequency**

Monitoring Sites*	Parameter	Frequency
AMB-01, AMB-02, AMB-03, AMB-04	Water level	At least one reading every 12 hours – electronic loggers
	pH, EC, TDS (lab), cations, anions, selected dissolved metals (Al, As, B, Cd, Cr, Co, Cu, Fe, Pb, Hg, Mn, Mo, Ni, Se, Ag, U, Zn), nutrients	Monthly until sufficient data is compiled
TSF standpipe bores ATSF-01B ATSF-02, ATSF-03, ATSF-04B, ATSF-07B, ATSF-07C, ATSF-08B, ATSF-08C, ATSF-06B, ATSF-06C, ATSF-05B, ATSF-05C, ATSF-09A, ATSF-09B	Water level	At least one reading every 12 hours – electronic loggers
	pH, EC, TDS (lab), cations, anions, selected dissolved metals (Al, As, B, Cd, Cr, Co, Cu, Fe, Pb, Hg, Mn, Mo, Ni, Se, Ag, U, Zn), nutrients	Monthly until sufficient data is compiled

Monitoring Sites*	Parameter	Frequency
Proposed monitoring bores adjacent infrastructure	Water level	At least one reading every 12 hours – electronic loggers
AlphaWest1, AlphaWest2, AlphaWest3, Landfill1, Landfill2, Landfill3, MIA, CHPP1, CHPP2, EWT, TLO1, RWD1, ROMSouth, ROMNorth	pH, EC, TDS (lab), cations, anions, selected dissolved metals (Al, As, B, Cd, Cr, Co, Cu, Fe, Pb, Hg, Mn, Mo, Ni, Se, Ag, U, Zn), nutrients, TPH (selected bores only)	Every 2 months (for at least two years)
VWP bores AVP_11, AVP_01, AVP_14, AVP_03, AVP_05, AVP_04, AVP_06, AVP_07, AVP_08, AVP_13, AVP_09, AVP_10	Water level only	At least one reading every 12 hours – electronic data readers
New TSF VWP bores ATSF-01A, ATSF-04A, ATSF-05A, ATSF-06A, ATSF-07A, ATSF-08A	Water level only	At least one reading every 12 hours – electronic data readers
New GAB bores AlphaWest4, AlphaWest5, and AlphaWest6	Water level only	At least one reading every 12 hours – electronic data readers
All monitoring bores	Al, As, Sb, B, Cd, Cr, Co, Cu, Fe, Pb, Hg, Mn, Mo, Ni, Se, Ag, U, Zn.	Annually

- (c) If groundwater monitoring results greater than the trigger levels (or outside the trigger levels range for pH) specified for the relevant aquifer in Table A3 to Table A7 (inclusive) are recorded, then the following must be conducted:
- (i) the relevant monitoring point(s) will be re-sampled and the samples analysed for major cations and anions, and selected dissolved metals, including Al, As, Sb, B, Cd, Cr, Co, Cu, Fe, Pb, Hg, Mn, Mo, Ni, Se, Ag, U, Zn;
  - (ii) if elevated concentrations (above trigger) are recorded on two consecutive sampling events then an investigation into cause, optimum response, and the potential for environmental harm must be conducted; and
  - (iii) if elevated concentrations are recorded on two consecutive sampling events then the administering authority will be notified within 1 month of receiving the analysis results.
- (d) If groundwater monitoring results greater than the contaminant limits (or outside the contaminant limits range for pH) specified for the relevant aquifer in Table A3 to Table A7 (inclusive) are recorded, then an investigation into cause, optimum response, and the potential for environmental harm must be conducted.

**Table A3: Groundwater contaminant limits and trigger levels – Alluvium Aquifers (wet season)**

Parameter	Units	Trigger Levels	Contaminant limits
<b><u>Dissolved metals</u></b> Aluminium (Al) Antimony (Sb) Arsenic (As) Iron (Fe) Molybdenum (Mo) Selenium (Se) Silver (Ag)	µg/L	80 <sup>th</sup> per centile of background data	99 <sup>th</sup> per centile of background data
Total Dissolved Solids	mg/L		
Electrical Conductivity	µS/cm		
<b><u>Major anions and cations</u></b> Sulfate Calcium Magnesium Sodium Potassium Chloride Carbonate Bicarbonate	mg/L		
Total Petroleum Hydrocarbons	ppb		
pH	unit	6.5 – 8.5	Note: ± 1 pH unit from highest/lowest readings
Groundwater level	For interpretational purpose only		

**Table A4: Groundwater contaminant limits and trigger levels – Alluvium Aquifers (dry season)**

Parameter	Units	Trigger Levels	Contaminant limits
<b><u>Dissolved metals</u></b> Aluminium (Al) Antimony (Sb) Arsenic (As) Iron (Fe) Molybdenum (Mo) Selenium (Se) Silver (Ag)	µg/L	80 <sup>th</sup> per centile of background data	99 <sup>th</sup> per centile of background data
Total Dissolved Solids	mg/L		

Parameter	Units	Trigger Levels	Contaminant limits
Electrical Conductivity	µS/cm		
<b><u>Major anions and cations</u></b> Sulfate Calcium Magnesium Sodium Potassium Chloride Carbonate Bicarbonate	mg/L		
Total Petroleum Hydrocarbons	ppb		
pH	unit	6.5 – 8.5	Note: ± 1 pH unit from highest/lowest readings
Groundwater level	For interpretational purpose only		

**Table A 5: Groundwater contaminant limits and trigger levels – Colinlea Sandstone Aquifers**

Parameter	Units	Trigger Levels	Contaminant limits
<b><u>Dissolved metals</u></b> Aluminium (Al) Antimony (Sb) Arsenic (As) Iron (Fe) Molybdenum (Mo) Selenium (Se) Silver (Ag)	µg/L	80 <sup>th</sup> per centile of background data	99 <sup>th</sup> per centile of background data
Total Dissolved Solids	mg/L		
Electrical Conductivity	µS/cm		
<b><u>Major anions and cations</u></b> Sulfate Calcium Magnesium Sodium Potassium Chloride Carbonate Bicarbonate	mg/L		

Parameter	Units	Trigger Levels	Contaminant limits
Total Petroleum Hydrocarbons	ppb		
pH	unit	6.5 – 8.5	Note: ± 1 pH unit from highest/lowest readings
Groundwater level	For interpretational purpose only		

**Table A6: Groundwater contaminant limits and trigger levels – Bandanna Formation Aquifers**

Parameter	Units	Trigger Levels	Contaminant limits
<u>Dissolved metals</u> Aluminium (Al) Antimony (Sb) Arsenic (As) Iron (Fe) Molybdenum (Mo) Selenium (Se) Silver (Ag)	µg/L	80 <sup>th</sup> per centile of background data	99 <sup>th</sup> per centile of background data
Total Dissolved Solids	mg/L		
Electrical Conductivity	µS/cm		
<u>Major anions and cations</u> Sulfate Calcium Magnesium Sodium Potassium Chloride Carbonate Bicarbonate	mg/L		
Total Petroleum Hydrocarbons	ppb		
pH	unit	6.5 – 8.5	Note: ± 1 pH unit from highest/lowest readings
Groundwater level	For interpretational purpose only		

**Table A7: Groundwater contaminant limits and trigger levels – Joe Joe Formation**

Parameter	Units	Trigger Levels	Contaminant limits
<b>JOE JOE FORMATION</b>			
<u>Dissolved metals</u> Aluminium (Al) Antimony (Sb) Arsenic (As) Iron (Fe) Molybdenum (Mo) Selenium (Se) Silver (Ag)	µg/L	80 <sup>th</sup> per centile of background data	99 <sup>th</sup> per centile of background data
Total Dissolved Solids	mg/L		
Electrical Conductivity	µS/cm		
<u>Major anions and cations</u> Sulfate Calcium Magnesium Sodium Potassium Chloride Carbonate Bicarbonate	mg/L		
Total Petroleum Hydrocarbons	ppb		
pH	unit	6.5 – 8.5	Note: ± 1 pH unit from highest/lowest readings
Groundwater level	For interpretational purpose only		

Notes for all tables Table A3 to Table A7 inclusive

Baseline value ±1.0 for pH, means the corresponding variation allowed is 1.0 pH unit above and below average and maximum/minimum pH values determined for the site.

Parameters and sampling frequency will be revised at the end of background sampling, based on results compiled at each monitoring point and proposed land use.

The administering authority and the holder will agree to suitable trigger levels and contaminant limits (per aquifer and season) once sufficient hydrochemical data has been compiled.

- (e) Groundwater contaminant trigger levels for Table A3 to Table A7 (inclusive) must be finalised based on the Groundwater Monitoring Program approved under Condition 17(a) and submitted to the administering authority 28 days prior to commencing coal extraction.
- (f) Groundwater monitoring bores must be constructed in accordance with methods prescribed in the Minimum Construction Requirements for Water Bores in Australia – 3rd Edition (LWBC), or equivalent.
- (g) The monitored data must be reported to the administering authority, and must satisfy the following criteria:

- (i) Data collected under the monitoring program will be forwarded to the administering authority on a quarterly basis within 30 business days of the end of each quarter and compiled in an annual monitoring report in a format approved by the administering authority;
- (ii) The proponent shall undertake an assessment of the impacts of mining on groundwater after the first 12 months of dewatering commencing and thereafter every subsequent calendar year;
- (iii) The annual monitoring report will be forwarded to the relevant authority by the first of March each calendar year; and
- (iv) The annual monitoring report will include an assessment of impacts, any mitigation strategies as well as any recommendations for changes to the approved monitoring program.
- (v) If there is a requirement to submit a similar groundwater report as part of any condition issued under a water licence under the *Water Act 2000* then the proponent and the relevant administering authorities may agree for the reports to be combined.

### **Schedule 3. Waste**

#### **Condition 18. Scrap Tyres**

- (a) Scrap tyres stored awaiting disposal or transport for take-back and recycling, or waste-to-energy options must be stored in stable stacks of up to four tyres or less than three metres high (whichever is greater), and at least 10 m from any other scrap tyre storage area, or combustible or flammable material, including vegetation.
- (b) All reasonable and practicable fire prevention measures must be implemented, including removal of grass and other materials within a 10 m radius of the scrap tyre storage area.
- (c) Disposing of scrap tyres resulting from the authorised activities in spoil emplacements is acceptable, provided tyres are placed as deep in the spoil as reasonably practicable. A record must be kept of the number and location for tyres disposed.
- (d) Scrap tyres resulting from the mining activities disposed within the operational land must not impede saturated aquifers or compromise the stability of the consolidated landform.

#### **Condition 19. Waste Management Plan**

- (a) A Waste Management Plan, must be developed and implemented prior to the commencement of mining activities and must cover:
  - (i) how the holder will recognise and apply the waste and resource management hierarchy
  - (ii) characterisations of wastes generated from the project and general volume trends over the past five (5) years (or for the duration of the environmental authority if it is less than five years old)
  - (iii) waste commitments with auditable targets to reduce, reuse and recycle
  - (iv) waste management control strategies including:

- (H) the type of wastes
- (I) segregation of the wastes
- (J) storage of the wastes
- (K) transport of the wastes
- (L) monitoring and reporting matters concerning the waste
- (M) emergency response planning, and
- (N) disposal, reused and recycling options
- (v) the potential adverse and beneficial impacts of the wastes generated
- (vi) the hazardous characteristics of the wastes generated including:
  - (O) disposal procedures for hazardous wastes
  - (P) processes to be implemented to allow for continuous improvement of the waste management systems
  - (Q) identification of responsible staff (positions) for implementing, managing and reporting the Waste Management Plan, and
  - (R) staff awareness and induction programs that encourage re-use and recycling.

**Condition 20. Waste—Landfill**

- (a) A Landfill Management Plan, in accordance with the administering authority's guideline *ERA 60 – Waste Disposal – Landfill siting, design, operation and rehabilitation*, must be developed and implemented prior to the commencement of disposing of waste as part of the mining activities.
- (b) The landfill facility must be located within the area identified in Table A8: Landfill Facility (Waste Disposal).

**Table A8: Landfill Facility (Waste Disposal)**

Waste Disposal Facility Name	Latitude (Decimal Degree GDA94)	Longitude (Decimal Degree GDA94)
Landfill Facility	-23.2225	146.5289
	-23.225	146.5343
	-23.2324	146.5293
	-23.2296	146.5241

- (c) The release of landfill gas from the landfill facility must not cause environmental harm.

**Condition 21. Waste—General**

- (a) Waste that is removed from the site must be taken to a facility that is lawfully able to accept the waste under the *Environmental Protection Act 1994*.
- (b) A record of all wastes removed from site must be kept detailing the following information:
  - (i) date of pickup of waste;
  - (ii) description of waste;
  - (iii) quantity of waste;
  - (iv) origin of the waste; and
  - (v) destination of the waste.
- (c) All regulated waste removed from the site must be removed by a person who holds a current approval to transport such waste under the provisions of the *Environmental Protection Act 1994*.
- (d) Each container of regulated waste must be marked to identify the waste contained therein.

**Schedule 4. Community****Condition 22. Community—General**

- (a) The holder of this environmental authority must record the following details for all complaints received and provide this information to the administering authority on request:
  - (i) name, address and contact number for complainant;
  - (ii) time and date of complaint;
  - (iii) investigations undertaken;
  - (iv) conclusions formed;
  - (v) actions taken to resolve the complaint;
  - (vi) any abatement measures implemented; and
  - (vii) person responsible for resolving the complaint.
- (b) The holder of this environmental authority must, when requested by the administering authority, undertake relevant specified monitoring within a timeframe nominated or agreed to by the administering authority to investigate any complaint of environmental harm. The results of the investigation (including an analysis and interpretation of the monitoring results) and abatement measures, where implemented, must be provided to the administering authority within 10 business days of completion of the investigation, or no later than 10 business days after the end of the timeframe nominated by the administering authority to undertake the investigation.

## Schedule 5. Sewage Treatment

### Condition 23. Sewage Treatment—General

- (a) The daily operation of the wastewater treatment plant must be carried out by a person(s) with appropriate experience and/or qualifications to ensure the effective operation of that treatment system.
- (b) Pipelines and fittings associated with the effluent irrigation system must be clearly identified. Lockable valves or removable handles must be fitted to all release pipelines situated in public access areas.
- (c) Treated effluent from the sewage treatment plant must only be discharged from the authorised discharge points, as specified in Table A9: Effluent Discharge Locations; and discharged to the areas shown in Table A11: Effluent Irrigation Area; in compliance with the limits stated in Table A10: Effluent Release Limits; and the conditions of this authority.

**Table A9: Effluent Discharge Locations**

Authorised Discharge Point	Location	Easting (GDA94)	Northing (GDA94)
Effluent Discharge Point 1	*	*	*
Effluent Discharge Point 2	*	*	*
Effluent Discharge Point 3	*	*	*
Effluent Discharge Point 4	*	*	*

\* Information to be added when provided by the authority holder

**Table A10: Effluent Release Limits**

Quality characteristics	Release limits		
	Minimum	Median	Maximum
5 day Biological oxygen demand (mg/L)	-	-	20
Suspended solids (mg/L)	-	-	30
Thermotolerant coliforms (Cfu/100mL <sup>2</sup> )	-	10	-
Total phosphorus (mg/L)	-	-	15
Total nitrogen (mg/L)	-	-	30
Electrical Conductivity (µS/cm)	-	1600	-
pH	6.5	-	8.5

**Table A11: Effluent Irrigation Area**

Authorised Discharge Point	Effluent Irrigation Location	Northing (GDA94)	Easting (GDA94)
Effluent Discharge Point 1	Effluent Irrigation Area 1	*	*
Effluent Discharge Point 2	Effluent Irrigation Area 2	*	*
Effluent Discharge Point 2	Effluent Irrigation Area 3	*	*
Effluent Discharge Point 2	Effluent Irrigation Area 4	*	*

\* Information to be added when provided by the authority holder

- (d) Subject to Condition 23(c) releases of effluent must not have any properties nor contain any organisms or other contaminants in concentrations that are capable of causing environmental harm.
- (e) Treated effluent must not be used for dust suppression.
- (f) Treated effluent must not be released from the site to any waters or the bed and banks of any waters.
- (g) Water or storm water contaminated by sewage treatment activities must not be released to any waters or the bed and banks of any waters.
- (h) The holder of this environmental authority must develop and implement an Irrigation Management Plan which adequately addresses the following:
  - (i) efficiency of application;
  - (ii) control of sodicity in the soil;
  - (iii) minimisation of degradation of soil structure;
  - (iv) control of build ups of nutrients and heavy metals in the soil and subsoil from effluent and other sources;
  - (v) preventing impacts on the groundwater resource through infiltration;
  - (vi) preventing subterranean flows of effluent to waters;
  - (vii) method of application; and,
  - (viii) health and safety in relation to effluent handling and irrigation.
- (i) The irrigation of effluent must be carried out in accordance with the Irrigation Management Plan, such that:
  - (i) there is no surface ponding of effluent;
  - (ii) soil erosion and soil structure damage is avoided;
  - (iii) percolation of effluent beyond the plant root zone is minimised;
  - (iv) the accumulation of nutrients and heavy metals in the soil and subsoil is minimised; and,
  - (v) the quality of groundwater is not adversely affected.
- (j) Notices must be prominently displayed on areas undergoing effluent irrigation, warning the public that the area is irrigated with effluent and not to use or drink the effluent. These notices must be maintained in a visible and legible condition.

- (k) The daily volume of contaminants released to land must be determined or estimated by an appropriate method, (such as a flow meter), and records kept of such determinations and estimates.
- (l) When conditions prevent the irrigation of treated effluent to land (such as during or following rain events), the contaminants must be directed to a wet weather storage or alternative measures must be taken to store or lawfully dispose of effluent (such as tanking off site or transfer to another treatment plant).
- (m) A record of the removal of treated effluent from site must be kept detailing the following information:
  - (i) date of pickup of treated effluent;
  - (ii) volume of treated effluent removed from the site;
  - (iii) destination of the treated effluent; and
  - (iv) the transporter.
- (n) The responsibility for disposal of treated effluent by a third party must only be given or transferred in accordance with a written agreement (the third party agreement) that:
  - (i) contains a commitment from the third party to dispose of or use the effluent in such a way as to prevent environmental harm or public health incidents and specifically makes the third party aware of the General Environmental Duty (GED) under section 319 of the *Environmental Protection Act 1994*, environmental sustainability of any effluent disposal, and the protection of environmental values of waters;
  - (ii) requires the giving and transferring of treated effluent to cease where the holder of this environmental authority is notified or otherwise becomes aware that the third party's use of effluent is causing or threatens to cause unlawful environmental harm or is posing a human health risk, and the third party does not rectify the situation upon written request; and
  - (iii) requires the third party to have implemented an Irrigation Management Plan that satisfies the requirements of Condition 23(h).
- (o) Monitoring at all effluent discharge points must be undertaken for the parameters specified in Table A12: Effluent Monitoring Parameters; on a monthly basis. Records of the monitoring program must be kept for a period of five years.

**Table A12: Effluent Monitoring Parameters**

Quality characteristics	Units
5 day Biological oxygen demand	mg/L
Suspended solids	mg/L
Thermotolerant coliforms	cfu/100mL
Total phosphorus	mg/L
Total nitrogen	mg/L
Electrical Conductivity	µS/cm
pH	pH units

- (p) The following information must be recorded in relation to all effluent sampling:
- (i) the date on which the sample was taken;
  - (ii) the time at which the sample was taken;
  - (iii) the monitoring point at which the sample was taken;
  - (iv) the measured or estimated daily flow of effluent at the time of sampling;  
and
  - (v) the results of all monitoring.

## Schedule 6. Water Treatment

### Condition 24. Water Treatment—General

- (a) The daily operation of the water treatment plant must be carried out by a person(s) with appropriate experience and/or qualifications to ensure its effective operation.
- (b) Brine and any contaminated water generated from the water treatment plant must only be released from the release points specified in Table A13: Brine Water Management Infrastructure to the water management infrastructure specified in Table A13: Brine Water Management Infrastructure.

**Table A13: Brine Water Management Infrastructure**

Release Point	Northing (GDA94)	Easting (GDA94)	Water Management Infrastructure
1	*	*	Temporary Brine Dam
2	*	*	Decant Dam

\* Information to be added when provided by the authority holder

- (c) Disposal of brine and any contaminated water to the Temporary Brine Dam must cease once the Decant Dam is operational.
- (d) The hazard category of the Temporary Brine Dam must be determined by a suitably qualified and experienced person, prior to its construction and at least once every two years thereafter.
- (e) On cessation of operation of the Temporary Brine Dam, that dam must be maintained so as to avoid unlawful environmental harm until that dam is decommissioned.
- (f) The Temporary Brine Dam must be decommissioned within 12 months of the cessation of operation of the Temporary Brine Dam such that it:
  - (i) either:
    - (A) becomes a stable landform, that no longer contains flowable substances, or
    - (B) is approved or authorised under relevant legislation for a beneficial use, or

- (C) is a void authorised by the administering authority to remain after decommissioning; and
- (ii) is compliant with the rehabilitation requirements of this environmental authority.

## **Appendix 2. Imposed conditions—mine**

This Appendix includes conditions imposed by the Coordinator-General under section 54B of the SDPWO Act.

All of the conditions imposed in this section take effect from the date of this Coordinator-General's report.

In accordance with section 54B(3) of the SDPWO Act, I have nominated entities as having jurisdiction for the conditions in this Appendix.

Pursuant to section 54D of the SDPWO Act, these conditions apply to any party developing the Alpha Coal Project, such as the proponent and any agent, contractor or licensee of the any party developing the project and any public utility providers undertaking public utility works as a result of the project.

The conditions are relevant to those parts of the project where there is no relevant approval applicable under other legislation.

These conditions do not relieve the proponent of the obligation to obtain all approvals and licences from all relevant authorities required under any other Act.

This appendix comprises the following:

**Part A – Imposed conditions—general**

**Part B – Imposed conditions to address cumulative impacts**

**Part C – Imposed conditions relating to Social Matters**

**Part D – Imposed conditions relating to offsets**

**Part E – Imposed conditions relating to transport**

**Part F – Imposed conditions relating to regulated structures**

## **PART A. IMPOSED CONDITIONS—GENERAL**

### **Condition 1.**

The proponent must implement proponent commitments as detailed in Appendix 5.

### **Condition 2. Infrastructure Agreement with Barcaldine Regional Council**

- (a) Prior to the commencement of any project construction works the proponent and BRC are to execute an infrastructure agreement. This agreement is to address the construction, upgrade and maintenance of infrastructure required by BRC to support the construction and operation of the project. Matters to be considered in development of this agreement include:
  - (i) maintenance and upgrades of local roads, including development of the Saltbush Road.
  - (ii) upgrades to the Alpha Aerodrome
  - (iii) upgrades to the existing sewerage system
  - (iv) upgrades to existing waste disposal/landfill facilities
  - (v) upgrades to existing water supply
  - (vi) upgrades to existing electricity supply infrastructure
  - (vii) upgrades to town fire service resources
  - (viii) upgrades to existing community/recreational infrastructure
- (b) The infrastructure agreement must be consistent with Appendix 2, Part C, Condition 6, Condition 9 and Condition 11

## **PART B.      IMPOSED CONDITIONS TO ADDRESS CUMULATIVE IMPACTS**

Mining activities for the Alpha project can only proceed on the proposed mining lease in accordance with an environmental authority issued under the EP Act. The authority sets conditions that must be complied with to protect the environment. However, the environmental authority can only apply to activities on the mining lease and is not suited to regulate the potential cumulative impacts arising from multiple mining activities in the Galilee region.

In the absence of a suitable approval mechanism, the Coordinator-General has proposed conditions relating to the implementation of regional monitoring and reporting programs for surface water and groundwater quality and quantity.

### **Condition 1.      Regional surface water monitoring and reporting program**

To address the potential cumulative impacts on surface water quality in the Galilee Basin off the mine site, the Coordinator-General has imposed the following condition for the Alpha project that will be similarly imposed for other mines in the area. DEHP is designated as the agency responsible for this condition.

- (a) The proponent must:
  - (i) before commencing mining activities prepare to the satisfaction of the administering authority and implement a surface water and aquatic ecosystem monitoring and reporting program in waterways upstream and downstream of the mining lease area
  - (ii) design the program to record background water quality, sediment load and local contaminant loads during representative natural flow events upstream and downstream of the mining lease area (including Sandy Creek and Lagoon Creek)
  - (iii) design the program to detect if the ephemeral streams downstream of the mine are subject to a significant increase in the concentration of any contaminants.
  - (iv) Include in the monitoring program:
    - (A) details of event sampling
    - (B) a comprehensive selection of suitable reference sites determined in accordance with the Queensland Water Quality Guidelines 2009
    - (C) a description of monitoring site characteristics and reasoning behind site selection
    - (D) the frequency of intended sampling effort for the duration of the project.
  - (v) make monitoring results from the program publicly available on the proponent's web site within six months of collection
  - (vi) contribute to any basin wide collaborative project established by the administering authority to develop local water quality guidelines, including pro-rata funding

- (vii) contribute to development of a basin wide water quality model for determining the capacity of the catchment and acceptable contaminant load, including pro-rata funding

Imposed Condition 1, Part B, Appendix 2 would be complemented by DEHP as the lead agency for developing a coordinated basin wide monitoring and assessment program, to organise and collate basin wide monitoring programs, data and reports, and to ensure such outcomes influence the ongoing management of environmental authorities.

**Condition 2. Regional groundwater monitoring and reporting program**

To address the potential cumulative impacts on groundwater quality and availability in the Galilee basin, the Coordinator-General has imposed the following condition for the Alpha project that will be similarly imposed for other projects in the basin. DEHP is designated as the agency responsible for this condition.

- (a) The proponent must:
  - (i) before commencing mining activities prepare to the satisfaction of the administering authority and implement a groundwater monitoring and reporting program for aquifers impacted by the project off the mining lease
  - (ii) design the program to complement the environmental authority requirements and other groundwater management programs in the Galilee basin. The program should aim to enable a basin groundwater model to be developed to predict, verify and monitor groundwater impacts.
  - (iii) make monitoring results from the program publicly available on the proponent's web site updated at least annually
  - (iv) contribute to any basin wide collaborative project established by the administering authority to develop a basin groundwater model, including pro-rata funding
  - (v) contribute to development of a basin wide groundwater model for determining the capacity of aquifers and acceptable extraction rates, including pro-rata funding

Imposed condition 2, Part B, Appendix 2 would be complemented by DEHP/DNRM as the lead agencies for developing a coordinated basin wide monitoring and assessment program, to organise and collate basin wide monitoring programs, data and reports, and to ensure such outcomes influence the ongoing management of groundwater resources.

