

South of the Embley project

Coordinator-General's report on the environmental impact statement

May 2012

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Synopsis

RTA Weipa Pty Ltd proposes to expand its bauxite mining operations in the Weipa area by developing a new mine south of the Embley River on Western Cape York Peninsula near Boyd Point. The mine will be located approximately 40 km south of Weipa and 40 km north of Aurukun.

The company currently operates mines at East Weipa and at Andoom north of the Embley River on mining lease ML7024 with some ore also mined from the Ely mining lease, ML7031. These ore reserves are depleting and the company plans to phase out mining operations north of the Embley River over the next 10 to 15 years.

The South of the Embley (SOE) Project involves a new open-cut bauxite mine, new processing plant, product stockpiles, new port and ship loading facilities as well as ancillary infrastructure, including power stations, workshops, offices, fuel storage, water supplies, access roads and barge and ferry facilities.

The new mine is expected to be staged, producing initially 22.5 million dry product tonnes per annum (Mdptpa) of bauxite from 2015 and expanding to 50 Mdptpa in future years depending on market conditions.

RTA Weipa Pty Ltd is a fully owned subsidiary of Rio Tinto Aluminium Limited. Both companies are held within the Rio Tinto Alcan group which is one of five operating groups within the global parent, Rio Tinto Limited.

A Coordinator-General's report is an essential step in a significant project's approval chain and is fundamental to whether a project proceeds or not.

This Coordinator-General's report evaluates the environmental impact statement (EIS) and environmental effects and social impacts of the South of the Embley Project and sets conditions and makes recommendations that must be implemented in subsequent development approvals and licences. It has been prepared in accordance with section 35 of the *State Development and Public Works Organisation Act 1971* (Qld) (SDPWO Act).

Assessed material includes, the EIS, supplementary information on the EIS (SEIS), properly made submissions and other submissions that have been accepted and other material relevant to the project, such as comments and advice from advisory agencies and other entities, technical reports and legal advice.

The following provides an overview of the main issues arising from the EIS assessment and conditions and recommendations made:

1. Rehabilitation and post-mining land use

One-third of all submissions received on the EIS raised concerns with rehabilitation at Weipa. In the main, these relate to post-mining land use and to lack of agreed completion criteria and have been raised by a number of community, government and scientific groups and members of the public.

I understand and share these concerns and believe that with continuous mining in the Weipa area now approaching fifty years, it is time for these key rehabilitation matters to be resolved. In drawing this conclusion however, I am mindful that RTAW and its

parent, Rio Tinto, acquired the Weipa operations in 2000 from Comalco and since then has strived to achieve rehabilitation outcomes in line with ecologically sustainable development principles.

On the question of post-mining land use, I believe the rehabilitation hierarchy as specified in the State's guideline, *Rehabilitation requirements for mining projects*¹ must be followed and, that as a base case, rehabilitation should be aimed at reinstating a natural ecosystem as similar as possible to the original, in accordance with the guideline, whilst acknowledging the post mining landscape.

Under RTAW's existing environmental authority, a rehabilitation management plan for the mines north of the Embley River must be prepared and submitted to the State by 30 August 2013. I believe that an interim rehabilitation management plan for the SOE site should be prepared and submitted concurrently, based on available information. The interim plan should be regarded as an adaptive management document, to be reviewed and updated on a regular basis in the light of rehabilitation trials and be finalised within three years of the commencement of mining.

It is acknowledged that RTAW has obligations under the Western Cape Communities Coordinating Committee Agreement to consult with traditional owners on rehabilitation methodologies and outcomes and that these consultations may lead to a future compelling case for a different post-mining land use in particular areas. If this situation eventuates and there are no significant associated environmental impacts, then I believe that the rehabilitation management plan should be adjusted accordingly as part of the review process.

I have stated conditions in this report in order to achieve these outcomes.

2. Commercial and recreational fisheries

The SOE project will have some adverse impact on commercial, recreational fishers and charter boat operators arising from capital and operational dredging for the port, loss of, or restricted access to fishing grounds and disturbance to the marine environment. RTAW recognises these impacts and has engaged with stakeholders to identify mitigation measures to offset these impacts.

In respect of commercial fisher impacts, RTAW proposes to provide financial compensation totalling \$242 000 based on compensation modelling undertaken by Fisheries Queensland, Department of Agriculture, Fisheries and Forestry (DAFF (FQ)), to those commercial fishers impacted by the development and to mitigate displaced fishing effort from effected areas. The amount, plus an administration fee is to be paid to DAFF (FQ) to develop suitable administrative arrangements with the Queensland Rural Adjustment Authority (QRAA) prior to the commencement of dredging operations at the proposed port. I view the impacts as essentially commercial in nature and endorse the proposal and make a recommendation that it be accepted by stakeholders.

¹ Department of Environment and Resource Management, *Rehabilitation requirements for mining projects*, Department of Environment and Resource Management, Brisbane, 2011, viewed 12 April 2012, <www.derm.qld.gov.au/register/p01673aa.pdf>.

In the matter of impacts to recreational fishers and charter boat operators, RTAW proposes to provide funding and/or works to the same value as that provided for commercial fishers (\$242 000) to be used for a community fisheries project within the Weipa region. A local recreational fishing reference group is proposed comprising representatives of charter boat operators and the Weipa Sportsfishing Club which shall be tasked with identifying a suitable community fisheries project. I endorse the approach and recommend that it be accepted by stakeholders.

3. New species of freshwater crab and shrimp

Ecological surveys undertaken for the EIS sampled two unidentified species of aquatic fauna.

The first of these is a species of freshwater crab (*Austrothelphusa* sp) first recorded in 2008 at a location near the proposed crossing of Winda Winda Creek by the mine access road from Hey Point at the northern end of the mine site. Assessment by the Queensland Museum suggests it may possibly be a new species.

The second species, a shrimp discovered in the upper Ward River estuary, was tentatively identified by the Queensland Museum as stygofauna belonging to the family Lepidomysidae. The shrimp habitat may be associated with groundwater springs (upwelling) that are common in the upper estuary.

I accept that both species may be new species and have adopted a precautionary approach in requiring that a conservative buffer setback of at least 200 metres from mining should apply in areas where the potential new species have been identified. It is also considered appropriate that further survey work be undertaken aimed at identifying the distribution of the species. Once this is completed and a decision taken on protection status for the species, the mining setback distance should be reviewed by DEHP. This report contains conditions to deliver these outcomes.

4. Social impacts and Indigenous training, employment and enterprise opportunities

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

The proponent has completed a comprehensive social impact assessment during the EIS process and lodged a draft SIMP as part of its supplementary information. 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, more than half of the SIMP action plans focus on employment outcomes or improving access to employment, primarily for Indigenous people over the life of the project.

There is an opportunity for the SOE project to contribute to future employment and training and education for Indigenous people in Aurukun, Mapoon and Napranum in addition to direct mining jobs. Some of these opportunities are being driven through the

Western Cape Regional Partnership Agreement, of which RTAW is a member. Other opportunities will be delivered through the respective SIMP action plans.

To ensure local and Indigenous business participation is maximised, the proponent will develop a Local and Indigenous Sourcing Strategy. The selection criteria for all contractors include aspects relating to Indigenous employment as a key component for a successful tender. A contractor's willingness to partner with RTAW to support Indigenous employment and promote local Aboriginal employment within construction as a pipeline for future careers with the contractor, or with RTAW operations, is an agreed action within the SOE Indigenous Employment and Training strategy

An overarching SIMP Steering Committee will be established to monitor and evaluate the progress of the SIMP action plans for the SOE Project. The SIMP Steering Committee will have an Independent Chair who will facilitate meetings in an independent and impartial manner. The chair will be jointly appointed by RTAW and the Coordinator General.

It is agreed that overall, RTAW workforce figures will largely reflect current levels until production is over 30 million dry product tonnes per annum. Accordingly, RTAW will liaise with Skills Queensland through the development of the SOE project to ensure the workforce management plan addresses workforce demand and supply issues and resulting mitigation strategies.

RTAW will develop a Weipa Housing and Accommodation and Infrastructure Master Plan before commencement of operations in consultation with the Department of Housing and Public Works. The plan will be provided to the SIMP Steering Committee for review, prior to commencement of operations.

5. Environmental offsets

I have determined that the principles of the Queensland Biodiversity Offsets Policy (BOP) will apply to the project and that offsets will be necessary where there are residual impacts to state significant biodiversity values that otherwise cannot be avoided or mitigated. The objective is no net loss of biodiversity in accordance with the principles of the BOP.

The proponent has undertaken an assessment of the project against the BOP to determine offset obligations and has submitted a proposal to meet these obligations which is presented in Appendix 5 of this report.

A terrestrial land based offset of 355.2ha of equivalent ecological value is proposed on the mining lease to offset residual impacts together with a marine turtle offset proposal aimed at enhancing turtle hatchling survival rates through control of feral pig predation of turtle nests on the foreshore between Ina and Winda Winda Creeks.

I accept these offset proposals and have stated conditions in this report covering their implementation and the future legal securing of sites in consultation with relevant aboriginal parties and DEHP.

Coordinator-General's conclusion

I consider that the environmental impact assessment requirements of the SDPWO Act for the South of the Embley Project have been satisfactorily fulfilled and that sufficient

information has been provided to enable a proper evaluation of the potential impacts of the project.

I conclude that there are significant local, regional, state and national economic benefits to be derived from the project, and that any negative environmental or social impacts can be acceptably managed by implementation of the measures and commitments outlined in the EIS documentation. Conditions and recommendations in this report have been formulated in order to further manage impacts to social, environmental and economic values through environmental authorities, development permits and Coordinator-General imposed conditions or other policy, regulatory and licence arrangements.

Pursuant to section 35 of the SDPWO Act, I find that the South of the Embley Project, as described in the EIS, SEIS and summarised in Section 2 of this report can proceed, subject to the conditions and recommendations contained herein and subject to RTAW obtaining subsequent statutory approvals and meeting its commitments listed in this report.



Barry Broe

Coordinator-General

23 May 2012

1. Introduction

This Coordinator-General's report evaluates the environmental impact statement (EIS) and subsequent supplementary material on the EIS (SEIS) prepared by RTA Weipa Pty Ltd (RTAW) for the South of the Embley Project (SOE project).

It assesses the key issues associated with the project's potential impacts on the physical, social and economic environment at the local, regional, state and national levels. It does not record all matters identified and addressed during the EIS process but concentrates on substantive environmental effects and related matters.

The report also sets conditions and makes recommendations that must be incorporated into subsequent development approvals and licences required to be issued by various State authorities.

It represents the conclusion of the Coordinator-General's impact assessment process pursuant to the *State Development and Public Works Organisation Act 1971* (SDPWO Act). 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.

2. About the project

2.1. The proponent

The project is to be developed and operated by RTAW which is a wholly owned subsidiary of Rio Tinto Aluminium Limited. Both of these companies are held in the Rio Tinto Alcan product group, which is one of five product groups operated by the global mining group, Rio Tinto.

Rio Tinto Alcan supplies bauxite, alumina and primary aluminium to Australia, New Zealand and export markets. About 37 per cent of Australia's total production of bauxite, 36 per cent of its alumina and 40 per cent of its primary aluminium is provided by Rio Tinto Alcan.

Rio Tinto Alcan bauxite and alumina interests held in Queensland include the existing Weipa mine and the Yarwun and Queensland Alumina Limited alumina refineries in Gladstone. The company also operates the Boyne Smelters Limited aluminium smelter in Gladstone.

2.2. Project description

RTAW and its parent company Rio Tinto Aluminium Limited (formerly Comalco Aluminium Limited) have collectively mined and shipped bauxite from its existing Weipa operations since 1963. Weipa is located on the western side of Cape York on the Gulf of Carpentaria in northern Queensland, approximately 600km north-west of Cairns—refer Figure 2.1 (Fig 1-1 of EIS).

RTAW holds mining lease (ML) 7024 (granted 1 January 1958) pursuant to the *Commonwealth Aluminium Corporation Limited Agreement Act 1957* (Qld) (Comalco Agreement Act), and ML6024 (granted 25 July 1985) pursuant to the Comalco Agreement Act and *Mineral Resources Act 1989* (Qld).

RTAW is currently mining the East Weipa and Andoom deposits located on ML7024 north of the Embley River and, by contractual arrangement, is also mining the adjacent Ely bauxite deposit on ML7031 held by Alcan South Pacific Pty Ltd which was acquired by Rio Tinto in 2007. Mined bauxite is trucked to one of two beneficiation plants located at Lorim Point and Andoom and then conveyed to RTAW's stockpiles prior to shipment from the Port of Weipa. These northern operations are shown in Figure 2.2 (Fig 1-2 of EIS).

RTAW holds Environmental Authority (EA) MIN 100939109 (mining activities) which authorises mining activities on ML7024 and ML6024. The company is proposing to amend this EA to permit mining activities south of the Embley River.

The northern bauxite reserves are gradually depleting, and with continuing demand for bauxite, RTAW plans to commence mining on ML7024 south of the Embley River, which could sustain a mining operation for about 40 years depending on annual production rate.

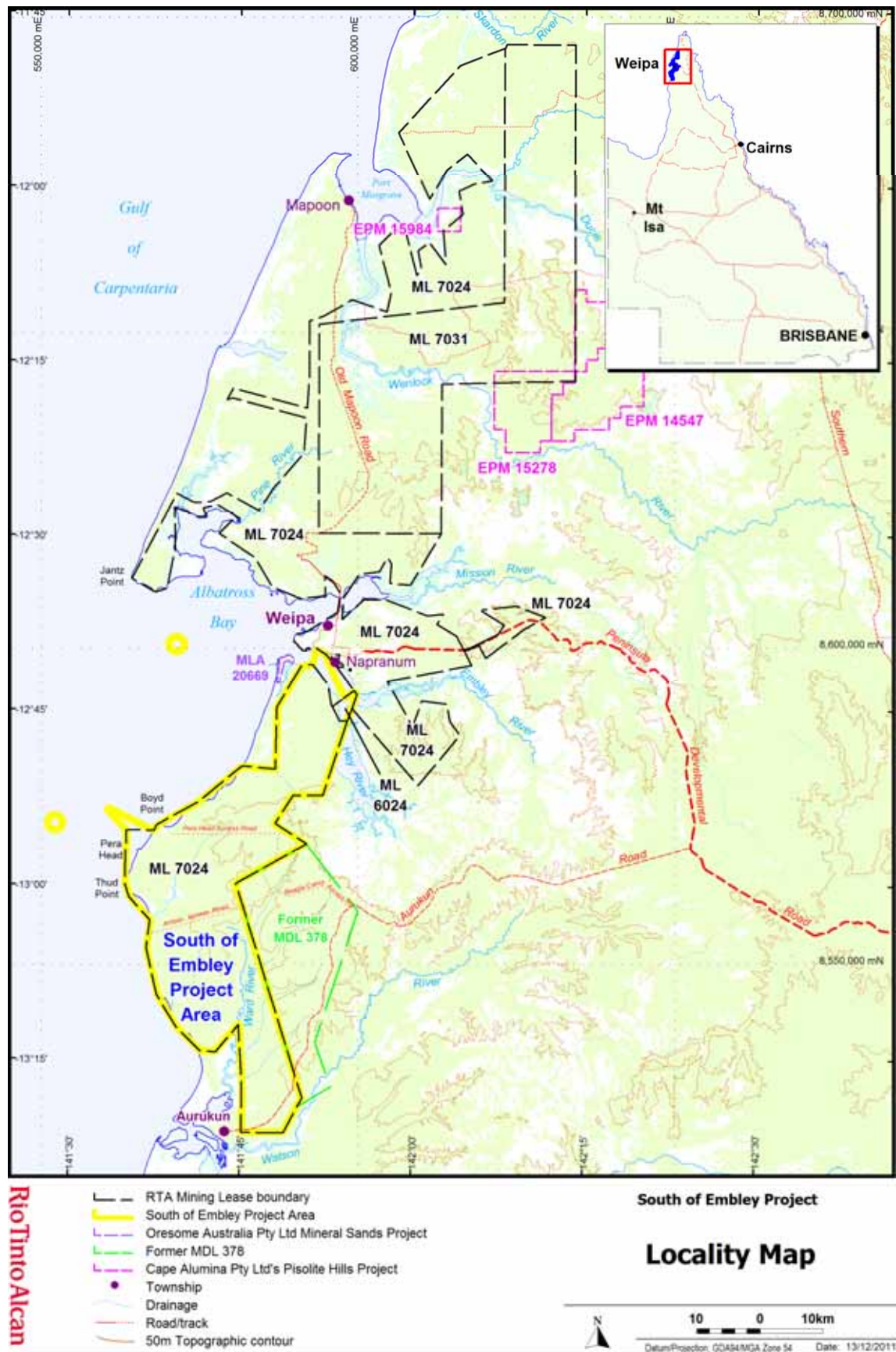


Figure 2.1 Project area

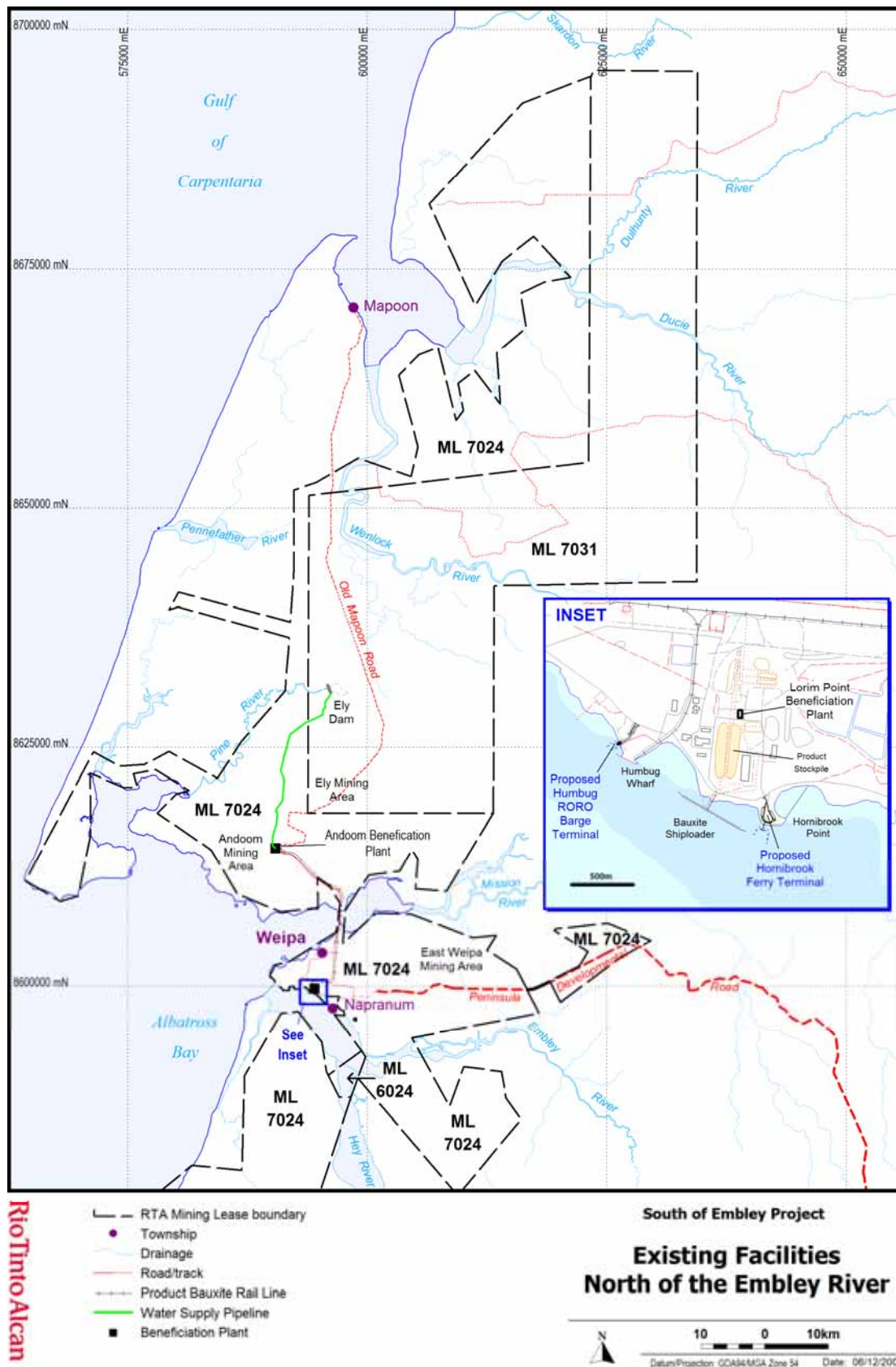


Figure 2.2 Existing facility north of the Embley River

2.2.2. Location

The SOE project is located near Boyd Point on the western side of Cape York Peninsula, approximately 40 kilometres south-west of Weipa and 40 kilometres north of Aurukun. The mining areas will be located on that portion of ML7024 south of the Embley River, whilst other elements will be located on ML6024, on certain strategic port land within the Port of Weipa, and at offshore dredging and disposal areas.

2.2.3. Components

The SOE project consists of the following key components:

- **bauxite mining**—clearing, salvage of topsoil, stripping of overburden, extraction of up to 50 million dry product tonnes per annum (Mdptpa) of bauxite, replacement of topsoil and revegetation. Mined areas will be progressively rehabilitated
- **bauxite processing**—crude bauxite transportation using a network of internal haul roads to one of two beneficiation plants (Boyd beneficiation plant, followed by a second plant at Norman Creek). A beneficiation plant separates the bauxite and waste materials through screening, crushing, washing and dewatering. Chemicals are not used in the process, only water. Fine waste materials will be discharged to tailings storage facilities
- **product bauxite stockpiles**—product stockpiles and a stacker-reclaimer established adjacent to the port facilities
- **port and ship-loading facilities**—construction and operation of a new port, ship-loading and tug mooring facilities between Boyd Point and Pera Head. Works will include a jetty, berths, ship-loader and dredging of berth pockets and departure areas. Protected moorings for tugs to use during inclement weather will also be constructed alongside the existing Lorim Point east wharf. Construction of these facilities will require the dredging and disposal at sea of approximately 6 500 000 m³ of dredged material, for the initial phase of the port. Maintenance dredging of the port and shipping channel will require annual disposal of about 1 200 000 m³ of spoil
- **ancillary infrastructure**—construction and operation of diesel-fuelled power stations, workshops, warehouse, administration facilities, a package sewage treatment plant, general waste disposal and diesel storage facilities
- **water infrastructure**—construction of a water supply dam on a freshwater tributary of Norman Creek (Dam C), with the later construction of a water pumping station on the Ward River, plus pipelines and up to 12 artesian bores
- **temporary on-site camp for the construction phase**—construction of a facility to accommodate, at peak, up to 1400 personnel (630 originally specified in the EIS) to meet a shortened construction timeframe. The existing Evans Landing camp (located on ML7024) will also be used during the construction phase as required. During the operations phase, employees will be housed in the existing Weipa community and commute to site on a daily basis via ferry and a new mine access road
- **barge and ferry facilities**—construction and operation of a new ferry terminal at Hornibrook Point, a roll-on/roll-off (RORO) barge facility at Humbug Wharf, and a new barge/ferry terminal on the western bank of the Hey River. These will be used

to transport workforce, materials and equipment between Weipa and the project. Dredged material derived from the construction of these facilities is to be disposed of at the existing spoil area for the Port of Weipa

- **temporary seaborne access**—the SEIS reported that early development of the site will involve constructing a temporary passenger jetty in the Boyd Bay area and a barge landing to the north of Pera Head, to enable landing of the start-up workforce and delivery of construction equipment and materials. The proponent has advised that these facilities will be required for a period of around 12 months.

The location of the main project infrastructure components are illustrated in Figure 2.3 (Fig 1-3(sup) of SEIS).

2.2.4. Development stages

The EIS indicated that initial production will take place at 15–22.5 Mdtpa, depending on further studies. In the SEIS, initial production was confirmed at 22.5 Mdtpa leading to full production of 50 Mdtpa at a future stage.

The initial phase of mining operations will involve production to substitute depleted East Weipa economic reserves as well as developing third party markets. Production capacity will expand to around 30 Mdtpa to replace Andoom production once those economic reserves are depleted in approximately 15 years. Production capacity will thereafter be expanded to 50 Mdtpa when market conditions are suitable. The project has bauxite reserves capable of sustaining a mine life of approximately 40 years, depending on annual production rate.

Project construction is anticipated to commence in 2013.

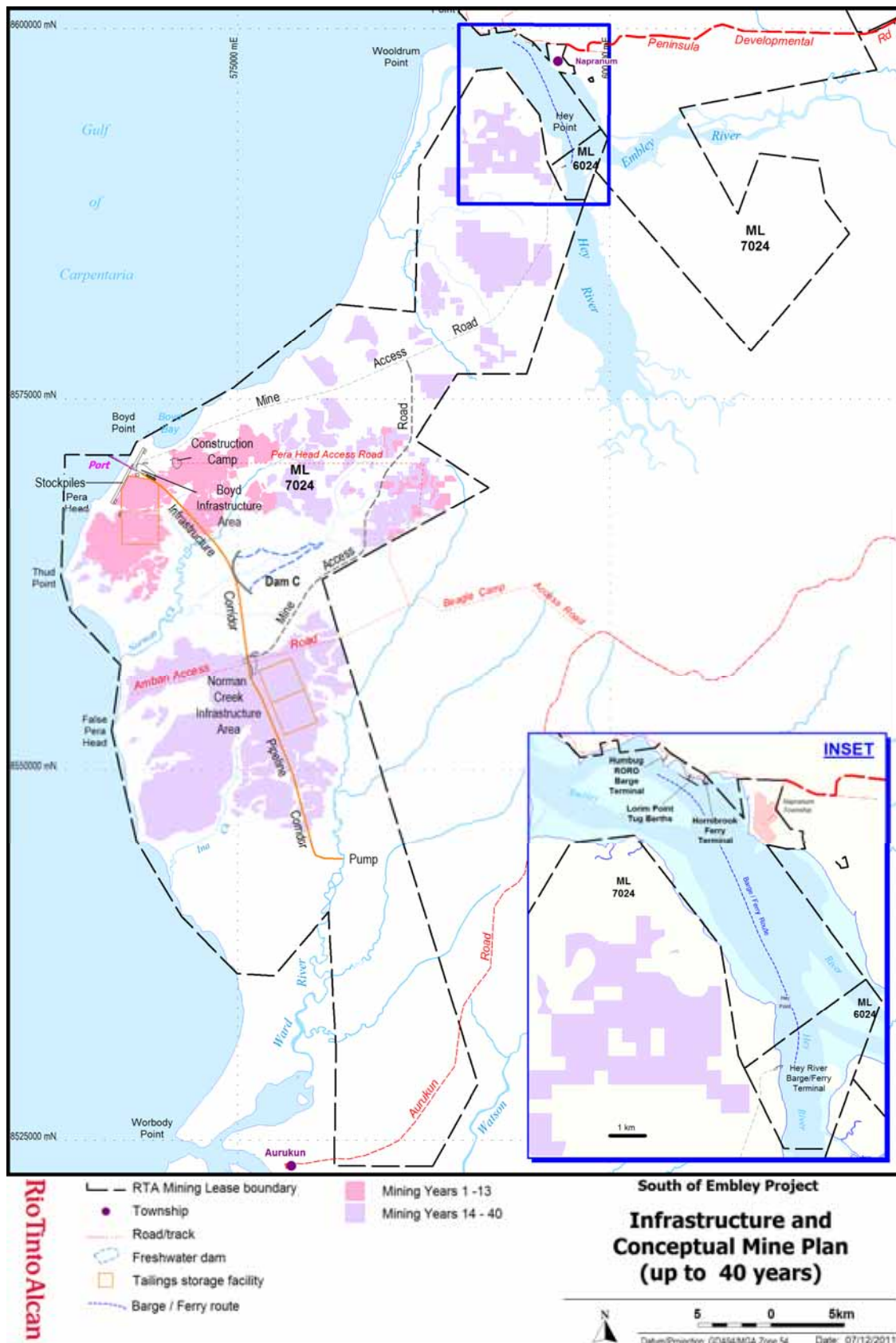


Figure 2.3 Major projects infrastructure components

2.3. Project rationale

Key objectives of the project are listed as:

- extension of the life of RTAW's mining operations in Weipa beyond depletion of East Weipa and Andoom reserves
- maintenance of continuity of bauxite supply to Gladstone refineries and third parties
- increased bauxite production in the Weipa region in response to the rising world demand for this product and enhancement of RTAW's competitiveness as a bauxite producer
- continuation of mining-related employment in the Western Cape region
- maintenance of Weipa as the main residential and commercial support base for the project
- operation of the mine in a manner that has an acceptable impact on surrounding communities and the environment
- development and operation of the project in compliance with all relevant statutory requirements
- continuation of an open and honest relationship with stakeholders.

The EIS reported that construction of the initial stage is expected to take approximately three years at an estimated capital cost of approximately \$1450 million, subject to completion of final feasibility studies. The project will deliver significant economic benefits to the local, regional, and state economies. Economic modelling in the EIS predicted:

- a peak construction workforce of 630 (since upgraded to 1400 in the SEIS), with an average of 310 full-time equivalent jobs over the three years
- following commencement of production, the project will generate direct employment for approximately 400 employees and 100 contractors (based on 15 Mdtpa) and up to 1020 employees and 255 contractors at maximum production (50 Mdtpa)
- an estimated 1170 jobs generated indirectly across other sectors of the Queensland economy, including approximately 790 jobs in the Far North Queensland (FNQ) region (based on a production rate of 15 Mdtpa)
- a contribution to Queensland's economy of approximately \$832 million per year (based on 15 Mdtpa) and up to \$3 billion per year at maximum production (50 Mdtpa)
- generation of approximately \$123 million in taxes and royalties per year (based on 15 Mdtpa) and up to \$410 million in taxes and royalties per year at a maximum production rate (50 Mdtpa).

The SEIS reported that since the EIS was released, further project refinements now place the average construction workforce at 950 per annum over 30 months (1400 peak) on account of a shortened construction time, changed work roster and increase in the scale of works.

RTAW has undertaken a range of studies to optimise the project design and a number of alternatives for various project components have been considered. These are addressed in the EIS and include:

- beneficiation plant location
- port and stockpile location
- workforce housing
- barge and ferry terminal locations
- power supply
- beneficiation plant technology
- water demand management
- water supply
- initial tailings storage facility establishment
- disposal of dredged material.

The option of not proceeding with the project is considered financially unfeasible as the bauxite reserves will be depleted in RTAW's current mining areas leading to the progressive closure of the Weipa mine. Without an alternative source, the Gladstone alumina refineries will lose a viable, ongoing source of bauxite and the town of Weipa will lose a major financial contributor.

3. Impact assessment process

3.1. Overview

This section of the report details the steps involved in the project's EIS assessment process. For a detailed explanation of the EIS process, refer to www.projects.industry.qld.gov.au

In undertaking this evaluation, the Coordinator-General has considered the following:

- initial advice statement (IAS)
- EIS
- issues raised in submissions relating to the EIS
- SEIS
- technical reports
- advice sought from Government advisory agencies:
 - Department of Communities (now Department of Communities, Child Safety and Disability Services—DCCSDS)
 - Department of Community Safety (DCS)
 - Department of Employment, Economic Development and Innovation (DEEDI) (now Department of State Development, Infrastructure and Planning—DSDIP)
 - Department of Environment, and Resource Management (now Department of Environment and Heritage Protection—DEHP)
 - Department of Justice and Attorney-General
 - Department of Local Government and Planning (now Department of Local Government—DLG)
 - Department of Transport and Main Roads (TMR)
 - Qld Health (QH)
 - Qld Police (QPS)
 - Aurukun Shire Council
 - Cook Shire Council
 - Mapoon Aboriginal Shire Council
 - Napranum Aboriginal Shire Council
 - North Queensland Bulk Ports Corporation
 - Weipa Town Authority
- comments and properly made submissions² from non-government organisations and members of the public.

Table 3.1 shows the steps taken in the project's EIS process.

² For a definition of a 'properly made submission', refer to the Glossary on page 262 of this report.

Table 3.1 Overview of EIS process

Date	Process
11 Jul 2008	Final initial advice statement and request for project declaration received
2 Oct 2008	Australian Government determined project is a 'controlled action' to be assessed under the bi-lateral agreement
21 Nov 2008	Project declared 'significant project' by Coordinator-General
17 Jan 2009 to 16 Feb 2009	Submission period for draft terms of reference (TOR)
1 Apr 2009	TOR finalised
13 Sep 2010	Re-referred to Australian Government on account of project variation
29 Oct 2010	Australian Government determined project is a 'controlled action' to be assessed by EIS under EPBC Act in parallel with the State process
19 Jan 2011	EIS provided to Coordinator-General and Australian Government for evaluation
26 May 2011	Australian Government approves release of EIS for a common public review with the State
1 Aug 2011 to 12 Sep 2011	EIS released for public and agency comment (six-week period)
18 Nov 2011	Coordinator-General direction to RTAW for supplementary EIS work required for State (SEIS)
27 Jan 2012	SEIS lodged with Coordinator-General
10 Feb 2012	SEIS released for public information and agency review
9 Mar 2012	Advisory agency review period closes
15 Mar 2012	Australian Government revokes referral decision and makes a new controlled action decision
	Coordinator-General releases evaluation report

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). This declaration initiated the statutory environmental impact evaluation procedure of Part 4 of the Act, which requires the proponent to prepare an EIS.

3.3. Controlled action

On 2 October 2008, the delegate of the then Commonwealth Minister for Environment, Heritage and the Arts determined that the project was a 'controlled action'³ under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) (EPBC Act) (EPBC ref 2008/4435).

³ For a definition of 'controlled action', refer to the Glossary on page 262 of this report.

The relevant controlling provisions under the EPBC Act were listed as:

- sections 18 and 18(a) listed threatened species and ecological communities
- sections 20 and 20(a) migratory species protected under international agreements.

The delegate also determined that assessment of the project should be undertaken through the bilateral agreement that exists between the Australian and Queensland governments. This allows the Queensland Government to conduct one EIS assessment process to meet the requirements of both jurisdictions.

On 13 September 2010, RTAW re-referred the project to the Commonwealth Environment Minister on account of project changes involving a substantial increase in port dredging to accommodate Cape-size vessels. On 29 October 2010, the minister determined that the amended project was a 'controlled action' with the following controlling provisions (EPBC ref 2010/5642):

- sections 18 and 18A listed threatened species and ecological communities
- sections 20 and 20A migratory species protected under international agreements
- sections 23 and 24A Commonwealth marine areas.

The minister also determined that the project should be assessed by way of an EIS under Part 8 of the EPBC Act in parallel with the State's assessment.

On the 15 March 2012 the Commonwealth Environment Minister revoked his referral decision of 29 October 2010 and made a new controlled action decision adding three new controlling provisions for the Commonwealth assessment:

- sections 12 and 15A World Heritage properties
- sections 15B and 15C National Heritage places
- sections 24B and 24C Great Barrier Reef Marine Park

Each EIS process requires matters to be addressed for the individual assessments by the Queensland and Australian governments and the project will require approval from both the Queensland and Australian governments before it can proceed.

This EIS evaluation report addresses matters of relevance to the State only and does not consider impacts to matters of national environmental significance. The Australian Government will separately assess impacts to matters of national environmental significance and will make a separate project approval decision.

3.4. Terms of reference

A draft terms of reference (TOR) for the EIS was prepared and publically reviewed over a four-week period from 17 January 2009 to 16 February 2009. Eighteen submissions were received, comprising 15 from advisory agencies, two from non-government organisations and one from a private submitter.

No substantive issues of widespread commonality were raised from the public review process. The more significant matters, related to:

- cumulative biodiversity impacts arising from existing and proposed mining projects on the western Cape York Peninsula

- impacts on Indigenous communities
- impacts from dredging and spoil disposal
- water supply, and hydrological impacts
- impacts on the Port of Weipa from the proposed new port near Boyd Point.

A final TOR was prepared having regard to submissions received and was issued to RTAW on 1 April 2009.

3.5. Review of the EIS

The EIS was approved for release by the Australian Government on 26 May 2011 and by the Coordinator-General on 3 July 2011 for a common public review period of six weeks from 1 August 2011 to 12 September 2011. The public review process was managed by the office of the Coordinator-General on behalf of the Queensland and Australian governments and provided submitters with a single point for lodging submissions.

Twenty four submissions were received including 9 from government agencies, 10 from non-government organisations and 5 from individuals. As well as RTAW, copies of all submissions were forwarded to the Department of Sustainability, Environment, Water, Population and Communities (SEWPaC) on behalf of the Australian Government, to allow SEWPaC to conduct its separate assessment of matters of national environmental significance under the EPBC Act.

From the State Government areas of responsibility, substantive issues raised in submissions related to:

- rehabilitation and post mining land use
- impacts to commercial and recreational fisheries
- impacts on potential new species of freshwater crab and shrimp
- indigenous training, employment and enterprise opportunities
- housing and accommodation provision.

Table 3.2 summarises the number of public and agency submissions on the EIS. For the Coordinator-General's assessment of the environmental impacts of this project, refer to Section 5 of this report ('Environmental impacts').

Table 3.2 Public and agency comments received on the EIS

Agency	No. submissions
Queensland Government • Department of Transport and Main Roads (TMR) • Department of Community Safety (DCS) • DOC (now Department of Communities, Child Safety and Disability Services—DCCSDS) • Queensland Health • DEEDI (now Department of State Development, Infrastructure and Planning—DSDIP) • Qld Police • DERM (now Department of Environment and Heritage Protection—DEHP)	7
Local Government • Weipa Town Authority • Cook Shire Council	2
Non-government organisations • Western Cape Communities Coordinating Committee • Western Cape York Turtle Conservation Project • Cape York Sustainable Futures • Western Cape Chamber of Commerce • Gulf Alumina • Fish's Fly & Sportfishing • Tackle World Weipa • Wilderness Society of Qld • Qld Seafood Industry Association • Gulf of Carpentaria Commercial Fishermen's Association Inc	10
Private individuals	5
TOTAL	24

3.6. Supplementary information

On 13 January 2012, the Coordinator-General requested that RTAW submit supplementary information to address issues raised in submissions on the EIS and to address impacts likely to arise from a number of minor project changes proposed since the EIS was released (SEIS). The more significant of these project changes are:

- temporary beach and/or jetty construction access to permit construction of the worker's camp to commence in advance of construction of the northern access road
- a 50-hectare increase in vegetation clearing for an expanded construction laydown and topsoil stockpile area
- increase in size of the construction campsite from 630 to 1400 workers at peak
- increase in aggregate haulage trips from the Archer River Quarry from 215 to 8300
- increase in the tailings storage facilities footprints from 1160 hectares to 2200 hectares.

RTAW submitted the SEIS on 27 January 2012.

3.7. Advisory agency advice

The SEIS was released for public information on 10 February 2012 and forwarded to advisory agencies for review and final comment which closed on 9 March 2012. The Coordinator-General has considered this final advice in framing this evaluation report.

4. Project approvals

On release of this evaluation report, RTAW will need to obtain a range of statutory approvals under State and Commonwealth law before the project can lawfully proceed.

In regard to approvals under State law, I have stipulated certain conditions that must be part of such approvals by the relevant agencies. These conditions are contained in Appendix 1 and Appendix 3 of this report. Approving agencies may add further conditions to approvals, if considered necessary, but these cannot be inconsistent with the Coordinator-General's conditions.

I have also made certain recommendations that must be considered by approving agencies in making their approval decisions. These recommendations are included in Appendix 4, Part A.

Key approvals/permits/licences that will need to be obtained by RTAW are listed in Table 4.1 below. State approvals may be sought following the release of this report.

Table 4.1 Key approvals/permits/licences required for the project

Approval/permit/licence	Legislation	Authority	Comments
Project-wide			
Significant project EIS approval	<i>State Development and Public Works Act 1971</i> (Qld) (SDPWO Act)	Department of State Development, Infrastructure and Planning (DSDIP)	Covered by this report.
Controlled action approval	<i>Environment Protection and Biodiversity Conservation Act 1999</i> (Cwlth) (EPBC Act)	Department of Sustainability, Environment, Water, Population and Communities (SEWPaC)	Project was declared a 'controlled action' on 29 October 2010.
Amended Environmental Authority (EA) ⁴	<i>Environmental Protection Act 1994</i> (Qld) (EP Act)	Department of Environment and Heritage Protection (DEHP)	Covers mining and all associated activities on the mining lease.
Humbug, Hornibrook terminals and tug berths			
Resource entitlement	<i>Sustainable Planning Act 2009</i> (Qld) (SPA) and Sustainable Planning Regulation 2009 (Qld) (SP Reg.)	Department of Natural Resources & Mines (DNRM)	Required for development applications involving State resources on areas outside the mining lease.

⁴ Existing Environmental Authority MIN 100939109 covers current mining operations on ML7024 north of the Embley River. This is to be amended to include the South of the Embley operations.

Approval/permit/licence	Legislation	Authority	Comments
Development approval for barge and ferry terminals	SPA and <i>Coastal Protection and Management Act, 1995</i> (Qld) (CPM Act)	North Queensland Bulk Ports (NQBP) assessment manager. DEHP concurrence agency	Required for operational works to reclaim land and operational works in the tidal areas of NQBP Strategic Port Land.
Commonwealth sea dumping permit (for dredged spoil)	<i>Environmental Protection (Sea Dumping) Act 1981</i> (Cwlth)	SEWPaC	Required for dredging and disposal of spoil at existing Albatross Bay spoil ground in Commonwealth waters.
Development approval for material change of use for an environmentally relevant activity (ERA) 16 and associated registration certificate.	SPA, EP Act and Environment Protection Regulation 2008 (Qld) (EP Reg.)	NQBP assessment manager. DEHP concurrence agency	Queensland Government approvals required for dredging in State waters outside a mining lease.
Removal of marine plants – development approval for operational works	SPA and <i>Fisheries Act 1994</i> (Qld)	NQBP assessment manager. Dept of Agriculture, Fisheries and Forestry (DAFF) concurrence agency	Required if marine plants found to be present and required to be removed.
Hey River Terminal			
Commonwealth sea dumping permit (for dredged spoil)	<i>Environmental Protection (Sea Dumping) Act 1981</i> (Cwlth)	SEWPaC	Required for dredging and disposal of spoil at existing Albatross Bay spoil ground in Commonwealth waters.
Temporary sea-borne access for personnel, equipment and materials for site establishment			
Minor amendment to EA MIN100939109	EP Act	DEHP	Passenger jetty and barge landing infrastructure associated with temporary seaborne access within the mining lease boundary.
Upgrade of Beagle Camp and Pera Head Access Roads			
Resource entitlement	SPA and SP Reg.	DNRM	Required for development applications involving state resources on areas outside the mining lease.

Approval/permit/licence	Legislation	Authority	Comments
Development approval for operational works for waterway barrier/fish barrier	SPA and <i>Fisheries Act 1994</i> (Qld)	DAFF assessment manager	Required for a dam or water crossing that inhibits fish movement outside of mining lease.
Development approval for operational work to clear vegetation	SPA and <i>Vegetation Management Act 1999</i> (Qld)	DNRM assessment manager	Required if road needs to be realigned or widened outside of mining lease.
Port			
Port approval	<i>Commonwealth Aluminium Corporation Limited Agreement Act 1957</i> (Qld) (Comalco Agreement Act)		Harbour works are authorised under the Comalco Agreement Act, which includes dredging in tidal waters for the port on ML7024.
Commonwealth sea dumping permit (for dredged spoil)	<i>Environmental Protection (Sea Dumping) Act 1981</i> (Cwlth) (EPSD Act)	SEWPaC	Required for dredging and disposal of spoil at proposed new spoil ground in Commonwealth waters.
Resource entitlement	SPA and SP Reg.	DNMR	Required for dredging in State waters outside the mining lease.
Development approval for approach-channel dredging	SPA and CPM Act	DEHP assessment manager	Required for operational works in tidal waters outside ML7024.
Development approval for material change of use for an environmentally relevant activity (ERA) 16 and associated registration certificate.	SPA, EP Act and EP Reg.	DEHP assessment manager	Queensland government approvals required for dredging in State waters outside a mining lease.
Water facilities on mining lease			
Licence to take water (surface water)	Comalco Agreement Act and <i>Water Act 2000</i>	DNRM	Pre-existing rights to take water for the project are held under the Comalco Agreement Act and preserved under section 1037A of the <i>Water Act 2000</i>

Approval/permit/licence	Legislation	Authority	Comments
Water storage dam – development approval	Comalco Agreement Act and <i>Water Act 2000</i>	DNRM	Pre-existing rights to build dams for the project are held under the Comalco Agreement Act and preserved under the <i>Water Act 2000</i> .
Approval of failure impact assessment (of dams)	<i>Water Supply (Safety and Reliability) Act 2008</i> (Qld)	DNRM	Required for dams with a wall height > 8 m in height and storage capacity of > 500 ML. Dam C water storage dam will require failure impact assessment.
Licence to take water (sub-artesian)	<i>Water Act 2000</i>	DNRM	Required if taking sub-artesian water in declared sub-artesian area under section 1046 of the <i>Water Act 2000</i> . A declared sub-artesian area exists. Use of sub-artesian water is not currently planned.
Licence to take water (artesian)	<i>Water Act 2000</i>	DNRM	The Comalco Agreement Act permits 12 artesian bores under section 32(b) (or more with Minister's consent). A licence to take artesian water is still required.
Development approvals for artesian bores	<i>Water Act 2000</i>	DNRM assessment manager	Required for installation of artesian groundwater bores.

5. Environmental impacts

This section outlines the major environmental effects⁵ identified in the EIS, supplementary project information, submissions on the EIS and comments from advisory agencies and other stakeholders. This report provides comments on the effects and, where necessary, includes conditions or recommendations to mitigate adverse impacts.

The following subsections describe the issue, explain the stakeholders' position, and provide the Coordinator-General's conclusions.

5.1. Land

5.1.1. Rehabilitation

Context

Bauxite mining at Weipa commenced in the early 1960s under the authority of a special agreement act - *Commonwealth Aluminium Corporation Pty. Limited Agreement Act 1957* (Comalco Agreement Act). In 1999, the State determined that environmental compliance of mining will be managed under the *Environmental Protection Act 1994* (EP Act) and arrangements were put in place to transition mines under special agreement acts to the EP Act. An environmental authority for RTAW's existing operations north of the Embley River was issued on 30 August 2011.

RTAW proposes to rehabilitate disturbed mining and infrastructure areas on the SOE site to a stable, self-sustaining landscape utilising appropriate local native tree, shrub and grass species that require minimal maintenance and protect downstream water quality.

The EIS outlines a rehabilitation strategy for the project based on *Technical Guidelines for the Environmental Management of Exploration and Mining in Queensland—Determination of Post-Mine Land Use*.⁶ The strategy consists of the following integrated measures:

- implementation of practical landform designs, to prevent erosion and establish final landform stability
- revegetation trials, for selection of appropriate revegetation species and methodologies
- progressive rehabilitation of disturbed areas, using rehabilitation procedures appropriate to the type of disturbance
- appropriate management of the final bauxite processing waste, including construction of an earth cover

⁵ For a definition of 'environmental effects', refer to the Glossary on page 262 of this report.

⁶ Department of Minerals and Energy, *Technical Guidelines for the Environmental Management of Exploration and Mining in Queensland—Determination of Post-Mine Land Use*, Department of Minerals and Energy, Brisbane, 1995, viewed 12 April 2012, <http://www.derm.qld.gov.au/environmental_management/land/mining/technical_guidelines.html>.

- erosion control measures, consistent with the practices described in *Technical Guidelines for Environmental Management for Exploration and Mining in Queensland – Erosion Control*.⁶

Rehabilitation will commence progressively as areas become available in accordance with the plan of operations and a detailed operational rehabilitation procedure, including a quality assurance process, will be developed and implemented.

In response to a request from the office of the Coordinator-General for further information on rehabilitation goals, objectives, indicators and completion criteria, RTAW provided broad information on the first three aspects in the SEIS but no details were provided on completion criteria. RTAW intends to report on these matters as part of a rehabilitation management plan that it proposes to lodge with DEHP three years after commencing mining south of the Embley River, following on-site rehabilitation trials and monitoring. The management plan will therefore likely not be submitted until 2018.

RTAW's existing EA MIN 100939109, which was issued on 30 August 2011, requires RTAW to furnish a rehabilitation management plan covering its existing operations north of the Embley River within two years—i.e. by 30 August 2013.

Under the Western Cape Communities Co-existence Agreement (WCCCA), RTAW has obligations to consult traditional owner groups about post-mining land use and rehabilitation and to surrender parts of the mining lease after rehabilitation, where practical to do so and with relevant government approvals. Traditional owners have indicated that seed collection and rehabilitation are two potential business opportunities arising from the project and RTAW has committed to involve traditional owners in rehabilitation programs where practicable.

Issues

A third of all submissions received on the EIS dealt with rehabilitation and were generally critical of rehabilitation efforts at RTAW's existing operations north of the Embley River. A recurring theme was that in almost 50 years of mining, no completion criteria had yet been agreed and no land successfully rehabilitated and surrendered.

Other submissions pointed to a number of research studies where it was found that the composition of the plant community of (partially) rehabilitated sites was substantially different to pre-mining communities, was more susceptible to fire damage and could not support the fauna assemblages that existed pre-mining. Specific mention was made in a number of cases to a published paper *Assessing the success of vegetation development on tropical rehabilitated landscapes following mining*, which found that of 33 regeneration sites assessed at RTAW's current mining operations, only one site met the current criteria for success.⁷

Some submissions argued that the SOE project should not be approved until a successful rehabilitation plan had been agreed and that an independent group should be appointed to oversee its development and implementation.

⁷ Pasco, A, *Assessing the success of vegetation development on tropical rehabilitated landscapes following mining*, University of Queensland, Brisbane, 2008.

However, against the general level of support for rehabilitation to a native vegetation landscape, some submissions argued for alternative post-mining land uses such as establishing long-term commercial forestry plantations to provide economic opportunity for Indigenous groups.

For its part, RTAW acknowledges that a variety of post-mining rehabilitation trials have been pursued since mining commenced in 1963 (with the support of various government agencies over the years). These initiatives have included pasture, native and non-native forestry and native vegetation. Undesirable outcomes have arisen in the case of improved pasture where some introduced species are now considered weeds.

The company views the outcomes of these alternative land use trials as less than successful and is now wholly dedicated to returning a native rehabilitated ecosystem to the post mining landscape and continues to use trials and monitoring outcomes to improve the establishment and maintenance techniques required to achieve this.

RTAW has committed to develop a rehabilitation process jointly with traditional owners and the Western Cape Communities Coordinating Committee (WCCCC) and does not discount alternative post-mining land use options to native vegetation, subject to obtaining all necessary government approvals.

Coordinator-General's conclusion

It is clear from submissions received that a number of community, government and scientific groups have concerns with the existing rehabilitation outcomes at Weipa. In general terms, these concerns relate mainly to post-mining land use and to lack of agreed completion criteria.

I also share these concerns and believe that with continuous mining in the Weipa area now approaching fifty years, it is time for these matters to be resolved. In drawing this conclusion, I am mindful that RTAW and its parent Rio Tinto acquired the Weipa operations in 2000 from Comalco and since then has strived to achieve rehabilitation outcomes in line with ecologically sustainable development principles.

On the question of post-mining land use, I require that the rehabilitation hierarchy as specified in the guideline, *Rehabilitation requirements for mining projects*⁸ be followed and that rehabilitation should be aimed at reinstating a natural ecosystem as similar as possible to the original in accordance with the guideline. It is noted that RTAW has adopted this position in recent years for rehabilitation north of the Embley River. To ensure this outcome for the SOE project, I have stated a condition for the draft EA at Appendix 3, Part B, Schedule 1, Condition 4.

It is acknowledged that RTAW has obligations under the WCCCA to consult with traditional owners on rehabilitation methodology and outcomes and that these consultations may lead to a compelling case for a different post-mining land use in particular areas. If this situation eventuates and there is general stakeholder support

⁸ Department of Environment and Resource Management, *Rehabilitation requirements for mining projects*, Department of Environment and Resource Management, Brisbane, 2011, viewed 12 April 2012, <www.derm.qld.gov.au/register/p01673aa.pdf>.

and support by DEHP, as the government regulator, then the rehabilitation management plan should be adjusted accordingly as part of this review process. This aspect is also covered by Condition 4.

On the question of completion criteria, I do not accept RTAW's proposal to prepare a rehabilitation management plan within three years of commencing mining at the SOE project in order to frame goals, objectives, indicators and completion criteria. I believe that the rehabilitation issue has remained unresolved for long enough and that there is a need for greater certainty and transparency. I accept there will be some minor geological, hydrological and ecological differences between areas south and north of the Embley River; however, the experience gained and lessons learned from mining and rehabilitation at existing operations should be sufficient for RTAW to set reasonable rehabilitation targets for the SOE project—especially so if an adaptive rehabilitation management regime is to be implemented.

As part of Condition 4, I require RTAW to prepare an interim rehabilitation management plan for the SOE project by 30 August 2013. This gives RTAW more than twelve months to prepare the information from the date of release of this report and aligns the requirement with a similar one set under the current EA by DEHP, covering existing operations north of the Embley River. The interim plan is to be viewed as an adaptive management document that must be regularly reviewed and updated in the light of trials and monitoring prior to lodging a final rehabilitation management plan within three years of mining commencing.

5.2. Terrestrial ecology

The project is located within the Weipa Plateau subregion of the Cape York Peninsula Bioregion. The Weipa Plateau subregion is relatively homogenous in vegetation and landform and is characterised by large areas of Darwin Stringybark (*Eucalyptus tetradonta*) open forest or woodlands dissected by smaller areas of riparian vegetation, vine thicket patches and paperbark swamps.

The project area is not used for agriculture and is relatively undisturbed by development. Vehicular tracks throughout the area are used by RTAW for mining exploration activities and by recreational users and traditional owners to access various sites. The area was subject to some cattle grazing and timber logging in the mid 1900s but this has been discontinued. Overall, the project area consists largely of remnant vegetation in good condition apart from localised areas affected by camping, rubbish dumping, frequent fires and feral pig damage.

The project area is not located near, nor does it impact on, any protected areas. It is however, included within a proposed study area for World and National Heritage nomination covering the whole of Cape York, extending north from approximately Port Douglas. The proposal is currently at a public review stage after which the Queensland and Australian governments will decide whether to proceed with the nomination or not.

RTAW conducted a number of vegetation and flora surveys of the project area over the period from 2006 to 2009. The early survey work focused on the Darwin Stringybark communities on the bauxite plateau where mining will occur, while later surveys

focused on the riparian, seasonally inundated and beach areas. Dry season and wet season surveys were covered through work in July (mid-dry season) and May (late wet season).

5.2.1. Regional ecosystems

Context

Ground-truthed RE mapping conducted for the EIS identified 27 regional ecosystems (REs), which are listed in Table 7-5 of the EIS and re-presented as Table 7-5(sup) in the SEIS in response to the DERM EIS submission seeking representation of protected areas.

The EIS and SEIS found that there are no 'endangered' REs listed under the *Vegetation Management Act 1999*⁹ (VM Act) in the project area. Three REs are listed as 'of concern' and 24 are listed as 'least concern'. In terms of biodiversity status, there are no 'endangered' REs, five are listed 'of concern' and 22 REs are listed as 'no concern at present'. Desktop surveys did not identify any endangered ecological communities (EECs) listed under the EPBC Act as likely to occur within the project area and none were identified during field surveys.

Impacts

The EIS identified that direct impacts on vegetation will arise from clearing vegetation within proposed mining areas and clearing for constructing project infrastructure, including the mine infrastructure area, Dam C, infrastructure corridors, Hey River barge/ferry terminal and mine access roads. Clearing for mining will be restricted to the bauxite plateau and will affect only Darwin Stringybark woodland, while disturbance of vegetation for infrastructure will affect a variety of vegetation types including woodland, riparian and wetland vegetation types, and also some regrowth vegetation.

Potential secondary impacts on vegetation during the operational phase of the project, have been identified, linked primarily to altered hydrological regimes due to mining activity, operation of Dam C, and water extraction from the Ward River. The potential introduction of exotic and weed flora, and fire regimes also pose a potential mechanism for impacts on native vegetation within the project area.

Direct impacts on REs arising from clearing are listed in Table 7-10 of the EIS and are updated in Table 7-10(sup) of the SEIS to account for minor project changes since the EIS was issued. The estimated RE clearing figures are included in Table 5.1 below, which also includes VM Act and biodiversity status as well as cleared areas expressed as a percentage of the local area, Weipa Plateau Subregion and Cape York Bioregion.

⁹ Sections 22LA, 22LB and 22LC of the VM Act provide and define three categories of REs: endangered, of concern and least concern. The classification of 'major vegetation groups' is provided in *Australia's Native Vegetation – A Summary of Australia's Major Vegetation Groups* (Department of Environment, Water, Heritage and the Arts 2007).

Table 5.1 Regional ecosystem clearance (based on Table 7-10(sup) of the SEIS)

RE	Description	VM Act Status	Biodiversity Status	Approx. area to be disturbed ¹ (ha)	Total mapped area in project area (ha)	Proportion to be disturbed in project area	Area in Weipa plateau subregion ² (ha)	Proportion of area in subregion to be disturbed	Area in Cape York bioregion ² (ha)	Proportion of area in bioregion to be disturbed
Land Zone 1 – Marine deposits										
3.1.1a	Closed forest of <i>Rhizophora stylosa</i> ± <i>Bruguiera gymnorhiza</i> . Occurs as outer mangroves	L	N	0.04	482	0.01%	29 051	<0.01%	68 365	<0.01%
Land Zone 2 – Coastal sand dunes and swales										
3.2.6a	<i>Casuarina equisetifolia</i> woodland. Occurs on foredunes	O	O	0.4	145	0.28%	420	0.10%	1.499	0.03%
Land Zone 3 – Alluvial plains and piedmont fans										
3.3.5a	Evergreen notophyll vine forest. Occurs on alluvia on major water courses	L	N	7.9	43	18.67%	22 603	0.04%	58 227	0.01%
3.3.9	<i>Lophostemon suaveolens</i> open forest. Occurs on streamlines, swamps and alluvial terraces	L	N	55.3	1,595	3.47%	24 815	0.22%	47 323	0.12%

RE	Description	VM Act Status	Biodiversity Status	Approx. area to be disturbed ¹ (ha)	Total mapped area in project area (ha)	Proportion to be disturbed in project area	Area in Weipa plateau subregion ² (ha)	Proportion of area in subregion to be disturbed	Area in Cape York bioregion ² (ha)	Proportion of area in bioregion to be disturbed
3.3.21	<i>Corymbia clarksoniana</i> ± <i>Syzgium eucalyptoides</i> woodland. Lower slopes of sand ridges and in drainage depressions	L	N	120.6	1,601	7.54%	11 688	1.03%	38 360	0.31%
3.3.50 a	<i>Melaleuca viridiflora</i> ± <i>Petalostigma pubescens</i> low open woodland on low plains	L	N	2.7	1,302	0.20%	2,435	0.11%	42 455	0.01%
Land Zone 5 – Sand deposits forming gently undulating plains (includes laterite plateau)										
3.5.2	<i>Eucalyptus tetradonta</i> , <i>Corymbia nesophila</i> tall woodland on deeply weathered plateaus and remnants	L	N	29 366 ³	87 446	33.58%	671 476	4.37%	794 330	3.70%
3.5.11	<i>Eucalyptus tetradonta</i> , <i>Corymbia nesophila</i> woodland on lower slopes of plains and rises	L	N	1.3	601	0.21%	101 769	0.00%	179 972	0.00%
3.5.22 c	<i>Corymbia clarksoniana</i> + <i>Erythrophleum chlorostachys</i> + <i>Corymbia</i> spp. + <i>Eucalyptus</i> spp. Woodland on plains.	L	N	102.3	3128	3.27%	42 202	0.24%	83 536	0.12%

RE	Description	VM Act Status	Biodiversity Status	Approx. area to be disturbed ¹ (ha)	Total mapped area in project area (ha)	Proportion to be disturbed in project area	Area in Weipa plateau subregion ² (ha)	Proportion of area in subregion to be disturbed	Area in Cape York bioregion ² (ha)	Proportion of area in bioregion to be disturbed
3.7.3	<i>Eucalyptus cullenii</i> ± <i>E. tetradonta</i> woodland on erosional escarpments and plains	L	N	1.6	245	0.65%	61 679	0.00%	71 354	0.00%
Total area to be disturbed for all zones				29 658						

Key to VM Act and Biodiversity Status Codes:

- L Least concern
- N No Concern at present
- O Of concern

Note: Only REs likely to be disturbed are listed.

