EIS assessment report

Aurukun Bauxite Project

Queensland Government

Prepared by: Environmental Impact Assessment,
Department of the Environment, Tourism Science and Innovation.

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April 2025

Executive summary

This report evaluates the environmental impact statement (EIS) for the Aurukun Bauxite Project under the *Environmental Protection Act 1994* (EP Act). It includes assessment of the potential impacts on the controlling provisions under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The project, proposed by Aurukun Bauxite Project Joint Venture, involves construction, operation, decommissioning and rehabilitation of an open cut bauxite mine and associated infrastructure. It would be located 23 kilometres north of Aurukun, on the traditional lands of the Wik and Wik Waya People. Production is expected to achieve up to 15 million tonnes of bauxite annually over 22 years. Screening and washing would occur on-site, before the ore is transported to a coastal loading facility for shipping offshore for export. A new 10.5 gigalitre water storage dam on Tapplebang Creek would be built to meet mine water requirements.

Key environmental considerations included:

- risk of land and water contamination to largely pristine terrestrial, aquatic and marine environments
- water resource losses and impacts on fish passage and riparian vegetation from the proposed dam
- significant impact to nationally vulnerable wildlife from the clearing of 6,879 hectares of habitat
- loss of access and permanent alteration to the traditional lands of the Wik and Wik Waya People
- economic benefits, including ~$482 million net benefit to Queensland and job creation (210-250 jobs during construction and 350-406 jobs during mine operation).

The EIS supports various other approvals and declarations required for the project. This includes an environmental authority and progressive rehabilitation and closure plan schedule, a social impact assessment, a water license, a declaration of a port and a decision under the EPBC Act. Outstanding matters identified by regulatory agencies will be addressed through legislative approval processes.

The project is considered suitable to proceed, subject to:

- recommendations in this assessment report being fully implemented including imposing conditions on the necessary approvals
- resolution of outstanding matters on key approvals, and
- the proponent progressing the project and honouring commitments as stated in the EIS.

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1 Introduction

This assessment report evaluates the EIS pursuant to Chapter 3 of the EP Act for the Aurukun Bauxite Project (the project). The project is proposed by Aurukun Bauxite Project Joint Venture (the proponent), an unincorporated joint venture between Glencore Bauxite Resources Pty Limited (Ltd) and MDP Bauxite Pty Ltd. The Department of the Environment, Tourism, Science and Innovation (DETSI) as the administering authority of the EP Act, coordinates the EIS process. This assessment report has been prepared pursuant to sections 57 to 59 of the EP Act.

In this assessment report I have used the EP Act version dated 9 December 2019, and the Environmental Protection Regulation 2019 (EP Regulation) version dated 1 December 2019. These were in effect on 19 February 2020 when the proponent submitted the draft terms of reference (TOR) for the EIS, which I consider is the relevant date for application of section 20 of the *Acts Interpretation Act 1954*.

The project was declared a controlled action under the Commonwealth EPBC Act by the Australian Government Minister for the Environment and Water on 11 June 2020 (referral number 2020/8624). The controlling provisions are listed in section 4.1 of this assessment report and addressed in detail in section 6.20. The EP Act EIS process assesses the potential impacts of the project on the controlling provisions as an accredited assessment process under Part 8 of the EPBC Act.

The objective of this assessment report is to:

- address the adequacy of the EIS in addressing the final TOR
- make recommendations about the suitability of the project
- recommend any conditions for approval required for the project
- address the matters prescribed in the EP Regulation.

This assessment report provides a summary of the key matters identified through the EIS process and discusses in more detail those issues of particular concern that were not resolved or require specific conditions for the project to proceed. Based on the information presented in the EIS, relevant legislation and the regulatory requirements under the EP Act, I have formed the view that the project is suitable to proceed.

The giving of this assessment report to the proponent completes the EIS process under the EP Act. The assessment stage under Part 8 of the EPBC Act ends when the Australian Government receives a copy of this assessment report.

2 Project description

The project proposes the construction, operation, decommissioning and rehabilitation of an open cut bauxite mine and associated infrastructure on a 23,100 hectare (ha) greenfield site in western Cape York, Queensland (Figure 1). The project would be located approximately 23 kilometres (km) north of Aurukun, 600km northwest of Cairns. It would have an operational mine life of approximately 22 years.

The project would comprise of the following elements: a Mine Site located within Mineral Development License (MDL) 2001, a Coastal Loading Facility (CLF) located to the west of MDL 2001, a Product Bauxite Transport Corridor (connecting the Mine Site to the CLF) and

transhipping in state and Commonwealth waters (Figure 2).

The project would produce up to 15 million tonnes per annum (Mtpa) of run of mine (ROM) bauxite, which equates to up to 8 million dry tonnes per annum of product bauxite. Bauxite ore would be mined using open cut mining methods. The ore would be washed in an on-site Beneficiation Plant, located within the Mine Infrastructure Area (MIA). A new 10.5 gigalitre (GL) water storage dam on Tapplebang Creek would be built to meet mine water requirements. Fines from the beneficiation process would be emplaced in a Fines Containment Area (FCA) for the first three years of operations and then emplaced in-pit in subsequent years.

Product bauxite would be transported via road trains from the Mine Site to the CLF via a 15km Product Haul Road. The CLF would be within a yet to be declared new port limit and include a Load-out Jetty (LOJ) with a hopper and conveyor system. The LOJ would provide for the transfer of product bauxite from the stockpiles at the CLF to the cargo hold of a dedicated Transhipment Vessel (TSV). Transhipping of product bauxite via the TSV to Ocean Going Vessels (OGV) for export would take place approximately 18km (10 nautical miles) offshore, in the Commonwealth Marine Area.

The project would also require construction of an up to 280 person Accommodation Village, power generation and supply infrastructure, mine workshops, haul roads, stockpiles and infrastructure areas associated with mining activities. A new Mine Access Road would connect the Mine Site to Aurukun Road, via a new intersection. This would require the realignment of the existing Amban Road, connecting Aurukun Road to Amban Outstation across the project site.

A detailed description of the project was provided in Chapter 4 of the EIS.

2.1 Places affected by the project

The Mine Site is located within the Aurukun Shire Local Government Area (LGA), while the Transport Corridor and CLF are in the Cook Shire LGA.

The project site is located on a broad tertiary plateau of gently undulating plains with occasional shallow drainage depressions. The elevation within the project site ranges from 9 meters (m) Australian Height Datum (AHD) near the coast, to 91m AHD in the eastern portion of the Mine Site. The Mine Site is traversed by Tapplebang and Coconut creeks. Waters flow south-west to join the Ward River, ultimately flowing into the Gulf of Carpentaria near Aurukun township. The project site is remnant vegetation, comprised of primarily eucalypt tall woodlands with scrubby woodland to open forest fringing the watercourses that drain the plateau.

A portion of the project site extends westward to the Gulf of Carpentaria and includes the section of coastline at the CLF. The primary landform at the CLF is a stretch of exposed lateritic plateau that forms a low headland on the landward boundary of a sandy beach. Transhipping activities would occur within the Commonwealth Marine Area.

The project site is located on the eastern flank of the Carpentaria groundwater basin, above regulated aquifers of the Great Artesian Basin (GAB). It is in the upper catchments of the Ward River and Norman Creek and local coastal catchments that drain to the Gulf of Carpentaria. The surface water resources in the vicinity currently support a range of environmental values (EVs), including aquatic ecosystems and human uses.

The project site is located on the traditional lands of the Wik and Wik Waya People (Traditional

Owners). It is used by Traditional Owners for recreation and traditional practices including hunting and collecting resources particularly along the creek systems. Built infrastructure within the project site is restricted to unsealed landowner/community roads and a non-operational communications tower.

The stretch of beach within the project site, and associated coastal waters, are used intermittently by Traditional Owners for a range of cultural activities, including recreational fishing, hunting, walking, and collecting marine turtle eggs. Non-Indigenous visitors to the area also use the beach and marine waters for recreational activities, particularly fishing. The marine waters in the vicinity of the project are utilised by commercial and recreational fisherman, and charter boat fishing operators.

Amban Outstation is the nearest sensitive receptor to the project site and is located along the coastline, approximately 2km south of the proposed CLF. It comprises a small residential building and some shelter structures that are used intermittently by Traditional Owners for overnight camping and recreation. Waterfall Outstation is also used intermittently by Traditional Owners for overnight camping and recreation, and is located on the coastline, approximately 13km south of the proposed CLF.

The Mine Site and adjacent land (to the south and east) is located within Lot 211 on SP241404. Ngan Aak-Kunch Aboriginal Corporation (NAK), on behalf of the Traditional Owners, is the holder of Aboriginal freehold title for this land under the *Aboriginal Land Act 1991*. The Traditional Owners also hold the Native Title rights over the majority of the Mine Site. The Product Bauxite Transport Corridor is also subject to the Native Title rights of the Traditional Owners, although there is no Aboriginal freehold title held over this land.

The land within the Product Bauxite Transport Corridor is subject to a Crown land mining lease 7024, held by RTA Weipa Pty Ltd (RTA Weipa) for mining and other purposes, as defined in the *Commonwealth Aluminium Corporation Pty Limited Agreement Act 1957* (Qld)(Comalco Act). The area of mining lease 7024 in proximity to the project is subject to approved plans for future mining as part of the Amrun Mine but is not currently being mined.

The project site is located within Restricted Area 315, as designated under the *Mineral Resources Act 1989* (MR Act), and encompasses a resource termed the Aurukun Bauxite Deposit. In 2015, by entering into a Development Agreement with the State of Queensland, the proponent was awarded the right to apply for an MDL (and ultimately a mining lease) for the development of the Aurukun Bauxite Deposit.

Figure 1 Aurukun Bauxite Project location ***(source: Figure 4-1 Aurukun Bauxite Project EIS, July 2024)***

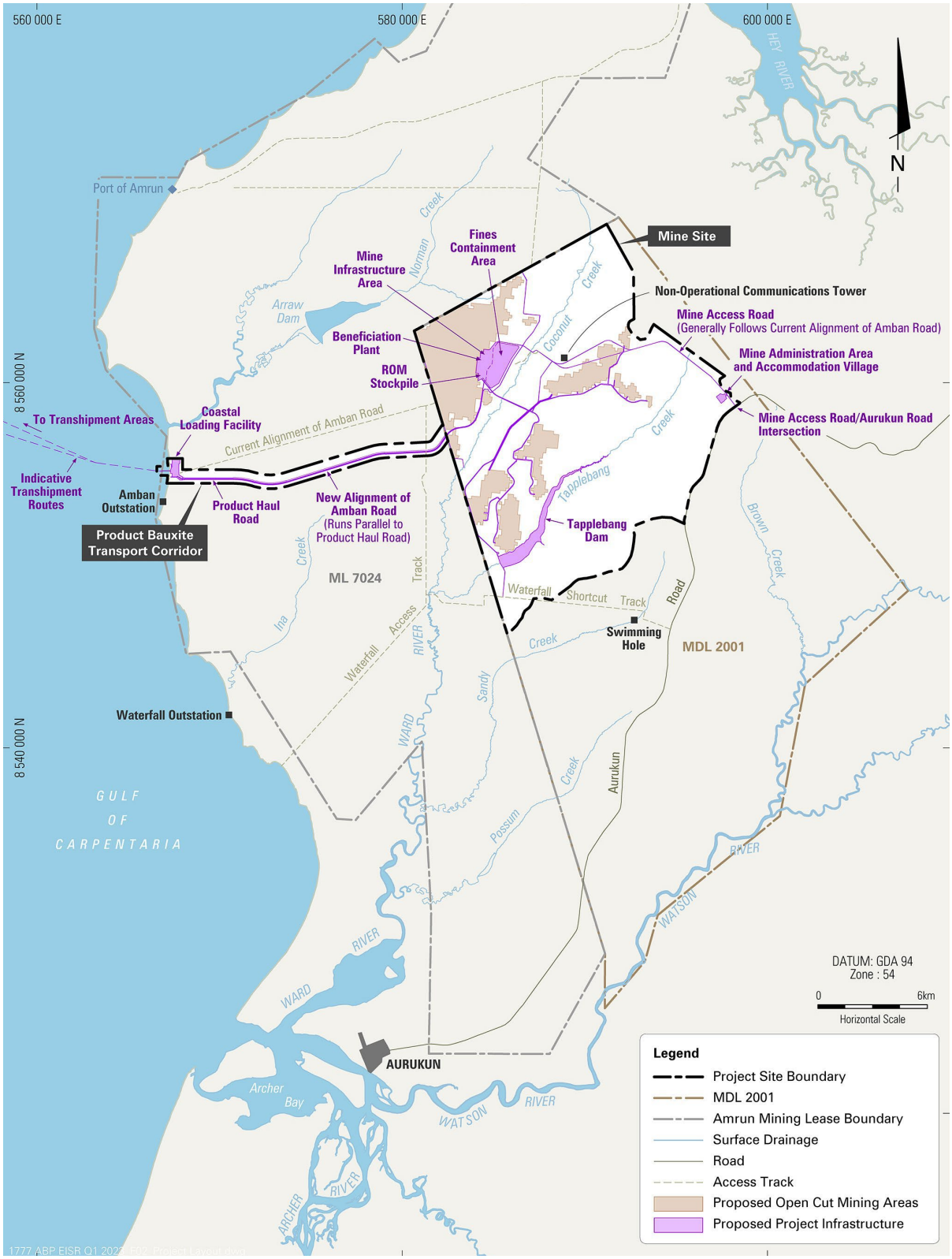

Figure 2 Aurukun Bauxite Project conceptual layout ***(source: Figure 4-2 Aurukun Bauxite Project EIS, July 2024)***

3 Statutory requirements

This section describes the statutory requirements that apply to the project and its EIS process, including:

- the approvals the project would require to operate
- the matters the EIS needed to adequately address
- the matters I needed to consider when preparing this assessment report
- the content requirements for this assessment report.

3.1 Project approvals

Key approvals and declarations that would be required for the project are summarised in Table 1. Recommended conditions for some of these approvals are included in section 7 of this assessment report.

Table 1 Key approvals required for the Aurukun Bauxite Project

Approval	Legislation (Administering Authority)	Detail
Environmental authority (EA) granted by Queensland Government		
EA	EP Act (DETSI)	The project would require a site-specific EA. The EA would also cover the following environmentally relevant activities (ERAs) that are directly associated with, or facilitate or support, the mining activities, and which would otherwise require approval under the EP Act as 'prescribed ERAs', listed under schedule 2 of the EP Regulation: • ERA 8(3) – Chemical Storage; storing 500 cubic meters or more of chemicals of class C1 or C2 combustible liquids under Australian Standard 1940 or dangerous goods class 3 • ERA 14(2)(a) – Electricity Generation; generating electricity by using a fuel, other than gas, at a rated capacity of – 10 Megawatt (MW) electrical to 150MW electrical • ERA 15 – Fuel Burning; using fuel burning equipment that is capable of burning at least 500 kilogram (kg) of fuel in an hour • ERA 31(2)(b) – Mineral Processing; processing, in a year, the following quantities of mineral products, other than coke – more than 100,000 tonnes (t) • ERA 33 – Crushing, Milling, Grinding or Screening; crushing, milling, grinding or screening - more than 5000t of material in a year

		• ERA 63 – Sewage treatment or operating a sewage pumping station with a total design capacity of more than 40 kilolitre (kL) in an hour (100 to 1,500 equivalent persons with treated effluent discharged through an irrigation scheme). The following notifiable activities prescribed under schedule 3 of the EP Act would be authorised under the EA: • notifiable activity 7 – Chemical Storage • notifiable activity 14 – Engine Reconditioning Works • notifiable activity 24 – Mine Wastes • notifiable activity 25 – Mineral Processing • notifiable activity 29 – Petroleum Product or Oil Storage • notifiable activity 37 – Waste Storage, Treatment or Disposal. Under the *Environmental Offsets Act 2014* (EO Act) an offset condition would be required for significant residual impacts to matters of state environmental significance (MSES) that are not also matters of national environmental significance (MNES). The EA would also require Estimated Rehabilitation Costs to be lodged prior to commencing any activities authorised under an EA (under the *Mineral and Energy Resources (Financial Provisioning) Act 2018).*
Other approvals granted by Queensland Government or local government		
Progressive Rehabilitation and Closure Plan (PRC plan)	EP Act (DETSI)	The proponent must submit a proposed PRC plan with the EA application. The Progressive Rehabilitation and Closure Plan Schedule (PRCP schedule) component needs to be approved by DETSI and any conditions imposed.
Grant of mining lease	MR Act (Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development (DNRMMRRD))	The project would require the following forms of tenure under the MR Act: • mining lease for the Mine Site, under section 234(1)(a) of the MR Act, 'to mine specified minerals' • mining lease for the Product Haul Road, under section 316 of the MR Act, for the 'transportation of something through, over or under the land by a pipeline, aerial ropeway, conveyor apparatus, transmission line or similar method of transport, or road' • mining lease for the CLF, under section 234(1)(b) of the MR Act, for 'such purposes, other than mining,

		as are specified in the mining lease and that are associated with, arising from or promoting the activity of mining'.
Water licence – for taking water from the strategic reserve	*Water Act 2000* (Water Act) (Department of Local Government, Water and Volunteers (DLGWV))	Required to allow for the take of unallocated water from the Water Plan (Cape York) 2019 (Water Plan (Cape York)) strategic reserve
Water licence – for interfering with water in a watercourse, lake or spring	Water Act (DLGWV)	Required to interfere with water in a watercourse. Would be required under section 55 of the Water Plan (Cape York) for the impoundment of water on Tapplebang Creek
Permit to take water (temporary)	Water Act (DLGWV)	Required for the temporary take of surface water for construction water supply
Declaration of Port	*Transport Infrastructure Act 1994* (Maritime Safety Queensland (MSQ) as part of Department of Transport and Main Roads (TMR))	Required to allow the operation of the LOJ and transhipping of bauxite product from the TSV to OGV for export
Declaration of Non-Compulsory Pilotage Area	*Transport Operations (Marine Safety) Act 1994* (MSQ/TMR in conjunction with the Regional Harbour Master)	Required in waters around the existing Aurukun barge landing to give the Regional Harbour Master the power to 'direct the master of a ship to navigate or otherwise operate the ship in relation to a pilotage area in a specified way'
Temporary road closure permit	*Transport Operations (Road Use Management) Act 1995* (TMR)	Required to transport large, indivisible loads to the project site using over dimensional vehicles
Wet season permit – Peninsula Development Road	*Transport Operations (Road Use Management) Act 1995* (TMR)	Required to access Peninsula Development Road during the wet season
Social impact assessment	*Strong and Sustainable Resource Communities Act 2017* (SSRC Act) Coordinator-General)	Required for social impacts for resource projects assessed by an EIS process
Development Application – Operational Works Permit	*Planning Act 2016* (Planning Act) (State Assessment Referral Agency and Aurukun	Required for the new Mine Access Road/Aurukun Road intersection, located outside of mining leases for the project

	Shire Council)	
Species Management Program	*Nature Conservation Act 1992* (NC Act) (DETSI)	Required for tampering with a protected animal breeding place
Cultural heritage management plan (CHMP)	*Aboriginal Cultural Heritage Act 2003* (Department of Women, Aboriginal and Torres Strait Islander Partnerships and Multiculturalism)	Required to manage potential impact on Aboriginal cultural heritage
Approvals granted by Australian Government		
Approval to undertake an action that may impact on a MNES: • Listed threatened species and communities (sections 18 and 18A) • Listed migratory species (sections 20 and 20A) • Commonwealth Marine Areas (section 23 and 24A).	Commonwealth (Cwlth) EPBC Act DCCEEW)	A copy of this assessment report will be given to the Australian Government Minister for the Environment and Water to assist in deciding whether or not to approve the project and any conditions that should apply under Part 9 of the EPBC Act, if approved.
Offset requirements for MNES and MSES	Cwlth EPBC Act; Cwlth Environmental Offsets Policy 2012 (DCCEEW) Queensland (Qld) EO Act; Environmental Offsets Regulation 2014; Qld Environmental Offsets Policy (DETSI)	Offsets would be required for significant residual impacts to MNES, including those that are also MSES. Under the EO Act an offset condition cannot be required by the state if the Australian Government has imposed a condition for the same, or substantially the same, impact on the same matter OR if the Australian Government has decided an offset is not required. Consequently, any conditions for offsetting that overlap jurisdictions would be placed on the Australian Government's approval

3.2 Criteria considered

Section 58 of the EP Act lists the criteria that must be considered when preparing this

assessment report, including:

(a) the final TOR for the EIS
(b) the submitted EIS
(c) all properly made submissions and any submissions accepted by the chief executive
(d) the standard criteria (as set out in Schedule 4 of the EP Act)
(e) another matter prescribed under a regulation.