## **PART C. IMPOSED CONDITIONS RELATING TO SOCIAL MATTERS**

In accordance with section 54A and 54B of the *State Development and Public Works Organisation Act 1971*, the Coordinator-General **imposes** the following conditions.

The proponent must implement conditions 1—13 (inclusive) to the extent relevant to the mine components of the project, as agreed with the Coordinator-General.

These conditions take effect from the date of this report.

### **Condition 1. Social impact management plan (SIMP)**

The proponent must:

- (a) Within six months of the project receiving a final investment decision to proceed, submit a final SIMP consistent with the *Guideline to preparing a social impact management plan (DIP, September 2010)*, for approval by the Coordinator-General prior to release.
- (b) In addition to action plans containing social mitigation and management strategies required under conditions 2–13, the SIMP must include:
  - (i) a Monitoring Program for social mitigation and management strategies
  - (ii) the Community and Stakeholder Engagement Plan containing a list of key stakeholders and their interest in the project; and actions, outcomes, and mechanisms to support a regular review of the effectiveness of the strategy, and
  - (iii) a Dispute Resolution Mechanism.
- (c) In the event of sale and/or separation of the Mine and Rail Project components so that the ownership structure varies from the representation in Section 2.1 of this report, each entity solely responsible for the separate Mine and Rail components must revise the SIMPs in agreement with the Coordinator General.

### **SPECIFICATION FOR DEVELOPMENT OF THE FINAL SIMP**

- (d) With respect to the development of the final SIMP:
  - (i) undertake engagement to provide opportunities for input from key stakeholders to discuss and agree on actions to partner in delivery of the SIMP
  - (ii) provide opportunities for input from those most affected by the project, especially community representatives
  - (iii) take into consideration the increased demands and cumulative effects placed on stakeholders and communities to participate in consultative processes in the region
  - (iv) advise the Coordinator General on the outcomes of stakeholder engagement, including local governments referred to in Condition 1(d)(vii)
  - (v) ensure that the action plans are consolidated and revised to include appropriate performance measures agreed with the Coordinator-General
  - (vi) ensure measures and timeframes for closure planning are included

- (vii) discuss and seek agreement from local governments affected by the project on the content of the final SIMP including the key responsibilities, timeframes and resourcing implications for those local governments.
- (e) Submit the final SIMP to the Coordinator-General for assessment and approval as per Condition 1(a).

#### **IMPLEMENTATION, REPORTING, REVIEW AND AUDITING ARRANGEMENTS**

- (f) Implement the approved final SIMP in conjunction with the social impact conditions specified in the Coordinator-General's report; and key social commitments in the Commitments Register (Appendix 5).
- (g) With respect to the approved final SIMP:
  - (i) submit an annual progress report. The actual date is to be mutually agreed by the proponent and the office of the Coordinator-General
  - (ii) undertake an external audit at the completion of the construction stage of the project, periodically every three years after the commencement of the operational stage, and at project closure during the decommissioning phase of the project
  - (iii) prepare and submit a report on each audit's findings to the Coordinator-General within 60 days of completion of the report.

#### **REQUIREMENTS FOR ANY AMENDMENTS TO APPROVED FINAL SIMP**

- (h) The proponent must revise the approved final SIMP after completion of the construction stage of the project or advise the Coordinator-General that amendments and updates to the approved final SIMP are required under the following circumstances:
  - (i) strategies and actions no longer meet the desired outcomes, or to improve their effectiveness
  - (ii) changes in government policy, significant changes to company operations and site structure, or significant national/international changes to management approaches and frameworks.
- (i) Identify a process to facilitate any amendments to be agreed by the proponent and the office of the Coordinator-General. The Community and Stakeholder Engagement Plan should be updated to describe how stakeholders will be engaged in any change process at the time.

#### **Condition 2. Dispute resolution and Community engagement**

##### **COMMUNITY AND STAKEHOLDER ENGAGEMENT PLAN**

- (a) The proponent must for the life of the project:
  - (i) implement the Community and Stakeholder Engagement Plan to:
    - (A) communicate the project's commitment to mitigating and managing social impacts
    - (B) generate awareness of the project, its timing and potential impact among all community members and stakeholders

- (C) ensure the timely distribution of accurate, relevant information to community and stakeholders
- (D) identify issues for consideration in construction program planning and management
- (E) target activities to reduce the potential for consultation fatigue
- (F) maintain a two way dialogue
- (ii) conduct issue specific workshops inviting a cross section of the community to discuss potential solutions to key issues
- (iii) consult and provide progress reports to the SCCC on the Community and Stakeholder Engagement Plan for the purposes of analysing stakeholder needs and tailoring engagement strategies to suit the level of interest and impact relative to each stakeholder
- (iv) analyse issues raised in the Issues Register and provide the proponent's response to these issues, including mitigation of social impacts in progress reports to the SCCC
- (v) prior to the project closure and decommissioning of the project component, the proponent must actively involve the community in the development of a closure plan.

#### **LANDHOLDER MANAGEMENT PLAN**

- (b) The proponent must for the life of the project:
  - (i) implement the Landholder Management Plan to ensure landholders interests, issues and opportunities are managed appropriately, and the dispute resolution mechanisms below are applied
  - (ii) ensure landholders are provided a copy of the Good Neighbour Policy prior to commencing construction on their property.

#### **DISPUTE RESOLUTION**

- (c) The proponent must for the life of the project:
  - (i) maintain a 24 hour feedback response line for all members of the community to report incidents or issues relating to project activities safety, health and environmental amenity or harm.
  - (ii) community members, landholders and other stakeholders must be able to provide face-to-face feedback to an employee of Hancock's community engagement team, or to a toll free number or to the project email address. Complaints must be acknowledged within 24 hours, and people advised regularly of progress in addressing their complaint.
  - (iii) Implement procedures for receiving and dealing quickly and effectively with complaints. The complaints procedures must include a range of methods including:
    - (A) Face-to-face meetings
    - (B) Project information line/telephone conversations
    - (C) Fact sheets and newsletters

- (D) Ensure residents are able to meet face-to-face in forums with senior Hancock representatives on a regular basis to discuss issues or opportunities
- (E) Continue the information display in the Barcaldine Regional Council's Alpha Office to be attended by the Community Liaison Officer at regular publicised times
- (F) Continue regular interaction with landholders through one-to-one discussions with Community Engagement Officers
- (iv) Ensure contractors engaged on the project have clear accountabilities for dispute resolution and issue management.
- (v) The proponent's performance in management of complaints is to be included in Progress reports to the SCCC
- (vi) Include the dispute resolution process on the Alpha Coal website once the project moves into the construction phase.

### **Condition 3. Workforce Management Plan**

The proponent is required to:

- (a) Finalise the Workforce Management Plan in the final Alpha Coal SIMP submitted for Coordinator-General approval as per Condition 1(a). The plan must include:
  - (i) Details on the full range of skills required for its labour force and an appraisal of the gaps in capacity of the local community and region to meet these requirements through its existing workforce and industries, as well as through the training programs offered in the local area and region.
  - (ii) Where there are identified gaps, the proponent is to provide a strategy that demonstrates how the proponent will contribute to the effective acquisition of skilled labour and/or training. Details of the Training and Apprenticeship Strategy will need to be submitted, including appropriate trainee and apprenticeship targets.
  - (iii) Update the action plan that has been developed in collaboration with Skills Qld, DETE, and ATSSIS and Multicultural Affairs, to reflect appropriate key performance measures and workforce targets, against the strategies outlined above including the targets for the Trainee and Apprenticeship Strategy; and employment opportunities for disadvantaged Queenslanders. Targets should be applied to both construction and operations.
- (b) By the time the final Alpha Coal SIMP is submitted:
  - (i) The proponent is required to provide evidence of working with relevant stakeholders such as local businesses, community groups, education providers and government to encourage local up skilling and establishing links with local and regional schools.
  - (ii) The proponent is required to provide evidence of working with government agencies, and local stakeholders to assist people who have traditionally remained out of the labour market due to a lack of opportunities to participate.

#### **Condition 4. Indigenous Participation Plan**

The proponent is required to:

- (a) Finalise the Indigenous Participation Plan in the final Alpha Coal SIMP submitted for Coordinator-General approval as per Condition 1(a). The plan must include:
  - (i) Details of the strategies to employ and retain skilled and unskilled Indigenous people either as direct employees or via contractors
  - (ii) Culturally appropriate recruitment policies and strategies that attract and retain Indigenous Australians (both local and FIFO)
  - (iii) Details of how the proponent will engage with Indigenous communities to build skills, competence and programs that enhance opportunities through education, training, development and employment
  - (iv) iv. Details of cross-cultural training and awareness for all employees and contractors, and cultural heritage induction programs
  - (v) Details of trainee and apprenticeship strategies
  - (vi) Details of pre-vocational training and job ready education programs
  - (vii) Update the action plan that have been developed in collaboration with Skills Qld, DETE, and ATSiS and Multicultural Affairs, which include Indigenous participation targets and appropriate key performance measures for both construction and operations.
- (b) Provide a clear Terms of Reference for the Indigenous Participation Liaison Committee, developed in consultation with the Chair and members
- (c) Ensure membership of the Indigenous Participation Liaison Committee includes relevant Native Title Claimants, State government agencies, local government representatives and community stakeholders as agreed with the Chair and members.
- (d) Identify and fund the Indigenous Participation Liaison Committee Chair, Secretariat and Liaison Officer
- (e) By the time the final Alpha Coal SIMP is submitted:
  - (i) The proponent is required to provide evidence of working with relevant stakeholders such as the Indigenous Participation Liaison Committee, Native Title Claimants, community groups, education providers and government to encourage Indigenous participation opportunities.

#### **Condition 5. Galilee Basin Cumulative Social Impact Assessment (CSIA) Roundtable**

- (a) The proponent must within 90 days of the project receiving a final investment decision to proceed:
  - (i) establish or participate actively in the Galilee Basin CSIA Roundtable for Galilee Basin project proponents for the life of the project, to provide strategic cross-project coordination across the region in response to cumulative social impacts
  - (ii) establish is defined as:

- (A) inviting representatives from the relevant regional councils, State government agencies, and Galilee Basin project proponents to identify, mitigate and manage cumulative social impacts of resource development in the Galilee Basin
  - (B) ensuring the invitations for membership of the Galilee Basin CSIA Roundtable are publicly advertised through regional and State newspapers
  - (C) identifying and funding an Independent Chair and Secretariat for the Galilee Basin CSIA Roundtable; and seeking the Coordinator General's approval of the Independent Chair
  - (D) developing the terms of reference for the Galilee Basin CSIA Roundtable in collaboration with members and the Independent Chair. The scope of the TOR should include the design of the Galilee Basin CSIA Study and development of the Galilee Basin Social Infrastructure Plan as detailed in Condition 6 (a), below
- (b) The proponent must provide the terms of reference and final membership of the Galilee Basin CSIA Roundtable to the Coordinator General for approval, within 90 days of the inaugural meeting of the Roundtable.

**Condition 6. Galilee Basin CSIA Study and Social Infrastructure Plan**

- (a) The proponent must:
- (i) develop or participate in the development of the terms of reference for the Galilee Basin CSIA Study and the Galilee Basin Social Infrastructure Plan through the Galilee Basin CSIA Roundtable, and submit these terms of reference to the Coordinator General for approval
  - (ii) participate actively in the Galilee Basin CSIA Study as a key deliverable of the Galilee Basin CSIA Roundtable. The Study will assess cumulative social impacts for relevant issues such as, but not limited to population, workforce, accommodation, health and housing and use of community infrastructure and services
  - (iii) participate actively in the Galilee Basin Social Infrastructure Plan as a key deliverable of the Galilee Basin CSIA Roundtable. The plan will determine short, medium and long term actions to deliver agreed priority social infrastructure initiatives through partnerships between industry, communities, and governments
  - (iv) consider and agree on the objectives and the timing of the Galilee Basin CSIA Study and the Galilee Basin Social Infrastructure Plan as an agenda item at the inaugural Galilee Basin CSIA Roundtable. Where clear agreement cannot be reached, the Coordinator General will provide a determination
  - (v) participate in annual data collections conducted by OESR, notably the Resource Operations Employment Survey and the Resource Projects employment survey, to provide current and future workforce and accommodation data for all company employees and contractors engaged

in construction, production and maintenance of the Alpha Coal Project as required

- (vi) participate in the preparation of the Alpha development plan through the Galilee Basin CSIA Roundtable with Barcaldine Regional Council, local governments, State government agencies, the local community and other relevant stakeholders
- (vii) provide financial contributions in which agreed industry funds are pooled to:
  - (A) mitigate the social impacts of major project developments in the Galilee Basin;
  - (B) contribute to the development of and implementation of the Alpha development plan; and
  - (C) implement the GB Social Infrastructure Implementation Plan through a priority social infrastructure schedule, as determined by the GB Cumulative Social Impact Study in Condition 6(a)(i) above
- (viii) participate as a member to implement a process for the application and allocation of funds and to ensure the priority needs for social infrastructure and services in the Galilee Basin are addressed
- (ix) include any future cumulative social impact mitigation and management strategies identified collaboratively with key stakeholders are included in future versions of the Alpha Coal SIMP
- (x) Update the final Alpha Coal Project SIMP to incorporate the process for the data collection in condition Condition 6(a)(v) above.

**Condition 7. Galilee Basin SIMP Community Consultative Committee (GBSCCC)**

- (a) The proponent must within 90 days of the project receiving a final investment decision to proceed:
  - (i) establish or participate in the GBSCCC for the life of the project to respond to social impact and management strategies identified throughout the EIS process, and to provide input into and review of the implementation of the SIMP
  - (ii) Establish is defined as:
    - (A) inviting representatives from the community, relevant regional councils, State government agencies and Galilee Basin project proponents to join the GBSCCC
    - (B) identifying and funding an Independent Chair and Secretariat for the GBSCCC; and seek the Coordinator General's approval of the Independent Chair
    - (C) ensure the GBSCCC terms of reference describe the linkages between the Galilee Basin CSIA Roundtable and GBSCCC governance arrangements in the region
- (b) The proponent must provide the terms of reference and final membership to the Galilee Basin CSIA Roundtable and Coordinator General for approval within 90 days of the inaugural meeting of the GBSCCC

**Condition 8. Commitments**

- (a) The proponent must:
  - (i) Update the Commitments Register in the final Alpha Coal SIMP for the Coordinator-General's approval as per Condition 1 (a). The Commitments Register must ensure alignment between the proponent's social commitments and the mitigation and management of potential social impacts

**Condition 9. Community Development fund and Community Infrastructure fund**

- (a) The proponent must:
  - (i) submit the final Community Development Fund Fund and Community Infrastructure Fund detailing the initial level of investment to the Coordinator-General prior to release of the approved draft SIMP for consideration, and
  - (ii) ensure the Community Development Fund and Community Infrastructure Fund is incorporated into the final Alpha Coal Project SIMP for approval.

**Condition 10. Housing**

- (a) The proponent must:
  - (i) conduct a Housing and Accommodation Study in collaboration with the Office of Economic and Statistical Research (OESR), the Department of Housing and Public Works, and the office of the Coordinator-General to inform the development of evidence-based accommodation and housing impact mitigation and management strategies
  - (ii) Provide financial contributions, subject to appropriate cost recovery arrangements, to the State agencies listed in 11 (a) for their contribution to the Housing and Accommodation Study. The amount of funding is to be agreed with the Office of the Coordinator-General.
  - (iii) The timing and scope of the Housing and Accommodation Study is to be agreed with OESR, the Department of Housing and Public Works, and the office of the Coordinator-General.
  - (iv) The Housing and Accommodation Study will include the following:
    - (A) Demographic analysis including:
      - (1) Resident population estimates and age-sex population projections
      - (2) Dwelling and household projections
      - (3) Place of work/place of residence
      - (4) Customised statistical local area and locality level profiles, as well as information on housing sales and rents
      - (5) Housing and accommodation – housing tenure, dwelling stock, sales volumes and prices
    - (B) Housing demand and housing need by low and moderate income households not employed by the resource sector

- (C) A description and analysis of the Alpha Coal Project current suite of accommodation arrangements for its entire personnel (both direct employees, contractors and sub-contractors engaged in Alpha Coal project business activities), including existing and proposed FIFO/BIBO/DIDO arrangements
  - (D) The likely impact of the Alpha Coal Project components on the housing market and housing demand
  - (E) A description of the currently available options for the provision of accommodation
  - (F) A final draft of the findings must be presented to the GB CSIA Roundtable, the SCCC, OESR, the Department of Housing and Public Works and to the Coordinator-General for review and input and the proponent must take into account any feedback or suggested amendments provided in the finalisation of the Housing and Accommodation Study.
  - (G) The Housing and Accommodation Study must be made publicly available and be considered in future revisions of the Alpha Coal Project SIMP, with intellectual property rights of the data collected shared between the Alpha Coal Project and OESR, or other research body for data supplied by the proponent; and retained by OESR or other research body for all other data.
- (iii) Integrated Housing Strategy
- (A) As a result of the Housing and Accommodation Study, the proponent is required to develop an Integrated Housing Strategy for the project in consultation with other major project proponents, the GB CSIA Roundtable, relevant councils and the Department of Housing and Public Works including agreement on the timing and the scope of the strategy. The proponent must take into account any feedback or suggested amendments provided in the finalisation of the strategy.
  - (B) the purpose of the Integrated Housing Strategy is to initiate cooperative and coordinated approaches in consultation with other major project proponents, councils and government agencies to resolve any cumulative accommodation and housing impacts, with the outcome of achieving joint mitigation strategies, and delivery of accommodation and housing solutions.
  - (C) the proponent must ensure the Integrated Housing Strategy:
    - (1) provides housing for Alpha Coal's non-resident workforce and workers (including contractors and sub-contractors) seeking to settle that are not housed in any project-specific worker accommodation by a range of means (but not limited to) direct supply of new housing/units and facilitating joint ventures for construction of new dwellings
    - (2) provides investment into affordable housing if low to moderate income non-resource industry households are affected by increased housing costs

- (3) advises workers and families of their accommodation and housing options, if they want to settle in project areas
- (4) monitors the project impacts on affordable housing, particularly for Indigenous people and low income households
- (5) reviews performance of workforce housing supply
- (D) The proponent must submit an annual progress report on the Integrated Housing Strategy to the Coordinator General for approval, after consideration and endorsement by the GB CSIA Roundtable, relevant councils and the Department of Housing and Public Works.

**Condition 11. Community medical and health services**

- (a) With respect to the final Alpha Coal SIMP as per Condition 1(a), the proponent must:
  - (i) develop a Memorandum of Understanding with Queensland Health to define the circumstances and protocols for accessing medical assistance from mine-based resources
  - (ii) investigate the option of offering medical treatment to landholders and local communities, particularly in Alpha
- (b) The proponent must throughout construction and operations:
  - (i) monitor the Alpha Coal Project's impact on the demand for the Alpha hospital, and any increased emergencies to Emerald or Rockhampton hospital
  - (ii) collaborate with Queensland Health to develop health service related mitigation strategies to address any impacts on the demands on current regional health services provided by Queensland Health
- (c) The proponent must provide a fully equipped ambulance and funding to Barcaldine Regional Council for five years throughout construction and operations, to cover the costs of two paramedics to operate the ambulance.
- (d) Cost recovery arrangements for the ambulance and funding in Condition 11(c) are to be negotiated with other proponents through the Galilee Basin CSIA Roundtable, and financial contributions reported in the final SIMP.

**Condition 12. Workforce behaviour and management**

- (a) For the duration of the project, the proponent must:
  - (i) ensure the Fitness for Work Management Plan is regularly reviewed and updated for project employees and contractors
  - (ii) ensure the Camp Management Plans, including the Workers Code of Conduct are implemented and regularly reviewed and updated for project employees and contractors
  - (iii) ensure site based employees have access to healthy activities outside work hours
  - (iv) implement workforce induction and awareness sessions to communicate requirements relating to safety, cultural awareness, security, behaviour, interaction with the community and land access both on and off the mining lease

- (v) ensure reported incidents of unacceptable behaviour are investigated and responded to appropriately and effectively
- (vi) implement policies for employees and contractors in relation to alcohol and other drugs
- (vii) implement fatigue management strategies for employees and contractors
- (viii) develop cross-cultural awareness programs and induction programs for all employees and contractors
- (b) The proponent is required to update the final SIMP to include the medical and health services initiatives, and Workforce behaviour and management policies and ensure they are consolidated in the appropriate Action Plans in agreement with the Coordinator-General.

**Condition 13. Police and emergency services**

- (a) With respect to the final Alpha Coal SIMP as per Condition 1(a), the proponent must:
  - (i) Consult with QPS regarding planning and response associated with the impacts of the Alpha Coal Project including potential impacts on police service delivery
  - (ii) provide an agreed financial contribution towards the provision of a police station in Alpha, police staffing and accommodation requirements, police vehicles for highway patrol and escort vehicles and communications support and education and training programs. The amount of the financial contribution is to be agreed by the Galilee Basin CSIA Roundtable.
  - (iii) Consult with QPS regarding the need for incidents and complaints management regarding traffic and transport movements. The proponent should note QPS is the final approving authority for the movement of oversized vehicles.
  - (iv) Consult with QPS and the Department of Community Safety on the development of Traffic Management Plans, the Road Safety Plan and protocols for QPS notification of relevant on site traffic incident
- (b) Cost recovery arrangements for financial contributions in Condition 13(a)(ii) are to be negotiated with other proponents through the Galilee Basin CSIA Roundtable, and financial contributions reported in the final SIMP.
- (c) The proponent is required to update the final SIMP to include the police and emergency services initiatives, and ensure they are consolidated in the appropriate Action Plan in agreement with the Coordinator-General.

## **PART D. IMPOSED CONDITIONS RELATING TO OFFSETS**

The mandatory provisions of the Queensland Biodiversity Offset Policy (QBOP) do not apply to significant projects declared under the SDPWO Act. However, the QBOP provides for the Coordinator-General to consider the QBOP in consideration of offset requirements for the declared significant project.

For the Alpha Coal Project, I note that the draft Biodiversity Offset Strategy provided by the proponent commits to applying the QBOP to the project site (mine).

I therefore imposed the following condition:

### **Condition 1.**

- (a) Prior to the commencement of mining activities, the proponent must submit the Alpha Coal Project—Biodiversity Offset Strategy – draft (Eco Logical Australia April 2012) for the approval of the administering authority for the EP Act
- (b) the Strategy in (a) is to demonstrate that impacts on State significant biodiversity values identified within the QBOP have been avoided or minimised
- (c) the Strategy in Condition 1(a) is to include the offset commitments made by the proponent in the EIS and SEIS and listed in Appendix 5
- (d) prior to the commencement of mining activities, the proponent and the administering authority are to sign a Deed of Agreement for offsets to be provided for impacts on State significant biodiversity values in accordance with the QBOP
- (e) the proponent is to only impact on State significant biodiversity values in accordance with the Deed of Agreement
- (f) the proponent is to undertake an ecological equivalence assessment using the Ecological Equivalence Methodology of the QBOP within six months of the grant of a final Environmental Authority.

### **Condition 2.**

The strategy in Condition 1(a) is to address any offsets requirements for the loss of threatened flora and fauna species and threatened ecological communities listed as Matters of National Environmental Significance under the EPBC Act.

## **PART E. IMPOSED CONDITIONS RELATING TO TRANSPORT**

### **Condition 1. Road impact assessment and road-use management plan**

- (a) The proponent shall undertake the following prior to the scheduled commencement of construction work for the project (mine);
  - (i) review and finalise the road impact assessment (RIA) to include details of the latest project traffic generation and all project transport impacts on the safety and efficiency of state controlled roads and local roads in accordance with *Guidelines for Assessment of Road impacts of Development (2006)* in consultation with TMR and relevant local councils; then submit the updated RIA to the Managers of the TMR Central West and Mackay/Whitsunday Offices and local authorities for review and approval.
  - (ii) prepare a road-use management plan (RMP) for all use of state controlled and other roads for each phase of the project in accordance with TMR's *Guide to Preparing a Road Use Management Plan*. The RMP must receive TMR's approval prior to its implementation and must include:
    - (A) latest traffic generation (vehicle numbers etc.)
    - (B) finalised assessment of impacts on safety and efficiency at intersections, on road links and on pavements etc
    - (C) updated impact mitigation strategies such as any road maintenance or necessary improvements.

### **Condition 2. Roads infrastructure agreement**

- (a) Prior to the scheduled commencement of any project construction works the proponent shall conclude infrastructure agreements with TMR and local road authorities on upgrading, access and contributions for the mitigation of road impacts as determined by the RIA and RMP conducted in Condition 1, including at least the following:
  - (i) Upgrade the intersection/accesses as determined and agreed upon with TMR Mackay/Whitsunday Regional Office and in accordance with the requirements of Chapter 13 of the Department's Road Planning and Design Manual;
    - (A) Alpha – Clermont Road/Clermont Connection Road;
    - (B) Alpha – Clermont Road/Capricorn Highway. and
    - (C) Provide all necessary access to the state-controlled road to a standard agreed upon by TMR.
  - (ii) Provide to the Department and relevant local authority, rehabilitation, maintenance and bring-forward contributions and/or works required to mitigate impacts of project construction and operational traffic as calculated and agreed upon with TMR Mackay/Whitsunday Regional Office and relevant local authority.

- (iii) Prior to undertaking any works, obtain the relevant licenses and permits under the *Transport Infrastructure Act (Qld) 1994* for works within the State-controlled road corridor.

**Condition 3. Traffic Management Plans**

- (a) Prior to the scheduled commencement of any project construction works the proponent shall present traffic management plans for review by TMR, the Queensland Police Service and Barcaldine Regional Council, Isaac Regional Council and Whitsunday Regional Council and take account of the reviews. The traffic management plans shall incorporate provisions on:
  - (i) Road safety from the increased level of vehicle movements, and intersection traffic;
  - (ii) Community awareness of construction and transport activities;
  - (iii) Traffic management arrangements, lane closures, speed limits;
  - (iv) Transport driver behaviour and fatigue management;
  - (v) Prior to commencing any program of oversize transport movements that may be required for the construction of the project, the proponent will consult with TMR, the Queensland Police Service, Barcaldine Regional Council, Isaac Regional Council and Whitsunday Regional Council;
  - (vi) Obtaining the necessary permits for any excess mass or over-dimensional loads associated with the project as required under *the Transport Operations (Road Use Management) Act (Qld) 1995*.
- (b) The proponent shall implement the traffic management plan during construction and commissioning of the project and construction of all access road intersection/s and other works to be undertaken within a state-controlled road corridor.