1. All RE spatial data based on analysis of V6 RE data and adjusted with ground-surveyed mapping by RTA within and adjacent to the project area. Project areas calculated using GDA94 MGA projection.
2. All regional areas calculated using GDA94 Latitude Longitude projection.
3. Includes an allowance for haul roads and borrow pits.

In total, RTAW estimates a total clearance of remnant vegetation of 29 658 hectares, comprising 27 709 hectares within mining areas, 778 hectares within the footprint of Dam C and 1171 hectares within the infrastructure footprint including allowance for haul roads. Areas of cleared REs aggregated by VM Act status, can be summarised as:

Endangered	nil
Of concern	0.4 hectares
Least concern	29 657.6 hectares
Total	29 658.0 hectares

The only REs where clearing is considered to have a significant impact at the local level are RE 3.3.5a—evergreen notophyll vine forest occurring predominately within the footprint of Dam C (18.67 per cent loss), and RE 3.5.2—*Eucalyptus tetradonta* (Darwin Stringybark), which occurs extensively across the mining area on the bauxite plateau (33.58 per cent loss). These losses are considered insignificant at the subregional and bioregional levels—0.04 per cent and 0.01 per cent in the case of RE 3.3.5a and 4.37 per cent and 3.70 per cent in the case of RE 3.5.2.

Mitigation

The EIS and SEIS outlined strategies and management measures to address impacts to vegetation communities and RTAW has made commitments which are included in the draft environmental management plan (EM plan) and are included at Appendix 6 of this report. In summary, these strategies and management measures include:

Environmental buffer system

RTAW propose to implement a buffer system to protect sensitive vegetation types such as areas of particular local, regional or national significance with respect to habitat values, biodiversity, presence of threatened species, conservation status, refuge function, or landscape connectivity. The buffers will comprise Darwin Stringybark woodland.

Set back distances will be determined following appropriate surveys of sensitive areas and will exceed the minimum requirements of the Regional Vegetation Management Code for Western Bioregions as they relate to clearing set-back distances from watercourses and wetlands.

Post-mining drainage

The post-mining drainage will be designed to emulate as far as possible the pre-mining regime of surface and subsurface flows with the aim of minimising changes to the hydrological regime. This will be achieved by a combination of surface drainage features and detention basins that recharge the shallow aquifer. The measures will be supported by a selective vegetation monitoring program.

Dam C streamflow regime

An environmental flow program will be implemented to mimic the natural flow regime as far as possible, to minimise impacts to riparian and wetland communities.

Fire management

A fire management program will be developed in cooperation with traditional owners aimed at conserving fire-sensitive flora and vegetation communities and promoting overall vegetation diversity by reducing fire intensity and frequency.

Weed and feral animal management

Weed and feral animal management programs will be developed and implemented. The feral animal program will focus on control of feral pigs which are the main pest in the project area.

Apart from the above mitigation strategies, measures and commitments, RTAW has committed to progressive rehabilitation of mined areas during the forty-year life of the mine. In the main, mined areas will be rehabilitated to native woodland. However, final land-use options will be developed and discussed with the traditional owners, as required under the WCCCA, and with relevant government stakeholders. The overall rehabilitation objective is to return the land to a post-mining land use that is stable, self-sustaining, requires minimal maintenance, and protects downstream water quality. Rehabilitation is discussed further in Section 5.1.1.

Issues

The natural heritage values of the region were raised as an issue in the EIS submissions as not being adequately addressed. Specific reference was made to conservation values in the Pera Head area, Hey-Embley River area and the west coast bauxite formations. The SEIS recognised the values involved, including the extensive bauxite cliff profile, the very high wilderness qualities and representative vegetation present in the area. However, for the most part, these high value areas are outside of the project area and will not be impacted by the project apart from minimal disturbance of vegetation at the Hey River Terminal site on the Hey River and the jetty for the proposed port, which will cross the top of the bauxite cliffs to the north of Pera Head. The bauxite cliffs will not be mined. I accept that the impacts to these natural heritage values will not be significant and to the extent they occur, will be managed by the measures outlined and commitments given by RTAW.

Cumulative impacts on vegetation communities, particularly Darwin Stringybark (RE 3.5.2), were raised as a concern in public submissions. The issue was addressed in the EIS at section 7.9.1 and in section 20.7.1 and is considered further in Section 5.13 of this report.

Coordinator-General's conclusion

The nature and scale of the project means there will be some impacts to vegetation communities in the short-term. In general, impacts will be confined to the Darwin Stringybark vegetation community on the bauxite plateau which is a 'least concern' RE. Other relatively minor impacts will occur to other communities from infrastructure placement but in the main, these higher value ecosystems will be protected by the proposed vegetation buffer system. Given RTAW's commitment to progressive rehabilitation of mined areas to a native vegetation landscape, the mitigation measures outlined in the EIS, the EM plan and RTAW's offset proposal, I consider that impacts to

vegetation communities can be effectively managed. I have stated a condition at Appendix 3, Part B, Schedule 2, requiring RTAW to prepare a land use management plan that addresses plans and procedures for managing vegetation including buffer systems, pre-clearance surveys of Category A, B and C environmentally sensitive areas and for listed species under the NC Act for the approval of DEHP. This plan must be approved by DEHP prior to commencing clearing work.

5.2.2. Flora species

Context

A total of 485 plant taxa was recorded in surveys conducted within the project area. Of these, 199 species were identified in *Eucalyptus tetrodonta* vegetation on the bauxite plateau where mining will occur.

Table 7-8 of the EIS identified 16 threatened flora species listed under the NC Act as potential inhabitants of the project area. Of these, six are also listed under the EPBC Act. The information has been reproduced in Table 5.2 below. The EPBC Act status for each species has been added for completeness. Only two listed species were found in surveys—the Cooktown Orchid and the Chocolate Tea Tree Orchid.

Table 5.2 Threatened flora listed under the NC Act

Species common name [family] (source of record)	NC Act status	EPBC Act status	Growth form and habitat	Likelihood of occurrence within project area
<i>Acacia fleckeri</i> No common name [Mimosaceae] (Wild)	NT	NL	A small to medium tree restricted to Cape York Peninsula. Known from sandy creek or river banks or on shell mounds in fringing woodland with species of <i>Melaleuca</i> , <i>Leptospermum</i> , <i>Eucalyptus</i> and other <i>Acacia</i> species. Occurs in riparian gallery forest in the Weipa area.	Likely: not located during field surveys but specimen record from the Hey River area. Likely to occur in the Hey Point area and possibly in other areas of fringing vegetation.
<i>Acacia ommatosperma</i> No common name [Mimosaceae] (Wild)	NT	NL	A shrub or small tree known from ironstone ridges and erosional edges of the bauxite plateau in <i>Eucalyptus tetrodonta</i> open forest habitats, and also <i>Corymbia clarksoniana</i> woodland on alluvium/colluvium. Restricted to the Weipa area of Cape York Peninsula.	Possible: not detected during field surveys but may occur in association with ironstone outcrops within the project area.
<i>Albizia retusa</i> No common name [Mimosaceae] (Wild)	NT	NL	A small to medium tree found in <i>Eucalyptus tetrodonta</i> open forest habitats particularly near vine forest. Known from the Weipa area.	Possible: not detected during field surveys but may occur in <i>Eucalyptus tetrodonta</i> habitats within the project area.
<i>Calophyllum bicolor</i> No common name [Clusiaceae] (Wild, epbc)	V	V	A small fire sensitive tree known to be associated with groundwater seepage zones particularly in evergreen vine forest.	Possible: not detected during field surveys but may occur in the project area in more robust groundwater-fed riparian gallery forest or seepage zones near the coast. Only limited areas of suitable fire retardant habitat occur within the project area.
<i>Combretum trifoliatum</i> Sepang [Combretaceae] (herb)	NT	NL	A small to medium tree known from riparian gallery forest in the western Cape York area. Little known in the Weipa area.	Unlikely: few records in the vicinity of the project area despite substantial survey effort, and not located in the project area during EIS field surveys.

Species common name [family] (source of record)	NC Act status	EPBC Act status	Growth form and habitat	Likelihood of occurrence within project area
<i>Dendrobium bigibbum</i> (also known as <i>Vappodes bigibba</i>) Cooktown Orchid [Orchidaceae] (Wild, epbc)	V	V	An epiphyte that grows on trees and rocks in situations with moderate light intensity. Occurs in a range of fire sensitive habitats including coastal scrub, streambank vegetation, monsoon thickets, and gullies in open forest and woodland where fire cannot penetrate. In the Weipa area grows as an epiphyte on trees (rocks absent) and commonly encountered in coastal vine forest and vine forest on bauxite.	Confirmed: located in coastal and non-coastal vine forest, and mangrove edges at several locations within the project area.
<i>Dendrobium johannis</i> (also known as <i>Cepobaculum johannis</i>) Chocolate Tea Tree Orchid [Orchidaceae] (+)	V	V	An epiphyte that grows in open humid habitats, on slopes in open woodland, close to swamps and in pockets of monsoon forests. It has been recorded growing on Tea-tree in Melaleuca woodland and in coastal semi-evergreen vine thicket. In the Weipa area commonly encountered growing on Melaleuca and <i>Syzygium suborbiculare</i> on the margin of Melaleuca swamps and riparian gallery forest.	Confirmed: located in riparian gallery forest and Melaleuca dominated swamps particularly along major drainage lines and associated tributaries.
<i>Habenaria hymenophylla</i> Rainforest Habenaria [Orchidaceae] (Wild)	NT	NL	Little known species with records from the Weipa area. Occurs in vine forest.	Possible: difficult to predict occurrence but may occur in the project area in vine forest habitats.
<i>Heterachne baileyi</i> No common name [Poaceae] (Wild, herb)	NT	NL	A tussock grass known from <i>Eucalyptus tetrodonta</i> dominated woodlands on lower slopes of the plateau, and <i>Melaleuca viridiflora</i> woodland on floodplains.	Possible: not detected during field surveys but may occur in <i>E. tetrodonta</i> woodlands within the project area.

Species common name [family] (source of record)	NC Act status	EPBC Act status	Growth form and habitat	Likelihood of occurrence within project area
<i>Hoya revoluta</i> No common name [Ascleiadaceae] (Wild, herb)	NT	NL	A climbing or scrambling vine recorded from vine forest on coastal dunes and lateritic red earths. Record from Pennefather area north of Weipa.	Possible: not detected during field surveys but may occur in coastal and bauxite vine forest habitats within the project area.
<i>Lepturus geminatus</i> No common name [Poaceae] (Wild)	NT	NL	Tussock grass. Record from the Weipa area.	Possible: difficult to predict occurrence but may occur in the project area.
<i>Lindsaea walkerae</i> No common name [Lindsaeaceae] (Wild)	NT	NL	A terrestrial fern found near streams and in swamps. Record from the Weipa area.	Possible: not detected during field surveys but may occur in wetland and riparian gallery forest in the project area.
<i>Myrmecodia beccarii</i> Ant Plant [Rubiaceae] (+)	V	V	A tuberous epiphyte known to grow in <i>Melaleuca</i> woodland and mangrove areas. Recently recorded from the Weipa area in a small groundwater seepage forest.	Possible: this species is of very restricted distribution in the Weipa area. If a permanent groundwater seepage zone was identified within the project area, this species may occur within this zone. At present only semi-permanent groundwater seepage zones have been identified within the project area. The species may also occur within mangroves within the project area.
<i>Sarcolobus vittatus</i> No common name [Apocynaceae] (Wild)	V	NL	Record from Unigan Nature Reserve at Weipa. Little known species.	Possible: not detected during field surveys but may occur in riparian gallery forest in lower sections of drainage lines.

Species common name [family] (source of record)	NC Act status	EPBC Act status	Growth form and habitat	Likelihood of occurrence within project area
<i>Solanum dunalianum</i> Beach Nightshade [Solanaceae] (Wild, epbc)	V	V	An herbaceous shrub growing to 2–4 m and found in or at the edge of semi deciduous vine forest.	Likely: not detected during field surveys but suitable coastal vine forest and vine forest on bauxite habitat occurs in the project area.
<i>Spathoglottis plicata</i> No common name [Orchidaceae] (epbc)	V	V	A terrestrial orchid with flower stems to 1 m that grows in or close to swamps, in seasonally inundated areas and in moist, grassy patches close to streams, in Melaleuca swamp forest and riparian gallery rainforest	Possible: not detected during field surveys but suitable stream, wetland and seepage habitat present within project area.

Key to Source of Record codes:

epbc Potential species from the EPBC database
Wild Records from the WildNet database
herb Specimen records from Queensland Herbarium HERBRECS
+ Additional potential threatened species added to assessment

Key to Status:

V Vulnerable
NT Near Threatened
NL Not Listed

Impacts and mitigation

Of the sixteen listed species in Table 5.2 above, one species, *Combretum trifoliatum* is considered unlikely to occur in the project area owing to the relative absence of records in the Weipa area. The remaining fifteen can be summarised by NC Act status as follows:

Endangered	nil
Vulnerable	7
Near-threatened	8
Total	15

The EIS identified the following impacts to listed flora species and proposed the mitigation measures as outlined:

Species associated with Darwin Stringybark woodland

Three species were identified:

- (a) *Heterachne baileyi*
- (b) *Acacia ommatosperma*
- (c) *Albizia retusa*.

These species generally occur on the lower slopes of the bauxite plateau or in the vicinity of vine forest and will be included within the proposed environmental buffer areas and will not be impacted by mining activities. *Heterachne baileyi* and *Acacia ommatosperma* may exist within the footprint of Dam C and be subject to clearing which could disturb up to five per cent of the species' potential habitat in the project area.

Species of riparian and wetland habitats

Eight species are involved:

- (d) *Acacia fleckeri*
- (e) *Calophyllum bicolor*
- (f) Cooktown Orchid (*Dendrobium bigibbum*)
- (g) Chocolate Tea Tree Orchid (*Dendrobium johannis*)
- (h) *Lindsaea walkerae*
- (i) Ant Plant (*Myrmecodia beccarii*)
- (j) *Sarcolobus vittatus*
- (k) *Spathoglottis plicata*.

These species do not occur in Darwin Stringybark woodland and will not be affected by clearing for mining. However, they may be affected by clearing for infrastructure construction. Both the Chocolate Tea Tree Orchid and Cooktown Orchid were variously identified in surveys in infrastructure corridor crossings of Norman and Winda Winda Creeks and within the footprint of Dam C. The EIS found that potential habitat for all the species occurs extensively elsewhere within the project area and that project impacts will not be significant.

Species of vine forest habitats

The remaining listed species fall into this group and do not occur in Darwin Stringybark woodland and will not be affected by clearing for mining. The environmental buffer system provides the primary mitigation measure for vine forest threatened species.

Issues

The NC Act is the primary legislation governing protection of threatened flora species in Queensland. Where there is a requirement for clearing of plants protected under the NC Act, a clearing permit will be necessary and clearing undertaken only in accordance with the permit.

Where clearing results in the permanent loss (take) of protected plants, offsets must be provided to achieve an equivalent, or better overall outcome at a regional scale in accordance with the Queensland Government Environmental Offsets Policy and in accordance with the Queensland Government Biodiversity Offsets Policy.

Coordinator-General's conclusion

The EIS found the project will not have a significant impact on listed flora species under the NC Act. The environmental buffer system as proposed by RTAW is designed to protect the sensitive ecosystems that support listed plant species and the Coordinator-General accepts this view. To the extent that protected plants are to be permanently cleared, then a permit under the NC Act will be required and, apart from conditions of the permit, an offset be provided generally in accordance with the Queensland Biodiversity Offsets Policy (BOP). I have stated a condition at Appendix 3, Part B, Schedule 1, Condition 1 to provide for this.

5.2.3. Fauna

Context

The EIS reported that a total of 269 native terrestrial vertebrate fauna species were recorded from all habitat types within the project area based on the results of EIS surveys and preliminary studies. Of these, 36 percent of species were recorded in Darwin Stringybark open woodland habitat (85 percent of the project area) and 64 per cent of species were recorded in other habitats (15 percent of the project area). The EIS concluded that fauna diversity is concentrated in the non-Darwin Stringybark habitats including closed forest, woodland and a range of stream, wetland and coastal habitats.

The EIS groups fauna habitats into seven categories:

- Darwin Stringybark (*Eucalyptus tetrodonta*) open forest
- riparian gallery forest and associated alluvial/colluvial woodland
- Notophyll vine forest on lateritic red earths
- paperbark woodland and wetland swamps
- foreshores, tidal flats and beach strand habitats
- semi-evergreen coastal vine forest

- mangrove and estuary.

Mining will be restricted to the bauxite plateau characterised by Darwin Stringybark open forest habitat, while the balance of habitats will not be cleared for mining and will largely be protected by RTAW's proposed environmental buffer system—refer Section 5.2.1. Clearing for infrastructure is proposed in some of these areas, particularly the riparian gallery forest and associated alluvial/colluvial woodland for Dam C.

The NC Act lists 20 species of protected fauna that have been recorded in the Weipa region or could potentially occur. These species are listed in Table 7-17 of the EIS together with an assessment of the likelihood of their occurrence within the SOE project area. The information is presented also in this report as Table 5.3 below. EPBC Act status has been included for completeness. Eight listed fauna species were identified in surveys of the project site.

Table 5.3 Listed fauna under the NC Act (Table 7-17 of EIS)

Species common name (source of record)	NCA status	EPBC Act status	Key resources	Habitat	Likelihood of occurrence within study area
Birds					
<i>Accipiter novaehollandiae</i> Grey Goshawk (Wild)	NT	NL	Large tall trees for nest sites. Availability of birds, small mammals, reptiles and insects	Occurs in a variety of more mesic forest types, particularly closed forests situated along coastal regions. Known from vine forest in the Weipa area	Possible: May occur in association with vine forest, riparian gallery forest and mangrove areas within the project area, but not anticipated to be numerous.
<i>Ephippiorhynchus asiaticus</i> Black Necked Stork (Wild)	NT	NL	Availability of prey items including fish, frogs, reptiles, crustaceans	Wetland areas including rivers, swamps and tidal areas with shallow pools and areas of deep permanent bodies of water	Confirmed: Frequently encountered in wetland, estuary and beach habitats throughout the project area.
<i>Erythrotriorchis radiatus</i> Red Goshawk (Wild, EPBC)	E	V	Trees >20m high for nesting within 1km of a watercourse or wetland. Abundance of passerine prey	Favours coastal and sub-coastal areas. Prefers a mix of vegetation types including tall open forest, woodland, lightly treed savannah and the edge of rainforest and riparian forests	Possible: The open forest, woodland and wetland habitats that occur throughout the project area present nesting and feeding opportunities required by the species.

Species common name (source of record)	NCA status	EPBC Act status	Key resources	Habitat	Likelihood of occurrence within study area
<i>Erythrura gouldiae</i> Gouldian Finch (Wild, EPBC)	E	E	Annual and perennial grasses (especially Sorghum), a nearby source of surface water and unburnt hollow-bearing Eucalyptus trees for nesting	Inhabits open woodlands that are dominated by Eucalyptus trees and support a ground cover of Sorghum and other grasses, close to a reliable dry season water supply.	Unlikely: The species is recorded only rarely, and in small numbers, on the Cape York Peninsula. The project area is located well outside the historical known range of the species although there are confirmed WildNet records from the Aurukun Council area. The current regime of frequent extensive fires is likely to affect the availability of favoured seed during the dry season over large areas of the project area. In most years, fresh water does not persist across the vast majority of the project area during the dry season, and it is likely that fresh surface water is totally absent following poor wet seasons. The species was not located during surveys in the most suitable habitat location within the project area and consequently it is anticipated that the project area does not support the species.
<i>Esacus magnirostris</i> Beach Stone Curlew (Wild)	V	NL	Availability of vegetation near foraging areas for shelter. Availability of hind dune areas for breeding	Inhabits beaches, tidal flats, estuaries, reefs and rocky points	Confirmed: A number of pairs identified along the project area Gulf coast and Hey–Embley estuary and expected to occur along beaches within the project area wherever there are rocky points or hind dunes in close proximity.

Species common name (source of record)	NCA status	EPBC Act status	Key resources	Habitat	Likelihood of occurrence within study area
<i>Lophoictinia isura</i> Square-tailed Kite (+)	NT	NL	Availability of small passerine prey, including eggs and nestlings. Presence of large wooded areas in close proximity to breeding sites	Structurally diverse landscape of Eucalypt open forests and woodlands, scrubs, riparian gallery forest, estuaries; not generally encountered in more open habitats	Likely: Suitable open forest and woodland habitats occur throughout the project area and present the nesting and feeding opportunities required by the species.
<i>Ninox rufa meesi</i> Rufous Owl (+)	NT	NL	Availability of medium sized mammal or bird prey species including flying fox, parrots, cockatoos. Availability of large tree hollows for breeding	Inhabits rainforests, monsoon forest, wet forested gullies, and adjoining woodland	Confirmed: One individual recorded in riparian rainforest on Norman Creek. Otherwise not detected during extensive survey effort but anticipated to be present at least occasionally along all major drainages in the project area including riparian gallery forest, Melaleuca swamp forest and mangrove forest on Norman Creek and Coconut Creek – Ward River system. Also possibly in minor drainage systems such as Ina Creek as well as larger vine forest patches near the coast in proximity to mangrove areas such as Ina Creek dunal vine forest, and vine forest patches at Hey Point.
<i>Numenius madagascariensis</i> Eastern Curlew (Wild)	NT	NL	Availability of invertebrate prey in moist substrate. No nesting behaviour recorded in Australia	Inhabits estuaries, tidal flats, mangroves, sand spits, saltmarsh and occasionally freshwater wetlands	Confirmed: Suitable estuarine, mud flat and sandy beach habitat is found within the project area. The western Cape York region is a main entry point to Australia for trans-equatorial migratory waders.

<i>Species</i> common name (source of record)	NCA status	EPBC Act status	Key resources	Habitat	Likelihood of occurrence within study area
<i>Probosciger aterrimus</i> Palm Cockatoo (Wild)	NT	NL	Mature trees with suitably sized nesting hollows. Available fruits and nuts for feeding	Rainforest/mesic environs often associated with riparian localities	Confirmed: Recorded on the major drainages of Norman Creek and Ward River in association with riparian rainforest and wetland areas; also recorded from vine forest on bauxite, and Darwin Stringybark open forest. Breeding pairs located within a relatively substantial riparian rainforest patch located in Norman Creek within the footprint of Dam C.
<i>Rostratula australis</i> * Australian Painted Snipe (EPBC)	V	V	Vegetated ephemeral wetlands	Inhabits shallow vegetated ephemeral wetlands in coastal and inland areas	Unlikely: Project area is well beyond the known range of the species, which is not known to occur on Cape York Peninsula.
<i>Sternula albifrons</i> Little Tern (Wild)	E	NL	Sandy foreshore nesting localities	Coastal environments, including beaches, sheltered inlets, estuaries, lakes, bays and harbours, especially where exposed sandbanks or sand spits occur	Confirmed: Observed on a sandbank roost near the mouth of Waterfall Creek. Likely to forage in coastal and estuary areas throughout the project area. Limited potential breeding habitat present due to the prevalence of coastal bauxite cliffs, but the scattered dunal areas that are present could accommodate breeding colonies.
<i>Tadornah radjah</i> Radjah Shelduck (Wild)	NT	NL	Availability of tree hollows for nesting. Availability of wetland invertebrate prey	Aquatic habitat types including coastal wetlands, rivers, flooded plains, marsh and swamp regions	Confirmed: Regularly observed in pairs or small groups in or near coastal wetlands and estuaries including Norman Creek, Ward River and Winda Winda catchments. Most numerous within the Ward River system on brackish wetlands and channels during the late dry season.

Species common name (source of record)	NCA status	EPBC Act status	Key resources	Habitat	Likelihood of occurrence within study area
<i>Tyto novaehollandiae kimberli</i> Masked Owl (+)	V	V	Medium to large tree hollows for nesting, and availability of preferred small mammal prey	Prefers tall eucalypt forest and woodlands	Possible: Sections of tall closed forest on major drainages along Norman Creek and the Ward River provide potentially suitable habitat; however, the prevalence of the species may be limited by the apparent paucity of small mammal populations.
Mammals					
<i>Notomys aquilo</i> Northern Hopping Mouse (EPBC)	V	V	Suitable sandy substrates for burrow excavation	In the Northern Territory part of its range, known to occur in Acacia scrub, heath and grasslands on sand dunes within coastal regions (Menkhorst and Knight 2004)	Unlikely: The type specimen of this species was recorded from Cape York Peninsula in 1867 but has since not been recorded in Queensland. Very little potential habitat within the project area associated with isolated dunal systems.
<i>Saccolaimus mixtus</i> Papuan Sheath-tail Bat (Wild)	NT	NL	Tall trees adjacent to open forests with suitable hollows for roosting	Tall open forests and woodlands (Churchill 1998)	Likely: Commonly recorded in Darwin Stringybark open forest north of Weipa by Dames and Moore (1996) and extensive potential habitat within the project area. Cannot be definitively identified from Anabat analysis but some call sequences from a variety of habitats, recorded during field surveys, were tentatively credited to the species.

Species common name (source of record)	NCA status	EPBC Act status	Key resources	Habitat	Likelihood of occurrence within study area
<i>Saccolaimus saccolaimus nudicluniatus</i> Bare-rumped Sheath-tail Bat (Wild)	E	CE	Long deep tree hollows for roosting. Availability of flying insect prey.	Known habitats on Cape York include riparian forest and vine forest and adjacent woodland, including Darwin Stringybark dominated habitats. Potential habitat comprises REs, 3.2.10c, 3.3.5, 3.3.9, 3.3.21, 3.3.49b, 3.3.61, 3.5.2, 3.5.4, 3.5.11, 3.5.22c and 3.7.3 (Refer to Figures 7-6 to 7-6d for the locations of RE's within the project area).	Possible: This species' habitat is poorly known. Records of the species from Iron Range and Coen indicate that it may favour riparian forest and vine forest and adjacent woodland including Darwin Stringybark dominated habitats. The species was found roosting in Darwin Stringybark at Iron Range. Based on this information, large areas of the project area may be suitable for the species, especially in the vicinity of riparian gallery forest and vine forest patches, and potentially also deeper into the Darwin Stringybark woodland.
<i>Sminthopsis archeri</i> Chestnut Dunnart (+)	NT	NL	Limited information available regarding the life history specifics of the species	Tall eucalypt woodlands and heathlands on red earth soils (Kutt 2008)	Possible: Records in synonymous eucalypt habitats to the north and south of the project area indicate the possible presence of the species in Darwin Stringybark open forest, or ecotonal areas adjacent to streams, although small mammal densities are low within the project area.

Species common name (source of record)	NCA status	EPBC Act status	Key resources	Habitat	Likelihood of occurrence within study area
<i>Spilocuscus maculatus</i> Common Spotted Cuscus (+)	NT	NL	Tall dense canopy structure situated near fruiting tree species	Lowland rainforests, mangrove margins, eucalypt and paper-bark open forests adjacent riparian strips (Winter and Leung 2008)	Possible: Riparian gallery and vine forest communities found on the Norman Creek and Ward River drainages represent potential habitat for the species. Vine forest on bauxite in the Hey Point area also provide potential habitat similar to that where the species has been recorded in the Weipa area. Apparently no recent knowledge of the species by traditional owners.
Reptiles					
<i>Antairoserpens warro</i> (a burrowing snake) (Wild)	NT	NL	Availability of scincid lizards and suitably friable soil composition for burrowing activity	Sclerophyll forests and woodlands with a grassy understorey on sandy soils (Cameron and Cogger 1992)	Likely: Recorded in very close proximity (a few kilometres) to the project area with a single specimen recorded from Beagle North Camp in the collection of the Queensland Museum (Cameron and Cogger 1992).

<i>Species</i> common name (source of record)	NCA status	EPBC Act status	Key resources	Habitat	Likelihood of occurrence within study area
<i>Crocodylus porosus</i> Estuarine Crocodile (Wild)	V	NL		A ubiquitous inhabitant of tropical watercourses including swamps, rivers and creeks. Will utilise monsoonal inundation to take advantage of prey opportunities in ephemeral localities	Confirmed: Presence in all freshwater and marine habitats in the study area including freshwater swamps and streams well inland. Overall, the species is widespread and numerous within the study area. Habitat utilisation likely to change seasonally with more use made of inland freshwater habitats during the wet season. Potential breeding habitat exists on the lower reaches of Norman Creek, Ward River and Winda Winda Creek, though more abundant in the Ward River system. Nests and hatchlings located on the lower Ward River and Norman Creek including within the footprint of Dam C.

Key to Source of Record codes:

EPBC Potential species from the EPBC database

Wild Records from the WildNet database

+ Additional potential threatened species added to assessment based on local knowledge

Key to Status:

E Endangered

V Vulnerable

NT Near Threatened

CE Critically Engangered

NL Not Listed

Of the twenty listed species in Table 5.3, three are assessed as being unlikely to occur within the project area. The remaining seventeen (confirmed, likely or possible) can be summarised by NC Act status as follows:

Endangered	3 (red goshawk, little tern, bare-rumped sheath-tail bat)
Vulnerable	3
Near threatened	11
Total	17

Six species of introduced fauna were detected during the fauna surveys, including feral cat, dingo/hybrids and feral pig (all class 2 pests), cane toads, feral horses and cattle. The EIS reported that all these species are commonly encountered throughout the Weipa–Aurukun area.

The feral pig is reported as the most abundant species within the project area, occurring within all habitat types. Foraging by feral pigs causes disturbance which can damage soil structure resulting in erosion, affect plant succession or play a role in dispersing exotic plant seeds, and subsequently affect native fauna habitat. Predation of turtle nests is also a major problem and is considered further in Section 5.4.2 of this report.

Impacts

Direct impacts on fauna communities arise from habitat removal associated with land clearing to accommodate mining and project infrastructure. Clearing for mining will affect only Darwin Stringybark open forest habitat, whilst disturbance of vegetation for certain infrastructure, particularly Dam C, will affect a selection of habitat types including Darwin Stringybark open forest, riparian gallery forest, and a small area of paperbark wetland.

Secondary impacts on fauna habitats may also occur during the operational phase of the project, linked primarily to potential effects from altered hydrological regime due to mining activity and construction and operation of Dam C. The introduction of exotic and weed flora, feral pig activity, and frequent fire regimes also have the potential to impact fauna habitat within the project area.

Alterations to the habitat landscape may affect the movement patterns of mobile fauna that need to move through the landscape to facilitate access to seasonal food resources, reproductive activity, dispersal of young individuals, seasonal migratory movements, or access to habitat patches for refuge, following fire or other natural disasters.

In regard to listed threatened species under the NC Act, the EIS found that habitat loss is, in most cases, not significant and that most species will utilise other undisturbed habitat types in the buffer system or unmined areas of Darwin Stringybark open forest.

Mitigation

Mitigation measures proposed for reducing the impact on terrestrial fauna communities are aimed at reducing the loss of fauna habitat. These are listed in the EIS and include:

- restricting clearing of vegetation for mining and infrastructure to the minimum required for the safe operation of mining equipment and infrastructure
- avoiding clearing vegetation outside of the mine plan/infrastructure footprint for infrastructure or purposes that could be accommodated within areas already disturbed by mining or to be disturbed by mining (e.g. borrow pits, laydown areas, access tracks)
- wherever possible, locating linear infrastructure—such as roads, tracks, pipelines, and power lines—in a single consolidated infrastructure corridor rather than several smaller corridors
- planning for clearing of vegetation and stripping of topsoil to occur as soon as practicable before mining, to avoid redundant vegetation clearing due to changes in the mine plan
- implementing an environmental buffer system to protect sensitive vegetation communities
- incorporating ‘dry culvert’ cells to access road crossings of Winda Winda Creek and the southern branch of Norman Creek to maintain habitat continuity along the riparian corridor to allow passage for non-aquatic fauna
- periodic monitoring of targeted fauna communities to be undertaken to monitor the condition and any trends in communities likely to be subject to indirect impacts such as hydrological changes, fire regime change, weeds and feral animals.

Apart from these general mitigation approaches, the EIS committed to additional specific mitigation measures, as outlined below, for endangered species listed under the NC Act that may be impacted. These include the red goshawk and the bare-rumped sheath-tail bat. The project is not expected to impact the habitat of the little tern.

Red goshawk (endangered under NC Act and EPBC Act)

Surveys for red goshawk nests will be undertaken in sections of the mining plan located within one kilometre of permanent water supporting riparian gallery forest or paperbark wetland, seasonally inundated paperbark wetlands, seasonal watercourses supporting riparian gallery forest, or an estuary. Surveys will be completed as soon as practicable prior to vegetation clearing for mining. If any active red goshawk nests are found within mining areas, a 200-metre buffer around the nesting tree will be excised from the mining plan until the end of the breeding season. Any active red goshawk nesting site identified within the mining path will be monitored until the nesting cycle has been completed, after which clearing activities will resume.

Bare-rumped sheath-tail bat (endangered under the NC Act and critically endangered under the EPBC Act)

The Bare-rumped sheath-tail bat is reported to breed during the wet season, with a colony containing juveniles reported as late as April in the Northern Territory. Targeted pre-clearing surveys will be undertaken to determine the presence of the species within the Dam C disturbance area, and if present, disturbance of habitat trees will be avoided until after the breeding season (i.e. clearing to commence no earlier than May and be completed by end of November). If the species is present, all potential roost trees will

also be identified within the Dam C disturbance area and pushed over in a manner that will allow any bats present to leave the roosts unharmed.

Issues

The Wilderness Society raised concerns over the flooding of eight hectares of evergreen notophyll vine forest by Dam C—the largest patch in the project area—and which may be linked to other vine patches with fauna species moving between. RTAW responded in the SEIS that RE3.3.5 (evergreen notophyll vine forest) is a ‘least concern’ regional ecosystem under the VM Act and that the clearing represents less than 0.04 per cent of the Weipa Plateau Subregion and 0.015 per cent of the Cape York Bioregion. It responded further that habitat continuity around the dam impoundment is to be provided by a minimum 200-metre environmental buffer from the full supply level of the impoundment. RTAW further advised that, while the main gallery forest on the Dam C reach of the creek will be displaced by the impounded water, observations of a similar water supply dam in the Weipa area by RTAW indicates some re-establishment of a riparian gallery can be expected around the full supply level, which will reinstate, to some extent, the displaced riparian corridor. The Coordinator-General accepts this position.

Coordinator-General’s conclusion

I consider that the EIS adequately identified likely impacts on native fauna. I accept that there will be some impacts on native fauna but consider that these will be largely of a transitory nature as domains are progressively mined and rehabilitated back to natural landscapes. I believe that impacts can be managed by the measures outlined in the EIS, SEIS, EM plan and commitments given by RTAW. I have stated a condition in Appendix 3, Part B, Schedule 1, Condition 3, requiring RTAW to prepare a species management plan for listed fauna species that may be impacted by the SOE project, for the approval of DEHP, prior to significant construction.

5.2.4. Terrestrial offsets

Context

Clearing of vegetation for mining activities on a mining lease is not assessable development under SPA; therefore, the VM Act, Regional Vegetation Management Code for Western Bioregions and the Queensland Policy for Vegetation Management Offsets do not apply to vegetation clearing on mining lease areas. However, SPA and the VM Act and associated policies will apply to clearing activities for project elements outside the mining lease areas.

The BOP was introduced on 3 October 2011, after the EIS was released for public review.¹⁰ The policy does not apply to development that is a significant project declared under section 26(1)(a) of the SDPWO Act, unless the Coordinator-General otherwise

¹⁰ Department of Environment and Resource Management, Queensland Biodiversity Offset Policy (version 1), Department of Environment and Resource Management, Brisbane, 2011, viewed 14 April 2012, <http://derm.qld.gov.au/environmental_management/environmental-offsets/pdf/biodiversity-offset-policy.pdf>.

determines. In assessing the need for environmental offsets in the case of the SOE project, I have determined that the principles of the BOP will apply and that offsets will be necessary where there are residual impacts to state significant biodiversity values (SSBVs) that otherwise cannot be avoided or mitigated. The aim of the BOP is to ensure that there is no net loss of biodiversity.

Assessment against the BOP

RTAW assessed the project impacts against the SSBVs of the BOP and presented the results in Table 7-A of the SEIS. Based on the analysis undertaken, an offset proposal was outlined to acquit the obligations involved and was summarised in the SEIS at Table 7-B. This summary proposal is reproduced below as Table 5.4.

Table 5.4 SEIS offset proposal summary

Offset trigger	Requirement	Element of proposed offset
Wetland: 55.3 ha of RE 3.3.9 (Dam C and linear infrastructure)	• ≥ area • ecological equivalence*	2:1 ratio of RE 3.3.9 (110.6 ha)
Watercourse: 69 ha of vegetation associated with stream order 2 watercourse (Dam C)	• ≥ area • ecological equivalence* • watercourse vegetation	2:1 ratio of riparian vegetation comprising one or more of RE 3.3.5, RE 3.3.9, RE 3.3.21, (138 ha)
Protected animal species: 177.6 ha of riparian habitat (RE 3.3.5, RE 3.3.9, RE 3.3.21) for rufous owl, palm cockatoo, estuarine crocodile (Dam C)	• ≥ area • suitable habitat	2:1 ratio of riparian habitat comprising one or more of RE 3.3.5, RE 3.3.9, RE 3.3.21 (355.2 ha)
Protected plant species: Cooktown orchid (Dam C)	• 3.5 replaced for each plant cleared • suitable habitat	Translocate and/or propagate a total of 3.5 plants for each plant within footprint of disturbance
Consolidated offset proposal		
• 2:1 ratio of riparian habitat comprising one or more of RE 3.3.5, RE 3.3.9, RE 3.3.21 (355.2 ha), of which 110.6 ha must be RE3.3.9 • Cooktown orchid establishment within the above offset area(s) • offset area(s) located on ML7024 • area(s) managed to protect and enhance environmental values by use of ecologically appropriate fire protection and feral animal controls.		

The above work was based on impacts to SSBVs, where listed species were confirmed from surveys undertaken during the EIS process. However, there was a range of other listed flora and fauna species where survey work undertaken could not definitively rule the species as present or not in the project area and whether or not the species will likely be impacted.

Following discussions on these matters between RTAW, the office of the Coordinator-General and DEHP, the proponent undertook further work specifically to include consideration of these species and a revised offsets proposal was lodged with the

office of the Coordinator-General on 5 April 2012. The revised offset proposal is included in this report as Appendix 5.

The revised proposal examines each SSBV under the BOP that could be impacted by the project, identifies impacts and mitigation measures and proposes a set of offsets that will meet the requirements of the BOP (and VM Act, were it to be applied), comprising:

- 2:1 ratio of riparian habitat comprising one or more of RE 3.3.5, RE 3.3.9, RE 3.3.21 (355.2 hectares), of which 110.6 hectares must be RE3.3.9
- translocate and/or propagate 3.5 plants of Cooktown orchid and chocolate tea tree orchid (if found) for each plant found within the footprint of disturbance) and establish within the above offset area(s)
- offset area(s) to be located on ML7024
- offset area(s) to be managed to protect and enhance environmental values by use of ecologically appropriate fire protection and feral animal controls.

RTAW has committed to consult with DEHP and traditional owners regarding the location of the proposed offset area(s) and the appropriate legal mechanism to secure the offset.

The proposal also provides offsets for impacts to marine turtles and this is discussed further under Section 5.4.3, 'Marine offsets'.

It should be noted that the offset proposal is aimed at addressing the offset requirements of the State under the BOP. RTAW must also meet offset requirements arising under the EPBC Act and the Commonwealth may specify different requirements in respect of individual environmental values being offset. Where a Commonwealth offset requirement is more demanding than the State's requirement, then the Commonwealth requirement shall apply in lieu of the State requirement, and vice-versa.

Coordinator-General's conclusion

I am satisfied with the assessment undertaken by RTAW to determine offset obligations under the BOP and with the offset proposal put forward and commitments made to acquit those obligations. I am also satisfied that suitable land-based offset areas are available for RTAW to acquit these obligations either on or off ML7024.

I have stated a condition at Appendix 3, Part B, Schedule 1, Condition 1, requiring RTAW to submit a final terrestrial biodiversity offset plan, based on the proposal as submitted on 5 April 2012 and generally consistent with the requirements of the BOP and Queensland Government Environmental Offsets Policy (QGEOP) for the approval of DEHP within 12 months of the final investment decision for the project.

5.3. Aquatic ecology

Context

The EIS reported an elevated, centrally located bauxite plateau of the project area is drained to the west via Ina and Norman Creek, to the north via Triluck–Winda Winda

Creek, Roberts and Leithen Creeks, to the east via unnamed tributary drainages of the Hey River estuary, and to the south via the Ward River system. A number of smaller, less defined drainage depressions also flow independently to the Gulf of Carpentaria between these named drainage systems. Within the project area there are also several swamps that occur in depressions within the bauxite plateau which are largely isolated from defined drainage networks.

It is further reported that, given the generally small size of these catchments and the highly seasonal rainfall of the region, many of the smaller streams and depressional swamps do not contain permanent aquatic habitats. However, shallow groundwater connectivity to surface water features is apparent throughout the project area and semi-permanent groundwater discharge is observed to maintain streamflows and wetland water levels beyond the wet season period at many sites.

The southern extremity of the project area overlaps with the Archer Bay Aggregation, which is a nationally significant wetland area listed in the Directory of Important Wetlands. Refer to Figure 5.1 (Fig 8-1 of EIS).

Project area aquatic ecosystems were observed, surveyed and sampled by RTAW variously over the period from August 2007 to March 2009 covering the dry season and late wet season. Information was gathered from 63 survey sites.

Aquatic ecological values

The following key aquatic ecological values are identified in the EIS:

Wetland aggregations

There are three wetland aggregations partially or wholly contained within the project area including the lower Winda Winda–Triluck Creeks, lower Norman Creek and lower Ward River. These wetlands provide important fishery and fishery nursery habitat as well as important nesting and feeding habitat for waterbirds and act as aquatic refugia for freshwater aquatic biota during the dry season. The wetlands are also sites of importance to traditional owners due to values associated with both hunting and gathering resources and spiritual significance.

Aquatic refugia

In a seasonally dry environment, the persistence of aquatic biota, such as non-migratory fish, is tied to the perennial nature and extent of freshwater habitats and the access and recruitment of biota to them. Within the project area, outside of the wetlands, these perennial areas are located in the mid and lower reaches of the two major tributaries of the Norman Creek system, the lower reaches of the Ward River and lower Winda Winda and Ina Creek systems.

Species of conservation significance

The EIS identified four aquatic species listed under the NC Act and EPBC Act that could occur in the project area:

- freshwater sawfish (*Pristis microdon*)
- green sawfish (*Pristis zijsron*)
- dwarf sawfish (*Pristis clavata*)
- speartooth shark (*Glyphis sp A.*)

Bauxite plateau freshwater fish assemblages

The EIS identified low diversity of freshwater fish within the project area. This is attributed largely to small catchment size and catchment isolation. The naturally high bio-availability of aluminium is also considered a potential limiting factor.

Species of restricted distribution

The EIS also found several freshwater species not listed in any conservation management lists or legislation, but have restricted distributions that confer conservation value. In addition, a new species of freshwater crab, *Austrothelphusa sp. nov.* was collected from Winda Winda Creek during the May 2008 sampling and a new species of freshwater shrimp discovered in the Ward River. These are discussed further below.

Impacts and mitigation

Direct impacts associated with vegetation clearance for mining occurs primarily within terrestrial ecosystems associated with Darwin stringybark communities. Implementing the environmental buffer system, as outlined in Section 5.2.1, will ensure that riparian, wetland and estuarine habitats are buffered from direct impacts associated with vegetation clearing, other than where they occur within narrow infrastructure and access corridors that cross drainage lines or for Dam C.

The EIS identified the following key impacts to riparian, wetland and estuarine habitats and mitigation measures.

Catchment hydrological impacts due to mining

Progressive mining and rehabilitation of 27 709 hectares of the project area over a 40-year mine plan represents a significant disturbance to catchments hosting the project area's aquatic ecosystems. RTAW proposes to address these potential impacts through:

- pre-mining definition of sub-catchment hydrology through establishment of baseline data and models
- mine pit drainage and detention management to mimic as far as practicable the pre-mining run-off characteristics
- hydrologically informed post-mining rehabilitation to ensure post-mining drainage emulates that pre-mining
- ongoing monitoring and assessment of hydrological performance.

Elevated catchment sediment loads

Clearing vegetation for mining and infrastructure development, including road corridors, in a seasonal tropical environment subject to monsoonal and cyclonic rainfall events may result in elevated sediment loads in catchment runoff. RTAW proposes to address these potential impacts by:

- maintenance of an environmental buffer system
- controlled drainage systems
- clearing and soil stripping scheduled for the dry season
- monitoring of performance measures and adaptive management.

Loss of aquatic habitat connectivity

The EIS found that the majority of the freshwater fish communities within the project area comprise few migratory species. However, the extreme seasonality of freshwater habitats imposes a requirement for movement and recruitment from restricted dry season refugia and suitable nursery areas to seasonally abundant aquatic habitats.

Infrastructure constructed within or across stream drainage lines including the Dam C embankment (12 metres high for 29.0 gigalitres of storage capacity) together with access and haul road stream crossings have the potential to create fish passage barriers and to disrupt the recruitment and movement of species from dry season refugia or downstream estuarine habitats, impacting the distribution of fish species and the composition of fish communities. RTAW proposes to address these impacts by:

- incorporating fish passage structures into Dam C and other in-stream infrastructure
- monitoring the impacts to aquatic habitat over the life of the mine every 3 to 5 years.

Freshwater crab and shrimp

The EIS reported on surveys in 2008 and 2009 that had sampled two unidentified species of aquatic fauna.

The first of these is a species of freshwater crab (*Austrothelphusa sp*) first recorded in 2008 at a location near the proposed crossing of Winda Winda Creek by the mine access road from Hey Point in the northern end of the mine site. Assessment by the Queensland Museum suggests it may possibly be a new species.

The second species, a shrimp discovered in the upper Ward River estuary, was tentatively identified by the Queensland Museum as stygofauna belonging to the family Lepidomysidae. The shrimp habitat may be associated with groundwater springs (upwelling) that are common in the upper estuary.

In its submission on the EIS, the Wilderness Society focused attention on the discovery of the potential new species of freshwater crab and called for mining to be precluded from the Wind Winda catchment.

The submission from DEHP advised that further investigation of the habitat and range of these species will lead to consideration of whether or not they should be listed as endangered, vulnerable, near threatened or least concern under Queensland legislation. This process will take a number of years to establish and, in the meantime, DEHP are of the view that the mining operation will need to provide the highest level of protection to the waters as they are currently relatively undisturbed and of high quality.

RTAW provided further advice in the SEIS, committing to additional survey work to confirm any wider distribution of the species in water catchments both south and north of the Embley River.

On the question of species protection, RTAW does not propose additional mitigation measures, believing the proposed environmental buffers around sensitive ecosystems based on the setbacks stipulated in the Regional Vegetation Management Code for Western Bioregions will adequately protect aquatic biota including the unidentified species of freshwater crab and stygofauna.

It is noted that mining activity in the Winda Winda catchment may not occur until year 14 of the development. However the mine access road from the Hey River ferry terminal to the mine site will be constructed early in the development schedule and will traverse Winda Winda Creek. Development and use of this road will be essential from early mine development activities and will continue throughout the life of the mine. Special consideration must be given to managing the potential for disturbance when planning, constructing and using the access road, and in particular in relation to earthworks and clearing associated with the Winda Winda Creek crossing.

Fish passage for Dam C

The project water supply includes construction of Dam C on a tributary of Norman Creek, to be constructed in two stages. At full development, the embankment will be 12 metres high and provide a water storage capacity of 29 gigalitres.

The proposed spillway is at a low gradient (less than three per cent) and is designed to facilitate fish passage during spillway flow events. RTAW has undertaken to collaborate with traditional owners and DAFF (FQ) to ensure the most appropriate and best final design is selected for the circumstances. The dam will have a low level outlet pipe to provide environmental flow releases when required.

DAFF (FQ) identified limitations in the fishway design described in the EIS, noting that fish will be attracted to environmental releases below the dam in periods of non-spill and will be vulnerable to entrapment, stranding, high levels of predation and harvest in this area.

Concerns were also expressed that the curtailment of the recessionary downstream flow was also a potential impact for the fish community at the dam.

Since the EIS was released, RTAW has held further discussions with DAFF (FQ) and has redesigned the fishway to incorporate it as a low gradient spillway channel in place of the spillway bypass channel fishway identified in the EIS. The revised fishway will operate over a wider range of headwater and tailwater conditions thus permitting extended opportunities for fish passage.

RTAW has committed to engage with DAFF (FQ) in a phased design process to:

- establish fish passage design principles, objectives and criteria specific to the Dam C site
- assess suitability of fishway options
- determine a suitable monitoring and management program for the fishway.

I note RTAW's commitment in this area and support this process and ongoing engagement with DAFF (FQ) to resolve issues on the design and operation of the fishway.

Coordinator-General's conclusion

Potential impacts to aquatic ecosystems are expected to largely arise from clearing for linear infrastructure placement and construction of Dam C, together with possible indirect hydrological impacts arising from mining. I consider that the impacts will not be significant and can be managed effectively by the protective vegetation buffer system together with other measures and commitments proposed in the EIS and SEIS and EM plan.

In regard to the unidentified species of freshwater crab and stygofauna, I acknowledge the commitment by RTAW to undertake additional surveys to confirm the wider distribution of the species at the end of the 2012 wet season. I support this planned survey work. However, until this work is completed and the protection status of these species established, I consider it prudent that a precautionary approach be followed. A conservative buffer setback of at least 200 metres should apply in areas where potential new species of aquatic fauna are identified until there is some confidence in the distribution of the species and a decision taken on protection status. Accordingly, I have stated a condition at Appendix 3, Part B, Schedule 1, Condition 5, requiring a minimum setback of 200 metres in areas where the possible new species have been found until its distribution and conservation status are determined.

On the question of the fishway at Dam C, I support the collaborative approach proposed by DAFF (FQ) and accepted by RTAW, and have imposed a condition (Appendix 1, Condition 4), which requires the fishway to be generally designed and managed in accordance with the DAFF (FQ) procedure as outlined in the guideline, *Fish Passage Design and Implementation Process and Criteria*.

5.4. Coastal environment

An essential component of the SOE project involves development and use of the marine environment. There will be a new port facility for exporting bauxite to various ports (including Gladstone) and there will be other marine transport developments to enable materials and employees to be moved to and from the site.

Activities will involve reclaiming some coastal areas and dredging of others, and constructing major marine infrastructure in the form of a wharf and associated shoreline facilities. There will also be temporary access works—a jetty and barge landing necessary for preliminary development work on the mine site.

These works and activities are described in Section 2 of the EIS and in the SEIS.

The estuarine and coastal environment includes a diversity of marine species, including inshore and offshore reefs, sponges, seagrasses, algae and fringing mangroves, providing habitat for a wide range of marine fauna.

Some marine species are afforded statutory protection, others are commercially harvested and others a focus for recreational fishing and tourism.

Importantly, the coastal environment also holds special significance to the Aboriginal people including cultural, historical and archaeological values.

5.4.1. Commercial and recreational fisheries

Context

The marine environment likely to be affected by the development includes areas favouring commercial net and line fisheries, blue water fishing charters and recreational fishing areas, inshore areas in the estuary of the Embley Rivers, Albatross Bay, Boyd Bay and south as far as Thud Point. Recreational fishing areas in the vicinity of the proposed port are shown in Figure 5.2 below (Figure 6-57 (sup) of the SEIS).

Issues

A range of issues was raised in submissions on the EIS, covering commercial fisheries, sport fishing charters, boat hire and general tourism.

Commercial fisheries

Of concern to the commercial fishing industry is that developing and operating the port will reduce access to commercial fishing grounds. The issues identified in support of this concern included:

- proposed dredging activities
- loss of access and increased competition, during construction (immediate) and permanent (long-term)
- habitat loss and degradation of the marine ecosystem
- displaced effort—local fishers will be forced to move to other fishing grounds causing additional fishing effort in those locations and restricting the income of fishers as a result and may also cause conflict between sectors
- increased vessel traffic and anchorage/steaming areas.

The Western Cape York Turtle Conservation Project stated in its submission that the EIS lacked fisheries-related data available from research having been undertaken in Albatross Bay. The submission highlighted the importance of the Three Mile Reef to commercial mackerel line fishing, as well as day-to-day charter sport fishing.

The submission also expressed concern at (unreported) ship-loader spills associated with the current operations that had covered the previously white beach sands with bauxite.

In common with several other submissions, this submission stressed the importance of recreational and sport fishing to the local economy.

DEHP raised the issue of structural damage to the benthos and associated biota, caused when large vessels need to anchor off-shore while awaiting access to a port. These vessels deploy hundreds of metres of heavy anchor chain that subsequently drags over the sea bed as the vessels swing with the wind and tide.

DAFF (FQ) advised that, where commercial fishing operators have a history of fishing in the area likely to be affected by this development, and can demonstrate an economic impact attributable to the development, that they be considered for compensation.

Charter boat sport fishing and associated tourism industry

Other submissions from private recreational and sport fishing charter operators focused on:

- relative importance of preferred fishing charter spots such as the Three Mile reef and Nine Mile reef and the potential impacts of dredging and spoil dumping on these localities
- a need to employ the precautionary principle and investigate the Three Mile and Nine Mile reef areas before activities take place, so that they can be sustainably managed

- potential restriction of public access to preferred fishing spots
- compensation for economic losses to the recreational and sport fishing industries
- development of an artificial reef to offset potential loss of access to favoured fishing areas.

Recreational fishing

Apart from the local area supporting boat and charter hire businesses operating from Weipa and Aurukun, one private submission identified that 70 per cent of households in Weipa had at least one boat for fishing (the highest ownership rate in Australia). This underpinned the high value placed on recreational fishing in the area which could be impacted by the project.

RTAW response

The proponent has examined the issues raised in the submissions and provided specific responses in Appendix 1 of the SEIS.

In regard to submissions concerned with potential impact on the Three Mile reef area from dredging and temporary turbidity from dredging activity, RTAW has re-aligned the wharf and dredging of the main access channel by two degrees south to avoid most of the Three Mile reef fishing area. This is a positive response that will reduce impacts and is supported by the Coordinator-General.

A compensation model for commercial fishing operations has been developed by DAFF (FQ) to determine the level of compensation which might apply to fishing operators impacted by projects in the marine environment. The model addresses two key aspects:

- compensation for lost income in the area impacted (fishers who traditionally fish the affected area)
- effort displacement (fishers who traditionally fish adjacent areas and will be subject to increased competition).

In subsequent discussions between RTAW, DAFF (FQ) and DSDIP, on the commercial fishery impact, modelling undertaken by DAFF (FQ) indicates that a total compensation amount of approximately \$242 000 would be reasonable in the case of commercial fishery impacts arising from the SOE project. RTAW has subsequently accepted this figure and for the Queensland Rural Adjustment Authority (QRAA) to administer compensation to impacted fishers and for a buyout of an appropriate level of fishing effort.

Since the SEIS was completed, the proponent has given commitments that are intended to offset any recreational and charter boat losses/inconvenience to fishers. These include:

- designation of a safe passage underneath the proposed jetty for the Port for small recreational and charter boat users to prevent the need to travel around the Port jetty, subject to Maritime Safety Queensland (MSQ) requirements
- support for the establishment of a local recreational fishing reference group to provide a forum to develop and help implement the establishment of a communities fisheries project (which may take the form of new or upgraded infrastructure or

studies or management measure). The reference group would comprise representatives from charter operators and the Weipa Sportsfishing Club and would operate by consensus. RTAW has committed to provide funding and/or works up to the value of \$242,000 for the agreed fisheries project.

Coordinator-General's conclusion

It is concluded that there will be some financial losses to commercial fishers arising from the construction and operation of the SOE project. RTAW acknowledges this fact and has committed to make a compensation payment to the State to administer and distribute to affected parties.

I support this approach to determining a settlement and accept that the compensation model developed by DAFF (FQ) for commercial fishing impacts provides a fair, reasonable, scientific and defensible basis for determining a compensation amount of \$242,000. I have not imposed any conditions on this matter as it is essentially commercial in nature, but have made a general recommendation in Appendix 4, Part B, Recommendation 1, for stakeholder acceptance of the settlement proposal and of the DAFF (FQ) compensation model as a basis for determining a settlement amount.

In regard to impacts to charter boat operators and recreational fishers, I accept that the project will have both positive impacts through enhanced fish habitat provided by jetty and wharf piles as well as negative impacts through access restrictions. I support the commitment given by RTAW to establish a local recreational fishing reference group to identify a suitable community fisheries project and to commit funding to the project to the level of \$242 000. A general recommendation is made to fishing stakeholders in Appendix 4, Part B, to accept the proposal.

5.4.2. Marine ecology

Context

Areas to be developed for barge and ferry terminals in the Embley and Hey River estuaries could affect seagrass meadows—feeding habitat for a range of marine fauna including some turtle species and dugongs. The EIS identified seagrass areas along the margins of the Embley and Hey Rivers, as well as the Albatross Bay and Pine River Bay, in waters generally shallower than four metres. The EIS identified approximately 1250 square metres of seagrass within the dredge footprint at the proposed Humbug terminal.

In addition to the potential loss of seagrass meadow from dredging and foreshore reclamation, the EIS reported that operation activities by barges and ferries could lead to injury or death of these species (protected under State and Commonwealth laws) if impacts are not properly mitigated.

The EIS indicated turtles nests have been recorded along beach areas including Pera Head to Boyd Point. Turtles may be impacted directly (loss of some nesting areas, loss of some feeding habitat, increased risk from vessel propeller strikes and dredging operations) and indirectly (introduction of artificial lighting, and increased recreational activity due to more people and improved beach access).

Shipping to and from the proposed port may encounter other protected marine mammals feeding and migrating near the channels and deeper waters of the gulf.

The EIS identified four species of protected sawfish that may inhabit estuarine and freshwater areas affected by the development. However, RTAW expects the project will have a minor impact, largely of a temporary nature arising from dredging activities, on these species, along with sharks, rays and bony fishes.

Issues

DERM commented in its EIS submission that feral pig management was a factor in improving the potential survival rate of turtle hatchlings. The potential to offset loss of habitat and minimise hatchling predation will require specific management techniques and RTAW proposes to develop such a management plan as part of its offset obligations under the BOP—refer Section 5.4.3 of this report. It is noted however, that feral pig control is a requirement under *the Land Protection (Pest and Stock Route Management) Act 2002* and that RTAW should diligently meet its obligations over the whole lease in this respect.

In its comments on the SEIS, DERM also identified a range of matters that should be covered in specific management actions:

- identifying and protecting turtle nests, including managing intrusive lighting on nesting beaches, particularly when disorientation of turtles will be most significant
- managing the potential for injury and death of protected turtles and other protected mammals using technology and vessel speed reduction
- minimising turbidity and turbulence
- controlling feral pests (pigs)
- managing and reporting injuries, strandings and deaths of marine mammals and turtles
- initiating and supporting integrated studies researching and monitoring turtle population.