The documents considered for criteria (b) and (c) are described below. For criterion (e), this assessment report has considered whether the EIS adequately addressed the matters prescribed in Schedule 1 of the EP Regulation.

I considered the above criteria when preparing this assessment report and forming my recommendations.

3.3 The submitted EIS

The submitted EIS was considered when preparing this assessment report and comprised the following documents:

- the original EIS (EIS version 1) received by DETSI on 23 December 2020
- the amended EIS (EIS version 2) received by DETSI on 1 December 2021
- the amended EIS (EIS version 3) received by DETSI on 4 April 2022
- the amended EIS (EIS version 4) received by DETSI on 18 July 2023 that was made available for public submissions from 11 September 2023 to 13 November 2023
- the amended EIS (EIS version 5) and Response to Public Submissions received by DETSI on 11 July 2024
- the amended EIS (EIS version 6) and Revised Response to Public Submissions received by DETSI on 16 January 2025.

The submitted EIS is hereon referred to as the EIS.

3.4 Submissions on the EIS

The EIS was made available for public submission from 11 September 2023 to 13 November 2023. Within the submission period DETSI received 23 properly made submissions from government agencies, regional bodies, non-government organisations and the community. All submissions were accepted under section 55 of the EP Act and considered when preparing this assessment report and forming my recommendations.

Submissions were received from the following stakeholders (government agency names reflect those at the time of submission):

- Department of Climate Change, Energy, the Environment and Water (DCCEEW)
- Department of Environment and Science (now DETSI)
- Department of State Development, Infrastructure, Local Government and Planning
- Department of Regional Development, Manufacturing and Water
- Department of Agriculture and Fisheries
- Department of Resources
- Department of Transport and Main Roads
- Department of Child Safety, Seniors and Disability Services
- Department of Youth Justice, Employment, Small Business and Training

- Department of Tourism, Innovation and Sport
- Department of Treaty, Aboriginal and Torres Strait Islander Partnerships, Communities and the Arts
- Department of Housing
- Queensland Fire and Emergency Services
- Queensland Police Service
- Queensland Ambulance Service
- Office of Industrial Relations (Major Hazards Facilities)
- Aurukun Shire Council
- Ports North
- Ngan Aak-Kunch Aboriginal Corporation
- McCullough Robertson on behalf of Directly Affected Traditional Owners
- RTA Weipa Pty Ltd
- Cape York Natural Resource Management
- Environmental Defenders Office on behalf of Streams in the Desert.

On 1 June 2023, the Australian Government Minister for the Environment and Water agreed for DETSI to request specialist technical advice on the project from the Independent Expert Scientific Committee on Unconventional Gas Development and Large Coal Mining Development (IESC). The IESC advice (IESC 2023-145) was provided to DETSI on 14 November 2023 and published on the IESC website on 28 November 2023. The IESC advice informed DETSI's submission on the EIS.

On 27 August 2024, DETSI received correspondence from RTA Weipa requesting additional information be accepted as a further submission in response to the EIS and IESC's advice. On 14 February 2025, DETSI received follow-up correspondence from RTA Weipa requesting additional information be accepted as a further submission in response to the EIS dated 16 January 2025. I considered this to be substantially outside of the submission period and not within a reasonable timeframe to be included, as such I did not accept these as a submission under section 55(3) of the EP Act. However, in the interest of natural justice, the additional information was provided to the proponent for consideration in their ongoing approvals outside of the EIS process.

Following the public submission period, there was additional correspondence with government agencies regarding the proponent's response to public submissions to provide clarity on critical matters. This correspondence was considered when preparing this assessment report and forming my recommendations.

While this assessment report is not an original decision under the EP Act (i.e. the decision is not subject to appeal and review rights), where properly made submissions are received under the EIS process, these submitters have express rights when any future environmental authority (EA) is issued. At the time of issuing any future EA, all successful submitters will be advised of the final conditions of approval (if granted) and will be notified of the process for appeal.

3.5 Required content

Section 59 of the EP Act specifies the required content of this assessment report, which must:

(a) address the adequacy of the EIS in addressing the final TOR (see section 6 of this assessment report)
(b) address the adequacy of any environmental management plan for the project
(c) make recommendations about the suitability of the project (specifically section 87 of this

assessment report and as mentioned throughout)
(d) recommend any conditions on which any approval required for the project may be given (see section 7 and the relevant Appendices A-D of this assessment report)
(e) contain another matter prescribed under a regulation.

Regarding item (b), another part of the EP Act has been amended to cease the requirement for an environmental management plan. Consequently, the requirement for this assessment report to address section 59(b) of the EP Act is obsolete.

Regarding item (e), section 9 of the EP Regulation prescribes the matters that this assessment report must contain, including:

(a) a description of the following
    (i) the project
    (ii) the places affected by the project
    (iii) any matters of national environmental significance (MNES) likely to be affected by the project.
(b) a summary of the project's relevant impacts
(c) a summary of feasible mitigation measures or changes to the project or procedures to prevent or minimise the project's relevant impacts, proposed by the proponent or suggested in a relevant submission
(d) to the extent practicable, a summary of feasible alternatives to the project identified in the assessment process and the likely impact of the alternatives on MNES
(e) to the extent practicable, a recommendation for any conditions of approval for the project that may be imposed to address impacts identified in the assessment process on MNES.

Section 2 of this assessment report describes the project and the places affected by the project. Section 6 includes information that summarises the project's relevant potential impacts and the matters listed immediately above in items (c) to (d) inclusive. Section 6.20 specifically addresses the required content regarding MNES likely to be affected by the project. Section 7.5 recommends, to the extent practicable, conditions of approval for the project that may be imposed to address potential impacts identified in the assessment process on MNES.

4 The EIS Process

Application was made by the proponent under section 70 of the EP Act for a voluntary EIS for the proposed project. Under section 72 of the EP Act, it was determined on 27 February 2020 that assessment of the project would be by EIS.

4.1 EPBC Act controlling provisions

As noted in section 1 of this assessment report, the Australian Government determined the project to be a controlled action pursuant to section 75 of the EPBC Act (referral number 2020/8624). The controlling provisions for the project are:

- Listed threatened species and communities (sections 18 and 18A)
- Listed migratory species (sections 20 and 20A)
- Commonwealth Marine Areas (sections 23 and 24A).

This EP Act EIS process assesses the potential impacts of the project on the controlling provisions as an accredited assessment under Part 8 of the EPBC Act. Section 6.20 of this assessment report assesses whether the EIS adequately addressed the impact on the controlling provisions.

The Australian Government's assessment stage under Part 8 of the EPBC Act ends when the Australian Government Minister for the Environment and Water receives a copy of this assessment report. This assessment report will assist the Australian Government Minister to decide whether to approve the project and any conditions that should apply under Part 9 of the EPBC Act, if approved.

4.2 Timeline of the EIS process

Table 2 outlines the stages, timing and actions undertaken in the EIS process for the project.

Table 2 Timeline of key steps undertaken during the Aurukun Bauxite Project EIS process

Step in the EIS process	EP Act section	Responsibility for taking step	Date completed
The proponent submitted an application for a voluntary EIS for the project (formerly known as the Coconut Project) on 26/06/2018. On 26/07/2018, DETSI advised the proponent that the application had not been accepted and required additional supporting information. On 11/02/2020, the proponent submitted additional information to support the application, which was accepted by DETSI	70 & 71	DETSI and proponent	11/02/2020
The delegate of the chief executive approved the voluntary EIS application for the project on 21/02/2020 and issued a notice about the decision to the proponent on 27/02/2020	72	DETSI	27/02/2020
On 25/02/2020, the proponent referred the project to the Australian Government, it was declared to be a controlled action under the EPBC Act on 11/06/2020	N/A	Australian Government	11/06/2020
The EIS process commenced when the proponent submitted a draft TOR for the project, accompanied by the fee prescribed under the EP Regulation	41(1) & 41(2)	Proponent	19/06/2020
DETSI gave the TOR notice to the proponent, which set the comment period at 30 business days	42(1) & 42(2)	DETSI	29/06/2020
DETSI published the TOR notice in the newspaper	43(1)	DETSI	04/07/2020
The 30 business day draft TOR comment period started on 06/07/2020 and ended on 17/08/2020	42(3)	DETSI	06/07/2020 to 17/08/2020
DETSI gave the proponent 15 sets of comments received during the comment period or accepted by the delegate to the chief executive, following close of the comment period	44	DETSI	25/08/2020
The proponent responded to the comments on the draft TOR	45 *(and section 11 of the EP Regulation)*	Proponent	22/09/2020
DETSI considered the proponent's response, produced the final TOR, and gave a copy of the final TOR to the proponent on 20/10/2020	46	DETSI	20/10/2020
The proponent submitted the EIS to DETSI	47	Proponent	23/12/2020

DETSI advised the proponent that there were matters in the TOR that the EIS had not adequately addressed. On 03/02/2021, to give the proponent time to revise the EIS, the delegate of the chief executive agreed to a longer period for deciding whether the EIS was suitable to proceed. The new date for the decision was set at 01/09/2021	49(2)	DETSI and proponent	29/01/2021
The proponent requested a period longer in which to submit the EIS to DETSI. The delegate of the chief executive decided to allow a longer period. The new date for the decision was set at 02/02/2022	47(1)(b)	DETSI and proponent	03/08/2021
The proponent submitted an amended EIS to DETSI	66	Proponent	01/12/2021
DETSI advised the proponent that there were matters in the TOR that the EIS had not adequately addressed. On 03/02/2022, to give the proponent time to revise the EIS, the delegate of the chief executive agreed to a longer period for deciding whether the EIS was suitable to proceed. The new date for the decision was set at 31/03/2022	49(2)	DETSI and proponent	17/01/2022
The proponent requested a period longer in which to submit the EIS to DETSI. The delegate of the chief executive decided to allow a longer period. The new date for the decision was set at 06/05/2022	47(1)(b)	DETSI and proponent	22/03/2022
The proponent submitted an amended EIS to DETSI	66	Proponent	04/04/2022
The delegate of the chief executive refused to allow the EIS to proceed to public notification under section 49 of the EP Act as there were matters in the TOR that the EIS had not been adequately addressed.	49(2)	DETSI	06/05/2022
DETSI issued the proponent a notice of the decision and statement of reasons for refusing to allow the EIS to proceed	49(6)	DETSI	19/05/2022
The proponent wrote to the Queensland Environment Minister on 03/06/2022 to request an extension of the time until 17/06/2022 for the proponent to provide notice to the Minister to request a review of the decision under section 49 of the EP Act to refuse to allow the EIS to proceed to public notification	50	Proponent	03/06/2022
The Queensland Environment Minister refused to allow the proponent to extend the time for ministerial review of the section 49 EP Act decision	50	Minister	16/09/2022
The proponent requested a period longer in which to submit the EIS to DETSI. The delegate of the chief executive decided to allow a longer period. The new date for the decision was set at 06/02/2024	47(1)(b)	DETSI and proponent	03/08/2022
The proponent submitted an amended EIS on 18/07/2023	66	Proponent	18/07/2023
DETSI gave the proponent a notice of decision that the EIS was suitable to proceed to public notification, and that the submission period would be a longer period of 45 business days	49(6)	DETSI	15/08/2023
The proponent gave a copy of the EIS notice to interested and affected persons and published the EIS notice in the newspaper. DETSI published the notice on the department's website. The EIS was made available in full on the proponent's website	51(2)(a) & 51(2)(b) *(and section 8 of the EP Regulation)*	DETSI and proponent	09/09/2023

The proponent gave DETSI a declaration of compliance stating that a copy of the EIS notice had been given to interested and affected persons and that the EIS notice had been published in an appropriate newspaper	53	Proponent	21/09/2023
The EIS submission period started on 11/09/2023 and ended on 13/11/2023	52(2)	DETSI	11/09/2023 to 13/11/2023
DETSI forwarded to the proponent 23 submissions about the EIS that were received and accepted during the submission period	55 & 56(1)	DETSI	27/11/2023
On 11/01/2024, the proponent and the delegate of the chief executive agreed to a longer period for submitting a response to submissions. On 11/07/2024, the proponent submitted a summary of submission, a response to submissions and the amended EIS. DETSI gave a copy of the documents to other government agencies who provided a submission on the EIS	56(2) & 56(3)	DETSI and proponent	11/01/2024
On 07/07/2024, DETSI advised the proponent that there were matters the EIS had not adequately addressed. Consequently, on 08/08/2024, the proponent requested an extension to the period for making the decision on whether the EIS could proceed, so that they could provide the outstanding information. The delegate of the chief executive agreed and the new date for the decision was set at 28/02/2025	56A(2) & 56A(3)	DETSI and proponent	08/08/2024
The proponent revised their response to submissions and submitted an amended EIS to DETSI on 16/01/2025. DETSI gave the documents to relevant government agencies for their review and comment	56(2) & 66	DETSI and proponent	16/01/2025
DETSI considered the EIS and the proponent's response to submissions and decided to allow the EIS to proceed under division 5 (EIS assessment report) and division 6 (completion of process) of the EP Act	56A(2) & 56A(4)	DETSI	28/02/2025
DETSI issued to the proponent a notice of the decision to proceed	56(A)(5)	DETSI	14/03/2025
DETSI prepared the EIS assessment report	57 to 59	DETSI	30/04/2025
DETSI completed the EIS assessment report and gave a copy to the Australian Government	*10 of the EP Regulation*	DETSI	30/04/2025
DETSI completed the EIS assessment report and gave a copy to the proponent completing the EIS process	60	DETSI	30/04/2025

5 Consultation program

5.1 Public consultation

In addition to the statutory requirements for advertising of the TOR and EIS notices and the mailing of the notices to interested and affected parties, the proponent undertook community consultation with members of the public and other stakeholders during the public submission period of the EIS. The submissions received in response to the public submission period are noted in section 3.4 of this assessment report.

5.2 Advisory body

DETSI invited the following organisations to assist in the development of the TOR and assessment of the EIS by participating as members of the advisory body for the project (agency names reflect those at the time of EIS submission):

- Department of Climate Change, Energy, the Environment and Water
- Department of Environment and Science (now DETSI)
- Department of State Development, Infrastructure, Local Government and Planning
- Department of Regional Development, Manufacturing and Water
- Department of Agriculture and Fisheries
- Department of Resources
- Department of Transport and Main Roads
- Department of Child Safety, Seniors and Disability Services
- Department of Youth Justice, Employment, Small Business and Training
- Department of Tourism, Innovation and Sport
- Department of Treaty, Aboriginal and Torres Strait Islander Partnerships, Communities and the Arts
- Department of Housing
- Department of Education
- Department of Local Government, Racing and Multicultural Affairs
- Department of Communities and the Arts
- Queensland Health
- Queensland Fire and Emergency Services
- Queensland Police Service
- Queensland Ambulance Service
- Office of Industrial Relations (Major Hazards Facilities)
- Maritime Safety Queensland
- Aurukun Shire Council
- Cook Shire Council
- Mapoon Aboriginal Shire Council
- Weipa Town Authority
- Cape York Natural Resource Management
- Cape York Partnership
- Cape York Land Council
- RTA Weipa Pty Ltd
- Cairns and Far North Environment Centre
- Gulf of Carpentaria Commercial Fishermen Association
- Australian Fisheries Management Authority
- Northern Prawn Fishery Industry Pty Ltd
- Construction, Forestry, Mining and Energy Union.

Hereon references to Queensland Government agency names throughout this report refer to their current titles. Any previous iterations are reflected through the Administrative Arrangements Orders re-issued or amended when a change in the structure of government occurs.

5.3 Public notification

In accordance with statutory requirements, DETSI published the draft TOR notice in The Weekend Australian and Courier Mail newspapers. A copy of the draft TOR was made available on the DETSI project website. In addition, DETSI's website displayed notices advising the availability of the draft TOR and EIS for public comment.

The proponent published the EIS notice in The Weekend Australian newspaper and made a copy of the EIS available on the Aurukun Bauxite Project website.

6 Adequacy of the EIS in addressing the TOR

I have focused on the critical environmental matters which the TOR stated I must give priority. These matters were: land, progressive rehabilitation and closure, water quality, water resources, regulated structures, flora and fauna, coastal environment, waste management, cultural heritage, social, economic and MNES. I consider that the EIS adequately addressed most components of the TOR.

In the following sections I discuss the findings of the EIS, summarise the relevant impacts and outline those environmental protection commitments made by the proponent that are recommended as conditions. Matters that require clarification or confirmation are discussed in detail. I have also included further recommended management measures and environmental protection conditions, as appropriate.

Those aspects of the EIS that are considered adequate are generally not discussed in detail in this assessment report, except where they were of particular importance for assessing the project, such as requiring modification of, or addition to conditions.