## **PART F. IMPOSED CONDITIONS RELATING TO REGULATED STRUCTURES**

In order to ensure that commitments made by the proponent to complete critical engineering conceptual design work relating to regulated structures on the mine site, prior to the issue of the Environmental Authority, I have imposed the following condition:

### **Condition 1. Mine Regulated Structures**

- (a) Prior to finalising the EA, the proponent is to review and provide to the administering authority for the *Environmental Protection Act 1994* a revised version of the *Alpha Coal Project Mine Water Structures Bridging Report* dated 27 April 2012 (Parsons Brinckerhoff Australia Pty Ltd) that includes:
  - (i) revised calculations for end wall stability using reduced cohesion values in the soil strength parameters
  - (ii) revised design for the drainage pipe installation in the Tailings Storage Facility that will not affect the permeability of the clay liner
  - (iii) verification of the location and depth of the sandstone/rock layers that could control sedimentary processes in the proposed flood levees
  - (iv) details of how the flood levee will be constructed to contain sedimentary/erosion processes to within the modified flood plain, including a certified engineering report that the design is feasible and sustainable
  - (v) contingency arrangements and commitments for dams that will avoid emergency release of poor quality water to the environment.
- (b) Monitoring of regulated structures must include:
  - (i) Those designs included in Section 6 of the Alpha Coal Project Mine Water Structures Bridging Report
  - (ii) Condition of levees and containment embankments
  - (iii) Weathering of riprap (channel armour material)
  - (iv) Aggregation and degradation of diversion channel floors
  - (v) Tailings placement within the Tailings Storage Facility including beach formation, drying, consolidation)
  - (vi) Performance of watercourse diversion during storms, including calibration of the diversion model included in the Alpha Coal Project Mine Water Structures Bridging Report

DEHP is responsible for this condition.

## Appendix 3. Coordinator-General's recommendations—mine

This appendix includes general recommendations, made under section 35(4) of the SDPWO Act. The recommendations relate to the applications for an environmental authority and a mining lease to undertake mining activities.

While the recommendations guide the administering authorities in assessing the applications, they do not limit their ability to seek additional information nor power to impose conditions on any approval required for the project.

The following recommended conditions are linked to the stated conditions for any Project environmental authority. At the time of writing this Evaluation Report, the proponent had yet to provide the administering authority with the information required to complete a full set of stated environmental authority conditions.

Each recommendation nominates the entity to be consulted by the proponent.

This Appendix comprises the following:

### **Part A—Coordinator-General's recommendations relating to the issuing of the DRAFT Environmental Authority (Mining Lease) for the Alpha Coal Project under the EP Act.**

Schedule 1—General

Schedule 2—Air

Schedule 3—Water

Schedule 4—Noise and Vibration

Schedule 5—Waste

Schedule 6—Land

Schedule 7—Regulated Structures

Schedule 8—Sewage Treatment

Schedule 9—Water Treatment

Schedule 10—Definitions

### **Part B—Coordinator-General's recommendations relating to approvals for the extraction and use of groundwater under the *Water Act 2000***

### **Part C—Coordinator-General's recommendations relating to approvals for the diversion of waterways under the *Water Act 2000***

### **Part D—Other Coordinator-General's recommendations**

## **PART A. COORDINATOR-GENERAL'S RECOMMENDATIONS RELATING TO THE ISSUING OF THE DRAFT ENVIRONMENTAL AUTHORITY (MINING LEASE) FOR THE ALPHA COAL PROJECT UNDER THE EP ACT.**

Jurisdiction for all of Appendix 3, Part A is the responsibility of the authority administering the *Environmental Protection Act 1994* (EP Act).

### **Schedule 1. General**

#### **Recommendation 1. Finalisation of EM plan**

The environmental authority applicant must provide the administering authority an Environmental Management (EM) Plan that meets the content requirements of Section 203 of the EP Act prior to the issue of any Draft Environmental Authority (EA).

#### **Recommendation 2. Location of Mining Activities**

The environmental authority applicant must provide to the administering authority all relevant details regarding the proposed location of the following mining activities:

- (a) the coal handling and preparation plant (CHPP);
- (b) Run of mine (ROM) stockpiles;
- (c) Ancillary infrastructure;
- (d) Pits;
- (e) Overburden; and
- (f) Accommodation Camp

to enable the inclusion of relevant conditions on the EA identifying where on the tenure mining activities are to be undertaken.

#### **Recommendation 3. Mining Activities**

The following condition may be used within any Draft EA issued.

- (a) The only mining activities to be carried out under this environmental authority are the mining activities defined within the parameters in Table A14: Mining activities and identified in the EM plan dated [date to be added when EM plan prepared under Section 203 of the EP Act has been approved].

*Note: Variation of mining activities to those identified within the conceptual designs is considered to be in accordance with these conditions as long as the variation is not significantly different to the conceptual design or causes a significant increase in environmental harm.*

**Table A14: Mining activities**

Mine Domain	Tenure Type and Number	Location *	Maximum disturbance area (ha) *	Constraints *
Pits/Voids/ Overburden and Rejects Emplacement	ML70426			
	ML70426			
	ML70426			
Tailings Storage	ML70426			
Infrastructure	ML70426			
	ML70426			
	ML70426			
	ML70426			
	ML70426			
	ML70426			
Other Lands	ML70426			

\* detail to be added by administering authority in consultation with proponent

## Schedule 2. Air

### Recommendation 4. Dust Nuisance

- (a) The release of dust and/or particulate matter resulting from the mining activity must not cause an environmental nuisance at any nuisance-sensitive place
- (b) Exceedence of any of the following levels when measured at any dust sensitive place is an environmental nuisance for the purposes of (a):
  - (i) a level of deposited dust of 120 milligrams per square metre per day based on a monthly average;
  - (ii) a concentration of total particulate matter suspended in the atmosphere of 90 micrograms per cubic metre over a 1 year averaging time.
- (c) The Environmental Authority holder must take all reasonable and practical measures to limit the concentration of particulate matter generated by the mining activities to an aerodynamic diameter of less than 10 micrometres (PM10) of 50 micrograms per cubic metre over a 24-hour averaging time at any nuisance-sensitive place with no more than five exceedences recorded over twelve months.
- (d) Where monitoring at location identified in table Table A15: Air Quality Monitoring Details indicates that the air quality levels detailed in (b) and objectives detailed in (c) have been exceeded the holder must investigate the matter and report to

the administering authority within fourteen (14) days of receipt of monitoring results:

- (i) The concentration of PM<sub>10</sub> particles or dust deposition rate recorded
- (ii) A description of meteorological conditions occurring at the time
- (iii) The measures taken to reduce dust generated by the mining activities.

**Recommendation 5. Ambient Dust Monitoring Program**

- (a) Prior to the commencement of mining activities for the project, the holder must develop and submit for approval to the administering authority, an Ambient Dust Monitoring Program (as outlined in Table A15: Air Quality Monitoring Details), to specify how the ambient dust impacts of the project will be monitored. The Program shall include, but not necessarily be limited to:
  - (i) procedures for monitoring dust emissions from the project, in accordance with the requirements of this approval;
  - (ii) locations, frequencies and methods for monitoring PM<sub>10</sub> and deposited particulate matter;
  - (iii) provision for the use of at least three Tapered Element Oscillating Microbalance Samplers (TEOMS), five dust depositional gauges and one meteorological station capable of monitoring wind direction and speed;
  - (iv) investigation of the use of TEOMS as part of the integrated air quality monitoring network. Should an alternative sampling method be proposed; the holder may seek approval from the administering authority to exclude this requirement. In seeking such exclusion, the reasons for the exclusion shall be provided and be fully justified;
  - (v) the holder shall utilise real-time monitoring data to inform environmental management decisions associated with the project;
  - (vi) a framework for identifying actual and potential dust impacts, and for applying pro-active and reactive mitigation and management measures to address those impacts;
  - (vii) provision for independent review and auditing of the Program; and
  - (viii) mechanisms for updating the Program.
- (b) Ongoing monitoring must be conducted in accordance with the standards, and at the locations specified in Table A15: Air Quality Monitoring Details.

**Table A15: Air Quality Monitoring Details**

Air Quality Determination	Monitoring Standard	Monitoring Point Description	Approximate Monitoring Point Location	
			Easting (m)	Northing (m)
PM <sub>10</sub>	AS 3580.9.8:2008: Methods for sampling and analysis of ambient air—Determination of suspended particulate matter—PM10 continuous direct mass method using a tapered element oscillating microbalance (TEOM) analyser	AQMS1: Forrester Homestead	446,462	7460,888
		AQMS2: Monklands Homestead	445,097	7411,185
		AQMS3: Alpha Coal Project Accommodation Village	455,734	7435,283
Dust deposition	AS 3580.10.1:2003: Methods for sampling and analysis of ambient air—Determination of particulate matter—Deposited matter—Gravimetric method	DG1: Forrester Homestead	446,462	7460,888
		DG2: Monklands Homestead	445,097	7411,185
		DG3: Alpha Coal Project Accommodation Village	455,734	7435,283
		DG4: Kia-Ora Homestead	437,918	7414,891
		DG5: Surbiton Homestead	461,950	7440,055
Meteorological data <sup>1</sup>	AS 2923:1987: Ambient air—Guide for measurement of horizontal wind for air quality applications	MS1: Alpha Coal Project Accommodation Village	455,734	7435,283

<sup>1</sup> Wind speed and direction, humidity, temperature and precipitation.

- (c) Where monitoring at locations identified in (b) indicates that the air quality levels detailed in Recommendation 4 have been exceeded, the holder of this environmental authority must investigate the matter and report to the administering authority within 14 days:
- (i) the concentration of PM<sub>10</sub> particulates or dust deposition rate recorded;
  - (ii) a description of meteorological conditions occurring at the time; and
  - (iii) the measures taken to reduce dust generated by the mining activities.
- (d) When requested by the administering authority or as a result of a complaint (which is neither frivolous nor vexatious nor based on mistaken belief in the opinion of the authorised officer), additional dust and particulate monitoring

(including dust deposition, total suspended particles (TSP), PM<sub>10</sub> and PM<sub>2.5</sub>) must be undertaken, and the results thereof notified to the administering authority within 14 days following completion of monitoring. This includes providing interim reports if the monitoring lasts for more than one month.

- (e) Note: This monitoring must be carried out at a place(s) relevant to the potentially affected dust sensitive place. Monitoring must be conducted in accordance with the appropriate standards.
- (f) If monitoring conducted as a result of a complaint indicates an exceedance of the air quality levels detailed in Recommendation 4, the holder must:
  - (i) address the complaint through the use of appropriate dispute resolution if required; and
  - (ii) implement dust abatement measures.
- (g) The results of PM<sub>10</sub>, dust deposition and meteorological monitoring must be reported to the administering authority on request.
- (h) If requested, the results of PM<sub>10</sub>, dust deposition and meteorological monitoring must be made available for use in any air quality monitoring network in the region operated independently of mining activities.

#### **Recommendation 6. Model Evaluation**

- (a) Following one full year of data collection (after the commencement of mining activities) in accordance with an approved Ambient Dust Monitoring Program (refer to Recommendation 5) the holder shall undertake a model validation study to review PM<sub>10</sub> and dust deposition levels to assess compliance with the dust impact predictions made in the document entitled "*Alpha Coal Mine Project Air Quality Assessment Report Model Refinements (post consultation update)*" (URS, March 2012)" and with the ambient air quality levels specified in Recommendation 4. The model validation study shall be undertaken in accordance with NSW DECC *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (DECC, 2005), and specific requirements of the administering authority.
- (b) Within 28 days of conducting the dust validation study referred to under (a) of this approval, the holder shall provide a copy of the report to the administering authority. If the dust validation study identifies any additional exceedances to those stated in the ambient air quality objectives stated in this EA, the holder shall detail what additional measures would be implemented to further mitigate dust impacts. The holder shall clearly indicate who would implement these measures, when these measures would be implemented, and how the effectiveness of these measures would be assessed and reported to the administering authority.

#### **Recommendation 7. Dust Management Plan**

- (a) The holder must develop and implement a Dust Management Plan to outline measures to minimise and manage any impacts from the operation of the project on local air quality. The Dust Management Plan shall include, but not necessarily be limited to:

- (i) identification of all major sources of dust emissions that may occur as result of the operation of the project;
- (ii) description of the procedures to manage the dust emissions from the sources identified;
- (iii) collection of air quality and meteorological data at location and using the methods described in Recommendation 5;
- (iv) identification of adverse meteorological conditions likely to produce elevated levels of PM<sub>10</sub> at a nuisance sensitive place due to the mining activities;
- (v) development of a method for using weather forecasting data for on-site dust management;
- (vi) integration of the dust control strategy with the weather forecast data feed that would activate the timely management of dust control in addition to the best practice dust control measures during the adverse meteorological conditions;
- (vii) protocols for regular maintenance of plant and equipment, to minimise the potential for fugitive dust emissions; and
- (viii) description of procedures to be undertaken if any non-compliance is detected.

**Recommendation 8. Dust control**

- (a) The holder must design, construct, commission, operate and maintain the project in a manner that minimises the emission of dust from the site including wind blown and traffic generated dust.
- (b) The holder must design, construct, operate and maintain the project in a manner that minimises the potential generation of fugitive dust emission from plant and equipment.
- (c) For the purpose of avoiding any release of dust or particulate matter from the approved place which could cause an environmental nuisance, the following measures must be taken:
  - (i) stockpiles must be maintained using all reasonable and practicable measures to minimise the release of wind blown dust or particulate matter to the atmosphere to ensure compliance with air quality levels detailed in Recommendation 4(b) and objectives detailed in Recommendation 4(c);
  - (ii) trafficable areas must be maintained using all reasonable and practicable measures to minimise the release of windblown dust or traffic generated dust to the atmosphere to ensure compliance with air quality levels detailed in Recommendation 4(b) and objectives detailed in Recommendation 4(c);
  - (iii) raw material preparation plants and external transfer conveyors must be operated and maintained using all reasonable and practicable measures to minimise the release of wind blown dust or particulate matter to the atmosphere to ensure compliance with with air quality levels detailed in Recommendation 4(b) and objectives detailed in Recommendation 4(c); and

- (iv) water sprays or alternative dust mitigation measures approved by the administering authority must be installed at all major dust emission sources.

**Recommendation 9. Odour Nuisance**

- (a) The release of noxious or offensive odour(s) or any other noxious or offensive airborne contaminant(s) resulting from the mining activity must not cause an environmental nuisance at any nuisance-sensitive place.
- (b) When requested by the administering authority, odour monitoring must be undertaken within a reasonable and practicable timeframe nominated by the administering authority to investigate any complaint (which is neither frivolous nor vexatious nor based on mistaken belief in the opinion of the authorised officer) of environmental nuisance at any nuisance-sensitive place, and the results must be notified within 14 days to the administering authority following completion of monitoring.
- (c) If the administering authority determines that the odour released constitutes an environmental nuisance, then the environmental authority holder must:
  - (i) address the complaint including the use of appropriate dispute resolution if required; and
  - (ii) immediately implement odour abatement measures so that emissions of odour from the activity do not result in further environmental nuisance.
- (d) The environmental authority holder must establish and maintain a permanent automatic meteorological station to continuously measure and record wind speed, wind direction, temperature, relative humidity and rainfall intensity.
- (e) Note: it is possible for environmental authority holders to utilise relevant and available weather monitoring information collected by other parties as reference data for the purpose of this condition.
- (f) The holder must record, compile and keep all monitoring records obtained from the automatic meteorological station.

### **Schedule 3. Water**

The following conditions may be used within any Draft EA issued.

**Recommendation 10. Mine Affected Water**

- (a) Unless otherwise permitted under the conditions of this environmental authority, the release of mine affected water to waters must only occur from the release points specified in Table A16: Contaminant Release Points, Sources, Monitoring Points and Receiving Waters and depicted in Figure X<sup>1</sup> attached to this environmental authority.

<sup>1</sup> *Figure X to accompany Recommendation 10(a) must be provided to the administering authority of the EP Act prior to the issue of any Draft EA.*

**Table A16: Contaminant Release Points, Sources, Monitoring Points and Receiving Waters**

<b>Release Point (RP)</b>	<b>Northing (GDA94)</b>	<b>Easting (GDA94)</b>	<b>Contaminant Source and Location</b>	<b>Monitoring Point</b>	<b>Receiving waters description</b>
RP1	7421246N	447833E	Sediment Dam SD1a	Spillway	Lagoon Creek
RP2	7421246N	447833E	Sediment Dam SD1a	Outlet works direct into Lagoon Creek – from release point.	Lagoon Creek
RP3	7426055N	448273E	Sediment Dam SD2b	Spillway	Lagoon Creek
RP4	7426055N	448273E	Sediment Dam SD2b	Outlet works direct into Lagoon Creek – from release point.	Lagoon Creek
RP5	7434017N	448698E	Sediment Dam SD4b	Spillway	Lagoon Creek
RP6	7434017N	448698E	Sediment Dam SD4b	Outlet works direct into Lagoon Creek – from release point.	Lagoon Creek
RP7	7442446N	449801E	Sediment Dam SD6b	Spillway	Lagoon Creek
RP8	7442446N	449801E	Sediment Dam SD6b	Outlet works direct into Lagoon Creek – from release point.	Lagoon Creek
RP9	7429529N	449501E	MIA Runoff Containment Dam	Spillway	Lagoon Creek
RP10	7429529N	449501E	MIA Runoff Containment Dam	Outlet works direct into Lagoon Creek – from release point.	Lagoon Creek

- (b) The release of mine affected water is permitted to internal water management infrastructure that is installed and operated in accordance with a water management plan that complies with Condition 13 (Appendix 1, Schedule 2).
- (c) The release of mine affected water to waters in accordance with Recommendation 10(a) must not exceed the release limits stated in

- (d) Table A17: Mine Affected Water Release Limits , when measured at the monitoring points specified in Table A16: Contaminant Release Points, Sources, Monitoring Points and Receiving Waters, for each quality characteristic.

**Table A17: Mine Affected Water Release Limits**

Quality Characteristic	Release Limit	Monitoring Frequency
Electrical conductivity ( $\mu\text{S/cm}$ )	Release limits specified in Table A19: Mine Affected Water Release during Flow Events for variable flow criteria.	Continuously
pH (pH Unit)	6.5 (minimum) 9.0 (maximum)	Continuously
Suspended Solids (mg/L)	387	Monitoring to be commenced within 2 hours of commencement of the release, and then at 24 hours thereafter.
Sulfate ( $\text{SO}_4^{2-}$ ) (mg/L)	Release limits specified in Table A19: Mine Affected Water Release during Flow Events for variable flow criteria.	Monitoring to be commenced within 2 hours of commencement of the release, and then at 24 hours thereafter.

*NOTE: for the above table the limits specified are indicative, finalisation is subject to consultation with the proponent.*

- (e) The release of mine affected water to waters from the release points must be monitored at the locations specified in Table A16: Contaminant Release Points, Sources, Monitoring Points and Receiving Waters and at the frequency specified in Table A17: Mine Affected Water Release Limits and Table A18: Release Contaminant Trigger Investigation Levels.

**Table A18: Release Contaminant Trigger Investigation Levels**

Quality Characteristic	Trigger Level	Monitoring Frequency
Aluminium (µg/L) <sup>1</sup>	55	Monitoring to be commenced within 2 hours of commencement of the release, and then at 24 hours thereafter.
Arsenic (µg/L) <sup>1</sup>	13	
Cadmium (µg/L) <sup>1</sup>	0.2	
Chromium (µg/L) <sup>1</sup>	1	
Copper (µg/L) <sup>1</sup>	2	
Iron (µg/L) <sup>1</sup>	300	
Lead (µg/L) <sup>1</sup>	4	
Mercury (µg/L) <sup>1</sup>	0.2	
Nickel (µg/L) <sup>1</sup>	11	
Zinc (µg/L) <sup>1</sup>	8	
Boron (µg/L) <sup>1</sup>	370	
Cobalt (µg/L) <sup>1</sup>	90	
Manganese (µg/L) <sup>1</sup>	1900	
Molybdenum (µg/L) <sup>1</sup>	34	
Selenium (µg/L) <sup>1</sup>	10	
Silver (µg/L) <sup>1</sup>	1	
Uranium (µg/L) <sup>1</sup>	1	
Vanadium (µg/L) <sup>1</sup>	10	
Ammonia (µg/L) <sup>1</sup>	900	
Nitrate (µg/L) <sup>1</sup>	1100	
Petroleum hydrocarbons (C6-C9) (µg/L) <sup>1</sup>	20	
Petroleum hydrocarbons (C10-C36) (µg/L) <sup>1</sup>	100	
Fluoride (µg/L) <sup>2</sup>	2000	
Sodium (µg/L) <sup>1</sup>	180000	

<sup>1</sup> All metals and metalloids must be measured as total (unfiltered) and dissolved (filtered). Trigger levels for metal/metalloids apply if dissolved results exceed trigger.

<sup>2</sup> Fluoride must be measured as total (unfiltered).

*NOTE: for the above table the limits specified are indicative, finalisation is subject to consultation with the proponent.*

- (f) If quality characteristics of the release exceed any of the trigger levels specified in Table A18: Release Contaminant Trigger Investigation Levels during a release event, the environmental authority holder must compare the downstream results in the receiving waters to the trigger values specified in Table A18: Release Contaminant Trigger Investigation Levels:
  - (i) where the trigger values are not exceeded then no action is to be taken; or
  - (ii) where the down-stream results exceed the trigger values specified in Table A18: Release Contaminant Trigger Investigation Levels characteristics, compare the results of the downstream site to the data from background monitoring sites and:
    - (A) if the result is less than the background monitoring site data, then no action is to be taken; or
    - (B) if the result is greater than the background monitoring site data, complete an investigation into the potential for environmental harm and provide a written report to the administering authority in the next annual return, outlining:
      - (1) details of the investigations carried out; and
      - (2) actions taken to prevent environmental harm.

*NOTE: Where an exceedance of a trigger level has occurred and is being investigated, in accordance with Recommendation 10(f)(ii), no further reporting is required for subsequent trigger events for that quality characteristic.*

- (g) If an exceedance in accordance with Recommendation 10(f)(ii) is identified, the holder of the authority must notify the administering authority within 14 days of receiving the result.

#### **Recommendation 11. Mine Affected Water Release Events**

- (a) The holder must ensure a stream flow gauging station/s is installed, operated and maintained to determine and record stream flows at the locations and flow recording frequency specified in Table A19: Mine Affected Water Release during Flow Events .
- (b) Notwithstanding any other condition of this environmental authority, the release of mine affected water to waters in accordance with Recommendation 10(a) must only take place during periods of natural flow events in accordance with the receiving water flow criteria for discharge specified in Table A19: Mine Affected Water Release during Flow Events when measured at the monitoring points specified in Table A16: Contaminant Release Points, Sources, Monitoring Points and Receiving Waters
- (c) The release of mine affected water to waters in accordance with Recommendation 10(a) must not exceed the Electrical Conductivity and Sulfate release limits or the Maximum Release Rate (for all combined release points flows) for each receiving water flow criteria for discharge specified in Table A19: Mine Affected Water Release during Flow Events when measured at the monitoring points specified in Table A16: Contaminant Release Points, Sources, Monitoring Points and Receiving Waters.

**Table A19: Mine Affected Water Release during Flow Events**

Receiving waters	Release Point (RP)	Gauging Station <sup>1</sup>	Gauging Station Northing (GDA94) <sup>1</sup>	Gauging Station Easting (GDA94) <sup>1</sup>	Receiving Water Flow Recording Frequency	Receiving Water Flow Criteria for discharge (m <sup>3</sup> /s)	Maximum release rate for all combined RP flows (m <sup>3</sup> /s)	Electrical Conductivity and Sulfate Release Limits
Lagoon Creek	RP1				Continuous	<5 m <sup>3</sup> /s	1 m <sup>3</sup> /s	Maximum Electrical Conductivity: 250 µS/cm Maximum Sulfate (SO <sub>4</sub> <sup>2-</sup> ): 250 mg/L
	RP2					>5 m <sup>3</sup> /s to 10 m <sup>3</sup> /s	1.7 m <sup>3</sup> /s	Maximum Electrical Conductivity: 2500 µS/cm
	RP3					10 m <sup>3</sup> /s to 15 m <sup>3</sup> /s	3.5 m <sup>3</sup> /s	Maximum Sulfate (SO <sub>4</sub> <sup>2-</sup> ): 985 mg/L
	RP4					15 m <sup>3</sup> /s to 20 m <sup>3</sup> /s	5.2 m <sup>3</sup> /s	
	RP5					20 m <sup>3</sup> /s to 25 m <sup>3</sup> /s	6.9 m <sup>3</sup> /s	
	RP6					25 m <sup>3</sup> /s to 50 m <sup>3</sup> /s	4 m <sup>3</sup> /s	Maximum Electrical Conductivity: 3500 µS/cm
	RP7					> 50 m <sup>3</sup> /s	8 m <sup>3</sup> /s	Maximum Sulfate (SO <sub>4</sub> <sup>2-</sup> ): 1800 mg/L
	RP8							
	RP9							
	RP10							

<sup>1</sup> Final gauging station location to be provided to and approved by the administering authority for the EP Act prior to issue of any Draft EA. The administering authority requires the final gauging station location to be up stream of the release points. The location of the gauging station should ideally be such that it is not significantly affected by other upstream point source releases or times of discharge are limited to periods of 'natural' flow.

*NOTE: for the above table the limits specified are indicative, finalisation is subject to consultation with the proponent.*

- (d) The daily quantity of mine affected water released from each release point must be measured and recorded at the monitoring points in Table A16: Contaminant Release Points, Sources, Monitoring Points and Receiving Waters.
- (e) Releases to waters must be undertaken so as not to cause erosion of the bed and banks of the receiving waters, or cause a material build up of sediment in such waters.

### **Recommendation 12. Notification of Release Event Exceedance**

- (a) If the release limits defined in Table A17: Mine Affected Water Release Limits are exceeded, the holder of the environmental authority must notify the administering authority within 24 hours of receiving the results.
- (b) The authority holder must, within 28 days of a release that exceeds the conditions of this authority, provide a report to the administering authority detailing:
  - (i) the reason for the release;
  - (ii) the location of the release;
  - (iii) all water quality monitoring results;
  - (iv) any general observations;
  - (v) all calculations; and
  - (vi) any other matters pertinent to the water release event.