It is noted that commitments by the proponent given in Appendix 2 of the SEIS cover most of the above matters and they are also addressed in the draft EM plan (Appendix 3 of the SEIS) and the dredge management plans in the SEIS at Appendices 4 and 5.

DERM acknowledged that submerged marine structures, such as the wharf, will provide a substrate for algae and colonising invertebrates—potential food sources for some species. However, attraction of turtles to an area of marine traffic could also increase the risk of propeller strike and turtle mortality.

DERM advised that dredging operations should also be controlled to minimise mortality, suggesting that dredge management should include provisions to cease operations or relocate if five or more turtles are killed in a week by the dredging operation and assessment of the causes of death should be recorded with DERM's *Strandnet* database.

DERM also noted that with a larger population living in Weipa for construction and operation of the project, water and beach-based recreation, including driving on beaches and using fast recreational vessels to go fishing, could seriously threaten

marine turtle, seabirds and shorebirds, especially on their breeding along the coast within 50 kilometres of Weipa. This is dealt with further in Section 5.4.4.

A private submission identified the Embley–Hey River estuary mangrove as being of high conservation significance and that approximately 400 square metres of mangrove will be cleared to allow the Hey River terminal to be developed. It is noted that in its draft EM plan, RTAW proposes to offset this loss, notwithstanding the loss lies within the mining lease (ML6024) and SPA does not apply and consequently the Fisheries Act is not triggered. I support RTAW's proposed action and believe that offsets for loss of marine habitat should be provided on or off lease in accordance with the principles of *Fish Habitat Management Operational Policy FHMOP 005: Mitigation and Compensation for Works or Activities Causing Marine Fish Habitat Loss*.¹¹

In its submission on the SEIS, DEEDI (FQ) stated that a 'package' to offset the loss of marine fish habitats (including marine plants) is being negotiated with RTAW.

I also note that a new distinctive species of sea snake was recently discovered and reported in scientific journals in January 2012. It is likely that the habitat of the species, commonly called the rough-scaled sea snake, includes sea grass beds less than 10 metres in depth, in the vicinity of the estuary of Mission River and Hey Rivers. At this stage, the species is not listed for State or Commonwealth protection.

Coordinator-General's conclusion

I have considered the potential impacts of the project on marine species and their habitat and am satisfied that they can be managed by the measures outlined in the EM plan, draft dredge management plans, commitments and conditions in this report.

5.4.3. Marine offsets

Context

RTAW has identified that the project will impact upon marine fauna, especially turtles, and has proposed management measures to mitigate these. Measures include managing intrusive lighting on nesting beaches and managing the potential for injury and death of protected turtles and other protected mammals using technology and vessel speed reduction.

Predation by feral pigs has been identified by a number of scientific studies, as a key threat to marine turtles on the west coast of Cape York. Doherty (2006)¹² reported 70 per cent of nests surveyed in 2003–04, between Pennefather River and Duyfken Point, were destroyed by feral pig predation, with a 100 per cent predation rate early in the nesting season.

As part of its offsets obligations under the BOP and EPBC Act, RTAW proposes to implement a management program to offset residual impacts of its project on marine

¹¹ 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, www.dpi.qld.gov.au/documents/Fisheries_Habitats/FHMOP005-Fish-Hab-Manage.pdf.
¹² Doherty, J. 2006. Ecological impact assessment of feral pig predation in marine turtle nesting habitat on the west coast of Cape York Peninsula. MTEM Thesis, Charles Darwin University

turtles by reducing feral pig predation on marine turtle nests and hence increase hatchling survivorship. The full BOP proposal is contained in this report at Appendix 5.

The turtle management program has two components, a monitoring program and a control program.

The monitoring program objectives are to:

- determine the abundance of nests on specific sections of beach over specified time intervals for olive ridley and flatback turtles (and other species if present)
- identify the significance of sections of the beach to each species
- establish the level of predation on nests and determine level due to feral pigs.

The feral pig control objectives are to reduce:

- feral pig numbers along nesting beaches and riparian areas
- the level of predation on turtle nests.

Coordinator-General's conclusion

I support the implementation of the turtle management program as a component of the BOP offsets plan and have stated a condition at Appendix 3, Part B, Schedule 1, Condition 2 for its finalisation and implementation through DEHP.

5.4.4. Controlled access to foreshore

Context

Chapter 16, Section 16.3.1 of the EIS assessed the potential changes likely to occur as a result of the development of the mine access road. Issues of concern to traditional owners were:

- the potential for illicit transport of alcoholic beverages onto the mining lease and traditional lands south of the Embley River between Weipa, Napranum and Aurukun
- increased risk to turtle nesting areas from quad bikes and off-road vehicles
- increased rubbish from tourists and weekend visitors from Weipa.

The EIS identified that improved access will also increase risk to migratory and sedentary fauna including shore waders such as the little tern and beach stone curlew.

Issues

The EIS (Section 3.1) reported that traditional owners considered improved access to the project area from the mine access road may increase recreational activities that could have negative impacts on the project area and adjacent coastal and beach areas.

DERM identified the increased population that will be living in the Weipa area due to construction and (to a lesser extent) operation of the project, will seek water and beach-based recreation including driving on beaches and using fast recreational vessels to go fishing. It can be expected that the increased workforce will result in increased vehicle traffic on beaches and increased recreational vessel traffic in shallow coastal waters. Both of these types of activities will be outside of the direct control of

the proponent and can seriously impact on marine turtle, seabird and shore birds, and especially on their breeding, along the entire coast within 50 kilometres of Weipa.

Coordinator-General's conclusion

I endorse the proponent's stated commitment to work with traditional owners and other relevant stakeholders to develop an effective permitting arrangement to protect cultural sites and environmental values, while allowing controlled recreational access.

I have stated a condition at Appendix 3, Part B, Schedule 1, Condition 6, requiring RTAW to prepare a foreshore access management plan as part of the land use management plan in consultation with traditional owners and the WCCCC for the approval of DEHP.

5.5. Water resources

As stated in Section 5.3 of this report ('Aquatic ecology'), the site is subjected to annual monsoonal rain depressions. The average annual rainfall at Weipa–Aurukun area is 1986 millimetres, mostly occurring during the wet season, from December through to March. Very little rainfall is reported from May to September.

While the site has a low relief, rainfall catchments are well defined—the Hey River being the largest catchment (with an area of about 756 square kilometres) affecting the mine development. Mining will also affect the catchments of Triluck Creek, Winda Winda Creek, Norman Creek, Coconut Creek, Ina Creek and Ward River.

The site geology fosters groundwater recharge during the wet season and this maintains shallow aquifers, springs and wetlands in the dry season.

The EIS indicated that mining areas are to be generally separated from major drainage lines by vegetation buffers of varying widths, principally because the drainage lines support notable riparian or higher value ecosystems.

Surface water demand will mainly be met from conserving water in a dam on a tributary of Norman Creek (Dam C) involving extraction of 12 to 25.4 gigalitres per annum, depending on the bauxite production rate. Surface water supply will be supplemented by pumping water from the Ward River (up to 2.5 gigalitres per annum depending on bauxite production rate). The annual water demand model was revised in the SEIS to align with the new start-up production capacity.

5.5.1. Surface water

Issues

The DEEDI (FQ) submission highlighted the need for operational management of the proposed Dam C on the tributary of Norman Creek, so that the hydrological regime does not materially affect the aquatic environment. This matter is discussed more fully in section 5.3, 'Aquatic ecology'. In particular, monitoring of the natural stream regime should commence as soon as possible, to provide baseline data for development of the post-construction operational flow management.

DERM noted that some of the waterways in the region may be relatively pristine, with little to no development or human-based alteration to riparian zones and stream hydrology. Limited human influences appear to be local recreational or subsistence fishing, recreational boating and potentially a very minor component of mining exploration water use. Other waterways and wetland areas have been adversely affected by feral pig. DERM stated that the DERM Operational Policy established guidelines for wastewater discharges, based on the classification of receiving waters.

The Wilderness Society submission stated that removing the bauxite layer will permanently alter surface topography and thereby the site hydrology. The society disputes the proponent's claim that the storage volume of rainfall will be unaffected by removal of the bauxite layer. The society also expressed concern about the potential impact of the proposed Dam C and also supplementing mining water demand by pumping water from the Ward River.

RTAW responded in the SEIS that the shallow aquifer is hosted predominately in the kaolinite layer below the bauxite and only during peak rainfall events does the water table rise into the bauxite layer. Due to the flat topography and the very high infiltration rates of the soils and lateritic strata, the proportion of annual surface runoff is unusually small in the project area (less than one per cent). Mining areas are internally draining and RTAW states that hydrological modelling demonstrates that post-mining discharge from rainfall runoff would be reduced by less than two per cent.

In response to DERM's comments, the proponent has provided water quality triggers and management objectives in the draft EM plan for the project.

The conclusion offered by RTAW in respect of run-off from mining and mined areas indicates there would only be a very small risk of contaminating surface waters. Elsewhere in the EIS, the proponent indicated that the active mining area would be minimised at all times through progressive site rehabilitation.

Despite such assurances however, it is clear that other elements may come into play to reduce the effectiveness of site rehabilitation, including fire, flood, extended drought and even destruction of ground cover by feral pigs. Consideration must therefore be given to performance conditions to protect water quality in receiving waters. In this regard, buffering activity areas from receiving waters would seem critical to successfully manage water quality.

Surface water management to supply water for mining purposes must incorporate measures to protect the aquatic environment, having regard to the natural flow regime and water quality, changes in the flood regime and rates of aquifer recharge. Most of the watercourses in the region appear to have specific ecosystem requirements that rely on a balanced surface water regime to maintain aquatic and riverine habitat.

Coordinator-General's conclusion

The EM plan associated with the environmental authority to develop the mine, must incorporate monitoring and recording of relevant parameters to determine the effects of modifying the natural surface water regimes, systematic review of operational procedures aimed at avoiding, or as a last resort, mitigating, adverse impacts. I

conclude surface water impacts will be adequately addressed through this process and I have therefore not stated any conditions covering surface water.

5.5.2. Groundwater

Context

The EIS identified a relationship between rainfall and seasonal groundwater levels. Groundwater contours presented in the EIS (figures 5.3 and 5.4) indicate that during wet season conditions, mining activity could potentially intersect shallow aquifers in areas close to defined surface water drainage lines and watercourses.

RTAW proposes to establish a new artesian bore-field near the proposed infrastructure corridor to provide access to the Gilbert River and Garraway sandstone aquifers. Groundwater supplies will be required to complement surface waters to meet production demands for the mine.

The SEIS also identified that the development will require increasing quantities of groundwater, as the mine production expands from 22.5 Mdtpa to 50 Mdtpa. Peak production will demand up to 15 gegalitres per annum from its authorised groundwater bores.

The worst case presented is a localised drawdown of 130 metres, resulting in a likely 40-metre effect at Aurukun and 25-metre effect at Weipa. The modelling shows that 50 years after cessation of mining, recovery to around 8 metres at Weipa will be likely.

The proponent has also identified three existing groundwater bores that could potentially be affected by the proposed mining operation. The potential maximum drawdown of one artesian bore (Sudley Station) will potentially be drawn down by as much as 10 metres, although the SEIS reported that the bore is not currently used for stock or domestic supply.

Issues

In its EIS submission, DERM raised two issues concerning groundwater resources. The first related to setting of triggers and management responses should mining activities result in sudden and excessive drawdown of the aquifer. DERM stated that additional information should be provided regarding the potential impacts of long-term pumping from the Gilbert River formation artesian aquifer on existing authorised users of water from this system. Information should also be provided regarding any existing or proposed agreements with landholders to remediate or mitigate undesirable impacts such as lowered water levels or long-term changes in water quality.

The second issue identified there are no mitigating actions proposed should the predicted drawdown impacts on recharge and watercourse springs be exceeded.

The SEIS stated that RTAW will continue to comply with the five-metre drawdown limits at the Bramwell Station, Batavia Downs and Weipa Crossroads monitoring bores, as well as undertaking predictive model validation. RTAW has applied to increase the allocation of artesian groundwater from 9 gegalitres per annum to 12 gegalitres per annum under the Water Act. The conditions relevant to the licence to take artesian water will be set through the Water Act licensing process. Further elaboration on the

subject of predictive modelling, mitigation and licence conditions is included in the SEIS at Appendix 3.

Coordinator-General's conclusion

I have reviewed the potential impacts on shallow and deep aquifers, including the proponent's response to matters raised in submissions on the EIS.

I am satisfied that the matters raised in DEHP's submission have been addressed in the material presented by the proponent in the SEIS. However, I do have concerns over possible cumulative impacts on the artesian aquifer and its sustainable capacity. This is discussed further in Section 5.13.

5.6. Air quality

Context

Air quality considerations generally relate to clearing land, moving topsoil and overburden, mining, transporting and stockpiling bauxite, then loading bauxite onto vessels for shipment to processing facilities. Sources of air emissions include dust, diesel exhaust emissions and smoke particulates from burn-off (planned or otherwise).

The EIS identified communities at Weipa, Napranum and Aurukun are the closest permanently located receptors of air emissions sourced from the mine. From time to time, there will also be tourists, campers and recreational fishers in the vicinity of the mining and load-out wharf.

Issues

A submission from the Western Cape York Turtle Conservation Project commented on the lack of dust control from the ship loader at RTAW's existing operations.

The Department of Communities' submission requested that the proponent be cognisant of the disturbance from mining and ship loading operations to settlements of Weipa, Napranum and Aurukun.

Both Queensland Health and DERM identified a need for consideration of sensitive receptors in temporary construction camps.

DERM also requested consideration of alternatives to burning the cleared timber and the proponent responded that alternatives had been considered and reported in the SEIS.

The practice of burning is a significant source of air pollution, bearing particulates and dust into the atmosphere.

The EIS indicated minimal risk of dust or smoke being blown towards any of the permanent settlements as the dominant wind direction in the dry season is from the east to north-east, towards the gulf. In the wet season, dominant wind direction is from the west to north-west, bringing in moist air from the gulf. The proponent advised that the nature of air emissions and impact on the community will be similar to those currently occurring.

All activities associated with mining, including transport and load-out, will comply with EA conditions. Proposed temporary construction camps will be sited at a location that will largely avoid air pollution impacts.

The arrangements proposed for control of spillage and dust in the load-out operations would appear to be appropriate.

Coordinator-General's conclusion

While details have not been provided for the stationary diesel powered equipment, my proposed air quality conditions will establish acceptable emission controls. Given the distance between potential sources of air pollutants and sensitive receivers, (mainly in the temporary construction camp), the nature of impacts, the mitigation measures contained within the draft EM plan, and approvals required for project activities that create air emissions, I am satisfied impacts on air quality will be minimal.

The issue of burn-off and burning felled timber from proposed mining coups needs to be considered in the context of cultural values and economic opportunities that might be afforded. If no decision is taken to avoid or limit burn-off, then air quality is likely to be similar to that presently occurring on the Western Cape.

In this regard, commitment by the proponent to maintain close liaison with the traditional owners is essential if sustainable benefits to the local communities are to be derived from the proposed development and from the natural resources of the region in the longer term.

Conditions regulating air quality are stated in Appendix 3, Part B, Schedule 4 .

5.7. Greenhouse gas emissions

Context

The proponent is required to report on greenhouse gas emissions under provisions of the *National Greenhouse and Energy Reporting Act 2008* (NGER Act) (Cwlth). The NGER Act prescribes an accounting methodology and requires publication of results. Non-energy greenhouse gas emissions from agriculture, land use, land use change and forestry are not currently included due to immaturity in suitable measurement systems.

Issues

The Wilderness Society, in its submission on the EIS, stated that the calculations of project greenhouse gas (GHG) emissions were misleading and did not appear to have been based on empirical data, which should be readily available to the proponent. The submission also stated that off-site transport (shipping) and downstream processing should also have been included in the assessment.

The proponent confirmed that the environmental impact assessment adopted methods and emission factors contained within the National Greenhouse Accounts (NGA) Factors workbook to calculate GHG emissions from the project. Also, although there was no requirement to report land clearing, the proponent had generally considered the

value of forest productivity rates in the Weipa region by adopting default values from the National Carbon Accounting Toolbox (Australian Greenhouse Office 2005).

Greenhouse gas emissions associated with shipping, refining and smelting have not been incorporated as downstream sources, as they were not specified in the TOR for the EIS. GHG emissions from refineries and smelters located in Australia are calculated and reported for those facilities and to include them the EIS would have been double-counting. GHG emissions from shipping were separately reported under the NGER Act.

Coordinator-General's conclusion

I am satisfied that the proponent has made a proper assessment of the GHG emissions attributable to the proposed mining activities as required by the EIS TOR and in accordance with legislative requirements. I am also satisfied that RTAW has appropriately considered ways in which to reduce GHG emissions in the design, construction and operation of the project.

5.8. Noise and vibration

Context

The proposed development involves a large range of noise sources including road works, construction activities for onshore and marine access, dredging, pile driving, earthmoving and heavy haulage vehicles, conveyors, beneficiation plants, stackers, power stations, worker transport to and from site, ferries, tugs and large bulk carriers.

Some of the potential noise sources can be attenuated; others by virtue of location and mobility would present difficulties for noise mitigation. However, the region is not widely settled, with almost all people living in Napranum, Aurukun, Weipa or further north at Mapoon.

Issues

Queensland Health and the Department of Communities identified the need to consider worker accommodation, stating that noise abatement measures must be incorporated if Environmental Protection Policy (EPP) Noise standards are likely to be exceeded.

Submissions from the Western Cape York Turtle Conservation Project and the Wilderness Society cited the need to protect the habitat of marine fauna from both direct and indirect project impacts. While not specifically mentioned, such impacts could include construction activities.

Regarding noise impacts on the construction camp during construction, Section 10.4.1 of the EIS states 'During the construction phase of the Project the most significant (noise) sources will be the construction of the proposed port and the ferry and barge terminals.' Given the distance of the camp from the port and barge/ferry terminals it is unlikely there will be significant impact to sensitive human receptors as a result of constructing these facilities and these impacts have not been modelled.

RTAW recognised the threats to marine species from various sources, including disturbance from pile driving, and has included a soft-start approach to pile driving to reduce sudden noise and vibration in feeding habitat areas.

Coordinator-General's conclusion

The proponent must meet the environmental conditions for all noise sources relevant to noise sensitive receptors.

Adopting best practice environmental management across all facets of the development will generally result in equipment selection that will not only minimise the risk of disturbance to in the temporary construction camp, but also reduce stress to fauna in the natural environment.

I have stated conditions regulating noise in Appendix 3, Part B, Schedule 8 (page 186).

5.9. Waste

Context

Section 13 of the EIS identified and quantified the range of wastes likely to be created in developing and operating the project. These include:

- tailings from the beneficiation plant (representing the largest volume of waste material) ranging from 9.7 million tonnes per annum to 21.5 million tonnes per annum, depending on the scale of production
- more than 890 000 cubic metres of dredge spoil
- a significant amount of green waste from site clearing and development, with an initial 98 900 tonnes created in site development and an annual contribution of between 20 500 tonnes per annum to 56 500 tonnes per annum, depending on the scale of bauxite production.

Other wastes, though small in volume, also pose environmental risks demanding appropriate management. Some wastes can be managed using existing local infrastructure; others will either require new infrastructure on site or be managed/disposed of by licensed trade waste contractors at off-site locations.

Issues

TMR advised in its EIS submission that all ship-sourced wastes must be managed through a ship-sourced pollution prevention management system, developed in consultation with the Maritime Safety Queensland (MSQ) and the Regional Harbour Master.

RTAW confirmed that operating vessels in the construction and operation phases will comply with maritime management plans developed, prior to construction commencing, in accordance with the *Maritime Safety Queensland guidelines for major development proposals (Sept 2010)*, in consultation with MSQ.

DERM's submission on the EIS identified a need to confirm the classification of receiving waters for discharge of wastes, where required, in view of the limited disturbance of waterways in the region.

In Appendix 3 of the SEIS (section 3.8) RTAW confirmed management arrangements for discharges to waterways.

DERM's submission also stated that the waste and resource management hierarchy proposed in *Queensland's Waste Reduction and Recycling Strategy 2010–2020* encourages reducing resource use and re-using waste as preferable to disposal. Backfilling any voids, integrating mine waste facilities and beneficial use are some of the methods now used for tailings disposal. Backfilling any voids with mining wastes, preferably to the original ground level, is generally considered more sustainable than placing waste material in purpose-built containment structures with operational and residual risks to the environment.

DERM recommended that the EIS should provide a comparison of alternative means of managing the tailings consistent with DERM's waste management strategy, including the use of tailings to backfill mined areas.

RTAW stated in the SEIS that it has considered alternative dry process beneficiation technology, but for reasons of technical limitation and production efficiency, RTAW has confirmed the wet beneficiation process will be adopted. The proponent also considered use of flocculants to 'thicken' the tailings, but concluded there would be no reduction in water demand, and an increase in energy use.

I have carefully considered the argument for placing tailings in the mining voids, and the management difficulties posed by wet tailings, particularly in respect of progressive site rehabilitation, and he concurs with RTAW's position.

DERM also sought confirmation of future landfill arrangements over the 40-year life of the project. In response, RTAW stated that either it or its contractor will seek permission for future landfill requirements prior to closure of the existing Evans Landing facility (some 20 years hence).

The submission from the executive officers of Aurukun Shire Council requested more consideration be given prior to clearing vegetation from mining areas, to consider alternative values and uses of the material proposed to be destroyed. The submission stated that the land will be degraded by the mining operation (with fertility and biodiversity levels drastically reduced for many years to come and water-holding capacity severely damaged). The submission argued that the proponent should undertake research focused on rehabilitating the land in such a way as to provide future economic potential in the land for its traditional owners and other local Aboriginal people.

The submission identified matters including:

- the relationship between micro-fauna biodiversity, their roles in the food chain, soil nutrition, and value for carbon credits
- faunal habitat opportunities that might be afforded by relocating scar trees, hollow logs and other habitat material to preserve biodiversity
- the recovery and relocation of flora, fauna and other items that could have important value to traditional owners (handcraft materials, medicine, food), for faunal habitat and in business and market opportunities

- the beneficiation plant represents the largest volume of waste material ranging from 9.7 million tonnes per annum to 21.5 million tonnes per annum, depending on the scale of production
- recovery and relocation of particular species, either for commercial gain or for nursery storage until site rehabilitation commences
- identifying traditional pathways so that they may be reinstated during rehabilitation
- feral cat and pig control
- spoil assessment of opportunities afforded from organic material for soil improvement, compost, bio-energy and bio-char and greenhouse gas offsets.

RTAW committed in the SEIS that it would be happy to consider and discuss issues regarding the rehabilitation process with traditional owners. The SEIS also stated that, as an alternative energy supply, biomass for the SOE project was assessed as not technically viable for low-base load demand situations.

Coordinator-General's conclusion

RTAW should give further consideration to recovery of biomass material rather than burning. It is understood that recovering millable timber and conserving fauna habitat resources are appropriate pre-mine development activities that have been conducted at bauxite developments in Australia, including RTAW's existing operations.

With RTAW's long history of regional operations and well-established liaison with traditional owners and other Aboriginal people residing in the area, I support the proposal that RTAW should engage with these key stakeholders to further examine Aboriginal involvement and recovery of materials and resources before any destruction of vegetation and other habitat materials commences.

I have stated a condition at Appendix 3, Part B, Schedule 1, Condition 6, requiring RTAW to liaise with traditional owners on biomass recovery prior to vegetation clearing and burning. Other conditions regulating waste management are stated in Appendix 3, Part B, Schedule 7.

5.10. Transport

The Weipa region is serviced by road, sea and air. There is no rail service although bauxite is transported from RTAW's Andoom mine to Weipa on a 20-kilometre single-track line owned by the company.

5.10.1. Road transport

Existing road network

The regional road network is shown in Figure 5.3 (Figure 14-1 in the EIS). The local road network in the vicinity of the project area is largely undeveloped, with vehicle access restricted to minor vehicular tracks. Current road access is from the Peninsula Development Road (PDR) via Aurukun Road, Beagle Camp Access Road, Pera Head Access Road, and Amban Access Road (the access roads)—refer to Figure 5.4 (Figure

14-3 in the EIS). There are no gazetted public roads on the portion of ML7024 that lies south of the Embley River.

Significant regional roads are described below.

Peninsula Developmental Road

The PDR is a state-controlled road between Mareeba and Weipa. The EIS reported that the road is largely unsealed; however, funding by the Australian and Queensland governments is aimed at progressively upgrading the road. The PDR has a posted speed limit of 60 kilometres per hour in urban areas, ranging up to 110 kilometres per hour along some sections. A number of bridges have load restrictions.

Between Napranum and Weipa, the PDR is also known as Kerr Point Road and John Evans Drive. It is the main thoroughfare for employees travelling from Weipa to work at RTAW's East Weipa operations. It is a sealed, two-lane road. The section of this road within the Weipa Town boundary is maintained by Weipa Town Authority (WTA) (with the assistance of RTAW) and the section outside the town boundary and within the mining lease is maintained by RTAW.

A bus service operates to transport children between Napranum and the school at Weipa.

Kennedy Highway

The Kennedy Highway is a state-controlled sealed highway, which runs from Smithfield near Cairns, to Mareeba and on to approximately 40 kilometres south of Mount Garnet. The Kennedy Highway has a posted speed limit of 60 kilometres per hour in urban areas, ranging up to 100 kilometres per hour along some sections.

Aurukun Road

Aurukun Road connects the township of Aurukun with the PDR. Aurukun Road is largely unsealed, and is maintained by Aurukun and Cook Shire Councils with funding provided through TMR.

Under the *Local Government (Aboriginal Lands) Act 1978* (Qld), permission must be obtained from Aurukun Shire Council for entry to all shire lands. Aurukun Road is predominantly used by residents of Aurukun travelling to Weipa or Cairns, and by some people accessing the area for recreational purposes. Freight is brought into Aurukun by road weekly during the dry season. During the wet season, road access is restricted and a barge delivers freight fortnightly.



Figure 5.3 Regional Road Network

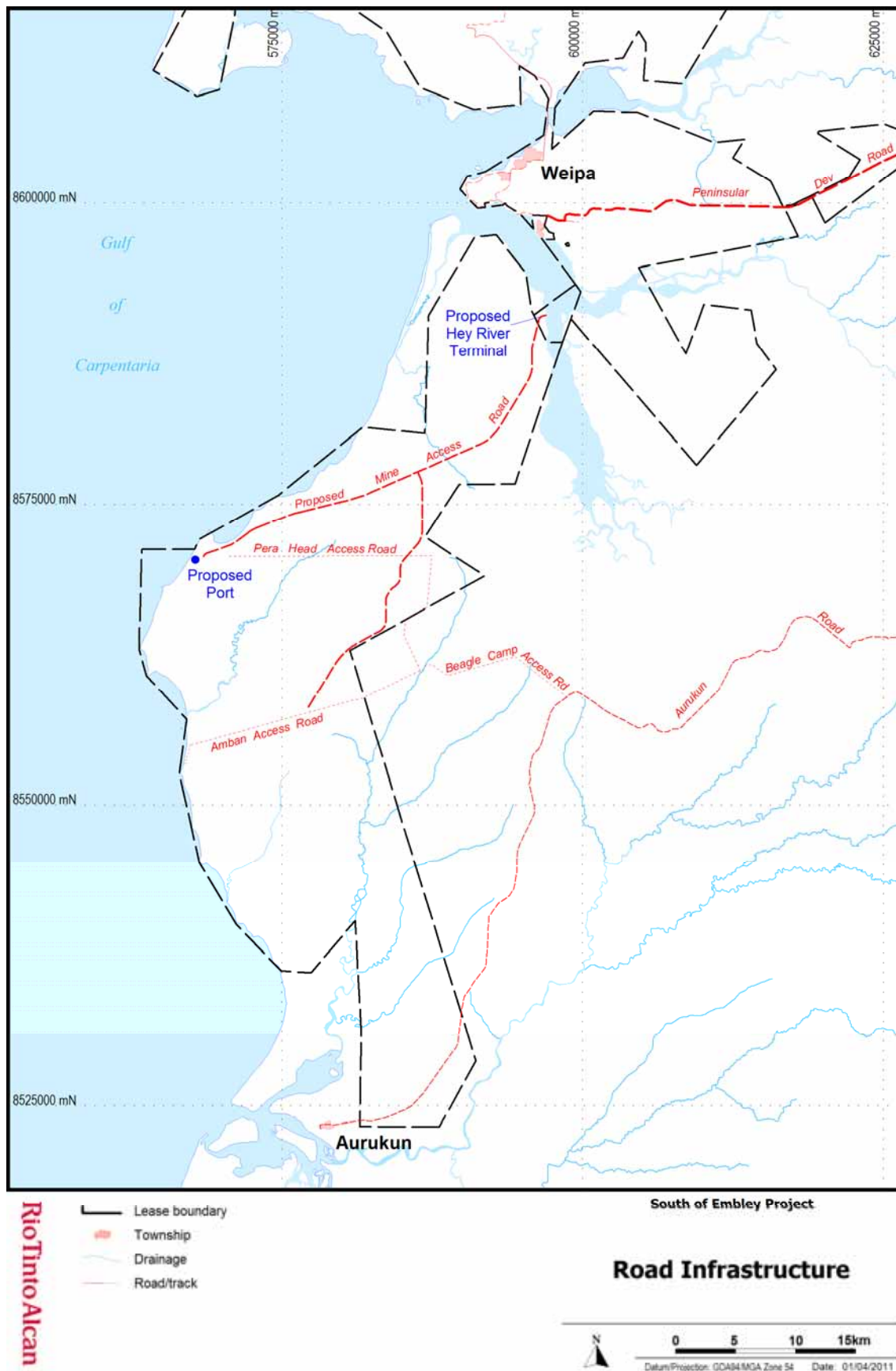


Figure 5.4 Road access from Peninsular Development Road

Proposed traffic routes

In the early construction phase (first six months) the EIS reported that access to the project area will be via the PDR, Aurukun Road, and the access roads.

Once the new barge/ferry terminals in the Embley and Hey Rivers and the mine access road are established, primary access to the project area will be as follows:

- barges will travel between a roll-on, roll-off (RORO) barge terminal near the Humbug Wharf on the north side of the Embley River, to a combined barge/ferry terminal on the western side of Hey River
- a passenger ferry will travel from a new ferry terminal at Hornibrook Point on the north side of the Embley River to the new Hey River barge/ferry terminal
- a new mine access road will link the Hey River terminal to the project site.

Transport tasks

The EIS outlined the following transport tasks:

Construction phase

Workforce

The construction workforce is to be based in a camp near the Boyd infrastructure area (1400 peak occupancy). At the beginning and end of each rotation, workers will travel on a bus, initially via the PDR, Aurukun Road, and the access roads. Once the ferry facilities have been constructed, workers will be transported by either car or bus from Weipa or Weipa airport to the Hornibrook ferry terminal, by ferry to Hey River, and then travel via the mine access road to the construction camp at the beginning and end of each rotation.

Equipment and materials

The EIS reported that the majority of equipment and materials for construction will be transported by sea, from Cairns to Weipa. Cargo ships and barges will predominantly be unloaded at Evans Landing or Humbug Wharf and cargo loaded onto trucks. Initially, the trucks will need to travel by road via Kerr Point Drive, the PDR and Aurukun Road to the site, until barge facilities have been constructed at Hey River. At this time, the loaded trucks will be transported by barge from Humbug Wharf to the Hey River Terminal and then by the mine access road to the site.

The EIS and SEIS also reported that some equipment and materials required for commencement of construction may be brought ashore by barge between Boyd Point and Pera Head, and at Hey Point. RTAW has indicated in the SEIS (section 2.2) that it is now seeking to establish temporary (12 months) early construction access facilities north of Pera Head and at Boyd Bay. This is dealt with further in Section 5.10.3 below.

Once the barge facilities and mine access road are established, the primary heavy vehicle usage of roads outside the site during construction will be deliveries of aggregate for concrete from Archer River Quarry to the site. The EIS reported that aggregate will predominantly be sourced from borrow pits within the project area using internal roads; however, further geotechnical work has determined that most aggregate

will need to be sourced from the Archer River Quarry (SEIS section 2.3). The quarry is located approximately 200 kilometres south-east of Weipa and 100 kilometres south of the Aurukun Road turn-off via the PDR.

Operational phase

Workforce

Employees and contractors are likely to be based in Weipa and commute to the project site daily by driving to the Hornibrook ferry terminal, where they will leave their vehicle, and then catch the ferry to the Hey River terminal where a bus will transport them to the workplace. Administrative staff will live in Weipa and work at the current RTA main facility, located opposite the proposed Hornibrook ferry terminal in Weipa.

Equipment and materials

The majority of equipment and materials will continue to be transported by sea from Cairns to Weipa. It will then be unloaded at Humbug or Evans Landing wharves, loaded onto trucks, transported by barge to the Hey River barge/ferry terminal and then travel via the mine access road to the site. Limited equipment and materials are expected to come by road from Cairns.

Traffic impacts and mitigation

Traffic generated by the proposed development has been estimated from the heavy vehicle haulage and employee requirements during both the construction and operational phases of the project. The traffic generation figures for the construction phase are presented in Table 14-3 of the EIS and were subsequently revised in the SEIS to account for the increase in aggregate transport from the Archer River Quarry. Minor adjustments were made also to estimated existing traffic volumes on the Aurukun Road in Table 14-3(sup) in the SEIS.

The EIS reported on the traffic impact analysis conducted in accordance with the *Guidelines for Assessment of Road Impacts of Development* (GARID) and the *Road Planning and Design Manual*.^{13,14} The analysis covers both construction and operation periods and has regard to natural traffic growth on the road network and the staging of the project over a forty-year period covering production levels from 15 Mdtpa to 50 Mdtpa. Results for project impacts on traffic volumes (annual average daily traffic—AADT) and pavement impacts (equivalent standard axles) are presented in the EIS as Table 14-6 and Table 14-7 respectively.

The traffic impact analysis was updated in the SEIS to account for the increased aggregate deliveries from the Archer River Quarry. The revised figures are presented as Table 14-6(sup) and Table 14-7(sup) in the SEIS.

¹³ Department of Main Roads, *Guidelines for Assessment of Road Impacts of Development*, Department of Main Roads, Brisbane, 2006, viewed 16 April 2012, <http://www.tmr.qld.gov.au/~media/ace67ef2-b6c3-46a3-91a7-39f790c309fe/garid_guidelines_200406.pdf>.

¹⁴ Department of Main Roads, *Road Planning and Design Manual*, Department of Main Roads, Brisbane, 2006, viewed 16 April 2012, <<http://www.tmr.qld.gov.au/Business-industry/Technical-standards-publications/Road-planning-and-design-manual.aspx>>.

Key findings of the impact analysis are:

Road link impacts

Kennedy Highway

The project is expected to have negligible impact on the Kennedy Highway.

PDR

The proposed development is not expected to have a significant impact on the PDR for most of its sections. The expected increase in daily traffic from Archer River Quarry to Aurukun Road is 94 per cent and from Aurukun Road to Weipa, 25 per cent during the construction phase.

After production commences, the increase in traffic for the section of the PDR between the Aurukun Road turnoff and Weipa is anticipated to be between 9–22 per cent of background traffic.

The EIS reported that, while these increases are significant in relative terms, the total daily traffic, inclusive of that generated by the proposed development, is considered to remain at very low levels and therefore, the project is not expected to have an adverse impact on daily operations of the PDR in future years.

Kerr Point Road/John Evans Drive

The EIS reported that heavy vehicles are expected to travel along Kerr Point Road and John Evans Drive from Evans Landing and Humbug wharves to the PDR during the initial six-month stage of construction, prior to construction of the barge terminal and mine access road. Negligible impacts are anticipated.

Once operating, the project is unlikely to cause an increase in traffic volume until maximum production of 50 Mdtpa is reached and the total mining workforce increases. This will result in a 12 per cent increase in traffic volume and is not expected to have an adverse impact on daily operations of these roads in view of the low volumes.

Aurukun Road

The increase in traffic volume on Aurukun Road during construction is expected to lie between 135 per cent and 216 per cent, depending on initial assumptions of pre-project traffic volumes. This increase is largely due to the increase in the transport of aggregate from the Archer River Quarry. During operations, traffic volumes are expected to increase from 38 per cent to 59 per cent, depending on production levels.

Overall, the EIS reported that, while the increases are significant in relative terms, the total daily traffic will remain at very low levels and the project will not adversely impact the operations of the Aurukun Road.

Pavement impact

In regard to pavement impact, the SEIS reported that the proposed development is expected to increase equivalent standard axles by up to 324 per cent on the PDR and by up to 631 per cent on Aurukun Road in the peak year of construction. The EIS reported that, although the increase appears to be significant, taking into account that

along each of these road sections traffic is less than 100 vehicles per day without the development and less than 200 vehicles per day with the proposed development, the increase in absolute terms is quite minor.

Issues

In its submission, TMR raised concerns over the impacts to the PDR and Aurukun Road, which are largely gravel, and the increase in traffic volumes is likely to impact on the safety and efficiency of the PDR. It sought a revised road impact assessment (RIA) in accordance with the GARID in consultation with the Manager of the TMR Far North Regional Office when further information is available on vehicle types and numbers. It further sought the preparation of a road-use management plan which must update and summarise the use of the PDR and other roads during each phase of the project and must include the latest traffic generation, final assessment of impacts on safety and efficiency of the PDR and PDR-Aurukun Road intersection, and impact mitigation strategies such as maintenance and improvements.

RTAW gave a commitment in the SEIS to undertake this work.

Mitigation

The EIS outlined a number of mitigation measures and made a number of commitments in relation to impacts to the road network and to safety:

PDR and Aurukun Road

RTAW will monitor road conditions and repair any damage to the PDR and Aurukun Road arising from project-related traffic. The monitoring approach is to be agreed with TMR and relevant shire councils.

A further RIA and road-use management plan is to be prepared in consultation with TMR.

Intersection upgrades

The PDR/Hornibrook Ferry Terminal access intersection and the Kerr Point Road/Humbug RORO Barge Terminal access intersection are to be upgraded to ensure operational efficiency and road safety.

Driver fatigue

RTAW has implemented a fatigue management standard and guideline for employees and contractors on site or while conducting business on behalf of RTAW. It has also implemented a Travel Remote Site Health Procedure that includes measures to prevent deep vein thrombosis, which may occur as a result of sitting in a vehicle for long periods at a time.

Access to culturally significant areas

RTAW will continue to manage traditional owners' access to specific areas within the project area (including Amban, Waterfall, and Six Ti Tree), in accordance with its obligations outlined within the WCCCA.

5.10.2. Air transport

Weipa Airport is located 13 kilometres south-east of the town and is managed by Weipa Air Charter. The airport is currently serviced by QantasLink, with flights leaving Weipa one to three times daily. Two car rental companies service the airport and BP Australia currently maintains a fuel facility.

Transport tasks and impacts

During the construction phase, personnel that are not based in Weipa will be transported from the construction camp to the airport for transportation back to their place of residence for their scheduled days off. The EIS estimated that one additional air service per day may be required, which is within the capacity of the existing airport infrastructure.

During the operational phase, personnel will be based in Weipa and therefore the use of the airport will be limited to visitors to the project site and personal trips by people living in Weipa. The EIS estimated that significant changes to the Weipa resident population will not occur until production reaches 50 Mdtpa, at which time the Weipa resident population is expected to rise to approximately 400 above 2007–08 levels. It is estimated that three additional flights per week will be required at this stage, which can be handled by existing airport infrastructure.

The SEIS noted that airport improvements are currently being considered to improve screening and security requirements as part of RTAW's existing operations, together with improvements to pavement and car parking.

5.10.3. Sea transport

Existing and proposed infrastructure

North Queensland Bulk Ports Corporation Limited (NQBP) is the port authority for the Port of Weipa. The port is primarily involved in the shipment of bauxite from RTAW's existing mining operations to Gladstone and markets overseas, as well as deliveries of fuel and general cargo. The port has four berths, two at Lorim Point for the export of bauxite, Evans Landing for deliveries of fuel and oil and Humbug Point Wharf for deliveries of general cargo.

Proposed new marine facilities for the SOE project include:

- a new port to be constructed on ML7024 between Boyd Point and Pera Head (outside the current Port of Weipa limits)
- a new ferry terminal to be constructed on the northern side of the Embley River near Hornibrook Point on NQBP land (Hornibrook ferry terminal)
- a new RORO barge terminal to be constructed near the existing Humbug Wharf on NQBP land (Humbug RORO barge terminal)
- a ferry terminal and RORO barge terminal to be constructed on the southern bank of the Hey River on ML6024 (Hey River barge/ferry terminal).

Berthing frames and walkways are to be installed on the landward side of the existing Lorim Point east wharf to accommodate the tugs that will be required for the proposed port during adverse weather conditions.

RTAW proposes to operate the new port facilities near Boyd Point which will initially be developed to 30 Mdtpa (two berths) with capacity to increase to 50 Mdtpa (four berths) or possibly to 63 Mdtpa to cater for third parties, should suitable commercial terms be negotiated with any future prospective user. The new port will cater for vessels up to Cape size (185 000 dead weight tonnes).

RTAW believes it has requisite authority under the Comalco Act to construct, own and operate the port facilities and does not require any approval under the TI Act. TMR however does not share this view and, at the time of releasing this report, TMR has sought legal opinion and the issue has yet to be settled.

Transport tasks

Marine transport tasks are discussed as part of road transport in Section 5.10.1.

Barge/ferry traffic

In regard to materials and equipment transport, the EIS estimated that barge deliveries in the Embley River estuary will increase from one to two per day during construction to forty per day during operations at full mining production of 50 Mdtpa. Similarly, passenger ferry trips are anticipated to reach four to six crossings per day between the Hornibrook and Hey River terminals at 50 Mdtpa production.

Early construction seaborne access

In the SEIS, RTAW canvassed the possibility of early construction access by sea to the project site area. The proposal outlined, involves barge access at a location north of Pera Head and passenger access by a jetty to be constructed in the Boyd Bay area. Both localities are on ML7024 and both facilities will be temporary and be used for approximately 12 months after which they will be removed.

Subsequent to the SEIS, RTAW has reviewed its early construction access needs and made a separate application to DEHP for a minor amendment to the existing environmental authority to allow early site access for purposes of investigations, water supply and camp establishment. I support this application provided DEHP's final determination is made after the release of this report.

RTAW has advised that it has discussed the proposal with the WCCCA SOE sub-committee and relevant traditional owners and that no concerns have been raised.

Early construction sea access will allow RTAW to commence construction in the first wet season following approvals, permitting early camp establishment and start-up activities, including transfer of personnel; delivery of camp modules, fuel, food and consumables; sewage and waste removal; and delivery of earthmoving equipment. RTAW estimates that early seaborne construction access could potentially save 12 months on the overall project construction schedule. Construction road access via the PDA, Aurukun Road and the access roads will also be utilised during the dry season.

Impacts and mitigation

The following key impacts were identified in the EIS and SEIS:

Shipments from/to Port of Weipa

Shipment of bauxite through the Port of Weipa will reduce when operations cease at East Weipa and will cease entirely when bauxite reserves at Andoom are depleted. The port will continue to be used for fuel imports and general cargo imports/exports. During construction of the project, deliveries are expected to increase by up to 20 per cent above existing levels but can be handled within the present port capacity.

During operations, cargo delivery volumes are expected to be largely similar to that at present but when mine production is increased to 50 Mdtpa, the volume of cargo is expected to double. The EIS reported that the port has sufficient capacity to handle this volume of cargo imports.

Vessel activity within the Port of Weipa limits

After the SOE operations commence, the number of bulk carriers travelling within the Embley estuary will decrease in line with the phasing out of mining from existing operations north of the Embley River. Cross estuary barge and passenger ferry traffic will progressively increase during construction and thereafter during operations as bauxite production from the SOE project ramps up.

All vessel traffic will be controlled by the port operator and, given the estuary is up to three kilometres wide in places, the EIS concluded that the risk of collision between bulk carriers and other vessels is low.

Ship movements between Weipa and Gladstone

The SEIS reported that, in 2014, immediately prior to the commencement of shipments from the proposed South of Embley Port, domestic shipping of bauxite to service the Queensland Alumina and Yarwun refineries in Gladstone will reach approximately 270 ships per annum. This shipping is of Panamax and Dedicated Post-Panamax (DPP) bulk carrier size and is approved to use the existing shipping route through the Great Barrier Reef Marine Park.

At maximum mine production of 50 Mdtpa, the SEIS reported that domestic shipping of bauxite into Gladstone will increase slightly to an average of 300 ships per annum (based on the Yarwun refinery operating at its approved 4 million tonnes per annum production).

Mine product beyond the levels servicing the Gladstone alumina refineries will be shipped directly overseas by bulk carriers up to Cape size and ships will not use the Great Barrier Reef Marine Park passage.

In 1999, the Coordinator-General approved the Yarwun Alumina Refinery Project¹⁵ for ultimate production of 4 million tonnes per annum of alumina, involving domestic shipping of bauxite from the Weipa mines of approximately 155 ships per annum.

¹⁵ Assessment Report on Comalco Aluminium Limited's IAS for an Alumina Refinery at Gladstone, March 1999

Given this and the existing production level of 4 million tonnes per annum of alumina for the Queensland Alumina Refinery (where incoming bauxite shipping from Weipa will roughly equate to 155 ships per annum), the Coordinator-General is satisfied that overall domestic shipping levels into Gladstone will reach approximately 310 from 2014, which is consistent with RTAW's assessment. .

Fuel, oil, chemical and bauxite spills at new SOE port

The EIS found that the risk of fuel, oil and chemical spills is low because larger and correspondingly fewer vessels will use the port, the port is remote from other shipping routes and there are no bulk fuel deliveries or refuelling proposed at the port.

In regard to product spillage, the EIS advised that bauxite is non-hazardous and therefore risk to the marine environment is low. Specific mitigation measures are proposed, including catch trays, belt scraping and water sprays and controlled belt starting.

Commercial and recreational fishing

The proposed mooring area in the EIS for bulk carriers is in an area of the Northern Prawn Fishery utilised by commercial trawlers. The area is also utilised for recreational fishing, although the most preferred reefs for fishing are in shallower water.

Fishing vessels are permitted to operate within mooring areas; however, MSQ requires commercial fishing boats keep clear of anchored bulk carriers. This means a small proportion of available fishing ground will be temporarily unavailable while vessels are anchored in the area. Impacts on commercial and recreational fishing are discussed further in Section 5.4.1.

The EIS estimated the mooring area will be utilised for 55 hours per year (0.6 per cent of the time) at a production level of 15 Mdtpa, increasing to approximately 753 hours per year (9 per cent of the time) at 30 Mdtpa and beyond. Port berthing will expand from the initial two berths to four berths at 50 Mdtpa.

The proposed mooring area was revised in the SEIS in favour of the existing Port of Weipa mooring area further north, on the advice of the Harbour Master. The change will reduce the area of potential impact caused by anchorage to benthic communities as well as reducing potential interactions with commercial, charter and recreational fishermen.

5.10.4. Coordinator-General's conclusion—transport

The road traffic impact analysis has concluded that the increase in traffic generated by the project during construction and operations will not have a significant impact on the road network. RTAW has committed to upgrade a number of intersections and to repair any damage to the PDR and Aurukun Road arising from the project.

In its submission on the EIS and the SEIS, TMR expressed concerns on impacts to the PDR and Aurukun Road and advised that further traffic and transport analysis is required to ensure impacts are identified and addressed when more detailed information is available. RTAW has committed to undertake this further work when

additional and more certain trip generation and traffic volume information is available prior to commencement of significant traffic.

Based on the mitigation commitments in the EIS and SEIS, and the approvals required for the project under the TI Act for state-controlled roads and local government legislation for local roads, I am satisfied that impacts to road traffic and transport will be minimal and can be suitably managed. I support TMR's view that the road impact assessment should be updated in light of more detailed information and of the need to prepare a road-use management plan. Accordingly, a recommendation has been made at Appendix 4, Recommendation 2 to achieve this and to address related matters. It recommends RTAW come to an agreement with the Aurukun Shire Council, Cook Shire Council and TMR in regard to upgrades to, and maintenance and monitoring of, local roads impacted by the project.

In regard to air services impacts, I am satisfied impacts will not be significant and that airport capacity is sufficient to handle demands from the project.

On the question of marine transport impacts, I am satisfied that these will not be significant and that having regard to commitments made, requirements under the TI Act, MSQ Act and *Transport Operations (Maritime Safety) Act 1994*, impacts can be suitably managed.

I am satisfied that impacts associated with the proposed early seaborne construction access will be both minor and temporary. I have stated a condition at Appendix 3, Part B, Condition 7, requiring the seaborne construction access works to be removed after 12 months and for surrounding land to be reinstated to its former condition.

In regard to domestic shipping movements between Weipa and Gladstone, I am satisfied that further environmental assessment of shipping movements is not required, provided the refinery capacity in Gladstone remains within current authorisations.

5.11. Cultural heritage

5.11.1. Context

Consistent with statutory provisions set out in the *Aboriginal Cultural Heritage Act 2003* (Qld) and the *Native Title Act 2003* (Cwlth) the proponent has consulted with the traditional owners of the area and through this consultation process, has conducted surveys over several years, documenting a large number of archaeological sites relevant to the heritage and culture of Indigenous people.

The EIS confirmed a commitment by the proponent to continue liaison through processes developed by the Western Cape Communities Co-existence Agreement. (WCCCA).

5.11.2. Issues

The submission by the WCCCA emphasised its role in providing an accepted platform for consultation with traditional owners and other Aboriginal stakeholders in the region and for cultural heritage management over the project area.

The WCCCA submission on the EIS indicated that, in relation to the development north of the Embley River, significant problems had arisen in relation to cultural site protection (among other matters) through failure by RTAW to adequately implement the terms of the WCCCA.

The WCCCA submission recommended that the Coordinator-General impose a condition requiring RTAW to enter in an implementation agreement with all signatories to the WCCCA, prior to the commencement of the SOE mine construction, in relation to:

- cultural site protection implementation measures
- environmental management implementation measures
- employment and youth education implementation measures
- economic development implementation measures.

It was argued that the agreement should include arrangements to ensure that RTAW implements the provisions of the WCCCA for the duration of mining activities at the SOE project. The submission did concede that the content of the EIS dealing with cultural heritage at the SOE project area, dealt appropriately with all issues of particular importance to traditional owners and the WCCCA.

Cultural heritage matters were also referred to in some other submissions. The context varied from general opposition to the mine to protection of bush food and medicines.

5.11.3. Coordinator-General's conclusion

I note the concern held by the WCCCA and particular Aboriginal groups that RTAW has not effectively implemented the terms of the WCCCA and that there is a need for a separate implementation agreement among relevant parties. Such an approach will be time consuming to implement however, and may not result in a unified outcome acceptable to all parties concerned.

I have considered the commitments made by RTAW, the inter-relationship between cultural heritage protection and aspects of biodiversity protection that are important to traditional owners and other Aboriginal people living in the region. It is concluded that the most appropriate arrangement for implementing Aboriginal groups' aspirations, including cultural heritage, employment, training and economic development, will be through the social impact management plan (SIMP) required to be developed by RTAW in consultation with Aboriginal groups and other stakeholders and approved by the Coordinator-General. This is dealt with further in Section 6 of this report.

5.12. Hazard and risk

5.12.1. Context

The TOR for the EIS required consideration of hazard potential from materials and activities associated with the development, as well as natural hazards from events, such as bushfire, flood, cyclone and wave surge; dangerous wildlife including crocodiles, snakes, dingoes and feral pigs, and insects including spiders and arboviral risks from mosquitoes.

These matters are assessed in various sections of the EIS, including Section 14 (Transport), Section 19 (Hazard and Risk) and Section 18 (Health and Safety). Further consideration is given to air and noise pollution in Section 16 (Social Impact).

5.12.2. Health and safety

Section 19 of the EIS addressed hazard and risk issues arising from dangerous goods required to be used for site operations and transportation and for a management plan under ISO14001 and OHSAS18001.

In Section 14, consideration was given to road safety and driver fatigue safeguards, marine traffic and the potential for accidents and spillages. There was no consideration of air transport requirements for contractors and employees, where required.

Section 18 dealt with health and safety issues in the workplace pursuant to the proponent's HSE Policy. Of particular importance is management of dust particles that include respirable crystalline silica particles that are known to be carcinogenic. Ultrafine particles (PM_{2.5} to PM₁₀) are almost invisible and can penetrate human tissue causing a range of ailments in addition to cancer and ultimately death. (Note that the diameter of a human hair is about PM₉₀).

Section 18 also considered the danger of employees being bitten by fauna.

5.12.3. Emergency management plan

The mine site is frequently affected by monsoon rain, including cyclonic events that may be coincident with peak tides. Section 19.3 dealt specifically with both natural climatic events and accidental release of hazardous goods, providing an Emergency Management Plan (Weipa Business Resilience and Recovery Plan).

Issues

In its EIS submission, the Department of Community Safety suggested that information on the extent of flooding and detailed explanation of flood management arrangements along the infrastructure corridor during construction and operational activities should be included in the EM plan for the project. It also argued that the EM plan should also confirm that the safety of workers on the development site will be maintained by the proposed flood mitigation measures from all floods up to and including the Defined Flood Event, in accordance with State Planning Policy 1/03: Mitigating the Adverse Impacts of Flood, Bushfire and Landslide (Annex 4.2) (SPP 1/03).¹⁶ The EM plan should also explain how the monitoring of cyclone, flood events and bushfire emergency will be managed.

In its submission on the EIS, DERM focused on hazard recognition in the design of the proposal and sought assurance that the marine aspects of the proposal would comply

¹⁶ Department of Local Government and Planning and Department of Emergency Services, Mitigating the Adverse Impacts of Flood, Bushfire and Landslide, Department of Local Government and Planning and Department of Emergency Services, Brisbane, 2003, viewed 16 April 2012, <<http://www.emergency.qld.gov.au/publications/spp/>>.

with the recently released *Queensland Coastal Plan and the Coastal Hazards Guideline*. The submission also focused on dam security.

Queensland Health sought to confirm what impact there will be on existing health and emergency services.

RTAW's response

Notwithstanding exemption from the provisions under SPA, RTAW has committed to account for potential adverse impacts of flood hazards on people, property and economic activity and will institute measures to mitigate those impacts in a manner consistent with SPP1/03 and provide emergency evacuation arrangements. RTAW has also committed to establishing a bushfire response consistent with SPP 1/03.

In the SEIS, RTAW confirmed that the proposed port facility will be five metres above the predicted 1:100 year Average Recurrence Interval (ARI) maximum breaking wave height. RTAW also confirmed failure risk had been incorporated into the management plan.

In relation to Queensland Health's submission, RTAW has indicated there will be no increase in demand for health and emergency services until mine production increased beyond 30 Mdtpa. At that point, RTAW will assist relevant stakeholders with planning and implementing mitigation measures associated with project capacity expansions, as required. The SEIS included a *Community health and wellbeing action plan* to assist in addressing this issue, which is further addressed in Section 6 of this report.

5.12.4. Coordinator-General's conclusion

The proponent has significant experience in bauxite mining in this region. In that period, there have been severe weather conditions and other issues that have required effective management to protect infrastructure, prevent environmental pollution and maintain the security and safety of employees.

With the proposed expansion of mining, RTAW has properly considered hazards and risks in planning and design and has made commitments to safely manage risks to the workforce, public and existing environmental values, including surrounding land uses associated with the project.

Based on the mitigation measures contained in the EIS, SEIS, the draft EM plan, legislative requirements that establish minimum health and safety standards, and conditions of this report, I am satisfied that hazards and risks will be appropriately managed during construction and operation of the project.

I have stated conditions requiring the preparation of an emergency response/contingency plan in Appendix 3, Part B, Schedule 3.

5.13. Cumulative impacts

5.13.1. Assessment approach

The TOR for the EIS required the cumulative impacts of the project be considered and assessed, in combination with other proposed mining projects on the biodiversity and ecological function of the Western Peninsula bauxite plateau. In particular, the proponent was required to assess any cumulative effect in relation to:

- regional ecosystems associated with the western Cape York Peninsula bauxite plateau
- the natural integrity of Cape York Peninsula as a whole
- key habitats (e.g. riparian, wetland, threatened species habitat), which retain connections with adjacent remnant vegetation and habitat
- hydrologically connected surface water and groundwater systems that support wetlands and base flows in rivers and creeks.

Section 20 of the EIS discussed the potential for proposed activities to create cumulative impacts with activities current or proposed outside the mine site boundaries. In this regard, three projects were identified that could potentially interact with the SOE Project:

- Urquhart Point Mineral Sands Project - proposed by Oresome Australia Pty Ltd over MLA 20669. The site is adjacent to the northern tip of the proposed RTAW project and is proposed to commence during 2012. The proposal is subject to an EIS being managed by DEHP. It is noted that Oresome Australia has mineral sands interests covering extensive areas of coastal land on the Western Cape.
- Aurukun Bauxite Project - a possible bauxite mine to the east of the RTAW development proposal covering Restricted Area RA 315. The development agreement between the Queensland Government and Aluminium Corporation of China Ltd covering this proposal ended on 30 June 2011. There are no current proposals for the site.
- Pisolite Hills Project - exploration permits are held by Cape Alumina Pty Ltd over EPM 14547 and EPM 15278 approximately 50 kilometres north-east of Weipa. The proposal involves the mining of bauxite and a possible barge loading facility at Port Musgrave. The proposal was declared not commercially viable by the company in July 2010 following declaration of the Wenlock River as a wild river under the *Wild Rivers Act 2005*.

5.13.2. Cumulative impacts and mitigation

Regional clearing of ecosystems

The cumulative impact of clearing was addressed in the EIS at section 7.9.1 and in section 20.7.1, where cumulative impacts were considered for the SOE project, the Aurukun Bauxite Project, Pisolite Hills Project and the Urquhart Point Mineral Sands Project in an overlapping timeframe. By far, the major clearing impact will be to Darwin Stringybark community (RE 3.5.2) where it was estimated that up to 74 200 hectares

could be cleared, including the existing clearance for RTAW's existing mines north of the Embley River. Such an aggregate clearance will reduce the subregional extent of RE 3.5.2 to 89 per cent of its current distribution and the bioregional extent to 90 per cent. It is noted that if this outcome eventuated, RE 3.5.2 would not be classed as 'of concern' under the VM Act.

Marine fauna

The Urquhart Point Mineral Sands proposal and the SOE Project are likely to have cumulative impacts on marine turtle nesting along the beach from Urquhart Point to south of Pera Head.

For its part, RTAW is proposing to mitigate its impacts through low intensity lighting at the port and to provide a marine turtle offset program aimed at controlling feral pig predation of turtle eggs along the beach from Ina Creek to Winda Winda Creek. I consider it reasonable that should the Urquhart Point proposal proceed, then a similar commitment to feral pig control should also be sought from that company.

It would also be reasonable to assume that with each new development in the Weipa area and consequent increase in workforce population, there is likely to be an increase in risk of boat strikes, particularly on slow-moving fauna such as dugong and turtles and especially in the Embley River estuary. RTAW has considered this increased risk in the Embley River and has committed to locate passenger ferry and barge traffic routes to deeper water and to limit speed to reduce adverse impacts to marine fauna. This is an issue going forward and I draw it to the attention of the Harbour Master.

Transport

The PDR and a part of Aurukun Road could suffer substantial cumulative impacts should the construction periods for the SOE project and the Aurukun Bauxite Project overlap. This is unlikely to occur however, given the lapse of the Development Agreement between the State and Chalco in June 2010. To the extent, cumulative impacts may arise when the SOE Project is in the operational phase and the Aurukun Project does get the 'green light', then these impacts would be mitigated through repair or upgrade of the relevant parts of the road network as agreed at the time with TMR. It is noted that no significant cumulative impacts are anticipated.