6.1 Introduction to the EIS

The EIS provided an adequate introduction to the project, its objectives and scope. It adequately identified the key approvals required for the project and outlined the assessment and approval processes.

6.2 Project description

The EIS adequately described the location, scope and phases of the project. An outline of the project is provided in section 2 of this assessment report.

6.3 Project need and alternatives

The EIS adequately addressed the commercial need for the project. It also addressed how its operations would contribute to the local, regional, state and national economies through royalties, taxes, charges, and wages. In addition, the EIS addressed how the project would help sustain employment and create opportunities for small business, regional development and investment.

6.3.1 Project alternatives

The EIS adequately addressed how there are no feasible alternatives to the location of the project, which is dictated by the location of the resource. Exploration work indicated that the Mine Site would be the most prospective area for mining within MDL 2001. Other parts of MDL 2001 were investigated for mining. However, the EIS presented that they are not economically viable at this stage, with a particular constraint being the distance between those areas of the MDL and suitable transhipping locations.

The EIS addressed alternatives for the construction and operation of the project, including the likely impacts of the alternatives on MNES (see section 6.20.3). The key aspects of the project where alternatives were considered during project planning include:

- **Alternative management of fines:** Fines are proposed to be emplaced in an FCA for the first three years of operations and thereafter emplaced in pits where mining has been completed. Alternative fines disposal strategies considered during project planning were described in the EIS. One alternative considered was storing all fines produced over the life of the mine within a larger FCA (or multiple FCAs). However, this would necessitate large out of pit emplacements, which would be challenging to rehabilitate and increase the closure risk of the project. The option of dewatering the fines before emplacing them in an FCA or in-pit emplacements was also considered. However, section 4.16 of the EIS stated that this option was not progressed because of the high operating costs and operational management challenges of dewatering the fines.
- **Alternative water supply:** Section 4.16 of the EIS presented a range of water supply options. These include the preferred option of building a dam on Tapplebang Creek, seasonal pumping of water into an off-stream storage, building an in-stream dam elsewhere (e.g. Coconut Creek), using groundwater (GAB or shallow groundwater), abstracting water from the Watson River, or constructing a desalination plant to enable the use of seawater. The proponent applied an assessment framework that considered technical viability, environmental and social impacts as well as operating and economic viability as part of the review of options. Based on this assessment, the proponent undertook a more detailed comparison between the proposed dam on Tapplebang Creek and an off-stream storage option which involved consideration of environmental and socio-cultural impacts as well as economic viability and operating risk. This comparison identified a proposed dam on Tapplebang Creek as the only feasible option for water supply for the project.
- **Alternatives in relation to marine facilities:** The proposed location for the transhipping operations (transhipment route and transhipment areas) has been selected to avoid sensitive environmental features. The ability to undertake transhipping in a manner that avoids significant environmental impacts was a key factor in siting the transhipping operations and associated CLF. Other factors included project economics and logistics (e.g. haulage distance from the Mine Site). The proponent undertook an options analysis, which considered alternative locations for the CLF, alternative methods for transporting product (e.g. constructing a facility to enable direct loading of OGVs, rather than transhipping) and use of existing facilities operated by RTA Weipa. Section 4.16 of the EIS discusses the alternatives that were considered and explains that none were found to be viable.
- **Alternative power supply:** There is no fixed or permanent electricity supply in the vicinity of the project site, hence diesel generated power is proposed to be used to meet the project's power requirements. The proponent considered various power supply alternatives

including energy storage options, solar power generation, other renewable energy sources and various combinations. In particular, the proponent considered design requirements for solar power generation combined with battery energy storage and diesel generation. The establishment of a sufficient scale of solar generation from the commencement of the project would require additional disturbance (approximately 30ha) in proximity to the Beneficiation Plant and MIA which is not available given the location of the resource area and the proximity to Coconut Creek. The proponent considers that there is potential to incorporate a hybrid solar power generation solution in future that could avoid additional clearing of vegetation by utilising existing disturbance areas (e.g. the decommissioned FCA). Section 4.16 of the EIS stated that the development of this option would be examined further closer to that time.
I recommend that when investigating the feasibility of this option, greenhouse gas (GHG) emissions reduction should be considered (see section 6.11.1 of this assessment report for further information on GHG emissions).

An assessment of the consequences of not proceeding with the project was also conducted with the following consequences inferred:

- the potential significant socio-economic benefits of the project for western Cape York and the Aurukun communities would not eventuate
- the opportunity to mine approximately 305Mt of bauxite ore, over the life of the project, would not eventuate
- the royalty payments and government taxes associated with the project would not eventuate
- the contribution of the project to the western Cape York and Queensland economies would not eventuate.

6.4 Climate

The EIS adequately described how climate could affect the potential for environmental impacts and the management of operations on site.

EIS Chapter 12 (Climate) presents climatic data collected from the Weipa Aero Bureau of Meteorology weather station which is located 40km north-east of the project site. This data presented a climate typical of Cape York with warm temperatures year-round and slightly cooler temperatures during the dry season. The rainfall patterns were consistent with that of a tropical climate, with 97% of the annual rainfall occurring from November to April. Winds were predominantly moderate in strength and travel from the east to south-east.

During the wet season the region is frequently affected by flooding and strong winds, associated with cyclones, storms and low monsoonal troughs. EIS Chapter 7 (Surface Water) described the flood study that was undertaken for the project. This study considered extreme flooding conditions, including the Probable Maximum Flood (PMF). The greatest risk of bushfire usually occurs towards the end of the dry season. During this time high temperatures, lower relative humidity, high winds, and lack of rain are common. Impacts on the project from natural hazards such as flood and fire are further discussed in section 6.14 of this assessment report.

The EIS identified that climate change is projected to increase the severity of weather events and environmental conditions across Queensland with local impacts including an increase in extreme temperatures, increase in evaporation rates, increase in extreme rain intensity and flooding, and increased sea level impacts. The EIS proposes mitigation and management

measures to ensure that the project can adapt to the impacts of climate change.

The IESC submission on the EIS stated that the EIS should consider climate change scenarios as part of groundwater modelling. The proponent did not amend the EIS in response to this recommendation. The EIS asserted that climate change scenarios were not considered in the modelling because the seasonal fluctuations in groundwater levels are so significant, they likely outweigh the forecasted changes in annual peaks and troughs due to climate change. The EIS stated that modelling future climate change is unlikely to significantly influence the impact assessment because impacts are predicted based on the difference between a no-mine model and a mining model. I accept the proponent's assertions as adequate.

6.5 Land

The EIS adequately described the existing and proposed qualities and characteristics of the land, as outlined in the following sections.

6.5.1 Topography

EIS Chapter 4 (Project Description) adequately described the existing topography. The project site is located on a broad tertiary plateau of gently undulating plains with occasional shallow drainage depressions. The elevation within the project site ranges from 9m AHD near the coast to 91m AHD in the eastern portion of the Mine Site.

Both the existing and proposed final topography of the project site are relevant to the propagation of noise and air pollution. EIS Appendix U (Air Quality and Greenhouse Gas Report) and Appendix V (Noise Report) adequately incorporated topographic data into the modelling of noise and air quality. The existing topography was satisfactorily incorporated into the EIS's assessment of visual amenity in Chapter 15 (Visual Amenity).

Similarly, the final, rehabilitated topography is relevant to water resource impacts. This is discussed in section 6.7.1.1.3 of this assessment report.

6.5.2 Geology and geomorphology

EIS Chapter 4 (Project Description) and Appendix F (Groundwater Report) adequately described the geology and geomorphology of the project site and its surrounding area. There are no known faults or significant geological structures within the project site or its surrounds.

The bauxite ore body is relatively shallow, typically exposed less than 1–2m below ground level. The bauxite ore is up to 13m thick in the elevated parts of the project site and is typically absent in and adjacent to the lower lying creeks. The bauxite ore is 2m to 13m thick in the proposed open cut mining areas.

The EIS adequately assessed the potential impacts of the project site's geology and geomorphology on the groundwater regime. This is discussed in section 6.7.2 of this assessment report.

6.5.3 Soils and land suitability

The EIS adequately described and assessed soils and land suitability in Appendix D (Soils and Land Suitability Report) of the EIS. The assessment included a description of soil mapping units present at the project site, the land suitability and agricultural land classes of each soil mapping unit and the available topsoil resources for rehabilitation.

The EIS presented that most of the project site is unsuitable for grazing with part of the project site being suitable for maize and sorghum cultivation. Notably none of the land within the project site is currently used for grazing or cropping.

Most of the project site contains soils that are suitable for reuse as topsoil in native vegetation rehabilitation. The depth of available topsoil resources varies from 0.15m to 0.4m across the project site. The EIS determined that there is sufficient available topsoil for it to be placed on rehabilitated areas at an average thickness of approximately 0.25m. The EIS adequately described measures to be adopted during topsoil stripping, stockpiling and respreading to ensure that soil resources are conserved and appropriately managed.

To ensure these mitigation measures are enforceable, I recommend that the conditions proposed in Schedule H Land and Biodiversity in Appendix A of this assessment report be applied to the draft EA. Further information on rehabilitation is available in section 6.6 of this assessment report.

The EIS identified a low risk of acid sulfate soils occurring at the CLF and western part of the Product Haul Road given the presence of bedrock at, or very close to, the ground surface. However, the EIS proposed the preparation of an Acid Sulfate Soils Management Plan for the construction of the CLF and coastal infrastructure. The plan would provide a framework to ensure that the potential impacts from disturbance of potential acid sulfate soil during the project construction activities are monitored, managed and, if necessary, mitigated.

To ensure this mitigation measure is enforceable, I recommend that conditions J28 to J30 proposed in Schedule J Marine in Appendix A of this assessment report be applied to the draft EA.

6.5.4 Land use

EIS Chapter 19 (Land Use) adequately described the land use of the project site and surrounds. The project site is largely undeveloped with natural bushland and coastal environments. It's predominantly used for traditional cultural practices as well as for recreational activities. Bauxite exploration has been undertaken within the project site since the 1950s. A derelict airfield is located in the project site. No farming or agricultural activities are undertaken within the project site.

The land is used by both Traditional Owners and other residents of Aurukun township for activities including hunting and resource collection, including roots and bulbs for pigments used for painting, leaves for weaving, wood for carving and plants for medicine. Resource collection predominantly occurs in the riparian zone of the creek systems that traverse the project site.

Surrounding land is used by Traditional Owners for a range of recreational activities (e.g. camping and fishing). Amban Outstation and Waterfall Outstation are used by Traditional Owners for camping. The Traditional Owners also access the rivers for fishing, camping and other social gatherings, particularly locations around the confluence of the Archer, Watson and Ward Rivers, near Aurukun township. The upper reaches of the Ward River are periodically accessed by Traditional Owners for fishing and there is a swimming hole in the upper reaches of Sandy Creek.

Amban beach and associated coastal waters are used intermittently by Traditional Owners for a range of activities including recreational fishing, hunting and walking. These activities extend

north and south of the project site along the coastline. Non-Indigenous visitors to the area also use the beach and marine waters for recreational activities.

6.5.4.1 Commercial fishing

The majority of non-Indigenous land use relevant to the project site relates to fishing, typically conducted from marine vessels moored offshore. The inshore marine waters, where the LOJ and transhipping activities are proposed, may occasionally be navigated by commercial and recreational fishermen, as well as charter boat fishing operators.

EIS Section 19.7.7 of Chapter 19 (Land Use) detailed the restrictions that would apply to the transhipping operations, designed to minimise impacts on other marine users, including commercial fishing vessels. Given the limited scope of these restrictions, the project would not be expected to significantly impact the economic output of the commercial fishing industry operating in the vicinity of the transhipping operations.

Section 6.9.2 of this assessment report discusses potential impacts and identified management strategies relevant to fisheries resources.

6.5.4.2 Fire and land management

As described in Chapter 11 (MNES) section 11.8.3 of the EIS, the region has experienced a history of frequent (typically yearly) and often intense fires which often occur late in the dry season. Additionally, much of the land within the project site is subject to periodic burning by Traditional Owners.

The EIS included a Bushfire Management Plan to reduce potential for ignition and guide the management of bushfire risks to both project infrastructure and human safety. The plan primarily focuses on areas near mining operations and infrastructure.

The Queensland Fire Department's submission on the EIS stated that the Bushfire Management Plan (Appendix Y of the EIS) did not adequately address the technical requirements of the Bushfire Resilient Communities document (Queensland Fire and Emergency Services 2019).The approach taken in the Bushfire Management Plan in the EIS deviated on some important parametric constraints and inputs, including the recommended requirement for available water supply for firefighting purposes.

The proponent updated Chapter 22 (Environmental Management and Conditions) of the EIS to include a commitment to update the Bushfire Management Plan prior to the commencement of construction. I support this commitment.

For areas outside the operational footprint, the proponent committed to consulting with Traditional Owners regarding land management activities, including fire management, and to establish a land and sea management organisation for the implementation of those activities.

6.5.4.3 Adjacent mining operations

The Product Bauxite Transport Corridor crosses mining lease 7024, a tenement held by RTA Weipa for the Amrun Mine. To facilitate EIS and engineering studies, the proponent and RTA Weipa entered into an Access Licence agreement for associated activities within mining lease 7024.

The EIS stated that the proponent plans to obtain a transportation mining lease and a specific purpose mining lease for the Product Haul Road and CLF, respectively. The proponent advised that they are consulting with RTA Weipa on this matter. This is being conducted outside of the

EIS process.

6.5.5 Landscape character and visual amenity

EIS Chapter 15 (Visual Amenity) adequately described and assessed the potential impacts on the existing landscape character and visual amenity. The visual assessment for the project involved undertaking field inspections and photographic and map analysis to identify visual receptors and characterise the existing visual setting, the sensitivity of visual receptors and the visual effect of the project. To support the visual assessment and understanding of the project, the proponent published an online interactive map in December 2022. It provided a comprehensive view of the project site, including information hot spots for key features, and photo montages at locations such as the CLF and Tapplebang Dam.

The EIS considered Amban Outstation to have a high visual sensitivity while Aurukun Road has a low visual sensitivity. No other receptor was identified from which the project would be visible. The overall visual effect on Amban Outstation was rated as very low, while the visual effect from the beach in front of the outstation was rated as moderate. The visual assessment found that the project would not be expected to be visible from the veranda at Amban Outstation, with views towards the CLF stockpiles, buildings and the jetty being largely obscured by vegetation.

The EIS described a range of measures to avoid and mitigate potential impacts on visual amenity, such as progressive rehabilitation of mined areas, neutral tones with matte finish on infrastructure cladding, and lighting design considerations. I support these, as committed to in Chapter 22 (Environmental Management and Commitments) of the EIS.

In their submission during the public notification stage of the EIS, the Traditional Owners requested consultation to identify appropriate flora to be used in buffer zones to minimise impacts on visual amenity at Amban Outstation. This was noted and agreed to by the proponent in the EIS. I support this commitment.

6.6 Rehabilitation

EIS Chapter 5 (Mine Rehabilitation and Closure) and Appendix E (Draft Proposed Progressive Rehabilitation and Closure Plan (PRC plan)) provided a proposed PRC plan for the project which comprised the rehabilitation planning part and a proposed draft PRC plan schedule (PRCP schedule). I assessed the documents in accordance with the requirements of the EP Act and department's statutory guideline, *Progressive rehabilitation and closure plans* (PRC plans guideline) (ESR/2019/4964) (DES 2023), including how the information provided in the rehabilitation planning part justifies the post mining land use (PMLU) as well as the associated milestones and milestone criteria contained in the PRCP schedule.

The proposed PRC plan generally followed the information requirements in the statutory PRC plans guideline at a high level. However, key details, information gaps and matters remain outstanding. These matters are described below.

6.6.1 Rehabilitation planning part

For the rehabilitation planning part of the proposed PRC plan, I consider the following elements were generally addressed: regulatory requirements, geochemistry, soils and land suitability, management of soil resources and acid sulphate soils. However, more detail on these matters is needed to provide greater certainty and meet statutory requirements. Sufficient details were provided for proposed soil management measures which is a key consideration in the likelihood

of revegetation success.

6.6.2 PRCP schedule and conditions

I do not consider the proposed PRCP schedule met the information requirements of the EP Act and PRC plans guideline in sufficient detail. I have identified the following key matters in my assessment of the proposed PRCP:

- The EIS presented sound objectives for the PMLU of 'native vegetation' but the terminology was incorrect. I propose the more appropriate PMLU terminology of 'native ecosystem' in the draft PRCP schedule in Appendix B.
- Rehabilitation areas are appropriately identified and the PMLU revegetation methodology, while only briefly described, is sound. Greater consideration is warranted for the use of tube stock rather than seeding, but the recommended trials may address the associated risk. I consider that drainage and topsoil management are adequately addressed.
- The rehabilitation milestones were not consistent with the SMART (being Specific, Measurable, Achievable, Reasonable/relevant, Time specific) principles, particularly regarding monitoring details and frequency during the first year.
- Rehabilitation reporting did not identify progress and positive outcomes that align with objectives and the achievement of rehabilitation milestones.
- Tables in the PRCP schedule did not reflect the progressive nature of the rehabilitation required, nor the time required to achieve specific milestones. I have reflected the expectations on how the tables should be presented in section C PMLU of the draft PRCP schedule in Appendix B of this assessment report. However specific timeframes for achieving certain milestones must be further considered by the proponent and addressed.
- Milestone dates proposed were not consecutive. Milestones are required to have a completion date of the 10 December of the calendar year nominated by the applicant. I have updated these in the draft PRCP schedule in Appendix B to reflect a consecutive timeframe, consistent with the PRCP guideline requirements.
- Reference sites have not been identified, justified, or described with measured attributes. These sites are essential for benchmarking vegetative, edaphic, and groundwater characteristics to calibrate rehabilitation milestones. Reference sites should match post-mine soil profiles and be minimally disturbed.
- The EIS adequately outlined species for revegetation, weed management, and trials, but further details are required on seed mixes, priority risks, and intervention actions in the revised proposed PRC plan and PRCP schedule.
- The objectives, indicators, and completion criteria need further development. Many milestones, while reasonable, lack clear outcomes. The monitoring and maintenance section should be expanded and aligned with the proposed milestones.
- Rehabilitation reports do not highlight achievements aligned with objectives and milestones. Some timelines are too short between seeding and completion. A minimum of 15 years is needed for native vegetation areas. Further, the establishment of Target Vegetation Types does not align with regrowth definitions or the age at which Regional Ecosystem (RE) types can be identified separately.
- Figures provided in the PRCP schedule require updating to ensure compliance with the PRC plans guideline. It is also recommended that the maps provided for inclusion in the PRCP schedule are separated into two parts (i.e. Mine Site and CLF part and Product

Bauxite Transport Corridor part), to ensure they are at a scale that allows for easy interpretation.