### **Recommendation 13. Cessation of Release**

- (a) During the release of mine affected water to waters from the release points, the receiving waters must be monitored at the locations specified in Table A20: Receiving waters release limits for each quality characteristic and at the frequency specified in Table A20: Receiving waters release limits.
- (b) Notwithstanding any other condition of this environmental authority, the release of mine affected water must not commence or cease if the water quality characteristics in in Table A20: Receiving waters release limits are met and or exceeded.

**Table A20: Receiving waters release limits**

Monitoring Point	Northing (GDA94)	Easting (GDA94)	Quality Characteristic	Limit	Monitoring Frequency
MP5	7444277	449480	Electrical conductivity (µS/cm)	700	Continuously

NOTE: for the above table the limits specified are indicative, finalisation is subject to consultation with the proponent.

- (c) In accordance with Recommendation 13(b), the release of mine affected water may commence if the water quality characteristics in Table A20: Receiving waters release limits.

*Note: If the release of mine affected water is ceased under condition C14, and the water quality within the receiving environment drops below the water quality characteristic limit in Table A20: Receiving waters release limits. Receiving water release limits, the release may recommence if all other release conditions are complied with.*

#### **Recommendation 14. Monitoring of Water Storage Quality**

- (a) Water storages stated in Table A21: Water Storage Monitoring which are associated with the release points must be monitored for the water quality characteristics and at the monitoring frequency specified in Table A22: Onsite Water Storage Contaminant Limits at the monitoring locations specified in Table A21: Water Storage Monitoring.

**Table A21: Water Storage Monitoring**

Water Storage Description <sup>1</sup>	Northing (GDA94) <sup>1</sup>	Easting (GDA94) <sup>1</sup>	Monitoring Location <sup>1</sup>

<sup>1</sup> The location of the water storages and the water storage monitoring locations for condition Recommendation 14(a) must be submitted to the administering authority for the EP Act prior to the issue of any Draft EA.

- (b) In the event that water storages defined in Table A21: Water Storage Monitoring exceed the contaminant limits defined in Table A22: Onsite Water Storage Contaminant Limits, the holder of the environmental authority must implement measures, where practicable, to prevent access to waters by all livestock.

**Table A22: Onsite Water Storage Contaminant Limits**

Quality Characteristic	Water Storage Contaminant Limit	Monitoring Frequency
pH (pH unit)	6.5 (minimum) 9.0 (maximum)	Quarterly
EC (µS/cm)	5970	
Sulfate (mg/L)	1000 <sup>1</sup>	
Fluoride (mg/L)	2 <sup>1</sup>	
Aluminium (mg/L)	5 <sup>1</sup>	
Arsenic (mg/L)	0.5 <sup>1</sup>	
Cadmium (mg/L)	0.01 <sup>1</sup>	
Cobalt (mg/L)	1 <sup>1</sup>	
Copper (mg/L)	1 <sup>1</sup>	
Lead (mg/L)	0.1 <sup>1</sup>	
Nickel (mg/L)	1 <sup>1</sup>	
Zinc (mg/L)	20 <sup>1</sup>	

<sup>1</sup> All metals and metalloids must be measured as total (unfiltered).

*NOTE: for the above table the limits specified are indicative, finalisation is subject to consultation with the proponent.*

**Recommendation 15. Receiving Environment Monitoring and Contaminant Trigger Levels**

- (a) The quality of the receiving waters must be monitored at the locations specified in Table A24: Receiving Water Upstream Background and Downstream Monitoring Locations for each quality characteristic and at the monitoring frequency stated in Table A23: Receiving Waters Contaminant Trigger Levels.

**Table A23: Receiving Waters Contaminant Trigger Levels**

Quality Characteristic	Receiving Water Trigger Level	Monitoring Frequency
pH	6.5 (minimum) 8.0 (maximum)	Continuously
Suspended solids (mg/L)	100	Monitoring to be commenced within 2 hours of commencement of the release, and then at 24 hours thereafter.
Sulfate (SO <sub>4</sub> <sup>2-</sup> ) (mg/L)	180	
Sodium (mg/L)	250	

*NOTE: for the above table the limits specified are indicative, finalisation is subject to consultation with the proponent.*

**Table A24: Receiving Water Upstream Background and Downstream Monitoring Locations**

Monitoring Point (MP)	Receiving Waters Location Description	Northing (GDA94)	Easting (GDA94)
<b>Upstream Background Monitoring Locations</b>			
MP1	Lagoon Creek XXm upstream of RPXX.	7418923	447249
MP2	Lagoon Creek – Murdering Lagoon XX location to RP details XX	7426371	448159
MP3	Sandy Creek	7444277	440745
MP4	Spring Creek	7424345	438988
<b>Downstream Monitoring Locations</b>			
MP5	Lagoon Creek at mining lease boundary, XXm downstream of RPXX.	7444277	449480
MP6	Lagoon Creek XXm downstream of RPXX.	7453981	449557

*Note: The distance of the monitoring point to the release points, as required under Table A24: Receiving Water Upstream Background and Downstream Monitoring Locations is required to be provided to the administering authority of the EP Act prior to the issue of any Draft EA.*

*The details of the release points located downstream of MP2 are required to be provided to the administering authority of the EP Act prior to the issue of any Draft EA.*

- (b) If quality characteristics of the receiving water at the downstream monitoring points exceed any of the trigger levels specified in Table A23: Receiving Waters Contaminant Trigger Levels during a release event, the environmental authority holder must compare the downstream results to the upstream results in the receiving waters and:
  - (i) where the downstream result is the same or a lower value than the upstream value for the quality characteristic then no action may be taken; or
  - (ii) where the downstream results exceed the upstream results complete an investigation into the potential for environmental harm and provide a written report to the administering authority in the next annual return, outlining:
    - (A) details of the investigations carried out; and
    - (B) actions taken to prevent environmental harm.

*NOTE: Where an exceedence of a trigger level has occurred and is being investigated, in accordance with Recommendation 15(b) of this condition, no further reporting is required for the subsequent trigger events for that quality characteristic.*

**Recommendation 16. Receiving Environment Monitoring Program (REMP)**

- (a) The environmental authority holder must develop and implement a Receiving Environment Monitoring Program (REMP) to monitor, identify and describe any adverse impacts to surface water environmental values, quality and flows due to the authorised mining activity. This must include monitoring the effects of the mine on the receiving environment periodically (under natural flow conditions) and while mining affected water is being discharged from the site.  
For the purpose of the REMP, the receiving environment is the waters of Lagoon Creek and Sandy Creek and connected or surrounding waterways within 10km downstream of the release. The REMP should encompass any sensitive receiving waters or environmental values downstream of the authorised mining activity that will potentially be directly affected by an authorised release of mine affected water.
- (b) The Receiving Environment Monitoring Program (REMP) must:
  - (i) assess the condition or state of receiving waters, including upstream conditions, spatially within the REMP area, considering background water quality characteristics based on accurate and reliable monitoring data that takes into consideration temporal variation (e.g. seasonality); and
  - (ii) include monitoring from background reference sites (e.g. upstream or background) and downstream sites from the release (as a minimum, the locations specified in Table A24: Receiving Water Upstream Background and Downstream Monitoring Locations;
  - (iii) specify the frequency and timing of sampling required in order to reliably assess ambient conditions and to provide sufficient data to derive site

specific background reference values in accordance with the *Queensland Water Quality Guidelines* 2006. This should include monitoring during periods of natural flow irrespective of mine or other discharges;

- (iv) include monitoring and assessment of dissolved oxygen saturation, temperature and all water quality parameters listed in Table A17: Mine Affected Water Release Limits and Table A18: Release Contaminant Trigger Investigation Levels;
  - (v) include, where appropriate, monitoring of metals/metalloids in sediments (in accordance with ANZECC & ARM CANZ 2000, BATLEY and/or the most recent version of AS5667.1 *Guidance on Sampling of Bottom Sediments*);
  - (vi) include, where appropriate, monitoring of macroinvertebrates in accordance with the AusRivas methodology;
  - (vii) apply procedures and/or guidelines from ANZECC and ARM CANZ 2000 and other relevant guidelines and documents;
  - (viii) describe sampling and analysis methods and quality assurance and control; and
  - (ix) incorporate stream flow and hydrological information in the interpretations of water quality and biological data.
- (c) A Receiving Environment Monitoring Program (REMP) Design Document that addresses each criterion presented in Recommendation 16(a) and Recommendation 16(b) must be prepared and submitted to the administering authority prior to commencement of mining activities. Due consideration must be given to any comments made by the administering authority on the REMP Design Document and subsequent implementation of the program.

**Recommendation 17. Design Storage Allowance Exceedence Release**

- (a) The release of mine affected water to achieve design storage allowance requirements in accordance with the provisions of Manual for Assessing Hazard Categories and Hydraulic Performance of Dams, must comply with conditions in Schedule 3.

## **Schedule 4. Noise and Vibration**

**Recommendation 18. General**

- (a) The environmental authority applicant must provide to the administering authority for the *EP Act* an agreed approach to noise and vibration modelling prior to the issue of a Draft EA.

**Recommendation 19. Nuisance**

Any Draft EA issued by the administering authority of the *EP Act* must include conditions that:

- (a) state that noise from activities must not cause any nuisance at any nuisance-sensitive place
- (b) set noise limits that are not to be exceeded by the activity at certain locations

- (c) require the holder of the EA to undertake an investigation into any complaint of nuisance caused by noise when requested by the administering authority of the EP Act;
- (d) state that vibration from activities must not cause any nuisance at any nuisance-sensitive place
- (e) require the holder of the EA to undertake an investigation into any complaint of nuisance caused by vibration when requested by the administering authority of the EP Act
- (f) state that air blast overpressure from activities must not cause any nuisance at any nuisance-sensitive place
- (g) require the holder of the EA to undertake an investigation into any complaint of nuisance caused by air blast overpressure when requested by the administering authority of the EP Act
- (h) require the holder of the EA to implement abatement measures following a nuisance complaint of noise, vibration or air blast overpressure if the investigation finds that nuisance has occurred.

## **Schedule 5. Waste**

### **Recommendation 20. Disposal of waste**

Any draft EA issued by the administering authority of the EP Act must include conditions that:

- (a) require all waste, other than scrap tyres, must either be disposed of in the designated landfill (waste disposal) facility or removed for disposal at an authorised waste receiver;
- (b) prohibit the disposal of the following waste materials at the landfill (waste disposal) facility:
  - (i) liquid or semi liquid waste other than liquid or semiliquid waste which has been produced in carrying out the activity
  - (ii) hot ash
  - (iii) material that is smouldering or aflame
  - (iv) material containing a substance which is corrosive, reactive or toxic unless this material is to be deposited into a dedicated moncell approved in writing by the administering authority of the EP Act
  - (v) all radioactive wastes, unless otherwise approved under the *Radiation Safety Act 1999*
  - (vi) contaminated soil
  - (vii) an explosive, or
  - (viii) ammunition, other than ammunition that no longer contains explosive, pyrotechnics or propellants apart from trace residues that are no longer capable of supporting combustion or an explosive reaction.

- (c) Require that at all times while the landfill (waste disposal) facility is operating, at least one person must be present who is responsible for the control and operation of the facility and whose duties must include, but not be limited to:
  - (i) controlling the reception, storage and removal of waste
  - (ii) maintaining the facility
  - (iii) controlling all employees working in the facility
  - (iv) supervising all persons entering the facility.
- (d) require all waste awaiting disposal or removal be stored in designated waste storage areas
- (e) require the landfill (waste disposal) facility to be covered under a final cover system once the deposition of waste ceases, which minimises:
  - (i) infiltration of water into the landfill facility
  - (ii) the likelihood of any erosion occurring to either the final cover system or the land filled materials
  - (iii) uncontrolled release of landfill gas.
- (f) require the landfill (waste disposal) facility be rehabilitated
- (g) require clear access for fire-fighting vehicles be provided at all times to the landfill (waste disposal) facility and any designated waste storage area
- (h) require an effective fire brake be constructed and maintained around the landfill (waste disposal) facility and any designated waste storage area
- (i) waste, excluding vegetation, must not be burned or allowed to be burned
- (j) waste batteries must be stored
  - (i) in a bunded and roofed area; or
  - (ii) palletised and plastic wrapped.

## **Schedule 6. Land**

### **Recommendation 21. Land – rehabilitation**

- (a) The environmental authority applicant must provide to the administering authority the rehabilitation completion criteria prior to the issue of a Draft EA.

*Note: completion criteria are required to be developed in line with the administering authority of the EP Act's guideline 'Rehabilitation requirements for mining projects'.*

### **Recommendation 22. Topsoil**

- (a) Topsoil must be stripped ahead of mining in accordance with a Topsoil Management Plan.
- (b) Topsoil and subsoils must be managed to ensure stability and minimise runoff and erosion.
- (c) A topsoil inventory which identifies the topsoil requirements for the Alpha Coal Mine project and availability of suitable topsoil on site must be detailed in the plan of Operations.

**Recommendation 23. Preventing contaminant release to land**

- (a) Contaminants must not be released to land in a manner which constitutes nuisance, material or serious environmental harm.
- (b) The environmental authority holder must take all practicable actions necessary to secure loads prior to transporting materials off site to minimise emissions or spillage of any material from vehicles or other transport infrastructure.

**Recommendation 24. Chemicals and flammable or combustible liquids**

- (a) All flammable and combustible liquids must be contained within an on-site containment system and controlled in a manner that prevents environmental harm and maintained in accordance with the current edition of *AS 1940 – Storage and Handling of Flammable and Combustible Liquids*.

**Recommendation 25. Land—General**

Any EA issued by the administering authority of the EP Act must include conditions that require:

- (a) topsoil be managed in a way that ensures sufficient topsoil will be available to meet rehabilitation requirements;
- (b) flammable and combustible liquids to be contained within an on-site containment system and controlled in a manner that prevents material or serious environmental harm and maintain in accordance with the most current edition of *AS 1940 – Storage and Handling of Flammable and Combustible Liquids*;
- (c) the spillage of all flammable and combustible liquids must be controlled in a manner that prevents material or serious environmental harm.
- (d) all chemicals to be contained within an on-site containment system and controlled in a manner that prevents material or serious environmental harm and maintained in accordance with the current version of the relevant Australian Standard;
- (e) the spillage of all chemicals to be controlled in a manner that prevents material or serious environmental harm;
- (f) all explosives, corrosive substances, toxic substances, gases and dangerous goods to be stored and handled in accordance with the relevant Australian Standard;
- (g) all chemicals and flammable or combustible liquids stored on site that have the potential to cause material or serious environmental harm to be stored in or serviced by an effective containment system that is impervious to the materials stored and managed to prevent the release of liquids to waters or land. Where no relevant Australian Standard is available, the following must be applied:
  - (i) storage tanks must be bunded so that the capacity and construction of the bund is sufficient to contain at least 110 per cent of a single storage tank or 100 per cent of the largest storage tank plus 10 per cent of the second largest storage tank in multiple storage areas; and
  - (ii) drum storages must be bunded so that the capacity and construction of the bund is sufficient to contain at least 25 per cent of the maximum design storage volume within the bund;

- (h) appropriate spill kit, personal protective equipment and relevant operator instructions/emergency procedure guides for the management of wastes, chemicals and flammable and combustible liquids associated with the activity to be kept at the site;
- (i) anyone operating with wastes, chemicals or flammable and combustible liquids under this approval to be trained in the use of the spill kit;
- (j) overburden, coarse and fine rejects and tailings be managed in a particular manner.

*Note: the administering authority of the EP Act must consider whether to impose conditions about the matters under Section 62 of the Environmental Protection Regulation 2008.*

- (k) each mine domain to be rehabilitated to meet specific rehabilitation goals and objectives;

*Note: Section 203 of the EP Act requires environmental protection objectives within the EM plan include specific rehabilitation objectives.*

*Note: Section 210(8) of the EP Act states that the proposed conditions must include conditions about rehabilitation objectives, indicators and completion criteria.*

*Note: where self-sustaining vegetation consistent with the surrounding landform or a specific vegetation community is identified as a rehabilitation objective, reference sites for rehabilitation completion will be required to be authorised within the EA.*

- (l) the identification of indicators that will be measured to establish when rehabilitation is, by reference to specific completion criteria, complete;

*Note: Section 203 of the EP Act requires that the EM plan identify the indicators that will be measured to establish when rehabilitation is, by reference to specific completion criteria, complete.*

*Note: Section 210(8) of the EP Act states that the proposed conditions must include conditions about rehabilitation objectives, indicators and completion criteria.*

- (m) the mine to be rehabilitated to meet specific completion criteria contained in the Guideline "Rehabilitation requirements for mining activities" (DERM 2011)
- (n) residual voids not to cause any serious environmental harm to land, surface waters or any recognised groundwater aquifer, other than the environmental harm constituted by the existence of the residual void itself or other conditions of the EA;
- (o) all areas significantly disturbed (within the meaning of section 28 of the *Environment Protection Regulation 2008*) by mining activities to be rehabilitated to meet specific slope and surface area requirements;
- (p) the holder of the EA to complete a rehabilitation management plan prior to the commencement of mining activities. The rehabilitation management plan must, at a minimum, include:

- (i) develop design criteria for rehabilitation of each domain;
- (ii) describe the monitoring of reference sites inclusive of statistical design;
- (iii) detail the rehabilitation methods to be applied to each domain;
- (iv) contain end of mine design;
- (v) detail how landform design will be consistent with the surrounding topography;
- (vi) provide schematic representation of final landform inclusive of:
- (vii) drainage design features;
- (viii) slope designs;
- (ix) cover designs;
- (x) erosion controls proposed on reformed land;
- (xi) describe rehabilitation monitoring and maintenance requirements to be applied to all areas of disturbance;
- (xii) develop a contingency plan of rehabilitation maintenance or redesign;
- (xiii) describe end of mine landform design plan and post mining land uses across the mine;
- (q) the holder of the EA to undertake a rehabilitation monitoring program, developed and implemented by a person possessing appropriate qualifications and experience in the field of rehabilitation management, on a yearly basis, which must include sufficient spatial and temporal replication to enable statistically valid conclusions as established under the rehabilitation program;
- (r) a post closure management plan for the site be developed and submitted to the administering authority of the EP Act at least 18 months prior to the final coal processing on the site and implemented for a nominal period of:
- (s) at least 30 years following final coal processing on site; or
- (t) a shorter period if the site is proven to be geotechnically and geochemically stable and it can be demonstrated to the satisfaction of the administering authority that no release of contaminants from the site will result in environmental harm;
- (u) the post closure management plan to include the following elements:
  - (i) operation and maintenance of:
    - (A) wastewater collection and reticulation systems
    - (B) wastewater treatment systems
    - (C) the groundwater monitoring network
    - (D) final cover systems of spoil dumps
    - (E) vegetative cover
  - (ii) monitoring of:
    - (A) surface water quality
    - (B) groundwater quality
    - (C) seepage rates
    - (D) erosion rates

- (E) the integrity and stability all slopes, ramps and voids
- (F) the health and resilience of native vegetation cover
- (v) all infrastructure, constructed by or for the environmental authority holder during the licensed activities including water storage structures, is to be removed from the site prior to surrender, except where agreed in writing by the post mining land owner/holder and in accordance with any requirements of the *Mineral Resources Act 1989*;
- (w) any final voids to be protected from probable maximum floods from nearby watercourses such that the protection is sustainable for the foreseeable future;
- (x) the holder of the EA to reinstate and rehabilitate, at a minimum, 1 wildlife corridor across the pits 1 to 6 in the vicinity of the creek systems, vegetated with local native species and of a sufficient width and to facilitate the inter-action and movement of native species east-west;
- (y) the design and location of wildlife corridor/s referred to in Recommendation 25(x) to be agreed by the administering authority;

## **Schedule 7. Regulated Structures**

### **Recommendation 26. Regulated structures—General**

- (a) The environmental authority applicant must provide the coordinates for all regulated structures in GDA94 to the administering authority of the EP Act prior to the issue of a Draft EA.
- (b) Any EA issued by the administering authority of the EP Act include conditions that are specified within the *The Manual for Assessing Hazard Categories and Hydraulic Performance of Dams* (DERM, February 2012) for regulated structures.

## **Schedule 8. Sewage Treatment**

### **Recommendation 27. Effluent Discharge Points**

- (a) The environmental authority applicant must provide the coordinates for the effluent discharge points in GDA94 to the administering authority prior to the issue of a Draft EA.

### **Recommendation 28. Effluent Irrigation Areas**

- (a) The environmental authority applicant must provide the coordinates for the effluent irrigation areas in GDA94 to the administering authority prior to the issue of a Draft EA.

## **Schedule 9. Water Treatment**

### **Recommendation 29. Brine Water Management Infrastructure**

- (a) The environmental authority applicant must provide the coordinates for the Brine Water Management Infrastructure in GDA94 to the administering authority prior to the issue of a Draft EA.

## Schedule 10. Definitions

**“acceptance criteria”** means the measures by which the actions implemented to rehabilitate the land are deemed to be complete. The acceptance criteria indicate the success of the rehabilitation outcome or remediation of areas which have been significantly disturbed by the mining activities. Acceptance criteria may include information regarding:

- (a) vegetation establishment, survival and succession;
- (b) vegetation productivity, sustained growth and structure development;
- (c) fauna colonisation and habitat development;
- (d) ecosystem processes such as soil development and nutrient cycling, and the recolonisation of specific fauna groups such as collembola, mites and termites which are involved in these processes;
- (e) microbiological studies including recolonisation by mycorrhizal fungi, microbial biomass and respiration;
- (f) effects of various establishment treatments such as deep ripping, topsoil handling, seeding and fertiliser application on vegetation growth and development;
- (g) resilience of vegetation to disease, insect attack, drought and fire; and
- (h) vegetation water use and effects on ground water levels and catchment yields.

**“acid rock drainage”** means any contaminated discharge emanating from a mining activity formed through a series of chemical and biological reactions, when geological strata is disturbed and exposed to oxygen and moisture as a result of mining activities.

**“administering authority”** means the Department of Environment and Heritage Protection or its successor responsible for the administration of the *Environmental Protection Act 1994*.

**“airblast overpressure”** means energy transmitted from the blast site within the atmosphere in the form of pressure waves. The maximum excess pressure in this wave, above ambient pressure, is the peak airblast overpressure measured in decibels linear (dBL).

**“ambient (or total) noise”** at a place, means the level of noise at the place from all sources (near and far), measured as the Leq for an appropriate time interval.

**“ANZECC”** means the Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000

**“appropriately qualified person”** means a person who has professional qualifications, training, skills or experience relevant to the nominated subject matter and can give authoritative assessment, advice and analysis on performance relative to the subject matter using the relevant protocols, standards, methods or literature.

**“authority”** means environmental authority (mining activities) under the *Environmental Protection Act 1994*.

**“bed and banks”** for a waters, river, creek, stream, lake, lagoon, pond, swamp, wetland or dam means land over which the water of the waters, lake, lagoon, pond,

swamp, wetland or dam normally flows or that is normally covered by the water, whether permanently or intermittently; but does not include land adjoining or adjacent to the bed and banks that is from time to time covered by floodwater.

**“blasting”** means the use of explosive materials to fracture-

- (a) rock, coal and other minerals for later recovery; or
- (b) structural components or other items to facilitate removal from a site or for reuse.

**“bunded”** means within bunding consistent with Australian Standard 1940.

**“competent person”** means a person with the demonstrated skill and knowledge required to carry out the task to a standard necessary for the reliance upon collected data or protection of the environment.

**“construction”** includes building a new dam and modifying or lifting an existing dam.

**“dwelling”** means any of the following structures or vehicles that is principally used as a residence –

- (a) a house, unit, motel, nursing home or other building or part of a building; or
- (b) a caravan, mobile home or other vehicle or structure on land; or
- (c) a water craft in a marina.

**“commencement of mining activities”** means the commencement of activities permitted by the issue of a mining lease under the *Mineral Resources Act 1989* for the operational land not including early works.

**“early works”** mean preconstruction surveying, establishment of work site security arrangements (including signs, fences, safety barriers and temporary security personnel facilities), demolition and removal of structures and required public utility works up to the boundary of construction sites, and vegetation clearing associated with these activities.

**“effluent”** mean treated waste water discharged from sewage treatment plants.

**“end of pipe”** means the location at which water is released to waters or land.

**“environmental authority holder”** means the holder of this environmental authority.

**“environmental nuisance”** means not causing an unreasonable interference with or likely interference with an environmental value in a way mentioned in subsections (a), (b) or (c) of Section 15 of the *Environmental Protection Act 1994*. Likely interference with the air quality environmental values affected by the project are measured against the levels or concentrations in 4(b) and 4(c) (Schedule 2, Part A, Appendix 3)

**“financial assurance”** means a security required under the *Environmental Protection Act 1994* by the administering authority to cover the cost of rehabilitation or remediation of disturbed land or to secure compliance with the environmental authority.

**“floodwater”** means water overflowing, or that has overflowed, from waters, river, creek, stream, lake, pond, wetland or dam onto or over riparian land that is not submerged when the watercourse or lake flows between or is contained within its bed and banks.

**“flowable substance”** means matter or a mixture of materials which can flow under any conditions potentially affecting that substance. Constituents of a flowable substance can include water, other liquids fluids or solids, or a mixture that includes water and any other liquids, fluids or solids either in solution or suspension.

**“foreseeable future”** is the period used for assessing the total probability of an event occurring. Permanent structures and ecological sustainability should be expected to still exist at the end of a 150 year foreseeable future with an acceptable probability of failure before that time.

**“infrastructure”** means water storage dams, roads and tracks, buildings and other structures built for the purpose of mining activities but does not include other facilities required for the long term management of mining impacts or the protection of potential resources. Such other facilities include dams, waste rock dumps, voids, or ore stockpiles and buildings as well as other structures whose ownership can be transferred and which have a residual beneficial use for the next owner of the operational land or the background land owner.

**“LA 10, adj, 10 mins”** means the A-weighted sound pressure level, (adjusted for tonal character and impulsiveness of the sound) exceeded for 10 per cent of any 10-minute measurement period, using Fast response.

**“LA 1, adj, 10 mins”** means the A-weighted sound pressure level, (adjusted for tonal character and impulsiveness of the sound) exceeded for 1 per cent of any 10-minute measurement period, using Fast response

**“LA, max adj, T”** means the average maximum A-weighted sound pressure level, adjusted for noise character and measured over any 10 minute period, using Fast response.

**“lake”** includes –

- (a) lagoon, swamp or other natural collection of water, whether permanent or intermittent; and
- (b) the bed and banks and any other element confining or containing the water.

**“land”** in the **“land schedule”** of this document means land excluding waters and the atmosphere.

**“land capability”** as defined in the DME 1995 Technical Guidelines for the Environmental Management of Exploration and Mining in Queensland.