Social impacts

Arrangements to address the effects on housing demand, affordability, services and infrastructure are dealt with in the SIMP and cumulative social impacts are covered in Section 6.6 of this report.

Ward River hydrology

The proposed Aurukun Bauxite Project is within the catchment of the Ward River estuary and should that project proceed, the EIS has identified that cumulative impacts could arise on Ward River flows and catchment hydrology. The EIS reports that if the Aurukun Bauxite Project surface water demands were met from a dam on a tributary of the Ward River, the cumulative overall decline in mean annual discharge to the Ward River estuary will be very minor and well within natural seasonal variation. Also, mining

disturbance in the Ward River catchment will only have a very minor change on the annual discharge from the overall Ward system.

Groundwater

RTAW proposes to increase its groundwater extraction from artesian aquifers from 9GL per annum to 12GL (average) per annum, with a peak of 15GL in any one year.

Modelling of the drawdown effects in the EIS indicates these extraction rates can be sustainability managed and that sustainable extraction rates up to 18GL per annum may be possible. The modelling also indicated that impacts on groundwater connected recharge springs will be minor and drawdown will comply with the spring factor limits set in the *Great Artesian Basin Resource Operations Plan* (DNRW 2007).

The Urquhart Point artesian groundwater demands are understood to be relatively small and therefore unlikely to significantly contribute to cumulative impacts. The groundwater demands from the Aurukun Bauxite Project are unclear at this time as is the groundwater resource capacity, and it is difficult to make any reasonable conclusion as to contribution to cumulative groundwater impacts. However, to the extent that Aurukun Bauxite demands are less than 6GL per annum then it is possible that the groundwater aquifer can meet the demands of all projects.

The capacity of the Great Artesian Basin aquifers in the region and the groundwater available to develop the Aurukun Resource are critical issues for the State that looks to develop the Aurukun Bauxite resource at a future time - especially so, given that RTAW has priority rights to surface water and groundwater supplies for its needs under the Comalco Agreement Act.

5.13.3. Coordinator-General's conclusion

RTAW has addressed cumulative impacts in the EIS having regard to proposed projects in the region and that may have overlapping time frames.

I am satisfied that cumulative impacts are not likely to have significant impacts and can be managed by the mitigating measures in the EIS, commitments given in Appendix 6, draft EM plan, SIMP and conditions of this report.

In regard to cumulative impacts to marine turtle nesting, I have made a recommendation to DEHP at Appendix 4 B, Recommendation 3, as the State agency managing the EIS and approval process for the Urquhart Point proposal, for that project to be conditioned requiring feral pig controls on the foreshore north of Winda Winda Creek, should that project be approved.

In the case of potential cumulative impacts to artesian aquifers in the Weipa region, I have made a recommendation to DNRW as the State agency administering the Water Act at Appendix 4, Part B, Recommendation 4, that work be undertaken to determine the sustainable groundwater capacity of the Great Artesian Basin in the region.

6. Social and economic impacts

6.1. Overview

Social and economic impacts of the SOE project have been identified through the social impact assessment (SIA) as part of the EIS.

RTAW began consultation on the SOE project in 2008 and although the preparation of the SIMP is not a requirement specified in the TOR, RTAW voluntarily agreed to include a SIMP in the EIS. The SIMP was informed by the community consultation, and includes eight action plans (listed in the next section) and a *Stakeholder engagement strategy*.

6.1.1. Consultation process and early development of draft SIMP

Consultation continued throughout the EIS public comment period in 2011 and further agency and local stakeholder engagement was undertaken in 2012. For detailed information on RTAW's consultation process, refer to Appendix 6, Section 6 of the draft SIMP (SEIS) February 2012.

Significant issues that were raised during the EIS public comment period and post-EIS consultation included:

- improved stakeholder engagement processes
- employment and training opportunities for people, particularly from Aurukun
- Indigenous education
- local business opportunities
- facilitation of daily transport between Aurukun and the SOE mine site
- improving opportunities for employment and training of Indigenous people in the Western Cape York region, in addition to mining jobs
- establishment of a Land and Sea Management Ranger Program that ensures Wik and Wik-Waya native title holders are able to participate in the Ranger Program
- traditional owner involvement in the communities, heritage and environment management plan
- community infrastructure and services
- housing and accommodation.

Given the considerable feedback RTAW received from stakeholders, more than half of the SIMP action plans focus on employment outcomes or improving access to employment, primarily for Indigenous people. The SIMP action plans are:

- *Community commute—Aurukun to the SOE mine site*
- *Communities, heritage and environment management plan (CHEMP)*
- *Land and sea management*
- *Indigenous employment and training*
- *Indigenous education*

- *Local and Indigenous sourcing*
- *Housing and accommodation*
- *Community health and wellbeing.*

For the purposes of this report, the significant issues raised during consultation, along with the Coordinator-General's analysis and conclusions, are dealt with in detail in Section 6.4.

Coordinator-General's conclusion

I note that RTAW has prepared a draft SIMP for the SOE project. I require the proponent to undertake further work on the draft SIMP, followed by further stakeholder engagement. The final SIMP is required to be submitted for approval within 60 calendar days of the project receiving a final investment decision to proceed.

I 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. (This is discussed further in Section 6.4.4, 'Indigenous employment and training targets and performance measures').

I will require all the social impacts and associated conditions contained in this report to be considered in the drafting of the final SIMP.

To demonstrate that RTAW has given adequate consideration to the concerns raised in the EIS and SEIS submissions, and to ensure the mitigation and management of the potential social impacts identified in the SIA, I impose Condition 7 (Appendix 1).

6.2. Weipa Town Authority and Indigenous Land Use Agreement

6.2.1. Weipa Town Authority model

Weipa has a long history as a mining town and is operated by RTAW via the Weipa Town Authority. RTAW is responsible for the administration of the town, which it does through the Town Office. The Town Office acts in the role of Local Authority and the services supplied and maintained through the Town Office are of a similar nature to those supplied by local councils such as road maintenance, water supply, town planning, public swimming pool, public library, parks and ovals and garbage collection.

Given this unique relationship, RTAW's business and its activities are embedded in the Weipa community and have strong relationships with surrounding Indigenous communities strengthened by formal agreements that exist with traditional owners (see Section 6.2.2).

Since 2009 the Weipa Town Authority, the State Government and RTAW have been working in partnership to investigate the sustainability of Weipa as a stand-alone council or amalgamated with Cook Shire Council.

Further community engagement, focused on the Weipa Town Governance Project, will be carried out in 2012 to identify the opportunities and risks and the community's view of governance options.

6.2.2. Western Cape Communities Co-existence Agreement

For the area of RTAW's mining leases registered as ML 7024 and ML 6024, RTAW operates in accordance with the WCCCA, an Indigenous Land Use Agreement (ILUA), which was signed on 14 March 2001 over the mining lease areas. It was registered with the National Native Title Tribunal under the *Native Title Act 1993* on 24 August 2001.

The WCCCA is monitored and implemented through the Western Cape Communities Coordinating Committee (WCCCC). The WCCCC is made up of democratically elected traditional owner group members who represent the eleven traditional owner groups and councils below:

- Aurukun, Napranum, Mapoon and New Mapoon Shire Councils
- the Alngith, Anathanangayth, Ankamuthi, Peppan, Taepadhighi, Thanikwithi, Tjungundji, Warranggu, Wathayn, Wik and Wik-Way and Yupungathi traditional owner groups.

WCCCA membership also comprises representatives of Rio Tinto Alcan, the Queensland State Government; and the Cape York Land Council on behalf of the native title parties.

The ILUA recognises Rio Tinto Alcan's support of native title rights and in return for access to land, the agreement provides for a range of benefits including employment, training, cultural heritage management and site protection, cultural awareness training, support for ranger programs and educational bursaries, relinquishment of land, and production-related payments into charitable trusts for community benefit purposes.

In 2008, the SOE project Sub-Committee was established. The sub-committee is chaired by a member of the WCCCC and has representatives from the Wik-Way Traditional Owner Group, RTAW and other WCCCC representatives. The sub-committee is a forum in which traditional owners and RTAW can consult, review, provide advice and make recommendations to the WCCCC related to the activities of the SOE project.

6.3. Government policy

The Queensland Government's Sustainable Resource Communities Policy (the policy) was released in 2008. It builds on the Sustainable Futures Framework for Queensland Mining Towns, released by the Government in June 2007. The policy outlines the government's commitment in partnership with industry and local government to strengthening social impact assessment within existing EIS processes. The initiatives contained in the policy reinforce the principles of leadership, collaboration, corporate responsibility, sustainability, communication and community engagement.

Improved social impact assessments have been identified as a core strategy to deliver better community outcomes.

6.3.1. Social impact management plan

The Queensland Government now requires proponents to develop a SIMP for new/expanding major resource development projects which require an environmental impact statement (EIS) to be prepared under either the EP Act or the SDPWO Act; or projects for which DEHP has given approval to a proponent to voluntarily prepare an EIS.

The purpose of a SIMP is to establish the roles and responsibilities of proponents, government, stakeholders and communities throughout the life of a project in the mitigation and management of social impacts and opportunities associated with construction, operation and decommissioning of major resource development projects. A *Guideline to preparing a social impact management plan* is available to assist proponents to develop SIMPs.¹⁷ It is noted that RTAW supplied a draft SIMP in its EIS and subsequently updated the document in the supplementary information provided in March 2012.

6.4. Social impacts

6.4.1. Construction and operational workforce

Construction phase

The SEIS reported that, since the EIS was released, further project refinements now place the average construction workforce at 950 per annum over 30 months (1400 peak) on account of a shortened construction time, changed work roster and increase in the scale of works.

The construction workforce is to be based in a camp near the Boyd infrastructure area (1400 peak occupancy). Most workers will be from the east coast of Australia, and will fly in and fly out of Weipa airport.

At the beginning and end of each rotation, workers will travel on a bus, initially via the PDR, Aurukun Road, and the access roads. Once the ferry facilities have been constructed, workers will be transported by either car or bus from Weipa or Weipa airport to the Hornibrook ferry terminal, by ferry to Hey River, and then travel via the mine access road to the construction camp at the beginning and end of each rotation.

If required, a new camp with up to 200 beds may be constructed on land adjacent to Nanum in the Weipa township, or another site as agreed with relevant stakeholders.

The on-site construction camp at SOE has been designed to include a range of fitness and recreational facilities such as fully equipped gyms, tennis courts, oval/cricket

¹⁷ Department of Infrastructure and Planning 2010, *Guideline to preparing a social impact management plan*, Department of Infrastructure and Planning, Brisbane, viewed 30 April 2012, <<http://www.deedi.qld.gov.au/cg/resources/guideline/simp-guideline.pdf>>.

pitches, basketball courts/volleyball courts, golf driving and putting range, and a lawn bowls green.

Employees will work rosters of 170 hours over a three week cycle, with three weeks on and one week off.

Operational workforce

During the operations phase, employees and contractors are likely to be based in Weipa and commute to the project site daily by driving to the Hornibrook ferry terminal where they will leave the vehicle, and then catch the ferry to the Hey River terminal where a bus will transport them to the workplace. Administrative staff will live and work in Weipa at the current RTAW main facility, located opposite the proposed Hornibrook ferry terminal.

Following commencement of production, the project will generate direct employment for approximately 400 employees and 100 contractors (based on 15 Mdtpa) and up to 1020 employees and 255 contractors at maximum production (50 Mdtpa).

The SOE project does not present a substantial shift in RTAW workforce requirements from that of the current operations. As production in East Weipa declines, the workforce will transition to SOE as production begins to ramp up. This means that the overall RTAW workforce figures will largely reflect current levels until production is over 30 Mdtpa.

As the operational workforce transitions from East Weipa to the SOE, the overall skill needs of the project also reflect the current trade, production, processing, administration and service department roles.

Coordinator-General's conclusion

I consider that the housing and accommodation mitigation and management strategies are appropriate for the increase in the SOE project workforce in the short term. Further details on housing and accommodation are included in Section 6.4.8.

I believe that RTAW must continue to liaise with agencies to develop mitigation and management strategies for when production exceeds 30 Mdtpa.

RTAW has advised it will continue to liaise with Skills Queensland through the development of the SOE project to ensure the workforce management plan addresses workforce demand and supply issues and propose strategies to manage those issues, particularly regarding any future expansion to production rates exceeding 30 Mdtpa. RTAW has advised it will complete the workforce management plan template and provide this information to Skills Queensland before construction commences.

The proponent has also committed to carrying out further assessment should there be future expansions to production levels exceeding 30 Mdtpa and will engage with the Department of Housing and Public Works regarding the application of the Major Resource Projects Housing Policy in the development of the Housing and Accommodation Master plan. Conditions relating to housing and accommodation are dealt with later in this report.

6.4.2. Stakeholder engagement strategy

In its EIS submission, the WCCCC states that consultation on the SOE project needs to be broader than consultation that occurs with the WCCCA Coordinating Committee and Sub-Committee meetings. In addition, traditional owners have requested that RTAW spend more time in communities and spend that time more productively, to ensure all traditional owners are aware of and support the SOE project.

The Aurukun Shire Council and the Ngan Aak-Kunch Aboriginal Corporation (Prescribed Body Corporate) met with the Office of the Coordinator General on 9 December 2011. Both parties raised the issue that RTAW needs to improve engagement with the Aurukun community, particularly to help people understand the SOE project in a culturally appropriate manner. It was also raised that a RTAW community liaison/facilitation role could improve awareness in the community.

It is clear that Rio Tinto has established mechanisms for engaging with the community, and in particular the native title parties through the WCCCA. The draft SIMP (Section 1.3) in the SEIS provides detail on the *Rio Tinto Communities Approach* that guides relationships with communities and Indigenous people in particular. Of particular note is RTAW's commitment to its *Reconciliation Action Plan* (RAP) to work in partnership with Indigenous communities to ensure they share in the economic benefits created by the project. Further details of the RAP can be found in the draft SIMP, SEIS (Appendix 6 Section 1.3).

In response to the concerns about engagement raised in the SEIS, and to improve stakeholder engagement with the Aurukun community, RTAW is working with the Aurukun Shire Council to establish a permanent office in Aurukun to coordinate RTAW's activities and facilitate a greater presence in the community (refer to the draft SIMP, SEIS Section 9.2.1).

The office will aim to improve engagement by appointing a program coordinator and at least two staff members and two additional trainees to support the Communities, Heritage and Environment management plan and the Land and Sea Management Program (see Section 6.4.3 for further details of these programs).

The draft SIMP also outlines RTAW's complaint and dispute resolution process that sets out the timelines, accountabilities and process for managing community complaints, disputes and grievances.

Coordinator-General's conclusion

I note that the *Stakeholder engagement strategy* in the draft SIMP is committed to extensive and diverse stakeholder engagement to ensure the community remains informed and up-to-date with ongoing project developments, and that RTAW maintains appropriate awareness of existing and emerging community issues.

I note the strategy includes non-Indigenous and Indigenous specific engagement mechanisms; and that the proponent presents opportunities for Indigenous participation such as employment and training, education, employment and business development opportunities in the separate action plans in the draft SIMP.

I support a strong approach to stakeholder engagement, especially in relation to improving Indigenous participation, and I commend the proponent for establishing the Community Office in Aurukun.

It is critical that RTAW and the Aurukun community develop a reciprocal, rewarding and sustainable relationship from the outset through a culturally appropriate communication strategy.

To reinforce this commitment and to demonstrate that RTAW has given adequate consideration to the concerns raised in the EIS and SEIS submissions, I impose Condition 8 (Appendix 1).

I support a robust approach to dispute resolution, and have therefore included a condition to address this matter as part of Condition 8 (Appendix 1).

6.4.3. Indigenous employment and training

Throughout the EIS consultation process, almost all stakeholder groups in the region raised the need for Indigenous employment and training opportunities. Employment was a key consideration for traditional owners in particular.

As discussed in the previous section, the proponent has presented Indigenous participation opportunities through the separate action plans in the draft SIMP. The action plans that deal with specific Indigenous employment and training outcomes are discussed in this section.

Further to the EIS and SEIS consultation process, the office of the Coordinator-General consulted in early 2012 with the Aurukun, Mapoon and Napranum Shire Councils, State and Commonwealth agencies such as DEEDI, DEEWR, DOCS, ICC, and the Western Cape Regional Partnership Agreement. Issues and opportunities that were raised through this process are also examined in this section.

Access from Aurukun to the mine (action plan)

Throughout the EIS consultation, Wik and Wik-Way traditional owners who reside in Aurukun expressed an interest to live in Aurukun and work in the mines, rather than residing in Weipa. DEEDI expressed the view that RTAW should consider transport/access options from Aurukun to the mine site, so that Aurukun residents can reside in their community.

The proponent has provided details of a *Community commute—Aurukun to the mine action plan* (refer to Section 7.2.1 of the draft SIMP, SEIS), to facilitate the provision of access for traditional owners living in Aurukun and working in the mine.

RTAW has committed to the implementation of a FIFO community commute arrangement for traditional owners living in Aurukun and working in the mine during construction. The proponent will also undertake a feasibility study in 2012 to assess community commute options and determine and implement an appropriate arrangement.

Coordinator-General's conclusion

I consider increased opportunity for Indigenous employment and training to be a critical component of the SOE project.

While I commend the proponent for considering options for a community commute arrangement, the Aurukun community still faces challenges such as high levels of unemployment and disengagement from economic opportunities.

In this context, simply directing additional funds to a commuting solution is unlikely to provide Aurukun residents with the work ready skills needed to work in the mine; nor does it assist Aurukun residents who may be interested in broader training and/or employment opportunities in Aurukun.

I believe there is a real opportunity for the SOE project to contribute to Indigenous employment and training outcomes, in addition to direct mining jobs. A collaborative effort across government, RTAW, Aboriginal Councils and other stakeholders to ensure the coordinated delivery of services on the ground; could assist in increasing employment and training outcomes.

Through an integrated approach, opportunities can be created for both RTAW and other stakeholders by building a pool of local talent comprising people who may want to work in the mine, but could also contribute to sustainable economic prosperity for local communities. This is discussed further under Regional employment and training opportunities towards the end of this section.

I impose conditions relating to the community commute arrangement in Appendix 1, Condition 9.

Land and Sea Management Program (action plan)

Throughout the EIS consultation, Wik and Wik-Way people expressed a desire to be employed in land and sea management activities throughout the development and life of the SOE project.

The proponent has prepared details of its *Land and Sea Management Program action plan* in the draft SIMP, SEIS (Section 7.2.2) and states the program will:

- directly employ at least two permanent full time traditional owners and a program coordinator based in Aurukun to manage the program activities
- include the development of an annual land and sea management work program in consultation with traditional owners, WCCCA SOE Sub-Committee and Aurukun Shire Council
- include ongoing casual employment of traditional owners to support the implementation of land and sea management activities across the area of the mining lease
- investigate and pursue opportunities to establish and promote career development pathways for traditional owners in areas such as environmental management, land management, cultural heritage management and/or community relations.

During consultation, the Aurukun Shire Council raised the issue that there is a limited understanding of the Land and Sea Management Program, and RTAW staff have not provided enough detail about what impact the program will have on their community.

In addition, DEEDI made the observation that Aurukun people feel isolated from the developments on their country and a structure is required that brings people together to build capacity.

Coordinator-General's conclusion

I acknowledge the establishment of the Land and Sea Management Program, and commend the proponent for pursuing employment outcomes and promoting career development opportunities for traditional owners.

I will require that further consultation is undertaken with Aurukun traditional owners and that the Aurukun community is regularly consulted in the development, management and monitoring of the land and sea management plan. The relevant condition is imposed in Condition 9 (Appendix 1).

Communities, heritage and environmental management plan (action plan)

The proponent states that in response to the issues raised by traditional owners, RTAW recognises the need for the joint development of a CHEMP for the area of the mining lease south of the Embley River.

The CHEMP will provide a framework for RTAW and traditional owners to work together to manage the community, heritage and environmental values of the mining lease within the context of the WCCCA.

The proponent states key outcomes from this action plan will include:

- direct engagement of traditional owners and other relevant stakeholders in the development of management plans for communities, heritage and environmental management
- ongoing employment of traditional owners in the development and implementation of the communities, heritage and environmental management plans, including heritage surveys and site protection programs, ongoing environmental surveys and monitoring, fire management, weeds and feral animal management etc.

Coordinator-General's conclusion

I believe it is critical to engage with the traditional owners to develop the CHEMP to protect cultural heritage, and provide employment opportunities.

To ensure this, I impose Condition 9 (Appendix 1).

Indigenous employment and training (action plan)

The proponent's *Indigenous employment and training action plan*, as detailed in the draft SIMP, (Section 7.2.4 of SEIS) identifies four actions to promote increased access, participation, retention and advancement for Indigenous people, specifically local Aboriginal people, and supports them to achieve their personal aspirations within RTAW.

RTAW has an established *Indigenous Employment and Training Strategy, July 2010 to June 2013*. The strategy was developed in collaboration with the WCCCA, the WCCCA Employment and Training Sub-Committee and the WCCT Administration Office, to

incorporate RTAW's current operations and future mine expansions. The full strategy is included in Appendix J to the draft SIMP, in the SEIS version.

The strategy outlines the following key focus areas:

- school to work pathways
- pre-work development
- direct employment
- employee retention
- career development.

During the EIS consultation process, stakeholders such as DEEDI, the WCCCA, and the Aurukun, Mapoon and Napranum Shire Councils consistently raised the issue about the low representation of Aurukun people in the RTAW workforce.

Napranum Council expressed the view that there are very few people from Napranum who work for RTAW. Mapoon Council stated that Mapoon is a small community with a quiet lifestyle including fishing, and living with family on the coast. The incentive to break away to work in a controlled environment with 12-hour shifts is not attractive.

RTAW recognises that Aurukun does not have the same level of representation in the workforce as other communities. In response, RTAW has advised that in 2008 the Destinations Program was designed to help people living in Aurukun move into full time employment in the mining industry. The employment model was developed by RTAW in collaboration with Wik Projects Limited, Myuma Pty Ltd, Aurukun Shire Council and members of the broader Aurukun community.

Participants spend 13 weeks on the Myuma training site at Camooweal participating in a work ready program before transferring to work experience at RTAW's mining operations.

The Destinations Program has come under some criticism from DEEDI, the WCCCA, and the Aurukun, Mapoon and Napranum Shire Councils for low attraction and retention rates post Myuma. Further feedback was that the transition for long-term unemployed people to a structured 12-hour day is an enormous change and many people do not end up with jobs.

The proponent has advised that the following improvements have been made to the Employment and Training Strategy that have resulted in improved outcomes.

- A revised 'case management' approach for mentoring was introduced during 2011, where trainees and mentors were matched and work more closely together along with their leaders. Increased accountability of mentors over specific trainees has allowed for more targeted and effective support.
- A revised traineeship induction process was introduced during 2011 to better integrate the Destination program participants (all from Aurukun) and trainees from other communities. The Destination participants begin their traineeship with a larger group of peers, with the aim of increasing retention and to achieve higher results for the Certificate courses work.
- Weekly ongoing meetings were conducted in 2011 with Job Services Australia (JSA) agencies in the community, to ensure that support and assistance is available for

traineeship applicants who failed to meet RTAW criteria, such as having a drivers licence, literacy and numeracy and passing a medical test. This process aims to achieve a higher success rate in subsequent intakes.

- RTAW is partnering with Indigenous Pathways Solutions (IPS) to assist employers with recruitment of work ready seekers and provides post-placement support.

As a result of some of these changes, the Destinations program delivered the following improved outcomes in 2011:

- highest levels of interest recorded in Aurukun for the Destinations Program with 37 people formally expressing interest and being considered for the work ready program at Myuma
- ten participants completed the Myuma work ready program during 2011 which is the most in any one year
- three Destination participants were offered traineeships during 2011—one in the engineering stream, one in HR and the other in the resource processing stream
- there were only two resignations from Destination program during 2011 which is the highest level of retention recorded for the program
- in early 2012, nine Destination trainees were employed at RTAW.

Coordinator-General's conclusion

I consider that the proponent has in place a number of structured programs through its Indigenous Employment and Training Strategy, and is committed to increasing the representation of Indigenous people in its workforce (see Section 6.4.4).

I recommend that RTAW continue to review the Indigenous Employment and Training Strategy, particularly the Destinations Program, to improve Indigenous representation from Aurukun.

Regional employment and training opportunities

The WCRPA is an agreement between industry, Indigenous stakeholders and Australian, state and local governments, to work together to achieve real benefits for the Indigenous people of Western Cape York.

In June 2005, the Australian Government and the Minerals Council of Australia signed a Memorandum of Understanding (MOU) with the aim of improving employment and business opportunities for Indigenous people in mining regions. The MOU is also about ensuring sustainable Indigenous communities with prosperous people and families that endure beyond the life of mining in the region.¹⁸

RTAW is actively engaged in the WCRPA working group on employment and training to identify opportunities where industry, governments and local Aboriginal people can strategically partner to develop relevant skills and employment pathways prior to and during the construction phase of the SOE project. RTAW also provides in-kind support for the appointment of the place-based WCRPA Coordinator to support the Steering Committee.

¹⁸ Details of the MOU are available at www.atns.net.au/agreement.asp?EntityID=3307

During consultation by the office of the Coordinator-General in early 2012, Aak Puul Ngantam (APN Cape York) stated that Aurukun is at a crossroads with real jobs and opportunities including the State housing development, caring for country jobs, ranger programs etc. but there is no coordinated structured plan to assist people into employment and training.

The Department of Communities advised there is an urgent need to 'step back' and assess the coordination of programs for employment, training and enterprise opportunities for Aurukun.

Coordinator-General's conclusion

I believe there is a real opportunity for the SOE project to contribute to Indigenous employment and training outcomes across the region, in addition to direct mining jobs.

While the proponent has made considerable effort in working with Indigenous communities, I recommend that RTAW continue its membership on the Western Cape Regional Partnership Agreement (WCRPA) to identify opportunities where industry and government can work together to increase Indigenous opportunities from mining projects, and broader employment and training opportunities.

6.4.4. Indigenous employment and training targets and performance measures

RTAW has set a long-term target to continue to increase representation of Indigenous people, particularly local Aboriginal people, across the operation year-on-year.

A Local Aboriginal Person (LAP) as defined by the WCCCA is:

- a member of a Traditional Owner Group
- an Indigenous person connected to a Traditional Owner Group by marriage or adoption
- a person recognised as a Local Aboriginal Person by the majority of Indigenous members of the Coordinating Committee who, once the decision is made, will always be a Local Aboriginal Person.

The proponent states that total Indigenous employment numbers have grown steadily from 13% to 22.5% since 2004. In 2011, Indigenous employees represented 25.5% of the RTAW workforce.

The Indigenous Training and Employment Strategy (Appendix J to the draft SIMP, in the SEIS version) includes key performance indicators (KPI) that are monitored by the WCCCA Coordinating Committee.

RTAW regularly report on the number of Indigenous trainees and employees who are local Aboriginal people in key focus areas such as:

- school to Work Pathways
- pre-work development
- direct employment
- employee retention
- career development

- SOE project.

This information will also be reported as part of the SIMP process to the SIMP Steering Committee. The action plans in the draft SIMP provide some level of information on KPIs; however, there are refinements that are required prior to the proponent submitting the final SIMP (as per conditions 7 and 10 (Appendix 1)).

DOCs, in its SEIS submission, advised the *Community commute—Aurukun to the mine action plan* lacks timeline detail and suggests incorporating milestones linked to performance indicators.

DOCs provided additional feedback about the need for specific timeframes and points out there are no key performance indicators for Indigenous Education. The KPIs in the *Indigenous education action plan* refer to the BOLT Strategic Plan; however, this document does not contain KPIs.

As discussed in previous sections the low representation of Aurukun people employed by RTAW as well as limited numbers from Napranum and Mapoon Shire Councils was consistently raised through consultation.

The proponent has developed various mitigation strategies to improve attraction and retention rates in the draft SIMP, however the reporting of *Local Aboriginal Person* through the above definition includes people who do not necessarily reside in their home community and could be recruited from across the Cape or other areas in Queensland. This means that specific data on Aurukun, Mapoon and Napranum may not be captured.

Coordinator-General's conclusion

I consider it essential that the performance indicators referred to in the draft action plans be expanded to include reporting on outcomes for Aurukun, Mapoon and Napranum Shire Councils.

To ensure this, I impose Condition 10 (Appendix 1).

I recommend that RTAW work in collaboration with the Department of Communities, Child Safety and Disability Services to refine the performance indicators.

6.4.5. Local and Indigenous sourcing

The proponent is developing a Local and Indigenous Sourcing Strategy to maximise opportunities for local and Indigenous business participation and business development with the SOE project.

RTAW's SIMP acknowledges the opportunity that the SOE project may provide to businesses in the Western Cape region and particularly acknowledges the objective of traditional owners to develop business and entrepreneurial skills and capabilities.

The proponent states it will work closely with engineering, procurement, and construction management (EPCM) companies, local and regional Chambers and other key agencies to determine the skills requirements and sourcing options for the various work packages for the construction phase.

The selection criteria for all contractors include aspects relating to Indigenous employment as a key component for a successful tender. A contractor's willingness to partner with RTAW to support Indigenous employment and promote local Aboriginal employment within construction as a pipeline for future careers with the contractor, or with RTAW operations, is an agreed action within the SOE Indigenous Employment and Training strategy. RTAW supports future inclusion of the EPCM and SOE project representatives on the WCCCA Employment and Training sub-committee to report on appropriate measures as the project commences.

One of the actions in the *Local and Indigenous sourcing action plan* is to 'identify and pursue opportunities that place members of the community into roles during the SOE construction phase'.

The Aurukun, Mapoon and Napranum Shire Councils have requested further detail about the contracting opportunities that may be available in the construction phase (e.g. timber harvest, parks and gardens, catering, hospitality, cleaning, supply of items etc.)

The councils have also requested assistance in up skilling where appropriate to:

- sponsor business
- assist in capacity building
- assist Indigenous businesses to provide goods and services.

Coordinator-General's conclusion

I conclude that while the draft SIMP provides some detail on the Local and Indigenous Sourcing Strategy, the strategy should be finalised in consultation with DSDIP.

I also believe there should be further consultation undertaken with the shire councils about the types of contracting opportunities available throughout the project.

I therefore **recommend** the proponent develops the Local and Indigenous Sourcing Strategy as per Recommendation 5, Part B Other Matters.

6.4.6. Indigenous education (action plan)

The objective of the proponent's *Indigenous education action plan* in the draft SIMP (Section 7.2.5 of SEIS) is to provide an integrated approach aimed at securing stronger school-to-work pathways for students in the Western Cape region.

RTAW has an established Building our Local Talent (BOLT) Strategy in collaboration with the Western Cape College (WCC) to better link school based programs with core industry requirements that will enable students to broaden their aspirations for the future as they transition beyond school into a variety of different career pathways. The BOLT Strategic Plan is included in Appendix L of the draft SIMP, SEIS version.

Under the BOLT Strategy, WCC students have a wide variety of career development opportunities, including career presentations, site visits, work experience, school-based traineeships, apprenticeships, scholarships, vacation work and other support programs. Some of the initiatives undertaken by RTAW include:

- primary school visits to the WCC to create an early awareness of RTAW, and the career opportunities available
- regular visits for students to different work areas so students can gain an understanding of RTAW jobs and the workplace
- delivery of lessons by RTAW employees at WCC relating to specialised career options (e.g. chemistry, engineering, business) to build an awareness and support students to learn their curriculum with practical and relevant examples from industry.

Consultation by the Coordinator-General in early 2012 revealed some consistent feedback from a range of stakeholders, listed below:

- the RTAW program should have a greater emphasis on supporting kids in the Aurukun school (DEEDI) as well as the WCC campus in Weipa
- there are issues with boarding school students who return to Aurukun, often the students don't make the transition to RTAW or other employment (Queensland Health)
- to assist the boarding school students who return to Aurukun, there needs to be a coordinated support program throughout the placement at boarding school to ensure career options are realised post school (Qld Education, QPS, DEEDI)
- RTAW should be more proactive and attend Aurukun school sessions to create an early awareness of RTAW (Qld Education).

In response, RTAW is developing a program that provides opportunities for boarding school students from Aurukun and students attending boarding school outside of the Western Cape region.

Transition Support Officers (TSOs) will work with Aurukun student boarders, their families and boarding school staff to identify preferred career pathways for each student. The Transition Support Service (TSS) will facilitate opportunities for students to participate in work experience and work sampling in consultation with boarding schools and industry sites.

TSS will work with RTAW to organise site visits for interested students and their families in the Easter vacation period each year and work experience will be offered to interested students in the July/July and September vacation periods to maximise students' participation.

In addition, RTAW has advised that it is currently developing an engagement strategy with the Aurukun school to begin a program of site visits and participate in school lessons.

Coordinator-General's conclusion

I note the range of strategies in place by the proponent to create awareness of career options, providing work experience opportunities; and ongoing case management of students to progress their career aspirations, particularly through the WCC in Weipa.

I believe that overall, the education focus is targeted towards students of the WCC Weipa campus, and initiatives need to be extended to Aurukun.

To reinforce this and to ensure that RTAW gives adequate consideration to the concerns raised, I impose Condition 11 (Appendix 1).

6.4.7. Social Infrastructure and community services

RTAW has made significant contributions to Weipa and surrounding communities. These contributions are made via agreements and partnerships and other capital works associated with managing the town.

In 2010 RTAW invested \$12.5m for a sewage treatment plant upgrade, and provided supporting infrastructure and power generation, including a community electrical distribution upgrade.

RTAW has committed to \$3m to upgrade town water infrastructure scheduled for 2012, and has invested \$4.5m into Cape Kids Childcare Centre expansion and refurbishment (\$2.5m funding provided by RTA Weipa) in 2012.

Approximately two to three million dollars per annum is provided towards ongoing town capital works, including water, sewage, airport upgrade, facility improvements and major maintenance works.

Furthermore, significant contributions have been made to capital infrastructure such as housing estate development (Golf Links Stage 2) as noted in the *Housing and accommodation action plan*.

Coordinator-General's conclusion

I acknowledge the proponent's financial and administrative role in the town of Weipa. I note the draft SIMP provides some details on community contributions, however the level of SIMP investment is not provided.

I will require that the SOE SIMP investment is reported 60 days after receiving a final investment decision to proceed, and reported annually to the Coordinator General thereafter as per Condition 12 (Appendix 1).

6.4.8. Housing and accommodation (action plan)

The proponent's draft SIMP states the current operational RTAW workforce is predominantly based in Weipa in privately owned homes and two single person villages located at Rocky Point (140 person capacity) and Evans Landing (200 person capacity).

As production in East Weipa declines, the workforce will transition to SOE as production ramps up. Overall RTA workforce figures will then largely reflect current levels until production is over 30 Mdtpa. This ongoing workforce will be predominantly housed locally in Weipa and some surrounding communities as a result of skills development initiatives and local commuting arrangements established during construction.

Current housing market and impacts

The Weipa housing market is under considerable pressure, and in early 2012 the Weipa Real Estate had 74 people on the waiting list for private rental, of which 48 were RTAW employees.

The pressure on the housing market has increased in recent years since the Scherger air force base was established as a detention centre for asylum seekers in 2010. Given the centre's close proximity to Weipa, approximately 200 Commonwealth staff and contractors working at the centre are residing in Weipa, which has resulted in a shortage of accommodation for tourists and regular contractors in Weipa.

In response to this demand, a number of private property developments have begun in Weipa including redevelopment of the old hospital site into a 90-bed accommodation site and the opening of the Albatross Hotel with approximately 70 beds.

The Scherger Detention Centre is expected to be decommissioned in mid 2012, which should ease housing pressure; however, the proponent is also proposing to build a new construction camp with up to 200 beds in Nanum, part of the Weipa township (or another site as agreed with relevant stakeholders) to help alleviate any short-term accommodation pressures should there be a delay to the decommissioning of the detention centre.

Proponent's mitigation strategies

Section 6.4.1 of this report provides details of the arrangements for the construction and operational phases for the SOE project. Weipa will continue to be a residential site, during the operational phase and as such, RTAW will ensure sufficient quality housing at affordable prices to attract and retain employees.

The *Housing and accommodation action plan* in the draft SIMP (Section 7.2.7 of SEIS) includes the following key outcomes:

- continued engagement with relevant State and Federal Government on cumulative housing and infrastructure impacts (eg. Scherger Detention Centre)
- Weipa township water and sewerage infrastructure upgrade to be completed in 2012
- Golf Links Stage 2 residential development that will provide 50 detached lots and 150 townhouse sites
- construction camp facilities established north and south of the Embley River to accommodate SOE FIFO construction workforce
- analysis of medium and long term residential, industrial, commercial and community land requirements and assess the availability of land within the Weipa Town Boundary
- developing a demographic analysis through continued engagement with relevant stakeholders, including Government agencies and develop a collaborative approach to future housing and accommodation development
- developing a Housing and Accommodation Master plan in 2014.

RTAW has a dedicated team whose core role is to regularly manage and monitor housing stock. This enables RTAW to closely monitor changes in housing trends such as growth, impacts and infrastructure capability. They also plan and manage workforce accommodation needs, are linked directly to the housing market, and keep abreast of emerging issues or cumulative impacts.

The proponent has committed to carrying out further assessment should there be future expansions to production levels exceeding 30mdptpa and will engage with the Department of Housing and Public Works in the development of the master plan.

Stakeholder views

Consultation undertaken by the office of Coordinator-General in Weipa in early 2012 identified that the housing market is under considerable pressure. Queensland Health reported that it is difficult to attract doctors to the area as there is no housing available, and people are forced to “couch surf” or to take up accommodation in the tourist park. It was generally reported that the Scherger Detention Centre was largely responsible for the increased housing pressure.

In its EIS submission, the Department of Communities commends the proponent for its commitment to the provision of housing and water and infrastructure in Weipa, and for its commitment to maintaining a long term residential and employment focus for the region, particularly for the Indigenous community.

The Department of Communities also states that experience in other resource communities has shown that low-income workers, not associated with mining companies, are faced with increasing rents and low availability of affordable housing.

The department recommends that in the likelihood of any future mine expansion, cumulative impacts on housing affordability and availability issues should be acknowledged, when considered in conjunction with other current and future projects in the region. In its SEIS submission, the department proposes further engagement with the proponent, particularly in relation to the future impacts of the Scherger Detention Centre, assistance with the demographic analysis, and development of a Housing and Accommodation Master plan.

Coordinator-General's conclusion

I accept that RTAW, as town administrator, has made significant contributions to Weipa capital works associated with managing the town. Therefore, I consider it reasonable for RTAW to have some flexibility in its arrangements for meeting its non-resource key worker obligations.

Nevertheless, the existing pressure and potential increase in pressure on the housing market, particularly when the project reaches 30mtpa will continue to place non-resource key workers in housing stress.

I note the demographic analysis underway and the Housing and Accommodation Master plan to be progressed by the proponent in 2014. I consider it critical that ongoing engagement occurs with the Department of Housing and Public Works to inform the demographic analysis and master plan, and analysis of any future impacts of the Scherger Detention Centre.

I emphasise the importance of the demographic analysis, particularly for when production reaches 30 Mdptpa on an already stressed housing market.

I impose Condition 13 (Appendix 1) that requires the proponent to prepare the demographic analysis in collaboration with the Department of Housing and Public

Works and OESR, to ensure population estimates and projections have been considered in relation to housing affordability and availability

The Housing and Accommodation Master plan is also to be developed in consultation with the Department of Housing and Public Works.

6.4.9. Community health and wellbeing (action plan)

The proponent has prepared details of a *Community health and wellbeing action plan* in the draft SIMP, SEIS version (Section 7.2.8). The actions are listed as:

- continue to implement existing policies and procedures and integrate these into recruitment and induction processes for SOE
- continue to identify and co-operatively support community-based health and wellbeing programs that encourage greater education and awareness around health risks
- assess and monitor the potential impact of the SOE construction workforce on the demands on current regional health services provided by both RTAW (Occupational Health Centre) and Queensland Health
- provide a comprehensive range of occupational health and family support services for all employees and contractors
- continue to support 18-24 year old men to participate in life-skills and leadership development program through Rio Tinto and AFL Footy Means Business Program
- undertake social baseline community assessments and monitor key social indicators
- support local Shire Councils with the implementation of permit systems and communication of Alcohol Management Plan requirements for visitors to local communities.
- expand current Cape Kids Childcare service from 28 places to 75 places.

Community medical and health services

Queensland Health, in its SEIS submission, recommended that if the 200-bed camp in Nanum (or elsewhere proceeds), consultation will be required with the Cape York Health Service District (to become Cape York Health and Hospital Network).

In addition, through consultation with the office of the Coordinator-General in early 2012 in Weipa, staff from the Cape York Health Service District reported that RTAW had not consulted with Health staff, and the proponent has not assessed what health services are currently offered within the immediate region, nor the impact of the proposed project. Staff also reported:

- high incidents of mental health in Weipa
- occupancy rates at Weipa Health Service are about 89% - an increased population will result in significant overcrowding
- no resident allied health services are currently available in Weipa

In its EIS submission, DEEDI raised the issue of the proponent needing to support or sponsor community based programs to overcome the identified social and health barriers to employment, as a pathway to employment strategy.

Police service delivery

In its EIS submission, QPS identified requirements for additional police resources, including the need for increased accommodation to allow an upgrade to a 24-hour operation, requiring an increase in staff from nine to 18 uniform officers (including a traffic office contingent of at least two officers). QPS anticipates impacts from the SOE project to be:

- general increase in calls for service relating to population growth
- increase in traffic volume and necessity for enforcement
- increase in calls for service relating to anti-social behaviour
- calls for service relating to mining-related incidents.

QPS is also concerned about the increase in water-based activities including ferry transfers, ship loader construction and water based transport of equipment during construction and operation. QPS notes a potential increase in search and rescue missions, and states Weipa Police Station has minimal search and rescue capabilities.

The proponent has provided some detail on mitigation strategies in its *Traffic and transport action plan*. The proponent states:

- The Existing RTAW Business Resilience and Response Plan will be extended to cover incidents on land and sea in the project area.
- RTAW will have paramedic and ambulance facilities located at the project site during construction and operations.
- Part of the sealed Mine Access Road near Boyd Bay will be constructed to accommodate Royal Flying Doctor Service aircraft landings and take-off and provision made for temporary night-time lighting.
- Helicopters will be able to use the above section of Mine Access Road as well.

The proponent will also implement Workforce Behaviour and Management Policies detailed below.

Queensland Ambulance Service

In its SEIS submission, the QAS Far Northern Region advised that the establishment of the SOE project is predicted to have a direct impact on the Weipa Ambulance Station. Issues involve the potential for injury or illness in a workforce amounting up to a third of the town population, working in site with restricted access. The movement on a daily basis of such a workforce to and from the site could also be expected to increase the risk of accidents in transit.

QAS has recommended the proponent has further consultation with QAS Far Northern Region in relation to access and evacuation of patients from this remote site should it occur. QAS has also recommended a Standard Operating Procedure be jointly agreed with the proponent for use in the event of an accident.

Workforce management and behaviour management policies

The proponent states it will reinforce the required SOE Code of Conduct for employees and contractors on the mining leases and emphasise the need for appropriate behaviour at all times. RTAW will continue to 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.

The proponent states it will implement strict policies for employees and contractors in relation to fitness for work, including alcohol and other drugs, with strict pre employment medical programs and an ongoing random drug and alcohol testing regime.

RTAW will continue to implement a complaints system and incident management process whereby any reported incidents of unacceptable behaviour are investigated, and engage with community stakeholders to establish a system to monitor and respond to issues, including the implementation of additional management measures where necessary.

The proponent will implement fatigue management strategies for employees and contractors commuting to the project area during construction and operations.

In relation to cultural awareness training, the proponent will continue to deliver cross-cultural awareness programs for all employees and contractors, in collaboration with Traditional Owners. RTAW will continue to support the implementation of alcohol management plans for each Indigenous community, with inclusion of this information in employee and contractor induction programs.

Coordinator-General's conclusion

I agree with the concerns raised in EIS and SEIS submissions from advisory agencies relating to potential increased demands on health, police and ambulance service delivery.

I note the proponent has indicated intentions to assess and monitor the potential impact of the SOE construction workforce on the demands on current regional health services provided by both RTAW (Occupational Health Centre) and Queensland Health.

I note the proponent's commitment to liaise with QPS, other Government agencies and local Councils to develop strategies in relation to law and order and alcohol management initiatives.

I note the proponent will consult with QAS Far Northern Region in relation to a Standard Operating Procedure for use in the event of an accident; and Workforce Behaviour and Management policies.

To reinforce this commitment on these specific issues and to ensure that RTAW gives adequate consideration to the concerns and takes appropriate action to address the issues, I impose Condition 14 (Appendix 1).

6.5. Governance arrangements

6.5.1. SIMP Steering Committee

The proponent has provided details of the proposed steering committee in Appendix 6, Section 8.2.1 of the draft SIMP, SEIS version.

The SOE SIMP Steering Committee will:

- perform the functions and roles clearly outlined in the Steering Committee Charter (yet to be developed)
- monitor and evaluate the progress of the SIMP action plans as they relate to the SOE project
- provide advice and support with the establishment of appropriate communication protocols between the steering committee and other stakeholder forums
- consider and provide recommendations to RTAW about issues related to the implementation of SIMP action plans.
- review annual SIMP progress reports before signed off by the Independent Chair and submitted to the Coordinator-General.

The SOE SIMP Steering Committee will have an independent chair and will comprise the following membership:

- one independent chair
- two RTAW representatives
- one Western Cape Chamber of Commerce representative
- two WCCCA representatives (Executive Officer, 1 x Traditional Owner)
- one WTA representative
- one Weipa community representative
- one State Government representative
- three Aurukun, Mapoon, and Napranum Shire Council representatives (one representative for each).

The proponent advises it is party to a variety of formal and informal mechanisms to engage with local stakeholder groups. These forums operate under agreements and charters and their membership includes representatives from the WCCCC, local councils, and government departments who have been collaborating for many years to address issues in the region and matters relating to the SOE project.

It is apparent that the proponent will need to ensure there is effective coordination between the SIMP Steering Committee and the alternative forums, to ensure a holistic approach is implemented across the region in response to social impacts.

Coordinator-General's conclusion

I believe there is merit in the SIMP Steering Committee being chaired by an Independent chair. It is concluded that the resourcing of the Steering Committee is necessary to demonstrate the proponent's commitment to the community engagement

process that is required to successfully maintain working relationships with key stakeholders.

I impose Condition 15 (Appendix 1) to provide this opportunity to demonstrate the partnership arrangements and in the oversight and implementation of the SIMP for the life of the project.

6.6. Social cumulative impacts

The SOE EIS Volume 3, Section 20 and draft SIMP provides the following information on cumulative social impacts for the SOE project:

6.6.1. Aurukun Bauxite Project

The draft SIMP states the agreement between Chalco and the Queensland government to develop the Aurukun Bauxite Project (on MDL378) ended on 30 June 2011, and there is currently some uncertainty about the future development of the Aurukun Bauxite Project.

One matter raised consistently by stakeholders, in relation to cumulative impacts that will arise should more than one project proceed, was concern about the potential for the establishment of a road connection between the project's Mine Access Road and the Aurukun Bauxite Project, thus facilitating the transport of illegal alcohol. A small number of stakeholders identified this as an opportunity for residents in Aurukun to obtain easier access to Weipa-based goods and services.

Should any adjacent project proponents proceed with their plans, RTAW will liaise with them and endeavour to identify cumulative impacts and opportunities associated with employment, training and business development for the local communities. RTAW will seek to co-ordinate its programs with others, including government programs and services currently being implemented in the region, and, where appropriate, will partner with the relevant Government agencies.

6.6.2. Scherger Detention Centre

The draft SIMP provides details of the Commonwealth's decision to use the Scherger air force base as a Detention Centre for Asylum seekers. As discussed previously, this has introduced approximately 200 Commonwealth staff and contractors to Weipa that has resulted in a shortage of accommodation for tourists and regular contractors and increased pressure on services and infrastructure.

The proponent advises that Scherger is expected to be decommissioned in mid 2012 and pressure should ease as support staff are no longer required. If there are delays to decommissioning however, RTAW proposes to build an additional 200-bed SOE contractor camp adjacent to Nanum to avoid placing further pressure on accommodation.

As discussed in the Housing and Accommodation section, RTAW has received development approval from the WTA to proceed with the development of a new residential housing area, Golf Links Stage 2, including 50 detached lots plus 150

townhouse sites. RTAW has also committed to undertake capital works to upgrade the town water infrastructure in 2012, to be completed prior to construction of housing on these blocks.

The *Housing and accommodation action plan* in the draft SIMP, SEIS (Section 7.2.7) includes continued engagement with relevant State and Australian Government on cumulative housing and infrastructure impacts.

6.6.3. Indigenous education

The Western Cape Residential Campus is a new boarding facility in Weipa due to open in 2012. The 120-bed Western Cape Residential Campus will provide much-needed accommodation for Indigenous secondary students who are living away from home. In its first year of operation, it is expected up to 60 students will board at the facility. The Indigenous Land Corporation has been funded by the Australian Government to project manage the construction of the facility and will own the facility on behalf of the Australian Government.

The new campus will also provide new employment opportunities for local people in Weipa through jobs such as house parenting, cleaning, laundry services, grounds maintenance and tutoring. Up to 13 positions will be available next year, increasing to 21 positions by 2016.

This development will bring Indigenous students and possibly families from other communities across the Cape to Weipa. It is likely to have a positive impact on RTAW programs as the school will have a larger pool of Indigenous students to draw from, which will likely flow on to greater interest in RTA traineeships and apprenticeship programs. This facility will enable Indigenous students from Aurukun, Mapoon and Napranum to be close to their families and support networks as well as reducing travel time.

Coordinator-General's conclusion

I recommend the proponent monitor the social cumulative impacts through the SIMP steering committee.

I recommend that in response to social cumulative impacts, the proponent coordinate its programs with government programs and services implemented in the region, and where appropriate, partner with the relevant government agencies.

7. Environmental management plan

An EM plan proposes environmental management strategies, actions and procedures to be implemented during the construction and operation of a project, in order to mitigate adverse and enhance beneficial environmental and social impacts. The plan becomes a key reference document that converts undertakings and recommendations of environmental studies into actions and commitments to be followed by the designers, constructors and future operators of the project.

An EM plan is required under section 201 of the EP Act as part of an application for an EA for a mining lease. Section 202 states that the purpose of an EM plan is to propose environmental protection commitments to assist the administering authority to prepare the draft EA.

Under the EP Act, an EM plan must contain the following sections:

- section 1—provides a description of all elements of the proposal including the relevant mining leases and land tenures; describes potential adverse and beneficial impacts on the environmental values likely to be affected by mining activities; and states any code of environmental compliance environmental protection commitments and any other information to allow the administering authority of the EP Act (DEHP) to decide the application and conditions to be imposed on the EA.
- section 2—outlines how the environmental protection commitments and objectives are to be measured and audited, and includes control strategies to ensure the objectives are achieved.
- section 3—states the rehabilitation objectives and identifies rehabilitation indicators against the environmental protection objectives described in section 2.
- section 4—states that the indicators described in section 3 may vary for different parts of the land that have different types of disturbance.

As required in the TOR for the EIS, RTAW has prepared a draft EM plan, which is presented as Section 21 of Volume 3 of the EIS. In response to comments received on the EIS and further work undertaken in the interim, the draft EM plan was subsequently revised and is presented as Appendix 3 of the SEIS.

The draft EM plan will be further refined and finalised following the release of this evaluation report to accompany the application to DEHP for an amendment to the existing EA covering RTAW's existing operations.

RTAW has also submitted, at Appendix 4 of the SEIS, a draft dredge management plan, which proposes environmental management strategies for dredging and spoil disposal activities associated with the proposed port. Similarly, a draft dredge management plan has been included at Appendix 5 of the SEIS for environmental management of dredging and spoil disposal activities associated with ferry/barge terminals in the Embley Estuary off the mining lease. Both dredge management plans will support applications to DEHP and NQBP for dredging approvals under the *Coastal Protection and Management Act 1995* and SPA as well as sea dumping permits with the Commonwealth.

RTAW has a health, safety and environment (HSE) management system accredited under ISO 14001. All approved EM plans prepared for the project will be incorporated within the company's HSE management system.

I have set no conditions in regard to EM plans.

8. Conclusion

I am satisfied that the EIS process undertaken for the SOE project meets the requirements for impact assessment, to the extent that is feasible and practicable, in accordance with the SDPWO Act. The EIS process provided sufficient information to allow an informed evaluation of the project's potential environmental impacts.

In reaching a conclusion on the acceptability or otherwise of the management of potential impacts of the SOE project, I have had regard to commitments given in the EIS, SEIS and in the EM plan and have stated and imposed conditions and made recommendations that RTAW (and its agents, lessees, successors and assignees) and State agencies are to implement.

These matters are covered in the report as follows:

- imposed conditions, made under the SDPWO Act (refer to Appendix 1)
- stated conditions, made under the SDPWO Act (refer to Appendix 3)
- recommendations, made under the SDPWO Act, for consideration by the entities nominated under each recommendation, and general recommendations (refer to Appendix 4)
- a list of proponent commitments (refer to Appendix 6).

If there are any perceived inconsistencies between the project (as described in the EIS and SEIS) and the conditions in this report, the conditions shall prevail.

I conclude that the project will deliver major benefits to the State and that environmental impacts can be appropriately managed. The benefits include continuing employment on the western Cape, economic benefits and training and job opportunities for Aboriginal communities.

In accordance with the SDPWO Act, I find that the SOE project can proceed, subject to:

- **complying with the conditions and recommendations listed in Appendices 1 to 4**
- **gaining subsequent statutory approvals (including those listed in Section 4)**
- **implementing the commitments listed in Appendix 6.**

Copies of this report will be issued to the following parties in compliance with various sections of the SDPWO Act:

- RTAW
- Minister for Environment and Heritage Protection
- DEHP
- NQBP
- DAFF (FQ)
- DNRM
- TMR
- Aurukun Shire Council
- Cook Shire Council

A copy of this report will also be available from: www.projects.industry.qld.gov.au

Appendix 1. Imposed conditions

This appendix includes conditions imposed¹⁹ by the Coordinator-General under section 54B of the SDPWO Act. The conditions are relevant to applications for development approvals for those parts of the project where there is no relevant approval applicable under other legislation.

All of the conditions imposed in this appendix take effect from the date of this Coordinator-General's report.

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.

In accordance with section 54B(3) of the SDPWO Act, the Coordinator-General has nominated entities as having jurisdiction for the conditions in this schedule. These entities are shown in Appendix 2.

Pursuant to section 54D of the SDPWO Act, these conditions apply to anyone who undertakes the project, such as the proponent and an agent, contractor, subcontractor or licensee of the proponent, and any public utility providers undertaking public utility works as a result of the project.

Condition 1. General conditions

DSDIP is to have jurisdiction for this condition.

- (a) The project must be carried out in accordance with the South of the Embley Project Environmental Impact Statement (EIS) (July 2011), the Supplementary Report (SEIS) for the project (January 2012), commitments given by the proponent (refer to Appendix 6) and this Coordinator-General's evaluation report.
- (b) The proponent must notify the Coordinator-General and all other agencies listed in Appendix 2, once RTAW has taken its final investment decision (FID) to proceed with the project and the date at which significant construction works²⁰ commenced.
- (c) The proponent must, when first becoming aware of a non-compliance of any Coordinator-General imposed condition:
 - (i) authorise and undertake action to bring the matter into compliance within an effective timeframe
 - (ii) report the non-compliance and remedial action to the Coordinator-General within 14 days of becoming aware of the non-compliance matter and seek the Coordinator-General's approval for the action and timeframe in (i) above.

¹⁹ For a definition of 'imposed conditions', refer to the Glossary on page 262 of this report.

²⁰ Significant construction works does not include early site access works or activities to support exploration, site investigation or site establishment works where approvals are held.

Condition 2. Audit reports

DSDIP is to have jurisdiction for this condition.

- (a) Compliance with the Coordinator-General's imposed conditions of this report must be audited by an appropriately qualified and experienced third party auditor or auditors relevant to the matters being audited, nominated by the proponent and accepted by the Coordinator-General. Condition 7(e) contains specific requirements relating to auditing conditions of the SIMP.
- (b) The first audit report shall be lodged within 12 months of RTAW taking a final investment decision to proceed with the project. Subsequent reports shall be submitted annually thereafter until the Coordinator-General is satisfied that all imposed conditions have been implemented.
- (c) The audit report must identify the conditions that were activated during the period, and include a compliance/non-compliance table. Evidence to support the compliance table must be provided. The third party auditor must certify the findings of the audit report.
- (d) The financial cost of the third party audit is borne by the proponent.
- (e) RTAW must immediately act upon any recommendations arising from the audit report and:
 - (i) investigate any non-compliance issues identified
 - (ii) as soon as practicable, implement measures or take necessary action to ensure compliance.

Condition 3. Failure impact assessment of Dam C

DNRM is to have jurisdiction for this condition.

- (a) RTAW is to complete a failure impact assessment of Dam C in accordance with the Guidelines for Failure Impact Assessment for Water Dams²¹ within three months of FID.
- (b) A statement containing details of the assessment, completed and signed by a registered professional engineer is to be submitted to DERM prior to construction.
- (c) The assessment should contain sufficient material to demonstrate compliance with relevant dam failure aspects of Schedule 1, Clause 31 of the *Commonwealth Aluminium Corporation Pty. Limited Agreement Act 1957* (Comalco Agreement Act).

²¹ Department of Natural Resources and Water 2002, Guidelines for Failure Impact Assessment for Water Dams, Department of Natural Resources and Water, Brisbane, viewed 12 April 2012, <http://www.derm.qld.gov.au/water/regulation/pdf/guidelines/guidelines_01.pdf>

Condition 4. Fishway passage

The Department of Agriculture, Fisheries and Forestry (DAFF) (Fisheries Queensland—(FQ)) is to have jurisdiction for this condition.

- (a) The design, construction and operation of the project shall adequately provide for the passage of fish across all waterway barrier works, as defined in the *Fisheries Act 1994*, to the satisfaction of DAFF (FQ).
- (b) A fishway, as defined in the *Fisheries Act 1994*, must be incorporated into Dam C and shall:
 - (i) generally be designed and managed in accordance with the guideline *Fish Passage Design and Implementation Process and Criteria*²²
 - (ii) be constructed and commissioned in accordance with final fish passage design documentation
 - (iii) be operated in accordance with the final fish passage design documentation
 - (iv) be maintained in good working order and repair throughout the life of Dam C
 - (v) be subject to independent review at RTAW's cost, by an independent reviewer acceptable to DAFF and RTAW.
- (c) The final fishway design documentation must be:
 - (i) developed at RTAW's cost in consultation with DAFF (FQ) and generally accord with the guideline *Fish Passage Design and Implementation Process and Criteria*²²
 - (ii) submitted to and approved by DAFF (FQ) prior to the commencement of fishway related construction activities at Dam C
- (d) DAFF (FQ) must be consulted on the decommissioning and handover process for Dam C and associated infrastructure following the end of mining.

Condition 5. Marine fish habitat loss on mining lease

DAFF (FQ) is to have jurisdiction for this condition.

- (a) For any marine works on the mining lease requiring the removal or damage of marine plants as defined under the *Fisheries Act 1994* (Fisheries Act), RTAW must gain the approval of DAFF (FQ) prior to those marine works commencing.
- (b) Surveys identifying the extent of seagrass that will be disturbed, both temporarily and permanently are to be lodged with DAFF (FQ).