- The retention of mine infrastructure should be removed from the PRCP schedule due to the lack of a supporting landholder statement (as discussed in section 6.6.3).
- The retention of part of Tapplebang Dam wall should be removed from the PRCP schedule as it is not considered consistent with the proposed PMLU of native ecosystems (as discussed in section 6.6.3).

I have attempted to resolve as many of the above issues as possible in the draft PRCP schedule in Appendix B. However, many issues remain outstanding and require further information from the proponent before they can be assessed and the PRCP schedule refined. While the draft PRCP schedule in Appendix B is incomplete, I considered it may assist the proponent when revising the proposed PRC plan prior to formal lodgement.

I recommend the proponent liaise with DETSI to resolve the above matters prior to formal submission of the PRC plan and PRCP schedule.

6.6.3 Retention of mine infrastructure

Throughout this assessment report, my assessment of Tapplebang Dam has been based on the proposed temporary nature of the infrastructure. However, I note that the proposed PRC plan indicated incomplete removal of the dam wall at decommissioning. I consider retention of any part of the dam wall to be inconsistent with the proposed native ecosystem PMLU. As such, I recommend the proposed PRC plan and PRCP schedule are updated to require full removal of Tapplebang Dam at decommissioning (no remaining embankment walls). No other infrastructure or waste has been approved for disposal onsite as supported by the draft EA, Appendix A of this assessment report. The proposed PRCP schedule in Appendix B also reflects this.

The EP Act requires that all areas disturbed within the relevant mining tenure must be rehabilitated to a PMLU or managed as a non-use management area. Infrastructure can be accepted as part of a PMLU, where the relevant landholder has agreed, through a signed landholder statement, declaring that they will accept responsibility for the infrastructure once mining has ceased. All infrastructure to be retained onsite should be consistent with the PMLU and be safe, stable and not cause environmental harm. As there is no certainty around who may take on the infrastructure proposed to be retained (including roads and the Tapplebang Dam wall), and in the absence of a landholder statement to support the proposed infrastructure retainment, references to the retainment of infrastructure within the PRCP schedule have been removed. Should a signed landholder statement be provided to support infrastructure retainment (roads) upon EA/PRCP application, the PRCP schedule may be modified to reflect this. Please note, separate approvals may also be required where infrastructure is to be retained onsite after the termination of the mining lease.

Additionally, the retention of other mine infrastructure should also be removed from the proposed PRC plan and PRCP schedule due to the lack of a supporting landholder statement. If provided, this may be revised to reflect the landholder's preferences.

6.7 Water

6.7.1 Surface water

Surface water resources and quality at the Mine Site, situated on the freshwater bauxite plateau is addressed in section 6.7.1.1 of this assessment report, and the CLF, positioned along the coastline, is addressed in sections 6.7.1.2, 6.9.3 and 6.10 of this assessment report.

6.7.1.1 Mine Site

I consider that the impact assessment of surface water resources and water quality largely aligns with relevant policies and guidelines, such as the Environmental Protection (Water and Wetlands Biodiversity) Policy 2019 (EPP (Water and Wetlands Biodiversity)). The TOR criteria and EIS submissions were largely addressed within the EIS. I recognise some outstanding matters including those related to submissions from the Department of Local Government, Water and Volunteers (DLGWV) and DCCEEW, as described in sections 7.3 and 7.5 of this assessment report. Where required, I have recommended EA conditions to ensure protection of the high ecological value (HEV) waters.

The waterways on the bauxite plateau, which include Coconut, Tapplebang, and Norman creeks, are ephemeral freshwater creeks that remain largely unmodified and unimpacted. Due to the relatively flat terrain and the high infiltration capacity of the soil and lateritic layers, rainfall tends to quickly permeate into the ground. Baseflow from the lateral recharge of groundwater plays a significant role in sustaining creek flows in the region. Notably, this lateral recharge persists well into the dry season, causing shallow groundwater to move toward the creeks even once rainfall subsides. While direct surface runoff into these creeks also happens, it becomes more pronounced when the soil reaches saturation, generally during the wet season.

The EIS presented both desktop assessments and on-site surveys that identified aquatic ecosystems and sensitive ecological receptors. No significant off-stream wetlands or wetlands of High Ecological Significance (HES) are situated within or immediately downstream of the project area of Coconut or Tapplebang creeks. However, a HES wetland in the Ward River is located approximately 3.0km downstream from the boundary of the Mine Site, as illustrated in Figure 8-6 of EIS Chapter 8 (Terrestrial Ecology). Section 6.9.2 of this assessment report addresses the potential impacts on aquatic ecology in relation to the project.

While the EVs for the project area are not currently specified under Schedule 1, column 1 of the EPP (Water and Wetland Biodiversity), the EIS aptly identified and assigned EVs for surface water protection in accordance with section 6(1)(b) of the EPP (Water and Wetland Biodiversity). They include aquatic ecosystem protection (HEV ecosystems); human consumption of aquatic foods; primary, secondary and visual recreation; drinking water; industrial uses (including Amrun's Mine dam, Mine Ward River abstraction, and supply borefield); and cultural, spiritual and ceremonial values.

The EIS included a surface water quality baseline assessment that was conducted from May 2019 until January 2023, during which between 7 and 19 water samples were collected from each of four monitoring sites within Coconut and Tapplebang creeks. Sampling also occurred in the upper reach of the Ward River. A tributary of Norman Creek, in the northern part of the mine, has not been the focus of monitoring efforts during the EIS, but the proponent has committed to gathering adequate baseline data before the mine operational phase commences. I support this commitment and the proposition that water quality data would be

collected and used to develop site-specific trigger values (SSTV) for Norman Creek, according to relevant guidelines, prior to mine operations commencing.

The EIS identified water quality to be relatively pristine, with observable seasonal fluctuations related to the ephemeral nature and wetting and drying of creeks, particularly for total suspended solids (TSS) and turbidity. The baseline levels of dissolved aluminium, iron and manganese are reported to reflect the natural mineral content of this bauxite-rich region. The EIS determined that, in general, statistical variability in water quality data across the four Mine Site monitoring locations is relatively low. Hence, I agree it is generally appropriate to combine the baseline data sets from the four monitoring sites within Coconut and Tapplebang creeks to establish more statistically robust SSTV for the Mine Site. These SSTV can be applied at Norman Creek until sufficient data is collated and assessed.

The EIS primarily relied on the *Queensland Government's Source Hydrological Model*, a refined version of the Queensland Government eWater Source catchment model, to predict monthly and annual flow volumes under existing creek conditions and under project influences. Site-specific surface water level data has reportedly been collected across Tapplebang and Coconut creeks since November 2018. However, this data was not fully presented in the EIS. The EIS explains the data collected at these stations was not converted to water flow rate data using a calibrated rating curve. Rather, an illustrative-only estimate of rainfall response over approximately 12 months at one location was presented (in EIS Chapter 7, Graph 7-2 and EIS Appendix I, Chart 3). This has been based on converting the site-specific water level data into discharge flow rates using a preliminary rating curve rather than a calibrated rating curve. Creek flows are concluded to be highly ephemeral and seasonal. The ongoing data collection has reportedly been used to inform project planning but has not been relied upon to validate the *Queensland Government's Source Hydrological Model*.

6.7.1.1.1 Potential impacts

The EIS generally evaluated the potential influences of the project on surface water resources and water quality, including:

- the direct removal of waterways and riparian zones owing to the construction of an in-stream dam
- diminished natural flows, alterations to hydrological regimes, and changes in water quality because of the dam and water takes
- overland water flows captured by mine pits
- the release of mine affected water to surface waters
- seepage of mine affected water into groundwater systems, followed by indirect flows to surface waterways
- sediment-associated releases from areas of disturbance or sediment and erosion control dams to surface waters
- the infiltration of water into the various mine dumps, followed by potential contaminated seepage outflows to surface waters
- the effects of open-cut mining on the yield of overland flows in the local creek catchments
- the installation of two creek crossings on Coconut Creek and one on Tapplebang Creek.

6.7.1.1.2 Water supply and demand

The project is projected to require approximately 10.1GL/year of water during 22 years of mining operations, primarily for the beneficiation processing of ROM bauxite ore. The EIS

concluded that the construction and operation of an in-stream dam on Tapplebang Creek was the only feasible water supply option given the predicted water demands and financial and environmental implications of alternative off-stream supply options. Section 6.3.1 of this assessment report details my consideration of the options analysis concerning alternative water supplies.

For the initial three years of operations, there is a strategy to recycle the water from the beneficiation process through the return of decant water from the FCA, supplying between 1000-2800 megalitre per year (ML/year). I support this strategy. However, the EIS omitted a longer-term water recycling appraisal or commitment, which does not meet best practice guidance (IAI 2022). This also complicates an assessment against section 14 of the EPP (Water and Wetland Biodiversity) and TOR criteria 9.4.2. The EPP (Water and Wetland Biodiversity) outlines the need to minimise the volumes of wastewater production and prioritise the reduction of environmental water consumption, wherever feasible.

The extent of potential water consumption savings from an improved water recycling program is not clearly quantified in the EIS. Thus, to align with policy expectations, I recommend that the proponent incorporate this in detailed mine planning to maximise water recycling from pit waters during operations, where an environmental cost analysis demonstrates that ongoing water recycling is beneficial for this site. This should consider power consumption, additional clearing for water storage and processing, contaminant concentration/disposal and other relevant environmental impacts.

In addition to the operational phase water requirements, construction water demand during the two-year construction phase was estimated to be 610ML proposed via a relatively minor abstraction from Tapplebang and Coconut creeks.

Potable water for the project would be supplied from a water treatment plant located adjacent to the Accommodation Village. Feed water to the water treatment plant would also be sourced from Tapplebang Dam. Treated effluent from the sewage treatment plant would be pumped to the Process Water Pond (PWP) at the MIA for reuse in the beneficiation process and used for dust suppression.

I note the above water supply requirements are contingent upon separate approvals administered by DLGWV which are summarised in Table 1. The proponent would need to seek a release of unallocated water from the strategic reserve directly with DLGWV. A licence to interfere with water in a watercourse would be required under section 55 of the Water Plan (Cape York) 2019 (Water Plan (Cape York) for the impoundment of water on Tapplebang Creek. The proponent would need to prepare and submit a water licence application. This is further discussed in section 7.3 of this assessment report. A water permit would also need to be sought to enable the project to take water temporarily for construction activities.

6.7.1.1.3 Water resources impacts, mitigation and monitoring measures

The EIS identified the primary water resources impacts relate to the construction and operation of Tapplebang Dam, such as reduced flow volumes and changes in flow regimes downstream. The proponent maintains that these impacts can be mitigated and managed effectively. This conclusion has been supported primarily using modelling evidence based on the *Queensland Government's Source Hydrological Model*. Some methodological issues were identified in EIS submissions. I consider that multiple lines of evidence would have better assured the EIS assertions of *low impact to the Ward River*. Calibration of the gauging data collected to date against the modelled outputs (at the Mine Site creeks) would have provided further assurances

regarding the EIS assertions that the modelling alone is suitably representative.

The EIS included a commitment to conduct environmental releases from the dam to help mitigate potential impacts on the aquatic ecosystems within Tapplebang Creek and the Ward River. The EIS concluded that post-mitigation only minor alterations to downstream hydrological regimes are likely. For example, the project influenced reduction in the predicted mean annual flow at the Ward River is estimated to be an approximate 5% reduction.

The water resources and flow impact assessment, including proposed monitoring and mitigation requirements and recommendations are discussed for each creek and the Ward River in more detail in section 6.9.2 of this assessment report. I support EA conditions for continuous monitoring of receiving water stream flow at three locations in Coconut, Tapplebang and Norman Creek as outlined in the proponent's proposed EA conditions in EIS Chapter 22 (Environmental Management and Conditions). In addition, I consider additional flow monitoring is required as outlined in section 6.9.2 of this assessment report.

The EIS presented a water balance model that accounts for local climatic variability and potential climate change impacts. The water management system features a 20ML dewatering dam and a 440ML MIA dam at the MIA. These dams are engineered to collect all contaminated runoff, including that from the ROM stockpiles, laydown, and workshop areas while limiting clean water ingress to reduce the frequency or likelihood of overflows throughout the project's life. Mine affected water dams are planned to be sized and managed to preclude overflows for some of the project duration. The proponent commits to continuous data collection, annual reviews of the water management system, and validation of the water balance model, which I support.

The PWP is designed as a fully lined Turkey's Nest dam with 125ML capacity (and up to 141ML to the dam spillway level). The PWP is planned to receive raw water from the proposed Tapplebang Dam, Class A treated sewage treatment plant wastewater (25.6ML/year), as well as water reclaimed from the FCA decant in the initial years of operations. For much of the operational phase, after bauxite processing, a proportion of the water moves with the fines to the FCA or in-pit fines areas where evaporation and seepage into land are planned to occur, with some additional releases to local surface waters modelled to occur.

The potential impact of the project on downstream aquatic ecosystems and cumulative impacts to other surface water users are assessed in section 6.9.2 and 6.7.1.1.5 of this assessment report, respectively.

6.7.1.1.4 Water quality impacts, mitigation and monitoring measures

Uncontrolled seepage of mine affected water is anticipated to shallow groundwater via the walls and floor of the mine pits and FCA. This is identified in the EIS as a key method of environmental releases of mine affected water from the Mine Site.

Mine affected waters releases to local creeks are also planned. The management intent for HEV waters, as stipulated under section 15(2) of the EPP (Water and Wetland Biodiversity), requires that decisions regarding wastewater discharges to surface waters ensure no alteration to the concentrations of water quality indicators relevant to all EVs. I consider this management intent was appropriately acknowledged by the proponent during the EIS process. However, the impact assessment of such discharges was somewhat lacking as discussed below. Overall, the EIS claims that risks of adverse water quality and aquatic ecosystem health impacts are low for this proposal.

For surface waters, I consider that the EIS largely assessed and met the EP Regulation objectives and performance outcomes and EPP (Water and Wetland Biodiversity) to avoid and minimise the direct release of mine affected water, where possible. This is discussed further in section 6.7.1.1.2 of this assessment report.

The surface water management approach focuses on the following key objectives to minimise potential impacts from direct discharges of mine affected water, namely:

- segregation of clean water from water affected by mining activities and disturbance, minimising the generation of possibly contaminated water
- active utilisation of available water storage capacity in open cut pits and in-pit fines emplacement areas to minimise the frequency and volumes of surface water releases
- prioritisation of dust suppression use of mine affected water if it complies with the requisite EA conditions
- prediction that mine affected water releases would only occur during periods of relatively high stream flows enhancing dilution and mixing
- commitment to ensure suspended sediments are effectively removed or reduced via the use of appropriately designed pit sumps and erosion and sediment control structures.

The EIS proposed nine release points for mine affected water to Tapplebang, Coconut and Norman creeks. The proposed release points located on Norman Creek appear to be off-lease, and hence further clarification and negotiation is required to determine if these release points are suitable. In the interim I recommend the spatial information for these release points are clarified and negotiated as part of the subsequent EA application.

I acknowledge that suspended sediments are clearly identified in the EIS as the primary potential contaminants of concern (COC) for surface waters associated with the Mine Site. No hazardous chemical additives are reportedly used in bauxite processing, and thus no additive COCs are expected from beneficiation processing. The main hazardous chemicals stored and used onsite are listed as diesel, oils and degreasing solvents. The EIS lacked a consistent and complete list of COC for surface water and groundwater. Therefore, I have determined that the primary COCs for contaminated and receiving waters, as a minimum are as follows: electrical conductivity (EC); sulphate; pH; dissolved oxygen (DO); turbidity; total suspended solids (TSS); dissolved aluminium; total iron; dissolved selenium; dissolved manganese; and petroleum/recoverable hydrocarbons. Further, due to the proposed co-mingling of Class A treated sewage treatment waste with process water and the operation of the dam on a HEV waterway, I consider the following additional COCs are relevant for mine affected water and the receiving environment — nutrients (including total nitrogen, total phosphorous, ammonia, nitrate), total chlorine and temperature.

The EIS asserted that surface water and groundwater quality impacts from the Mine Site are unlikely. This conclusion is primarily based on qualitative assumptions based on the findings of EIS Appendix K (Mine Water Balance Modelling Report) and Appendix C (Geochemistry Report). I note that the requirements outlined in the *Technical guideline: Wastewater release to Queensland waters* (ESR/2015/1654) (DESI 2024) were inadequately addressed in the EIS. Despite DETSI's EIS submission, the EIS failed to present a quantitative prediction of the impacts of proposed mine affected water releases on the HEV receiving waters. A detailed evaluation of the anticipated release concentrations and volumes, and dilution and mixing with baseline water quality and stream flow volumes would have better informed the EIS appraisals.

The main EIS rationale provided for the assertion of low potential for adverse water quality

impacts is based on the stated low-frequency and relatively low-volume releases of mine affected water. These are modelled to be confined to periods of high stream flow. These releases are projected to constitute a minor proportion of natural stream flows. However, I note that no corresponding conditions, commitments or ongoing monitoring was proposed to ensure this level of assumed dilution is actively assured, measured or reported.

In addition, evidence from geochemical characterisation of bauxite ore, fines, and pit floor materials, as well as static and kinetic leachate analyses of the same materials is presented as suitable justification of minimal impact. EIS Appendix C (Geochemistry Report) concluded that the bauxite ore is unlikely to be highly dispersive and that runoff or seepage from the ore would exhibit low acidity, low salinity, and low concentrations of heavy metals and metalloids. Additionally, site-specific fines kinetic leachate studies were used to discount risks of water quality impacts, including acid-forming potential due to long-term weathering processes. Review of this material identified some potential additional COCs as stated above. Additional risk assessment and scientific rationale including assessment of baseline data against the freshwater toxicity trigger values for 99% species protection as published in the *Australian and New Zealand guidelines for fresh and marine water quality* (ANZG 2018) could have provided refinement for the development of limits.

Five sediment basins are proposed to assist in the removal of suspended sediments at the Mine Site. The EIS Appendix AA (Draft Erosion and Sediment Control Plan (ESCP)) detailed that Type D sediment dams were planned during both construction and operational phases. These dams would intercept runoff from disturbed areas, channelling it into treatment basins before discharging treated water in a controlled manner. Uncertainty remains regarding the potential for sediment basins to receive contaminants other than suspended sediments due to run-off from various mine-affected areas. Hence, I recommend the addition of sediment basins as release points in Table F1 proposed in Schedule F in Appendix A of this assessment report.

I consider that the sediment quality baseline studies presented in the EIS were lacking detail. I recommend that the Receiving environment monitoring program (REMP) proposed in the EIS apply the default national sediment quality guideline and triggers of the most recent *Guideline values for water/sediment quality (ANZG)* until suitable detailed information is presented regarding baseline sediment mineralisation concentrations.