**“land suitability”** as defined in the DME 1995 Technical Guidelines for the Environmental Management of Exploration and Mining in Queensland.

**“land use”** term to describe the selected post mining use of the land, which is planned to occur after the cessation of mining activities.

**“landfill”** means land used as a waste disposal site for lawfully putting solid waste on the land.

**“mg/L”** means milligrams per litre.

**“mine affected water”** means the following types of water:

- (b) pit water, tailings dam water, processing plant water;
- (c) water contaminated by a mining activity which would have been an environmentally relevant activity under Schedule 2 of the *Environmental Protection Regulation 2008* if it had not formed part of the mining activity;
- (d) rainfall runoff which has been in contact with any areas disturbed by mining activities which have not yet been rehabilitated, excluding rainfall runoff discharging through release points associated with erosion and sediment control structures that have been installed in accordance with the standards and requirements of an Erosion and Sediment Control Plan to manage runoff containing sediment only, provided that this water has not been mixed with pit water, tailings dam water, processing plant water or workshop water;
- (e) groundwater which has been in contact with any areas disturbed by mining activities which have not yet been rehabilitated;
- (f) groundwater from the mine's dewatering activities;
- (g) a mix of mine affected water (under any of paragraphs i)-v)) and other water.

**"mining activity"** means as defined in section 147 of the EP Act 1994

**"natural flow"** means the flow of water through waters caused by nature.

**"nature"** includes:

- (a) ecosystems and their constituent parts;
- (b) all natural and physical resources; and
- (c) natural dynamic processes.

**"noxious"** means harmful or injurious to health or physical well being.

**"nuisance-sensitive place"** includes –

- (a) a dwelling, residential allotment, mobile home or caravan park, residential marina or other residential premises; or
- (b) a motel, hotel or hostel; or
- (c) a kindergarten, school, university or other educational institution; or
- (d) a medical centre or hospital; or
- (e) a protected area under the *Nature Conservation Act 1992*, the *Marine Parks Act 1992* or a World Heritage Area; or
- (f) a public thoroughfare, park or gardens; or
- (g) a place used as a workplace, an office or for business or commercial purposes and includes a place within the curtilage of such a place reasonably used by persons at that place

except were located on the mining lease.

**"offensive"** means causing reasonable offence or displeasure; is disagreeable to the sense; disgusting, nauseous or repulsive, other than trivial harm.

**"operational land"** means the land associated with the project for which this environmental authority has been issued.

**“palletised”** means stored on a movable platform on which batteries are placed for storage or transportation.

**“peak particle velocity (ppv)”** means a measure of ground vibration magnitude which is the maximum rate of change of ground displacement with time, usually measured in millimetres/second (mms-1).

**“Probable Maximum Flood (PMF)”** is the flood that may be expected from the most severe combination of critical meteorological and hydrologic conditions that are reasonably possible in a particular drainage area.

**“progressive rehabilitation”** means rehabilitation (defined below) undertaken progressively or a staged approach to rehabilitation as mining activities are ongoing.

**“protected area”** means –

- a protected area under the *Nature Conservation Act 1992*; or
- a marine park under the *Marine Parks Act 1992*; or
- a World Heritage Area.

**“public utility works”** means:

- (a) the replacement, modification or relocation of public utilities required as a consequence of the project; and
- (b) the construction of new utility infrastructure required for the project.

**“receiving environment”** means all groundwater, surface water, land and sediments that are not disturbed areas authorised by this environmental authority.

**“receiving waters”** means all groundwater and surface water that are not disturbed areas authorised by this environmental authority.

**“reference site”** (or analogue site) may reflect the original location, adjacent area or another area where rehabilitation success has been completed for a similar biodiversity. Details of the reference site may be as photographs, computer generated images and vegetation models etc.

**“rehabilitation”** the process of reshaping and revegetating land to restore it to a stable landform and in accordance with the acceptance criteria set out in this environmental authority and, where relevant, includes remediation of contaminated land.

**“representative”** means a sample set which covers the variance in monitoring or other data either due to natural changes or operational phases of the mining activities.

**“residual void”** means an open pit resulting from the removal of ore and/or waste rock which will remain following the cessation of all mining activities and completion of rehabilitation processes.

**“saline drainage”** the movement of waters, contaminated with salt(s), as a result of the mining activity.

**“self sustaining”** means an area of land which has been rehabilitated and has maintained the required acceptance criteria without human intervention for a period nominated by the administering authority.

**“sewage”** means the used water of person’s to be treated at a sewage treatment plant.

**“stable”** in relation to land, means land form dimensions are or will be stable within tolerable limits now and in the foreseeable future. Stability includes consideration of geotechnical stability, settlement and consolidation allowances, bearing capacity (trafficability), erosion resistance and geochemical stability with respect to seepage, leachate and related contaminant generation.

**“stormwater”** means all surface water runoff from rainfall.

**"suitably qualified and experienced person"** in relation to dams means a person who is a Registered Professional Engineer of Queensland (RPEQ) under the provisions of the *Professional Engineers Act 2002*, or at the relevant time holds a 'deemed registration' within the meaning of the *Mutual Recognition (Queensland) Act 1992*; and has knowledge, suitable experience and demonstrated expertise in relevant fields, as set out below:

- (a) knowledge of engineering principles related to the structures, geomechanics, hydrology, hydraulics, chemistry and environmental impact of dams; and
- (b) a total of five years of suitable experience and demonstrated expertise in the geomechanics of dams with particular emphasis on stability, geology and geochemistry, and
- (c) a total of five years of suitable experience and demonstrated expertise each, in three of the following categories:
  - (i) investigation and design of dams.
  - (ii) Construction, operation and maintenance of dams.
  - (iii) hydrology with particular reference to flooding, estimation of extreme storms, water management or meteorology.
  - (iv) hydraulics with particular reference to sediment transport and deposition, erosion control, beach processes.
  - (v) hydrogeology with particular reference to seepage, groundwater.
  - (vi) solute transport processes and monitoring thereof.
  - (vii) dam safety.

**“waste and resource management hierarchy”** means as defined in Section 9 of the *Waste Reduction and Recycling Act 2011*.

**“water quality”** means the chemical, physical and biological condition of water.

**“waters”** includes –

- (a) river, creek, stream in which water flows permanently or intermittently either:
  - (i) in a natural channel, whether artificially improved or not; or
  - (ii) in an artificial channel that has changed the course of the river, creek or stream; or
  - (iii) lake, lagoon, pond, swamp, wetland, dam; or
  - (iv) unconfined surface water; or
  - (v) storm water channel, storm water drain, roadside gutter; or

- (vi) bed and banks and any other element of a river, creek, stream, lake, lagoon, pond, swamp, wetland, storm water channel, storm water drain, roadside gutter or dam confining or containing water; or
- (vii) groundwater; or
- (viii) non-tidal or tidal waters (including the sea); or
- (ix) any part thereof.

“**µg/L**” means micrograms per litre

“**µS/cm**” means microsiemens per centimetre

“**20<sup>th</sup> per centile flow**” means the 20<sup>th</sup> per centile of all daily flow measurements (or estimations) of daily flow over a 10 year period for a particular site. The 20<sup>th</sup> per centile calculation should only include days where flow has been measured (or estimated), i.e. not dry weather days.

**PART B. COORDINATOR-GENERAL'S  
RECOMMENDATIONS RELATING TO APPROVALS  
FOR THE EXTRACTION AND USE OF  
GROUNDWATER UNDER THE *WATER ACT 2000***

**Recommendation 1. Water Security**

- (a) Before the commencement of mining activities, the proponent must develop to the satisfaction of the administering authority for the *Water Act 2000*, a plan to address the short and long term implications for groundwater users of dewatering the following:
  - (i) Alluvium aquifers
  - (ii) Colinlea sandstone
  - (iii) Bandanna Formation
  - (iv) Joe Joe Formation; and
- (b) the plan in (a) must provide for actions to assure the long term security of water for all current groundwater users affected by the project.

**Recommendation 2. Groundwater Modelling**

- (a) The proponent must recalibrate the groundwater model referred to in the Groundwater Modelling Report – Alpha Coal Project (Hancock Coal Pty Ltd, 28 March 2012) initially at a minimum of 3-yearly intervals, and subsequently with the approval of the administering authority for the *Water Act 2000*, at 5-yearly intervals throughout the mining phase of the project; and
- (b) The proponent must provide a report on each recalibration to the administering authority for the *Water Act 2000* within 6 weeks of completion of the recalibration.

**Recommendation 3. Monitoring**

- (a) The proponent must:
  - (i) Monitor and record groundwater levels at representative monitoring bores agreed to by the administering authority for the *Water Act 2000*, at frequencies determined on the basis of the results of baseline monitoring and trigger values (monthly/quarterly/continuous);
  - (ii) Monitor and record groundwater inflows and dewatering volumes pumped (monthly/continuous);
  - (iii) Compare water level changes with model-predicted water level changes, to verify the reliability of model predictions, for input to Condition 25;
  - (iv) Report annually to the administering authority for the *Water Act 2000*, the results of monitoring and comparison of observed impacts with predicted impacts.

## **Recommendation 4. Water Licence Terms**

### **RECITAL A**

[Insert name of applicant]

[insert name of applicant] (hereinafter "the licensee") is the owner of property described on the LicDFence, upon which it operates the Alpha Coal Project. The licensee will construct works (comprising works that take groundwater from a bore, shaft or sump pump within [insert number of mining tenement/s]) accessing the Sedimentary Undifferentiated Formation. These works are referred to as the Dewatering Works.

The operation of the Dewatering Works will impact on the piezometric levels in the region of the Alpha Coal Project during the life of the mine and for a period after the mines closure.

The conditions set out in Schedule A and Schedule B of this Licence are herewith after referred to as "the Conditions".

### **DEFINITIONS**

In this Licence, unless the context otherwise requires:

**"bore owner"** means the registered owner of the land on which a bore exists as approved development under the *Sustainable Planning Act 2009* and/or from which water is taken under the authority of the *Water Act 2000*;

**"business day"** means a day on which trading banks are open for normal banking business in Brisbane;

**"Chief Executive"** means the Chief Executive of the Department administering the *Water Act 2000*;

**"cost of restoration measures"** means the cost incurred in carrying out the restoration measures as are reasonably necessary to restore supply of water to the bore owner pursuant to SPEC 05 (1);

**"licensee"** has the meaning ascribed to it in Recital A;

**"Sedimentary Undifferentiated Bore"** means a bore accessing the Sedimentary Undifferentiated Formation

**"Tertiary bore"** means a bore accessing the Tertiary sedimentary unit

**"Permian bore"** means a bore accessing the Permian sedimentary unit

**"Colinlea bore"** means a bore accessing the Colinlea Sandstone Formation

**"Dewatering Works"** has the meaning ascribed to it in Recital A;

**"Monitoring Bores"** means the monitoring bores as identified in *[insert reference]*, and any subsequently drilled bores for monitoring purposes;

**"pre-existing bore"** has the meaning ascribed to it in SPEC 01 (1) and SPEC 01 (2)(a) but does not include a bore referred to in SPEC 01 (2)(b);

**"restoration measures"** has the meaning ascribed to it in SPEC 04 (1);

"**Condition**" has the meaning ascribed to it in Recital A; and  
"unduly affected" has the meaning ascribed to it in SPEC 02.

## **INTERPRETATION**

In this Licence:

- (a) headings to Conditions are for ease of reference only and shall not in any way affect the meaning of the Conditions;
- (b) a reference to days or months is a reference to business days and calendar months; and
- (c) words in the singular shall include the plural and vice versa.

## **NOTICES**

- (a) Form of Notice

Any notices, consents, document, invoice or other communication ("notice") required or permitted to be given by this Licence:

- (i) must be in writing; and
- (ii) may be given by being delivered or sent by prepaid registered post (or by facsimile transmission where facsimile transmission facilities are available for receipt of such a communication) to the address of the parties set out below or such other address as may be notified as the appropriate address from time to time for the purposes of this Licence.

The Chief Executive  
Department of Natural Resources and Mines  
PO Box 1762  
ROCKHAMPTON QLD 4700

Att; Senior Advisor Mining Regulation (Water Management and Use)  
Telephone: (07) 49384600  
Facsimile: (07) 49273079  
Licensee: [insert name and address]

- (b) Time Service Occurs

A notice is deemed to be served on a party, in the case of post, on the third business day after posting and, in the case of facsimile, on the day of transmission if the transmission is before 5.00pm on a business day and in all other circumstances on the business day following transmission of the facsimile provided that the sending party has received a report that there has been a correct and complete transmission.

## EXISTING WATER SUPPLIES TO BE PROTECTED

### SPEC 01

#### (1) Existing bores

At the date of issue of this Licence, any Sedimentary Undifferentiated, Tertiary, Permian, or Colinlea bore, or those in surrounding geological formations that are in existence and:

- (a) are approved developments under the Sustainable Planning Act 2009 and/or,
- (b) take water under the authority of the Water Act 2000 shall be regarded as a "pre-existing bores."

#### (2) Future bores

- (a) If after the date of issue of this Licence,
  - (i) a new bore is required; and
  - (ii) such new bore is approved development under the *Sustainable Planning Act 2009* and/or takes water under the authority of the *Water Act 2000*; and
  - (iii) such new bore is brought into existence, as either:
    - A. a new bore to supply a water licence from the Sedimentary Undifferentiated, Tertiary, Permian, or Colinlea formations, or surrounding geological formations, issued prior to this water licence; or
    - B. a remedial measure required under this Licence to restore unduly affected water supplies; or
    - C. replacement works,

then such a new bore will be regarded as a "pre-existing bore" for the purposes of this licence.

- (b) Any bore constructed after the date of issue of this Licence that does not meet the criteria listed in Spec 01 (2)(a) above will not be regarded as a "pre-existing bore" for the purposes of this Licence.

### SPEC 02

If, in the opinion of the Chief Executive, at the site of a pre-existing bore:

- (a) the actual piezometric drawdown caused by the operation of the Dewatering Works causes the pre-existing bore to have an "impaired capacity", which shall mean after consultation between the Chief Executive, the licensee and the bore owner or a person authorised by the bore owner to represent him as the case may be, the bore is assessed by the Chief Executive as being no longer able to provide an adequate supply of water solely for the authorised purpose/s required at that location; and;

- (i) in the case of a bore used to supply domestic water, shall mean, a reduction in the ability of the bore to supply water for domestic requirements as authorised under the *Water Act 2000*
- (ii) in the case of a bore used to supply stock water as authorised under the *Water Act 2000*, shall mean, any material reduction in the number of stock able to be watered, having regard to the stock carrying capacity of the land serviced by the pre-existing bore, including seasonal variations in the stock carrying capacity of that land;
- (iii) in the case of a bore used to supply water for another purpose under the authority of the Water Act 2000, a material reduction in the pumping supply required for the purpose, as reasonably assessed by the Chief Executive after consultation between the Chief Executive, the licensee and the bore owner or a person authorised by the bore owner to represent him;

then the pre-existing bore will be regarded as being "unduly affected" by the operation of the Dewatering Works.

### **SPEC 03**

If in the reasonable opinion of the Chief Executive, a pre-existing bore may be unduly affected by the operation of the Dewatering Works, then the Chief Executive may direct the licensee to carry out necessary investigations and provide to the Chief Executive any data the Chief Executive reasonably requires in order to establish if the pre-existing bore is unduly affected.

### **SPEC 04      UNDULY AFFECTED SUPPLIES TO BE RESTORED**

#### **(1)**

Where, after Spec 02 and Spec 03 have been complied with, a pre-existing bore is determined to be unduly affected by the operation of the Dewatering works, the licensee shall, at its cost, carry out such measures, or cause such measures to be carried out, as are reasonably necessary to make good the supply of water to the unduly affected bore pursuant to the conditions of this licence (the "restoration measures").

#### **(2)**

A water supply from a pre-existing bore unduly affected by the operation of the Dewatering Works will be considered to be restored if:

- (b) there is an adequacy of supply for the authorised use, having regard, after consultation between the Chief Executive, the bore owner and the licensee, to the following factors:
  - (i) allocation issued to water licence holder that the pre-existing bore supplies; or
  - (ii) The supply capacity to service the authorised use described in SPEC02 (b)(i)(ii) and (iii) is not materially less than that which would have existed but for the operation of the Dewatering Works; and

- (c) the bore owner does not suffer increased cost in the operation of the water supply following the implementation of restoration measures determined in SPEC 05.

## **SPEC 05      AGREEMENTS ON RESTORATION MEASURES**

### **(1)**

- (a) If a pre-existing bore is unduly affected by the operation of the Dewatering Works then the licensee will agree with the bore owner appropriate restoration measures and carry out same. The licensee shall bear the cost of restoration measures.
- (b) Failure to reach agreement pursuant to SPEC 05(1)(a) will constitute a dispute between the licensee and the bore owner arising out of SPEC 04(1) and SPEC 04(2). The dispute may be referred by the parties, or either of them, to the Chief Executive.

### **(2)**

If a dispute is referred to the Chief Executive, pursuant to SPEC 05(1)(b) then the Chief Executive:

- (a) may direct the licensee to provide to the reasonable satisfaction of the Chief Executive any data required in order to determine what restoration measures are required;
- (b) will reasonably determine what restoration measures are to be taken. Restoration, measures may include one or more of the following:
  - (i) Providing water by carting;
  - (ii) Deepening a pre-existing bore in the Sedimentary Undifferentiated, Tertiary, Permian, or Colinia formations or surrounding geological formations;
  - (iii) Replacing a pre-existing bore;
  - (iv) Replacing or modifying existing water supply equipment;
  - (v) providing a supply of an equivalent quantity of suitable quality water by piping from an alternative water source;
  - (vi) providing a cash settlement to the bore owner; or
  - (vii) Other reasonable measures as may be agreed by the licensee and the bore owner.

### **(3)**

Before making any determination or direction pursuant to SPEC 05(2), the Chief Executive will first reasonably consult with the licensee and the bore owner.

### **(4)**

If the Chief Executive makes a determination pursuant to SPEC 05(2), the Chief Executive may proceed to amend the licence to give effect to the decision of the Chief Executive pursuant to SPEC 05(2).

## **SPEC 06      URGENT RESTORATION**

### **(1)**

If, in the reasonable opinion of the Chief Executive,

- (a) restoration measures agreed pursuant to SPEC 05(1)(a) or as determined pursuant to SPEC 05(2)(b), need to be carried out urgently to maintain an adequate supply of water, and
- (b) the licensee is not responding with appropriate haste to carry out the restoration measures;

then the Chief Executive will issue a notice to the licensee directing the licensee to commence an appropriate program for implementation of restoration measures within forty-eight hours of receipt of the notice.

### **(2)**

If, in the opinion of the Chief Executive, the licensee fails to adequately comply with a notice issued pursuant to SPEC 06(1), the Chief Executive will:

- (a) carry out the necessary restoration measures; and
- (b) notify the licensee of the cost of the restoration measures and direct the licensee to reimburse the Chief Executive for the cost of the restoration measures

The licensee shall pay to the Chief Executive the costs so notified.

## **SPEC 07      MONITORING AND ASSESSMENT**

### **(1)**

The licensee shall provide to the Chief Executive a Performance Review Report in respect of the performance of the Alpha Coal Project Pit Dewatering works and those monitoring bores as identified in the "Definitions" at the times stated in SPEC 08.

Topics addressed in any Performance Review Report shall include:

- (a) the monthly volume of water extracted from Dewatering Works;
- (b) any changes in water quality in the Dewatering Works and monitoring bores;
- (c) the piezometric levels on a quarterly basis in the Monitoring Bores;
- (d) an assessment of the need for adjustment of the model used to assess piezometric impact;
- (e) details of any adjustment since the previous Performance Review Report to the model used to predict piezometric impact, and if adjustments have been made to the model, plans are to be provided showing:
  - (i) the revised prediction, made using the adjusted model, of the total piezometric impact from the commencement of pumping to 20 years after the commencement of pumping or such other period as the Chief Executive may determine; and
  - (ii) the difference between these predicted piezometric impacts and the piezometric impacts as predicted at the time of application for licences for the Alpha Coal Project Dewatering Works as described in SPEC 08(f) below.

- (f) an assessment of any material departure of the performance of the Dewatering works (including piezometric impact) from the performance predicted for a withdrawal amount of 400 Megalitres per annum
- (g) plans showing the piezometric impact caused by the operation of the Dewatering Works, using the then current model, are to be included in the next scheduled Performance Review Report pursuant to SPEC 08(1);
- (h) details of any pre-existing bores which are predicted by the then current model to become unduly affected by the Dewatering Works to be included in the next scheduled Performance Review Report; and
- (i) details of any restoration measures carried out since the commencement of pumping if it is the first Performance Review Report or since the previous Performance Review Report, in respect of pre-existing bores unduly affected by the Dewatering works including details of piezometric drawdown, bore description and licence number.

**(2)**

- (a) In conjunction with the second Performance Review Report, the licensee will provide the Chief Executive with a Peer Review Report (PRR) of the model used by [insert name of proponent] to predict piezometric drawdown and associated impacts of the Dewatering Works. The peer review must be undertaken external to the proponent and the models developing consultants. The PRR must at least review the following:
  - (i) the assumptions about the hydrogeology of the aquifers;
  - (ii) impacts on the physical integrity of the aquifers;
  - (iii) the ability of the geological formation to contain the piezometric drawdown and impacts due to the extraction of the water;
  - (iv) any other matter the Chief Executive considers reasonable;
- (b) The name and contact details of the reviewers who undertake the PRR in SPEC 07 (2)(a) must also be provided to the Chief Executive.

**SPEC 08 FREQUENCY OF REPORTING**

**(1)**

The first water year shall be defined as the period covering the period from the commencement of extraction (under the authority of this licence) of water from the Dewatering Works to the end of the next June after that time. Thereafter the water year shall commence on 1 July of any year and end on 30 June the following year. The first Performance Review Report shall cover the period as defined by the first water year. Thereafter scheduled Performance Review Reports shall then be provided in respect of the relative intervening periods, at the end of the 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup>, 5<sup>th</sup>, 7<sup>th</sup> and 10<sup>th</sup> water years. The Chief Executive may call for a Performance Review Report at any other time during the currency of the Licence (unscheduled Performance Review Report) if he is of the reasonable opinion that the piezometric impact of the Dewatering Works is greater than the most recent prediction of piezometric impact reported by the licensee.

**(2)**

An unscheduled Performance Review Report will cover the period from the date of the immediately preceding Performance Review Report, be it an unscheduled or a scheduled Performance Review Report, and the date notified by the Chief Executive as the date of the unscheduled Performance Review Report, or such other period as the Chief Executive may determine. The scheduled Performance Review Report next following an unscheduled Performance Review Report will cover the period from the date of that unscheduled Performance Review Report and the date of the scheduled Performance Review Report.

**(3)**

A Performance Review Report will be due three months after the end of the relevant water year, or three months after notification of requirement of an unscheduled report.

**(4)**

The Chief Executive will advise the licensee of the acceptability of a Performance Review Report or Monitoring Report within 60 days of the date of receipt of same. If the Chief Executive reasonably considers a report unacceptable, he will notify the licensee in writing of the deficiencies. The licensee will then submit a further report within 60 days of such notification, or such longer period as determined by the Chief Executive and the same procedure shall be followed as with the original report.

## **SPEC 09      CLOSURE OF ALPHA COAL PROJECT OPERATIONS**

**(1)**

One year prior to the closure of the operations, the licensee will:

- (a) In the case of a pre-existing bore that has become unduly affected since the commencement of pumping from the Dewatering Works and where the restoration measures carried out by the licensee depend on matters beyond the control of the bore owner, enter into arrangements with the bore owner, to the reasonable satisfaction of the bore owner, to maintain a supply at the affected bore in accordance with SPEC 04(2);
- (b) Provide to the Chief Executive a Alpha Coal Project Operation Pre-Closure Report

**(2)**

It shall be acceptable for the bore owner entering into an arrangement with the licensee pursuant to SPEC 09(1) to require that the arrangement reasonably provides the bore owner with independent control over restored water supply.

**(3)**

The Alpha Coal Project Operation Pre-Closure Report pursuant to SPEC 09(1) shall contain:

- (a) the piezometric levels in the Monitoring Bores and the Dewatering Works;

- (b) an assessment of the need for adjustment of the model used to assess piezometric impact;
- (c) details of any adjustment since the previous Performance Review Report to the model used to predict piezometric impact;
- (d) details of any restoration measures carried out since the last Performance Review Report;
- (e) plans showing the prediction, using the then current model, of the total piezometric impact from the commencement of pumping to 48 months after commencement of pumping;
- (f) details of any unduly affected bores for which arrangements could not be successfully made pursuant to SPEC 12(1);

**(4)**

The Chief Executive will advise the licensee of the acceptability of the Alpha Coal Project Operation Pre-Closure Report within 60 days of the date of receipt of the same. If the Chief Executive considers the report unacceptable, he will notify the licensee in writing of the deficiencies. The licensee will then submit a further report within 30 days of such notification or such longer period as determined by the Chief Executive and the same procedure shall be followed as with the original report until the final report is reasonably accepted by the Chief Executive.

**(5)**

The licensee will fully implement arrangements pursuant to SPEC 09(1) at least 90 days before Alpha Coal Project Operation closure.

**(6)**

SPEC 09 will operate even if this licence has expired at the relevant time unless a licence is then in place and otherwise regulates closure.

**SPEC 10      GENERAL PROVISIONS**

**(1)**

The taking of water under the authority of this water licence is only permitted for the express purposes listed on this licence and only during the Alpha Coal Project mining operation authorised on ML 70426.

**(2)**

This licence expires on the day stated in the licence, or the day stated in any subsequent renewal of the licence, or upon the closure of the mine referred to in SPEC 09.

## **PART C. COORDINATOR-GENERAL'S RECOMMENDATIONS RELATING TO APPROVALS FOR THE DIVERSION OF WATERWAYS UNDER THE *WATER ACT 2000***

### **Recommendation 1. Detailed Design**

- (a) Prior to commencement of mining activities, the proponent must submit a detailed report and final designs of waterway diversions for approval of the administering authority for the *Water Act 2000* that:
  - (i) Are consistent with the diversion plan-forms depicted in Alpha Coal Project Water Structures Bridging Report (PB May 2012).
  - (ii) Provide a detailed baseline geomorphic assessment of undiverted creek reaches that are predicted to be affected by changed hydraulic conditions up to 5km downstream and up to 5 Km upstream from the confluence with the proposed diversions;
  - (iii) Provide quantitative benchmarks of current condition (e.g. bank structure, vegetation, in-stream sediment, channel location and dimensions) as a comparison to potential future changes;
  - (iv) Provide a detailed evaluation of soil conditions along the diversion routes and propose designs to minimize erosion potential for areas with erodible and/or dispersive soils;
  - (v) Demonstrate compliance with hydraulic criteria (see Table A25: Criteria for hydraulic design below);
  - (vi) Propose alternative design solutions for any locations that do not meet hydraulic criteria;
  - (vii) detail how the design will avoid a significant increase in flood heights off the mining lease above levels specified in Appendix 3, Part C, Recommendation 2;
  - (viii) Provide for equivalent aquatic habitat diversity based on the range of habitats being removed as a result of the diversion;
  - (ix) Specify riparian and floodplain vegetation planting to re-establish natural densities and species diversity;
  - (x) Specify methods to maximize vegetation establishment rates (e.g. temporary irrigation, soil amendment) and maintain viable plants;
  - (xi) Include contingency plans for temporary stabilisation during vegetation establishment period e.g. grassing, anionic polyacrylamide application.
  - (xii) considers the cumulative impact on any adjacent mining projects.