²² Refer to www.dpi.qld.gov.au/28_12907.htm

- (c) RTAW shall enter into a Deed of Agreement with the chief executive, managing the Fisheries Act, or his delegate, within three months of FID, to ensure that all impacts to marine plants and tidal lands on the mining lease are offset in a way that is mutually acceptable to DAFF (FQ) and the proponent, and is in line with Fisheries Queensland Policy, *FHMOP 005 Mitigation and compensation for activities and works causing marine fish habitat loss*, and the information sheet, *Offset Measures for Marine Fish Habitats*.

Condition 6. Biomass recovery prior to burning

DSDIP is to have jurisdiction for this condition

- (a) RTAW shall liaise with traditional owners on biomass recovery prior to vegetation clearing and burning.
- (b) Participation by traditional owners is to be encouraged.

SOCIAL CONDITIONS

DSDIP is to have jurisdiction for conditions 7–15 inclusive.

Condition 7. Social impact management plan (SIMP)

- (a) The proponent must, within 60 calendar days 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 assessment and approval of the Coordinator-General prior to release.
- (b) The final SIMP must update the mitigation strategies in line with the recommendations and relevant conditions set out in this report and include:
 - (i) a monitoring program for mitigation and management strategies designed to address social impacts
 - (ii) a revised stakeholder engagement strategy which contains a list of key stakeholders and their interest in the project; actions and outcomes, review mechanisms to support effectiveness, culturally appropriate engagement methods as per Condition 8(a)(ii)
 - (iii) a dispute resolution mechanism that utilises culturally appropriate engagement strategies as per the revised stakeholder engagement strategy
 - (iv) measures and timeframes for closure planning
 - (v) revised action plans as per Condition 10
 - (vi) updated action plans that detail implementation actions, progress, achievements, and specific activities
 - (vii) evidence it has taken reasonable steps to engage and collaborate on the strategies contained in the final SIMP with the relevant stakeholders, including State Government agencies

- (viii) actions proposed to resolve matters where clear agreement has not been reached in relation to social impact management strategies, and include the provision of evidence of reasonable steps towards agreement. Outcomes of these actions will be reviewed in the first annual report requirements of the SIMP, as specified as part of the reporting, review and auditing arrangements
- (c) A record of stakeholder feedback and a report on the outcomes of the release of the draft SIMP must be provided when the proponent submits the final SIMP.
- (d) The proponent must implement the final SIMP in conjunction with the social impact conditions specified in this report; and key SIMP commitments and action plans as per Section 16 in the Summary of Commitments (Appendix 6).

Reporting, review and auditing arrangements

- (e) With respect to the SIMP the proponent must:
 - (i) submit an annual progress report on the implementation of the SIMP, which has been submitted to the SIMP Steering Committee for early consideration and comment and endorsed by RTAW. The annual report should be submitted 12 months after approval of the final SIMP and include the results of engagement on the report with the SIMP Steering Committee.
 - (ii) undertake an independent external audit two years after the commencement of significant construction, then at key project milestones, as agreed with the Coordinator-General
 - (iii) ensure the terms of reference for the audit are endorsed by RTAW and the Coordinator-General and include culturally appropriate engagement and participation
 - (iv) ensure the auditor has specific knowledge and understanding of the local area and Indigenous Australian cultures and issues, and the ability to communicate sensitively and effectively with Indigenous communities
 - (v) forward the independent audit to the Coordinator General within 20 business days of receipt
 - (vi) not more than three months following the submission of the audit report, provide written advice to the Coordinator-General addressing:
 - (A) actions taken by the proponent promptly and routinely to ensure compliance with the Coordinator-General's imposed conditions
 - (B) actions taken to prevent a recurrence of any non-compliance issues.
- (f) The proponent may also elect to conduct additional internal reviews.

Requirements for any amendments to SIMP

- (g) In consultation with affected stakeholders, the proponent must revise the SIMP after completion of the construction stage of the project or advise the Coordinator-General that amendments and updates to the 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.
- (h) The proponent must work with the Coordinator-General and affected stakeholders consistent with the SIMP guideline to facilitate any amendments to the SIMP. This engagement must be reflected in the stakeholder engagement plan.

Condition 8. Stakeholder engagement strategy and dispute resolution

Indigenous stakeholder engagement

- (a) Prior to commencement of significant construction works, the proponent must:
 - (i) provide to the Coordinator-General, job descriptions for the 'office coordinator' and other staffing positions for the Community Office in Aurukun, together with documentation confirming Aurukun Shire Council's opportunity to contribute to the job descriptions
 - (ii) implement culturally appropriate engagement methods with the Aurukun Shire Council and traditional owners. These must include a variety of methods including:
 - (A) spending appropriate time in the community with traditional owners and broader community members
 - (B) using interpreters if required
 - (C) using simple communication tools to assist people with understanding the SOE project information, including EIS and SIMP documents
- (b) RTAW must, throughout construction and for the life of the project, provide regular verbal and written progress reports to the SIMP Steering Committee that:
 - (i) detail stakeholder issues of Aurukun, Napranum, Mapoon and Weipa in relation to the project, and the effectiveness of engagement strategies in addressing these issues
 - (ii) analyse issues raised and detail the actions taken by the proponent in addressing these issues, including mitigation strategies to respond to social impacts.

Dispute resolution

- (c) RTAW must, for the life of the project:
 - (i) implement a community feedback procedure. Stakeholders must be able to deal effectively with RTAW regarding any concerns on project activities. RTAW must 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) implement procedures for receiving and dealing quickly and effectively with community feedback

- (iii) include the dispute resolution process for community feedback on the RTAW website once the project moves into the construction phase
- (iv) ensure contractors engaged on the project have a clear process for dispute resolution and issue management and ensure compliance with RTAW's community feedback procedure.

Condition 9. Increased employment and training opportunities

Access from Aurukun to the mine—community commute

- (a) Prior to the commencement of significant construction, the proponent must inform the Aurukun Shire Council (using interpreters if necessary) and the Western Cape Communities Coordinating Committee, and other stakeholders consistent with the revised stakeholder engagement strategy, about roster and accommodation arrangements for fly-in fly-out workers.
- (b) Throughout the construction phase, the proponent must report to the Aurukun Shire Council (using interpreters if necessary), the Western Cape Communities Coordinating Committee, and other stakeholders consistent with the revised stakeholder engagement strategy, on the number of Aurukun residents using the commute arrangements.
- (c) Prior to the start of the operational phase, the proponent must:
 - (i) provide a report on the community commute options and the resultant community commute arrangement for the operations phase to the Western Cape Communities Coordinating Committee, SIMP Steering Committee, and other stakeholders as detailed in the revised Stakeholder Engagement Strategy.
 - (ii) implement the community commute arrangements.
- (d) During operation the proponent must:
 - (i) Collaborate with the Western Cape Communities Coordinating Committee, SIMP Steering Committee, and other stakeholders as detailed in the revised Stakeholder Engagement Strategy to develop an assessment mechanism to regularly measure the effectiveness of the community commute arrangements
 - (ii) During the operational phase, report on the level of effectiveness of the commute arrangements
 - (iii) Include in the annual SIMP progress reports the relevant performance measures to measure the effectiveness of the community commute arrangements and any proposed amendments and/or updates to mitigation strategies. Collaboration with relevant stakeholders must be undertaken in accordance with Condition 10(a).

Land and sea management program

- (e) Prior to commencement of significant construction, the proponent must:
 - (i) explain to the traditional owners and other relevant stakeholders, consistent with the revised Stakeholder Engagement Strategy, the details of the land and sea management program (using interpreters if necessary)
 - (ii) commence implementation of the land and sea management program in close consultation with traditional owners.

Communities, heritage and environmental management plan

- (f) Prior to commencement of significant construction, the proponent must:
 - (i) explain to the traditional owners and other relevant stakeholders, consistent with the Stakeholder Engagement Strategy, the details of the communities, heritage and environmental management plan (using interpreters if necessary)
 - (ii) commence implementation of the communities, heritage and environmental management plan in close consultation with traditional owners.

Condition 10. Performance measures for Aurukun, Mapoon and Napranum

- (a) RTAW must:
 - (i) Collaborate with relevant stakeholders to ensure that appropriate measures related to Community Commute—Aurukun to the Mine, Indigenous employment and training, Indigenous education and local and Indigenous sourcing, accurately measure outcomes for residents of Aurukun, Mapoon and Napranum communities. Ensure these measures are incorporated into the monitoring plan and embedded into the relevant RTAW strategies and reported in the annual SIMP progress reports.
 - (ii) Revise the relevant action plans in the final SIMP to reflect the process required to achieve Condition 10(a).

Condition 11. Indigenous education

- (a) Throughout the life of the project, RTAW must:
 - (i) regularly engage with students with agreement from the Aurukun School, to create an early awareness of RTAW, and promote career opportunities
 - (ii) where possible, provide specialist lessons in mining related careers, such as chemistry, engineering, and business to promote range of career options
 - (iii) host regular visits to RTAW for students from the Aurukun school to showcase the types of jobs available and the workplace environment
 - (iv) develop a coordinated support program for boarding school students who return to Aurukun, Mapoon and Napranum throughout the placement at boarding school to assist in advancing employment or education outcomes.

Condition 12. SIMP investment

- (a) RTAW must report its community contribution, including SIMP investment to the Coordinator General within 60 days of receiving a final investment decision to proceed and then annually from the first SIMP progress report. The reporting on the SIMP investment should be for the previous 12-month period.
- (b) The SIMP investment may exclude some contributions which are subject to confidentiality requirements of other community agreements.

Condition 13. Housing and accommodation

- (a) RTAW must:
 - (i) Complete the Weipa water infrastructure upgrade and commence development of Golf Links Estate Stage 2, consistent with development approval from Weipa Town Authority.
 - (ii) Construct a camp to accommodate the SOE construction workforce as part of project construction, and if required, a new camp of up to 200 beds on previously disturbed land adjacent to Nanum.
 - (iii) Before commencement of construction, prepare the Weipa demographic analysis in collaboration with the Department of Housing and Public Works and OESR, to inform the development of the Housing and Accommodation Master Plan.
 - (iv) Before commencement of operations, develop the Housing and Accommodation Master Plan in consultation with the Department of Housing and Public Works and relevant local stakeholders as stated in the SIMP.
 - (v) Submit the Housing and Accommodation Master Plan to the SIMP Steering Committee for comment before commencement of operations.
 - (vi) Include relevant housing mitigation and management strategies in future revisions of the SIMP and report on their implementation via the SIMP progress reports.

Condition 14. Community health and wellbeing

- (a) RTAW must develop a community health and wellbeing action plan for inclusion in the draft SIMP to incorporate the following health, policing, and community safety service delivery strategies, and Workforce Behaviour and Management policies.

Queensland Health

- (b) RTAW must:
 - (i) collaborate with Queensland Health, before and throughout construction to identify any impacts associated with the Nanum camp, in relation to the potential demand on acute and non-acute health services
 - (ii) develop health service related mitigation strategies before and throughout construction to address any impacts on the demands on current regional health services provided by Queensland Health.

Police service delivery

- (c) RTAW must:
- (i) before and throughout construction, collaborate with Queensland Police Service (QPS) to identify any project impacts on police service delivery, water policing, traffic and transport movements, incidents and complaints
 - (ii) before construction and with the involvement of the Weipa Police, conduct a risk assessment to determine the requirements for suitably trained rescue staff and resources located in close proximity to any likely river-based operations
 - (iii) before construction, establish appropriate protocols with the Weipa Police to ensure an appropriate response to incident management on site
 - (iv) throughout construction and operations, provide adequate lighting, security fencing, and CCTV monitoring around the car park area at the ferry pick-up point at Hornibrook

Queensland Ambulance Service (QAS)

- (d) RTAW must:
- (i) before construction, establish appropriate protocols and implement a standard operating procedure with QAS to ensure an appropriate response to incident management on site
 - (ii) throughout construction and operations, provide appropriate on-site paramedic services complete with appropriate resources.

Workforce behaviour and management

- (e) For the duration of the project, RTAW must:
- (i) ensure the SOE Project Code of Conduct is regularly reviewed and updated for project employees and contractors
 - (ii) 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
 - (iii) ensure reported incidents of unacceptable behaviour are investigated and responded to
 - (iv) implement policies for employees and contractors in relation to fitness for work, including alcohol and other drugs
 - (v) implement fatigue management strategies for employees and contractors
 - (vi) collaborate with traditional owners to maximise opportunities to deliver cultural awareness programs and cultural heritage induction programs for the SOE project.
 - (vii) develop cross-cultural awareness programs and induction programs for all employees and contractors, in collaboration with traditional owners.

Condition 15. SIMP Steering Committee

- (a) Early in the development phase of the final SIMP, the proponent must establish the SOE SIMP Steering Committee
- (b) The SIMP Steering Committee must meet quarterly during construction and the frequency of the meeting is to be reviewed during the operational phase.
- (c) RTAW must:
 - (i) provide clear terms of reference, developed in consultation with the Chair and members
 - (ii) provide the terms of reference and final membership to the Coordinator General for approval, prior to the SIMP Steering Committee inaugural meeting
 - (iii) appoint and fund the Independent Chair's position
 - (iv) provide full resourcing of the secretariat for the SOE Steering Committee.

Appendix 2. Jurisdiction for imposed conditions

Table A1 lists the organisations/agencies responsible for each of the Coordinator-General's imposed conditions (listed in Appendix 1).

Table A1 **Entities with jurisdiction for Coordinator-General imposed conditions**

Condition no.	Topic	Entity with jurisdiction
1	General conditions	DSDIP
2	Audit reports	DSDIP
3	Failure impact assessment of Dam C	DNRM
4	Fish passage	DAFF (FQ)
5	Marine fish habitat loss on mining lease	DAFF (FQ)
6	Biomass recovery	DSDIP
7–15	Social conditions	DSDIP

Appendix 3. Stated conditions

This appendix includes the Coordinator-General's stated conditions for approvals required under the *Sustainable Planning Act 2009* (SPA) (stated under section 39 of the SDPWO Act) and stated conditions for the draft amendments to the existing environmental authority MIN 100939109 (mining activities), under the *Environmental Protection Act 1994* (EP Act) (stated under section 49 of the SDPWO Act).

The appendix is structured as follows:

PART A. SPA APPROVALS—OFF MINING LEASE

Schedule 1—Humbug, Hornibrook Terminals and tug berth conditions

Schedule 2— Port conditions

Schedule 3—Coordinator-General's specific conditions for all MCU and tidal operational works approvals

PART B. ENVIRONMENTAL AUTHORITY—ON MINING LEASE

Schedule 1—Coordinator-General's specific conditions

Schedule 2—General conditions common to all coastal facilities

Schedule 3—General

Schedule 4—Air

Schedule 5—Land and rehabilitation

Schedule 6—Regulated dams (including structures containing mineral waste)

Schedule 7—General and regulated waste management

Schedule 8—Noise

Schedule 9—Water

Schedule 10—Sewage treatment

Schedule 11—Definitions/acronyms

Schedule 12—Plans

PART A. SPA APPROVALS—OFF MINING LEASE

These conditions must attach to a development approval issued under SPA and are taken to be concurrence agency conditions.

The conditions stated do not limit the assessment manager's power to assess the development application and to impose conditions not inconsistent with the Coordinator-General's conditions.

The Coordinator-General has determined that, after the development approval has taken effect under SPA, DEHP shall have jurisdiction for all conditions listed under Schedules 1, 2 and 3.

Schedule 1. Humbug, Hornibrook Terminals and tug berth conditions

MCU (ERA16) AND OPERATIONAL WORKS (DREDGING) DEVELOPMENT APPROVAL

Agency interest: General

Prevent environmental harm

- G1 The operator must ensure that environmental harm is not caused by this ERA except where specifically permitted by a condition of this development permit.

Limit of dredging approved

- G2 The maximum quantity of material to be removed during the capital dredge activities at Humbug barge terminal is 15,600 cubic metres, Hornibrook ferry terminal is 18,700 cubic metres, and tug berths up to 71,300 cubic metres. Operations must meet the following restrictions:
- (a) the removal of dredge material is confined to the locations shown on the approved plan attached to the permit
 - (b) dredge spoil must not be disposed of into Queensland waters that are within the limits of the State, or are coastal waters of the State unless otherwise authorised.

Maintenance of measures, plant and equipment

- G3 The operator must:
- (c) install all measures, plant and equipment necessary to ensure compliance with the conditions of this development permit
 - (d) maintain and calibrate such measures, plant and equipment in an efficient condition and keep records of the maintenance
 - (e) operate such measures, plant and equipment in an efficient manner.
- G4 Capital and maintenance dredging activities must be in accordance with the respective Final Dredge Management Plan – River Facilities or subsequent versions as approved by the administering authority.

Equipment

- G5 Any dredging must be conducted using equipment that is in survey and registered and, in relation to environmental performance, is equal to or better than the following equipment:
- (a) Trailing Suction Hopper Dredge that is equipped, as a minimum, with:
 - (i) below keel discharge of tail waters via an anti-turbidity control valve
 - (ii) on-board systems for determining solids to water ratio or density of dredged material
 - (iii) electronic positioning and depth control system for defining the location and depth of dredging activities
 - (iv) dredge heads and depth control capable of, and where appropriate, fitted with fauna exclusion devices (e.g. turtle deflectors).
 - (b) Cutter Suction Dredge that is equipped, as a minimum, with:
 - (i) electronic positioning and depth control system for defining the location and depth of dredging activities
 - (ii) a system or process to ensure the delivery system integrity is maintained at all times
 - (iii) systems for determining solids to water ratio or density of dredged material during operations.
 - (c) Grab Dredge that is equipped, as a minimum, with:
 - (i) electronic positioning system for defining the location and depth of dredging activities.
- G6 No change, replacement or alteration of any plant or equipment is permitted if the change, replacement or alteration increases, or is likely to increase the risk of environmental harm above that expressly provided for by this approval.

Display of development approval

- G7 A copy of this development approval must be kept in a location readily accessible to personnel carrying out the activity.

Records

- G8 Record, compile and keep all monitoring results required by this development approval and present this information to the administering authority upon request.

Notification

- G9 The holder of this authority must notify the administering authority by telephone, email or facsimile as soon as reasonably possible (but no later than twenty-four (24)) hours after becoming aware of:
- (a) any emergency event 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 approval; or
 - (b) any monitoring result that indicates an exceedance of any environmental approval limit.

- G10 The notification must include but not be limited to the following:
- (a) the development approval number and name
 - (b) the name and telephone number of the designated contact person
 - (c) the location of the emergency event or incident
 - (d) the date and time of the emergency event or incident
 - (e) the time you became aware of the emergency event or incident
 - (f) the estimated quantity and type of substances involved in the emergency event or incident, if known
 - (g) the cause of the emergency event or incident if known
 - (h) a description of the nature and effects of the emergency event or incident including risks to the environment, public health or live stock, if known
 - (i) immediate actions taken to prevent or mitigate any further environmental harm caused by the emergency event or incident
 - (j) details of any notification of persons who may be affected by the emergency event or incident.
- G11 Within fourteen (14) days (or as otherwise agreed) following the initial notification of an emergency event, incident or exceedance, further written advice must be provided to the administering authority including the following:
- (a) results and interpretation of any samples taken and analysed
 - (b) outcomes of actions taken at the time to prevent or minimise unlawful environmental harm
 - (c) proposed actions to prevent a recurrence of the emergency event, incident or exceedance.

Spill kits

- G12 Appropriate spill kit(s) and relevant operator instructions /emergency procedure guides for the management of wastes and chemicals associated with the ERA must be kept at the site.
- G13 All relevant personnel operating under this approval must be trained in the use of the spill kit(s).
- G14 All instruments, equipment and measuring devices used for measuring or monitoring in accordance with any condition of this development approval must be calibrated and appropriately operated and maintained.

Trained/experienced operators

- G15 All persons engaged in the conduct of the dredging activities, including but not limited to employees and contract staff, must be:
- (a) Trained in the procedures and practices necessary to:
 - (i) comply with the conditions of this development approval
 - (ii) prevent environmental harm during normal operation and emergencies, or
 - (b) under the close supervision of such a trained person.

- G16 The administering authority must be advised in writing of the date of commencement of a capital or maintenance dredge campaign at least 5 business days prior to that date.

Post-construction

- G17 The administering authority must be advised within ten (10) days following completion of the capital or maintenance dredging campaign.

Agency interest: Air

- A1 The release of airborne contaminants from the activity must not cause environmental nuisance.

Agency interest: Noise

- N1 Noise from dredging activities must not cause environmental nuisance at a nuisance sensitive place.
- N2 When requested by the administering authority, noise monitoring and recording must be undertaken within a timeframe nominated by the administering authority to investigate any complaint of environmental nuisance (considered in the opinion of an authorised officer to be neither frivolous or vexatious) at any sensitive place or commercial place, and the results must be provided to the administering authority within fourteen (14) days following completion of monitoring.
- N3 Noise monitoring and recording must include the following descriptor characteristics and matters:
- (a) L_{Aeq} , and L_{AN} (where N equals the statistical levels of 1, 10 and 90 and T = 60 mins)
 - (b) background noise L_{A90}
 - (c) the level and frequency of occurrence of impulsive or tonal noise and any adjustment and penalties to statistical levels
 - (d) atmospheric conditions including temperature, relative humidity and wind speed and directions
 - (e) effects due to any extraneous factors such as traffic noise
 - (f) location, date and time of monitoring
 - (g) if the complaint concerns low frequency noise, Max, $L_{pLIN,T}$
 - (h) if the complaint concerns low frequency noise, one third octave band measurements in dB(LIN) for centre frequencies in the 10–200 Hz range.
- N4 The method of measurement and reporting of noise levels must comply with the most recent edition of the administering authority's *Noise Measurement Manual* or the most recent version of *Australian Standard AS1055 Acoustics – Description and measurement of environmental noise*.

Agency interest: Water

- W1 In carrying out the ERA dredging activity, the release of contaminants (including any release caused by extraction of material from the bed of waters) must:
- (a) only occur from the permitted areas specified on approved plans
 - (b) be suitable for unconfined ocean disposal when assessed in accordance with the *National Assessment Guidelines for Dredging*
 - (c) not produce any slick or other visible evidence of oil or grease, nor contain visible floating oil, grease, scum, litter or other objectionable matter
 - (d) be carried out taking all practicable measures necessary to minimise the concentration of suspended solids released during the loading and pump-out of the vessel.
- W2 Dredging must not start until provision has been made to lawfully place or dispose of the dredge material. Evidence of applicable approvals must be made available to the administering authority when requested.
- W3 All reasonable and practicable measures shall be taken to limit the potential turbidity.
- W4 Where trailer suction dredging is carried out, an effective turtle exclusion device must be fitted to the dredge head. Evidence that this device has been installed and used on the dredge for the entire period of the dredging activity must be provided to the administering authority.
- W5 Mobile dredging operations:
- (a) must not commence if dugongs, turtles, or cetaceans are observed within 300 metres of the dredge
 - (b) where underway, must alter course if dugongs, turtles, or cetaceans are likely to be struck or captured.
- W6 Stationary dredging operations:
- (a) must not commence if dugongs, turtles, or cetaceans are observed within 300 metres of the dredge
 - (b) must cease if dugongs, turtles or cetaceans are observed within 50 metres of the dredge head.
- W7 Operating procedures that minimise the risk of turtle capture by the dredge head, and the risk from all activities of injury to marine species of conservation significance, must be developed prior to the commencement of dredging activities.
- W8 The administering authority is to be immediately notified of any turtle captures by the dredge or of injury to any marine species of conservation significance.
- W9 Turtle monitoring
- (a) daily monitoring for impacted turtles must be undertaken at the dredge and at the shoreline down-current from the dredging operation

- (b) if monitoring indicates that more than two turtles are killed within a 24 hour period as a result of dredging, the dredge must relocate from the area until an incident investigation has been carried out and relevant preventative actions implemented.
- (c) a trailing suction hopper dredge must be fitted with marine wildlife protection or exclusion devices such as deflector plates, tickler chains or drag heads prior to and during operation.

Agency interest: Land

L1 Dredge material must not be disposed of on land unless otherwise authorised.

Agency interest: Waste

WA1 Waste generated in the carrying out of the activities must be stored, handled and transferred in a proper and efficient manner.

Agency interest: Social

Complaint response

- S1 The operator of the ERA must record the following details for all complaints received and provide to the administering authority upon request:
- (a) time, date, name and contact details of the complainant
 - (b) reasons for the complaint
 - (c) details of investigations undertaken
 - (d) conclusions formed
 - (e) actions taken to resolve the complaint.

OPERATIONAL WORKS (TERMINAL TIDAL WORKS) DEVELOPMENT APPROVAL

- C1 All temporary works associated with the construction are to be removed from the site at the completion of the works, unless otherwise authorised by DEHP, and all wastes shall be collected from the site by the permit holder and disposed of at a licensed waste facility.
- C2 Once a barge has berthed on the ramp, the vessel's propulsion system must be minimised to the extent practicable and safe to reduce the risk of disturbance to the seabed during loading/unloading operations.
- C3 Erosion protection measures and sediment control measures must be implemented and maintained to minimise erosion and the release of sediment and contamination of stormwater as described in the Erosion and Sediment Control Plan.
- C4 The holder of this authority must remove any material, other than that from authorised activities, that is deposited outside of the alignment of the works shown on the approved plans or any debris that falls or is deposited on tidal lands or into tidal waters as a result of construction of the works.
- C5 All rock, stone, gravel, sand or other fill material used in reclamation and construction of the revetment wall must be:

- (a) suitable for the purpose having regard to the location of the land and to the proposed use of the land
 - (b) free from contaminants that may cause environmental harm.
- C6 All reasonable and practicable measures must be taken to prevent polluting adjacent waters as a result of silt run-off, oil and grease spills from machinery, and concrete truck washout. Concrete agitator wash out must only be conducted in a specified area to facilitate reuse or the removal of waste concrete from the area to landfill. Wastewater from cleaning equipment must not be discharged directly or indirectly to any watercourses or stormwater systems unless otherwise authorised.
- C7 The development must maintain local and regional drainage and hydrological systems, other than to the extent provided for under the approved plans.
- C8 The development must not result in a change in water chemistry that will impact on ecological values on or off site.
- C9 Acid sulfate soils must be managed such that contaminants are not directly or indirectly released to any waters.
- C10 The State Planning Policy 2/02 Guideline: Planning and Managing Development Involving Acid Sulfate Soils and the latest edition of any relevant Guidelines must be complied with when treating and managing acid sulphate soils.
- C11 The operator must:
 - (a) ensure that the construction of the works are carried out using suitable plant and equipment and that measures are taken to limit turbidity in tidal waters as a result of the construction
 - (b) ensure that the disturbance to the bed and banks of the waterway is kept to a minimum.
 - (c) take all appropriate measures to minimise pollution of tidal waters as a result of silt runoff, and the discharge of other contaminants, such as fuel, oil and hydraulic fluid to the waterway during construction of the works.
 - (d) assess the area with regards to the occurrence of acid sulfate soils, where any excavations are made in or adjacent to tidal land or waters. If these soils are found to be present, then action must be undertaken to minimise the impact these soils will have on the water quality of the waterway.
 - (e) restore the bank to its former condition and take such other action as is necessary to ensure the stability of the bank, if as a result of carrying out the works, or any other cause attributable to the works, any bank adjacent to the works is displaced or affected by erosion.

Schedule 2. Port conditions

MCU (ERA16) AND OPERATIONAL WORKS (DREDGING) DEVELOPMENT APPROVAL

Agency interest: General

Prevent environmental harm

- G1 The operator must ensure that environmental harm is not caused by this ERA except where specifically permitted by a condition of this development approval.

Limit of Dredging Approved

- G2 The maximum quantity of material to be removed during the capital dredge activities at the Port (off-lease) is 3,000,000 cubic metres and operations must meet the following restrictions:
- (a) the removal of dredge material is confined to the locations shown on the approved plan attached to the permit
 - (b) dredge spoil must not be disposed of into Queensland waters that are within the limits of the State, or are coastal waters of the State unless otherwise authorised.

Maintenance of measures, plant and equipment

- G3 The operator must:
- (a) install all measures, plant and equipment necessary to ensure compliance with the conditions of this development approval
 - (b) maintain and calibrate such measures, plant and equipment in an efficient condition and keep records of the maintenance
 - (c) operate such measures, plant and equipment in an efficient manner.
- G4 Capital and maintenance dredging activities must be in accordance with the respective Final Dredge Management Plan – Port or subsequent versions as approved by the administering authority.

Equipment

- G5 Any dredging must be conducted using equipment that is in survey and registered and, in relation to environmental performance, is equal to or better than the following equipment:
- (a) Trailing Suction Hopper Dredge that is equipped, as a minimum, with:
 - (i) below keel discharge of tail waters via an anti-turbidity control valve
 - (ii) on-board systems for determining solids to water ratio or density of dredged material
 - (iii) electronic positioning and depth control system for defining the location and depth of dredging activities
 - (iv) dredge heads and depth control capable of, and where appropriate, fitted with fauna exclusion devices (e.g. turtle deflectors).
 - (b) Cutter Suction Dredge that is equipped, as a minimum, with:

- (i) electronic positioning and depth control system for defining the location and depth of dredging activities
 - (ii) a system or process to ensure the delivery system integrity is maintained at all times
 - (iii) systems for determining solids to water ratio or density of dredged material during operations.
 - (c) Grab Dredge that is equipped, as a minimum, with electronic positioning system for defining the location and depth of dredging activities.
- G6 No change, replacement or alteration of any plant or equipment is permitted if the change, replacement or alteration increases, or is likely to increase the risk of environmental harm above that expressly provided for by this approval.

Display of development approval

- G7 A copy of this development approval must be kept in a location readily accessible to personnel carrying out the activity.

Records

- G8 Record, compile and keep all monitoring results required by this development approval and present this information to the administering authority upon request.

Notification

- G9 The holder of this authority must notify the administering authority by telephone, email or facsimile as soon as reasonably possible (but no later than twenty-four (24) hours) after becoming aware of:
- (a) any emergency event 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 approval, or
 - (b) any monitoring result that indicates an exceedence of any development approval limit.
- G10 The notification must include but not be limited to the following:
- (a) the development approval number and name
 - (b) the name and telephone number of the designated contact person
 - (c) the location of the emergency event or incident
 - (d) the date and time of the emergency event or incident
 - (e) the time you became aware of the emergency event or incident
 - (f) the estimated quantity and type of substances involved in the emergency event or incident, if known
 - (g) the cause of the emergency event or incident, if known
 - (h) a description of the nature and effects of the emergency event or incident including risks to the environment, public health or live stock, if known
 - (i) immediate actions taken to prevent or mitigate any further environmental harm caused by the emergency event or incident

- (j) details of any notification of persons who may be affected by the emergency event or incident.
- G11 Within fourteen (14) days or as otherwise agreed following the initial notification of an emergency event, incident or exceedance, further written advice must be provided to the administering authority including the following:
- (a) results and interpretation of any samples taken and analysed
 - (b) outcomes of actions taken at the time to prevent or minimise unlawful environmental harm
 - (c) proposed actions to prevent a recurrence of the emergency event, incident or exceedance.

Spill kits

- G12 Appropriate spill kit(s) and relevant operator instructions /emergency procedure guides for the management of wastes and chemicals associated with the ERA must be kept at the site.
- G13 All relevant personnel operating under this approval must be trained in the use of the spill kit(s).
- G14 All instruments, equipment and measuring devices used for measuring or monitoring in accordance with any condition of this development approval must be calibrated and appropriately operated and maintained.

Trained/experienced operators

- G15 All persons engaged in the conduct of the dredging activities, including but not limited to employees and contract staff, must be:
- (a) Trained in the procedures and practices necessary to:
 - (i) comply with the conditions of this development approval
 - (ii) prevent environmental harm during normal operation and emergencies, or
 - (b) under the close supervision of such a trained person.
- G16 The administering authority must be advised in writing of the date of commencement of a capital and maintenance dredge campaign at least five business days prior to that date.

Post-construction

- G17 The administering authority must be advised within ten (10) days following completion of the capital and maintenance dredging campaign.

Agency interest: Air

- A1 The release of airborne contaminants from the activity must not cause environmental nuisance.

Agency interest: Noise

- N1 Noise from dredging activities must not cause environmental nuisance at a nuisance sensitive place.

- N2 When requested by the administering authority, noise monitoring and recording must be undertaken within a timeframe nominated by the administering authority to investigate any complaint of environmental nuisance (considered in the opinion of an authorised officer to be neither frivolous or vexatious) at any sensitive place or commercial place and the results must be provided to the administering authority within fourteen (14) days following completion of monitoring.
- N3 Noise monitoring and recording must include the following descriptor characteristics and matters:
- (a) L_{Aeq} , and L_{AN} (where N equals the statistical levels of 1, 10 and 90 and T = 60 mins)
 - (b) background noise L_{A90}
 - (c) the level and frequency of occurrence of impulsive or tonal noise and any adjustment and penalties to statistical levels
 - (d) atmospheric conditions including temperature, relative humidity and wind speed and directions
 - (e) effects due to any extraneous factors such as traffic noise
 - (f) location, date and time of monitoring
 - (g) if the complaint concerns low frequency noise, Max, $L_{pLIN,T}$
 - (h) if the complaint concerns low frequency noise, one third octave band measurements in dB(LIN) for centre frequencies in the 10–200 Hz range.
- N4 The method of measurement and reporting of noise levels must comply with the most recent edition of the administering authority's *Noise Measurement Manual* or the most recent version of *Australian Standard AS1055 Acoustics – Description and measurement of environmental noise*.

Agency interest: Water

- W1 In carrying out the ERA dredging activity, the release of contaminants (including any release caused by extraction of material from the bed of waters) must:
- (a) only occur from the permitted areas specified on approved plans
 - (b) be suitable for unconfined ocean disposal when assessed in accordance with the *National Assessment Guidelines for Dredging*
 - (c) not produce any slick or other visible evidence of oil or grease, nor contain visible floating oil, grease, scum, litter or other objectionable matter
 - (d) be carried out taking all practical measures necessary to minimise the concentration of suspended solids released during the loading and pump-out of the vessel.
- W2 Dredging must not start until provision has been made to lawfully place or dispose of the dredge material. Evidence of applicable approvals must be made available to the administering authority when requested.
- W3 All reasonable and practicable measures shall be taken to limit the potential turbidity.

- W4 Where trailer suction dredging is carried out, an effective turtle exclusion device must be fitted to the dredge head. Evidence that this device has been installed and used on the dredge for the entire period of the dredging activity must be provided to the administering authority.
- W5 Mobile dredging operations:
- (a) must not commence if dugongs, turtles, or cetaceans are observed within 300 metres of the dredge
 - (b) where underway, must alter course if dugongs, turtles, or cetaceans are likely to be struck or captured.
- W6 Stationary dredging operations:
- (a) must not commence if dugongs, turtles, or cetaceans are observed within 300 metres of the dredge
 - (b) must cease if dugongs, turtles or cetaceans are observed within 50 metres of the dredge head.
- W7 Operating procedures that minimise the risk of turtle capture by the dredge head, and the risk from all activities of injury to marine species of conservation significance, must be developed prior to the commencement of dredging activities.
- W8 The administering authority is to be immediately notified of any turtle captures by the dredge or of injury to any marine species of conservation significance.
- W9 Turtle monitoring
- (a) daily monitoring for impacted turtles must be undertaken at the dredge and at the shoreline down-current from the dredging operation
 - (b) if monitoring indicates that more than two turtles are killed within a 24 hour period as a result of dredging, the dredge must relocate from the area
 - (c) a trailing suction hopper dredge must be fitted with marine wildlife protection or exclusion devices such as deflector plates, tickler chains or drag heads prior to and during operation.

Agency interest: Land

- L1 Dredge material must not be disposed of on land.

Agency interest: Waste

- WA1 Waste generated in the carrying out of the activities must be stored, handled and transferred in a proper and efficient manner.

Agency interest: Social

Complaint response

- S1 The operator of the ERA must record the following details for all complaints received and provide to the administering authority upon request:
- (a) time, date, name and contact details of the complainant
 - (b) reasons for the complaint

- (c) details of investigations undertaken
- (d) conclusions formed
- (e) actions taken to resolve the complaint.

Schedule 3. Coordinator-General's specific conditions for all MCU and tidal operational works approvals

Condition 1. Dredging and marine works

- (a) All dredging must be undertaken in accordance with a dredge management plan/s (DMP/s) based on the draft DMP/s forming part of the SEIS and be approved by DEHP prior to dredging commencing.
- (b) Marine works (excluding dredging) must be undertaken in accordance with a marine works environmental management plan (marine works EMP) and be approved by DEHP prior to the marine works commencing.
- (c) DEHP and DAFF (FQ) shall be consulted in the preparation of all final DMP/s and marine works EMPs and NQBP shall also be consulted in the preparation of the final DMP/s and marine works EMP in the Embley River.
- (d) The port DMP shall provide details of water quality and coral health monitoring programs and water quality objectives proposed to be implemented.
- (e) The Embley River DMP/s shall provide details of water quality monitoring or Photosynthetically Available Radiation (PAR) programs proposed to be implemented.
- (f) Dredging campaigns at the Humbug and Hornibrook ferry/tug berth sites must not occur for longer than 14 consecutive days at each site. Dredging at any one of these sites may extend over a longer time period, provided:
 - (i) there is a pause in dredging of at least three days between periods of dredging at each site or
 - (ii) Where turbidity monitoring is employed, turbidity levels have not increased significantly above background levels as defined in the River DMP

Condition 2. Marine plants and fish habitat

- (a) For any construction and operational tidal works requiring the removal or damage of marine plants as defined under the *Fisheries Act 1994*, (Fisheries Act) RTAW must submit an application for approval of marine plant disturbance to DAFF (FQ), if required, prior to any works commencing.
- (b) RTAW must submit surveys to DAFF (FQ) that determine the extent of any seagrass that will be disturbed, both temporarily and permanently.
- (c) RTAW must:
 - (i) report on implementation of the Dredge Management Plan(s) for the river facilities to the NQBP Technical Advisory and Consultative Committee for the Port of Weipa

- (ii) establish a technical advisory group which must include representatives from DEHP and DAFF (FQ) for dredging at the South of Embley port. RTAW must report to the group on proposed dredging activities for the Port and implementation of the Dredge Management Plan(s) for the South of Embley port, including monitoring results, management triggers and response actions. The group will assist in the establishment, where appropriate, of longer term management for the maintenance dredging program
- (d) RTAW shall enter into a Deed of Agreement with the chief executive, managing the Fisheries Act, or his delegate, within three months of FID, to ensure that all impacts to marine plants and tidal lands are offset in a way that is mutually acceptable to DAFF (FQ) and the proponent, and is in line with Fisheries Queensland Policy, *FHMOP 005 Mitigation and compensation for activities and works causing marine fish habitat loss* and the fact sheet, *Offset Measures for Marine Fish Habitats*.

PART B. ENVIRONMENTAL AUTHORITY—ON MINING LEASE

These conditions are stated for inclusion in the draft environmental authority to amend the existing environmental authority held by RTAW, MIN 100939109 (mining activities).

Schedule 1. Coordinator-General's specific conditions

Condition 1. Terrestrial biodiversity offset plan

- (a) A final terrestrial biodiversity offset plan, generally consistent with the requirements of the Queensland Biodiversity Offset Plan (BOP) and Queensland Government Environmental Offsets Policy (QGEOP) shall be submitted to DEHP for approval within 12 months of the final investment decision for the project.
- (b) The final plan shall include the following elements and be consistent with the offset proposal submitted to the Coordinator-General by RTAW on 5 April 2012 and presented in this report as Appendix 5:
 - (i) 2:1 ratio of riparian habitat comprising one or more of RE 3.3.5, RE 3.3.9, RE 3.3.21 (355.2 hectares), of which 110.6 hectares must be RE3.3.9
 - (ii) translocate and/or propagate 3.5 plants of Cooktown orchid and chocolate tea tree orchid as well as any other listed flora species under the NC Act for each plant found within the footprint of disturbance and establish within the offset area(s)
 - (iii) offset area(s) may be located on ML7024 subject to meeting ecological equivalence measures and agreement of Traditional Owners and relevant Government agencies
 - (iv) offset area(s) are to be managed to protect and enhance environmental values including ecologically appropriate fire protection and feral animal controls
- (c) RTAW must consult with and gain the approval of DEHP and traditional owners (where relevant) regarding the location of the proposed offset area(s) and must use its reasonable endeavours to secure the offset area/s under an appropriate legal mechanism within 18 months of the final investment decision for the project
- (d) Should RTAW be unable to legally secure all or part of the offset area/s within the period prescribed in (c) despite its reasonable endeavours, RTAW may apply to DEHP for an extension to legally secure the offset
- (e) Should RTAW be unable to legally secure all or part of the offset despite an extension granted under (d), RTAW may submit an alternative biodiversity offsets plan to the Coordinator General for approval.

Condition 2. Marine turtle offset plan

- (a) A marine turtle offset plan shall be submitted to DEHP for approval within 6 months of the final investment decision for the project.

- (b) The offset plan must provide for the annual control of feral pigs on ML7024 in the coastal zone between Ina Creek and Winda Winda Creek and associated riparian hinterland areas and be consistent with the proposal submitted to the Coordinator General by RTAW on 5 April 2012 and presented in this report at Appendix 5.
- (c) The marine turtle offset plan shall provide for the annual monitoring of beaches for turtle nesting and nest predation rates.

Condition 3. Species management plan

- (a) RTAW must prepare a management plan for fauna species listed under the NC Act and identified in the EIS as species where impacts may be likely or possible, for the approval of DEHP, prior to any clearing of vegetation associated with significant construction work.
- (b) The plan must satisfy the requirements of the Nature Conservation (Wildlife Management) Regulation 2006 relating to tampering with animal breeding places.
- (c) The plan may be either stand-alone or form part of the land use management plan required under Appendix 3, Part B, Schedule 5, Condition (7) and must, as a minimum, address the red goshawk, bare-rumped sheath-tail bat, palm cockatoo, estuarine crocodile, rufous owl, square-tailed kite and masked owl.
- (d) Specifically the plan must address:
 - (i) Protection of riparian, wetland, estuarine, vine forest and coastal vegetation on sand from mining by an environmental buffer system. The buffer system must meet or exceed the minimum requirements of the *Regional Vegetation Management Code for Western Bioregion (Version 2)* as they relate to clearing set-back distances from watercourses and wetlands. Surveys must be carried out to define the boundaries of mapped sensitive vegetation types in the field prior to disturbance.
 - (ii) Surveys must be conducted for red goshawk, masked owl and square-tailed kite nests prior to undertaking significant disturbance to land located within 1km of permanent water supporting riparian gallery forest of paperbark wetland, seasonally inundated paperbark wetlands, seasonal water courses supporting riparian gallery forest, or an estuary. If any active red goshawk, masked owl or square-tailed kite nests are found within mining areas, a 200m buffer around the nesting tree must not be mined until the end of the breeding season.
 - (iii) Relocation of mature crocodiles, if required due to safety concerns, in consultation with DEHP.
 - (iv) For the bare-rumped sheath-tail bat:
 - (A) undertake an additional targeted bat survey, using broad spectrum acoustic monitoring, prior to the commencement of construction. The survey must relate to areas planned for initial infrastructure required prior to production

- (B) support a research program being conducted by the Australian Bat Society which will aim to acquire a quality reference call library for microbats of the Cape York region
- (C) utilise the reference calls acquired by the research program to analyse the targeted survey results for the bare-rumped sheath-tail bat within the project area and further define habitat preferences. Should the species be identified in the project area through analysis of survey results, then in liaison with DEHP, adaptive management must be implemented based on the habitats within which it is found.

Condition 4. Rehabilitation

- (a) Disturbed areas must be rehabilitated to a natural ecosystem as similar as possible to the original, pre-disturbance ecosystem, recognising the limitations of the post-mining landscape, in accordance with the guideline *Rehabilitation requirements for mining projects*.²³
- (b) Based on knowledge available at the time, an interim rehabilitation management plan listing goals, objectives, indicators and completion criteria amongst other matters, as listed in Appendix 3, Part B, Schedule 5, Condition (16) as far as practicable, must be prepared and submitted by 30 August 2013 for the approval of DEHP.
- (c) The interim rehabilitation management plan shall be viewed as an adaptive management tool and must be regularly reviewed and updated in the light of trials and experience as required in Appendix 3, Part B, Schedule 5, Condition (17).
- (d) RTAW must, following a request from the Western Cape Communities Coordinating Committee (WCCCC), liaise with traditional owners and the Committee on opportunities for alternative post-mining land uses and may propose amendment to the rehabilitation management plan to reflect such opportunities (this does not preclude other stakeholders from proposing changes to the plan, all of which must be approved by DEHP).

Condition 5. Mining setbacks where potential new aquatic species identified

- (a) Unless otherwise expressly permitted by DEHP, bauxite mining shall not be undertaken within 200 metres of aquatic habitat, where a potential new species of aquatic fauna has been identified.
- (b) RTAW must prepare a survey plan aimed at determining the distribution of the potential new species of freshwater crab identified in Winda Winda Creek and the potential new species of stygofauna identified in the Ward River. In preparing the survey plan, RTAW must liaise with the Queensland Museum and DEHP and have regard to comments made by those agencies.
- (c) The survey plan shall form part of the land use management plan required in Appendix 3, Part B, Schedule 5, Condition (7).

²³ Department of Environment and Resource Management 2011, *Rehabilitation requirements for mining projects*, 28 March 2011, Department of Environment and Resource Management, Brisbane, viewed 12 April 2012, www.derm.qld.gov.au/register/p01673aa.pdf.

- (d) Once the survey plan has been lodged and the conservation status determined for each of the species, RTAW shall make a recommendation to DEHP on any proposed changed setback distance.

Condition 6. Foreshore access management plan

- (a) RTAW shall prepare a management plan for foreshore access in consultation with DEHP, traditional owners and the WCCCC and shall be aimed at restricting access to foreshore areas to permitted persons only, in order to protect environmental and heritage values.
- (b) The plan shall cover the foreshore area between Ina Creek and Winda Winda Creek.
- (c) The plan may either be stand-alone or form part of the Communities Heritage and Environment Plan required under Appendix 1, Condition 9(f) or form part of the Land Use Management Plan required under Appendix 3, Part B, Schedule 5, Condition (7) and shall be finalised prior to commencement of significant construction work.

Condition 7. Marine transport—early seaborne construction access

- (a) The temporary seaborne construction access facilities comprising a barge landing north of Perra Head and passenger jetty in Boyd Bay are to be removed following commissioning of the barge and ferry terminals in the river and mine access road unless otherwise agreed to by DEHP.
- (b) After removal of the temporary seaborne construction access facilities, the surrounding land and marine environment are to be reinstated to the condition exiting previously to the satisfaction of DEHP.

Condition 8. Dredging and marine works on the mining lease

- (a) All dredging must be undertaken in accordance with a dredge management plan/s (DMP/s) based on the draft DMP/s in the SEIS approved by DEHP prior to dredging commencing.
- (b) Marine works (excluding dredging) must be undertaken in accordance with the Marine Works EM Plan and be approved by DEHP prior to any marine works commencing.
- (c) DEHP and DAFF (FQ) must be consulted in preparation of the final DMP/s and NQBP shall be consulted in preparation of plans involving the Hey River terminal.
- (d) The DMP for the port must provide details of water quality and coral health monitoring programs and water quality objectives proposed to be implemented.
- (e) The DMP for the Hey River terminal site shall provide details of water quality monitoring or Photosynthetically Available Radiation (PAR) programs proposed to be implemented.
- (f) The dredging campaign at the Hey River site must not occur for longer than 14 consecutive days. Dredging may extend over a longer time period, provided:
 - (i) there is a pause in dredging of at least three days between periods of dredging at each dredging site in the river or

- (ii) Where turbidity monitoring is employed, turbidity levels have not increased significantly above background levels as defined in the River DMP.
- (g) RTAW must:
 - (i) report on implementation of the Dredge Management Plan(s) for the river facilities to the NQBP Technical Advisory and Consultative Committee for the Port of Weipa
 - (ii) establish a technical advisory group which must include representatives from DEHP and DAFF (FQ) for dredging at the South of Embley port. RTAW must report to the group on proposed dredging activities for the Port and implementation of the Dredge Management Plan(s) for the South of Embley port, including monitoring results, management triggers and response actions. The group will assist in the establishment, where appropriate, of longer term management for the maintenance dredging program.

Schedule 2. General conditions common to all coastal facilities

General conditions common to all coastal facilities—Port, Wharf/Ship Loading Facility, Hey River Barge/Ferry Terminal, Reclamation Works and Temporary Seaborne Access—Barge Landing Area and Seaborne Access

GENERAL

- (1) A report from a Registered Professional Engineer of Queensland must be submitted to the administering authority within three (3) months of the date of commissioning of the coastal works certifying that:
 - (a) the coastal works (including any other associated works) have been constructed in accordance with the approved drawings;
 - (b) the coastal works:
 - (i) are structurally adequate for the anticipated use
 - (ii) comply with all relevant codes including the administering authorities operational policy

Note: This approval does not constitute a ruling on the structural safety of the coastal works, and it is the responsibility of the applicant to ensure adequacy of the design, construction and ongoing maintenance of the works.

- (2) All temporary coastal works associated with construction are to be removed from the site at the completion of the works unless otherwise authorised by DEHP, and all wastes must be collected from the site by the holder of this environmental authority and reused or disposed of at a licensed waste facility.
- (3) Acid sulfate soils must be managed so that contaminants are not directly or indirectly released to any waters.
- (4) The *State Planning Policy 2/02 Guideline: Planning and Managing Development Involving Acid Sulfate Soils* and the latest edition of any relevant guidelines must be complied with when treating and managing acid sulfate soils.
- (5) The development must maintain local and regional drainage and hydrological systems, other than to the extent provided for under the approved plans identified in Appendix 3, Part B, Schedule 12.
- (6) The holder of this environmental authority must remove any material, other than that from authorised activities, that is deposited outside of the alignment of the coastal works shown on the approved plans identified in Schedule 12 or any debris that falls or is deposited on tidal lands or into tidal waters during the construction of the works.

PORT & HEY RIVER DREDGING ACTIVITIES

Limit of dredging approved

- (7) The maximum volumes of material to be removed as a result of Port & Hey River capital dredging activities are identified in Table A1: Volumes of capital dredged material.

Table A1: Volumes of capital dredged material

Location	Volume (m³)
Port—Stage 1 capital works	6 500 000
Port—Stage 2 capital works	2 400 000
Hey River	37 380

- (8) Dredging activities must be confined to the removal of capital and maintenance dredge material at the locations shown on the approved plan(s).
- (9) Dredge spoil must not be disposed of into Queensland waters that are within the limits of the State, or are coastal waters of the State, unless otherwise authorised
- (10) Dredging activities must not start until provision has been made to lawfully place or dispose of the dredge material. Evidence of applicable approvals must be made available to the administering authority when requested.
- (11) The administering authority must be advised in writing of the date of commencement of capital and maintenance dredging campaign at least five (5) business days prior to that date.
- (12) Capital and maintenance dredging activities must be in accordance with a final respective dredge management plan(s) for Port and Hey River Facilities or subsequent versions as approved by the administering authority.

Post-construction

- (13) The administering authority must be advised within ten (10) days following completion of capital or maintenance dredging campaigns.

Trained/experienced operators

- (14) All persons engaged in the conduct of the dredging activities, including but not limited to employees and contract staff, must be:
 - (a) trained in the procedures and practices necessary to:
 - (i) comply with the conditions of this environmental authority
 - (ii) prevent environmental harm during normal operation and emergencies, or
 - (b) under the close supervision of a trained person.

Release to waters

- (15) In carrying out dredging activities, the release of contaminants (including any release caused by extraction of material from the bed and banks of waters) must:
 - (a) only occur from the permitted areas identified in approved plans specified in Appendix 3, Part B, Schedule 12.
 - (b) only occur in accordance with conditions of this environmental authority
 - (c) be carried out taking all practical measures necessary to minimise the concentration of suspended solids released during the loading of the vessel.

- (16) All reasonable and practicable measures shall be taken to limit the potential for turbidity plumes to cause environmental harm to seagrass meadows adjacent to the proposed dredge site at Hey River barge/ferry terminal.

Equipment

- (17) Any dredging activities must be conducted using equipment that is in survey and registered and, in relation to environmental performance, is equal to or superior to the following equipment:
- (a) Trailing Suction Hopper Dredge that is equipped, at a minimum, with:
 - (i) below keel discharge of tail waters via an anti-turbidity control valve
 - (ii) on-board systems for determining solids to water ratio or density of dredged material
 - (iii) electronic positioning and depth control system for defining the location and depth of dredging activities
 - (iv) dredge heads and depth control capable of, and where appropriate, fitted with fauna exclusion devices (e.g. turtle deflectors).
 - (b) Cutter Suction Dredge that is equipped, at a minimum, with:
 - (i) electronic positioning and depth control system for defining the location and depth of dredging activities
 - (ii) a system or process to ensure the delivery system integrity is maintained at all times
 - (iii) systems for determining solids to water ratio or density of dredged material during operations.
 - (c) Grab Dredge that is equipped, as a minimum, with:
 - (i) electronic positioning system for defining the location and depth of dredging activities.
- (18) Where trailer suction dredging is carried out, an effective turtle exclusion device must be fitted to the dredge head. Evidence that this device has been installed and used on the dredge for the entire period of the dredging activity must be provided to the administering authority on request.
- (19) Mobile dredging operations:
- (a) must not commence if dugongs, turtles, or cetaceans are observed within 300 metres of the dredge
 - (b) where underway, must alter course if dugongs, turtles, or cetaceans are likely to be struck or captured.
- (20) Stationary dredging operations:
- (a) must not commence if dugongs, turtles, or cetaceans are observed within 300 metres of the dredge
 - (b) must cease if dugongs, turtles or cetaceans are observed within 50 metres of the dredge head.

- (21) Turtle monitoring:
 - (a) Daily monitoring for impacted turtles must be undertaken at the dredge and at the shoreline down-current from the dredging operation
 - (b) If monitoring indicates that more than two turtles are killed within a 24 hour period as a result of dredging, the dredge must relocate from the area until an incident investigation has been carried out and relevant preventative actions implemented.
- (22) A trailing suction hopper dredge must be fitted with marine wildlife protection or exclusion devices such as deflector plates, tickler chains or drag heads prior to and during operation.
- (23) Operating procedures that minimise the risk of turtle capture by the dredge head, and the risk from all activities of injury to marine species of conservation significance, must be developed prior to the commencement of dredging activities.
- (24) The administering authority is to be immediately notified of any turtle captures by the dredge or injury to any marine species of conservation significance.

Land

- (25) Dredge material must not be disposed of on land unless otherwise authorised.
- (26) In relation to Acid Sulfate Soils and/or Potential Acid Sulfate Soils present at the dredge site, the holder of this environmental authority must manage dredging activities in accordance with the *Queensland Acid Sulfate Soils Technical Manual Soil Management Guidelines*.

HEY RIVER BARGE/FERRY TERMINAL, RECLAMATION WORKS AND TEMPORARY SEABORNE ACCESS—BARGE LANDING AREA AND SEABORNE ACCESS

- (27) Once a vessel has berthed, the use of the vessel's propulsion system must be minimised to the extent practicable and safe to reduce the risk of disturbance to the seabed during loading/unloading operations at the Hey River Barge/Ferry Terminal ramp.
- (28) All rock, stone, gravel, sand or other fill material used in construction must be:
 - (a) suitable for the purpose having regard to the location of the land and to the proposed use of the land
 - (b) free from contaminants that may cause environmental harm.
- (29) Bed levelling activities must not result in the release of contaminants to waters.

Schedule 3. General

Activity

- (30) This environmental authority authorises environmental harm caused by the carrying out of mining activities by the holder of this environmental authority, provided the mining activities are carried out in accordance with conditions herein. Where a condition in this environmental authority refers to environmental harm the condition is taken to authorise the environmental harm occurring in compliance with the condition. Where there is no condition or the authority is silent on a matter, the lack of a condition or silence shall not be construed as authorising harm.
- (31) The activities to be carried out under this environmental authority are the mining activities defined within Table A2: Authorised activities and identified in Appendix 3, Part B, Schedule 12, Plan 12.2 – South of Embley Project Infrastructure and Conceptual Mine Plan.

Table A2: Authorised activities

Mining activity/ domain	Mine feature	Tenure	Maximum surface area of disturbance (ha)	Map reference (MGA 94)	
				Northing	Easting
Exploration	Pads (SOE)	ML7024	N/A ¹	N/A	N/A
Extraction Areas	Mining areas	ML7024	246 024	N/A	N/A
	Boyd Port dredge extraction area	ML7024	78	8571105 8574142 8573560 8570525	567170 561485 561175 566860
	Hey River Terminal dredge extraction area	ML6024	2.5	8590950 8590950 8590665 8590665	597005 597140 597140 597005
Processing Activities	Boyd beneficiation plant (total infrastructure area)	ML7024	270	TBD ²	TBD ²
				TBD ²	TBD ²
				TBD ²	TBD ²
				TBD ²	TBD ²
	Norman Creek beneficiation plant (total infrastructure area)	ML7024	21	TBD ²	TBD ²
				TBD ²	TBD ²
				TBD ²	TBD ²
				TBD ²	TBD ²
Regulated Dams	Boyd tailings storage facility	ML7024	1100	8569825	567195
				8569825	569675
				8565185	567195
				8565185	569675

Mining activity/ domain	Mine feature	Tenure	Maximum surface area of disturbance (ha)	Map reference (MGA 94)	
				Northing	Easting
	Norman Creek tailings storage facility	ML7024	1100	8557545 8552305 8553185 8556665	578560 578140 580320 576380
Water Supply Dam	Dam C	ML7024	780	8566275 8566890 8564570 8561490	574055 579665 581175 575595
Waste disposal/ treatment	Sewage treatment plant temporary camp in the SOE area	ML7024	N/A ¹	N/A ¹	N/A ¹
	Boyd infrastructure area sewage treatment plant	ML7024	N/A ¹	N/A ¹	N/A ¹
	Norman Creek infrastructure area sewage treatment plant	ML7024	N/A ¹	N/A ¹	N/A ¹
Electricity generation	Boyd infrastructure area power station	ML7024	N/A ¹	N/A ¹	N/A ¹
	Norman Creek infrastructure area power station	ML7024	N/A ¹	N/A ¹	N/A ¹
	Electrical generators	ML7024 and ML6024	Mobile (defined in Plan of Operations where >1MW)	N/A ¹	N/A ¹
Chemical storage areas	Boyd infrastructure area	ML7024	N/A ¹	N/A ¹	N/A ¹
	Norman Creek infrastructure area	ML7024	N/A ¹	N/A ¹	N/A ¹
	For Heavy Equipment in Mining Areas	ML7024	Mobile/ Temporary (defined in Plan of Operations where >10m ³)	N/A ¹	N/A ¹
Motor vehicle workshops	Boyd infrastructure area	ML7024	N/A ¹	N/A ¹	N/A ¹
	Norman Creek infrastructure area	ML7024	N/A ¹	N/A ¹	N/A ¹
Accomm- odation	Temporary camp	ML7024	Defined in Plan of Operations	TBD ² TBD ² TBD ² TBD ²	TBD ² TBD ² TBD ² TBD ²

Mining activity/ domain	Mine feature	Tenure	Maximum surface area of disturbance (ha)	Map reference (MGA 94)	
				Northing	Easting
Port/ship loading facilities	Boyd Port	ML7024	TBD ²	8571220 8570465 8570410 8571170	566305 567725 567695 566275
Water treatment	Temporary accommodation camp water treatment plant in SOE area	ML7024	N/A ¹	N/A ¹	N/A ¹
	Boyd infrastructure area water treatment plant	ML7024	N/A ¹	N/A ¹	N/A ¹
	Norman Creek infrastructure area water treatment plant	ML7024	N/A ¹	N/A ¹	N/A ¹
Transport corridors	Transport corridor	ML6024	2	N/A	N/A
	Haul roads/access tracks	ML6024 & ML7024	Defined in plan of operations	N/A	N/A

¹ Maximum surface area of disturbance and location included in the total infrastructure area within the mining activity/domain identified as 'Extraction Areas', 'Processing Activities' or 'Accommodation'.