Based on my assessment summarised above, I recommend conservative water quality limits be applied for release points and for receiving environment monitoring points until further scientific justification is provided. I recommend that the conditions proposed in Schedule F Surface Water in Appendix A of this assessment report be applied to the draft EA.

I further recommend that:

- additional COC indicators, interpretation parameters and more stringent limits or triggers are applied at the point of release and receiving environment monitoring points
- the upstream monitoring point on Coconut Creek be relocated further upstream to ensure it is not influenced by runoff from future mining disturbance areas, stockpiles, release points or erosion and control structures
- a condition is added to ensure mine affected water discharges to surface waters do not take place during periods of no stream flow in receiving waters
- an additional EA water quality monitoring point is added within the dam impoundment area (as per Table F4 in Schedule F Surface Water in Appendix A of this assessment report) due to mine affected water discharges planned to be directed towards Tapplebang Dam

- ongoing REMP water quality and flows monitoring be undertaken at relevant locations including the Ward River to provide information regarding the baseline versus impact condition at this sensitive receptor.

These matters can be reassessed if additional information is provided with the EA application.

6.7.1.1.5 Cumulative impacts

The EIS stated that there would be no cumulative impacts associated with the proposed Tapplebang Dam and the neighbouring RTA Weipa mine dam (Arraw Dam), as the dams would be situated in separate surface water catchments.

The only current approved surface water entitlement in the Ward River catchment is the RTA Weipa Amrun Mine Pump site. It is projected in the EIS that water extraction from the Tapplebang Dam would have minor impacts on flow volumes at the Amrun Pump site, potentially affecting pumping availability for an additional three days per year on average during low-flow periods. The probability of the annual water entitlement availability is predicted to remain above 97%, which is well above the Water Plan (Cape York). Therefore, the project is not anticipated to have a significant adverse impact on downstream surface water usage at the Amrun Pump site. The EIS assessed the water access constraints and requirements stipulated by the Comalco Act. This matter is further discussed in section 7.3 of this assessment report.

Since there are no other current surface water entitlements within the Ward River catchment, the EIS did not identify any further cumulative impacts on downstream water users.

6.7.1.1.6 Dust suppression

To protect the relatively fresh groundwaters from mine affected or blended water used for dust suppression, electrical conductivity of dust suppression water must be monitored. I recommend condition G3 proposed in Schedule G Sewage Treatment in Appendix A of this assessment report be applied to the draft EA. Treated water from the onsite sewage treatment plant, blended or otherwise, may be used for dust suppression only if it meets the water quality criteria listed in Table G2 proposed in Schedule G Sewage Treatment in Appendix A of this assessment report.

6.7.1.2 CLF dams

The assessment of potential water quality impacts from the construction and operation of the CLF and TSV activities is discussed in sections 6.9.3 and 6.10 of this assessment report.

The Draft ESCP proposed the early construction of four Type D sediment dams at the CLF to reduce sediment-related impacts and releases during both construction and operational phases. These dams are intended to intercept runoff from the CLF's disturbed areas, channelling it into treatment basins before discharging in a controlled manner to land at the designated release points shown in Figure 7-12 of EIS Chapter 7 (Surface Water).

To ensure the protection of the receiving environment at the CLF, I recommend that conditions F41 to F44 proposed in Schedule F Surface Water in Appendix A of this assessment report be applied to the draft EA. This is to expand on the EIS commitments and draft EA conditions to implement an ESCP prior to construction phase.

6.7.2 Groundwater

EIS Chapter 6 (Groundwater) and Appendix F (Groundwater Report) addressed the TOR with

respect to the groundwater resources and quality. I am satisfied that the impact assessment largely aligns with relevant policy and guidelines, including the EPP (Water and Wetland Biodiversity). The EIS concludes that it can meet the environmental objectives and performance outcomes in Schedule 8 of the EP Regulation. Namely, that the activity will be managed to minimise adverse effects on groundwater and any associated surface ecological systems.

I consider that the project is unlikely to result in significant, permanent adverse changes to groundwater quality, levels, or impact sensitive EVs. Ongoing monitoring and compliance will be imperative to ensure the relatively low impact assertions predicted in the EIS are achieved during the mine life. There were several potential changes noted in terms of mounding, drawdown and water quality alterations which require ongoing monitoring and EA conditioning.

The EIS competently described the aquifers at the Mine Site and offers a conceptual hydrogeological model that shows groundwater flow directions and interactions with surface waters, as well as seasonal water table level variability. The site falls within the area relevant to the Water Plan (Great Artesian Basin and Other Regional Aquifers) 2017 (Water Plan (GABORA)) and the Water Plan (Cape York).

Local hydrogeology features a permeable shallow lateritic aquifer, comprising the bauxite layer (1 to 13m thick) and underlying weathered Bulimba Formation (7 to 27m thick). These are highly hydraulically connected and virtually act as a single aquifer. There are no significant geological barriers inhibiting lateral groundwater movement and the water table reacts sensitively to rainfall.

The underlying fresh Bulimba Formation, consisting of consolidated siltstones, and the underlying Rolling Downs Group, positioned up to 40m below ground level at the Mine Site (and reaching depths of 970m), restricts interactions between shallow lateritic aquifer water and underlying GAB aquifers. As the project does not involve water resource extraction from the GAB, which the EIS classifies as saline and unsuitable for direct application in beneficiation process, it is unlikely to impact these deeper aquifers to any measurable extent.

During the dry season, the bauxite layer largely remains dry, while the water table is found within the underlying weathered Bulimba Formation. Typically, the bauxite's base is only saturated for a period of less than eight weeks annually. Seasonally, the groundwater table at the Mine Site fluctuate up to approximately 10m. Following the wet season, groundwater levels peak, reaching within 0 to 8m of the ground surface. Conversely, in the dry season, groundwater depths exceed 8m below the surface but still intersect with creek beds in some areas.

The relevant EVs for shallow groundwater have been presented in the EIS, as discussed in section 6.7.1.1 of this assessment report, where they align with those for surface waters. The EPP (Water and Wetland Biodiversity) necessitates that HEV waters experience no change in water quality due to resource project wastewater releases. This was appropriately identified in the EIS.

The EIS presented and analysed site specific baseline data and information on local groundwater resources and quality. However, there may still be a need for more bore-specific data, particularly for the planned yet to be installed ‘p’ suffix bores and for detailed trigger and water level baseline settings.

The EIS found shallow groundwater to be slightly acidic and non-saline, with low concentrations

of most dissolved metals and metalloids. The bauxite layer groundwater quality is similar to local surface water quality reflecting the predominance of rainfall infiltration and runoff and the low residence time of this groundwater with the local geologies.

Shallow groundwater's lateral movement towards local surface water creeks means that this section should be read in conjunction with surface water evaluations in section 6.7.1.1 of this assessment report.

6.7.2.1 Potential impacts

The EIS provided a thorough evaluation of the project's potential impacts on groundwater resources and water quality. The assessment included potential impacts such as:

- seepage of pit water or mine affected water from areas including the open cut mining pits, FCA and in-pit fines disposal areas
- leakage of hydrocarbons and chemicals from storage areas or during transit
- infiltration of groundwater into the open mine pits
- localised effects on the shallow aquifer, including potential drawdown or mounding, with potential for impacts on Groundwater dependant ecosystem's (GDE) or groundwater seeps and surface water interactions
- seepage from water stored within the dam's impoundment area.

The project did not propose to actively extract groundwater to supply water needs. However, the EIS provided an assessment of the use of GAB water as an alternative water supply for the project in response to DLGWV's submission. This is further discussed in section 7.3 of this assessment report.

Incidental groundwater take was committed to follow the established provisions set out for resource projects under the MR Act, contingent upon the approval of an EA and adherence to monitoring, reporting, and notification protocols mandated by DETSI. In response to EIS submissions, the proponent has recognised the restriction on mine dewatering without authorisation under the EP Act. They explain that, based on the regional groundwater regime, topography of the mine site, mining strategy and regional experience, dewatering will not be required to achieve safe operating conditions in the mine. The proponent also appropriately acknowledges that they would be required to seek an amendment to their future EA pursuant to section 227AA of the EP Act if they were required to exercise underground water rights at some future point in the mining operation. The proponent also agreed to monitor and report any actual groundwater usage or divergence, if relevant, from the predictions in line with mandatory requirements of the MR Act and underground water impact report review processes stipulated by the *Water Act 2000* (Water Act).

6.7.2.2 Water resources impacts, mitigation and monitoring measures

I am satisfied the groundwater resources impact assessment broadly met the requirements of the TOR and addressed EIS submissions. Refer to section 7.3 of this assessment report for further detail on DLGWV's outstanding matters relating to groundwater.

EIS Appendix F (Groundwater Report) predicted no net groundwater extraction from the fresh Bulimba Formation or the Rolling Downs Group. Instead, it demonstrated an overall general increase in groundwater recharge is likely from the proposed project.

The bauxite is a thin surficial layer and is rarely saturated at the Mine Site. Thus, it is not typically practical to obtain a reliable groundwater supply from the bauxite in the Mine Site and

surrounds. Importantly, there were no identified groundwater bore users targeting the bauxite layer or weathered Bulimba Formation within 5km of the Mine Site.

Mine pit depths were not expected to reach the water-bearing weathered Bulimba Formation beneath the bauxite ore, nor intersect with deeper strata. Hence, depressurisation zones would be generally less than those from more invasive mining practices. Any potential areas of depressurisation were predicted to be somewhat mitigated by quick rainwater infiltration and water mounding from pits or the dam. Additionally, the removal of vegetation in mining areas was predicted to increase groundwater levels generally by reducing transpiration-induced losses.

Site specific baseline data was used in the development of a conceptual groundwater regime model, 3D numerical flow models, and the prediction of potential mining impacts on groundwater resources, including from mine associated seepage, mounding, and drawdown. The EIS presented a series of modelling scenarios to reflect the stages of mine development and predicted impacts both on and off-lease.

Predicted impacts on watercourses and drainage features were presented in detail and are predicated to be minimal. Any minor baseflow changes were noted to be unlikely to measurably alter the natural flow regimes, which are subject to significant annual seasonal variation. Further discussion on this matter is presented in section 6.9.2.2 of this assessment report.

Modelling presented in the EIS indicated the worst-case seasonally fluctuating drawdown zone may extend up to 600m from the project's disturbance area and off-lease. The EIS predicted off-lease drawdown, will not adversely impact any water users, terrestrial ecosystems, creek baseflows or the deeper fresh Bulimba Formation layers. Similarly, no potential impacts to the Aurukun township groundwater supply bores (20km away from Mine Site) and coastal waters of the Gulf of Carpentaria (20km away from Mine Site) are predicted to be likely.

The EIS presented detailed analysis and modelling to demonstrate the predicted mounding is unlikely to significantly or adversely impact any water users, terrestrial ecosystems or creek baseflows off-lease. Mounding is anticipated to be most pronounced near the mining in-pit fines placement areas, FCA, and adjacent to Tapplebang Dam, with the groundwater level experiencing up to 16m of mounding, largely remaining within the Mine Site. The maximum extent of the worst-case zone of mounding is predicted as less than approximately 1,400m outside the western boundary of the Mine Site.

Following EIS submissions, further modelling assessed the worst-case scenarios for neighbouring bauxite operations, revealing potential mounding impacts, particularly near RTA Weipa mining lease 7024. The predicted impacts fluctuate over the mine life and due to seasonal influences, and it is unlikely to remain a consistent impact during the operational phase. Detailed analysis of the EIS modelling hydrographs revealed the nature, timing and magnitude of mounding impacts at various locations within RTA Weipa mining lease 7024. The largest predicted mounding during post dry season scenarios is up a maximum of 2.4m and occurs in the November of project years 17 and 18 at TE5. Yet, this modelled mounding is still not anticipated to saturate the base of the bauxite in the post dry season scenarios.

For post wet season mounding scenarios at the RTA Weipa locations, the degree of mounding due to the proposed project is relatively low (up to approximately 0.2m), noting that all mining and no-mining scenarios model the bauxite as being partially or fully saturated at these times due to the wet-season rainfall infiltration influences. I note that it does not appear that drawdown or mounding impacts were assessed cumulatively with Amrun mine pit development

plans, and the proponent explained this was due to a lack of relevant input data pertaining to the Amrun mine development schedule and mine pit designs.

Given groundwater mounding predictions in the EIS are used to discount the likelihood of adverse impacts to off-site terrestrial EVs, access to or use of groundwater at RTA Weipa's mining lease 7024, and will fluctuate seasonally regardless, I consider the proponent's proposal to monitor groundwater levels at a new proposed bore p_MB13 adjacent to the RTA Weipa lease to be a suitable measure. I recommend this monitoring bore is formalised in Table E1 in Schedule E Groundwater in Appendix A of this assessment report, noting that further assessment work will be required once data has been collected from this new bore to derive an appropriately protective ground water level trigger.

The EIS clearly identifies the importance of maintaining aquifer groundwater quality and groundwater levels to support ecosystems including for any existing aquatic, terrestrial and subterranean GDEs. The Mine Site GDE study area was defined spatially and sized to align to the mapped drawdown and mounding modelling results (as presented in Figure 6-9 of EIS Chapter 6 (Groundwater)). GDE databases and atlases were then searched to prioritise the field-based surveys accordingly.

No off-stream GDE wetlands were found within the specific GDE study area from database searches or field-based studies, hence impacts to GDE wetlands from groundwater drawdown or mounding are not predicted. In terms of potential impacts to GDE springs or creek baseflows, section 6.9.2.2 of this assessment report notes potential changes to Coconut Creek baseflows and groundwater surface expression.

Terrestrial GDEs were found within the maximum anticipated impact zone for drawdown or mounding associated with Coconut Creek, Tapplebang Creek and their tributaries.

I consider that subterranean GDEs, stygofauna, were adequately considered as part of the EIS. This included site-specific baseline surveys to determine their presence or absence in the Mine Site shallow aquifers. No endemic or specialised stygofauna were found but rather a limited number of common aquatic species usually found in soils and aquatic sediment environments. EIS Appendix Z (Stygofauna Report) noted that the characteristics of the local shallow groundwater systems do not align with typical stygofauna habitat, due to the unsuitable geological and hydrogeological factors observed. Consequently, the EIS concluded that the proposed project is not expected to adversely affect any endemic or specialised stygofauna.

6.7.2.3 Water quality impacts, mitigation and monitoring measures

As interactions between shallow groundwater and surface water are a notable feature of the Mine Site, the groundwater and surface water quality sections of this assessment report should be considered collectively. Additionally, I note that similar methodological issues identified for the surface water monitoring program and impact assessments are also relevant to groundwater baseline assessments and refinements of the EA conditioning.

The proposed water management strategy for the Mine Site includes the planned seepage of mine-affected waters via the walls and floors of the mine-pits, FCA, and in-pit fines emplacement areas. The EIS describes the potential characteristics of the seepage mine affected water as being non-saline with low metal concentrations and a pH comparable to the typical local surface waters. This has been primarily based on geochemical and leachate assessments of the bauxite ore and fines (as described in the EIS Appendix C (Geochemistry Report)) and assumed dilution of mine affected water with rainfall or groundwater infiltrations.

Consequently, the EIS suggests that the likelihood of detrimental impacts on groundwater quality from the release of mine affected water is minimal. This conclusion was questioned in EIS submissions, and no further detailed quantitative impact assessments was presented in the response to submissions.

The EIS asserts that the seepage-based release strategy poses lower risk of water quality impacts than increasing the volumes of direct surface water discharges, which could elevate the release of suspended solids and other contaminants to HEV creeks and the Tapplebang Dam. I agree that if this strategy were to be implemented in full alignment with EIS assumptions of suitable clean water dilution, it would represent a relatively low risk approach for local groundwaters. However, the HEV status of the local groundwaters necessitates further assurances to account for these assumptions.

I recommend conservative bore specific groundwater quality limits and a Limit A and Limit B style compliance approach as proposed in Schedule E Groundwater in Appendix A of this assessment report, to align with the HEV protection status. I also support the integration of conditions and new monitoring bores from the additional provided information in the proponent's Appendix AB (Response to Submissions) of the EIS. These conditions are designed to monitor against the existing baseline water quality conditions and to alert of water quality changes within the relevant hydrogeological units on the Mine Site and to safeguard groundwater resources EVs which include Mine Site groundwater seeps, potential surface water interactions and potential terrestrial GDEs. I highlight that these monitoring and compliance stipulations require additional refinement and baseline data collection to establish statistically robust baseline datasets and limits, especially for the new proposed bores. Refer to Schedule E Groundwater in Appendix A of this assessment report for the recommended EA conditions and future refinement requirements of conditioning.

I also recommend a Groundwater Monitoring and Management Plan (GMMP). This should be a comprehensive assessment, ensuring adequate coverage by the monitoring bore network and indicators. An annual review by an appropriately qualified person is also mandated to verify the GMMP's compliance with condition E12 in Schedule E Groundwater in Appendix A of this assessment report, and to implement any necessary adjustments once further baseline information is collected or to ensure the protection of local groundwater EVs.

I am satisfied that the potential impacts associated with seepage of hydrocarbons and other chemicals have been adequately assessed in the EIS. I support the commitment to store all hydrocarbon or chemical bulk stores in appropriately designed and sized bunding or storage areas. To ensure the protection of HEV groundwaters I endorse the expanded bore network proposed in EIS Appendix AB (Response to submissions) which include bores that will be monitored monthly for hydrocarbons, specifically in areas which are most proximal to potential bulk hydrocarbon sources. Also, the commitment to monitor for hydrocarbons on a routine basis at all other groundwater monitoring bores is supported.

6.7.2.4 Cumulative impacts

The EIS identified the Amrun Mine as the only approved project or activity in the vicinity that would potentially contribute to cumulative groundwater impacts. The main activities identified as potentially contributing to groundwater level impacts of the Amrun Mine included shallow open cut operations and groundwater take from the deep aquifers of the Carpentaria Basin (specifically the Gilbert River Formation, part of the GAB).

The predicted groundwater impacts from the project are expected to be limited to the shallow

groundwater table.

The target groundwater supply for the Amrun Mine is the deeper aquifers approximately 1km below ground level. The groundwater supply borefield for Amrun Mine (6 – 15km west of the project) is outside the maximum predicted drawdown from the project and no depressurisation of the deep aquifers in the GAB is expected for the project, as no GAB water take is proposed.

Given that the impacts to deep GAB groundwater resulting from the proposed project are not predicted to occur, no cumulative impacts were predicted by the EIS. No ongoing mitigation or monitoring measures for the GAB were determined necessary.