**Table A25: Criteria for hydraulic design**

Criterion	Diverted reaches—maximum value <sup>1</sup>	Natural reaches – maximum increase <sup>2</sup>	Notes
2 yr ARI Stream Power (W/m <sup>2</sup> )	60	7% (up to 60W/m <sup>2</sup> )	SEIS does not present graphs of stream power for natural reaches. ACARP guideline is used as default.
50 yr ARI Stream Power (W/m <sup>2</sup> )	220	3% (up to 150W/m <sup>2</sup> )	As above; ACARP criterion is too high for the natural reaches of the creek.
2 yr ARI Velocity (m/s)	1.5	50% (up to 1.5m/s)	
50 yr ARI Velocity (m/s)	2.5	10% (up to 2.0m/s)	Maximum velocity in natural reach based on SEIS Appendix J, Figure B-5
2 yr ARI Shear Stress (N/m <sup>2</sup> )	40	50% (up to 40N/m <sup>2</sup> )	
50 yr ARI Shear Stress (N/m <sup>2</sup> )	80	10% (up to 120N/m <sup>2</sup> )	Maximum shear stress in natural reach based on SEIS Appendix J, Figure B-7.

<sup>1</sup>—DERM/ACARP criteria

<sup>2</sup>—The **lower** of the two figures is applicable. Per centages are relative to a discrete point or uniform reach; allowable limits for velocity and shear stress derived from SEIS Appendix J, Figures B-4 to B-7. Absolute limit is shown in parentheses and is based on ACARP guidelines and Appendix J, Figures B-4 to B-7.

### **Recommendation 2. Afflux at mine boundary**

Afflux at the MLA boundary as outlined in Table A26: Maximum afflux for 1000 and 3000 year average recurrence interval (ARI) at reporting locations, shall not be exceeded for the life of the project.

**Table A26: Maximum afflux for 1000 and 3000 year average recurrence interval (ARI) at reporting locations**

Reporting location ID	Description	Creek	Flood level (m AHD)	
			1000-yr ARI	3000-yr ARI
1	5 km U/S of mine site	Lagoon Creek	0.08	-0.03
2	1 km U/S of mine site	Lagoon Creek	0.22	0.10

			Flood level (m AHD)	
3	U/S MLA Boundary	Lagoon Creek	0.29	0.19
4	Hobartville Homestead	Lagoon Creek	0.21	0.07
5	Opposite Pit 2 ramp	Lagoon Creek	0.62	0.53
6	Opposite MIA	Lagoon Creek	1.93	1.89
7	Chainage km 1 of active channel diversion	Lagoon Creek	1.71	1.48
8	Chainage km 5 of active channel diversion	Lagoon Creek	0.94	0.68
9	Chainage km 9 of active channel diversion	Lagoon Creek	-0.40	-0.68
10	Wendouree Homestead	Lagoon Creek	0.44	0.15
11	500 m U/S of NW Creek diversion	Lagoon Creek	0.63	0.62
12	D/S MLA Boundary	Sandy Creek	0.19	0.13
13	1 km D/S of mine site	Sandy Creek	0.14	0.08
14	4 km D/S of mine site	Sandy Creek	0.06	0.03
15	8 km D/S of mine site	Sandy Creek	0.02	0.00

### **Recommendation 3. Construction Plan**

- (a) The proponent must develop and implement a construction plan that includes specific measures to minimise erosion risk during diversion construction, in particular, effective measures to control erosion risk from dispersive soils exposed during construction;
- (b) The construction plan in Recommendation 3(a) must identify and commit to the implementation of contingency measures to minimize the risk of major erosion damage in the event of a high waterway flows occurring during the construction period.

**Recommendation 4. Post construction stabilisation and revegetation**

- (a) During the construction and operation of the diversion, the proponent must
  - (i) Test bed and bank materials from the constructed channels for erodibility (EXP, pH, EC, Emerson dispersion) and modify the channel stabilisation measures accordingly
  - (ii) treat areas of dispersive soils to minimize dispersion – e.g. addition of gypsum and topsoiling (minimum 0.5m), meshing, seeding;
  - (iii) Undertake revegetation and other channel stabilisation works as per the approved design
  - (iv) Undertake progressive stabilisation and planting within one week of bulk earthworks
  - (v) Provide contingency measures for high risk events such as floods and high intensity rainfall to prevent high rates of sediment mobilization during plant establishment phase (10 year minimum)
  - (vi) Rehabilitate areas affected by post construction erosion and/or deposition (e.g. following floods, overbank flow or dispersion)

**Recommendation 5. Monitoring**

- (a) Monitoring sites are to be established at critical areas within diversions, within natural channels within the site and in affected reaches downstream of the MLA.
- (b) Reference (control) sites are to be established.
- (c) The monitoring program should include the Index of Diversion Condition, as outlined in the ACARP Project C9068 for all watercourses and stream diversions impacted by mining activities.
- (d) Monitoring is to be undertaken quarterly and after flood events (1 year ARI and above)
- (e) Monitoring is to include:
  - (i) Plant health and mortality
  - (ii) Bank erosion, slumping and loss of topsoil;
  - (iii) Soil dispersion in channel;
  - (iv) Sediment deposition in channels
  - (v) Change in channel location/planform (may require aerial photography at 1 year intervals)

## **PART D. OTHER COORDINATOR-GENERAL'S RECOMMENDATIONS**

### **Recommendation 1. Application to disturb listed plants**

- (a) Prior to the commencement of mining activities, and in accordance with the NCA, approval from DNPRSR must be obtained where construction and/or operation of the project is likely to disturb Type A restricted plants as defined under the NCA.
- (b) Prior to the commencement of mining activities, approval must be obtained from DNPRSR under the NCA for a class exemption to clear least concern plants on site.

### **Recommendation 2. Protection of fish passage**

- (a) Any waterway diversions; levee designs; culvert or bed level crossings; or rock armouring within the Mining Lease shall be consistent with the requirements of the *Fisheries Act 1994* and adequately provide for fish passage, and provide equal or enhanced habitat values and habitat complexity.
- (b) The proponent shall ensure the diversions in (a) mimic the meandering of the low flow channel, the width and depth of the waterway and natural bed substrates to the greatest extent possible to promote fish passage and the replacement of lost habitat.
- (c) The proponent shall not directly or indirectly increase water velocities within waterways or waterway diversions to a level that would prevent fish movement through the project site.
- (d) The proponent shall obtain development approval for operational works that is the building or raising of waterway barrier works under the *Fisheries Act 1994* including any and all: waterway diversions; levee designs; culvert or bed level crossings; rock armouring; or all and any other works within a waterway as defined under the Act for both permanent and temporary works which occur outside the Mining Lease.

### **Recommendation 3. TSF liner investigation**

- (a) Prior to construction of the TSF, a thorough investigation of the floor of each proposed TSF cell be undertaken to identify any potential zones of enhanced vertical permeability that may provide preferred pathways (such as geological structures, soil features, etc) for seepage to the underlying Colinlea Sandstone and/or down-gradient areas.
- (b) Given the results of this investigation referred to in Recommendation 3(a) a detailed plan of the type of liner that will be implemented/installed must be submitted to DEHP for approval.

### **Recommendation 4. In-pit tailings disposal assessment**

- (a) Prior to the in-pit disposal of tailings from the coal handling and preparation plant into the mine pit, the environmental authority holder should undertake a comprehensive assessment of the impacts of this method of disposal, including on groundwater.

- (b) The assessment referred to in Recommendation 4(a) must be referred to the administering authority for review.

#### **Recommendation 5. Local Industry Participation Plan**

The proponent should submit a finalised Local Industry Participation Plan (LIPP) with the final Alpha Coal SIMP submitted for approval.

- (a) The LIPP should be developed in consultation with DSDIP and Industry Capability Network (ICN) Queensland. The LIPP should:
  - (i) Provide local firms with opportunities to supply under the same terms, standards and conditions as interstate or overseas businesses
  - (ii) Describe in detail the communications strategy to local businesses about current and future supply opportunities
  - (iii) Provide evidence that all requests for information and tender documents sent by the project proponent or its major contractors includes a local industry participation clause and that local content forms part of the evaluation criteria
  - (iv) Describe in detail the systems, policies, procedures and processes the proponent and major contractors will use to ensure full, fair and reasonable effort has been made to encourage local industry participation in the project
  - (v) Include evaluation criteria so contracts and purchase orders are awarded on the basis of the best overall evaluated proposal, which includes 'due consideration' of direct and indirect cost factors such as reliability, maintainability, servicing, whole-of-life support, procurement administration costs, etc.
  - (vi) Describe tender/contract feedback mechanisms used to inform local businesses
  - (vii) Include the proponent's reporting requirements to government so major contractors are aware of the proponents regular outcome reports to government.
- (b) In cooperation with Strategic Economic Projects (DSDIP), proponents should provide a project specific LIPP reporting framework that includes LIPP outcome reports to DSDIP every six months during and a final report upon completion of the project construction phase.
- (c) Establish a project profile on the ICN Gateway website that provides as a minimum:
  - (i) A project overview that will be regularly updated to reflect key project announcements, milestones and major contract awards
  - (ii) A description of required contractor scope of works (at least to the tier 2 level) naming contractors once appointed and description of inputs required from subcontractors at lower tiers of the supply chain
  - (iii) A registration facility that allows local industry to register an interest to supply against a scope of works and to appointed contractors
  - (iv) Functionality for major suppliers to become ICN gateway superusers

- (d) Provide details of the LIPP in the final Alpha Coal Social Impact Management Plan (SIMP) submitted for approval.

## Appendix 4. Conditions—rail

The proponent has indicated the intention to seek a Ministerial community infrastructure designation (CID) under Chapter 5 of the Sustainable Planning Act 2009 for the rail project.

In the event that the proponent requests the relevant Minister to designate land for community infrastructure under the *Sustainable Planning Act 2009* (SPA) for some or all of the rail corridor project and the Minister decides to designate the land for all or part of the rail corridor project, this Appendix 4, in accordance with section 43 of the SDPWO Act, provides recommended conditions for the relevant community infrastructure designation.

Alternatively, if a designation of land for community infrastructure does not eventuate for the rail corridor project and approvals under SPA are not required, then in accordance with section 54A and 54B of the *State Development and Public Works Organisation Act 1971* (SDPWO Act), I impose the conditions provided within this Appendix 4 on this rail project.

These conditions take effect from the date of this report.

The Coordinator-General nominates the Department of Environment and Heritage Protection (DEHP) as the entity having jurisdiction for the conditions in this Schedule under either the SPA or as imposed conditions under section 54B of the SDPWO Act.

### **Part A—CID recommended or imposed rail environmental conditions**

### **Part B—Imposed condition relating to social matters**

### **Part C—Coordinator-General's recommendations—rail**

Schedule 1—MCU conditions—rail loop in Abbot Point State Development Area

Schedule 2—General recommendations for the rail line

Schedule 3—Local industry participation policy

## **PART A. CID RECOMMENDED OR IMPOSED RAIL ENVIRONMENTAL CONDITIONS**

### **Condition 1.**

The proponent must implement proponent commitments as detailed in Appendix 5

### **Condition 2. Compliance Auditing**

- (a) The following third party auditing requirements must be applied for the rail component of the project:
  - (i) Compliance with the conditions of this Coordinator-General report, in respect of the rail project and line and associated activities, must be audited by an appropriately qualified third party auditor, nominated by the holder of the approval for the rail project and accepted by the Coordinator-General and administering authority, within two months of commencement of construction of the rail project and six monthly thereafter during construction.
  - (ii) Within 30 days of the end of the relevant period, the holder of the approval for the rail project must submit a copy of the report to the Coordinator-General and to the administering authorities for the conditions.
  - (iii) The third party auditor must certify the findings of the audit in the report as being an accurate and independent assessment of compliance with conditions.
  - (iv) The audit report must include timeframes within which recommendations are to be acted on.
  - (v) The financial cost of the third party audit must be borne by the proponent.
  - (vi) The holder must, within the timeframes set in 2(iv), act upon any recommendations arising from the audit report.
  - (vii) Not more than 30 days following the submission of the report, the holder must provide a written report to the Coordinator-General and administering authorities for the conditions on:
    - (A) actions taken by the holder or its agents to ensure compliance with conditions;
    - (B) actions taken to prevent a recurrence of any non-compliance with conditions identified by the report of the third party auditor.

### **Condition 3. Environmental management plans (EMP)**

- (a) Three months prior to commencing construction works for the rail project, the proponent must submit for approval to the administering authority a Construction EMP (CEMP) for all construction activities of the rail project.
- (b) Three months before the rail project is scheduled to commence the coal hauling operations, the entity operating the rail project must submit for approval to the administering authority an Operational EMP (OEMP) for the rail operational activities.
- (c) The CEMP must be specific to both the construction site(s) and method of construction and incorporate the final project design, the findings of site-specific

surveys, and commitments made in the EIS to mitigation and management of environmental impacts.

- (d) The CEMP and OEMP must include sub-plans to address the environmental objectives, performance criteria, mitigation measures, monitoring, reporting, responsibility and corrective action for the following, but not limited to:
  - (i) Air quality and Greenhouse Gas
  - (ii) Noise and Vibration
  - (iii) Erosion and Sediment Control
  - (iv) Water quality
  - (v) Terrestrial Flora and Fauna
  - (vi) Aquatic Flora and Fauna
  - (vii) Waste
  - (viii) Lighting and Visual Impact
  - (ix) Weeds
  - (x) Pest Animals
  - (xi) Environmental Incident Management
  - (xii) Stock routes
  - (xiii) Rehabilitation
  - (xiv) Transport and Roads
  - (xv) Indigenous and non-Indigenous cultural heritage
- (e) The EMPs must take account of the results of investigations and plans developed in accordance with other conditions referring to the rail corridor.
- (f) Before commencement of any construction work for the rail project, the CEMP must be finalised to the reasonable satisfaction of the administering authority.
- (g) The Alpha Rail CEMP and OEMP must be made available to relevant local government authorities, State government departments, and the public.
- (h) The proponent, its contractors and/or entity operating the rail project must regularly review the rail project CEMP and OEMP and implement further or alternative mitigation measures in response to monitoring results, where non-conformance is identified and corrective action is required.

**Condition 4. Greenhouse gas (GHG) emissions**

- (a) The proponent must revise estimates of project GHG emissions made in the EIS to include all construction-related activities and provide to the administering authority the revised inventory of projected future GHG emissions before commencing construction.
- (b) Before commencing construction, the proponent must provide to the administering authority a GHG Management Plan, proposing measures to mitigate the carbon footprint of the rail project and which includes a commitment to implementing the proposed mitigation measures and monitoring GHG emissions.
- (c) The proponent must implement the GHG Management Plan throughout construction and operation of the rail..

**Condition 5. Good quality agricultural land (GQAL)**

- (a) The placement of any permanent and temporary project infrastructure and agricultural infrastructure and facilities located outside the footprint of the rail infrastructure corridor must not cause disruption to ongoing agricultural activities on Class A GQAL where practicable.

**Condition 6. Erosion and Sediment Control**

- (a) The proponent must, prior to commencement of construction work for the rail line, complete detailed soil (soil profiles and soil chemistry) and geotechnical investigations which accurately identify and map those soil types that were recognised in the broad-scale land systems mapping as soils at increased risk of erosion or salinity resulting from construction work activities such as cut-and-fill and compaction works in and around the rail infrastructure corridor alignment, water storages, access tracks, and any other associated disturbance area.
- (b) The proponent must include in the finalised rail project CEMP and OEMP an Erosion and Sediment Control Plan to prevent adverse impacts on natural waters or adjacent lands based on detailed soil surveys, giving particular attention to management of soils with increased risk of erosion such as sodic subsoils.
- (c) The finalised Erosion and Sediment Control Plan must reflect a recognised guideline such as International Erosion Control Australasia 2008 “Best Practice Erosion and Sediment Control”, and any local government guidelines that may apply.

**Condition 7. Soil Survey**

- (a) The proponent must conduct a soil survey to the satisfaction of DEHP for the rail corridor as per the proposed methodology outlined in Volume 2, Appendix AL of the SEIS, and amend the EM plan to take account of this.

**Condition 8. Acid Sulfate Soils**

- (a) The proponent must prepare to the satisfaction of the agency administering State Planning Policy 2/02 and implement an acid sulfate soil management plan for the rail project generally consistent with the following:
  - (i) State Planning Policy 2/02 Guideline: Acid Sulfate Soils;
  - (ii) Guidelines for Sampling and Analysis of Lowland Acid Sulfate Soils in Queensland 1998;
  - (iii) Queensland Acid Sulfate Soil Technical Manual Soil Management Guidelines, 2002;
  - (iv) the National Guidance on Acid Sulfate Soils publication, National guidance for the management of acid sulfate soils in inland aquatic ecosystems 2011.

**Condition 9. Approvals under the Water Act 2000**

- (a) Prior to construction of the railway all statutory approvals should be obtained under the *Water Act 2000* for the following matters:
  - (i) temporary take of water for the construction of the proposed rail project,
  - (ii) for any interference with water flow, and

- (iii) for operational works within a waterway (riverine protection permit).

**Condition 10. Waterway works**

- (a) Prior to construction of the railway all statutory approvals should be obtained under the *Fisheries Act 1994* for any proposed works within a waterway; and must be designed so that during normal flow conditions, the project must not directly or indirectly increase water velocities within waterways or waterway diversions to a level that would prevent fish movement through a structure.

**Condition 11. Stock routes**

- (a) The proponent must manage stock routes in accordance with local landholder and local government requirements. If there are changes to the 2010 agreed stock route management options for the Alpha rail project the proponent will need to renegotiate stock route crossings to enable safe diversion of travelling stock and personnel, including the general public. The stock route agreements must be finalised before construction work for the rail project commences.

**Condition 12. Fauna passage**

- (a) The proponent must include appropriate designs where practicable in accordance with the following guidelines and in accordance with nominated fauna passage principles:
  - (i) Three strand fencing is recommended (not closed mesh) to exclude cattle but permit native fauna passage. The top strand would not be barbed to minimise impact on bats and gliders;
  - (ii) use of stock routes where practicable;
  - (iii) use of DPI fish passage designs at waterway crossings;
  - (iv) use of culverts as per DNRM conditions under the *Water Act 2000*;
  - (v) consider the TMR road drainage design manual advice, Chapter 9;
  - (vi) consider other rail project outcomes for applicable fauna passage designs;
  - (vii) consider existing literature such as work by Griffith University (Darryl T Jones).
- (b) Where practicable the fencing of the rail infrastructure corridor alignment boundaries to be designed so as to direct fauna into underpasses at bridges and culverts, and where necessary, exclude cattle but permit macropods and other native fauna.
- (c) The proponent must prepare, in consultation with DEHP a more detailed assessment of fauna habitat, and apply the findings to the design, construction and operational measures to mitigate impacts on fauna movement.
- (d) The proponent must carry out surveys to identify any terrestrial species that are ecologically-dependent on wetlands/waterways and incorporate design and management measures to mitigate impacts on any such species and provide such information to DEHP.
- (e) The proponent must undertake an ongoing monitoring program to determine the effectiveness of passage for defined species such as – macropods, gliders, koalas, small birds.

- (f) The proponent must construct the railway consistent with the faunal passage design and management measures authorised by DEHP.

**Condition 13. Coal dust management**

- (a) The Alpha Coal Rail Project will:
  - (i) develop in consultation with DEHP and the coal producer, a Coal Dust Management Plan that is similar to and broadly consistent with the QR Network Coal Dust Management Plan (CDMP Draft V10D 22<sup>nd</sup> February 2012).
  - (ii) Use best endeavours to liaise with QR National regarding the implementation of the QR National CDMP and seek to implement similar technology and support systems, and incorporate the improvements emerging from the QR National CDMP implementation process.
  - (iii) not accept coal for transport using the Hancock Coal Railway (HCR) from other coal producers without implementing measures consistent with the Coal Dust Management Plan developed in accordance with clause (a) above, at their respective projects to manage coal dust impacts on the HCR.
- (b) The Alpha Coal Rail Project will, in consultation with the operator of the Alpha Coal Rail Project and other coal producers using the HCR:
  - (i) develop and implement an effective veneering strategy, including veneering systems and other support systems in a Coal Dust Management Plan.
  - (ii) install veneer spray stations at coal load-outs consistent with the veneering strategy.
  - (iii) develop standards informed by monitoring processes and coal type testing (as has already been progressed in consultation with the coal industry as part of the QR National CDMP).
  - (iv) implement wagon loading and load profiling practices that prevent over-loading, over-filling and reduces parasitic loads.
  - (v) implement appropriate coal moisture regulating systems.
  - (vi) install batch weighing load out systems.
  - (vii) implement coal type testing for dustiness.

**Condition 14. Land holder engagement**

- (a) Prior to commencement of construction works for the rail project the proponent must:
  - (i) develop to the reasonable satisfaction of the Coordinator-General and the administering authority a land access protocol for visiting personnel, consultants, contractors;
  - (ii) reach agreement with each landholder on the provision of cattle, vehicle and machinery crossings (such as occupational level crossings, underpasses, drainage culverts) to connect both sides of the corridor;
  - (iii) reach agreement with each landholder and relevant local government on providing service conduits at nominated locations under the railway to allow the laying of water pipes and other services;

- (iv) fence the corridor boundaries where as the rail project construction progresses in the corridor;
- (v) pay financial compensation for property severance and any reduced economic viability;
- (vi) provide 24 hour 7 days a week a safety and operational contact phone number.

**Condition 15. Biodiversity surveys**

- (a) The proponent must complete biodiversity field surveys along the proposed rail line route prior to final route selection, and submit the surveys to DEHP for approval at least three months before the commencement of any construction activities on the rail corridor are scheduled to commence.
- (b) The final rail-line corridor should avoid remnant regional ecosystem 11.5.3 within Lot 1RU89 and Lot 5 RU81, or if avoidance is not possible, the proponent must demonstrate to the satisfaction of the Department of Environment and Heritage Protection that all practical and reasonable steps have been taken to firstly avoid and then minimise impacts on State significant biodiversity values.
- (c) Any residual impacts on State significant biodiversity values will be offset in accordance with the Vegetation Management Act 1999.

**Condition 16. Rail line traversing dam site**

- (a) In the event that the Alpha Coal rail line, at some time in the future, needs to be relocated as a result of a demonstrated requirement to construct the RA8 Dam, the proponent of the rail line will pay for the relocation of the rail line.
  - (i) The total cost will include the cost to design, obtain approvals, construct and commission the relocated section of rail line which will be the minimum relocation necessary for the effective operation of the dam.
- (b) The proponent will submit plans for the relocation to the appropriate authorities for approval when the relocation is proposed.

**Condition 17. Flood modelling**

- (a) The proponent should re-run the flood modelling during the detail design phase in areas where it presently does not replicate historical data and make adjustments to allow outcomes to be more consistent with known historical data. The results of this analysis will be presented to all the affected landowners.

**Condition 18. Flood design criteria**

- (a) The Alpha railway should be designed to achieve a maximum flood afflux of 0.3 m where practicable, and must achieve the following criteria:
  - (i) Maximum afflux of 0.5 m for the design flood event, subject to special conditions in (c) for lands other than infrastructure and housing. The maximum afflux should be 0.1 m or less, and at infrastructure (for example state roads, and sub-stations etc), the maximum afflux should be less than 0.2 m.
  - (ii) Maximum culvert outlet velocity must be 2.5 m/s generally for the design flood event, subject to special conditions in (c).

- (iii) Any increase in duration of floodplain inundation is not to exceed an average across the model extent of 72 hours (or 20%, whichever is greater) of existing flood duration conditions for the design ARI 50<sub>year</sub> event, subject to special conditions in (c).
- (iv) Any increase in duration of inundation for the design ARI 50<sub>year</sub> event must not alter rural land uses or result in significant impacts upon valued pasture land, other valued agricultural land uses such as cultivated ground or flood-free ground and evacuation access for cattle, subject to special conditions in (c)
- (v) Any alteration in duration for the design ARI 50<sub>year</sub> event must not irreversibly impact listed ecosystems.
- (b) Prior to commencement of construction, landholders in affected areas must be informed of any changes in predicted flood extent and/or duration on or near to their property.

*Note: Maximum afflux and water velocity criteria are applicable both upstream and downstream for those waterways that may exhibit reverse flow under some circumstances*

- (c) Notwithstanding (a) the following Special Conditions may be applied in the limited circumstances as follows:
  - (i) In some locations, for example in floodplain areas, highly erodible areas, and areas where there is significant flood-prone infrastructure within short distances upstream of the alignment, a smaller afflux may be appropriate. The afflux and culvert outlet velocity criteria may be set at lower values in these areas in response to landholder and other stakeholder consultation and requests, and an assessment by the administering authority.
  - (ii) In other locations, for example in remote undeveloped locations in erosion resistant landscapes, a larger afflux may be permissible. This will only be considered where:
    - (A) A separate design report is prepared, to justify the higher afflux;
    - (B) Impacted landholders have sighted the design report, acknowledged the variation and agreed to the higher afflux conditions in writing; and
    - (C) Assessment by an independent consultants report confirms no adverse consequences are likely.
- (d) Three months prior to any project construction works being scheduled to commence, the proponent must submit to the Coordinator-General for approval a detailed design report for flood passage and drainage associated with the railway, generally in accordance with the items listed in Appendix Y, section 3.2.1, of the SEIS with the following additional information:
  - (i) Flood levels
  - (ii) Afflux for 5, 50 and 100 year ARI events comparing current and developed conditions
  - (iii) Duration of inundation and culvert velocities for 50 year ARI events comparing current and developed conditions

- (iv) Frequency of overtopping of the lowest rail level at the cross drainage location.
- (v) Specific impacts on infrastructure, assets (including housing) and rural operations.
- (vi) Sensitivity analysis demonstrating the effects of different design options on afflux

**Condition 19. Reporting of flood events**

- (a) Following a significant flood event, the proponent will be responsible for the following actions:
  - (i) Undertaking a damages survey of assets and waterways within 500 m of the railway.
  - (ii) In the event that adverse impacts to assets or waterways are identified to be a result of the railway, the proponent shall rectify and/or compensate any damage to assets, infrastructure and demonstrated farm production loss that has resulted from the railway.
  - (iii) providing a one-off bond of \$200 000 for an independent auditor to assess flood impacts attributable to the construction of the railway and verify the requirement for, and the appropriateness of, rectification and/or compensation measures. Any balance not required by the auditor and after rectification or compensation, if paid from the bond, will be returned to the proponent.