² TBD and notified to the administering authority upon completion of final design.

Maintenance of measures, plant and equipment

(32) The holder of this environmental authority must:

- (a) install measures, plant and equipment necessary to ensure compliance with the conditions of this environmental authority
- (b) maintain such measures, plant and equipment in a proper condition
- (c) operate such measures, plant and equipment in a proper manner.

(33) No change, replacement or alteration of any plant or equipment is permitted if the change, replacement or alteration increases, or is likely to increase the risk of environmental harm caused by the mining activities.

Monitoring and reporting

- (34) 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 each time a plan of operations is prepared or amended, or otherwise in accordance with the relevant timeframe as specified in this environmental authority, and amended as promptly as necessary to meet that objective.
- (35) The holder of this environmental authority must record, compile, evaluate and keep for a period of five (5) years all monitoring results, records and documents required by this environmental authority and any complaints received about the mining activities, and make available for inspection all or any of these records upon request by the administering authority.
- (36) All monitoring referred to in this environmental authority shall be undertaken by a suitable competent person using monitoring equipment that is accurately calibrated and maintained in good working order and condition.
- (37) All analyses and tests required to be conducted under this environmental authority must be carried out by a laboratory that has NATA certification for such analyses and tests, except as otherwise authorised by the administering authority.

Financial assurance

- (38) The environmental authority holder must provide a financial assurance of an amount determined by the administering authority in accordance with the administering authorities Guideline – *Calculating Financial Assurance for Mining Projects* and in a form acceptable to the administering authority. The financial assurance must remain in force until the administering authority is satisfied no claim on the assurance will be required.

Risk management

- (39) The holder of this environmental authority must develop and implement a risk management system for mining activities within twelve (12) months from the date of issue of this environmental authority which conforms to the Australian Standard for Risk Management (AS/NZS 31000:2009) or the latest edition of the Australian Standard for Risk Management.

Emergency response/contingency

- (40) An emergency response/contingency plan must be developed and implemented to respond to emergency events and incidents. This plan must be provided to the administering authority upon request.
- (41) The emergency response/contingency plan must be developed in accordance with the most recent version of ISO14001 standard and must include but not be limited to the following matters:
 - (a) response procedures which aim to minimise the extent and duration of environmental harm
 - (b) procedures to investigate the cause of an emergency event or incident and remedial actions to be taken to prevent a recurrence

- (c) timely and accurate reporting of the circumstance and nature of an emergency event or incident to the administering authority
- (d) procedures for accessing monitoring points during an emergency event or incident
- (e) procedures to notify any person who may be affected by the emergency event or incident within twenty-four (24) hours, with the following information to be provided at a minimum:
 - (i) the location of the emergency event or incident
 - (ii) the date and time of the emergency event or incident
 - (iii) the estimated quantity and type of any substances (if in available concentrations) involved in the emergency event or incident
 - (iv) the potential impacts to environmental values, livestock and public health caused by the emergency event or incident.

Notification of emergencies, incidents and exceptions

- (42) The holder of this environmental authority must notify the administering authority by telephone, email or facsimile as soon as reasonably possible (but no later than twenty-four (24) hours after becoming aware of:
 - (a) any emergency event 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, or
 - (b) any monitoring result that indicates an exceedence of any environmental authority limit.
- (43) The notification must include but not be limited to the following:
 - (a) the environmental authority number and name of the holder
 - (b) the name and telephone number of the designated contact person
 - (c) the location of the emergency event or incident
 - (d) the date and time of the emergency event or incident
 - (e) the time the holder of this environmental authority became aware of the emergency event or incident
 - (f) the estimated quantity and type of substances involved in the emergency event or incident, if known
 - (g) the cause of the emergency event or incident, if known
 - (h) a description of the nature and effects of the emergency event or incident including risks to the environment, public health or live stock, if known
 - (i) immediate actions taken to prevent or mitigate any further environmental harm caused by the emergency event or incident
 - (j) details of any notification of persons who may be affected by the emergency event or incident.
- (44) Within fourteen (14) days or as otherwise agreed following the initial notification of an emergency event, incident or exceedence, further written advice must be provided to the administering authority including the following:

- (a) results and interpretation of any samples taken and analysed
- (b) outcomes of actions taken at the time to prevent or minimise unlawful environmental harm
- (c) proposed actions to prevent a recurrence of the emergency event, incident or exceedence.

Transition to new standards

- (45) Where a condition requires compliance with a standard published externally to this environmental authority and the standard is amended or changed subsequent to issue, the holder of this environmental authority must, unless otherwise agreed with the administering authority:
 - (a) comply with the amended or changed standard within two (2) years, unless a different period is specified in the amended standard or relevant legislation
 - (b) until compliance with the amended or changed standard can be achieved, continue to remain in compliance with the standard that was current immediately prior to the relevant amendment or change.

Complaints

- (46) Records must be kept of all environmental complaints received about the mining activities, including the following details, and must be made available for inspection by the administering authority on request:
 - (a) name, address and contact number for complainant
 - (b) time and date of complaint
 - (c) reasons for the complaint
 - (d) investigations undertaken
 - (e) conclusions formed
 - (f) actions taken to resolve complaint
 - (g) any abatement measures implemented
 - (h) person responsible for resolving the complaint.
- (47) When requested by the administering authority, the holder of this environmental authority must undertake relevant specified monitoring within a timeframe agreed to by the administering authority to investigate any complaint of environmental harm, considered in the opinion of an authorised officer not to be vexatious or frivolous. The results of the investigation (including an analysis and interpretation of the monitoring results) and abatement measures implemented must be provided to the administering authority within fourteen (14) days of completion of the investigation.

Community

- (48) The holder of this environmental authority must establish, promote and maintain easily accessible lines of communication between residents and land owners to ensure that community impacts are identified and managed.

Third party auditing

- (49) Compliance with the conditions of this environmental authority must be audited by an appropriately qualified third party auditor nominated by the holder of this environmental authority and accepted by the administering authority within 12 months of the issue of this environmental authority and then at regular intervals not exceeding once every three (3) years. A copy of the final audit report must be submitted to the administering authority upon request
- (50) The holder of this environmental authority must promptly respond to any findings arising from the audit and implement measures or take necessary action to ensure compliance with the conditions of this environmental authority.

Schedule 4. Air

General

- (1) The release of dust, noxious or offensive odour or any other airborne contaminants resulting from the mining activities must not cause environmental harm at any sensitive place or commercial place.
- (2) The holder of this environmental authority must ensure that vehicles (including trains) used for transporting bulk materials from the mining lease, leave the mining lease with appropriate load preparation to minimise the spillage and/or loss of particulate matter and/or windblown dust during transport.
- (3) In the event of a complaint made to the administering authority (which in the opinion of an authorised officer is considered neither frivolous nor vexatious) about airborne contaminants generated in carrying out the authorised activity, dust and particulate matter must not exceed any of the levels identified in Table A3: Ambient air quality limits, when measured at any sensitive or commercial place:

Table A3: Ambient air quality limits

Contaminant	Limit	Methodology
Dust deposition	120 milligrams per square metre per day, averaged over one (1) month	Monitored in accordance with the most recent version of Australian Standard AS3580.10.1 <i>Methods for sampling and analysis of ambient air – Determination of particulate matter – Deposited matter – Gravimetric method</i>
Particulate matter with an aerodynamic diameter of less than 10 micrometres (PM ₁₀) suspended in the atmosphere	50 micrograms per cubic metre, averaged over twenty-four (24) hours	Monitored in accordance with the most recent version of the relevant Australian Standard for measuring 10 micrometres (PM ₁₀) suspended Note: Five (5) days of exceedences allowed each year including natural causes
Particulate matter (TSP) suspended in the atmosphere	90 micrograms per cubic metre, averaged over one (1) year	Monitored in accordance with any method for measuring TSP as recommended in the most recent version of the relevant Australian Standard for measuring TSP

- (4) If monitoring indicates the airborne contaminants specified in Condition (3) have been exceeded, the holder of this environmental authority must compare the results of the impacted site to that of the reference monitoring site. If the level of airborne contaminants at the impacted site does not exceed the reference monitoring site, then no action is to be taken and the contaminants will be regarded as not having been generated in the carrying out of the authorised activity.
- (5) If monitoring indicates the limits in Condition (3) have been exceeded, the holder of this environmental authority must promptly implement dust abatement measures so that emissions of dust generated by the mining activities cease to exceed the limits in Condition (3).

Appendix 3: Stated conditions

South of the Embley project

Coordinator-General's report on the environmental impact statement

Light

- (6) In the event of a complaint about light emissions from any mining activity that, after investigation, is in the opinion of an authorised person causing a nuisance at a sensitive place, the administering authority may request the holder of this environmental authority to take appropriate action to mitigate the nuisance and the holder must take appropriate action (e.g. by screening or directing the light away from the sensitive place) within a time set by the administering authority.
- (7) Lighting management and monitoring must be implemented at the port and temporary seaborne access to minimise light horizon changes on and over the beach that negatively impact on turtles.
- (8) Low-pressure sodium vapour lamps, or other lighting demonstrated to have a low impact on the relevant turtle species, that are shielded and appropriately directed to minimise light spill, must be used on the coastal and marine structures to minimise impacts on nesting and hatchling turtles.

Offsets

[To be inserted once offset requirements have been finalised]

Point source releases to air

- (9) Power station emissions must only be released to the atmosphere from the release points specified in Table A4: Release points.

Table A4: Release points

Release point/ monitoring location	Min. release height (m)	Min. exit gas temperature (°C)	Min. efflux velocity (m/s)	Contaminant parameter	Maximum contaminant concentration ^{4,5}	Frequency of monitoring
Boyd infrastructure area power station stack TBD ¹	TBD ¹	TBD ¹	TBD ^{1,2}	Carbon monoxide ⁶	11mg/m ³ (dry) @ 3% O ₂	Annual
				Oxides of nitrogen ⁷ (expressed as NO ₂)	500mg/m ³ (dry) @ 3% O ₂	
				Total particulate matter ⁷	50mg/m ³	
Norman Creek infrastructure area power station stack TBD ¹	TBD ¹	TBD ¹	TBD ^{1,2}	Carbon monoxide ⁶	11mg/m ³ (dry) @ 3% O ₂	
				Oxides of nitrogen ⁷ (expressed as NO ₂)	500mg/m ³ (dry) @ 3% O ₂	
				Total particulate matter ⁷	50mg/m ³	

¹ TBD and notified to the administering authority upon completion of the final design plan for the power station.

² Average velocity based on four (4) consecutive sampling events.

⁴ All determinations of point source emissions to air are to be taken from isokinetic sample results.

⁵ All determinations of point source emissions to air are to be corrected to Dry @ Standard Temperature & Pressure (273K, 101.3KPa).

⁶ Limits based on Schedule 1 of the *Environmental Protection (Air) Policy 2008*.

⁷ Limits based on Schedule 3 of the *Protection of the Environment Operations (Clean Air) Regulation 2010* (NSW).

(10) Except during engine start up, maintenance and engine shut down, the release of contaminants at the locations specified in Table A4: Release points must be:

- (a) directed vertically upwards with no impedance
- (b) released in accordance with the minimum velocity, gas temperature and release height stated in Table A4: Release points
- (c) released at a mass emission rate and concentration that does not exceed the limits stated in Table A4: Release points.

(11) The holder of this environmental authority must develop, implement and keep records of a stack emission monitoring program (SEMP) to monitor and record the release of contaminants from the release points and at the frequency identified in Table A4: Release points and ensure that emissions generated by the power station do not exceed the maximum contaminant concentrations identified in Table A4: Release points. A copy of the draft SEMP must be provided to the administering authority prior to its implementation and due consideration given to any comments made on the SEMP by the administering authority.

- (12) The SEMP must be developed and implemented upon commissioning of the Boyd and Norman Creek Infrastructure Area power stations and include, but not be limited to the following tests performed and recorded for each sample taken at the release points identified as the power station stacks specified in Table A4:
Release points:
- (a) monitoring provisions for the release points must comply with the most recent edition of Australian Standard AS4323.1 *Stationary source emissions method 1: Selection of sampling provisions*
 - (b) all determinations of contaminant releases to the atmosphere must be made in accordance with methods prescribed in the most recent version of the administering authorities *Air Quality Sampling Manual*. If monitoring requirements for specific contaminants are not described in the *Air Quality Sampling Manual*, monitoring protocols must be in accordance with a method as approved by New South Wales DEC/EPA, Victorian EPA or United States EPA
 - (c) the following tests must be performed for each sample taken at each release point specified in Table A4: Release points:
 - (i) gas velocity, volume and mass flow rate
 - (ii) temperature and oxygen content
 - (iii) water vapour concentration (for non continuous sampling).
 - (d) samples taken must be representative of the contaminants discharged when operating under maximum operating conditions; and
 - (e) during the sampling period the following additional information must be gathered:
 - (i) plants throughput rate at the time of sampling
 - (ii) fuel type and consumption rate
 - (iii) any factors that may influence odour and particulates emissions
 - (iv) the odour and particulates treatment system operating, system status and rate; and
 - (v) reference to actual test methods and accuracies.
- (13) When requested by the administering authority, the density of smoke released from a release point identified in Table A4: Release points must be monitored using the Ringelmann method to investigate any complaint of environmental nuisance at any sensitive place or commercial place. Smoke emissions from the licensed place are not considered to be environmental harm if monitoring shows the density of smoke from any release point serving a generator unit on the mining lease does not exceed Ringelmann 1 except for a two (2) minute period immediately after engine start-up, maintenance or engine shut down of the power station unit served by the release point.
- (14) The sulfur content of any fuel burned in the power station units identified in Table A4: Release points must not exceed 0.5 per cent by weight.
- (15) Any power generator must be designed, operated and maintained in accordance with the relevant Australian Standard.

Meteorological monitoring

- (16) Under circumstances where relevant wind, temperature and rainfall data cannot be provided to the holder of this environmental authority from the Weipa Meteorological Station operated by the Bureau of Meteorology, the holder must promptly deploy a portable automatic meteorological station to continuously measure and record wind speed and direction, temperature and rainfall data when and where these data measurements are required.
- (17) The portable automatic meteorological station referred to in Condition (16) must be installed in accordance with the latest edition of the Bureau of Meteorology—Observation Specification No. 2013.1—*Guidelines for the siting and exposure of meteorological instruments and observing facilities*.
- (18) The holder of this environmental authority must record, compile, evaluate and keep all monitoring records obtained from the portable automatic meteorological station.

Schedule 5. Land and rehabilitation

General

- (1) Contaminants that will or may cause environmental harm must not be directly or indirectly released to land except as permitted under this environmental authority.
- (2) Any spillage of wastes, contaminants or other materials must be promptly cleaned up. Such spillages must be cleaned up using methods that minimise the release of wastes, contaminants or materials to any stormwater drainage system, roadside gutter or waters.

Disturbance to land

- (3) When carrying out mining activities the holder of this environmental authority must:
 - (a) avoid, minimise or mitigate (in order of preference) any impacts on areas of sensitive vegetation or other areas of ecological value
 - (b) minimise the risk of injury, harm, or entrapment to wildlife and stock
 - (c) minimise disturbance to land that may otherwise result in land degradation
 - (d) ensure that for land that is to be significantly disturbed by mining activities the topsoil layer is removed and handled in a manner that will minimise degradation of its biological, chemical and physical properties and is used for rehabilitation purposes (in accordance with Appendix 3, Part B, Schedule 5, conditions (14) and (15))
 - (e) prior to carrying out any disturbance activities, make all relevant staff, contractors or agents carrying out those activities, aware of the location of any Category A, B or C Environmentally Sensitive Area (ESA) and the relevant requirements of this environmental authority;
 - (f) if significant disturbance to land is unavoidable, clear vegetation in a way which minimises fragmentation
 - (g) manage cleared vegetation so that it is stockpiled in a manner that facilitates salvage, respreading or burning and does not impede vehicle, stock or wildlife movements.

Note: This environmental authority does not authorise the taking of protected animals or the tampering with an animal breeding place that is being used by a protected animal to incubate or rear the animal's offspring.

- (4) The holder of this environmental authority may burn vegetation cleared in the course of carrying out extraction activities provided the activity does not cause environmental harm at any sensitive place or commercial place.
- (5) The holder of this environmental authority must ensure that, other than those activities covered in Condition (6), mining activities are not conducted:
 - (a) in or within 200 metres of any listed Category A, B or C ESA
 - (b) within 50 metres of any high bank of a watercourse with stream order 1 or 2
 - (c) within 100 metres of any high bank of a watercourse with stream order 3 or 4

- (d) within 200 metres of any high bank of a watercourse with stream order 5 and above
 - (e) within 100 metres of any natural wetland
 - (f) within 200 metres of any natural significant wetland.
- (6) Activities which are ancillary to extraction activities such as haul and access roads, conveyors, bridges, loading ramps, pumps and pipelines and exploration activities may encroach upon buffer areas provided that all reasonable measures are undertaken to minimise such disturbances and the activities are detailed in the plan of operations.

Land use management plan

- (7) The holder of this environmental authority must develop and implement a land use management plan (LUMP) for land within the ML6024 and ML7024 mining leases. The LUMP must be submitted to the administering authority prior to commencement of significant construction work. The LUMP must include:
- (a) plans and procedures for managing vegetation including buffer systems, pre-clearing surveys for any Category A, B or C ESAs and the presence of species classed as endangered, vulnerable, or near threatened under the *Nature Conservation Act 1992*
 - (b) plans and procedures for the preparation and burning of vegetation cleared in the course of carrying out mining activities
 - (c) plans and procedures for obtaining base line soils information covering the identification of soil units within areas to be disturbed by mining activities as nominated in the plan of operations at a scale of 1:100,000, in accordance with the *Guidelines for Surveying Soil and Land Resources*,²⁴ or *Australian soil and land survey field handbook*²⁵ or *The Australian soil classification*²⁶ or similar recent guidelines
 - (d) plans and procedures for managing acid sulfate soils so that when clearing in areas with acid sulfate soils (or potential acid sulphate soils), the holder of this environmental authority must develop and implement an acid sulfate soil environmental management plan prepared in accordance with the *State Planning Policy 2/02 Guideline: Planning and Managing Development Involving Acid Sulfate Soils* and the administering authority's *Queensland Acid Sulfate Soil Technical Manual* (Version 2.2, September 2004)²⁷ or more recent editions or supplements to these documents when these become available. The holder of this environmental authority must treat and manage acid sulfate soils in accordance with the latest edition of the administering authority's instructions for the treatment and management of acid sulfate soils

²⁴ McKenzie et al. 2008, *Guidelines for Surveying Soil and Land Resources*, 2nd edn, CSIRO Publishing, Collingwood, Victoria.

²⁵ National Committee on Soil and Terrain 2009, *Australian soil and land survey field handbook*, 3rd edn, CSIRO Publishing, Collingwood.

²⁶ Isbell & CSIRO 2002, *The Australian soil classification*, CSIRO Publishing, Collingwood, Victoria.

²⁷ Refer to www.derm.qld.gov.au/land/ass/products.html

- (e) plans and procedures for the carrying out of mining activities to prevent or minimise harm or the potential risk of causing harm to native fauna. The fauna management procedures must include training and awareness of staff and contractors, or access to appropriately qualified contractors trained in fauna handling, to ensure that any planned fauna handling is undertaken by a appropriately qualified person
- (f) plans and procedures for an effective pest management program that includes but is not limited to the following:
 - (i) identification of pest species and infestation areas
 - (ii) prevents and/or minimises the introduction and/or spread of pests
 - (iii) control and management of pest outbreaks as a result of mining activities.
- (8) Prior to conducting mining activities that involve significant disturbance to land, an assessment must be undertaken in accordance with the LUMP to determine the type and ecological value of any vegetation in such areas where the activity is proposed to take place.
- (9) The assessment required by Appendix 3, Part B, Schedule 5, Condition (8) must be undertaken by a appropriately qualified person and include the carrying out of field validation surveys, observations and mapping of any Category A, B or C ESAs and the presence of species classed as endangered, vulnerable or near threatened under the *Nature Conservation Act 1992*, in accordance with the LUMP.

Rehabilitation objectives

- (10) Land disturbed by mining activities as identified in Schedule 12, Plan 12.2—South of the Embley General Area Plan, must be rehabilitated in accordance with Table A5: Rehabilitation requirements and the objectives of the rehabilitation management plan required under Appendix 3, Part B, Schedule 5, Condition (16).

Table A5: Rehabilitation requirements

Mine domain	Mine feature name	Rehabilitation goal	Rehabilitation objectives	Indicators	Completion criteria
TBD ¹	TBD ¹	All land subject to mining activities must be rehabilitated to meet the requirements of the administering authorities Guideline - Rehabilitation requirements for Mining Projects and will be defined in the rehabilitation management plan	TBD ¹	TBD ¹	TBD ¹

¹ Post-mine land use, rehabilitation indicators and completion criteria are to be nominated in accordance with Condition 16.

- (11) Areas that are available for rehabilitation must be identified in the current plan of operations.
- (12) Rehabilitation must commence progressively as areas become available in accordance with the plan of operations.
- (13) Rehabilitation can be considered successful when:
 - (a) the site can be managed for its designated land-use (e.g. similar to that of surrounding undisturbed areas)
 - (b) no greater management input than for other land in the area being used for a similar purpose is required and there is evidence that the rehabilitation has been successful
 - (c) the rehabilitation is carried out in accordance with the goals, objectives, indicators and completion criteria as specified in Table A5: Rehabilitation requirements
 - (d) written agreement is obtained from the landowner/holder and administering authority.

Topsoil

- (14) Topsoil and subsoils must be stripped separately and replaced directly in an area awaiting rehabilitation or else be stockpiled and subsequently used in rehabilitation.
- (15) Topsoil must be managed in accordance with the rehabilitation management plan and stockpiled in a manner that ensures stability. Measures must include:
 - (a) vegetating topsoil stockpiled during the months 1 November to 1 May
 - (b) optimising the height and footprint of stockpiles
 - (c) re-using stockpiles as soon as possible.

Rehabilitation management plan

- (16) The holder of this environmental authority must develop and submit to the administering authority for approval, a rehabilitation management plan within three years of commencing mining that must include :
 - (a) schematic representation of final land form inclusive of drainage features
 - (b) slope and cover designs
 - (c) drainage design
 - (d) erosion controls proposed on reformed land
 - (e) revegetation methods inclusive of plant species selection, re-profiling, soil handling (including stockpiling), soil ameliorants/amendments, surface preparation and method of propagation
 - (f) materials balance including available topsoil and low permeability capping material
 - (g) geotechnical, geochemical and hydrological studies
 - (h) chemical, physical and biological properties of soil and water
 - (i) agreed post-mining land and/or infrastructure use with the landowner/holder and the administering authority

- (j) rehabilitation goal, rehabilitation objective, indicators and measurable completion criteria for each agreed post mining land use within each domain that enables determination of rehabilitation success
 - (k) description of experimental design for monitoring of reference and rehabilitated areas inclusive of statistical design
 - (l) a rehabilitation monitoring program based on a statistically sound, mutually agreed sampling design
 - (m) research program and associated milestones
 - (n) programs for maintenance of rehabilitation as required to achieve the nominated rehabilitation objective
- (17) An interim rehabilitation management plan must be prepared and submitted to DEHP for approval before 30 August 2013 and include rehabilitation goals, rehabilitation objectives, indicators and measurable completion criteria for each agreed post mining land use within each domain that enables determination of rehabilitation success. The plan must also address, as far as practicable, those other matters listed in Condition (16)
- (18) The holder of this environmental authority must review and update the interim rehabilitation management plan yearly thereafter until the final plan in Condition (16) is submitted and approved by DEHP.

Infrastructure

- (19) All infrastructure, mining equipment and plant erected and/or used for the mining activities must be removed from the licensed place prior to surrender except where agreed in writing by the administering authority and the landowner.

Post-closure management plan

- (20) A post-closure management plan for the site must be prepared at least eighteen (18) months prior to final ore processing on site and implemented for a nominal period of:
- (a) at least thirty (30) years following final ore processing on site, or
 - (b) a shorter period if the site is proven to be geo-technically and geo-chemically 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.
- (21) The post-closure management plan must include, where necessary, the following elements:
- (a) operation and maintenance of:
 - (i) wastewater collection, treatment and reticulation systems
 - (ii) the groundwater monitoring network
 - (iii) final cover systems
 - (iv) vegetative cover
 - (b) monitoring of:
 - (i) surface water quality
 - (ii) groundwater quality

- (iii) erosion rates
- (iv) the integrity and effectiveness of final cover systems
- (v) the health and resilience of vegetative cover.

Storage and handling of hazardous materials

- (22) All explosives, hazardous chemicals, corrosive substances, toxic substances, gases, dangerous goods, flammable and combustible liquids must be stored and handled in accordance with the relevant Australian Standard where such is available. Where no relevant Australian Standard exists, store such materials within an effective on-site containment system.
- (23) Notwithstanding the requirements of any Australian Standard, any hazardous materials stored on the licensed place that have the potential to cause environmental harm must 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:
 - (a) 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
 - (b) all chemical product drum storages must be bunded so that the capacity of the bund is sufficient to contain at least 100 per cent of the maximum design storage volume within the bund.
- (24) All containment systems for chemicals and flammable or combustible liquids must be designed to minimise rainfall collection within the system.
- (25) Minimise the potential for contamination of land and waters by diverting stormwater around contaminated areas and facilities used for the storage of explosives, hazardous chemicals, corrosive substances, toxic substances, gases, dangerous goods, flammable and combustible liquids.
- (26) Spillage of any contaminant must be contained and land remediated to prevent environmental harm.

Contaminated land

- (27) Prior to making an application for surrender or approval for progressive rehabilitation, the holder of this environmental authority must undertake a contaminated land assessment/investigation of the relevant areas of the licensed place in accordance with the administering authority's *Guideline for the Assessment & Management of Contaminated Land in Queensland*.

Bio-Remediation Pads

- (28) Soil and absorbent materials potentially contaminated with hydrocarbons must be treated on site in a designated bioremediation area. Treated material will not be used for any purpose unless contamination thresholds defined in Table A2: TPH thresholds in treated soils are achieved.

Table A2: TPH thresholds in treated soils

Recoverable Hydrocarbon Fraction	Maximum¹
C6-C9	100 mg/kg
C10-14	100 mg/kg
C15 and greater	1000 mg/kg

¹ Guidelines for Assessment of Contaminated Land in Qld. 1991.

Schedule 6. Regulated dams (including structures containing mineral waste)

General

- (1) The hazard category of all dams must be assessed by a suitably qualified and experienced person at least once every two (2) years, based on documented evidence sufficient to define or confirm the current nature and extent of environmental consequences for potential failure of that dam.
- (2) The holder of this environmental authority must not commence construction of any regulated dam (i.e. dams determined to be in the significant or high hazard category) unless the location, hydraulic performance, size and purpose of that dam are specifically referenced in accordance with this environmental authority in the form of tabulated details as identified in Appendix 3, Part B, Schedule 6, conditions (4), (5) and (20).
- (3) Water and tailings may be stored at the locations and within the parameters described in Table 6.1—Location of regulated dams and Table 6.2—Size and purpose of regulated dams. This condition does not exclude the storage of water or tailings that otherwise comply with other applicable conditions of this environmental authority.

Location of regulated dams

- (4) The construction and operation of regulated dams listed in Table A3: Location of regulated dams, must be located on the mining lease(s) within the polygonal area defined by the co-ordinates listed in Table A3: Location of regulated dams.

Table A3: Location of regulated dams

Name of regulated dams	Latitude (MGA 94)	Longitude (MGA 94)
Boyd Tailings Storage Facility	TBD ¹	TBD ¹
	TBD ¹	TBD ¹
	TBD ¹	TBD ¹
	TBD ¹	TBD ¹
Norman Creek Tailings Storage Facility	TBD ¹	TBD ¹
	TBD ¹	TBD ¹
	TBD ¹	TBD ¹
	TBD ¹	TBD ¹

¹ TBD and notified to the administering authority upon completion of final design.

- (5) The construction and operation of regulated dams must comply with Table A4: Size and purpose of regulated dams.

Table A4: Size and purpose of regulated dams

Regulated dam	Hazard Category	Maximum Surface Area (Ha)	Maximum Volume (m ³)	Maximum RL ¹ (m)	Purpose
Boyd Tailings Storage Facility	Significant	1100	240	55	Storage of tailings
Norman Creek Tailings Storage Facility	Significant	1100	260	80	

¹ RL represents a height above the Australian Height Datum (A.H.D.).

Regulated dams—certification and operation

- (6) Every regulated dam must be constructed in accordance with a certified design plan that has been submitted to the administering authority and developed so that the resulting dam will deliver the performance identified in the submitted design plan and is compliant with this environmental authority.
- (7) The holder of this environmental authority must not commence construction of a regulated dam unless:
 - (a) the holder has submitted to the administering authority two (2) electronic copies (including one (1) locked and one (1) working copy) of a design plan together with the certification of a suitably qualified and experienced person that the design of the regulated dam will deliver the performance stated in that submitted design plan and that dam is compliant with this environmental authority
 - (b) at least twenty (20) business days has passed since the receipt of those documents or the administering authority notifies the holder that a design plan and certification has been submitted for that dam.
- (8) A containment used for the storage of tailings from the processing of bauxite must be designed and operated to minimise impact on the environment, including any potential impact on people and the community.
- (9) When construction or modification of any regulated dam is complete and prior to commencing operation of that dam, the holder must submit to the administering authority two (2) electronic copies (including one (1) locked and one (1) working copy) of 'as constructed' drawings, together with the certification of a suitably qualified and experienced person that the dam 'as constructed' will deliver the performance stated in the submitted design plan and that the dam is compliant with this environmental authority.
- (10) An operational plan must be kept current for each regulated dam, and cover all matters relevant to its operation and maintenance so as to be consistent with conditions in this environmental authority.
- (11) Where an operational plan covers decommissioning and rehabilitation, those operations are to be consistent with the design plan for the regulated dam and the rehabilitation requirements of this environmental authority.
- (12) Any certified design plans for regulated dams on the mining lease(s) must be consistent with the erosion and sediment control plan.

Inspection of regulated dams

- (13) A suitably qualified and experienced person must inspect all regulated dams annually before 1 November each year and at any time when abnormal or otherwise unsatisfactory conditions are observed.
- (14) At each annual inspection, the condition and adequacy of each regulated dam must be assessed for dam safety and in terms of the necessary structural, geotechnical and hydraulic performance criteria.
- (15) At each annual inspection if a mandatory reporting level is required it must be determined and marked on each regulated dam.
- (16) A final assessment of the adequacy of available storage in each regulated dam must be based on a dam level observed within the month of October each year and result in an estimate of the level in that dam as at 1 November each year.
- (17) For each annual inspection, two (2) electronic copies (including one (1) locked and one (1) working copy) of a final report on the condition and adequacy of each regulated dam, certified by the suitably qualified and experienced person and including any recommended actions to be taken to ensure the integrity of each regulated dam, must be provided to the administering authority by 1 December each year.
- (18) The holder of this environmental authority must, upon receipt of the final annual inspection report, consider the report and its recommendations and within one month of receipt of the annual inspection report, formulate actions to ensure that each regulated dam safely performs to its intended functions. Taking into account the weather conditions at the time, the holder of this environmental authority must promptly implement the formulated actions where practicable.
- (19) All containment embankments within all regulated dams must be monitored for signs of embankment deterioration in accordance with the monitoring requirements of the design plan.

Hydraulic performance criteria

- (20) Regulated dams constructed on the mining lease(s) must comply with the hydraulic performance criteria shown in Table A5: Hydraulic performance criteria for regulated dams.

Table A5: Hydraulic performance criteria for regulated dams

Name of regulated dam	Design storage allowance (dams other than levees) AEP	Spillway capacity or diversion capacity (levees) AEP	Mandatory reporting level¹ (Dams other than levees) AEP²
Boyd Tailings Storage Facility	1 in 20 AEP, 2 month wet season plus other net inputs for the 2 month wet season, to be available on 1st November each year	1 in 1000 AEP	1 in 10 AEP, 72 hour duration rainfall event or wave allowance
Norman Creek Tailings Storage Facility	1 in 20 AEP, 2 month wet season plus other net inputs for the 2 month wet season, to be available on 1st November each year	1 in 1000 AEP	1 in 10 AEP, 72 hour duration rainfall event or wave allowance

¹ Refers to the level below the spillway crest, required to contain either the AEP (design risk) 72hr storm or the AEP (design risk) wave allowance, whichever is lower.

² AEP means the Annual Exceedence Probability, which is the probability that at least one event in excess of a particular magnitude will occur in any given year.

- (21) The spillway for any regulated dam constructed within the operational land must be designed and maintained to withstand the peak flow from the critical design storm in Table A5: Hydraulic performance criteria for regulated dams.
- (22) The holder of this environmental authority must notify the administering authority as soon as possible, but within twenty-four (24) hours, of the level in any regulated dam reaching the mandatory reporting level in Table A5: Hydraulic performance criteria for regulated dams; and must promptly act to prevent or minimise the risk of environmental harm.

Decommissioning of regulated dams—objective

- (23) Regulated dams must be dealt with in accordance with the conditions of this environmental authority and must not be abandoned.
- (24) On cessation of operation of any regulated dam that regulated dam must be maintained so as to avoid environmental harm until that regulated dam is decommissioned.
- (25) Prior to the cessation of mining activities, each regulated dam must be decommissioned such that it either:
 - (a) becomes a stable landform that safely confines flowable substances;
 - (b) is approved or authorised under relevant legislation for a beneficial use;
 - (c) is a void authorised by the administering authority to remain after decommissioning; or
 - (d) is compliant with the rehabilitation requirements of this environmental authority.

- (26) The holder of this environmental authority must, prior to surrender of the mining leases implement either:
- (a) a plan for de-commissioning the regulated dams such that, amongst other things, the regulated dams and their contents will be structurally stable and resistant to erosion and any seepage or other emissions will not cause environmental harm; or
 - (b) a site management plan for the continued operation and maintenance of the regulated dams.

Decommissioning of regulated dams—documentation and compliance

- (27) The design plan for a regulated structure must include a plan for the decommissioning and rehabilitation of the regulated structure at the end of its operational life.

Schedule 7. General and regulated waste management

General and regulated waste disposal

- (1) This schedule does not apply to the Evans Landing Landfill.
- (2) The following wastes may be disposed of on the mining lease at locations beyond the boundary of the Evans Landing Landfill in accordance with the requirements of this environmental authority:
 - (a) mine waste including green waste, waste bauxite and tailings
 - (b) sewage sludge in drying beds located at the Awonga Point Sewage Treatment Plant (STP), the Lorim Point STP, STP for the temporary camp in the area south of Embley River, Boyd Infrastructure Area STP and Norman Creek Infrastructure Area STP.
- (3) General and regulated waste generated in the mining activity can be temporarily stored on site awaiting removal provided it is stored to ensure there is minimal risk of causing fire or contamination to land or waters.

Waste management program

- (4) Within twelve (12) months from the date of issue of this environmental authority a waste management program in accordance with Part 5 of the Environmental Protection (Waste Management) Policy 2008 must be developed, implemented and maintained for all mining activities on the mining lease(s). The waste management program must include:
 - (a) a description of the mining activities that may generate waste
 - (b) the types and amounts of wastes generated by the mining activities
 - (c) a program for re-using, recycling or disposing of all wastes
 - (d) how the waste will be dealt with in accordance with the waste and resource management hierarchy, including a description of the types and amounts of waste that will be dealt with under each of the waste management practices in the waste and resource management hierarchy (i.e. avoidance, reuse, recycling, energy recovery, disposal)
 - (e) how the waste will be stored, handled and transferred in a proper and effective manner
 - (f) procedures for identifying and implementing opportunities to minimise the amount of waste generated, promote efficiency in the use of resources and improve the waste management practices employed
 - (g) procedures for dealing with accidents, spills, and other incidents that may impact on waste management
 - (h) details of any accredited management system employed, or planned to be employed, to deal with the waste
 - (i) how often the performance of the waste management practices will be assessed
 - (j) the indicators or other criteria on which the performance of the waste management practices will be assessed
 - (k) staff training and induction to the waste management program.

Regulated waste

- (5) Regulated waste, other than that authorised to be disposed of on site under this authority, must only be removed and transported from the site by a person who holds a current authority to transport such wastes to a facility that is lawfully able to accept the waste under the *Environmental Protection Act 1994*.
- (6) Each container of regulated waste stored awaiting movement off-site must be clearly marked to identify the contents.

Schedule 8. Noise

General

- (1) Noise from any mining activity must not cause environmental harm at any sensitive place or commercial place.
- (2) In the event of a complaint made to the administering authority (considered in the opinion of an authorised officer to be neither frivolous or vexatious) about noise generated in carrying out the licensed activity and the noise is considered by the administering authority to be an unreasonable noise, the holder of this environmental authority must take action to ensure that it is no longer an unreasonable noise.

Noise monitoring

- (3) Ensure that noise generated by the mining activities (excluding public roads, railway and port) does not cause the limits in Table A6: Noise limits to be exceeded.

Table A6: Noise limits

Noise Level dB(A) measured as:	Monday to Saturday			Sundays and Public Holidays		
	7am to 6pm	6pm to 10pm	10pm to 7am	9am to 6pm	6pm to 10pm	10pm to 9am
$L_{Aeq, adj, 1 \text{ hour}}$	45	45	43	45	45	43
$L_{A1, adj, 1 \text{ hour}}$	50	50	45	50	50	45

- (4) When requested by the administering authority, noise monitoring and recording must be undertaken within a timeframe nominated by the administering authority to investigate any complaint of environmental nuisance (considered in the opinion of an authorised officer to be neither frivolous or vexatious) at any sensitive place or commercial place and the results must be provided to the administering authority within fourteen (14) days following completion of monitoring.
- (5) Noise monitoring and recording must include the following descriptor characteristics and matters:
 - (a) L_{Aeq} , and L_{A1} (where N equals the statistical levels of 1, 10 and 90 and T = 60 mins)
 - (b) background noise L_{A90} ,
 - (c) the level and frequency of occurrence of impulsive or tonal noise and any adjustment and penalties to statistical levels
 - (d) atmospheric conditions including temperature, relative humidity and wind speed and directions
 - (e) effects due to any extraneous factors such as traffic noise
 - (f) location, date and time of monitoring
 - (g) if the complaint concerns low frequency noise, Max $L_{p_{LIN,T}}$

- (h) if the complaint concerns low frequency noise, one third octave band measurements in dB(LIN) for centre frequencies in the 10–200 Hz range.
- (6) The method of measurement and reporting of noise levels must comply with the most recent edition of the administering authority's *Noise Measurement Manual* or the most recent version of *AS1055 Acoustics – Description and measurement of environmental noise*.

Schedule 9. Water

General

- (1) Contaminants that will, or have the potential to cause environmental harm must not be released directly or indirectly to any waters except as permitted under the conditions of this environmental authority.
- (2) The maintenance and cleaning of vehicles and any other equipment or plant must be carried out in areas and in a manner which minimises the potential for environmental harm.
- (3) All determinations of water quality must be:
 - (a) made in accordance with methods prescribed in the latest edition of the administering authorities *Monitoring and Sampling Manual*
 - (b) carried out on representative samples.
- (4) 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 when requested:
 - (a) the date and time upon which the sample was taken
 - (b) the monitoring point at which the sample was taken
 - (c) the measured or estimated daily quantity of the contaminants released from the release points identified in Table A7: Release points (point source release)
 - (d) the release flow rate at the time of sampling for each release point identified in Table A7: Release points (point source release)
 - (e) the results of all monitoring and details of any exceedences with the conditions of this environmental authority
 - (f) water quality monitoring data provided electronically in the specified format.

Contaminant release to waters

- (5) The release of contaminants to waters from the licensed activity must only occur:
 - (a) at the release points specified in Table A7: Release points (point source release)
 - (b) from extraction areas specified in Table A8: Release from extraction areas.

Table A7: Release points (point source release)

Release point	Description of water released	Contaminant source	Description & nature of receiving waters	Release point Northing (MGA94)	Easting (MGA 94)
Tailings storage facilities					
Boyd TSF North Cell Spillway	Tailings decant water	Boyd TSF	Norman Creek Tributary	8568435	569675
Boyd TSF South Cell Spillway				8566395	569670
Boyd Tailings Recovery Slot			Unnamed Creek (Pera Head)	8567215	567050
Norman Creek TSF North Cell Spillway		Norman Creek TSF	Ward River Tributary	8556550	578960
Norman Creek TSF South Cell Spillway				8554340	579855
Norman Creek Tailings Recovery Slot				8554160	577090
Beneficiation plant/infrastructure areas					
Boyd Process Water Pond	Tailings decant water	Boyd TSF	Gulf of Carpentaria via unnamed drainage	8569850	568250
Boyd MIA Drainage Slot	Processing area drainage	Plant Infrastructure		8570680	568795
Boyd Northern Stockpile Sediment Pond	Stormwater runoff	Ore stockpiles	Gulf of Carpentaria via unnamed drainage	8571615	568855
Boyd Southern Stockpile Sediment Pond			Unnamed Creek (Pera Head)	8567960	566695
Shiploader Stockpile Sediment Pond			Gulf of Carpentaria via unnamed drainage	8570630	567925
Norman Creek Process Water Pond	Tailings decant water	Norman Creek TSF	Norman Creek Tributary	8557380	575460

Release point	Description of water released	Contaminant source	Description & nature of receiving waters	Release point Northing (MGA94)	Release point Easting (MGA 94)
Norman Creek MIA Drainage Slot	Processing area drainage	Plant Infrastructure		8557970	576210

Table A8: Release from extraction areas

Monitoring location	Description of water releases	Contaminant source	Description of receiving waters	Release point/monitoring location	
				Latitude (MGA94)	Latitude (MGA94)
Downstream Monitoring sites					
Defined in Plan of Operations in accordance with the REMP.	Release of contaminated stormwater via sediments dams	Extraction area	Streams, creeks, rivers and coastal environments in and adjacent to ML7024 and ML6024	TBD ¹	TBD ¹
Reference sites					
TBD ¹	TBD ¹	TBD ¹	TBD ¹	TBD ¹	TBD ¹

¹ TBD based on Receiving Environment Monitoring Program in accordance with Condition (15).

- (6) The release of contaminants to waters from the release points and extraction areas must be monitored at the monitoring locations listed in Table A7: Release points (point source release) and Table A8: Release from extraction areas and at a frequency specified below for each quality characteristic specified in Table A10: Receiving water trigger levels and contaminant limits. For any release, waters must be monitored if it is safe to do so:
 - (a) promptly and within twenty-four (24) hours of the commencement of release
 - (b) daily during release for seven (7) days
 - (c) weekly thereafter for one (1) month
 - (d) monthly for the remainder of the wet season.
- (7) The release of contaminants directly or indirectly to waters must not:
 - (a) produce any slick or other visible or odorous evidence of oil, grease or petrochemicals; nor
 - (b) contain visible floating oil or grease.
- (8) Releases to waters from the mining activities 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.

Receiving waters monitoring

- (9) Receiving waters must be monitored at the locations specified in Table A9:
 Receiving water reference and downstream monitoring locations at the frequency specified in Condition (6) for each quality characteristic stated in Table A10:
 Receiving water trigger levels and contaminant limits.

Table A9: Receiving water reference and downstream monitoring locations

Release point	Description of water released	Contaminant source	Description & nature of receiving waters	Reference monitoring location		Downstream monitoring location	
				Northing (MGA94)	Easting (MGA94)	Northing (MGA94)	Easting (MGA94)
Tailings storage facilities							
Boyd TSF North Cell Spillway	Tailings decant water	Boyd TSF	Norman Creek Tributary	TBD	TBD	TBD	TBD
Boyd TSF South Cell Spillway				TBD	TBD	TBD	TBD
Boyd Tailings Recovery Slot			Unnamed Creek (Pera Head)	TBD	TBD	TBD	TBD
Norman Creek TSF North Cell Spillway		Norman Creek TSF	Ward River Tributary	TBD	TBD	TBD	TBD
Norman Creek TSF South Cell Spillway				TBD	TBD	TBD	TBD
Norman Creek Tailings Recovery Slot				TBD	TBD	TBD	TBD
Beneficiation plant/infrastructure areas							
Boyd Process Water Pond	Tailings decant water	Boyd TSF	Gulf of Carpentaria via unnamed drainage	TBD	TBD	TBD	TBD
Boyd MIA Drainage Slot	Processing area drainage	Plant Infrastructure		TBD	TBD	TBD	TBD
Boyd Northern Stockpile Sediment Pond	Stormwater runoff	Ore stockpiles	Gulf of Carpentaria via unnamed drainage	TBD	TBD	TBD	TBD
Boyd Southern Stockpile Sediment Pond			Unnamed Creek (Pera Head)	TBD	TBD	TBD	TBD

Appendix 3: Stated conditions

South of the Embley project

Coordinator-General's report on the environmental impact statement

Release point	Description of water released	Contaminant source	Description & nature of receiving waters	Reference monitoring location		Downstream monitoring location	
				Northing (MGA94)	Easting (MGA94)	Northing (MGA94)	Easting (MGA94)
Shiploader Stockpile Sediment Pond			Gulf of Carpentaria via unnamed drainage	TBD	TBD	TBD	TBD
Norman Creek Process Water Pond	Tailings decant water	Norman Creek TSF	Norman Creek Tributary	TBD	TBD	TBD	TBD
Norman Creek MIA Drainage Slot	Processing area drainage	Plant Infrastructure		TBD	TBD	TBD	TBD
Extraction areas							
Defined in Plan of Operations	Release of contaminated stormwater via sediment dams	Extraction area	Streams, creeks, rivers and coastal environments in and adjacent to ML7024 and ML6024	TBD	TBD	TBD	TBD

¹ TBD – To be determined and agreed to by the administering authority within three (3) months from the date of issue of this environmental authority. Note; a single reference monitoring location may apply to more than one release point and may be located in another sub-catchment.

- (10) The release of contaminants to waters from point sources and extraction areas as defined in Table A7: Release points (point source release) and Table A8: Release from extraction areas must not exceed the contaminant limits stated in Table A10: Receiving water trigger levels and contaminant limits when measured at the downstream monitoring locations specified in Table A9: Receiving water reference and downstream monitoring locations and Table A8: Release from extraction areas for each quality characteristic.
- (11) If the quality characteristics of the receiving water monitored at the downstream monitoring locations defined in Table A9: Receiving water reference and downstream monitoring locations and Table A8: Release from extraction areas exceed any of the trigger levels specified in Table A10: Receiving water trigger levels and contaminant limits during a release event, the holder of this environmental authority must compare the results of the impacted site to the data from reference monitoring sites and:
- if the level of contaminants at the downstream monitoring location does not exceed the reference monitoring site data, then no action is to be taken; or
 - if the level of contaminants at the downstream monitoring location is greater than the reference monitoring site data, complete an investigation in accordance with the ANZECC & ARMCANZ (2000) methodology into the potential for environmental harm and provide a written report to the administering authority within three (3) months outlining:

- (i) details of the investigations carried out; and
- (ii) actions taken to prevent environmental harm.

Note: Where an exceedence of a trigger level has occurred and is being investigated in accordance with paragraph (b) of this condition, no further reporting is required for subsequent trigger events for that quality characteristic within the three month investigation period.

Table A10: Receiving water trigger levels and contaminant limits

Quality characteristic	Trigger levels (µg/L for toxicants)—freshwater	Trigger levels (µg/L for toxicants)—estuarine waters	Contaminant limit ^{11,14} (mg/L for toxicants)—freshwater	Contaminant limit ^{11,14} (mg/L for toxicants)—estuarine waters
South of Embley				
pH (pH unit)	4.6 ¹⁶ (minimum) 7.5 ¹⁶ (maximum)	5.7 ⁹ (minimum) 8.5 ¹⁷ (maximum)	5 th percentile ^{3,5,13} of reference value ^{7,12} (minimum) 95 th percentile ^{3,5,13} of reference value ^{7,12} (maximum)	5 th percentile ^{3,5,13} of reference value ^{7,12} (minimum) 95 th percentile ^{3,5,13} of reference value ^{7,12} (maximum)
EC (µS/cm)	140 ¹⁰	N/A	95 th percentile ^{3,5,13} of reference value ^{7,12}	N/A
Sulphate (SO ₄ ²⁻)	80 th percentile ^{1,2,3,5,13} of reference ⁴	N/A	95 th percentile ^{3,5,13} of reference value ^{7,12}	N/A
Turbidity (NTU)	80 th percentile ^{1,2,3,5,13} of reference ⁴ or 15 ¹⁸ , whichever is higher	80 th percentile ^{1,2,3,5,13} of reference ⁴ or 20 ¹⁸ , whichever is higher	95 th percentile ^{3,5,13} of reference value ^{7,12}	95 th percentile ^{5,13} of reference value ^{7,12}
Suspended Solids (Mg/L)	N/A	N/A	95 th percentile ^{5,13} of reference value ^{7,12,21}	95 th percentile ^{5,13} of reference value ^{7,12,21}
Aluminium	27 ¹⁸	80 th percentile ^{1,2,3,5,13} of reference ⁴	95 th percentile ^{3,5,13} of reference value ^{7,12} or 5 ⁶ , whichever is lower	95 th percentile ^{5,13} of reference value ^{7,12}
Copper	1.0 ¹⁸	0.3 ¹⁸	95 th percentile ^{3,5,13} of reference value ^{7,12} or 1 ⁶ , whichever is lower	95 th percentile ^{5,13} of reference value ^{7,12}
Iron	300 ¹⁹	80 th percentile ^{1,2,3,5,13} of reference ⁴	95 th percentile ^{3,5,13} of reference value ^{7,12}	95 th percentile ^{5,13} of reference value ^{7,12}
Lead	1.0 ¹⁸	2.2 ¹⁸	95 th percentile ^{3,5,13} of reference value ^{7,12} or 0.01 ⁸ , whichever is lower	95 th percentile ^{5,13} of reference value ^{7,12}

Quality characteristic	Trigger levels (µg/L for toxicants)—freshwater	Trigger levels (µg/L for toxicants)—estuarine waters	Contaminant limit ^{11,14} (mg/L for toxicants)—freshwater	Contaminant limit ^{11,14} (mg/L for toxicants)—estuarine waters
Zinc	2.4 ¹⁸	7 ¹⁸	95 th percentile ^{3,5,13} of reference value ^{7,12} or 3 ⁸ whichever is lower	95 th percentile ^{5,13} of reference value ^{7,12}
Total Nitrogen ²⁰ (µg/L)	240 ¹⁰	100 ¹⁷	95 th percentile ^{3,5,13} of reference value ^{7,12}	95 th percentile ^{3,5,13} of reference value ^{7,12}
Total Phosphorus ²⁰ (µg/L)	10 ¹⁹	15 ¹⁷	95 th percentile ^{3,5,13} of reference value ^{7,12}	95 th percentile ^{3,5,13} of reference value ^{7,12}
Ammonia ²⁰ (µg/L)	320 ¹⁸	500 ¹⁸	95 th percentile ^{3,5,13} of reference value ^{7,12}	95 th percentile ^{3,5,13} of reference value ^{7,12}

¹ An interim trigger value can be derived from ≥ 8 but ≤ 17 consecutive reference site samples, derived using DERM (2006) methodology (section 3.4.3.1).

² Trigger values are based on the 80th percentile of at least 10 and no more than 24 consecutive reference site samples, derived using the DERM (2006) methodology (Table D1, and section 3.4.3.1).

³ 5th, 80th and 95th percentiles are calculated using data from samples obtained between 1 November and 1 May.

⁴ Reference sites are to be determined in accordance with Condition 14.

⁵ 80th and 95th percentiles are calculated using ANZECC (2000) methodology (section 7.4.4.1).

⁶ Contaminant limit based on ANZECC (2000) stock water quality guidelines.

⁷ Limit levels based on reference data are to be based on 24 consecutive samples obtained at the time of a release (18 at a minimum).

⁸ Contaminant limit based on NHMRC Drinking Water Guidelines (2011)

⁹ 5th, 20th, 80th and 95th percentile based on South of Embley Project surface water (estuarine) quality monitoring results (RTA 2011)

¹⁰ Contaminant trigger based on Queensland Water Quality Guidelines (Table A.1 and G.4 – 80th percentile).

¹¹ Where 95th percentile of reference is exceeded and the reference site also exceeds the value during the same event, the value of the reference site during the same event applies.

¹³ TBD based on Receiving Environment Monitoring Program.

¹⁴ Contaminant limits for fresh and estuarine waters are to be developed as a recommendation on completion of the Receiving Environment Monitoring Program and a report to be submitted under Condition (16).

¹⁵ 5th, 20th, 80th and 95th percentile based on South of Embley Project surface water (freshwater) quality monitoring results (RTA 2011)

¹⁶ ANZECC 2000, default trigger value for tropical Australia for slightly disturbed ecosystems, lowland river

¹⁷ ANZECC 2000, default trigger value for tropical Australia for slightly disturbed ecosystems, estuaries and marine

¹⁸ ANZECC 2000, default trigger value for tropical Australia for high conservation/ecological value systems, upland and lowland rivers, and, estuarine and marine

¹⁹ ANZECC 2000 trigger value applying to typical slightly–moderately disturbed systems, freshwater

²⁰ Monitoring of this quality characteristic only applies to receiving waters monitoring point associated with a release from the Boyd MIA Drainage Slot and/or Norman Creek MIA Drainage Slot

²¹ 95th percentile to be determined within 12 months of the issuing of this Environmental Authority

Note: Trigger levels for metal/metalloids apply if dissolved results exceed trigger.

Stream flow monitoring

- (12) The holder of this environmental authority must develop and adopt a suitable methodology to determine and record stream flows at the locations upstream of each release point as specified in Table A7: Release points (point source release) for any receiving water into which a release occurs.

Water supply dam (South of Embley)

- (13) Groundwater abstracted from artesian bores located on ML7024 must not be directed to the Water Supply Dam (Dam C).
- (a) Water may be released from the release points specified in Table A11: Water supply dam release point.

Table A11: Water supply dam release point

Release Point (RP)	Northing (GDA94)	Easting (GDA94)	Release Point	Receiving Waters Description
1	8,563,000	574,800	Dam C valve	Freshwater tributary of Norman Creek

Receiving environment monitoring program

- (14) A receiving environment monitoring program (REMP) must be developed and implemented within 1 year of the commencement of this EA for the South of Embley Project area to monitor and record the effects of the release of contaminants on the receiving environment periodically and whilst contaminants are being discharged from the licensed place, with the aim of identifying and describing the extent of any adverse impacts on local environmental values and to monitor any changes in the receiving water. A copy of the REMP and any update or variation of the REMP following adoption of a new Plan of Operations must be provided to the administering authority prior to its implementation and due consideration given to any comments made on the REMP by the administering authority.

For the purposes of the REMP, the receiving environment is the waters and connected waterways downstream of any release associated with the following:

- (a) release points specified in Table A7: Release points (point source release)
- (b) extraction areas specified in Table A8: Release from extraction areas
- (15) The REMP must address (but not necessarily be limited to) the following:
- (a) description of potentially affected receiving surface waters including key communities and reference water quality and sediment characteristics based on accurate and reliable monitoring data that takes into consideration any temporal variation (e.g. seasonality);
- (b) description of applicable environmental values and water quality objectives to be achieved (i.e. as scheduled pursuant to the Environmental Protection (Water) Policy)
- (c) any relevant reports prepared by other governmental or professional research organisations that relate to the receiving environment to which the REMP applies
- (d) water and sediment quality targets within the receiving environment to be achieved and clarification of contaminant concentrations or levels indicating

adverse environmental impacts during the period upon which the REMP applies;

- (e) monitoring for any potential adverse environmental impacts caused by a release
- (f) monitoring of stream flow or alternative estimation method to gain an understanding of the hydrology of the receiving waters and the circumstances under which releases occur
- (g) monitoring of toxicants that must consider the indicators specified in Table A10: Receiving water trigger levels and contaminant limits to assess the extent of the compliance of concentrations with water quality objectives and/or the ANZECC & ARMCANZ (2000) Guidelines for slightly to moderately disturbed ecosystems
- (h) monitoring of physical and chemical parameters including as a minimum those specified in Table A10: Receiving water trigger levels and contaminant limits (in addition to dissolved oxygen saturation and temperature). The list of quality characteristics required to be monitored as per Table A10: Receiving water trigger levels and contaminant limits will be reviewed once the results of the monitoring data becomes available. If it is determined that there is no need to monitor for certain individual quality characteristics then these can be removed from Table A10: Receiving water trigger levels and contaminant limits
- (i) monitoring biological indicators (for macroinvertebrates in accordance with the administering authorities' monitoring and sampling manual (AusRivas Methodology) and metals/metalloids in sediments (in accordance with ANZECC & ARMCANZ (2000), BATLEY and/or the most recent version of AS5667.1 *Guidance on Sampling of Bottom Sediments*) for permanent, semi-permanent water holes and water storages
- (j) the locations of monitoring points (including the locations of reference/upstream and downstream potentially impacted sites for each release point). Reference sites must comply with the following criteria:
 - (i) be from the same bio-geographic and climatic region
 - (ii) have similar geology, soil types and topography
 - (iii) contain a range of habitats similar to those at the potentially impacted sites
 - (iv) have a similar flow regime
 - (v) not be so close to the potentially impacted sites that any disturbance at the potentially impacted sites also results in a change at the reference site
- (k) a frequency or scheduling of sampling and analysis that is sufficient to determine water quality objectives and to derive site specific reference values within two (2) years (depending on wet season flows) in accordance with the *Queensland Water Quality Guidelines*. For ephemeral streams, this should include periods of flow irrespective of mine or other discharges
- (l) specify sampling and analysis methods and quality assurance and control

- (m) any historical datasets to be relied upon
 - (n) description of the statistical basis on which conclusions are drawn
 - (o) any spatial and temporal controls to exclude potential confounding factors
 - (p) inclusion of additional monitoring points at least twelve (12) months prior to potential impact on the site as set out in the Plan of Operations.
- (16) A report outlining the findings of the REMP including all monitoring results and interpretations in accordance with Appendix 3, Part B, Schedule 69, Condition (14), must be prepared and submitted in writing to the administering authority within 2 years of the submission of the REMP under Appendix 3, Part B, Schedule 9, Condition (14) for the South of Embley Project area. This should include an assessment of reference water quality, any assimilative capacity for those contaminants monitored and the suitability of current discharge limits to protect downstream environment values and include recommendations to set appropriate contaminant limits for the purpose of Appendix 3, Part B Schedule 69, Condition (11).

On-site water storages

- (17) Water storages stated in Table A12: On-site water storage monitoring locations must be monitored for the water quality characteristics specified in Table A13: On-site water storage contaminant limits at the monitoring locations and at the monitoring frequency specified in Table A12: On-site water storage monitoring locations.

Table A12: On-site water storage monitoring locations

Water storage description	Latitude MGA (GDA 94)	Longitude MGA (GDA 94)	Monitoring location	Frequency of monitoring
Boyd Tailings Storage Facility	568445	8567370	Primary Decant Location ¹	Quarterly
Norman Creek Tailings Storage Facility	578320	8554910		

¹ Location is dependant on the volume of the individual storage and must consider stratification (i.e. depth profiles) and be appropriate for monitoring of in situ water quality characteristics.

- (18) In the event that waters storages defined in Table A12: On-site water storage monitoring locations exceed the contaminant limits defined in Table A13: On-site water storage contaminant limits, the holder of this environmental authority must implement measures to prevent access to waters by all livestock and minimise access by native fauna.