6.7.3 Flooding

EIS Appendix J (Flood Study Report) provided an adequate assessment of flooding scenarios under the existing conditions of the Mine Site area. The 0.1% Annual Exceedance Probability (AEP) (1 in 1,000 year) flood event and PMF were simulated and mapped along the main channels of Coconut and Tapplebang creeks. Overall, the flooding behaviour is noted as being generally channelised with limited floodplain areas observed. The Mine Site has been specifically designed to locate the open cut mining pits, FCA, in-pit fines stockpiles and MIA outside of the 0.1% AEP flood event. This negated the need for extra flood protection measures for Tapplebang and Coconut creeks during the operational phase.

I note, the EIS lacked a baseline flood modelling study which included the tributary of Norman Creek or a flood study that considered the introduction of the dam infrastructure on Tapplebang Creek flooding behaviour. The tributary is very high in the Norman Creek catchment. Therefore, I have appraised this EIS shortcoming as posing a relatively low risk of significant flood impacts to the proposed mapped MIA locality.

The TOR required that the EIS present flood modelling to assess how the proposed project infrastructure may potentially change flooding onsite, upstream and downstream. The EIS did not address the potential for the dam embankment to act as a barrier upstream, nor did it quantitatively map or assess potential impacts on the Mine Site or neighbouring infrastructure or roads. Issues concerning flood impact were raised during the EIS submission phase. The proponent's response advised that Tapplebang Dam would have a negligible effect on downstream flows greater than 1,000ML/day. The flood flows required to engage the floodplain of Tapplebang Creek or the Ward River are reportedly significantly larger than 1,000ML/day. The EIS concluded that the dam would not have a discernible impact on the floodplain engagement in downstream Tapplebang Creek or the Ward River. I consider that the explanation provided and the commitment that the dam wall is temporary and will be partially removed lowers the risks any of additional adverse impacts. The EIS reported that the dam would be decommissioned, with the dam embankment removed from the full extent of the 0.1% AEP flood area (see section 6.6.3 for further discussion).

6.8 Regulated structures

6.8.1 Consequence Category Assessments

The EIS described all potential regulated structures generally in accordance with the *Manual for Assessing Consequence Categories and Hydraulic Performance of Structures* (ESR/2016/1933). Initial consequence category assessments for Tapplebang Dam, the FCA, the PWP and sediment basins indicated that the FCA would be the only regulated structure.

6.8.2 Tapplebang Dam

I consider the initial consequence category assessment for Tapplebang Dam to be inadequate. The assessment presented in EIS Appendix B (Consequence Category Assessments) is limited to consideration of contaminates related to dam water quality. However, section 11(d) of the EP Act states that energy can also be a contaminant. I consider that the amount of potential energy stored in the water held behind Tapplebang Dam (up to 10.5GL) to be substantial.

During a dam break scenario, the energy could be released through the sudden rush of a significant volume of fast-moving water that the downstream environment would not otherwise experience if the dam was not there. The Consequence Assessment Report, Appendix B, Figure 3 of the EIS, indicates that the impact zone with elevated flow velocity would overlap sensitive environmental areas. I recommend that the consequence category assessment for Tapplebang Dam be updated as part of the detailed design to consider the impacts of such flow on sensitive areas.

Further, I do not consider that the initial consequence category assessment for Tapplebang Dam adequately considered the local communities' presence on Country when calculating the population at risk in the flood zone. The lifestyle of the local population who frequent the area should be further investigated and taken into account in the assessment (refer to section 6.5.4 of this assessment report for further information on land use). I recommend that the consequence category assessment is updated following consultation with the local community to better understand downstream use of Country.

Should the outcome of the final consequence category be altered, I recommend a pre-lodgement meeting with DETSI prior to formal EA application, to discuss the applicability of the conditions proposed in Schedule I Structures in Appendix A of this assessment report.

6.8.3 Fines Containment Area

EIS Appendix A (Fines Emplacement Conceptual Design Report) adequately assessed the potential impacts of the FCA as a regulated structure in accordance with the current relevant guidelines. The consequence category assessment presented in the EIS assigned the following ratings for the FCA:

- environmental spill—low
- dam break—significant
- failure to contain (seepage)—low.

While a dam break assessment of the worst-case failure scenario for the FCA would result in zero population at risk. the potential large volume of fines discharging into Coconut Creek and flowing downstream would likely cause environmental harm to matters of state environmental significance (MSES).

The EIS proposed adequate measures to avoid, minimise or mitigate the engineering and environmental risks associated with potential failure of the FCA dam walls, seepage through the dam floor or overtopping of the structure.

The EIS stated that the FCA would be designed and constructed in compliance with the *Manual for Assessing Consequence Categories and Hydraulic Performance of Structures* (ESR/2016/1933) to ensure that the design integrity would not be compromised by:

- floodwaters from entering the regulated structure from any watercourse or drainage line

- wall failure due to erosion by floodwaters arising from any watercourse or drainage line.

The FCA would be shaped at closure to promote runoff and ensure a stable post mining landform. Runoff control structures would be installed to manage long-term drainage from the FCA final landform.

To ensure the safe operation of regulated structures, I recommend that the conditions proposed in Schedule I Structures of Appendix A of this assessment report be applied to the draft EA.

The EIS stated that a fines management plan (FMP) would be developed, which would include a detailed fines deposition strategy. A FCA monitoring program would be implemented to monitor key environmental and design performance indicators. The FCA monitoring program would be developed during detailed design and would form part of the FMP.

To ensure these mitigation measures are enforceable, I recommend that conditions C5 and C6 proposed in Schedule C Waste in Appendix A of this assessment report be applied to the draft EA.

6.9 Ecology

6.9.1 Terrestrial ecology

The EIS undertook and described desktop research into the project area's ecology, reviewing records from fauna and flora studies, published vegetation mapping, database searches and analysis of recent high-resolution aerial photography.

The EIS undertook field surveys of the terrestrial and aquatic ecology of the project area and additional locations downstream that have the potential to be impacted by the project. Detailed terrestrial flora and fauna field surveys included:

- Flora surveys of 54 secondary sites, 171 tertiary sites and 194 quaternary sites over the period 2018, 2019 and 2021. Forty-six of the secondary sites were upgraded to habitat quality plots in accordance with the *Guide to determining terrestrial habitat quality* (DES 2020)
- Vegetation communities within the project area were surveyed in accordance with the Queensland Herbarium's *Methodology for survey and mapping of regional ecosystems and vegetation communities in Queensland*, versions 2.01, 4.0, 5.0, 5.1 and 7.0 (Neldner et al. 2024)
- Conservation significant flora field observations were also conducted using the *Flora survey guidelines – Protected Plants* (NCS/2016/2534) (DES 2025)
- Fauna surveys conducted in the early dry season (2019, 2021 and 2022), the early wet season (2018, 2019 and 2022), and the dry season (for palm cockatoos in 2022).

Aquatic ecology surveys were conducted at 38 sites within, upstream and downstream of the project area over 51 days in the late wet seasons and dry seasons of 2018 and 2019. 11 sample sites were sampled on both Coconut Creek and Tapplebang Creek, 12 sites were sampled on the Ward River, one site on the upper reaches of a tributary on the Norman Creek, and three sites in off-channel wetlands (one located near Coconut Creek and two adjacent to the Ward River).

Environmental DNA (eDNA) sampling to detect sawfish species was undertaken once in 2023 and twice in 2024. A remnant waterhole survey was undertaken in 2024 in Coconut Creek and Tapplebang Creek.

GDE field surveys were not undertaken for ecosystems dependent on the surface expression of groundwater, or for ecosystems dependent on the subsurface presence of groundwater. Stygofauna sampling of groundwater monitoring bores was undertaken in 2019.

6.9.1.1 Existing environmental values

The project is located in the Cape York bioregion and is within the Weipa Plateau subregion. The project is primarily within the Ward River sub-catchment of the Watson Basin. Coconut Creek and Tapplebang Creek and their respective catchments are located within the site and the watercourses run from the north-east draining to the south-west where they join approximately 2.5km beyond the project site to form the Ward River. A small tributary of the Norman Creek and its catchment are located near the northern boundary of the project area.

The terrestrial ecology assessment adopted a wider area of study extending beyond the project area of the mining lease. This included a 500m buffer to the mining areas and the Product Bauxite Transport Corridor to the CLF. To consider potential impacts to the downstream environment, an area downstream of Coconut Creek and Tapplebang Creek and their confluence with the Ward River was incorporated. The ecology study area is 26,251.5ha.

Ground-truthing surveys confirmed that remnant regulated vegetation consists of tall eucalypt woodlands, also described as savannah woodlands, and fringing vegetation associated with the watercourses. The savannah woodlands with abundant hollow-bearing trees cover 98% of the study area. The EIS identified the following 13 remnant REs within the study area listed in Table 3.

Table 3 Remnant regional ecosystems within the study area

Regional ecosystem	Description	*Vegetation Management Act 1999* status	Biodiversity status	Extent (ha)
RE 3.2.2	Semi-deciduous vine thicket to vine forest on beach dunes and ridges	Least concern	No concern at present	0.7
RE 3.2.24	Mixed open tussock grassland and open forblands or shrublands on exposed foredunes and islands	Least concern	No concern at present	0.7
RE 3.3.9a	*Lophostemon suaveolens* woodlands to sometimes open forest +/- *Melaleuca viridiflora* +/- *Parinari nonda*. Occurs on streamlines, swamps and alluvial terraces	Least concern	No concern at present	250.1
RE 3.3.9b	*Xanthostemon crenulatus, Lophostemon suaveolens, Asteromyrtus brassii* woodland to open forest +/- *Dillenia alata* +/- *Melaleuca saligna*. Occurs in broad drainage depressions	Least concern	No concern at present	44.6
RE 3.3.20a	*Corymbia clarksoniana* woodland to	Least concern	No concern at	3.5

	open forest +/- *Erythrophleum chlorostachys*. Occurs on a variety of alluvial plains derived from a range of geological substrates		present	
RE 3.3.20b	*Corymbia novoguinensis* woodland to open forest +/- *Lophostemon suaveolens*. Occurs on floodplains	Least concern	No concern at present	337.1
RE 3.3.49	*Melaleuca viridiflora* +/- *Corymbia clarksoniana* low open woodland on floodplains and alluvial plains	Least concern	No concern at present	12.2
RE 3.3.50g	*Melaleuca quinquenervia* shrubland to closed heath +/- *Asteromyrtus lysicephala* +/- *Gahnia sieberiana* +/- *Pandanus spp*. Occurs on swamps predominantly on floodplains	Least concern	No concern at present	10.3
RE 3.3.64	*Baloskion tetraphyllum subsp.Meiostachyum* and/or *Leptocarpus spp*. and/or *Dapsilanthus spathaceus* open sedgeland in drainage swamps	Least concern	No concern at present	0.4
RE 3.5.36b	Woodland to open forest of *Eucalyptus tetrodonta* and *Corymbia nesophila* +/- *Erythrophleum chlorostachys* +/- *C. stockeri*. Occurs on sands on tertiary plateaus	Least concern	No concern at present	25,222.20
RE 3.5.39	*Eucalyptus tetrodonta* +/- *Corymbia clarksoniana* woodland on sand plains	Least concern	No concern at present	0.3
RE 3.7.3	*Eucalyptus cullenii* +/- *E. tetrodonta* woodland on erosional escarpments and plains	Least concern	No concern at present	0.7
RE 3.7.4	*Eucalyptus tetrodonta* and *Corymbia stockeri* woodland on ironstone knolls	Least concern	No concern at present	260.1
Total area				**26,142.90**

Adapted from Chapter 8, Table 8-3 of the EIS.

An extensive list of 473 native flora species were recorded in the study area. No threatened flora species were identified in field surveys. A likelihood of occurrence assessment determined that four species listed under the *Nature Conservation Act 1992* (NC Act) and eight species listed under the EPBC Act, had a low likelihood of occurrence within the study area. Two 'high risk' areas for protected plants related to the Cooktown orchid, *Dendrobium bigibbum*, were mapped under the Flora Survey Trigger Map in proximity to the far western end of the Product Bauxite Transport Corridor. No mapped wetland areas were identified within the project site.

182 native fauna species were recorded in the study area that included 31 species of mammals, 34 species of reptiles, 16 species of amphibians and 101 species of birds. Two terrestrial protected wildlife species listed under the NC Act were recorded in the study area – the palm cockatoo, *Probosciger aterrimus macgillivrayi*, and the red goshawk, *Erythrotriorchis radiatus*. The white-throated needletail, *Hirundapus caudacutus*, and the masked owl (northern), *Tyto novaehollandiae kimberli*, were considered to have a high and moderate likelihood of occurring in the study area respectively. A range of migratory birds were recorded on site or considered to have a moderate likelihood of occurrence. The short-beaked echidna, *Tachyglossus aculeatus*, listed as special least concern under the NC Act, and the rufous owl (Cape York subspecies), *Ninox rufa meesi*, were also recorded as present in the study area.

6.9.1.2 Impacts on terrestrial ecosystem values

The EIS stated that 6,897ha of remnant vegetation would be directly impacted by project clearing activities. Additional indirect impacts from fragmentation of habitat were recognised in relation to the clearing associated with Tapplebang Dam, and the isolation of habitat between linear infrastructure and active mining areas for the palm cockatoo totalling 1,828.5ha, and totalling 2,409ha for the red goshawk and masked owl (northern).

Impacts to MSES were assessed against the *Queensland Environmental Offsets Policy Significant residual impact guideline* (DEHP 2014).

Regulated vegetation

One class of MSES regulated vegetation subject to significant residual impacts includes watercourse vegetation. Riparian vegetation would be cleared as the result of three creek crossings for mine roads. The majority of watercourse vegetation clearing would be a result of the development of Tapplebang Dam. A total of 111.8ha of watercourse vegetation is proposed to be cleared comprising 39.9ha of RE 3.3.9a, 7ha of RE 3.3.9b, 1.4ha of RE 3.3.20b and 63.5ha of RE 3.5.36b. The significant residual impact would require an offset under the Queensland environmental offsets framework.

A second class of regulated vegetation is a RE that intersects with an area shown as a wetland on the vegetation management wetlands map. One wetland is mapped adjacent to the lower reaches of Coconut Creek but 1.3km south-west of the disturbance footprint. Several wetlands are mapped adjacent to the CLF but outside the project area. These wetlands would not be subject to a significant impact.

A third class of regulated vegetation is an area of essential habitat on the essential habitat map for threatened wildlife. The estuarine crocodile, *Crocodylus porosus*, and the Eastern curlew, *Numenius madagascariensis*, have previously been recorded within the project site and are mapped as essential habitat. No significant impact is predicted for these species. As both species are also listed as an EPBC species, see the assessment provided in section 6.20.4.2 for listed migratory species.

Essential habitat is also mapped for the rufous owl (Cape York subspecies), *Ninox rufa meesi* that has a near threatened conservation status under the NC Act. The rufous owl was recorded in the study area mainly within the fringing riparian vegetation of Coconut Creek and Tapplebang Creek. The EIS stated that 47.8ha of preferred roosting habitat (swamp mahogany woodlands) would be cleared, but all 6,897ha of habitat to be cleared is considered to be foraging habitat for the species. The rufous owl is only subject to MSES offsets under the Queensland environmental offsets framework for prescribed activities subject to development assessment

under State code 16 (native vegetation clearing). However, the State code 16 does not apply to this resource activity. No offset for this species is therefore required.

Connectivity areas

The Landscape Fragmentation and Connectivity Tool (LFC tool) was used to assess the significance of impact to the MSES connectivity areas. Despite the large clearing area of 6,897ha, the LFC tool used a calculation that considers regional impacts within a 20km buffer of the project site. Therefore, the core remnant areas in the project area would not be significantly impacted by project activities, due to the existing intact remnant vegetation surrounding the project area.

Protected wildlife habitat

The EIS has determined that habitat clearing would result in a significant residual impact to three protected wildlife species: palm cockatoo, *Probosciger aterrimus macgillivrayi*, red goshawk, *Erythrotriorchis radiatus*, and the masked owl (northern), *Tyto novaehollandiae kimberli*. As these three species are also listed as MNES, the impact and mitigation assessment are provided in section 6.20.4.1 of this assessment report.

One protected wildlife species that is not dual listed as MNES is the short-beaked echidna, *Tachyglossus aculeatus*, listed as special least concern under the NC Act. The short-beaked echidna was recorded in the study area but the loss of 6,897ha habitat was not considered to result in a significant residual impact to the species due to the widespread similar habitats in the local and regional landscape.

Note that the assessment of estuarine crocodile, *Crocodylus porosus*, and the Eastern curlew, *Numenius madagascariensis*, are described in section 6.20.4.2 of this report.

6.9.1.3 Proposed mitigation measures

The following measures are proposed to mitigate direct impacts from clearing vegetation:

- project design that has minimised the clearing of vegetation near watercourses and to provide a habitat buffer zone that is key breeding habitat for the palm cockatoo, red goshawk, masked owl (northern) and black-footed tree-rat
- the 500m buffer from the centreline of Coconut Creek and upper Tapplebang Creek would also minimise indirect and edge effects from mining activities on this habitat
- reducing habitat clearing by returning fines waste material to mine pits
- reducing creek crossings
- locating the Tapplebang access road one kilometre from Coconut Creek
- using a suitably qualified and experienced person such as an ecologist to undertake pre-clearance targeted surveys for the palm cockatoo, red goshawk, masked owl (northern) and black-footed tree-rat
- using a Ground Disturbance Permit to define the limits of clearing and to plan progressive rehabilitation activities
- undertaking vegetation clearance outside of the wet season and in accordance with an Erosion and Sediment Control Plan
- using fauna spotter/ catchers to monitor clearance activities and attend to any injured wildlife, and to relocate wildlife to suitable habitat if required
- establishing a 200m buffer zone of an identified threatened species' nesting location until the nest is abandoned or the fledgling/juvenile leaves the nest

- undertaking clearance of any wildlife breeding areas in accordance with a Species Management Program under the NC Act
- undertaking progressive rehabilitation throughout the mine life with the goal to return the site to a native vegetation community comprised of locally native species characteristic of the existing REs RE 3.5.36b, RE 3.3.20b and RE 3.3.9a
- salvaging and relocating logs, and tree hollows for enhancing habitat in rehabilitated areas
- undertaking weed management activities in accordance with a Weed Management Plan
- undertaking feral animal management activities to control feral pigs and cats
- undertaking fire management activities in accordance with a Bushfire Management Plan, particularly to reduce bushfire risk to sensitive riparian and tree hollow habitats.