**Condition 20. Impacts on associated infrastructure**

- (a) Upon completion of detail design for the rail project the proponent must provide TMR and relevant local authorities with details of any impact the rail project will have on TMR and local authority infrastructure and any road reserves. Any reasonable mitigation measures that TMR and local authorities require must be included in the final rail design submitted for approval to the administering authority.

**Condition 21. Road impact assessment and road use management plan**

- (a) The proponent must undertake the following no later than three months prior to the scheduled commencement of any construction work for the rail line;
  - (i) review and finalise the road impact assessment (RIA) to include details of the latest project traffic generation and all project transport impacts on the safety and efficiency of state controlled roads and local roads in accordance with *Guidelines for Assessment of Road impacts of Development (2006)* in consultation with TMR and relevant local councils; then submit the updated RIA to the Managers of the TMR Central West and Mackay/Whitsunday Offices and local authorities for review and approval.
  - (ii) prepare a road-use management plan (RMP) for all use of state controlled and other roads for each phase of the project in accordance with TMR's *Guide to Preparing a Road Use Management Plan*. The RMP must receive TMR's approval prior to its implementation and must include:
    - (A) Latest traffic generation (vehicle numbers etc.);

- (B) Finalised assessment of impacts on safety and efficiency at intersections, on road links and on pavements etc.; and
- (C) Updated impact mitigation strategies such as any road maintenance or necessary improvements.

**Condition 22. Roads Infrastructure Agreement**

- (a) Prior to the scheduled commencement of any project construction works the proponent must conclude infrastructure agreements with TMR and local road authorities on upgrading, access and contributions for the mitigation of road impacts as determined by the RIA and RMP conducted in Condition 21, including at least the following:
  - (i) Upgrade intersections/accesses as determined and agreed upon with TMR Mackay/Whitsunday Regional Office and in accordance with the requirements of Chapter 13 of the Department's Road Planning and Design Manual;
    - (A) Alpha – Clermont Road/Clermont Connection Road;
    - (B) Alpha – Clermont Road/Capricorn Highway. and
    - (C) Provide all necessary access (including those required for construction camps) to the state-controlled road to a standard agreed upon by TMR.
  - (ii) Provide to the Department and relevant local authority, rehabilitation, maintenance and bring-forward contributions and/or works required to mitigate impacts of project construction and operational traffic as calculated and agreed upon with TMR Mackay/Whitsunday Regional Office and relevant local authority.
  - (iii) Prior to undertaking any works, obtain the relevant licenses and permits under the *Transport Infrastructure Act (Qld) 1994* for works within the State-controlled road corridor.

**Condition 23. Traffic Management Plans**

- (a) Three months prior to the scheduled commencement of any significant rail construction works the proponent must present traffic management plans for review by TMR, the Queensland Police Service and Barcaldine Regional Council, Isaac Regional Council and Whitsunday Regional Council and take account of the reviews and actions recommended by these agencies. The traffic management plans must incorporate provisions on:
  - (i) Road safety from the increased level of vehicle movements, and intersection traffic;
  - (ii) Community awareness of construction and transport activities;
  - (iii) Traffic management arrangements, lane closures, speed limits;
  - (iv) Driver behaviour and fatigue management;
  - (v) Prior to commencing any program of oversize transport movements that may be required for the construction of the project, the proponent will consult with TMR, the Queensland Police Service, Barcaldine Regional Council, Isaac Regional Council and Whitsunday Regional Council;

- (vi) Obtaining the necessary permits for any excess mass or over-dimensional loads associated with the project as required under *the Transport Operations (Road Use Management) Act (Qld) 1995*.
- (b) The proponent must implement the traffic management plan during construction and commissioning of the project and construction of all access road intersection/s and other works to be undertaken within a state-controlled road corridor.

**Condition 24. Infrastructure Agreement – Road/Rail Grade Separated and level Crossings**

- (a) Prior to the commencement of any project construction works, the proponent will enter into Infrastructure Agreements with the State of Qld (DTMR) and the relevant local authority to address all aspects of the design, construction and maintenance of grade separated crossings where the Alpha Coal railway intersects with state-controlled roads (SCR) listed in (b), and level crossings with appropriate safety protection elements, for other roads.
- (b) The Infrastructure Agreements are to address funding, construction and maintenance of key infrastructure that impacts on the road network and specifically addresses the provision of grade-separated crossings at all the following roads:
  - (i) Bruce Highway (Bowen-Ayr);
  - (ii) Bowen Development Road;
  - (iii) Cerito (Collinsville-Elphinstone) Road;
  - (iv) Suttor Development Road;
  - (v) Kilcummin—Diamond Downs Road; and
  - (vi) Gregory Developmental Road.
- (c) Where the DTMR and the proponent have not concluded infrastructure agreements within one month after commencement of construction of the rail project, either party may refer the matter to the Coordinator-General for resolution.

**Condition 25. Biodiversity offsets strategy**

- (a) Prior to commencing construction the proponent must submit the Alpha Coal Project—Biodiversity Offset Strategy – draft (Eco Logical Australia April 2012) for the approval of the administering authority for the *Environmental Protection Act 1994* and the administering authority for the *Vegetation Management Act 1999*;
- (b) The strategy in Condition 25(a) is to address any offsets requirements for the loss of threatened flora and fauna species and threatened ecological communities listed as Matters of National Environmental Significance under the EPBC Act.

## **PART B.      IMPOSED CONDITION RELATING TO SOCIAL MATTERS**

In accordance with section 54A and 54B of the *State Development and Public Works Organisation Act 1971*, the Coordinator-General **imposes** the following condition.

This condition takes effect from the date of this report.

### **Condition 1.      Conditioning for rail social matters**

The proponent must implement conditions 1—13 (inclusive) in Appendix 2, Part C of this report to the extent relevant to the rail components of the project, as agreed with the Coordinator-General.

## **PART C. COORDINATOR-GENERAL'S RECOMMENDATIONS—RAIL**

This appendix includes general recommendations, made under section 35(4) of the SDPWO Act. The recommendations relate to the applications for development approvals for the project.

While the recommendations guide the assessment managers<sup>20</sup> in assessing the development applications, they do not limit their ability to seek additional information nor power to impose conditions on any development approval required for the project.

Each recommendation nominates the entity to be consulted by the proponent.

### **Schedule 1. MCU conditions—rail loop in Abbot Point State Development Area**

#### **MCU APPROVAL UNDER THE DEVELOPMENT SCHEME FOR THE ABBOT POINT STATE DEVELOPMENT AREA**

In accordance with section 52 of the *State Development and Public Works Organisation Act 1971* I recommend the following conditions in considering an MCU approval of the rail loop under the development scheme for the Abbot Point State Development Area (SDA).

##### **Recommendation 1. Rail loop dimensions and operating parameters**

The proponent will undertake the design and construction and operation of the Rail Loop within the following specific dimensions and operating parameters in the Caley Valley Wetlands area in the Abbot Point SDA:

- (a) The maximum width of the area within the Kaili (Caley) Valley Wetlands impacted during construction must be 59 metres
- (b) The maximum width of the area within the Kaili (Caley) Valley Wetlands impacted by the rail line and associated infrastructure must be 55 metres
- (c) The maximum area permanently impacted by the rail line and associated infrastructure must be 14 hectares
- (d) The maximum area enclosed by the rail line and associated infrastructure within the Kaili (Caley) Valley Wetlands must be 99 hectares. The maximum area enclosed by the entire rail loop and associated infrastructure must be 167 hectares.
- (e) During normal operations loaded coal wagons must not travel over the part of the rail loop extending over the wetland.
- (f) Empty rail wagons must be subject to wheel washdown to remove excess coal dust prior to entering the part of the rail loop extending over the wetland

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<sup>20</sup> For a definition of 'assessment manager' refer to the Glossary on page 385 of this report.

### **Recommendation 2.            Acid sulfate soil survey**

Prior to approval of an application for a material change of use of land within the Abbot Point SDA, an acid sulfate soil survey must be carried out for all areas subject to excavation or disturbance during construction of the rail line, consistent with:

- State Planning Policy 2/02 Guideline: Acid Sulfate Soils;
- *Guidelines for Sampling and Analysis of Lowland Acid Sulfate Soils in Queensland 1998 (CR Ahern, MR Ahern and B Powell 1998)*; and
- *Acid Sulfate Soils Laboratory Methods Guidelines (CR Ahern, AE McElnea, LA Sullivan 2004)*.

A copy of the acid sulfate survey must be provided to the administering authority.

### **Recommendation 3.            Environmental Management Plan**

Prior to approval of an application for material change of use of land within the Abbot Point SDA, the proponent is to lodge with the Department of Environment and Heritage Protection a draft Environmental Management Plan for construction and operation of the rail line within the SDA. The Environmental Management Plan must incorporate at least the following provisions:

- (a) Acid Sulfate Soils Management Plan
  - (i) Acid sulfate soils (ASS) must be managed such that contaminants, including acidic drain water (pH <6.5), are not directly or indirectly released to any land or waters except as approved by the administering authority.
  - (ii) If acid sulfate soils are found to be present in areas subject to excavation or filling, an Acid Sulfate Soil Management Plan consistent with the Queensland Acid Sulfate Soil Technical Manual, Soil Management Guidelines (2002) must be developed and implemented for the construction of the rail line in areas found to contain acid sulfate soil.
    - (A) The Acid Sulfate Soil Management Plan must be prepared to the satisfaction of the administering authority prior to construction in the Abbot Point SDA.
    - (B) All information and data from acid sulfate soil surveys must be provided to the administering authority for State Planning Policy 2/02 as a separate document with the submission of the Acid Sulfate Soils Management Plan.
    - (C) Amendments to the Acid Sulfate Soil Management Plan are subject to written acceptance by the administering authority prior to the implementation of the amendment.
    - (D) The Acid Sulfate Soil Management Plan must include, but not be limited to:
      - (1) the construction methodology for the project;
      - (2) management, treatment and disposal of any excavated material potentially containing potential acid sulfate soils (PASS), including management of spilled material from excavation and transport;

- (3) management of any material potentially containing PASS that is displaced or dewatered by works to an extent that may result in oxidation through exposure to air or through loss of saturation, including any accidental disturbance of areas containing ASS and vertical or lateral displacement of sediment containing ASS;
- (4) management of any material potentially containing PASS excavated or disturbed during decommissioning or rehabilitation;
- (5) management of water within pits and trenches during construction, decommissioning and rehabilitation, including any treatment: source of water, treatment location, storage capacity, storage design, monitoring, discharge quality limits, discharge point, discharge management, monitoring, records and reporting to the administering authority;
- (6) where disposal of material containing PASS relies on permanent saturation details of the following:
  - (I) location and depth of disposal;
  - (II) handling to prevent spillage or oxidation; and
  - (III) existing or necessary permits and relevant information to support such permits;
- (7) where disposal of material containing PASS will be by neutralisation, details of the following:
  - (I) location;
  - (II) design of treatment pads;
  - (III) neutralisation techniques (guard layer, liming rates and process, contingencies, validation, records and reporting);
  - (IV) water management (storage capacity, monitoring, discharge quality limits, discharge point, discharge management, monitoring, records and reporting to the administering authority);
  - (V) disposal of treated material;
  - (VI) disposal of drain water; and
  - (VII) final rehabilitation of the site;
- (8) for PASS treatment pads, provide design drawings for PASS storage and treatment pads and the surrounding area to demonstrate:
  - (I) capacity to contain treated and untreated PASS plus a 100 year ARI daily rainfall event at the location throughout the period of use of the storage and treatment pads; and
  - (II) bund and stormwater management system design to prevent failure of the bunds or sediment export resulting from erosion of the bunds or disturbed areas;

- (9) where disposal of material containing PASS will be by neutralisation, provide a commitment to competent specialist operators and supervision, with periodic strategic third party auditing and reporting to the administering authority.
- (E) All bunded areas used for the storage or treatment of excavated material containing acid sulfate soil must be constructed, installed and maintained to:
  - (1) prevent any release of contaminants through the bed or banks of the bunded area to any land or waters including ground water;
  - (2) ensure a freeboard to retain a 100 year ARI 24 hour rainfall event; and
  - (3) ensure the stability of the bunds during a 100 year ARI 24 hour rainfall event.
- (b) Erosion and Sediment Control Plan
  - (i) An Erosion and Sediment Control Plan must be prepared to the satisfaction of the administering authority and implemented for construction and operation of the rail including provision for:
    - (A) Use of silt curtains or similar sediment containment devices during construction to contain sediment and restrict contaminant/runoff into the wetland
    - (B) Rehabilitation of exposed soil as soon as is practical
    - (C) Dust suppression during construction
    - (D) Location of construction plant and stockpiles away from the wetland area
    - (E) Stormwater runoff from the rail directed to sedimentation basins located within the permanent impact area of the rail loop or outside the wetland, prior to discharge to the wetland.
- (c) Water Quality Management Plan
  - (i) A Water Quality Management Plan must be prepared to the satisfaction of the administering authority and implemented for the part of the Caley Valley wetland located within, and adjacent to, the rail loop, including:
    - (A) Water quality objectives
    - (B) Monitoring and reporting program
    - (C) Reflection of objectives, specific outcomes, actions and guidelines of the Development Scheme for the Abbot Point SDA
    - (D) Corrective actions for non-compliance or failure to maintain water quality within the stated objectives
- (d) Rehabilitation Plan
  - (i) A Rehabilitation Plan must be prepared to the satisfaction of the administering authority and implemented for temporary (construction) disturbance areas

- (e) Construction and Operational Management Plans
  - (i) Develop a construction management plan and an operation management plan. Such plans must be developed to the satisfaction of the administering authority prior to any construction within the Abbot Point SDA.

**Recommendation 4. Completion of the Environmental Management Plan**

The Environmental Management Plan must be completed to the satisfaction of the Department of Environment and Heritage Protection, and the administering authority before construction commences.

**Recommendation 5. Material Change of Use Application**

Prior to, or accompanying an application for a material change of use of land within the Abbot Point SDA, the proponent must provide to the Coordinator-General:

- (a) A detailed description of the proposed location, design, and construction methodology for the rail loop, including maps and drawing at appropriate scales, generally in accordance with material provided to the Coordinator-General on 5 April 2012.
  - (i) Location and dimensions of all temporary and permanent works within and adjacent to the wetland
  - (ii) Location and design of culverts including cross-section and base height relative to land surface of wetland
  - (iii) Construction materials
  - (iv) Construction methodology, including any excavations
- (b) Detailed information on how the location, design, construction methodology and operational procedures will recognise and protect the environmental values of the Abbot Point SDA, and recognise, protect and maintain areas of high ecological significance within and adjacent to the Abbot Point SDA (including the Kaili (Caley) Valley Wetlands), consistent with the provisions of the Development Scheme for the Abbot Point SDA.
- (c) A comparative analysis report, detailing the potential environmental impact of the selected design for the rail loop located within the Kaili (Caley) Valley Wetlands with the potential environmental impact if this section was constructed entirely on trestles above the Kaili (Caley) Valley Wetlands, and provide justification for the selected design based on impact on the environmental values of the Kaili (Caley) Valley Wetlands.
- (d) A detailed impact mitigation strategy that includes but is not limited to:
  - (i) A full list of species that are known to utilise the area in and around the rail loop over wet and dry seasons and any other species that may use the area at any point of its lifecycle.
  - (ii) Habitat requirements of each species or suite of species (feeding, breeding, roosting)
  - (iii) Impact of any proposed bund and proposed culverts on each species or suite of species of the proposed rock wall during construction, and in the short term and long term of operation

- (iv) Specific mitigation measures that will be implemented through design, construction and operation to ensure that fauna can move freely in and out of the rail loop and that plant recolonisation can occur after dry periods, including but not limited to:
  - (A) Maximum period during which water within the loop will be isolated from the rest of the wetland during construction
  - (B) Maximum period during which fauna within the loop will be isolated from the rest of the wetland during construction
  - (C) Culvert design to maintain flows, water quality conditions, habitat connectivity and fauna movements between habitats inside and outside of the rail loop for each impacted species—cross-section, base sill height relative to ground (sill height will affect fish passage)
  - (D) Landing and take off requirements for birds (the area inside the rail loop and physical barrier of the loop may exclude some shorebirds from access)
  - (E) Fish passage requirements such as light availability through the culvert, substrate/texture of the floor of culvert, maximum flow velocities through the culvert, culvert location selection to optimise opportunity for inflows and draining.
- (v) An operational management plan that describes 'normal operation' of loaded coal wagons. Details must be provided in respect to the movement of the coal wagons over the Kaili (Caley) Valley Wetlands, with consideration given to the likelihood of technical, mechanical or some other unforeseen circumstance necessitating loaded coal wagon movement over the Kaili (Caley) Valley Wetlands.

**Recommendation 6. Offsets**

- (a) An offset strategy for provision of offsets addressing the requirements of the Queensland Biodiversity Offset Policy (BoP) October 2011 must be prepared to the satisfaction of the administering authority for the BoP.
- (b) The offset strategy must include:
  - (i) General Requirements:
    - (A) how the development has been or can be designed and located on the lot/s to avoid and minimise the extent of impact
    - (B) tenure of the impact area
    - (C) when (at time of approval or rolling plan) and how (the offset delivery mechanism) offsets will be provided
    - (D) the expected impacts of the project/s represented spatially
    - (E) the known values (including extent) which will be impacted relevant to this Policy
    - (F) other known values which are being addressed through other offset policies
    - (G) the likelihood of an offset being available which meets the Policy requirements

- (H) whether the impact area includes an existing offset area
- (ii) For each offset proposal:
  - (A) details of how the Criteria contained in the BOP have been met
  - (B) tenure of offset area/s
  - (C) details of any rights to take forestry products
  - (D) details of any mining encumbrances, including exploration permits
  - (E) an analysis of the proposed location of the offset area in relation to existing and future land uses, and the implications of the land use on the offset area's long term viability. Matters to be considered as part of the analysis include:
    - (1) zoning and regional land-use category (if available) of the offset area and surrounding area under the local government planning scheme and Regional Plan produced either under the repealed *Integrated Planning Act 1997* or *Sustainable Planning Act 2009*
    - (2) maps spatially identifying the current and potential future land-uses, including proposals for major infrastructure, mining, petroleum and gas activities on or in the general vicinity of the offset area
    - (3) threatening processes which may impact on the effectiveness of the management actions on the proposed offset area
- (iii) Specific Requirements for Offset Area Management Plans
  - (A) an offset area management plan is provided which includes (but is not limited to):
    - (1) A map (preferably digital) that clearly identifies the proposed offset area with Global Positioning System (GPS) points, including any areas subject to specific management actions
    - (2) the proposed clearing regional ecosystem/s and essential habitat, and those on the proposed offset area
    - (3) the ecological equivalence assessment of the offset area and the date it was undertaken; and
    - (4) the offset area management objectives and outcomes
    - (5) activities that will be undertaken to achieve the management objectives and outcomes
    - (6) restrictions imposed on the use of the offset area to achieve the management objectives and outcomes
    - (7) an analysis of the risks to achieving the management objectives and outcomes, actions to minimise the risks and remedial action that will be undertaken if any of the risks occur
    - (8) a yearly schedule of management actions, to ensure achievement of the management objectives and outcomes
    - (9) a monitoring and reporting program

- (10) the estimated time until the offset management objectives and outcomes will be achieved
  - (B) identification of all registered interests including mortgages, leases, subleases, covenants, profit á prendre, easements and building management statements, that have been registered on title under the *Land Act 1994* or the *Land Title Act 1994*.
- (iv) Management Costs and Activities
  - (A) The following requirements are to ensure that the Landholder providing the offset is aware of their responsibilities and that there are adequate resources available to deliver the offset area management plan;
    - (1) evidence that the landholder has received legal advice in regards to their obligations under the legally binding mechanism
    - (2) the estimated management costs associated with achieving the offset management objectives, actions and outcomes
    - (3) where management is required for more than three years, the trust account details (financial institution, bank account number and name) for the holding of funds for the ongoing management actions for the offset area, and milestone payments
      - (I) Where management of the area will be for three years or less, a trust account is not required. However, the applicant will need to provide information, including any management contracts with third parties and the payment of funds arrangements to the landholder, within four months of the relevant development permit being issued (for direct offsets), or at the time the offset area is legally secured (for offset transfers)
    - (4) evidence that the management costs identified in b) have been transferred into the nominated trust account within four months of the relevant development permit being issued (for direct offsets) or at the time the offset area is legally secured (for offset transfers)
    - (5) the entity/ies responsible for undertaking the management actions and the skills or expertise of the entity/ies responsible for undertaking the management actions.

**Recommendation 7. Marine plants and tidal fish habitats**

- (a) The proponent must obtain development approval for operational works that involve the removal, destruction or damage of marine plants under the Fisheries Act 1994.
- (b) The design of the rail project must minimise, mitigate and avoid the disturbance of tidal fish habitats and marine plants where possible, and offset any unavoidable disturbances under the specific-issue offset policy FHMOP005- Mitigation and compensation for activities and works causing marine fish habitat loss: Departmental Procedures.

## **Schedule 2. General recommendations for the rail line**

### **Recommendation 8. Items for attention in update of road impact assessment**

- (a) I recommend that the following matters identified by state and local road authorities should be items of particular attention in the update of the road assessment and preparation of road management plans for the Alpha Rail Project. Items of particular attention include:
- (i) vehicle movement assumptions
  - (ii) intersection analysis
  - (iii) traffic impacts on the Peak Downs Highway
  - (iv) traffic impacts on unsealed local roads

### **Recommendation 9. Overlap of mine and rail traffic generation**

- (a) I recommend that the traffic generation from the Alpha mine construction and other mine/rail projects, to the extent that they overlap in time and location with the three year construction of the Alpha Rail Project, be clearly taken into account in the road impact assessment process for determining impacts and management plans for the Alpha Rail Project.

### **Recommendation 10. Crossing of the Bowen Development Road**

I recommend that:

- (a) Prior to the commencement of the operation of the Alpha rail line, the owner of the Northern Missing Link Newlands-Abbot Point rail crossing of the Bowen Development Road near to the Alpha rail line crossing of that road should complete construction of a grade separated (road over rail) crossing to a design approved by the relevant Regional Manager of DTMR
- (b) If feasible, the proponent, DTMR and the owner of the Northern Missing Link Newlands-Abbot Point rail line should coordinate the design and construction of the road bridge required in (a) with the road bridge required to be constructed under Condition 24(b)(ii) (Appendix 4, Part A).

### **Recommendation 11. Application to disturb listed plants**

- (a) Prior to the commencement of construction activities, and in accordance with the NCA, approval from DNPRSR must be obtained where construction and/or operation of the project is likely to disturb Type A restricted plants as defined under the NCA.
- (b) Prior to the commencement of construction activities, approval must be obtained from DNPRSR under the NCA for a class exemption to clear least concern plants on site.

### **Schedule 3. Local industry participation policy**

#### **Recommendation 12. Local Industry Participation Plan**

The proponent should implement Appendix 3, Part D, Recommendation 5 of this report to the extent relevant to the rail components of the project, as agreed with the Coordinator-General.

# Appendix 5. Proponent commitments

## PROJECT-WIDE

### SOCIAL IMPACT MANAGEMENT

HCPL has prepared a detailed draft Social Impact Management Plan (SIMP) for the project. The SIMP is a living document that will be updated as the project develops. The SIMP outlines HCPL's obligations and commitments to manage social impacts, consistent with legislative requirements and State Government policies. HCPL will submit the SIMP to the Coordinator General (CG) for approval prior to commencing major construction works.

The SIMP will identify, document and mitigate project-associated impacts, and in particular will:

- Document responsibilities of all parties in delivery of funding and services to the community,
- Involve external stakeholders in the development and on-going review of the SIMP,
- Prepare an annual SIMP progress report and circulate a copy to affected parties,
- Provide project personnel with a community and workplace induction,
- Advise external stakeholders of the project's bus-in and bus-out (BIBO) routes and schedules with a view to minimise project impacts,
- Discuss infrastructure opportunities for local economic and community development,
- Develop Action Plans to identify the roles and responsibilities of stakeholders in relation to impact management and formalise the on-going review process, and
- Consult with Councils and local stakeholders to determine appropriate strategies to enhance the potential benefits of the project in the community.

The SIMP includes Action Plans and strategies informed by consultation and collaboration with key stakeholders and relevant Government Agencies. The plans and strategies will address:

- Landholder Management (including a Good Neighbour Policy),
- Workforce Management (including Code of Conduct, Traineeships and Apprenticeships),
- Local Housing,
- Community & Stakeholder Engagement,
- Community Development,
- Local Employment,
- Local Industry Participation,
- Indigenous Participation, and
- Cumulative Social Impact Management.

HCPL will, in implementing the SIMP:

- SIMP Consultation

- Work closely with Regional Councils to implement the SIMP,
- Consult with a variety of employment, training and education providers,
- Define and integrate consultation and management strategies for protecting community values, and
- Undertake transparent and open communications, and conduct regular meetings in order to provide feedback to local communities and stakeholders.
- SIMP Monitoring:
  - Monitor project activities and related social impacts throughout the project life,
  - Provide updates following significant project milestones or release of monitoring results, and
  - Involve Regional Councils and other affected stakeholders in work to monitor external changes (e.g. road upgrades) that are related to the project.

In particular, the SIMP will monitor the following for project related impacts:

- Effects of population change on community services and infrastructure in the region,
- Local employment trends,
- Wages in the local and regional areas,
- Number of workers moving from other industries into the mining sector,
- Change in community associated with culture and community dynamics,
- Procurement of local businesses and employment of local residents,
- Demand on emergency services,
- Community crime and deviance levels,
- Availability of recreation and sporting activities,
- Community participation levels and volunteer participation rates, and
- Potential for cumulative impacts arising from future projects.