Table A13: On-site water storage contaminant limits

Parameter	Test value	Contaminant limit
pH (pH unit)	Range	Greater than 4, less than 9 ²
EC (µS/cm)	Maximum	5970 ¹
Sulphate (mg/L)	Maximum	1000 ¹
Aluminium (mg/L)	Maximum	5 ¹
Copper (mg/L)	Maximum	1 ¹
Lead (mg/L)	Maximum	0.1 ¹
Zinc (mg/L)	Maximum	20 ¹

¹ Contaminant limit based on ANZECC (2000) stock water quality guidelines.

² Page 4.2-15 of ANZECC (2000) 'Soil and animal health will not generally be affected by water with pH in the range of 4–9'.

Note: All metals and metalloids must be measured as total (unfiltered).

Groundwater

- (19) Groundwater level and water quality must be monitored if it is safe to do so at the locations and frequencies defined in Table A14: Groundwater monitoring locations, parameters and frequency (South of Embley).

Table A14: Groundwater monitoring locations, parameters and frequency (South of Embley)

Monitoring point	Northing (GDA94)	Easting (GDA94)	Parameter	Monitoring frequency
GM1 (Boyd MIA)	TBD ²	TBD ²	Surface RL ¹ (m) Total P, Total N, Ammonia pH, Electrical Conductivity, Aluminium, Copper, Iron, Lead, Zinc	Quarterly
GM2 (Boyd MIA)	TBD ²	TBD ²		
GM3 (Norman Creek MIA)	TBD ²	TBD ²		
GM4 (Norman Creek MIA)	TBD ²	TBD ²		
GM5 (Boyd TSF North)	TBD ²	TBD ²	Surface RL ¹ (m) pH, Electrical Conductivity, Aluminium, Copper, Iron, Lead, Zinc	Quarterly
GM6 (Boyd TSF East)	TBD ²	TBD ²		
GM7 (Boyd TSF South)	TBD ²	TBD ²		
GM8 (Boyd TSF West)	TBD ²	TBD ²		
GM9 (Norman Creek TSF North)	TBD ²	TBD ²		
GM10 (Norman Creek TSF East)	TBD ²	TBD ²		
GM11 (Norman Creek TSF South)	TBD ²	TBD ²		
GM12 (Norman Creek TSF West)	TBD ²	TBD ²		
GM13 (upgradient of mining areas)	TBD ²	TBD ²		

Monitoring point	Northing (GDA94)	Easting (GDA94)	Parameter	Monitoring frequency
GM14 (within mining areas)	TBD ²	TBD ²		
GM15 (downgradient of mining areas)	TBD ²	TBD ²		
GM16 (upgradient of mining areas)	TBD ²	TBD ²		
GM17 (within mining areas)	TBD ²	TBD ²		
GM18 (downgradient of mining areas)	TBD ²	TBD ²		
Bore 1	8,570,666	573,297		
Bore 3	8,572,656	576,494		
MB01	8,564,656	567,707		
MB02	8,563,676	570,084		
MB03	TBD ²	TBD ²		
MB04	8,566,660	572,490		
SOE10	TBD ²	TBD ²		
SOE10	TBD ²	TBD ²		

¹ RL must be measured to the nearest 5cm from the top of the bore casing.

² TBD and notified to the administering authority upon construction of the bore.

- (20) Groundwater monitoring bores must be constructed and operated in accordance with methods prescribed in the latest edition of the Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ) manual titled *Minimum Construction Requirements for Water Bores in Australia*.
- (21) Annual groundwater monitoring reports analysing groundwater chemistry and hydro-geological status of all groundwater bores and groundwater conditions must be prepared and submitted to the administering authority on request.
- (22) The Environmental Authority holder may request, as a part of the report prepared under Condition (21) that the Administering Authority reduce the frequency of monitoring or vary the water quality parameters monitored.

Stormwater, sediment and erosion controls

- (23) An erosion and sediment control plan must be developed by an appropriately qualified person within twelve (12) months of the date of issuing this environmental authority and revised where necessary and implemented for all stages of mining activities on the mining lease(s) to prevent or minimise erosion and the release of sediment to receiving waters and the contamination of storm water.
- (24) The erosion and sediment control plan must provide for at least the following stormwater management functions and be made available to the administering authority upon request:
 - (a) prevent or minimise the contamination of stormwater

- (b) diverting uncontaminated stormwater run-off around areas disturbed by mining activities or where contaminants or wastes are stored or handled
 - (c) contaminated stormwater runoff, incident rainfall and leachate is collected; and treated, reused, or released in accordance with the conditions of this environmental authority
 - (d) roofing where practicable or minimising the size of areas where contaminants or wastes are stored or handled
 - (e) using alternate materials and or processes (such as dry absorbents) to clean up spills that will minimise the generation of contaminated waters
 - (f) erosion and sediment control structures are placed to minimise erosion of disturbed areas and prevent the contamination of any waters
 - (g) procedures to ensure that erosion and sediment control structures are maintained and adequate storage is available in sediment dams in accordance with design criteria
 - (h) training of staff that will be responsible for maintenance and operations of erosion and sediment control structures.
- (25) Erosion protection and sediment control measures must be implemented and maintained to minimise erosion and the release of sediment and contamination of stormwater as described in the erosion and sediment control plan.
- (26) Any spillage of wastes, contaminants or other materials must be cleaned up as quickly as practicable to minimise the release of wastes, contaminants or materials to any stormwater drainage system or receiving waters.
- (27) Sediment dams identified in Table A7: Release points (point source release) must be designed and constructed with a minimum volume equivalent to a 1 in 10 year Annual Exceedence Probability (AEP) 24-hour storm event and must be maintained above the maximum sediment deposition levels.
- (28) Sediment dams constructed as part of erosion and sediment control measures that treat releases of water from extraction areas to surface waters or to a place that is reasonably expected to reach surface water are to be built at a minimum with a volume equivalent to a 1 in 10 year Annual Exceedence Probability (AEP) 24-hour storm event and must be maintained above the maximum sediment deposition levels.

Water management plan

- (29) A water management plan must be developed and implemented before within twelve (12) months of the date of this environmental authority that provides for the proper and effective management of the actual and potential environmental impacts resulting from the mining activity and to ensure compliance with the conditions of this environmental authority.
- (30) The water management plan must be developed in accordance with the latest version of the administering authority's *Guideline for Preparing a Water Management Plan* and must include at least the following components:
- (a) contaminant source study

- (b) site water balance and model
 - (c) water management system
 - (d) saline drainage prevention and management measures
 - (e) emergency and contingency planning
 - (f) monitoring and review.
- (31) Each year the holder of this environmental authority must undertake a review of the water management plan no later than 1 November to ensure that proper and effective measures, practices or procedures are in place to ensure that the mine is operated in accordance with the conditions of this environmental authority and that environmental harm is prevented or minimised.
- (32) A copy of the water management plan and/or a copy of the final review document of the Water Management Plan must be provided to the administering authority on request.

Schedule 10. Sewage treatment

Release to waters

- (1) Treated sewage effluent must only be directly released to receiving waters from the release points identified in Table A15: Release points.

Table A15: Release points

Description	Latitude (MGA 94)	Longitude (MGA 94)	Location
Boyd Infrastructure Area Sewage Treatment Plant	TBD ¹	TBD ¹	Boyd Mine Industrial Area Drainage Slot
Norman Creek Infrastructure Area Sewage Treatment Plant	TBD ¹	TBD ¹	Norman Creek Mine Industrial Area Drainage Slot

¹ TBD and notified to the administering authority before commissioning.

- (2) Treated sewage effluent released to surface waters must be monitored at the location identified in Table A16: Monitoring points and in accordance with the contaminant limits stated in Table A17: Contaminant release limits and the conditions of this environmental authority.

Table A16: Monitoring points

Description	Location
Boyd Infrastructure Area Sewage Treatment Plant	Boyd Mine Industrial Area Drainage Slot spillway
Norman Creek Infrastructure Area Sewage Treatment Plant	Norman Creek Mine Industrial Area Drainage Slot spillway

Table A17: Contaminant release limits

Quality characteristic	Unit	Release limit	Limit type	Frequency
5 day Biochemical oxygen demand (BOD)	mg/L	30 10 5	Maximum 50 th percentile short term 50 th percentile long term	Upon commencement of release and weekly thereafter during a release
Total Suspended Solids	mg/L	45 15 10	Maximum 50 th percentile short term 50 th percentile long term	
Total Residual Chlorine	mg/L	0.55	Maximum	
Dissolved Oxygen	mg/L	2	Minimum	
pH	pH units	6.0 - 8.5	Range	
Temperature	°C	<2% increase	Range	
Total Nitrogen	mg/L	10	Maximum	
Total Phosphorus	mg/L	5	Maximum	
Thermo-tolerant Coliforms	CFU/100ml	1000	Maximum	Upon commencement of release and fortnightly thereafter during a release
Oil & Grease	mg/L	10	Maximum	

- (3) The release of contaminants to waters must not:
- (a) produce any slick, discoloration of ambient waters or visible evidence of oil or grease
 - (b) contain visible floating oil, grease, scum, litter or other objectionable matter, or
 - (c) have any other properties nor contain any other contaminants in concentrations that may cause environmental harm.

Waste management (South of Embley)

- (4) Upon decommissioning, screenings, grit and sewage treatment plant sludge in drying beds located at the Boyd Infrastructure Area Sewage Treatment Plant and the Norman Creek Infrastructure Area Sewage Treatment Plant must be rehabilitated using a low permeability cap. The cap must conform to the following criteria:
- (a) consists of at least 300 mm of compacted material; and,
 - (b) to achieve a maximum permeability of 1×10^{-7} metres per second;

- (c) minimise infiltration of water into the waste and ponding of water on the surface of the site; and
- (d) is resistant to erosion by surface water flows.
- (5) Screenings, grit, sewage and wastewater treatment plant sludge's generated must be stored, managed and utilised so as not to cause environmental harm.
- (6) Sewage sludge generated on the mining lease(s) must be monitored at least annually to obtain the following information:
 - (a) the estimated annual quantity and nature of each sludge produced; and
 - (b) the current method(s) of pre-treatment or disposal.
- (7) Plant and equipment must be designed to allow for continued operation during flood events and inundation of the site.

Release to land

- (8) Sewage effluent (including treated sewage effluent released to land within the nominated irrigation areas) must only be released to land within areas identified in Table A18: Release points to land and Schedule 12, Plan 12.3—Treated effluent sewage release points to land (South of Embley) and in accordance with the contaminant limits stated in Table A19: Contaminant release limits to land (for sewage systems only) and the conditions of this environmental authority.

Table A18: Release points to land

Release point	Description of land releases	Contaminant source	Release point/monitoring location	
			Latitude (MGA94)	Longitude (MGA 94)
Sewage System ¹ – South of Embley				
Temporary Camp in SoE area	Treated Effluent - Irrigation Discharge to Irrigation Area	Package STP	570737	8571026

¹ Release points for septic and sewage systems with a total daily peak design capacity of >21 equivalent persons. Any systems below this threshold must be managed in accordance with Condition 9 & Condition 17 respectively.

Septic systems

- (9) Septic systems specified in Table A18: Release points to land must be designed, operated and maintained in accordance with the relevant Australian standard.

Irrigation of treated sewage effluent (South of Embley)

- (10) Treated effluent release to land through an irrigation system identified in Table A18: Release points to land must utilise a minimum area 1000 m² of land, excluding any necessary buffer zones, for the irrigation of treated sewage effluent.

Table A19: Contaminant release limits to land (South of Embley)

Contaminant	Unit	Release Limit	Limit Type	Frequency
5 day Biochemical oxygen demand (BOD) ¹	mg/L	20	Maximum	Weekly
Total Suspended Solids	mg/L	30	Maximum	
Nitrogen	mg/L	30 10 5	Maximum 50 th percentile short term 50 th percentile long term	
Phosphorus	mg/L	15 8 5	Maximum 50 th percentile short term 50 th percentile long term	
<i>E coli</i>	Organisms/100ml	10	Found in 95% of samples taken for 12 month period	
		200	Maximum	
Faecal Coliforms ¹	CFU/100ml	10	Found in 95% of samples taken for 12 month period	
		1000	Maximum	
pH	pH units	6.0 - 8.5	Range	

¹ Based on at least 5 but no more than 10 consecutive samples.

- (11) Monitoring of contaminant sources for sewage systems identified in Table A18: Release points to land must be undertaken and records kept of a monitoring program of contaminant releases to the irrigation area at the monitoring points, frequency and for the parameters specified in Table A19: Contaminant release limits to land.
- (12) The daily volume of effluent released to land must be determined or estimated by an appropriate method, for example a flow meter and records kept of the volumes of effluent released.
- (13) Any sewage system with a total daily peak design capacity of less than twenty-one (21) equivalent persons must be designed, operated and maintained in accordance with the relevant Australian Standard.

Schedule 11. Definitions/acronyms

Words and phrases used throughout this license are defined below except where identified in the EP Act or subordinate legislation. Where a word or term is not defined, the ordinary English meaning applies, and regard should be given to the Macquarie Dictionary.

Interpretation—Word definitions/acronyms

‘active waste disposal cell’ means a cell currently being used for the disposal of wastes accepted under a condition of this approval and includes all or part of a disposal cell.

‘administering authority’ means the Department of Environment & Resource Management or its successor.

‘AEP’ means the Annual Exceedence Probability, which is the probability that at least one event in excess of a particular magnitude will occur in any given year.

‘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 Environment Conservation Council

‘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.

‘ARMCANZ’ means Agriculture and Resource Management Council of Australia and New Zealand

‘assess’ by a suitably qualified and experienced person in relation to a hazard assessment of a dam, means that a statutory declaration has been made by that person and, when taken together with any attached or appended documents referenced in that declaration, all of the following aspects are addressed and are sufficient to allow an independent audit at any time:

- (f) exactly what has been assessed and the precise nature of that assessment;
- (g) the relevant legislative, regulatory and technical criteria on which the assessment has been based;
- (h) the relevant data and facts on which the assessment has been based, the source of that material, and the efforts made to obtain all relevant data and facts; and
- (i) the reasoning on which the assessment has been based using the relevant data and facts, and the relevant criteria.

‘background noise’ means the existing acoustic environment including both near and far noise sources under normal mining operations.

‘beneficial use’ in respect of dams means that the current or proposed owner of the land on which a dam stands, has found a use for that dam that is:

- (j) of benefit to that owner in that it adds real value to their business or to the general community,
- (k) in accordance with relevant provisions of the *Environmental Protection Act 1994*,
- (l) sustainable by virtue of written undertakings given by that owner to maintain that dam, and
- (m) the transfer and use have been approved or authorised under any relevant legislation.

‘animal breeding place’ means a bower, burrow, cave, hollow, nest or other thing that is commonly used by the animal to incubate or rear the animal’s offspring.

‘capping’ means the covering of a landfill with suitable material as outlined within this EA to inhibit penetration by liquids.

‘certification’, ‘certifying’ or ‘certified’ by a suitably qualified and experienced person in relation to a design plan or an annual report regarding dams, means that a statutory declaration has been made by that person and, when taken together with any attached or appended documents referenced in that declaration, all of the following aspects are addressed and are sufficient to allow an independent audit at any time:

- (n) exactly what is being certified and the precise nature of that certification.
- (o) the relevant legislative, regulatory and technical criteria on which the certification has been based;
- (p) the relevant data and facts on which the certification has been based, the source of that material, and the efforts made to obtain all relevant data and facts; and
- (q) the reasoning on which the certification has been based using the relevant data and facts, and the relevant criteria.

‘clinical waste’ means waste that has the potential to cause disease including, for example, the following:

- animal waste
- discarded sharps
- human tissue waste
- laboratory waste.

‘construction’ or ‘constructed’ in relation to a dam includes building a new dam and modifying or lifting an existing dam, but does not include investigations and testing necessary for purposes of preparing a design plan.

‘commercial place’ means a place used as an office or for business or commercial purposes, other than a place within the boundaries of the operational land.

‘completion criteria’ means the measures by which the actions implemented to rehabilitate the land are deemed to be complete. The completion criteria indicate the success of the decommissioning and rehabilitation outcomes or remediation of areas which have been significantly disturbed by the mining activities. Completion criteria may include information regarding:

- stability of final land forms in terms of settlement, erosion, weathering, pondage and drainage
- control of geochemical and contaminant transport processes
- quality of runoff waters and potential impact on receiving environment
- vegetation establishment, survival and succession
- vegetation productivity, sustained growth and structure development
- fauna colonisation and habitat development
- ecosystem processes such as soil development and nutrient cycling, and the re-colonisation of specific fauna groups such as collembola, mites and termites which are involved in these processes
- microbiological studies including recolonisation by mycorrhizal fungi, microbial biomass and respiration
- effects of various establishment treatments such as deep ripping, topsoil handling, seeding and fertiliser application on vegetation growth and development
- resilience of vegetation to disease, insect attack, drought and fire
- vegetation water use and effects on ground water levels and catchment yields.

‘commingled waste’ means waste that is mixed in such a way that it cannot be reasonably expected that the individual waste types can be segregated.

‘dam’ means a land-based structure or a void that is designed to contain, divert or control flowable substances, and includes any substances that are thereby contained, diverted or controlled by that land-based structure or void and associated works. However; a dam does *not* mean a fabricated or manufactured tank or container designed to a recognised standard, *nor* does a dam mean a land-based structure where that structure is designed to an Australian Standard. In case there is any doubt, a levee (dyke or bund) is a dam, but (for example) a bund designed for spill containment to AS1940 is *not* a dam.

‘dB’ means decibel. The unit used to measure sound level.

‘design plan’ is the documentation required to describe the physical dimensions of the dam, the materials and standards to be used for construction of the dam, and the criteria to be used for operating the dam. The documents must include all investigation and design reports, plans and specifications sufficient to hand to a contractor for construction, and planned decommissioning and rehabilitation outcomes; so as to address all hazard scenarios that will be identified by a properly conducted hazard assessment for the structure. Documentation must be such that a ‘suitable qualified and experience person’ could conduct an independent review without seeking further information from the designer.

‘design storage allowance’ or **‘DSA’** means an available volume, estimated in accordance with the Site Water Management Technical Guideline for Environmental

Management of Exploration and Mining in Queensland (DME 1995), that must be provided in a dam as at the first of November each year in order to prevent a discharge from that dam to a probability (AEP) specified in that guideline. The DSA is estimated based on 100% runoff of wet season rainfall at the relevant AEP, taking account of process inputs during that wet season, with no allowance for evaporation.

‘domain’ means a parcel of land for which the same rehabilitation goal, rehabilitation objective, indicators and measurable completion criteria for each agreed post mining land use can be defined

‘decommissioned’ means plant, infrastructure or equipment that has been removed or retired from active service

‘environmental authority’ means an environmental authority granted in relation to a mining activity under the *Environmental Protection Act 1994*.

‘environmentally sensitive areas’ means areas as described in the codes of compliance for tenures relating to mining and Chapter 5A (*Environmental Protection Regulation 2008*) activities, towns and roads.

‘equivalent passenger-tyre unit (EPU)’ is equivalent to one passenger tyre from a normal sedan or station wagon.

‘extraction areas’ include any areas of ML6024 and ML7024 disturbed by mining activities associated with the extraction of bauxite or that facilitate the extraction of bauxite including but not limited to pits, haul roads, access tracks, pipelines and conveyors.

‘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.

‘hazard’ in relation to a dam as defined, means the potential for environmental harm resulting from the collapse or failure of the dam to perform its primary purpose of containing, diverting or controlling flowable substances.

‘hazard category’ means a category, either low significant or high, into which a dam is assessed as a result of the application of tables and other criteria in the Site Water Management Technical Guideline for Environmental Management of Exploration and Mining in Queensland (DME 1995).

‘high bank’ of a watercourse is the level to which water rises during normal season peak flows and may include a flood plain area.

‘hydraulic performance’ means the capacity of a regulated dam to contain or safely pass flowable substances based on a probability (AEP) of performance failure specified for the relevant hazard category in the Site Water Management Technical Guideline for Environmental Management of Exploration and Mining in Queensland (DME 1995).

‘levee’, ‘dyke’ or ‘bund’ means a long embankment that is designed only to provide for the containment and diversion of stormwater or flood flows from a contributing catchment, or containment and diversion of flowable materials resulting from releases from other works, during the progress of those stormwater or flood flows or those

releases; and does not store any significant volume of water or flowable substances at any other times.

'L_{A90,T}' is the A-weighted sound pressure level exceeded 90% of the sample duration T.

'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 operations.

'large items of green waste' means oversize items of green waste that are incapable of being processed by a tub grinder.

'leachate' means a liquid that has passed through or emerged from, or is likely to have passed through or emerged from, a material stored, processed or disposed of at the operational land which contains soluble, suspended or miscible contaminants likely to have been derived from the said material.

'leaching contaminant levels' means the results of the 'Toxicity Characteristic Leaching Procedure (TCLP)' means the test described in 'U.S. EPA: Toxicity Characteristic Leaching Procedure (TCLP)' Federal Register, 40 CFR, Vol. 51, No. 286, Appendix 2, Part 268, page 40643 or as modified to reflect non-acidic leaching procedures suitable for waste characteristic assessment where co-disposal with putrescible wastes will not occur.

'long term 50th percentile' means that not more than twenty-six (26) of the measured values of the quality characteristic are to exceed the stated release limit for any fifty-two (52) consecutive samples where:

- the consecutive samples are taken over a one (1) year period;
- the consecutive samples are taken at approximately equal periods; and
- the time interval between the taking of each consecutive sample is not less than three (3) days or greater than eleven (11) days.

'mandatory reporting level' or 'MRL' means a warning and reporting level determined in accordance with the Site Water Management Technical Guideline for Environmental Management of Exploration and Mining in Queensland (DME 1995). An MRL is the lowest level required in a regulated dam to allow either of the following to be retained:

- (r) the runoff from a 72 hour duration storm at a relevant AEP (design risk),
or
- (s) a wave allowance at that AEP as estimated using a recognised engineering method.

‘measures’ includes any measures to prevent or minimise environmental impacts of the activity such as bunds, silt fences, diversion drains, capping, and containment systems.

‘mining activities’ means an activity in accordance with section 147 of the *Environmental Protection Act 1994*.

Note: Mining activities authorised on ML7024 and ML6024 under the *Mineral Resources Act 1989* are those authorised under the *Commonwealth Aluminium Corporation Pty Ltd Agreement Act 1957*.

‘mining related infrastructure’ The facilities, structures and installations needed for mining including but not limited to mining transportation networks, processing plant, communications systems and tailings storage facilities.

‘MIA’ means mine infrastructure area.

‘NATA’ means National Association of Testing Authorities.

‘natural flow’ means the flow of water through waters caused by nature.

‘noxious’ means harmful or injurious to health or physical well being, other than trivial harm.

‘non-polluting’ means having no adverse impacts upon the receiving environment.

‘offensive’ means causing reasonable offence or displeasure; is disagreeable to the sense; disgusting, nauseous or repulsive, other than trivial harm.

‘operational plan’ means a document that amongst other things sets out procedures and criteria to be used for operating a dam during a particular time period. The operational plan as defined herein may form part of a plan of operations or plan otherwise required in legislation.

‘permeability’ means a measure of the rate at which a fluid will pass through a medium. The coefficient of permeability of a given fluid is an expression of the rate of flow through unit area and thickness under unit differential pressure at a given temperature. Synonymous with hydraulic conductivity when the fluid is water.

‘progressive rehabilitation’ means rehabilitation (defined below) undertaken progressively OR a staged approach to rehabilitation as mining operations are ongoing.

‘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.

‘regulated dam’ means any dam in the significant or high hazard category as assessed using the Manual for Assessing Hazard Categories and Hydraulic Performance of Dams published by the administering authority.

‘rehabilitation’ the process of reshaping and revegetating land to restore it to a stable landform and in accordance with the completion 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.

‘Ringelmann method’ refers to a chart that provides shades of gray by which the density of columns of smoke rising from stacks may be compared.

‘self sustaining’ means an area of land which has been rehabilitated and has maintained the required completion criteria without human intervention for a period nominated by the administering authority.

‘sensitive place’ means:

- a dwelling, residential allotment, mobile home or caravan park, residential marina or other residential premises, or
- an educational institution, or
- a medical centre or hospital, or
- a protected area under the *Nature Conservation Act 1992*, the *Marine Parks Act 1992* or a World Heritage Area, or
- a public park or gardens, or
- a place used as a workplace, an office or for business or commercial purposes which is not part of the mining activity and does not include employees accommodation or public roads.

‘short term 50th percentile’ means not more than five (5) of the measured values of the quality characteristic are to exceed the stated release limit for any ten (10) consecutive samples for a release/monitoring point at any time during operation.

‘significant construction works’ are construction works to facilitate or support mining activities but does not include early site access works or activities to support exploration, site investigation or site establishment works where approvals are held.

‘significant wetlands’ are those designated under the Ramsar Convention as containing representative, rare or unique wetlands, or wetlands that are important for conserving biological diversity. They are listed on the List of Wetlands of International Importance because of their ecological, botanical, zoological, limnological or hydrological importance.

‘South of Embley’ means the area on ML7024 and ML6024 that lies south of the Embley River.

‘spillway’ means a weir, channel, conduit, tunnel, gate or other structure designed to permit discharges from the dam, normally under flood conditions or in anticipation of flood conditions.

‘stable’ in relation to land, means land form dimensions are and will remain within tolerable limits now and in the foreseeable future. Issues to be properly considered in regard to whether or not the landform is stable include geotechnical stability, settlement and consolidation allowances, bearing capacity (trafficability), erosion resistance and geochemical stability with respect to seepage, leachate and related contaminant generation.

‘stream order’ denotes a stream classification system where a watercourse is given a classification according to the number of additional tributaries associated with the watercourse.

‘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 1988*, OR registered as a National Professional Engineer (NPER) with the Institution of Engineers Australia, OR holds equivalent professional qualifications to the satisfaction of the administering authority for the Act; AND the administering authority for the Act is satisfied that person 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
- (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
- (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.

‘tolerable limits’ means a range of parameters regarded as being sufficient to meet the objective of protecting relevant environmental values. For example, a range of settlement for a tailings capping, rather than a single value, could still meet the objective of draining the cap quickly, preventing pondage and limiting infiltration and percolation.

‘town activities’ means the activities carried out by the holder of this environmental authority pursuant to the *Commonwealth Aluminium Corporation Pty Limited Agreement Act 1957* in connection with the operation of the township of Weipa.

‘TPH’ means total petroleum hydrocarbon.

‘μS/cm’ means micro Siemens per centimetre.

‘void’ means any constructed, open excavation in the ground.

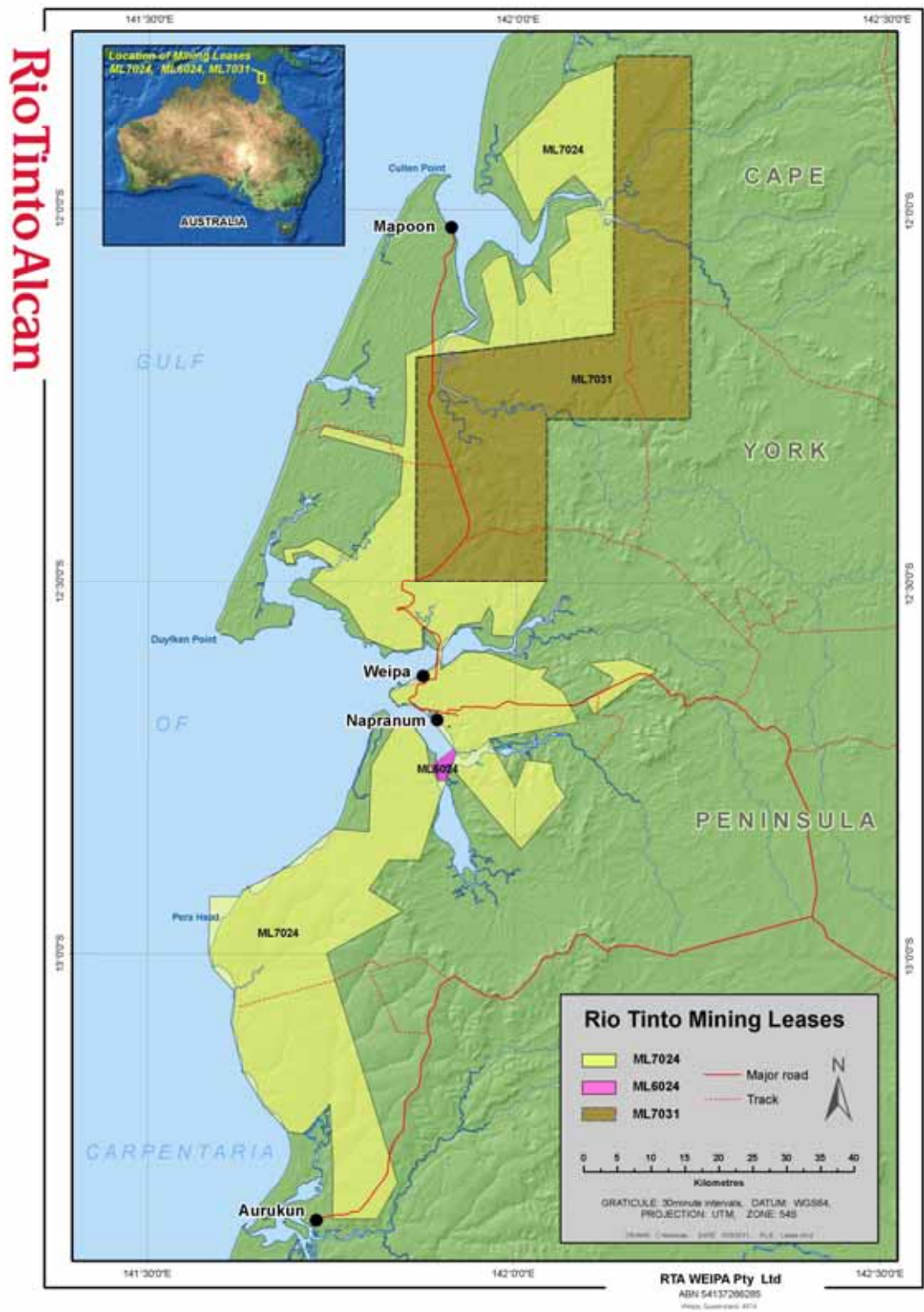
‘waters’ - includes all or any part of a river, stream, lake, lagoon, pond, swamp, wetland, unconfined surface water, unconfined water in natural or artificial watercourses, bed and banks of a watercourse, dams, non-tidal or tidal waters (including the sea), stormwater channel, stormwater drain, roadside gutter, stormwater run-off, and groundwater.

‘water release event’ means release of any waters that are or maybe contaminated by the mining activity.

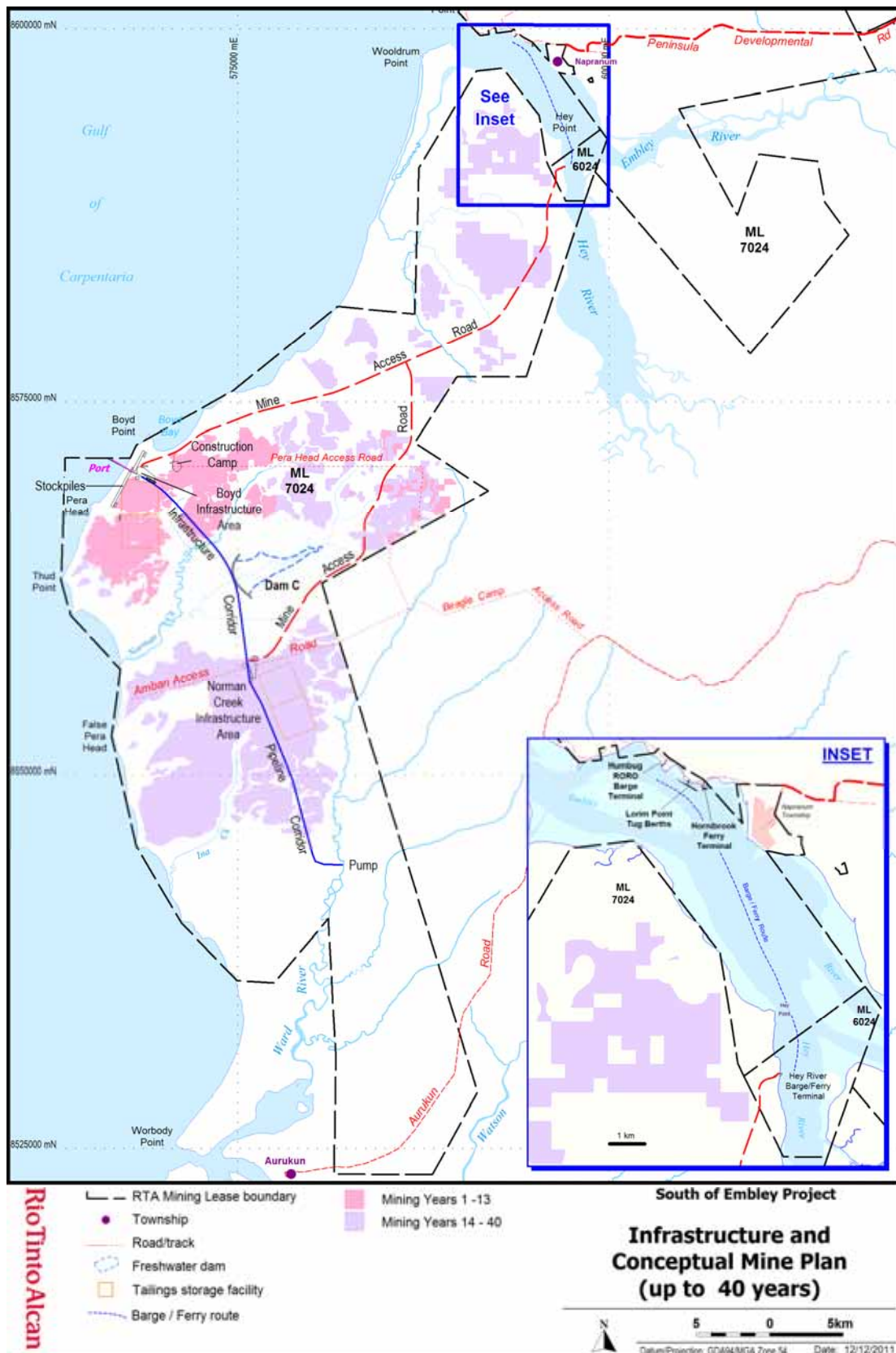
‘wetlands’ are areas of permanent or periodic/intermittent inundation, with water that is static or flowing fresh, brackish or salt, including areas of marine water, the depth of which at low tide does not exceed 6 metres. To be classified as a wetland, the area must have one or more of the following attributes:

- (a) at least periodically, the land supports plants or animals that are adapted to and dependent on living in wet conditions for at least part of their life cycle, or
- (b) the substratum is predominantly undrained soils that are saturated, flooded or ponded long enough to develop anaerobic conditions in the upper layers, or
- (c) the substratum is not soil and is saturated with water, or covered by water at some time.

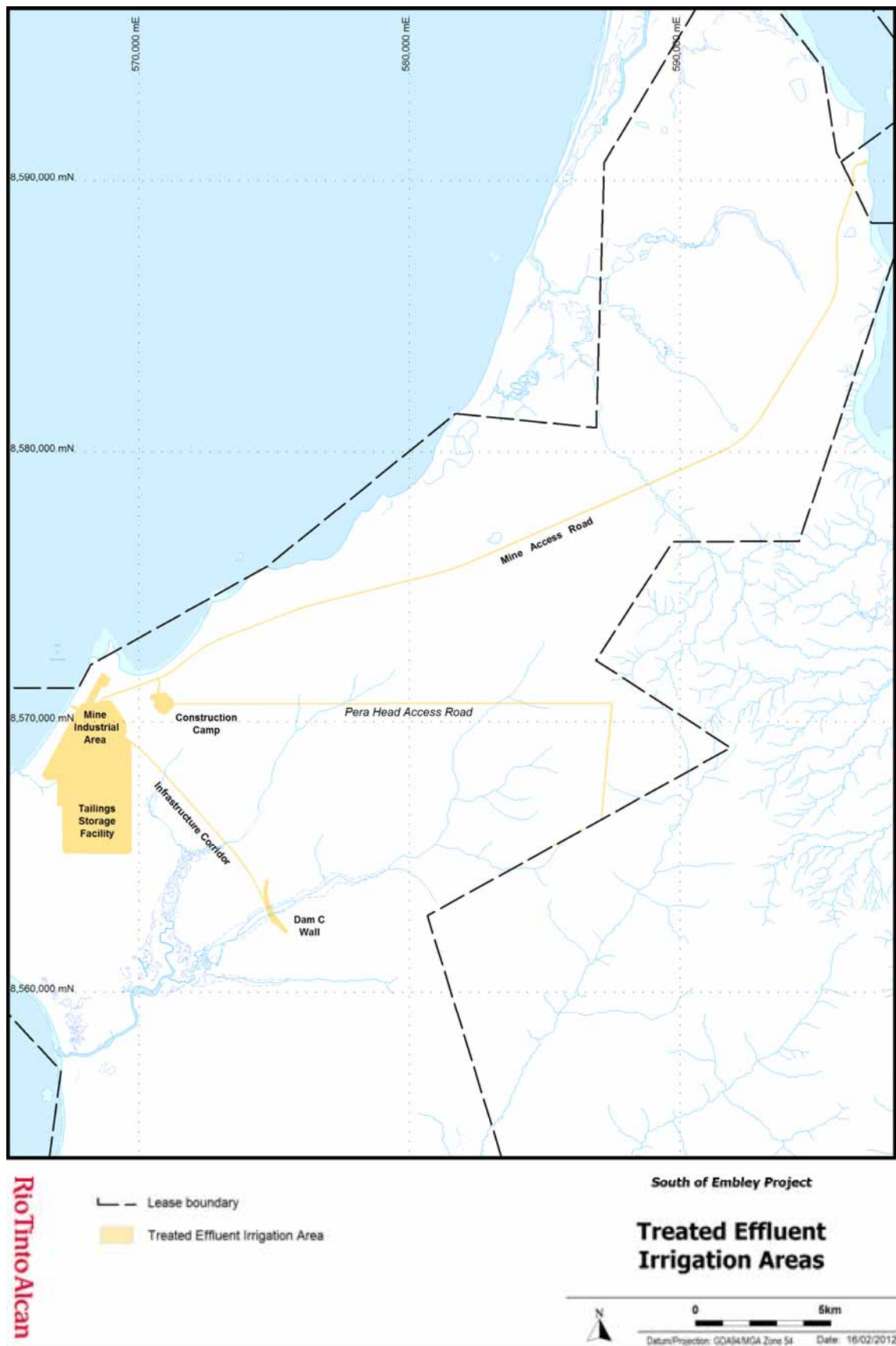
Schedule 12. Plans



Plan 12.1 – Weipa general area plan



Plan 12.2 – South of Embley Project infrastructure and conceptual mine plan



Plan 12.3 – Treated sewage effluent release points to land (South of Embley)

Appendix 4. Coordinator-General's recommendations

PART A. FOR OTHER SOUTH OF EMBLEY APPROVALS

This section includes recommendations, made under section 52 of the SDPWO Act. The recommendations relate to the applications for development approvals for the project.

While the recommendations guide the assessment managers²⁸ 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. However, the Coordinator-General requires that development approvals by the relevant assessment managers should not be unreasonably withheld.

Recommendation 1. Licence to interfere and take water under the *Water Act 2000*

It is recommended to DNRM that a licence be issued to RTAW to:

- (a) take surface water from Dam C of up to 32.0 GL/annum (peak) and 25.4 GL/annum (average) generally in accordance with projected water demands in the EIS at Table 5-14 Average Annual Water Supply
- (b) interfere with surface water up to 29 GL storage capacity for the dam at Dam C
- (c) take surface water from the Ward River of up to 2.67 GL/annum (peak) and 2.5 GL/annum average) generally as proposed in the EIS and summarised in Table 5-14 Average Annual Water Supply
- (d) take artesian water up to 15 GL/annum – to replace the existing licence to take artesian water.

Recommendation 2. Road transport

This recommendation is made to TMR for approvals under the *Transport Infrastructure Act 1994* (TI Act).

- (a) RTAW is to apply for and have approved, permits such as Road Corridor Permits for any works in State-controlled road reserves before commencement of significant traffic²⁹
- (b) RTAW must comply with the following requirements:
 - (i) any RTAW contractor for capital works on state-controlled roads must be selected in consultation with and accepted by TMR
 - (ii) RTAW must maintain and/or construct roadworks on state-controlled roads to TMR standards and intervention levels

²⁸ For a definition of 'assessment manager' refer to the Glossary on page 262 of this report.

²⁹ Significant traffic is more than an average of five movements a day, over a six day period, of vehicles exceeding 20 tonnes GVM, or a higher volume of traffic as identified by the proponent in an assessment and agreed by DTMR as not having a significant impact on the safety and condition of State-controlled roads.

- (iii) all traffic on the unsealed sections of the Peninsula Developmental Road (PDR) is subject to a travel permit system when road conditions deteriorate due to 'wet season' rainfall. Heavy haulage vehicles are not permitted to travel on the unsealed PDR during such periods. The period when traffic restrictions apply will be determined by TMR Cairns Regional Director or delegate
 - (iv) RTAW shall investigate the need to source additional water supplies required for necessary project road maintenance and procure additional water as identified
 - (v) any monitoring, maintenance and/or improvement measures for the PDR and Aurukun Road will be submitted to TMR's Far North Regional Office for approval prior to these activities occurring.
- (c) After first liaising with TMR, the proponent shall undertake the following work, prior to the commencement of significant traffic on State-controlled roads associated with construction of the project:
- (i) finalise the road impact assessment (RIA) based on the latest project traffic generation projections, to identify and mitigate the transport impacts on the safety and efficiency of state-controlled roads in accordance with *Guidelines for Assessment of Road impacts of Development (2006)*. It is recommended that consultation with the TMR occur during the preparation of this document
 - (ii) submit the finalised RIA to the TMR for review and approval
 - (iii) prepare a road-use management plan (RMP) for all use of state-controlled roads for each phase of the project in consultation with the regional office contact. The RMP must:
 - (A) detail road-use management strategies to minimise and manage project traffic impacts on the state-controlled road network, especially but not limited to heavy vehicle impacts during the construction and operations phases
 - (B) summarise latest traffic generation, finalised assessment of impacts on road safety and efficiency and other updated impact mitigation strategies such as any road maintenance or necessary improvements to ensure adequately safe access/egress to state-controlled roads from project-related sites including the Archer River quarry
 - (C) be approved by TMR prior to its implementation and prior to commencement of significant traffic.
- (d) RTAW must monitor road conditions in accordance with the RMP during periods of significant traffic.
- (e) RTAW must maintain the relevant sections of the PDR (expected to be approx. 96km, from Archer River quarry access to the Aurukun Road turnoff) and Aurukun Road which will be impacted by RTAW traffic during construction and

operations, in accordance with the RMP to the extent reasonably attributable to the SOE project.

- (f) RTAW must be responsible for all roadworks and maintenance to manage project traffic impacts during construction and operations required to ensure the PDR and Aurukun Road remains safe for all road users, to the extent reasonably attributable to the SOE project.
- (g) RTAW must consult with Aurukun Shire Council and Cook Shire Council in respect of local roads within each local authority area as relevant to develop and undertake suitable monitoring, road maintenance and improvements to current local government standards, to the extent reasonably attributable to the SOE project.

PART B. OTHER MATTERS

This section includes a listing of general recommendations made in the report that must be considered by State agencies and not be unreasonably rejected.

Recommendation 3. Commercial fisher compensation

It is recommended that:

- (a) the compensation model developed by DAFF (FQ) for commercial fishing impacts, provides a fair, reasonable, scientific and defensible basis for determining compensation
- (b) the DAFF (FQ) model compensation amount of \$242 000 be accepted
- (c) the Queensland Rural Adjustment Authority administer the compensation to impacted fishers and a buyout of an appropriate level of fishing effort.

Recommendation 4. Recreational fishing offset

It is recommended that:

- (a) in regard to impacts to charter boat operators and recreational fishers, RTAW establish a local recreational fishing reference group comprising representatives of charter boat operators and the Weipa Sportsfishing Club to be tasked with examining and recommending to RTAW a suitable community fisheries project for development
- (b) RTAW fund the project development to a level equivalent to that agreed for the commercial fishers at \$242 000
- (c) the community fisheries project be initiated within 6 months of receiving the recommendation from the reference group and be undertaken directly or indirectly by RTAW with all expenditures to be audited.

Recommendation 5. Complementary marine turtle offset plan

It is recommended to DEHP that in regard to cumulative impacts to marine turtle nesting on the Western Cape south of the Embley River, any approval of the Urquhart Point Mineral Sands Project, contain a condition complementary to that stated in this report at Appendix 3, Part B, Schedule 1, Condition 2, requiring the preparation of a

marine turtle offset plan and covering the foreshore area between Winda Winda Creek and Urquhart Point.

Recommendation 6. Artesian groundwater capacity

It is recommended to DNRM as the State agency administering the Water Act, that work be undertaken to determine the sustainable capacity of the Great Artesian Basin in the Cape York region to inform on any future development in the region including the Aurukun bauxite resource.

Recommendation 7. Local and Indigenous Sourcing

It is recommended that:

- (a) Throughout construction, RTAW should promote the contracting opportunities to the Aurukun, Mapoon and Napranum Shire Councils, as consistent with the revised stakeholder engagement strategy. Contracting opportunities should also be promoted in the operational phase.
- (b) RTAW should submit a finalised Local and Indigenous Sourcing Strategy upon completion, which has been developed in consultation with DSDIP.
- (c) RTAW should promote supply and contracting opportunities within the Local and Indigenous Sourcing Strategy as follows:
 - (i) include local industry, including Western Cape Communities Trust (WCCT), within its contracting and procurement strategies
 - (ii) strategies should flow down through second and third tier contractors (where appropriate)
 - (iii) where firms are competitive, provide favourable consideration to bidders who involve local Aboriginal people or local Aboriginal corporations in their bid
 - (iv) maximise use of local and regional suppliers where they are comparable or superior in terms of price, delivery time and quality
 - (v) undertake ongoing stakeholder engagement on local and Indigenous sourcing consistent with the revised stakeholder engagement strategy which includes key stakeholders such as the WCCT, Weipa Chamber of Commerce, Cairns Chamber of Commerce
 - (vi) in line with Rio Tinto procurement and Bechtel policies, establish local and Indigenous procurement processes and systems for the project.
- (d) RTAW should develop and implement a reporting framework during the construction phase that provides quarterly local content detail on:
 - (i) value of project spend in Australian dollars within Queensland
 - (ii) value of project spend in Australian dollars within greater Australia
 - (A) value of project spend in Australian dollars overseas
 - (B) SOE project employment data
 - (C) SOE project training and skills development programs

- (iii) communication of supply opportunities—number of events held and attendees, website view, supplier registrations, etc.

The reporting framework should provide a quarterly report to the Coordinator-General and a final report upon completion of the project.

Appendix 5. RTAW offset proposal

South of Embley Project Offset Proposal

This paper provides an outline of the offset proposal for the South of Embley Project. Proposals for each biodiversity feature of interest are discussed. Some proposals are subject to continuing discussions with the Commonwealth Department of Sustainability, Environment, Water, Population and Communities as an overall offset package for significant impacts on matters of national environmental significance.

Offset Proposal

1. Protected Plants

1.1. Cooktown Orchid (*Dendrobium bigibbum*) (Vulnerable) - Dam C footprint

Background

The Cooktown Orchid occurs within the proposed footprint of Dam C.

Proposal

Reference: Supplementary EIS, p. 105.

Carry out a pre-clearing survey in Dam C to identify individual orchids for relocation from the clearing area

Relocate orchids to 'SOE Offset Area' and supplement with 2.5 propagated plants for each plant removed (total of 3.5 plants replaced for each plant cleared).

1.2. Chocolate Tea Tree Orchid (*Dendrobium johannis*) (Vulnerable) - infrastructure corridor

Background

The Chocolate Tea Tree Orchid occurs within the project area and depending on the alignment of major roads could be disturbed at road crossings over Norman Creek and Winda Winda Creek.

Proposal

Reference: Supplementary EIS, p. 105.

Carry out a pre-clearing search for *Dendrobium johannis* where linear infrastructure crosses Norman Creek and Winda Winda Creek.

If any *Dendrobium johannis* plants are found the following actions will be carried out:

- o Report findings to DERM
- o Relocate orchids to 'SOE Offset Area' and supplement with 2.5 propagated plants for each plant removed (total of 3.5 plants replaced for each plant cleared).

2. Protected Animals

2.1. Riparian habitat for the Palm Cockatoo (*Probosciger aterrimus* (Near threatened))

Reference: EIS, Chapter 7, pp: 102-103 & 114; Supplementary EIS, p. 105.

Background

The Palm Cockatoo was recorded from several locations in the Project area comprising vine forest near Hey Point, riparian gallery forest along Norman Creek and Ward River, and Melaleuca swamp on the Ward River. The records from Norman Creek include two breeding pairs attending hollows in a relatively large area (7.2ha) of riparian gallery rainforest within the footprint of the proposed Dam C.

It is likely the species utilises most areas of vine forest (including coastal vine forest), riparian gallery forest and Melaleuca wetland within the Project area and adjacent Darwin Stringybark open forest. The species will traverse extensive areas of Darwin Stringybark open forest to access these preferred habitat areas.

The footprint of the proposed Dam C impoundment will impact number of riparian vegetation ecosystems including RE 3.3.5, RE 3.3.9 & RE 3.3.21 (total of 177.6ha).

The majority of preferred habitats will not be disturbed by the Project.

There is likely to be a short-term impact on the breeding success of some pairs of Palm Cockatoos during construction of Dam C. However, given the availability of other habitats likely to support suitable nesting trees, and the occurrence of foraging habitat elsewhere throughout the Project area, a long-term impact on the species is unlikely.

Offsets Proposal

RTA proposes a set of offsets that will meet the requirements of the *Queensland Biodiversity Offsets Policy* should it be applied, comprising:

2:1 ratio of riparian habitat comprising one or more of RE 3.3.5, RE 3.3.9, RE 3.3.21 (355.2ha)
Offset area(s) located on ML7024; and

Area(s) managed to protect and enhance environmental values by use of ecologically appropriate fire protection and feral animal controls
[Refer Supplementary EIS, pp.105-106 for further details]

2.2. Estuarine Crocodile (*Crocodylus porosus* (Vulnerable))

Reference: EIS, Chapter 7, pp: 93-96, 100 & 115-117; Supplementary EIS, p.105.

Background

The Estuarine Crocodile is widespread and numerous within the study area. Potential breeding habitat exists on Norman Creek, Ward River and Winda Winda Creek, though more abundant in the Ward River system.

Two nests have been located on Norman Creek (within the footprint of Dam C) and the Ward River.

Curtis et al (2012) list historic intensive hunting as the main cause for the population decline and lack of suitable nesting grounds as the reason for its slow recovery. They describe the Cape York nesting grounds south of 13°S as 'marginal' or 'poor'. It is noted that the Dam C embankment lies at 13°S.

The Estuarine Crocodile is quickly recovering in the Weipa Region under the current management regime

Offsets Proposal

RTA proposes a set of offsets that will meet the requirements of the *Queensland Biodiversity Offsets Policy* should it be applied, comprising:

2:1 ratio of riparian habitat comprising one or more of RE 3.3.5, RE 3.3.9, RE 3.3.21 (355.2ha)
Offset area(s) located on ML7024; and

Area(s) managed to protect and enhance environmental values by use of ecologically appropriate fire protection and feral animal controls
[Refer Supplementary EIS, pp.105-106 for further details]

2.3. Rufous Owl (*Ninox rufa meesi* (Near threatened)) - Dam C footprint

Reference: EIS, Chapter 7, pp: 102 & 116; Supplementary EIS, p.105.

Background

Rufous Owl habitat comprises major drainages in the Project area including riparian gallery forest, Melaleuca swamp forest and mangrove forest on Norman Creek and Coconut Creek – Ward River system, and possibly in minor drainage systems such as Ina Creek and the larger vine forest patches near the coast in proximity to mangrove areas such as Ina Creek dunal vine forest, and vine forest patches at Hey Point.

Apart from clearing for Dam C and stream crossings necessary to access the ore body, the wetland and riparian gallery forest habitat and the vine forest habitat will remain undisturbed by mining or infrastructure.

Darwin Stringybark open forest habitat represents only low suitability habitat.

The Rufous Owl population is very likely to be limited by the decline in populations of small and medium sized native mammals in the top end as a result of changed fire regimes

The footprint of the proposed Dam C impoundment will impact 177.6ha of potential Rufous Owl habitat including RE 3.3.5, RE 3.3.9 & RE 3.3.21.

Offset Proposal

RTA proposes a set of offsets that will meet the requirements of the *Queensland Biodiversity Offsets Policy*, should it be applied, comprising:

2:1 ratio of riparian habitat comprising one or more of RE 3.3.5, RE 3.3.9, RE 3.3.21 (355.2ha)

Offset area(s) located on ML7024; and

Area(s) managed to protect and enhance environmental values by use of ecologically appropriate fire protection and feral animal controls

[Refer Supplementary EIS, pp.105-106 for further details]

3. Wetlands

3.1. RE 3.3.9: *Lophostemon suaveolens* open forest — Dam C & Infrastructure footprints

Reference: Supplementary EIS, pp.104-105.

Background

The Project will disturb 55.3ha of RE3.3.9.

Offset Proposal

RTA proposes a set of offsets that will meet the requirements of the *Queensland Biodiversity Offsets Policy* and *Policy for Vegetation Management Offsets*, were they to be applied, comprising:

2:1 ratio of RE 3.3.9 (110.6ha); and

Offset area(s) located on ML7024; and

Area(s) managed to protect and enhance environmental values by use of ecologically appropriate fire protection and feral animal controls

[Refer Supplementary EIS, pp.105-106 for further details]

4. Watercourses

4.1. Watercourse - Dam C footprint

Reference: Supplementary EIS, pp.104-105.

Background

The Project will disturb 69ha of vegetation associated with stream order 2 watercourses in the Dam C footprint.

Offset Proposal

RTA proposes a set of offsets that will meet the requirements of the *Queensland Biodiversity Offsets Policy* and *Policy for Vegetation Management Offsets*, were they to be applied, comprising:

2:1 ratio of riparian vegetation comprising one or more of RE 3.3.5, RE 3.3.9, RE 3.3.21 (138ha)
Offset area(s) located on ML7024; and

Area(s) managed to protect and enhance environmental values by use of ecologically appropriate fire protection and feral animal controls

[Refer Supplementary EIS, pp.105-106 for further details]

5. Other Flora Species

5.1. *Spathoglottis plicata* (Orchidaceae) (Vulnerable)

5.2. *Lindsaea walkerae* (Lindsaeaceae) (Near Threatened)

5.3. *Sarcolobus vittatus* (Apocynaceae) (Vulnerable)

Reference: EIS, Chapter 7, pp: 33, 38 & 44.

Background

The Dam C area has been intensively surveyed by RTA's field ecologists and the chances of finding any of these endangered species in the Dam C footprint is considered remote. RTA have concluded that these species are absent from the Dam C disturbance area and will not be impacted by the development.

Potential habitat for these species is restricted to streams and swamps, riparian galleries, vine forests and mangrove communities.

Apart from the disturbance area in Dam C and creek crossings required to access the ore body, no other potential habitat for these threatened species will be disturbed by mining

Contingency

Since RTA has already committed to a relocation of protected orchids in the Dam C footprint, RTA proposes the following actions:

If any of these protected plants are found during the orchid surveys, the findings will be immediately reported to DERM and the plants will be translocated to the SOE Offsets Area.

5.4. *Heterachne baileyi* (Poaceae) (Near Threatened)

Reference: EIS, Chapter 7, pp: 43 & 60.

Background

Heterachne baileyi is known to occur on the lower slopes of the Weipa bauxite plateau and adjoining alluvial plains and probably colluvial plains. This habitat generally lies within the environmental buffer areas and hence outside of the mining footprint; consequently, *Heterachne baileyi* is unlikely to be directly affected by mining activity.

Although the Dam C area is considered potential habitat it has been intensively surveyed by RTA's field ecologists so the chances of finding *Heterachne baileyi* in the Dam C footprint is considered remote. RTA have concluded that this species is absent from the Dam C disturbance area and will not be impacted by the development.

Apart from the disturbance area in Dam C, no other potential habitat for these threatened species will be disturbed by mining

Contingency

Since RTA has already committed to a relocation of protected orchids in the Dam C footprint, RTA proposes the following actions:

If *Heterachne baileyi* is found during the orchid surveys, the findings will be immediately reported to DERM and the plants will be translocated to the SOE Offsets Area.

5.5. *Acacia ommatosperma* (Mimosaceae) - proposed mining area

Reference: EIS, Chapter 7, pp: 42 & 60.

Background

The only record of *Acacia ommatosperma* in the Weipa region is from a collection in *Eucalyptus tetradonta* open forest habitat, approximately 10km to the southeast of the Ely Project area in the vicinity of Andoom Creek north of Weipa. It has not been recorded anywhere else in the Weipa region despite substantial and repeated targeted survey effort over the past seven years.

Records for *Acacia ommatosperma* in the Cape York Peninsula bioregion indicate that this species favours ironstone outcrops within Darwin Stringybark (*Eucalyptus tetradonta*) open forest which corresponds to ironstone outcrops within vegetation unit 2b and colluvial/alluvial plains adjacent to the lower plateau. Potential habitats are most likely to occur on the eroding slopes on land systems further to the east and on the bauxite margins found in the environmental buffer areas. Ironstone ridges are generally excluded from mining areas as they do not yield commercial bauxite.

Conclusion

RTA considers it extremely unlikely that *Acacia ommatosperma* will be found in the mining area, since the recorded habitat for *Acacia ommatosperma* corresponds with ironstone ridges outside the commercial bauxite zone. This has been confirmed by substantial and repeated targeted survey effort over the past seven years. No offset actions are proposed for this species.

6. Other Fauna Species

6.1. Little Tern *Sternula albifrons* (Endangered)

6.2. Beach Stone Curlew *Esacus magnirostris* (Vulnerable)

6.3. Eastern Curlew *Numenius madagascariensis* (Near threatened)

Reference: EIS, Chapter 7, pp: 101-103 & 117; Supplementary EIS, p. 102 & Appendix 1, p. 6.

Background

These species are found on the intertidal zones or foredunes in coastal estuaries and foreshores. Apart from the narrow strip of land occupied by the jetty for the proposed port, the proposed operation will have no impact to the preferred habitat of these species. Since the beach area at the jetty for the proposed port is subject to tidal flooding, the small impacted area is unsuitable resting or breeding habitat for any of these species.

Conclusion

Given the absence of impact to the habitat occupied by these species, no specific actions are proposed for these species.

6.4. Black-necked Stork *Ephippiorhynchus asiaticus* (Near threatened)

6.5. Radjah Shelduck *Tadorna radjah* (Near threatened)

Reference: EIS, Chapter 7, pp: 101, 103 & 117

Background

These species are found on coastal wetlands and estuaries and/or in tidal areas or swamps with shallow pools. The proposed operation will not impact the habitats occupied by these species.

Conclusion

Given the absence of impact to the habitat occupied by these species, no specific actions are proposed for these species.

6.6. Red Goshawk *Erythrotriorchis radiatus* (Endangered)

Reference: EIS, Chapter 7, pp: 84, 86, 113, 117-118 & 120

Note: The Red Goshawk is subject to detailed discussions with the Commonwealth Department of Sustainability, Environment, Water, Population and Communities as an overall offset package for significant impacts on matters of national environmental significance. The Department of Environment and Resource Management and Department of Employment, Economic Development and Innovation will be kept informed of the progress of these negotiations.