6.9.2 Aquatic ecology

6.9.2.1 Existing environmental values

The project site includes the watercourses and floodplains of Coconut Creek, Tapplebang Creek, and a tributary of the Norman Creek. Adjacent to the Mine Site the two major creeks join approximately 9km downstream from the Coconut Creek boundary and 3km downstream of the proposed Tapplebang Dam to form the Ward River. The Ward River then continues another 4.5km downstream to reach the boundary of the Archer Bay Aggregation wetland (a wetland recorded in the Directory of Important Wetlands in Australia). Three off-channel palustrine wetlands are also located downstream from the Mine Site. No off-channel wetlands were identified within the Tapplebang Creek catchment, however seasonal in-stream groundwater seeps were encountered in the upper catchments of both creeks, significantly extending the presence of water during the dry season in Coconut Creek. All watercourses and wetlands in the aquatic study area were considered by the EIS to meet the criteria for HEV waters as defined in schedule 2 of the EPP (Water and Wetland Biodiversity).

The EIS targeted eight parameters to survey at the sample sites. Habitat condition and aquatic macro-invertebrates were sampled in accordance with the methods described in the Queensland Australian River Assessment System (AusRivAS): Sampling and processing manual (DNRM 2001). Fish, freshwater turtles and large macro-invertebrates were sampled at freshwater sites and estuarine sites (along the lower reaches of the Ward River). Aquatic flora (submerged, floating or emergent macrophytes or algae) were also surveyed, along with water quality and sediment quality. Not all targeted parameters were surveyed at each site due to difficulties with access and health and safety concerns due to the presence of crocodiles.

eDNA sampling was undertaken to target sawfish species in June 2023 (following the wet season) at nine locations along Coconut Creek, Tapplebang Creek and the upper reach of the Ward River. The proponent responded to DETSI's request for further sampling in the wet season to target the large-toothed sawfish, when individuals are known to be present in the lower reaches of the Ward River, and undertook sampling in early April 2024 in high flow/ flood conditions. Not all the sites could be safely accessed due the flood waters which limited the representativeness of the surveys.

EIS Chapter 9 (Aquatic Ecology) and Appendix M (Aquatic Ecology Report) identified the following aquatic EVs within the ecology study area:

- two undisturbed ephemeral watercourses (Coconut Creek and Tapplebang Creek) within the project site, which join to form the Ward River. These creeks were determined to be HEV waters by the proponent

- the upper, middle and lower reaches of the Ward River, which are all mapped as HES wetlands
- the upper reaches of a small ephemeral tributary of the Norman Creek within the project site
- three off-channel wetlands downstream of the project site consisting of Melaleuca wetlands in the lower reaches of Coconut Creek and the upper reach of the Ward River; graminoid marshlands along the middle reach of the Ward River; and saline sedgelands/ grasslands and associated tidal flats along the lower reach of the Ward River
- type 1 GDE, described as seasonal groundwater seeps within the upper catchment of the Coconut Creek and Tapplebang Creek
- aquatic habitats scored as good to excellent condition against AusRivAS (DNRM 2001) physical and biophysical criteria, with minimal disturbance to condition from upstream impacts
- 47 taxa of freshwater macroinvertebrates and 58 taxa in estuarine reaches were recorded
- 19 species of native fish were recorded in freshwater habitats and 37 species were recorded in estuarine habitats. No threatened species or pest species were observed
- waterways providing fish passage
- no species of freshwater turtles were recorded
- the estuarine crocodile, *Crocodylus porosus*, was recorded in Coconut Creek, Tapplebang Creek and the Ward River
- no species of sawfish or speartooth shark were captured however evidence of the presence of sawfish in the estuarine reaches of the Ward River is presented in the EIS
- 11 aquatic flora species were recorded, mostly submerged or emergent macrophytes, in freshwater habitats, and two species were recorded in estuarine habitats. No threatened species or pest species were observed.

A likelihood of occurrence assessment concluded that the large-toothed sawfish, *Pristis pristis*, had a moderate likelihood of occurrence for the Ward River but is not predicted to occur in Coconut Creek or Tapplebang Creek. The EIS concluded that the dwarf sawfish, *Pristis clavata*, Green sawfish, *Pristis zijsron*, narrow sawfish, *Anoxypristis cuspidate*, and the speartooth shark, *Glyphis glyphis*, all had the potential to occur in the estuarine reaches of the Ward River but not within the project site. An assessment of the largetooth sawfish and estuarine crocodile are provided in section 6.20 of this assessment report.

6.9.2.2 Impacts on aquatic ecosystem values

The EIS identified potential impacts specific to Tapplebang and Coconut Creeks and the Ward River as well as potential impacts to aquatic ecosystem values across the catchment as a result of the proposed project. Most impacts would be for the duration of the project. These may diminish as the Mine Site is progressively rehabilitated and Tapplebang Dam is decommissioned at the end of mine life.

EIS Appendix I (Surface Water Flow Assessment) identified the impacts on surface water flows using the Queensland Government's Source Model catchment model which was run on a daily time-step for a 124-year period (1889-2013) using rainfall and evaporation data. Flow data collected during development of the EIS was not incorporated into the model or used for calibration of the model. Impacts on flow were assessed against the environmental flow objectives and performance indicators of the Water Plan (Cape York).

The following impacts on Tapplebang Creek, Coconut Creek and the Ward River were considered by the EIS as potentially or likely to occur due to the project.

Tapplebang Creek

The EIS identified the following potential or likely impacts to Tapplebang Creek:

- A significant residual impact (SRI) on 5.76 ha of HEV waters due to the inundation of approximately 10 km of HEV waters of Tapplebang Creek and associated floodplains and tributaries as a result of the construction of Tapplebang Dam.
- A SRI on 111.88 ha of regulated vegetation within a defined distance of a watercourse as a result of the construction of Tapplebang Dam (refer to section 6.9.1 of this assessment report).
- Impacts on a waterway providing for fish passage from:
    - total loss of access by fish to riverine habitat within the footprint of the dam due to inundation
    - total barrier to fish and other aquatic fauna upstream and downstream passage at the dam wall during non-overtopping flows
    - changes in hydrology from a riverine to a lacustrine ecosystem within the dam footprint with:
        - extended permanency of water and potential for a change in biotic composition
        - large-scale (up to 5.1m) drawdown in water levels due to water harvesting.
- Establishment of invasive flora and aquatic fauna species within the dam, including through anthropogenic introductions. Lacustrine environments can favour non-native and pest species.
- Lag between inflows to the dam and overtopping flows into the creek below Tapplebang Dam.
- Reduction in the frequency and duration of flows between 5ML/day to 1,000ML/day to the creek below Tapplebang Dam as the dam fills at the beginning of the wet season and as dam levels drop with harvesting, at the end of flow events.
- Reduction in mean annual flow by 12% in Tapplebang Creek below the dam.
- Reduction in floodplain inundation flows downstream of the dam (6.5%).
- Physical disturbance as a result of the construction of a waterway crossing in the upper reaches.

Coconut Creek

The EIS identified the following potential or likely impacts to Coconut Creek:

- Groundwater level rises and ~6% increases in baseflow during the life of mine in the middle reaches of Coconut Creek. These are due to changes in recharge rates and transpiration as a result of vegetation clearing and mining. Post-mining, the increase in baseflow is predicted to reverse to a 3% reduction upon equilibrium of groundwater, when vegetation is fully re-established.
- An approximately 1m reduction in maximum and minimum groundwater levels post-mining at a groundwater seep in the Creek's lower reaches, due to the lowered ground level of the adjacent final landform. However, groundwater levels are modelled to seasonally intersect the surface with no predicted reduction in seepage.
- Short-term (1-3 months) of water abstraction during the construction period (two years) at two sites on Coconut Creek of up to 12% of stream flow volume at the most upstream site.
- Physical disturbance of aquatic ecosystems from the construction of two waterway crossings for the Mine Access Road and the Heavy Mobile Equipment crossing.

Ward River

Flow modelling provided the basis for estimates of impacts to the aquatic ecology of the Ward River. Modelled predictions included:

- no change in frequency of flows <20ML or >1000ML
- minor reduction in frequency of flows >100ML up to 1000ML
- no increases in dry period days (>200 days zero flow)
- reduction in mean annual flow volumes by of 5% in the upper Ward and 2% at end of system (Archer Bay)
- no predicted impacts on water quality in the Ward River as a result of dam water releases and overtopping events
- no predicted impacts on tidal extent or salinity profile or river forming flows
- no changes to the frequency of floodplain inundation (>2 year average recurrence interval (ARI)) of off-stream wetlands associated with the Ward River.

The EIS concluded that virtually all potential impacts on the Ward River were either negligible, minor or not an impact, where changes to flow metrics were ≤1% or where delays or durations of flows were altered by a matter of days (as opposed to weeks or months). Annual flow volumes were shown to be highly variable. The predicted impacts on flows were all considered to be within the range of natural year to year variation.

Concerns were raised in the IESC advice and several submissions on the EIS about impacts from a lag in the onset of flows in Tapplebang Creek and the Ward River at the beginning of the wet season while Tapplebang Dam fills and before it spills. Concerns were also expressed about potential impacts from shortened recession flows, cut off by the dam at the end of the wet season. These concerns particularly related to the impact any lag might have on fish movement and reproductive cues as well as breeding habitats in the lower Ward floodplains. The proponent response provided modelled results that found:

- Where the dam was above minimum operating volume, and the first flow was large enough to fill the storage, a lag of about two days would occur for flows to overtop the spillway ('typical year').
- Where the dam was at or below minimum operating volume and low volume events occurred at the beginning of the wet season, the lag in low - medium (500ML/day) flows could be up to two months ('worst case year'). However, in this case, flows preceding dam filling were not continuous. High flows of 2800ML/day that filled the dam resulted in approximately a 7-day lag before the dam overtopped.
- In the upper Ward, data presented for 20th (dry), 50th (average) and 80th (wet) percentile flow annual flow volume representative years did not show an apparent lag in timing, although there was a reduction in flow volume.
- Modelling of the onset of high flows (9875ML/day or1.5 ARI) in the upper Ward across the whole simulation period (124 years) showed there was an approximate 7-day delay with the project.
- Duration of the flow recession was not materially changed at Tapplebang Creek below the dam or within the Ward River.
- No material change in the timing of initial wet season flows at the end of system for the Ward River.

While the modelled results for the Ward River did not appear to identify significant flow lags, I have taken into account issues raised by DCCEEW regarding the importance of early wet season

flows and low to medium flows to largetooth sawfish and have made recommendations in section 6.20 of this assessment report.

6.9.2.3 Proposed mitigation measures

Flows

The EIS assessed the habitat values downstream of the dam site based on the environmental assessment framework and performance indicators for the Water Plan (Cape York). The key proposed mitigation for impacts on downstream flows is a low flow environmental release of up to 5.1ML/day. Environmental releases would occur when there are inflows to the dam recorded at the upstream gauge or where rises in water levels of the dam are recorded, until the dam is overtopping. Releases would be sourced from surface level dam waters to optimise water quality.

Low flow aquatic ecological assets identified in Tapplebang Creek downstream of the dam were confined to in-stream refugia waterholes. Environmental flow objectives for this low flow ecological asset under the Water Plan (Cape York) aim to minimise or avoid increases in dry periods (>200 days of flows ≤5ML/day) above a given percentage. With the proposed environmental flow, there would be zero increases in dry periods downstream of Tapplebang Dam (in Tapplebang Creek or in the Ward River), as a result of the project. I recommend that the proposed implementation of environmental flows is conditioned in the EA, as it is a critical mitigation to reduce impacts from changes in flows. The conditions should be written in such a way that they do not preclude variable environmental releases. I recommend that conditions H23 to H25 proposed in Schedule H Land and Biodiversity in Appendix A of this assessment report be applied to the draft EA. Recommendations relating to a variable environmental release strategy for early wet season flows, to maintain habitat and reproductive cues for largetooth sawfish, are addressed in section 6.20 and recommended Australian Government condition 7 in Appendix D of this assessment report.

No mitigation is proposed for other changes to flows in Tapplebang Creek downstream of the dam such as the predicted 6.5% reduction in floodplain inundating flows, the reduction in mean annual flow volumes, the reduction in the frequency and duration of flows between 5ML/day and 1000ML/day (e.g. a 12.5% reduction in the flow days >10ML) and the lag time between the onset of wet season flows and overtopping flows into lower Tapplebang Creek. However, the assessment did not identify a significant residual impact for HEV waters in this section of the creek as a result of these flow reductions and I accept that the provision of low flow environmental releases is considered to mitigate potential impacts on the creek's key downstream ecological assets of dry season refugia.

No significant impacts were predicted on baseflows in Coconut Creek as a result of changes to groundwater levels. As raised in section 6.7.2 of this assessment report, condition E10 proposed in Schedule E Groundwater in Appendix A of this assessment report restricts changes in groundwater levels as a result of the project to protect ecological values including aquatic ecosystems associated with Coconut Creek. Any impacts on surface flows in Coconut Creek from construction water harvesting were considered short-term and minor.

Impacts on high flows and annual flow volumes and consequences for aquatic ecosystems and processes in the Ward River such as floodplain wetlands, river formation and tidal extent were assessed as negligible or minor and generally within the range of natural year to year variations. These conclusions are based on comparisons between modelled outputs of current hydrological conditions and changed conditions as a result of the project.

DCCEEW raised concerns that insufficient site-specific flow data has been presented by the EIS to substantiate the model outputs, and I consider that multiple lines of evidence would have been preferable. In line with my comments in section 6.7.1.1.3 of this assessment report, I recommend that the proponent progresses the development of rating curves for Tapplebang and Coconut Creeks from ongoing flow monitoring and instigates flow monitoring within the upper Ward River. This data should be used to adjust the flow model and improve confidence in the accuracy of flow estimates, by undertaking any necessary refinement of environmental release criteria before the activity commences.

I further recommend that monitoring under the REMP is used to assess wetland condition, river channel maintenance and tidal extent in the Ward River catchment and to confirm the model predictions of negligible and minor impacts on these high flow and annual flow indicators. I also recommend that the proponent implements management measures under the project Water Management Plan or other relevant management plans, where unanticipated impacts are identified by the REMP monitoring. To address both recommendations, I recommend that condition F25 proposed in Schedule F Surface Water in Appendix A of this assessment report be applied to the draft EA.

Dam design, construction and operation

EIS Appendix AB (Response to Submissions) presented comparative evidence that water quality in the Tapplebang Dam should be analogous to natural lacustrine habitats in the region and therefore potentially support lacustrine aquatic and fringing ecosystems. This capacity was a function of the existing catchment conditions including substrate, source groundwater and surface water quality (particularly clarity and temperature) and anticipated water column mixing.

The EIS also identified active steps that could be taken by the proponent to promote water quality, productivity and stability in the dam, as well as establishment and maintenance of functional edge and aquatic habitats in both wet and dry seasons. Mitigation and monitoring measures identified in Appendix 1 of Supplementary Memorandum E, EIS Appendix AB, together with an outline of dam and fishway habitat restoration options in Appendix 2 of the same document should form the basis for a dam habitat restoration and management plan committed to in EIS Chapter 22 (Environmental Management and Commitments). This plan should include key dam design, construction and operational requirements including: avoiding isolated backwater formation during drawdown through bathymetric planning and contouring; maintaining access to seed sources and minimising fringing vegetation loss by detailed planning and demarcation of clearances; appropriate disposal of cleared vegetation and spoil; retaining a minimum depth of two metres in the majority of dam waters at minimum operating level; utilising remote sensing and other technologies (e.g. LIDAR, aerial imagery, drones) and field based surveys in monitoring water quality and ecosystem outcomes.

I recommend that presentation of a detailed habitat restoration and management plan to the administering authority, prior to commencement of dam construction, is conditioned in the EA. I further recommend that water quality monitoring undertaken upstream of, within and downstream of the dam in Tapplebang Creek and the upper Ward River is analysed to trigger mitigation measures under the plan, should a deterioration in water quality be detected. These matters are captured in conditions F35, F36 and F37 proposed in Schedule F in Appendix A of this assessment report.

Fish passage

A conceptual design for a bypass fishway to provide fish passage at Tapplebang Dam was presented in EIS Appendix N (Tapplebang Dam Fishway Conceptual Design Report). Given the remote location of the site, I support the use of a volitional fishway as an appropriate option. I consider the proposed bypass fishway to be experimental, particularly for a structure the height of Tapplebang Dam. It differs from the nearby Arraw Dam fishway, which is incorporated into the Arraw Dam spillway. This means that there is a risk of the Tapplebang Dam fishway not functioning as anticipated.

To minimise the risk of sub-optimal performance and to reduce the risk of fish mortality and injury in downstream passage over the dam, I support the proponent commitment to incorporate hydraulic modelling and engagement with the Department of Primary Industries (DPI) (former Department of Agriculture and Fisheries) in the detailed fishway design process. I recommend extending this engagement to design of the spillway and apron, any screening, and placement of the water intake and release points. The fishway design team should also include an appropriately qualified fishway biologist and work in close consultation with the dam design engineers, builders and operators to integrate considerations of aquatic fauna passage and survival into the total design, construction and operation of the dam. I further recommend that a fishway commissioning and refinement stage should be incorporated into the proposed Fishway Monitoring and Management Plan and that the Plan is to be implemented for the life of the dam. These recommendations are captured in proposed conditions H15-H22 in Schedule H in Appendix A of this assessment report.

DETSI, DLGWV and DPI submissions on the EIS identified an SRI to the MSES that is waterways providing for fish passage. The SRI as a result of the construction of the dam is on the basis of modification of habitat necessary for breeding and survival of fish, significant changes in hydrology within the dam footprint and reduction of fish passage opportunities. While a fishway is proposed to be installed, this does not fully mitigate impacts to fish movement. Fish passage opportunities would be constrained both by the impacts to flow volumes, timing and duration described above and by the operating range of the fishway. The operation of the fishway is constrained to periods from when the spillway at the fishway entrance is being overtopped up to flows of 5000ML/day. In addition, fish that move up or downstream into the dam would arrive into a lacustrine habitat with a loss of the riverine habitat and HEV waters that currently make up Tapplebang Creek.

The existence of an SRI on waterways for fish passage was disputed by the proponent in the EIS, however an offset for the inundated area of Tapplebang Creek has subsequently been included in EIS Appendix Q (Offset Management Strategy). I recommend that offset requirements for both HEV waters, and waterway providing for fish passage are conditioned in the EA as I consider there are SRIs on both MSES (see conditions H8, H12 and H13 proposed in Schedule H, Appendix A of this assessment report).

Potential physical disturbance impacts from the proposed waterway crossings for the project would be mitigated through implementation of ESC, appropriate batter design and stabilisation of disturbed soils. The EIS also commits to consideration of design options to ensure fish passage in the three proposed crossings over Coconut and Tapplebang Creeks, however I note it should be feasible to commit to incorporating fish passage into these waterway crossings. I therefore recommend that incorporation of fish passage in project waterway crossings is a requirement of EA conditions, and that the proponent seeks input from DPI on crossing

designs, as part of the fishway consultation process (see conditions H15 and H19 proposed in Appendix A of this assessment report).