## **GREENHOUSE GAS**

HCPL will:

- Develop and implement an Energy Efficiency and Greenhouse Gas (GHG) Management Plan for the construction and operational phases of the project,
- Ensure that all sources of emissions are identified and emissions levels are quantified during engineering and design,
- Consider energy efficiency in the selection of plant and equipment for the project and identify and evaluate energy efficiency opportunities throughout the project life,
- Implement and maintain a GHG inventory from construction activities, and
- Participate in GHG and emissions reporting programs for the project.

## **RAIL**

### **AIR QUALITY**

HCPL will:

- Prepare and implement a Dust Management Plan to outline measures to minimise and manage any impacts from the rail line on local air quality during the construction and operational phases,
- Implement mitigation measures to reduce the potential for air quality impacts at the nearest nuisance-sensitive places,
- Investigate all substantiated dust complaints and maintain a complaints register,
- Implement corrective action resulting from substantiated complaint investigations, and
- Design train wagons to minimise loss of coal particles.

### **NOISE AND VIBRATION**

HCPL will:

- Confine construction activities that are likely to generate noise near nuisance-sensitive places to standard day-time working hours,
- Notify nearby residents prior to undertaking non-typical high noise activities, such as rock blasting, and as applicable, schedule the activities to suit local conditions,
- Ensure equipment utilised is maintained and operated as per manufacturer's specifications,
- Install and properly maintain noise suppression equipment consistent with the requirements of the activity,
- Locate mobile plant (such as portable compressors and generators) as far as practicable away from neighbouring nuisance-sensitive places, and
- Investigate all substantiated noise and vibration complaints, take remedial actions, and maintain a complaints register.

### **WASTE MANAGEMENT**

HCPL will:

- Develop and implement a Waste Management Plan for the construction of the rail line,
- Where practicable implement a waste management hierarchy,
- Ensure detailed design and specifications are undertaken so as to minimise the generation of waste during construction and consider the durability of materials,
- Appropriately manage stockpile areas and storage areas,
- Set up designated waste transfer areas,
- Dispose non-recyclable construction materials at a licensed waste facility, and
- Store all chemicals, fuels and oils within appropriately controlled areas in accordance with Australian Standards.

## **SURFACE WATER AND EROSION AND SEDIMENT CONTROL**

HCPL will:

- Liaise with Government transport authorities and Local Councils regarding the railway hydrological design within and adjacent to road corridors and existing transport infrastructure,
- Develop and implement an Erosion and Sediment Control Plan (ESCP) for rail construction,
- Implement erosion and sediment controls as required by the ESCP during construction to ensure water quality requirements are met and minimise impacts on aquatic habitats from run-off and sedimentation,
- Develop construction staging plans with consideration to the climatic conditions,
- Divert surface water flows away from disturbed areas,
- Take erosion and sediment control principles into consideration prior to designing and constructing temporary access tracks and construction roads,
- Regularly inspect and maintain all drainage structures when necessary during construction and operations,
- Discharge wastewater and stormwater from the marshalling yard and maintenance facilities in accordance with relevant design standards and local authority requirements,
- Prevent any unauthorised discharges to natural waterways, and
- In relation to the Caley Valley Wetlands at Abbot Point, design the railway culvert structures to maintain flows, water quality conditions, habitat connectivity and fauna movements between habitats inside and outside of the wetland area affected by the rail loop.

## **FAUNA AND FLORA PROTECTION**

HCPL will:

- Develop and implement a Species Management Plan and Vegetation Management Plan,
- Develop a flora and fauna species relocation plan particularly for threatened species,
- Map and clearly mark on the ground the locations of populations of species of conservation significance, to ensure disturbance is kept to a practicable minimum,
- Engage fauna spotters to conduct a thorough survey of clearing areas prior to clearing,
- Engage ecologists to precede or accompany clearing crews when clearing significant vegetation, to ensure disturbance to rare, threatened or other significant fauna is minimised,
- Construct fauna underpasses and culverts within important habitat areas,
- Re-use hollow logs and hollow bearing trees to promote habitat where practicable,
- Use appropriate lighting in work areas, to ensure the minimum practicable disturbance,

- Develop a fauna mortality register to determine the location, frequency of mortality, and types of species most susceptible to mortality, and use the register to minimise recurring events,
- Approach areas of high ecological value such as riparian corridors with care and re-establish connectivity to the highest practicable extent, and
- Minimise, mitigate and avoid the disturbance of tidal fish habitats and marine plants.

## **SOIL AND TOPSOIL MANAGEMENT**

HCPL will:

- Develop and implement a Soil and Topsoil Management Plan,
- Undertake appropriate treatment of the soil if dispersive soils are necessary to be incorporated as construction material,
- Implement soil and stockpile management measures,
- Locate construction areas, such as soil stockpiles, machinery/equipment storages, away from sensitive environmental receptors,
- Locate material and stockpiling areas within the construction corridor until its ultimate destination is determined,
- Undertake an acid sulfate soil investigation where required,
- Restore construction camps and storage areas located within a GQAL resource to pre-existing conditions following completion of the project,
- Stabilise stockpiles that are left exposed for any period longer than two weeks,

Wherever practicable, re-use spoils onsite as backfill or as no load bearing fill, and

- Transport any surplus spoil that cannot be reused off-site to an approved landfill site.

## **WEED AND PEST CONTROL**

HCPL will:

- Develop and implement a Weed and Pest Management Plan,
- Ensure all equipment is appropriately serviced, maintained and free of declared weeds as defined in Land Protection (Pest and Stock Route Management) Act 2002, and
- Conduct a post-construction weed audit of the project footprint at the end of the first wet season following completion.

## **CONTAMINATED LAND**

HCPL will:

- Conduct a preliminary contaminated land assessment prior to any activities in an EMR listed site that may contain contaminated soil,
- Develop a site management plan and detail management responses if contaminated land is identified,
- Develop appropriate disposal methods for contaminated soils and other materials,

- Ensure procedures for storage and handling of fuel and chemicals (including refuelling) are put in place,
- Maintain all treatment systems to treat contaminated waters or wastewater from construction camps,
- Maintain spill response kits and personal protective equipment in tanker trucks and at all locations where spills may occur, and
- Incorporate spill response procedures and training into incident response plans.

## **CULTURAL HERITAGE**

HCPL will:

- Implement the requirements of the approved Cultural Heritage Management Plans,
- Work with traditional owners to monitor major land disturbance during construction,
- Avoid impact on sites and places of significance,
- Educate all project staff about significant sites and their management requirements,
- Employ a Heritage Consultant if dealing with sites of State significance,
- Stop all work upon discovery of fossils in the work area, notify the project Environmental Representative and notify the regulating authority, and
- Avoid impacts on sites of State Archaeological Significance.

## **REHABILITATION**

HCPL will:

- Develop a Decommissioning and Rehabilitation Plan for completion of construction works,
- Re-contour sites to a stable form resembling the surrounding landscape,
- Stabilise and rehabilitate disturbed areas during construction as soon as practicable,
- Undertake rehabilitation planting where practicable to replace vegetation that provided screening to adjacent sensitive visual receptors,
- As far as practicable, ensure vegetation materials are mulched and used onsite for rehabilitation and revegetation works, and
- Monitor re-vegetation of areas to detect effectiveness of re-vegetation activities and identify encroachment of pest species.

## **BIODIVERSITY OFFSETS**

HCPL has prepared a draft project Biodiversity Offset Strategy. HCPL will implement the strategy following approval and in consultation with the applicable regulatory authorities. The strategy includes:

- Identification of suitable potential offset areas with ecological values analogous to impacted ecological communities, and options for securing offsets,
- Options for pooling or consolidation of offset requirements,
- Assessment of the ecological value and equivalence of offsets to ensure suitable offset extent, species assemblage, floristic structure and ecological integrity utilising an appropriate biometric field methodology,

- Development of appropriate management prescriptions to ensure long-term viability of offsets, including management activities such as pest control, weed control, livestock management, access exclusion, ameliorative plantings and fire regime management,
- Placement of appropriate covenants for future conservation and management of offsets, and
- Monitoring and maintenance activities and performance review processes to ensure long-term protection and viability of the offsets.

The rail offsets strategy will address the requirements of the following State policies:

- Policy for Vegetation Management Offsets- Version 3 (2011),
- Biodiversity Offset Policy- Version 1 (2011),
- Fish Habitat Management Operational Policy FHMOP 005 (2002), and
- Draft EPBC Act Environmental Offsets Policy (2007).

### **CALEY VALLEY WETLAND**

HCPL will:

- Develop and implement a Wetland Management Plan in collaboration with other proponents,
- Employ directional lighting with protective guards around the construction to reduce and avoid light spill into wetland areas adjacent to the construction footprint, thereby minimising potential for disturbance to roosting and nocturnal species,
- Monitor seasonal occupation of the wetland by water birds and undertake adaptive management if populations are considered to be impacted upon by construction and operation noise, vibration, required lighting or visual disturbance,
- Implement a Water Quality Monitoring Plan to monitor the wetland composition and condition. The plan will consider the proponent's contribution to the overall wetland impacts,
- Integrate with the existing wetland Water Quality Monitoring Program where practicable,
- Implement erosion and sediment control devices to minimise construction impacts,
- Monitor turtle mortality rates at large palustrine habitats within the wetland, and
- Restrict speed limits within the Caley Valley Wetland.

### **TRAFFIC MANAGEMENT**

HCPL will:

- Develop and implement a Transport Management Plan for each of the construction and operations phases of the rail project,
- Include in the plans a procedure for notifying the Ambulance Communications Centre of any proposed road closures, road diversions and related road impact activities.

## **MINE**

### **AIR QUALITY**

HCPL will:

- Prepare and implement a Dust Management Plan to outline measures to minimise and manage any impacts from the operation of the mine on local air quality during the construction and operational phases,
- Achieve and maintain the level of dust control outlined in the Environmental Authority,
- Meet the ambient air monitoring program requirements, using techniques that are consistent with the DEHP Air Quality Sampling Manual and applicable Australian Standards,
- Implement and monitor mitigation measures,
- Validate the dispersion modelling undertaken to predict the impacts,
- Investigate all substantiated dust complaints and maintain a complaints register,
- Implement corrective action resulting from substantiated complaint investigations, and
- Maintain plant and equipment in a proper condition.

### **NOISE AND VIBRATION**

HCPL will:

- Carry out noise and vibration monitoring as required by the administering authority, and the relevant Guidelines and Australian Standards,
- Investigate all substantiated noise and vibration related complaints and maintain a complaints register, and
- Implement corrective action resulting from complaints investigations as required.

### **GENERAL WASTE MANAGEMENT**

HCPL will:

- Maintain a register of all chemicals stored on the mine site,
- Develop and implement a Waste Management Plan for general waste for the construction and operation phases of the mine. The plan will document strategies for managing and reducing waste, and the storage, transport and disposal requirements for each waste stream,
- Handle and store all flammable and combustible liquids in accordance with the Australian Standard for storage and handling of flammable and combustible liquids,
- Dispose of all regulated wastes to a facility licensed to receive such wastes and, where required, track the transport of regulated waste,
- Encourage re-use and recycling as part of the staff awareness and induction program, and
- Construct and operate the site landfill in accordance with the accepted guidelines and the project's Environmental Authority conditions.

## **MINE WASTE MANAGEMENT**

HCPL will:

- Develop and implement a Mine Waste Management Plan for the mine operations phase,
- Delineate the extent of any materials that may require selective handling, such as materials having potential to generate high saline, sodic or acidic levels, by conducting pre-mining and ongoing geochemical sampling and testing of mining materials,
- Ensure that any identified materials are selectively handled and managed as per the plan,
- Consider the geochemistry of materials with respect to their potential risk to cause harm to the environment and their suitability for use in revegetation in the ongoing management of mining waste,
- Document the procedures for placement of mining waste materials to minimise run-off, erosion and potential seepage, including the encapsulation of coarse coal rejects,
- Store coal process fine tailings in an approved out-of-pit tailings storage facility (TSF),
- Line the TSF with an engineered clay liner and install drainage controls to avoid seepage, and
- Investigate the technical and economic viability of disposing the coal process fine tailings within the mining pits, and if confirmed a greater viability than the TSF, change the tailings storage location from the TSF to in-pit location within the first five years of mining operation.

## **SURFACE WATER AND EROSION AND SEDIMENT CONTROL**

HCPL will:

- Develop and implement a Water Management Plan to manage the impacts of the mining operations on surface water,
- Include emergency response procedures and a monitoring program in the plan,
- Use the plan as input for preparation of site water balance modelling and the design basis for a mine site Water Management System (WMS),
- Use the WMS to manage water flows onto, within and from the mine site in order to safeguard mine operations and protect downstream water quality,
- Segregate clean and mine-affected water using dams and drainage and pumping systems,
- Implement baseline and ongoing surface water monitoring programs in accordance with recognised procedures and guidelines. The monitoring programs will be undertaken at the locations and for the parameters specified in the Environmental Authority,

Use water resources efficiently on the mine site. This will include the re-use of TSF decant water and mine-affected water onsite as a priority,

- Design and construct all creek diversions in accordance with relevant elements of the ACARP (2002) design guideline and the DEHP guideline “Central West Water Management and Use Regional Guideline for Watercourse Diversions”. The detailed design of the creek diversions will form the basis of applications for Water Licences under the Water Act 2000,
- Consult with the relevant authority on the design of the fish passages during the detailed design phase of the creek diversions,
- Design and construct flood levees to provide protection for the mine infrastructure up to the 3000 year ARI flood level. Detailed levee designs will be submitted to the administering authority prior to construction commencing. Ongoing monitoring and maintenance of the creek diversions will be undertaken throughout the life of the project,
- Design, construct and operate all significant and high-hazard dams in accordance with the latest version of the DEHP Manual for Assessing Hazard Categories and Hydraulic Performance of Dams. Detailed designs for all significant and high-hazard dams will be submitted to the administering authority prior to construction commencing, and
- Develop and implement an Erosion and Sediment Control Plan for the mine.

## **GROUNDWATER**

HCPL will:

- Develop and implement a Groundwater Monitoring Program detailing the location and frequency of groundwater monitoring activities, as well as trigger levels and response actions,
- Expand the existing groundwater monitoring network over time to enable ongoing groundwater impact evaluations,
- Install groundwater monitoring bores a minimum six months prior to mining in an area,
- Undertake groundwater monitoring and sampling via a suitably qualified and experienced professional in accordance with recognised procedures and guidelines,
- Conduct an annual review of the monitoring data, using suitably qualified expert,
- Include in the review an assessment of groundwater level and water quality data, and the suitability of the monitoring network,
- Undertake groundwater modelling audits on a regular basis (intervals not exceeding three years) and provide the modelling results to the administering authority for review,
- Investigate all groundwater-based complaints, including the maintenance of a complaints register. The register will be made available to the regulating authority upon request, and
- Implement make-good agreements with land holders affected by groundwater drawdown.

## **FLORA AND FAUNA PROTECTION**

HCPL will:

- Develop and implement a Species Management Plan (SMP) to manage impacts on animal breeding places during construction and operations,
- Include a flora and fauna monitoring program in the SMP,
- Engage fauna spotters to conduct a thorough survey of clearing areas prior to clearing,
- Engage ecologists to precede or accompany clearing crews when clearing significant vegetation, in order to minimise disturbance to rare, threatened or other significant fauna,
- Ensure unauthorised disturbances to vegetation do not occur,
- Implement procedures to ensure that only the minimum land required for the safe construction and operation of the mine will be cleared,
- Obtain permits for clearing of any Endangered, Vulnerable, Near-Threatened or Least Concern species as required.

## **SOIL AND TOPSOIL**

HCPL will:

- Develop and implement a Topsoil Management Plan to effectively manage topsoil through the mining and rehabilitation process, and
- Include in the plan procedures for topsoil stripping, handling and stockpiling, recording of topsoil inventories, topsoil re-spreading, and amelioration.

## **WEED AND PEST CONTROL**

HCPL will:

- Develop and implement a Weed Management Plan to outline the procedures to be adopted to control the spread of weeds,
- Consult with local landholders prior to commencing construction or mining activities,
- Provide dedicated vehicle wash-down facilities on the mine site,
- Conduct an ongoing program to identify and treat existing weed populations on-site together with ongoing weed treatment over the life of the mine, and
- Develop and implement a Pest Management Plan in consultation with the local community and landowners to ensure consistent and effective onsite feral pest management.

## **CULTURAL HERITAGE**

HCPL will:

- Implement the requirements of the approved Cultural Heritage Management Plans,
- Work with traditional owners to monitor major land disturbance during construction,
- Avoid impact on sites and places of significance,
- Educate all project staff about significant sites and their management requirements,

- Employ a Heritage Consultant if dealing with sites of State significance,
- Stop all work upon discovery of fossils in the work area, notify the project Environmental Representative and notify the regulating authority, and
- Avoid impacts on sites of State Archaeological Significance.

## **MINE REHABILITATION**

HCPL will:

- Prepare and implement a Rehabilitation Management Plan to outline rehabilitation design and success criteria, species selection, rehabilitation procedures, and monitoring requirements,
- Comply with DEHP Guideline 18: Rehabilitation Requirements for Mining Projects,
- Undertake progressive rehabilitation of areas impacted by mining activities within twelve months of the affected areas becoming available for permanent rehabilitation, and
- Prepare and implement a Post Closure Management Plan prior to cessation of mining to detail post-closure maintenance and monitoring activities.

## **BIODIVERSITY OFFSETS**

HCPL has prepared a draft project Biodiversity Offset Strategy. HCPL will implement the strategy following approval and in consultation with the applicable regulatory authorities. The strategy includes:

- Identification of suitable potential offset areas with ecological values analogous to impacted ecological communities, and options for securing offsets,
- Options available for pooling or consolidation of offset requirements,
- Assessment of the ecological value and equivalence of offsets to ensure suitable offset extent, species assemblage, floristic structure and ecological integrity utilising an appropriate biometric field methodology,
- Development of appropriate management prescriptions to ensure long-term viability of offsets, including management activities such as pest control, weed control, livestock management, access exclusion, ameliorative plantings and fire regime management,
- Placement of appropriate covenants for future conservation and management of offsets, and
- Monitoring and maintenance activities and performance review processes to ensure long-term protection and viability of the offsets.

The mine offsets strategy will address the requirements of the following State policies:

- Biodiversity Offset Policy- Version 1 (2011)
- Fish Habitat Management Operational Policy FHMOP 005 (2002)
- Draft EPBC Act Environmental Offsets Policy (2007)

# Acronyms and abbreviations

Acronym/abbreviation	Definition
ACH Act	<i>Aboriginal Cultural Heritage Act 2003 (Qld)</i>
AEP	annual exceedence probability
AHD	Australian height datum
AMD	acid and metalliferous drainage
ANZECC	Australian and New Zealand Environment Conservation Council
BIBO	bus-in-bus-out
BRC	Barcaldine Regional Council
CDMP	coal dust management plan
CHMP	cultural heritage management plan
CHPP	coal handling and preparation plant
CLR	Contaminated Land Register
DAFF	Department of Agriculture, Fisheries and Forestry (Qld)
DCS	Department of Community Safety (Qld)
DEEDI	The former Department of Employment, Economic Development and Innovation (Qld)
DERM	The former Department of Environment and Resource Management (Qld)
DIDO	drive-in-drive-out
DNRM	Department of Natural Resources and Mines (formerly part of DERM)
DOC	Department of Communities (Qld)
EA	environmental authority
EIS	environmental impact statement
EIS	environmental impact statement
EMP	environmental management plan
EMR	Environmental Management Register
EP Act	Environmental Protection Act 1994 (Qld)
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999 (Cwlth)</i>
EPC	exploration permit for coal
EPP (Air)	Environmental Protection (Air) Policy 2008
EPP (Noise)	Environmental Protection (Noise) Policy 2008
EPP (Water)	Environmental Protection (Water) Policy 2009
ERA	environmentally relevant activity
FIFO	fly-in fly-out
GBRWHA	Great Barrier Reef World Heritage Area
GHG	greenhouse gas
GQAL	good quality agricultural land
HC IPL	Hancock Coal Infrastructure Pty Limited

HCPL	Hancock Coal Pty Ltd
IAS	initial advice statement
IOL	Indicative Offset Liability
IPCC	in-pit crushing and conveying
IRC	Isaac Regional Council
LOM	life of mine
MCU	material change of use
MDL	mineral development licence
MLA	mining lease application
MNES	matters of national environmental significance
MRA	Mineral Resources Act 1989 (Qld)
mtpa	million tonnes per annum
NAF	non-acid forming
NAPP	net acid producing potential
NCA	<i>Nature Conservation Act 1992 (Qld)</i>
NQBP	North Queensland Bulk Ports Corporation
OD	over-dimensional
PAF	potential acid forming
PMAV	property map of assessable vegetation
PMF	probable maximum flood
PMST	Protected Matters Search Tool
PVMO	Policy for Vegetation Management Offsets
QGEOP	Queensland Government Environmental Offsets Policy
RE	regional ecosystem
RIA	road impact assessment
ROL	reconfiguration of a lot
ROM	run-of-mine
RUMP	road-use management plan
SDA	state development area
SDPWO Act	<i>State Development and Public Works Organisation Act 1971 (Qld)</i>
SEIS	supplementary environmental impact statement
SEWPac	Australian Government Department of Sustainability, Environment, Water, Population and Communities
SIA	social impact assessment
SIAU	Social Impact Assessment Unit
SIMP	social impact management plan
SMP	species management program
SPA	<i>Sustainable Planning Act 2009 (Qld)</i>
TECs	threatened ecological communities
TMP	traffic management plan
TMR	Department of Transport and Main Roads (Qld)

TOR	terms of reference
TSF	tailings storage facility
TSP	total suspended particulate
VKT	vehicle kilometres travelled
VMA	<i>Vegetation Management Act 1999</i> (Qld)
WHAM	Whitsunday Hinterland and Mackay Region
WRC	Whitsunday Regional Council
WRP	water resource plan

# Glossary

Term	Definition
bilateral agreement	The agreement between the Australian and Queensland governments that accredits the State of Queensland's EIS process. It allows the Commonwealth Minister for the Environment to rely on specified environmental impact assessment processes of the state of Queensland in assessing actions under the <i>Environment Protection and Biodiversity Conservation Act 1999</i> (Cwlth).
controlled action	A proposed action that is likely to have a significant impact on a matter of national environmental significance; the environment of Commonwealth land (even if taken outside Commonwealth land); or the environment anywhere in the world (if the action is undertaken by the Commonwealth). Controlled actions must be approved under the controlling provisions of the <i>Environment Protection and Biodiversity Conservation Act 1999</i> (Cwlth).
controlling provision	The matters of national environmental significance, under the <i>Environment Protection and Biodiversity Conservation Act 1999</i> (Cwlth), that the proposed action may have a significant impact on.
Coordinator-General	The corporation sole constituted under section 8A of the <i>State Development and Public Works Organisation Act 1938</i> and preserved, continued in existence and constituted under section 8 of the SDPWO Act.
environment	As defined in Schedule 2 of the SDPWO Act, includes: <ul style="list-style-type: none"> <li>a) ecosystems and their constituent parts, including people and communities</li> <li>b) all natural and physical resources</li> <li>c) the qualities and characteristics of locations, places and areas, however large or small, that contribute to their biological diversity and integrity, intrinsic or attributed scientific value or interest, amenity, harmony and sense of community</li> <li>d) the social, economic, aesthetic and cultural conditions that affect, or are affected by, things mentioned in paragraphs (a) to (c).</li> </ul>
environmental effects	Defined in Schedule 2 of the SDPWO Act as the effects of development on the environment, whether beneficial or detrimental.
environmentally relevant activity (ERA)	An activity that has the potential to release contaminants into the environment. Environmentally relevant activities are defined in Part 3, section 18 of the <i>Environmental Protection Act 1994</i> (Qld).
imposed condition	A condition imposed by the Queensland Coordinator-General under section 54B of the SDPWO Act. The Coordinator-General may nominate an entity that is to have jurisdiction for the condition.

Term	Definition
initial advice statement (IAS)	<p>A scoping document, prepared by a proponent, that the Coordinator-General considers in declaring a significant project under Part 4 of the SDPWO Act. An IAS provides information about:</p> <ul style="list-style-type: none"> <li>• the proposed development</li> <li>• the current environment in the vicinity of the proposed project location</li> <li>• the anticipated effects of the proposed development on the existing environment</li> <li>• possible measures to mitigate adverse effects.</li> </ul>
matters of national environmental significance (MNES)	<p>The matters of national environmental significance protected under the <i>Environment Protection and Biodiversity Conservation Act 1999</i>. The eight matters are:</p> <ol style="list-style-type: none"> <li>a) world heritage properties</li> <li>b) national heritage places</li> <li>c) wetlands of international importance (listed under the Ramsar Convention)</li> <li>d) listed threatened species and ecological communities</li> <li>e) migratory species protected under international agreements</li> <li>f) Commonwealth marine areas</li> <li>g) the Great Barrier Reef Marine Park</li> <li>h) nuclear actions (including uranium mines).</li> </ol>
nominated entity (for an imposed condition for undertaking a project)	<p>An entity nominated for the condition, under section 54B(3) of the SDPWO Act.</p>
properly made submission (for an EIS or a proposed change to a project)	<p>Defined under section 24 of the SDPWO Act as a submission that:</p> <ol style="list-style-type: none"> <li>a) is made to the Coordinator-General in writing</li> <li>b) is received on or before the last day of the submission period</li> <li>c) is signed by each person who made the submission</li> <li>d) states the name and address of each person who made the submission</li> <li>e) states the grounds of the submission and the facts and circumstances relied on in support of the grounds.</li> </ol>
proponent	<p>The entity or person who proposes a significant project. It includes a person who, under an agreement or other arrangement with the person who is the existing proponent of the project, later proposes the project.</p>
significant project	<p>A project declared as a 'significant project' under section 26 of the SDPWO Act.</p>

Term	Definition
stated condition	<p>Conditions stated (but not enforced by) the Coordinator-General under sections 39, 45, 47C, 49, 49B and 49E of the SDPWO Act. The Coordinator-General may state conditions that must be attached to a:</p> <ul style="list-style-type: none"> <li>• development approval under the <i>Sustainable Planning Act 2009</i></li> <li>• proposed mining lease under the <i>Mineral Resources Act 1989</i></li> <li>• draft environmental authority (mining lease) under Chapter 5 of the <i>Environmental Protection Act 1994</i> (EPA)</li> <li>• proposed petroleum lease, pipeline licence or petroleum facility licence under the <i>Petroleum and Gas (Production and Safety) Act 2004</i></li> <li>• non-code compliant environmental authority (petroleum activities) under Chapter 4A of the EPA.</li> </ul>