Background

The Red Goshawk has been recorded in riparian gallery forest associated with the lower Wenlock River to the north of the Project area (Blandford and Associates 1994), and was also recorded in the open woodland of the Merluna Plain to the north-east of the Project area (Winter and Atherton 1985).

Recent sightings on Cape York come from central and eastern areas of the Cape.

The Red Goshawk is known to inhabit large home ranges of between 50 and 220km in Queensland, with foraging regularly taking birds up to 8km from established nesting sites (Marchant and Higgins 1993).

The open forests of the Project area and adjacent habitats constitute likely habitat for the Red Goshawk, although no sightings of the Red Goshawk were made during multiple surveys. The species could possibly utilise the study area at least occasionally as part of its extensive home range.

The area of the proposed mining area represents the area of approximately one home range (Debus, 2012) but consists mainly of the less productive plateau stringybark forest that is least likely to be used for foraging and breeding by the goshawk.

Revegetated mine areas with shrubs and trees attract high numbers of prey species after 5-10 years and are expected to be suitable foraging habitat for the Red Goshawk.

177.6ha of suitable riparian habitat for the Red Goshawk will be cleared for Dam C.

Proposal

Surveys for Red Goshawk nests will be undertaken in parts of the mining plan and water supply dams located within 1km of permanent water supporting riparian gallery forest or

paperbark wetland, seasonally inundated paperbark wetlands, seasonal watercourses supporting riparian gallery forest, or an estuary.

If any active Red Goshawk nests are found within mining areas, a 200m buffer around the nesting tree will be excised from the mining plan until the end of the breeding season. Surveys will be completed in the breeding season.

Establish an SOE Offset Area comprising:

- o 2:1 ratio of riparian habitat comprising one or more of RE 3.3.5, RE 3.3.9, RE 3.3.21 (355.2ha)
- o Offset area(s) located on ML7024; and
- o area(s) managed to protect and enhance environmental values by use of ecologically appropriate fire protection and feral animal controls

The disturbance of sensitive environmental areas by mining will be avoided by the development of an environmental buffer system. The buffer system will exceed the minimum requirements of the Queensland Government's *Regional Vegetation Management Code* as they relate to clearing set-back distances from watercourses and wetlands. (See EIS, Chapter 7, pp. 51-53.)

6.7. Square-tailed Kite *Lophoictinia isura* (Near threatened)

Reference: EIS, Chapter 7, pp: 101-102 & 114-115.

Background

The Square-tailed Kite has not been recorded in the Project area, but is considered likely to occur as it has previously been recorded in open forests and woodlands in the Weipa region (including post-mining revegetation areas).

The Square-tailed Kite is a specialised predator of the tree canopy preying on small birds, nestlings and insects. If present, it will utilise a habitat focussing on riparian and wetland areas where these prey resources are most abundant, although Darwin Stringybark open forest habitat is also likely to be utilised to a lesser extent.

With respect to foraging habitat, the Square-tailed Kite is a highly mobile species that will be able to access un-mined areas to compensate for any lost Darwin Stringybark open forest foraging habitat within the mine area, and rehabilitation areas will also reinstate foraging habitat to some extent.

Although the Square-tailed Kite may nest in Darwin Stringybark open forest, nesting is anticipated to occur in proximity to foraging habitats; thus, nesting deep within Darwin Stringybark open forest habitat is most unlikely.

Very little of the proposed mining area occurs in close proximity to the riparian and wetland complexes occurring on the mid to lower reaches of the main drainage systems.

Therefore, it is unlikely that the Square-tailed Kite will be adversely affected by mining area development.

177.6ha of suitable riparian habitat for the Square-tailed Kite will be cleared for Dam C.

Proposal

RTA proposes the following offsets and management actions to protect potential Square-tailed Kite habitat and Square-tailed Kite individuals if found:

Surveys for Square-tailed Kite nests will be included in the Red Goshawk pre-clearing nest surveys.

If any active Square-tailed Kite nests are found within mining areas, a 200m buffer around the nesting tree will be excised from the mining plan until the end of the breeding season.

Any active Square-tailed Kite nesting site identified within the mining path will be

monitored until the nesting cycle has been completed, after which clearing activities will resume.

Establish an SOE Offset Area comprising:

- o 2:1 ratio of riparian habitat comprising one or more of RE 3.3.5, RE 3.3.9, RE 3.3.21 (355.2ha)
- o Offset area(s) located on ML7024; and
- o area(s) managed to protect and enhance environmental values by use of ecologically appropriate fire protection and feral animal controls

The disturbance of sensitive environmental areas by mining will be avoided by the development of an environmental buffer system. The buffer system will exceed the minimum requirements of the Queensland Government's *Regional Vegetation Management Code* as they relate to clearing set-back distances from watercourses and wetlands. (See EIS, Chapter 7, pp. 51-53.)

6.8. Masked Owl *Tyto novaehollandiae kimberli* (Vulnerable)

Reference: EIS, Chapter 7, pp: 87,114-115 & 121.

Note: The Masked Owl is subject to detailed discussions with the Commonwealth Department of Sustainability, Environment, Water, Population and Communities as an overall offset package for significant impacts on matters of national environmental significance. The Department of Environment and Resource Management and Department of Employment, Economic Development and Innovation will be kept informed of the progress of these negotiations.

Background

The Masked Owl was not recorded during surveys within the Project area. General habitat preference of this species comprises riparian gallery forest, rainforest, mangroves and the periphery of Melaleuca swamp forest (Garnett and Crowley 2000).

There is strong evidence to suggest that the main threat to the Masked Owl is the decline in populations of small and medium sized native mammals, which are the Masked Owl's primary food source (Woinarski, 2004). *The Action Plan for Australian Birds 2010* (Garnett et al. 2010) indicates that shortage of food is the most probable cause of the Masked Owl's decline, possibly exacerbated by the intense, frequent and extensive fires which also reduce the availability of large trees and hollows required for nesting. Fitzsimons et al. (2010) and references therein support the scarcity of small ground mammals (Masked Owl prey) in the tropical woodlands.

177.6ha of suitable riparian habitat for the Masked Owl will be cleared for Dam C.

Proposal

Dusk stag-watching and call-playback surveys will be carried out for this species, coincident with the Red Goshawk pre-clearing nest surveys. Areas supporting large hollow trees in the productive (non-plateau) habitats will be targeted. Survey records and pertinent ecological will be documented.

If any active Masked Owl nests are found within mining areas, a 200m buffer around the nesting tree will be excised from the mining plan until the end of the breeding season. Any active Masked Owl nesting site identified within the mining path will be monitored until the nesting cycle has been completed, after which clearing activities will resume.

Establish an SOE Offset Area comprising:

- o 2:1 ratio of riparian habitat comprising one or more of RE 3.3.5, RE 3.3.9, RE 3.3.21 (355.2ha)
- o Offset area(s) located on ML7024; and

- o area(s) managed to protect and enhance environmental values by use of ecologically appropriate fire protection and feral animal controls

The disturbance of sensitive environmental areas by mining will be avoided by the development of an environmental buffer system. The buffer system will exceed the minimum requirements of the Queensland Government's Regional Vegetation Management Code as they relate to clearing set-back distances from watercourses and wetlands. (See EIS, Chapter 7, pp. 51-53.)

6.9. Chestnut Dunnart *Sminthopsis archeri* (Near threatened)

Reference: EIS, Chapter 7, pp: 102 & 114-115.

Background

The Chestnut Dunnart (*Sminthopsis archeri*) was previously recorded in low numbers in early surveys of the mining lease north of the Embley River (Winter & Atherton, 1985).

The species has not been found since 1985 even though a number of subsequent surveys have been carried out since. Previously the Chestnut Dunnart appeared to be sparsely and patchily distributed, potentially over a wide area of open forest and woodland throughout the bioregion, although this interpretation is based on only a few, isolated records (Winter & Alford, 1999), including the lower Archer River near Aurukun.

While little qualitative data exists, it is thought that changes in fire frequency and intensity over the past few decades may have been responsible for the Chestnut Dunnart's decline in the region.

Other Northern Australian studies provide evidence that changes in fire frequency and intensity are closely linked with the general decline in populations of small mammals (Fitzsimons et al., 2010).

While the Chestnut Dunnart was not found within the Project area, if present it will be likely to utilise Darwin Stringybark open forest, riparian gallery forest and alluvial/colluvial woodland, and vine forest.

Conclusion

RTA has concluded that the Chestnut Dunnart is most unlikely to be found in the Project area and no offsets are proposed for this species.

6.10. Bare-rumped Sheathtail Bat *Saccolaimus saccolaimus nudiclunatus* (Endangered)

Reference: EIS, Chapter 7, pp: 88, 114-115, 118 & 123-124. Supplementary EIS, Appendix 2, p. 13.

Note: The Bare-rumped Sheathtail Bat is subject of discussions with the Commonwealth Department of Sustainability, Environment, Water, Population and Communities as an overall offset package for significant impacts on matters of national environmental significance. The Department of Environment and Resource Management and Department of Employment, Economic Development and Innovation will be kept informed of the progress of these negotiations.

Background

This species' habitat is poorly known. Records of the species from Iron Range and Coen indicate that it may favour riparian forest and vine forest and adjacent woodland including Darwin Stringybark dominated habitats. The species was found roosting in Darwin Stringybark at Iron Range. Based on this information, large areas of the Project area may be suitable for

the species, especially in the vicinity of riparian gallery forest and vine forest patches, and potentially also deeper into the Darwin Stringybark woodland.

There are no current survey techniques that can reliably identify the presence of this species.

Anabat identification methods cannot distinguish the species and trapping is very difficult since it forages high in the forest canopy.

Proposal

Targeted pre-clearing surveys will be undertaken to determine the presence of the Bare-rumped Sheathtail Bat within the initial 2,500ha of forest planned for clearing. If active breeding places are present, disturbance of the breeding place shall not occur without authorisation under the *Nature Conservation (Wildlife Management) Regulation 2006*.

RTA will support a research to identify a call signature for the Bare-rumped Sheathtail Bat using an acoustic monitor with a wider frequency range than the Anabat

Survey methods will include:

- o Survey of key habitats using broad scale acoustic monitoring (utilising a wider frequency range than Anabat)
- o Searches for potential roost hollows using remote camera techniques
- o Use of elevated mist nets
- o If any Bare-rumped Sheathtail Bats are captured they will be fitted with radio transmitters and tracked to locate roost sites
- o Re-evaluation of survey data following development of a more reliable automated acoustic identification system

The status of the species in the Project areas shall be re-evaluated with DSEWPac and DERM following the completion of the survey/research programme.

6.11. Burrowing Snake *Antairoserpens warro* (Near threatened)

Reference: EIS, pp.7-104, & 7-115

Background

- *Antairoserpens warro* is a nocturnal burrowing snake known from three records in the Weipa region including two museum specimens from eucalypt open forest and woodland habitat (Cameron and Cogger, 1992) near Mapoon and just outside the Project area near Beagle Camp, and a third record from previously mined and regenerating woodland habitat at Weipa (demonstrating an ability to utilise revegetated areas).
- Despite trapping surveys and active searches for the species it was not located within the Project area. If present, it is anticipated that it will have a patchy distribution within moist zones in the deeper litter layers in Darwin Stringybark open forest and in upper tributary riparian areas within the Project area.

The species is limited by availability of scincid lizards and suitably friable soil composition for burrowing activity which is generally found in moist zones near drainage lines.

Proposal

RTA proposes the following management actions to protect *Antairoserpens warro* and its habitat:

The disturbance of sensitive environmental areas by mining will be avoided by the development of an environmental buffer system. The buffer system will exceed the minimum requirements of the Queensland Government's *Regional Vegetation Management Code* as they relate to clearing set-back distances from watercourses and wetlands. (See EIS, Chapter 7, pp. 51-53.) This represents the majority of the potential

Antairosepens warrofavours habitat since the species favours moist areas with deep litter layers to support its burrowing activity.

7. Consolidated Offset Proposal for Terrestrial Flora and Fauna

RTA proposes a set of offsets that will meet the requirements of the *Queensland Biodiversity Offsets Policy* and *Policy for Vegetation Management Offsets*, were they to be applied, comprising:

- 2:1 ratio of riparian habitat comprising one or more of RE 3.3.5, RE 3.3.9, RE 3.3.21 (355.2ha), of which 110.6ha must be RE3.3.9
- Translocate and/or propagate 3.5 plants of Cooktown Orchid and Chocolate Tea Tree Orchid (if found) for each plant found within the footprint of disturbance) and establish within the above offset area(s)
- Offset area(s) located on ML7024 (refer to Section 45, Part 2a, of the *Nature Conservation Act 1992* where gazettal of a protected area (including Nature Refuge) on a Mining Lease is permitted upon the lease owner's written consent) ; and
- area(s) managed to protect and enhance environmental values by use of ecologically appropriate fire protection and feral animal controls

The proposed offset area comprises undisturbed habitat in the general vicinity of the disturbed zones and is therefore considered to be ecologically equivalent. The *Queensland Biodiversity Offsets Policy* applies an offset ratio of 1:1 where the offset area is deemed ecologically equivalent to the disturbed zone. RTA has adopted an offset ratio of 2:1 even though the offset areas are considered ecologically equivalent.

RTA shall consult with DERM and Traditional Owners regarding the location of the proposed offset area(s) on ML7024 and the appropriate legal mechanism to secure the offset. ML7024 is located on State land. (Supplementary EIS, pp.105-106).

8. Marine Turtle Proposal

Reference: EIS, Chapter 6, pp: 167-172; Supplementary EIS, p.62.

Note: Marine turtles are the subject to detailed discussions with the Commonwealth Department of Sustainability, Environment, Water, Population and Communities as an overall offset package for significant impacts on matters of national environmental significance. The Department of Environment and Resource Management and Department of Employment, Economic Development and Innovation will be kept informed of the progress of these discussions.

Background

Western Cape York is known to support nesting populations of Olive Ridley (*Lepidochelys olivacea*) and Flatback (*Natator depressus*) turtles. Data from limited surveys on western Cape York indicate that peak nesting periods for these two species of marine turtles may be between July and November (GHD, 2010). Long term census studies for marine turtle species on western Cape York are required to confirm these times.

A single observation of a Hawksbill Turtle nest was recorded during surveys of the Project area. Predation has been identified as a key threat to marine turtles under the EPBC Act in the 'Recovery Plan for Marine Turtles in Australia' (Environment Australia, 2003) and Feral Pig

Threat Abatement Plan (2005). Doherty (2005) and Limpus and Chatto (2004) identify one of the greatest threats to marine turtle populations is the loss of eggs from predation by feral pigs on the west coast of Cape York. Doherty (2006) reported 70% of nests surveyed in 2003-2004, between Pennefather River and Duyfken Point, were destroyed by feral pig predation, with a 100% predation rate early in the nesting season.

Proposal

The South of Embley project proposes to establish an offsets program to reduce feral pig predation on marine turtle nests and hence increase hatchling survivorship. The Program has two components:

Marine Turtle Monitoring:

Monitoring Objectives:

- Determine the abundance of nests on specific sections of beach over specified time intervals for Olive Ridley and Flatback turtles (and other species if present);
- Identify the significance of sections of the beach to each species;
- Establish the level of predation on nests and determine level due to feral pigs.

Monitoring Methods:

- A baseline survey of 2 days each month (after spring high tides where high tides occur late in the evening (after 20:00 hours) designed to detect peak nesting patterns. In addition during the initial baseline year, two 14 day intensive surveys in July and October (during potentially the peak nesting periods);
- From year 2 onwards, annual monitoring over two 14 day periods during peak of the nesting season (between July and October, to be confirmed from initial baseline year data);
- The extent of beach to be monitored will include from Ina Creek in the south to the ML7024 boundary in the north (shown on Figure 1);
- Monitoring teams will include Traditional Owner representatives and will occur in daylight hours. Sections of beach where turtles could not physically nest will be excluded. The annual monitoring programme shall be reviewed each year may be amended based on earlier results.

Monitoring details to be recorded:

- o Total number of nests
- o Location of nests (GPS)
- o Species nested
- o Number of false crawls (mark all turtle tracks with GPS)
- o Number and location of disturbed nests
- o Record all hatched nests
- o Potential cause of disturbance.

1. Feral pig control:

Feral Pig Control Objectives:

- To reduce feral pig numbers along nesting beaches;
- To reduce the level of predation on turtle nests.

Pig Control Methods

An annual feral pig management programme will be implemented using aerial shooting (helicopter) in May, prior to the peak turtle nesting period (timing to be confirmed to be confirmed subject to results of initial baseline survey);

The feral pig control programme shall cover the coastal strip and riparian areas shown on Figure 1 and extend from the boundary of ML7024 in the south to Winda Winda Creek in the north;

The pig control program will commence after the Year 1 baseline Turtle Monitoring Program and continue to the extent necessary while RTA operates the SOE Port.

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Appendix 6. RTAW commitments

Rio Tinto Alcan

South of Embley Project

SUMMARY OF COMMITMENTS

April 2012

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SECTION 3 - LAND

- 3.1 In collaboration with Traditional Owners, RTA will develop a land access strategy to manage access for Traditional Owners to specific areas (including Hey Point, Boyd Bay, Pera Head, Amban, Norman Creek, Waterfall and Six Ti-Tree) in accordance with its obligations outlined within the Western Cape Communities Co-existence Agreement (WCCCA). This will be monitored on a regular basis in line with the mine plan, safety requirements and the needs of Traditional Owners of the Project area during construction, operational and non-active mining phases.
- 3.2 RTA will work with Traditional Owners and other relevant stakeholders to develop an effective permit system to protect significant cultural heritage sites and environmental values and allow controlled access for recreational purposes. The administration of such a system by Traditional Owners will be subject to discussions between Traditional Owners, RTA and other stakeholders.
- 3.3 The economic bauxite reserves from the Boyd tailings storage facility and the Norman Creek tailings storage facility will be mined or used in construction before tailings are deposited so as not to sterilise economic reserves.
- 3.4 The following proposed erosion and sediment control measures will be employed throughout the life of the Project:
 - Restrict clearing to areas essential for mining and associated facilities.
 - Vegetation clearing and topsoil stripping will occur following the wet season where possible.
 - Backfilled pits will be revegetated as soon as is practicable.
 - In the event that active or backfilled pits are not fully internally draining, storm water runoff will be directed via a sediment pond.
 - Disturbed areas around construction sites will be rehabilitated promptly.
 - Sediment traps will be included as part of the drainage designs at points where haul roads cross watercourses.
- 3.5 An erosion monitoring procedure will be developed and implemented for the Project which will include the beach and cliff in areas that have been disturbed by the Project.
- 3.6 RTA has commitments under the WCCCA to surrender parts of the mining lease after their rehabilitation. Such surrendering of parts of the mining lease will be undertaken where it is practical to do so, and will be subject to Government approvals.
- 3.7 Consultation regarding rehabilitation and post-mining land use will continue to be undertaken with the Traditional Owners and the relevant Western Cape Communities Coordinating Committee (WCCCC) sub-committee.
- 3.8 RTA will jointly develop a rehabilitation process with the Traditional Owners and relevant WCCCC Sub-committee prior to the commencement of mining. RTA will continue to report annually to the relevant WCCCC sub-committee on rehabilitation programs.
- 3.9 Nominated draft rehabilitation objectives, indicators and completion criteria will be developed further through stakeholder consultation, research, on-going monitoring, and site specific trials and included in a Rehabilitation Management Plan which will be submitted to DERM within 3 years of the commencement of mining.
- 3.10 The final landform will not have any out of pit dumps of excavated overburden or soil.

- 3.11 The tailings storage facility embankments and surface will be revegetated after decommissioning and minor earthworks are undertaken to install suitable water management features.
- 3.12 Rehabilitation will commence progressively as areas become available and in accordance with the Plan of Operations. The Plan of Operations will be provided to the relevant WCCCC Sub-committee in accordance with the WCCCA.
- 3.13 A detailed operational rehabilitation procedure, including a quality assurance process, will be developed and implemented. Procedures for topsoil stripping, stockpiling and placement activities, including a quality assurance process will be included in the site rehabilitation procedure.
- 3.14 Soil will be stripped and directly placed on mined out areas in readiness for regeneration, where possible, or otherwise stockpiled.
- 3.15 Any soil stockpiled for more than one year will be sown with a native local seed mix to control weeds and erosion.
- 3.16 Native species seed mixes will be tailored to the anticipated post-mining conditions of the area to be rehabilitated.
- 3.17 On-site revegetation trials will be undertaken to test selected species, seeding rates and establishment methodologies. RTA will also undertake a trial, to determine if use of some felled timber for fauna refuge in rehabilitation areas is feasible, including monitoring to determine increase of faunal recolonisation/utilisation.
- 3.18 Controlled burning of rehabilitation will be accompanied by a monitoring program in selected representative areas. This may include a pre- and post-burn vegetation survey, fuel load estimations and fire intensity calculations, and spatial data of burnt areas and degree of vegetation removal, including canopy scorch. The impacts of both controlled burning and wildfire on rehabilitation areas will be monitored.
- 3.19 A Final Rehabilitation Report, which includes a contaminated site assessment, will be prepared prior to surrender of the Mining Lease.
- 3.20 A contaminated site register will be maintained for the operation.
- 3.21 Any contaminated sites will be managed using methods developed on a case by case basis in accordance with DEHP guidelines.
- 3.22 On the completion of mining, subject to agreement with relevant regulators and Traditional Owners, the barge/ferry terminals, port, water storage dams and certain roads may be left in place. Otherwise, RTA shall remove these facilities.
- 3.23 RTA will jointly develop an initial mine closure plan with the Traditional Owners and relevant WCCCC Sub-committee prior to the commencement of mining and update this plan every five years.
- 3.24 RTA will provide Traditional Owners with the opportunity to purchase decommissioned construction camp accommodation once the construction phase is complete.

SECTION 4 – CLIMATE

- 4.1 The deck of the proposed port has been designed to withstand the 1:500 year ARI maximum breaking wave height. On-shore product stockpile pad levels will also be above this level.
- 4.2 The proposed Humbug barge terminal, Hornibrook ferry terminal, and Hey River barge/ferry terminal have fixed facilities designed to at least the Highest Astronomical Tide level. Floating pontoons and ramps have been designed to

move down to Lowest Astronomical Tide level and up to a level higher than the 1:100 year ARI level. The facilities will incorporate foreshore protection designed to withstand water levels in excess of the 1:200 year ARI level. Car parking access for the ferry terminals are above the 1:100 year ARI level.

- 4.3 RTA will adopt best practice safety design for major infrastructure to minimise impact caused by extreme events.
- 4.4 The RTA Cyclone Emergency Procedure will be updated as required for the Project area.
- 4.5 The floating pontoon on the temporary passenger jetty will be designed such it could be removed in the event of a cyclone warning.

SECTION 5 – WATER RESOURCES

- 5.1 Land-based infrastructure will be designed to appropriate criteria for storms (the current criteria are shown in tables below.)

Relevant Infrastructure	Flood Design Criteria (ARI)
Mine Infrastructure Areas	1:100yr
Mine Access Road	>300mm over top once in 10yr
Creek crossings for conveyor and for water pipelines	1:100yr
Water Storage Dam – spillway	1:2,000 yr

Tailings Storage Facility Design Criteria

Location	Design Storage Allowance	Spillway Critical Design Storm	Mandatory Reporting Level
Boyd Tailings Storage Facility	0.05 AEP, 2 month wet season plus other net inputs for the 2 month wet season, to be available on 1st November each year	0.001 AEP	72 hour 0.1 AEP
Norman Creek Tailings Storage Facility	0.05 AEP, 2 month wet season plus other net inputs for the 2 month wet season, to be available on 1st November each year	0.001 AEP	72 hour 0.1 AEP

AEP = Average Exceedance Probability

- 5.2 RTA will continue to extract water from the artesian aquifer in accordance with existing Water Act licence conditions. These include restricting drawdown at designated monitoring bores.

- 5.3 A network of shallow groundwater bores will be maintained. Water levels will be measured manually on a monthly basis (subject to site access).
- 5.4 Ongoing monitoring of geomorphic assessment sites in Norman Creek will be conducted.
- 5.5 Stream flow gauging stations will be used to monitor stream flows upstream and downstream of Dam C, as well as two Norman Creek sub-catchments (one to be mined and one non-mined).
- 5.6 Stormwater runoff from product stockpiles will be directed to sediment ponds sized to a volume equivalent to the runoff volume from a 1:10 ARI 24 hour rainfall event, plus 20% for sediment storage.
- 5.7 Water from the heavy and light vehicle wash bays in the infrastructure areas will be treated in oil water separators prior to recycling.
- 5.8 Treated effluent from the construction camp sewage treatment plant will be recycled in dust suppression and compaction during construction in the Boyd infrastructure area, the mine access road, the infrastructure corridor and Dam C as well as irrigation for gardens around the construction camp. Treated effluent from the Boyd and Norman Creek sewage treatment plants will be recycled as process water. The sludge drying beds will be covered and will therefore not release water to the environment.
- 5.9 Dam C spillways will be at a low gradient and be designed to facilitate fish passage during spillway flow events. RTAW will collaborate with Traditional Owners and DAFF (FQ) to ensure the most appropriate final fish passage design is selected for the circumstances.
- 5.10 Relevant aspects of the Engineering Guidelines for Queensland for Soil Erosion and Sediment Control will be followed.
- 5.11 Dam C water storage dam will be fitted with a low level outlet pipe which will permit the controlled release of environmental flows when required following cessation of spillway flows. Sufficient water will be reserved for environmental flows to enable continued release in the driest months (August to October) of up to 25% of dam inflows. The release pipe will be sized to enable peak discharge of up to 1,000L/s, if required. When dam inflows cease, environmental flow releases will cease. If environmental flow releases are required during the wet season, they will commence after the dams are full. These criteria will be subject to change based on operation experience and the results of monitoring.
- 5.12 The annual volume of water pumped from the Ward River will be capped at 1% of mean annual river flow at the pump station (2.67GL). In addition, no pumping will occur when Ward River flow is less than 1,000L/s and the rate of pumping at all times will be less than 20% of the river flow rate.
- 5.13 A surface water monitoring program is proposed to provide an early indicator of potential impacts. Locations will be monitored monthly until a statistical baseline is established (consistent with ANZECC requirements) and then quarterly thereafter. Project-specific trigger values will be developed for key water quality parameters.
- 5.14 Quarterly vertical salinity profiling of Norman Creek upper estuary is proposed to evaluate if the Project has had any impact on the fresh/salt water interface.

SECTION 6 – MARINE

- 6.1 All vessels owned and contracted by Rio Tinto will manage ballast water through a Ballast Water Management Plan which will comply with Australian mandatory requirements and the *International Convention for the Control and Management of Ships Ballast Water and Sediments*.
- 6.2 There will be no hull cleaning at the proposed port.
- 6.3 RTAW will undertake regular mussel trap monitoring in the vicinity of the new port when overseas ships are used.
- 6.4 RTAW will designate a safe passage underneath the proposed jetty for the Port for small recreational and charter boat users to prevent the need to travel around the Port, in accordance with Maritime Safety Queensland (MSQ) requirements.
- 6.5 Dredge Management Plan/s will be developed and implemented prior to commencement of respective capital or maintenance dredging activities.
- 6.6 No bulk fuel or chemicals will be unloaded at the proposed operating port facilities.
- 6.7 RTAW will work with Traditional Owners and the relevant WCCCC Sub-committee on design principles for port lighting. Monitoring, review and evaluation of port lighting will be included as part of the Community, Heritage and Environmental Management Plan (CHEMP) development.
- 6.8 RTAW will implement a lighting plan at the port to mitigate the potential effects of lighting on sea turtle hatchlings. RTAW will work with the DEHP through an adaptive approach to minimise the impacts of changes to the light regime during both the construction and operation phases of the proposed port on marine turtles, while still allowing a safe working environment. The following factors will be considered:
 - ensuring lighting is minimised overall to that which is essential for safe and efficient operation of the facility;
 - installation of timer switches or movement sensors where applicable;
 - shielding and/or recessing of lights to minimise light spill;
 - installation of long wavelength lights or other lighting demonstrated to have a low impact on the relevant turtle species; and
 - any other lighting options that further reduce impacts to marine turtles while allowing for the safe and efficient operation of the port facility ensuring lighting is minimised overall to that which is essential for safe and efficient operation of the port facility.
- 6.9 RTAW will work with DEHP to reduce threats to marine turtles in the Project area and assist with marine turtle research programs.
- 6.10 RTAW will document any injury or death of marine turtles (e.g. animals entangled in ghost nets), dugong or other threatened marine fauna and report these to DEHP for inclusion in the Wildlife Stranding database. Any injury or death that may be attributable to RTAW operations will be investigated to determine appropriate mitigation measures.
- 6.11 RTA will work with Traditional Owners on a program to reduce feral pigs in the Pera Head to Boyd Point area as well as areas used for nesting further north of Boyd Point and/or south of Pera Head and remove ghost nets from beaches adjacent to the port area.

- 6.12 A sea turtle monitoring program will be developed with consideration of turtle nesting activities (number, type, predation, success), behaviour (hatchling activity) and incident reporting.
- 6.13 RTA will monitor for scouring of the sea bed at the temporary barge access near Pera Head and will implement mitigation measures if required, this may include extending the concrete matting under where the barge will enter and leave the facility or conducting localised repair work.
- 6.14 The following factors will be considered for lighting at the temporary seaborne facilities:
- ensuring lighting is minimised overall to that which is essential for safe and efficient operation of the facility;
 - reducing lighting when there are no vessels at berth or being piloted in the area;
 - shielding and/or recessing lights to minimise light spill;
 - installing long wavelength lights or other lighting demonstrated to have a low impact on the relevant turtle species.
- 6.15 RTA will support the establishment of a local recreational fishing reference group to provide a forum to develop and help implement the establishment of a communities fisheries project (which may take the form of new or upgraded infrastructure or studies or management measure). The reference group will comprise representatives from charter operators and the Weipa Sportsfishing Club and will operate by consensus. RTAW shall provide funding and/or works up to the value of \$250,000 for the agreed fisheries project.

SECTION 7 – TERRESTRIAL FLORA AND FAUNA

- 7.1 The following vegetation types will be protected from mining by an environmental buffer system: riparian, wetland, estuarine, vine forest and coastal vegetation on sand. The buffer system will meet or exceed the minimum requirements of the the *Regional Vegetation Management Code for Western Bioregion (Version 2)* as it relates to clearing set-back distances from watercourses and wetlands.
- RTA will work with Traditional Owners and the relevant WCCCC Sub-committee on establishment of environmental buffers as part of the CHEMP.
- 7.2 Surveys will be carried out to define the boundaries of mapped sensitive vegetation types in the field prior to disturbance.
- 7.3 Authorisation for clearing will be managed through a ground disturbance approval system.
- 7.4 A vegetation monitoring program will be developed and implemented to assess mining impacts. The monitoring program will include monitoring sites in representative areas of sensitive vegetation units adjacent to and downstream of mining areas, as well as control sites away from mining and infrastructure areas. Monitoring will be undertaken periodically and specimens will be collected for herbarium identification if the plant cannot be identified.
- 7.5 A weed management program will be developed and implemented prior to commencement of construction, and will include weed surveys annually (post wet season) targeting operational areas and site access. The weed management

program will be developed in cooperation with Traditional Owners and the relevant WCCCC Sub-committee as part of the CEMP.

- 7.6 A fire management program will be developed in cooperation with Traditional Owners and the relevant WCCCC Sub-committee as part of the CEMP
- 7.7 Clearing of vegetation for mining and infrastructure will be restricted to the minimum required for the safe operation of mining equipment and infrastructure.
- 7.8 If constructed access road crossings of Winda Winda Creek and the southern branch of Norman Creek require culverts, the design will incorporate 'dry culvert' cells to maintain habitat continuity along the riparian corridor.
- 7.9 Surveys for Red Goshawk nests will be undertaken prior to undertaking significant disturbance to land located within 1km of permanent water supporting riparian gallery forest of Paperbark wetland, seasonally inundated Paperbark wetlands, seasonal water courses supporting riparian gallery forest, or an estuary. If any active Red Goshawk nests are found within these areas, a 200m buffer around the nesting tree will not be mined until the end of the breeding season.
- 7.10 The following mitigation measures will be implemented for the Bare-rumped Sheath-tail Bat:
 - An additional targeted bat survey, using broad spectrum acoustic monitoring, will be undertaken prior to the commencement of construction. This survey will primarily focus survey efforts in areas planned for initial infrastructure required prior to production (Boyd infrastructure area and TSF, stockpiles, Dam C and the infrastructure corridor between Boyd and Dam C, and the mine access road).
 - RTAW will support a research program being conducted by the Australian Bat Society within the Cape York Peninsula which will aim to acquire a quality reference call library for microbats of the region.
 - The reference calls acquired by the research program will be used to analyse the targeted survey results for the bare-rumped sheath-tail bat within the Project area and further define habitat preferences. Should the species be identified in the Project area through analysis of survey results, adaptive management will be implemented based on the habitats within which it is found. .
- 7.11 If a mature crocodile needs to be relocated due to safety concerns, RTAW will consult with DEHP on appropriate relocation method.
- 7.12 A flora and fauna survey will be undertaken for clearing associated with the upgrade of the Beagle Camp and Pera Head Access Roads prior to undertaking significant disturbance to land.
- 7.13 Stormwater drainage from the Hornibrook terminal car park will be directed away from the mangrove area wherever practicable and flood lighting of the car park will be oriented such that it does not directly illuminate the mangrove area. Some replacement mango trees will be incorporated into the final landscaping.

SECTION 8 – AQUATIC ECOLOGY

- 8.1 Aquatic ecology monitoring will include:

- Seasonal salinity regimes in upper Norman Creek estuarine reaches and their relationship to surface base flows, groundwater inflows and reach habitats (quarterly vertical salinity profiling and macrophyte community monitoring at upper estuary water quality sampling sites);
- Baseflow water quality in receiving reaches and their relationship to ambient dissolved oxygen levels, soluble aluminium, iron and manganese concentrations (at least quarterly water quality monitoring);
- Salt water/freshwater interface mapping will be undertaken downstream of Dam C. Mapping of representative vegetation ecotonal boundaries (e.g. sclerophyll, riparian/wetland/estuarine) from aerial photography to detect any long-term (decadal) shift, and surface water will be monitored for salinity; and
- Maintenance of aquatic faunal communities in receiving reaches and Dam C (fish and other aquatic fauna surveys on a 3-5 yearly frequency).

8.2 RTA will undertake additional surveys at the end of the 2012 wet season for the unidentified crab and Mysid species found in baseline surveys to investigate the geographical extent of these species.

SECTION 9 – AIR QUALITY

- 9.1 Conventional haul road watering will be undertaken.
- 9.2 Water sprays will be used at the chutes where trucks dump crude ore into the beneficiation plant. Water is used in the beneficiation to remove fine material from the bauxite.
- 9.3 Water sprays will also be used to clean the ship-loading conveyor belt which will reduce build-up of any fine material.
- 9.4 Energy use will be metered and an inventory of greenhouse gas emissions and sinks will be developed and maintained.
- 9.5 Regular energy audits will be conducted to identify inefficient equipment or operating procedures in order to assist with minimising greenhouse gas emissions.

SECTION 10 – NOISE AND VIBRATION

- 10.1 Baseline noise monitoring will be undertaken at Napranum prior to the commencement of construction. A noise monitoring campaign, including attended monitoring at Napranum, will also be conducted after operation commences to validate the noise model.
- 10.2 It is proposed that an exclusion zone be established and monitored by an observer around pile driving activities and that a 'soft start' approach be undertaken prior to normal pile driving. Normal pile driving will not be conducted while threatened marine fauna species are identified within the nominated exclusion zone. The extent of the exclusion zone will be defined based on further literature review and quantitative analysis of the potential underwater noise impacts from pile driving relating to threatened marine fauna. The final extent of the exclusion zone will be defined in consultation with DSEWPAC.

SECTION 11 – CULTURAL HERITAGE

- 11.1 Further management work will be undertaken in accordance with the WCCCA process to fully assess the impact of the proposed Project on Aboriginal cultural heritage and development mitigation strategies where required. This will include progressive detailed surveys of all areas identified for future development which have not already been surveyed.
- 11.2 RTA will work with Traditional Owners and the WCCCA SOE Sub-Committee to develop a CEMP. The CEMP shall be developed as a long term strategy for the management of land access, fire, flora and fauna, signage, feral animals, weeds, environmental buffer establishment and management, land and sea management, ballast water management, environmental monitoring and cultural heritage.
- 11.3 The CEMP will include protocols for managing culturally sensitive information and procedures to manage the accidental discovery of cultural heritage materials, including human remains, in the Project area. These procedures will be developed in consultation with the Traditional Owners through the relevant WCCCA Sub-Committee and will comply with relevant requirements of the *Aboriginal Cultural Heritage Act 2003*. The procedure will take into consideration the DNRM (2005) guidelines on *The Discovery, Handling, and Management of Human Remains*.
- 11.4 RTA is committed to ensuring no impacts from mining on story places and to consult with Traditional Owners regarding their management.
- 11.5 Impacts on scarred trees and stone artefact scatters will be mitigated in consultation with Traditional Owners.
- 11.6 The Hey River barge/ferry terminal will be positioned to avoid large shell mound complexes. If any shell material is uncovered during construction works mitigation measures will be developed through consultation with Traditional Owners and the relevant WCCCA Sub-committee.
- 11.7 RTA will take a proactive approach to the management of places of cultural significance and initiate discussions with the WCCCA and the Traditional Owners to establish separate heritage action plans for each location.
- 11.8 The dispute resolution process outlined in the WCCCA will apply if RTA, the Traditional Owners and the WCCCA representatives fail to negotiate a Site Protection Plan.
- 11.9 RTA will evaluate options to work collaboratively with WCCCA and Traditional Owners to develop a knowledge database of flora and fauna species of cultural significance in the region.
- 11.10 In the event that previously unidentified non-indigenous heritage sites are located within the Project area during the course of mining activity, an unanticipated discovery process will be implemented.

SECTION 12 – VISUAL AMENITY

- 12.1 Where possible, the port approach jetty, wharf and ship loaders will be painted in a colour that minimises visual impacts, while adhering to marine safety standards.
- 12.2 Lighting at the barge/ferry terminals will be designed to minimise nuisance lighting (e.g. shielding, low intensity sodium lighting).

SECTION 13 – WASTE MANAGEMENT

- 13.1 Waste streams will be assessed regularly for potential reuse and if a feasible reuse option is not available the waste will be transported to a licensed disposal facility by a licensed waste transporter.
- 13.2 RTA will consult with the relevant WCCCC Sub-committee about waste management strategies for the Project.
- 13.3 Wastes will be separated to allow for recovery where feasible, and will be stored appropriately to prevent pollution until they are transferred off-site.
- 13.4 The construction camp sewage treatment plant will be designed and operated to treat water to meet Class A Recycled Water quality. Treated effluent will be recycled on-site.
- 13.5 All vessels owned and contracted by Rio Tinto will manage ballast water through a Ballast Water Management Plan which will comply with mandatory requirements.

SECTION 14 – TRANSPORT

- 14.1 The PDR/Hornibrook ferry terminal intersection will be upgraded.
- 14.2 The Kerr Point Road/Humbug barge terminal intersection will be upgraded.
- 14.3 Materials will be brought in via the Aurukun Road only when the road is declared open by the Police and Department of Transport (i.e. not during wet season closures).
- 14.4 RTA will monitor the road condition and repair any damage to the PDR or Aurukun Road resulting directly from project-related haulage, but will not be responsible for general wear and tear from normal use. In consultation with the Manager of the TMR Far North Regional Office, RTA will prepare a road impact assessment (RIA) and a road use management plan (RMP). Any mitigation measures for the state-controlled road reserve of the PDR shall be submitted for approval by the TMR Far North Regional Office prior to construction. RTA will also consult with Aurukun Shire Council to develop a suitable monitoring approach.
- 14.5 The following management plans will be developed in accordance with the *Maritime Safety Queensland guidelines for major development proposals* (Sept 2010):
 - Aids to navigation management plan (ANMP);

- Ship-sourced pollution prevention management plan (SSPPMP);
- Vessel traffic management plan (VTMP); and
- Dynamic and static ships under keel clearance management plan.

The plans will be developed in consultation with the relevant authorities including Maritime Safety Queensland (MSQ) and the Regional Harbour Master (RHM) prior to construction commencing.

- 14.6 RTA will provide the locations and arrangements for safe mooring of construction craft and dredging plant prior to construction commencing. Marine aspects of the Emergency Management Plan will be developed for the Project in consultation with MSQ and include mooring arrangements and procedures to mitigate risks during cyclones during construction.
- 14.7 Port operational rules will be developed for the proposed Port in consultation with MSQ. This document will incorporate the results of ship simulations, minimum and maximum size ships, fendering and mooring arrangements, operational aspects of lines handling and details of tug capacity and capability, and appropriate response to severe weather.
- 14.8 RTA will consult with MSQ to determine how pilotage services can be provided to meet demands associated with the proposed facility.

SECTION 15 – CONSULTATION

RTA will continue to implement a comprehensive stakeholder engagement schedule that includes regular points of engagement through different mechanisms to ensure accessibility of information to a wide audience. The detail of ongoing consultation and associated commitments can be found in the Social Impact Management Plan (SIMP).

SECTION 16 – SOCIAL IMPACT ASSESSMENT

In order to demonstrate ongoing mitigation of the identified social impacts, RTA has developed a Social Impact Management Plan (SIMP). The SIMP summarises key commitments and details the ongoing RTA stakeholder engagement initiatives, issue-specific Action Plans to address the issues of most significance to stakeholders, and clear reporting and governance structures to provide transparent monitoring of mitigation measures.

SECTION 17 – ECONOMICS

- 17.1 RTA's current obligations under WCCCA related to the Weipa operations will also apply to the Project, these commitments include:
- proactively consider tenders which involve local Indigenous people and/or local Indigenous enterprises;
 - work collaboratively with key regional stakeholders, including the WCCT, Western Cape Chamber of Commerce and the RPA Steering Committee to identify and support the ongoing development of Indigenous and non-Indigenous businesses;

- examine applicable contracts for local and Indigenous business opportunities, including the breakdown of larger contracts to smaller jobs to increase the potential opportunities for awarding contracts to local providers of goods and services;
 - provide updates to the WCCT on the status of Indigenous business spending across the RTA Weipa operations in line with RTA's existing reporting requirements for employment and training;
 - in collaboration with key local and regional stakeholders, RTA will identify opportunities to support the implementation of a range of business development programs and support services;
 - initiatives targeting pre-work development, employment and training for local Indigenous people;
 - continuation of partnership with the Western Cape College to provide supportive school-to-work pathways and effective case management for students looking to pursue careers at all levels in the mining industry; and
 - continuation of support the implementation of the Rio Tinto Graduate Program.
- 17.2 RTAW will work with Weipa Town Authority to develop additional subdivisions as required to allow for the construction of additional houses.
- 17.3 RTAW will work with the Weipa Town Authority to consider expansion of the town boundary, whilst adhering to any relevant processes, and develop industrial lots if required.

SECTION 18 – HEALTH AND SAFETY

- 18.1 RTA will implement a Health Safety and Environment (HSE) Management System as part of the Project which will align with RTA Weipa's existing integrated CLASSIC HSE Management System.
- 18.2 Rio Tinto-owned vessels will operate under the MarineSafe system developed by Rio Tinto Marine.
- 18.3 Control programs for disease vectors such as rats, mosquitoes and other insects will be undertaken on a regular basis by a licensed Pest Control Technician.
- 18.4 Water storages and other impoundments of water constructed on the Project site will be greater than 60cm deep and not conducive to mosquito breeding, in accordance with the Queensland Health *Guidelines to minimise mosquito and biting midge problems in new development areas*.
- 18.5 RTA will regularly monitor potable water quality to ensure compliance with the *Australian Drinking Water Guidelines*.
- 18.6 Recycled water will be managed in accordance with the *Water Supply (Safety and Reliability) Act 2008* and relevant environmental and health regulatory guidelines. This will include monitoring to ensure water quality meets the DNRW (2008) *Water quality guidelines for recycled water schemes*.
- 18.7 Clinical waste will be segregated and disposed of at the Evans Landing Landfill (in accordance with the existing Licence).

- 18.8 Regular testing for Legionella bacteria at at-risk water sources (e.g. beneficiation plant, hot water storages etc) will be carried out and the water treated where required.
- 18.9 A register of all approved chemicals will be maintained.
- 18.10 Training on chemical use and storage will be provided to employees and contractors through the site induction and specific chemical awareness programs will be undertaken for relevant workers.
- 18.11 To minimise the hazards associated with fuel oil leaking during road tanker unloading, the following controls will be implemented to reduce risks to health and safety of site personnel and potential adverse impacts to the environment:
- equipment inspection and testing programs will be undertaken to ensure reliable performance of fuel tanks and bunds;
 - Standard Operating Procedures (SOPs) will be prepared to address the refilling of fuel storage tanks and mine vehicles, maintenance and spill response;
 - Operator training will be provided in the safe operation of the equipment and knowledge of emergency response procedures in the event of a fuel oil leakage;
 - Spill containment bunds will be installed to contain any spillage of liquids;
 - Sumps will be constructed to collect any spillage and allow recovery;
 - Ignition sources will be strictly monitored and maintained to avoid fire;
 - Appropriate fire fighting facilities and suppression systems will be installed, maintained and available to extinguish fires;
 - An approved fire protection system is to be installed and maintained around hydrocarbon storage areas; and
 - Inspections of all storage facilities shall be carried out on a regular basis.
- 18.12 Where relevant, vessels will comply with the National Standard for Commercial Vessels, which defines safety equipment standards for various classes of commercial ships.

SECTION 19 – HAZARD AND RISK

- 19.1 Strategies will be employed to minimise risks associated with dangerous goods and hazardous substances, including:
- Storage, handling and use in accordance with relevant Australian Standards;
 - Secondary containment will be utilised to reduce the risk of spills occurring as a result of accidental rupture of tanks or leaks from transfer points;
 - The transfer of dangerous goods and hazardous substances by barge will be carried out in accordance with relevant regulatory requirements;
 - Procedures will be developed for storage, handling, transfer and disposal of hazardous substances to minimise the risk of spills;
 - Relevant employees and contractors involved in the storage, handling use and disposal of hazardous substances and materials will be trained to ensure that they are aware of their responsibilities in relation to hazardous substances; and

- Procedures will be developed for spill cleanup and appropriate emergency response equipment provided at key locations to reduce the risk of harm resulting from a spill.
- 19.2 Designated first aid and emergency rescue facilities and equipment will be available on-site during the construction and operation phases.
- 19.3 A paramedic and ambulance will be based at the Boyd infrastructure area (on shift).
- 19.4 A two kilometre section of the Mine Access Road near the Boyd infrastructure area will be designed to accommodate Royal Flying Doctor Service aircraft landings and take-offs and provision for temporary night-time lighting will be made. Helicopters will be able to land on this portion of the road as well.
- 19.5 The transfer of dangerous goods and hazardous substances by barge will be carried out in accordance with Australian Maritime Safety Authority guidelines. RTA will prepare an oil spill response plan for the barges storing or transporting bulk fuel.
- 19.6 Spill prevention measures will be implemented and the existing RTA spill response procedures will be utilised.
- 19.7 The existing Weipa Business Resilience and Recovery (BRR) Plan (otherwise known as an 'Emergency Management Plan') will be updated to include the Project area and updated regularly throughout each stage of the Project to ensure that it continues to appropriately manage risks. The plan will identify adequate access for fire fighting/other emergency vehicles, address flooding and bushfire risks, and provide for safe evacuation during each stage of the Project.
- 19.8 The site will have fire brigade-approved fire fighting equipment and fire alarms.
- 19.9 All fire fighting facilities and equipment will be installed, serviced, maintained and inspected by a certified body.
- 19.10 Stores, workshops and offices will be fitted with approved and certified fire detection systems (smoke and thermal detectors).
- 19.11 Permanent facilities, such as fuel storage areas, will have a dedicated fire alarm, suppression and fire fighting equipment.
- 19.12 The Project will maintain a Fire and Rescue Service trained and equipped to appropriately respond to fire risk.
- 19.13 The risk of bushfire damage to people and property shall be mitigated by:
 - Appropriate siting of buildings;
 - Provision of fire breaks;
 - Provision of adequate vehicle access for fire-fighting; and
 - Provision of adequate water supplies for fire-fighting.
- 19.14 The Project will maintain a detailed Cyclone Emergency Procedure detailing specific requirements and responsibilities for each of the cyclone conditions for each operational area.
- 19.15 The proposed Port will have a rapidly deployable rescue boat and life saving apparatus, and each dolphin of the wharf will have a ladder that extends down to the water. The barge and ferry terminals will have fixed life saving apparatus

and RTA will have a small shuttle boat that can be used for immediate response in the event of an incident. The Marine Rescue service, which is based in Weipa, will be utilised if necessary.

- 19.16 The construction camp and bulk hazardous materials storage areas will be located above the Q100 line.

Acronyms and abbreviations

Acronym	Definition
µS/cm	microsiemens per centimetre
AADT	Annual average daily traffic
ABARE	Australian Bureau of Agricultural and Resource Economics
ACH Act	<i>Aboriginal Cultural Heritage Act 2003 (Qld)</i>
AHD	Australian height datum
ANZECC	Australian and New Zealand Environment Conservation Council
ARI	Average Recurrence Interval
AS/NZS	Australian standard/New Zealand standard
BOM	Board of Management
BOP	Biodiversity Offset Policy
CAMBA	China–Australia Migratory Bird Agreement
CEMP	construction environment management plan
CHMP	cultural heritage management plan
CIS	community investment strategy
CLR	Contaminated Land Register
CO ₂ -e	carbon dioxide equivalent
CWSP Act	<i>Coastal Waters (State Power) Act 1980</i>
Comalco Agreement Act	<i>Commonwealth Aluminium Corporation Ltd Agreement Act 1957 (Qld)</i>
dB(A)	decibels measured at the 'A' frequency weighting network
DAFF	Department of Agriculture, Fisheries and Forestry (formerly DERM)
DATSIMA	Department of Aboriginal & Torres Strait islander & Multicultural Affairs (formerly DoC)
DCS	Department of Community Safety
DCCSDS	Department of Communities, Child Safety and Disability Services (formerly DoC)
DEEDI	Former Department of Employment, Economic Development and Innovation (now DSDIP)
DEHP	Department of Environment and Heritage Protection (formerly DERM)
DERM	Former Department of Environment and Resource Management (now DEHP)
DEWHA	Former Department of Environment, Water, Heritage and the Arts (now DSEWPaC) (Cwlth)
DEWS	Department of Energy and Water Supply (formerly DEEDI)
DET	Former Department of Employment and Training (now DETE)
DETE	Former Department of Education, Training and Employment (formerly DET)
DHPW	Department of Housing and Public Works (formerly DoC and DPW)
DIDO	drive-in drive-out (workforce)
DIP	Former Department of Infrastructure and Planning (now DSDIP)

Acronym	Definition
DLGP	Former Department of Local Government and Planning (now DLG and DSDIP)
DLG	Department of Local Government (formerly DLGP)
DNRM	Department of Natural Resources and Mines (formerly DEEDI)
DNPRSR	Department of National Parks, Recreation, Sport and Racing (formerly DERM, DEEDI & DoC)
DOC	Former Department of Communities (now DCCSDS)
DPP	Dedicated post-panamax
DSDIP	Department of State Development, Infrastructure and Planning (formerly DEEDI)
DSEWPaC	Department of Sustainability, Environment, Water, Population and Communities (formerly DEWHA) (Cwlth)
DSQ	Former Disability Services Queensland (now DCCSDS)
DWT	dead weight tonnes
EA	environmental authority
EIS	environmental impact statement
EMP	environmental management plan
EMR	Environmental Management Register
EP	equivalent persons
EP Act	<i>Environmental Protection Act 1994 (Qld)</i>
EPA	Environmental Protection Agency (now DERM)
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999 (Cwlth)</i>
EPP	Environmental Protection Policy (water, air, waste, noise)
EPP (Air)	Environmental Protection (Air) Policy 2008
EPP (Noise)	Environmental Protection (Noise) Policy 2008
EPP (Water)	Environmental Protection (Water) Policy 2009
EPSD Act	<i>Environment Protection (Sea Dumping) Act 1980</i>
ERA	environmentally relevant activity
ESQ	Energy Skills Queensland
FEED	front-end engineering design
FID	financial investment decision
FIFO	fly-in fly-out
FQ	Fisheries Queensland
FSL	full supply level
FTE	full-time equivalent
GARID	Guidelines for Assessment of Road Impacts of development
GBRMP	Great Barrier Reef Marine Park
GBRWHA	Great Barrier Reef World Heritage Area
GHG	greenhouse gas
GL	gigalitres
GLpa	Gigalitres per annum

Acronym	Definition
GPF	gas processing facilities
GSDA	government state development area
HDPE	high density polyethylene
HSEMS	health, safety and environment management system
IAS	initial advice statement
ICLR	independent community liaison representative
IDAS	Integrated Development Assessment System
IP Act	<i>Integrated Planning Act 1997</i> (Qld)—now SPA
JAG	Department of Justice and Attorney-General
JAMBA	Japan–Australia Migratory Bird Agreement
kPa	kilopascal
L _{A1}	those noise levels that are exceeded for one per cent of each one-hour sample period
L _{Aeq}	the average A-weighted sound pressure level of a continuous steady sound that has the same mean square sound pressure as a sound level that varies with time
L _{Amax}	the maximum average A-weighted sound pressure measured over a specified period of time
LAN,T	statistical descriptor for the variation of noise
LNGC	LNG carriers
LOA	length over all
LPR	Land Protection Regulation 2002
MCU	material change of use
mg/L	milligrams per litre of liquid/gaseous liquid
ml	megalitres
ML	Mining lease
MNES	matters of national environmental significance
MOF	marine offloading facility
MOU	memorandum of understanding
MRA	<i>Mineral Resources Act 1989</i> (Qld)
mtpa	million tons per annum
MSQ	Marine Safety Queensland
Mdptpa	Million dry product tons per annum
NC Act	<i>Nature Conservation Act 1992</i> (Qld)
NEPC	National Environmental Protection Council
NEPM	national environment protection measure
NGA	National Greenhouse Accounts
NGAF	National Greenhouse Accounts Factors
NGER	National Greenhouse and Energy Reporting Act
NGOs	non-government organisations
NO ₂	nitrogen dioxide

Acronym	Definition
NO _x	oxides of nitrogen, which includes NO ₂
NQBP	North Queensland Bulk Ports Corporation
NT agreement	native title agreement
OCG	office of the Coordinator-General
PDR	Peninsula Development Road
pH	potential of hydrogen
PLF	product loading facility
PM ₁₀	particulate matter with equivalent aerodynamic diameter less than 10µm
PM _{2.5}	particulate matter with equivalent aerodynamic diameter less than 2.5µm
PPV	peak particle velocity, which is a measure of ground vibration magnitude and is the maximum instantaneous particle velocity at a point during a given time interval in mms ⁻¹
QGEOP	Queensland Government Environmental Offsets Policy
QH	Queensland Health
QMEA	Queensland Minerals and Energy Academy
QPS	Queensland Police Service
QR	Queensland Rail
QWC	Queensland Water Commission
QWQG	<i>Queensland Water Quality Guidelines</i>
RCCC	regional community consultation committee
RE	regional ecosystem
REDD	Regional Ecosystem Description Database
RIA	road impact assessment
RMP	road-use management plan
RORO	Roll on roll off
ROP	resource operation plan
ROW	right of way
RTAW	Rio Tinto Alcan Weipa
SDPWO Act	<i>State Development and Public Works Organisation Act 1971 (Qld)</i>
SDWPO Regulation	State Development and Public Works Organisation Regulation (Qld)
SEIS	supplementary environmental impact statement
SES	State Emergency Service
SIA	social impact assessment
SIAU	Social Impact Assessment Unit
SIMP	social impact management plan
SLA	statistical local area
SOE	South of the Embley
SPA	<i>Sustainable Planning Act 2009 (Qld)</i>
SPP	state planning policy
SSBV	State significant biodiversity values

Acronym	Definition
TDS	total dissolved solids
TI Act	Transport Infrastructure Act
TMP	traffic management plan
TMR	Department of Transport and Main Roads
TO Act	<i>Transport Operations (Road Use Management) Act 1995</i>
TOR	terms of reference
TSP	total suspended particles
TWAF	temporary workers accommodation facility
ULDA	Urban Land Development Authority
WCCCC	<i>Western Cape Communities Coordinating Committee</i>
VM Act	<i>Vegetation Management Act 1999 (Qld)</i>
WMP	waste management plan
WRP	water resource plan

Glossary

Term	Definition
assessment manager	For an application for a development approval, means the assessment manager under the <i>Sustainable Planning Act 2009</i> (Qld).
bilateral agreement	The agreement between the Australian and Queensland governments that accredits the State of Queensland's EIS process. It allows the Australian Government 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).
Capesize	Capesize vessels are classified as ships with a cargo-carrying capability (referred to as the Deadweight tonnage or DWT) in excess of 100,000 metric tonnes. Because of their size (over 1000' in length), Capesize vessels have a narrow range of ports and terminals capable of receiving them.
construction areas	The construction worksites, construction car parks, and any areas licensed for construction or on which construction works are carried out.
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: a) ecosystems and their constituent parts, including people and communities b) all natural and physical resources 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 d) the social, economic, aesthetic and cultural conditions that affect, or are affected by, things mentioned in paragraphs (a) to (c).
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).
Fishway	A fishway is constructed onto a waterway barrier to assist in providing adequate fish movement across the barrier
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.

initial advice statement (IAS)	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: • the proposed development • the current environment in the vicinity of the proposed project location • the anticipated effects of the proposed development on the existing environment • possible measures to mitigate adverse effects.
matters of national environmental significance	The matters of national environmental significance protected under the <i>Environment Protection and Biodiversity Conservation Act 1999</i>. The eight matters are: a) world heritage properties b) national heritage places c) wetlands of international importance (listed under the Ramsar Convention) d) listed threatened species and ecological communities e) migratory species protected under international agreements f) Commonwealth marine areas g) the Great Barrier Reef Marine Park h) nuclear actions (including uranium mines).
nominated entity (for an imposed condition for undertaking a project)	An entity nominated for the condition, under section 54B(3) of the SDPWO Act.
properly made submission (for an EIS or a proposed change to a project)	Defined under section 24 of the SDPWO Act as a submission that: a) is made to the Coordinator-General in writing b) is received on or before the last day of the submission period c) is signed by each person who made the submission d) states the name and address of each person who made the submission e) states the grounds of the submission and the facts and circumstances relied on in support of the grounds.
proponent	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.
significant construction works	Construction works to facilitate or support mining activities but does not include early site access works or activities to support exploration, site investigation or site establishment works where approvals are held.
significant project	A project declared as a 'significant project' under section 26 of the SDPWO Act.
Stygofauna	Fauna that live within groundwater systems such as caves and aquifers

stated condition	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: • development approval under the <i>Sustainable Planning Act 2009</i> • proposed mining lease under the <i>Mineral Resources Act 1989</i> • draft environmental authority (mining lease) under Chapter 5 of the <i>Environmental Protection Act 1994</i> (EPA) • proposed petroleum lease, pipeline licence or petroleum facility licence under the <i>Petroleum and Gas (Production and Safety) Act 2004</i> • non-code compliant environmental authority (petroleum activities) under Chapter 4A of the EPA.
works	Defined under the SDPWO Act as the whole and every part of any work, project, service, utility, undertaking or function that: a) the Crown, the Coordinator-General or other person or body who represents the Crown, or any local body is or may be authorised under any Act to undertake, or b) is or has been (before or after the date of commencement of this Act) undertaken by the Crown, the Coordinator-General or other person or body who represents the Crown, or any local body under any Act, or c) is included or is proposed to be included by the Coordinator-General as works in a program of works, or that is classified by the holder of the office of Coordinator-General as works.