I note a submission on the EIS calling for opportunities for integration of cultural practices at the fishway and further information on access for Traditional Owners to the dam. The standard requirement under the *Fisheries Act 1994* for public infrastructure is to prohibit the taking of fish from within or below fishways, given the vulnerability of fish in fishways. Tapplebang Dam would be privately owned infrastructure, located on Traditional Owner's land. However, access to the fishway for the purpose of harvesting fish should be similarly discouraged.

Aquatic pests

The EIS recognised the potential for aquatic pests to be introduced and to proliferate as a result of the proposed project, particularly in Tapplebang Dam and through anthropogenic vectors. The proponent reports no known aquatic pest flora and fauna species at the project site. There are considerable difficulties in eradicating aquatic pests once established in open systems. The development and implementation of aquatic pest prevention, monitoring, management and eradication plans for the project is therefore of the highest priority for the life of the dam. I recommend that the Aquatic Pest Management Plan is submitted for review to the administering authority before construction commences and that the Plan demonstrates the highest commitment to maintaining the current aquatic pest-free status of waters within, up and downstream of the project site for the life of the dam (see conditions F38, F39 and F40 proposed in Schedule F in Appendix A of this assessment report).

6.9.3 Marine ecology

The EIS proposed two project activities that would be undertaken in or adjacent to the marine environment.

- Construction and operation of the CLF located adjacent to the coast and approximately 15km west of the Mine Site. Product bauxite would be loaded onto a TSV from a 450m long jetty.
- The TSV would transport the product bauxite approximately 18km offshore to load onto OGVs that would be anchored in a transhipment area. The OGVs would ship the product bauxite to export markets.

The marine study area consisted of the proposed CLF coastal infrastructure and an area extending approximately 3km to the north and 3km to the south of the CLF (from Norman Creek to False Pera Head) and offshore to the transhipment area.

6.9.3.1 Existing environmental values

EIS Chapter 10 (Marine Ecology) and Appendix O (Marine Assessment Report) adequately identified marine EVs that have the potential to be impacted by the project including water quality, terrestrial coastal habitats, inshore reef and boulder habitats, migratory shorebirds, fish and marine fauna such as dolphins, dugong and turtles.

6.9.3.2 Impacts on marine ecosystem values

6.9.3.2.1 Water quality impacts

The EIS identified that the project has the potential to disturb the seafloor due to piling activity during construction and vessel movement during operation, causing turbidity to rise. The project also could result in accidental spills of hydrocarbons and other chemicals.

The proponent deployed a photosynthetically active radiation (PAR) logger which measured turbidity, temperature, EC and depths at 15-minute intervals between November 2018 and April 2019. This was deployed at two sensitive receptor reef sites, north and south of the CLF. The water column samples were taken for physical and chemical water quality parameters at 10 sites on two occasions. Similarly, water grab samples were taken at 10 sites on two occasions.

Except for the data collected using PAR, I consider the background marine water sampling data to be insufficient as data was only collected twice. The EIS stated that most metals except copper, zinc, particulate nitrogen, phosphorous and chlorophyll-a were below the *Australian and New Zealand guidelines for fresh and marine water quality (ANZG 2018)* guideline values.

6.9.3.2.2 Permanent direct habitat modifications

The EIS stated that there would be no significant impacts from the CLF infrastructure, including jetty and loading structures. The CLF would be constructed within subtidal soft sediment and would result in the loss of 42.2m^2 of marine habitat within the pile footprints. In addition, there would be no clearing of *Casuarina* along the coastal area for the CLF construction.

6.9.3.2.3 Marine pollution and debris

The EIS identified that the project has the potential to have unplanned spills of bauxite during the loading and transportation of bauxite materials. Although bauxite itself is not toxic to marine biota, a spill could smother benthic flora and fauna and alter substrate conditions. The design of the LOJ and the TSV aims to minimise product loss and associated impacts.

Project risks include accidental spills and leaks of hydrocarbons and liquid wastes. The toxic fraction contains aromatic hydrocarbon that is less dense and volatile. This fraction may impact the surface water aquatic biota more than those in the water column. The spilled substances have the potential to cause toxicity effects on fish and invertebrates and an increase in algal growth. The likelihood of spills is proposed to be minimised by having double hull protection and reducing the frequency of fuelling events. The procedural mitigation also includes emergency spill response procedures.

An accidental release of wastes such as plastic bags and packaging can also pose risks to marine fauna. Waste management strategies would be put in place to reduce waste generation and marine debris entering the marine environment.

6.9.3.2.4 Vessel strike

Increase in vessels pose risks to marine fauna, especially to those that are slow-moving, such as dugongs, crocodiles, turtles and whales. The EIS stated that the likelihood of vessel strike is unlikely given the small number of vessel movements with speed limited to 8 knots inside the ring of reefs around the CLF.

6.9.3.2.5 Lighting impacts

The project would require lighting for safety around the CLF buildings, LOJ and the TSV. The lighting could potentially impact any nearby nesting flatback, olive ridley, green, loggerhead and hawksbill turtles. Artificial lighting can also cause disorientation for the turtle hatchlings and increase predation risks.

All five marine turtle species are likely to transit through the marine study area to and from feeding habitats. The EIS stated that the marine study area does not support any important populations for breeding or dispersal for green, hawksbill and flatback turtles. The EIS also

stated that habitat critical to the survival of a species does not apply to the green, loggerhead, flatback and hawksbill turtles within the marine study area.

The expanding bauxite mining industry of the region overlaps with the Queensland endemic nesting population of olive ridley turtles (*Lepidochelys olivacea*), making the study area a critical habitat. A recent study has found that the nesting population of western Cape York Peninsula is a genetically distinct stock for this species (Limpus, C.J.; Shimada, T. 2024). Night-time lighting from ports, associated mines and coastal development contribute to skyglow that is known to negatively impact the orientation of turtles (Shimada, T. et al. 2023).

Artificial lighting can also impact seabirds and shorebirds through collision, entrapment, stranding, grounding, disorientation and interference with navigation. This can result in reduced fitness, injury and death. The project area sits within the East Asian Australasian Flyway and migratory shorebirds may migrate through the project area. Peak season for migratory shorebirds is between September and April during the wet season. The closest internationally important site for migratory shorebirds is located approximately 550km south of the project site. The EIS stated that although the lighting may alter the abundance and distribution of seabirds and shorebirds, they are localised impacts.

6.9.3.2.6 Acoustic impacts

The EIS identified three potential acoustics impacts from the project:

- underwater acoustic impacts from construction, mainly from piling activities
- underwater acoustic impacts from shipping noise
- terrestrial acoustic impacts from CLF machinery, conveyors and haul trucks.

Underwater acoustic impacts have the potential to alter behaviour leading to permanent or temporary loss of hearing and associated behavioural response injuries. The EIS undertook acoustic assessment which considered the sound pressure level and sound exposure level. The EIS determined the temporary threshold shift and injury levels using the data from the literature, including Amrun EIS's underwater noise modelling.

The EIS stated that the potential impact of 24-hour cumulative sound exposure level would not be significant as the piling would be short-lived each day, only lasting between 2-17 minutes per day. The EIS noted that there would be insignificant behavioural impact as there is very little overlap between the area of fish behavioural impact and the surrounding reefs. As turtles do not forage or nest within the CLF area, the EIS indicated that a significant impact is not expected. For cetaceans, the EIS predicted that they would potentially move away from the noise impact area.

The underwater acoustic noise from the TSV and OGVs has the potential to elevate ambient noise levels. The EIS stated that this would not have a significant impact as most marine fauna communicate at frequencies outside of what large vessels produce.

Shorebird habitats are found at the mouth of Norman Creek (2.3km north of CLF), False Pera Head (2.5km south of CLF) and Puuk-Aww Reef (1.3km north of CLF). The EIS indicated that the average terrestrial acoustic impacts from construction and operation of CLF and road trains would have noises below 50 decibels A (dBA) at the closest habitat. The maximum noise level for construction was predicted to be higher than the operation. However, the pile driving would be undertaken outside of the peak migratory shorebird season.

6.9.3.2.7 Other indirect impacts and habitat modifications

Vessel wash has the potential to mobilise bed sediments that could impact the light levels as the sediment loads build-up on corals. The numerical modelling shows that the levels of total suspended solid concentrations would not cause significant impacts as the area of impact contains soft sediment habitat with sparse hard coral colonies.

Anchor damage was estimated to be 250m in radius and it would occur within the designated transhipment areas of approximately 926m radius. The area was selected as it has sandy substrate containing sparse to no epifauna cover. The nearest reefs are 590m from the Outer Transhipment Area 1 and 1,325m from the Outer Transhipment Area 2.

The project also has the potential to introduce marine pests from ballast water or biofouling of the vessel hull.

The EIS did not consider potential impacts from increased recreational use of beaches and waters due to increased human residency and employment in the area. For example, vehicle traffic for beach-based fishing and recreational fishing vessel operations may increase the risk of damage to beach nesting habitat, and boat strikes and interaction with line fishing and crab fishing on marine fauna.

6.9.3.2.8 Cumulative impacts

The project would have the potential to contribute to other project's impacts within the region. This includes from the Port of Amrun 15km north, Port of Weipa 50km north and the transhipping operation associated with Bauxite Hills Mine 150km north. The cumulative impacts considered in the EIS process include water quality, noise, lighting and vessel movements. The EIS stated that the water quality and noise would not cause cumulative impacts due to the distance between the project and the other facilities, and the lighting would be mitigated and would not cause cumulative impacts. While the impacts on turtle and shorebirds foraging, breeding and nesting may be non-significant per facility, I consider that multiple disturbance sites in the region could cumulatively impact on the population health of the species.

6.9.3.3 Proposed mitigation measures

6.9.3.3.1 Water quality

The EIS included mitigation measures to prevent accidental spills by having double hull protection and emergency spill response procedures. I recommend further water quality monitoring is to better understand the baseline levels especially for the parameters which exceeded the guideline values. I also recommend the use of the most recent *Guideline values for water/sediment quality (ANZG)* 99th percentile level of protection for aquatic ecosystem values as interim water quality trigger limits.

I also agree with the monitoring proposed in the EIS, and recommend undertaking monitoring for: marine pests, reef benthic cover, water quality at CLF, Puuk Aww reef, Norman Creek, False Pera Head and Thud Point (monthly for 18 months and then quarterly); and coral health, twice prior to commencement of operations and then annually.

6.9.3.3.2 Planning and design of marine infrastructure

The EIS proposed the following key measures to avoid impacts on the marine environment,

which I support:

- project infrastructure, navigation routes and transhipment areas would be located to avoid reefs and sensitive marine habitats and have been designed to avoid the impacts of dredging
- the CLF would be located more than 100m from the edge of the coastal vegetation to avoid clearing, would include a fully enclosed load-out system to avoid spillages and use water sprays on CLF stockpiles for dust emissions
- the TSV would have an enforced low speed zone over the first 1.6km of the transhipment route, use megafauna spotters to reduce the risk of vessel strike, have double hull protection for diesel cargo spaces, and operate as a dry bilge vessel, limiting the use of ballast water
- ballast water exchanges would occur outside of 12 nautical miles (NM) from shore in water greater than 50m deep (as per *Australian Ballast Water Management Requirements* (DAWE 2020)) and antifouling would be used on the TSV, with regular marine pest inspection
- procedures would be in place for hazardous materials handling and emergency spill response
- waste management strategies would be employed to reduce waste generation and to ensure that waste does not enter the marine environment
- feral animal management would be implemented.

I also agree with the monitoring proposed in the EIS, and recommend to undertake monitoring for: marine pests, reef benthic cover, water quality at CLF, Puuk Aww reef, Norman Creek, False Pera Head and Thud Point (monthly for 18 months and then quarterly); and coral health, twice prior to commencement of operations and then annually.

6.9.3.3.3 Light impact mitigation measures

For seabirds, the EIS stated that the implementation of a bird interaction procedure and the Artificial Light Management Plan would reduce light spill and result in insignificant impacts to the bird species. The Wildlife Lighting Impact Assessment Report indicates that the existing vegetation would be retained as it reduced the visibility of onshore lighting.

The EIS has undertaken viewshed analysis to assist with their Artificial Light Management Plan. The viewshed analysis indicated that the height of some of the light fixtures may have a direct impact on areas of marine turtle nesting habitat north and south of the CLF.

The EIS assessed that the highest impacts would be to the emerging hatchlings on the beach. The proposed control measures include: monitoring for any changes to hatchling behaviour during construction and operation; eliminating light spills; shielding any directly visible light at the nesting habitat; avoiding skyglow; the height of mobile light sources would be at a minimum to prevent light on roosting and nesting beaches; and only essential lighting would be used.

6.9.3.3.4 Acoustic impact mitigation measures

To reduce acoustic impacts on migratory shorebirds, the EIS proposed that piling would be undertaken for the period April to October during daylight hours, outside peak migration periods, and would implement soft starts. The EIS noted that the preferred shorebird habitat would be more than 1.3km from the noise impact zone. This is further than the recommended buffer zones of 165-255m by the EPBC Act Policy Statement 3.21 (Commonwealth of Australia 2017).

I support the commitments related to the marine environment stated in Chapter 22 (Environmental Management and Commitments) of the EIS. To ensure these commitments, proposed mitigation measures and matters outlined in my assessment above are enforceable, I recommend that the conditions proposed in Schedule J Marine in Appendix A of this assessment report be applied to the draft EA. Additional conditions for MSES and MNES are discussed in sections 6.20, 7.5 and Appendix D of this assessment report.

6.9.4 Biosecurity

The EIS adequately surveyed and described the current distribution and abundance of pest animals, weeds and disease vectors on the project site. It also adequately assessed the potential impacts of the project's construction and operation on the potential spread of pest animals, weed species and disease.

Sampling identified 13 exotic terrestrial flora species across the project site, none of which are weeds of national significance restricted species under the *Biosecurity Act 2014* (Biosecurity Act). Relative abundance was low, and distributions were limited to areas of historical disturbance. The project site is located within the scope of the *Threat abatement plan to reduce the impacts on northern Australia's biodiversity by the five listed grasses* (DSEWPC 2012a). Whilst the presence of Gamba Grass (*Andropogon gayanus*) or other listed grasses were not recorded on the site, the EIS notes that their invasion of native habitat is a threatening process under EPBC Act and the risk of introduction must be mitigated.

Six exotic terrestrial fauna species were recorded within the study area. Five of those are restricted species under the Biosecurity Act.

No aquatic pest species were observed across the study area or the adjacent marine environment. It is noted that the Asian Green Mussel (*Perna viridis*) has previously been detected at the neighbouring RTA Weipa site. Subsequent survey work provided no further evidence of this species presence or establishment in the area.

The EIS stated the following impacts have the potential to occur as a result of the project:

- exotic flora introduction from construction machinery and/or materials
- increased disturbance of creek beds and riparian vegetation from feral pig foraging
- aquatic pest introduction during the construction and operation of Tapplebang Dam
- increased native fauna predation from feral cats
- marine pest introduction to the CLF through ballast water exchange.

The EIS proposed the following measures to avoid or mitigate the impact or spread of pest species and disease vectors to meet Biosecurity Act obligations:

- inclusion of biosecurity awareness training in the Mine Site induction program to be delivered to staff, contractors and Traditional Owners
- implementation of a Weed Management Plan with mitigation including a vehicle wash-down protocol, a monitoring program for weed introduction detection and the establishment of a site-wide weed register
- monitoring and active control of invasive fauna, primarily focused on feral pigs and cats, facilitated by the Traditional Owner led land and sea management organisation
- adoption of an Aquatic Pest Management Plan for Tapplebang Dam
- adoption of a proposed feral animal control program in consultation with Traditional Owners and RTA Weipa

- compliance with the *Australian Ballast Water Management Requirements* (DAWE 2020) and the Biosecurity Act for the management of ballast water within the marine study area
- the installation of settlement plate arrays and a quarterly monitoring protocol for early detection of marine pest introductions.

The EIS stated the project's commitment to establish and implement a Weed Management Plan and a monitoring plan for invasive pests for the operation of the CLF. I support these commitments. I also support the proposed feral animal management measures and recommend that Traditional Owners and RTA Weipa are engaged in the process.

EIS submissions raised concerns that the construction and operation of Tapplebang Dam would increase the risk of aquatic pest establishment in a previously unmodified watercourse. To ensure the Aquatic Pest Management Plan mitigation measures are enforceable, I have recommended conditions as per section 6.9.2.3.

6.9.5 Summary of project impacts on MSES

The construction, operation and decommissioning of the project would have the potential to cause the following significant impacts on MSES listed in Table 4.

Table 4 Summary of MSES impacts

Prescribed environmental matters		Total impact (ha)
Regulated vegetation		
REs occurring within the defined distance from the defining banks of a relevant watercourse	RE 3.3.9a	39.9
	RE 3.3.9b	7.0
	RE 3.3.20b	1.45
	RE 3.5.36b	63.5
Wetlands and watercourses		
a wetland or watercourse in HEV waters		5.76
Protected wildlife habitat*		
palm cockatoo, *Probosciger aterrimus macgillivrayi*		8,725.5
red goshawk, *Erythrotriorchis radiatus*		9,306
masked owl (northern), *Tyto novaehollandiae kimberli*		9,306
Waterway providing for fish passage		
Tapplebang Creek		5.76

* Subject to offsets under the EPBC Act

6.9.5.1 Proposed offsets

MSES offsets were assessed under the Queensland environmental offsets framework. Four

prescribed environmental matters would be significantly impacted due to the proposed project:

- **Regulated vegetation**: four REs within the defined distance from the defining banks of a relevant watercourse or drainage feature
- **Wetlands and watercourses**: a HEV watercourse (Tapplebang Creek)
- **Protected wildlife habitat**: three protected wildlife species: palm cockatoo, *Probosciger aterrimus macgillivrayi*, red goshawk, *Erythrotriorchis radiatus*, and masked owl (northern), *Tyto novaehollandiae kimberli*
- **Waterway providing for fish passage**: Tapplebang Creek.

The total significant impact area to be offset for regulated (watercourse) vegetation (due to the loss and modification of a 10km reach of Tapplebang Creek from the proposed dam and two road crossings on Coconut Creek) is 111.8ha. This impact area would be subject to a 4:1 offset ratio requiring an offset area of approximately 447ha. An assessment of the watercourse vegetation on the preferred Offset Area 1 found there was approximately 3,812ha of watercourse vegetation on the property, and 5,253ha on Offset Area 2. The EIS stated that the MSES watercourse vegetation offset would be co-located with the MNES listed threatened species offset and that habitat quality gains would be achieved through pest animal and weed control and bushfire management.

The total significant impact area to be offset for the HEV watercourse (due to the loss and modification of a 10km reach of Tapplebang Creek from constructing the proposed dam) is 5.76ha. This impact area would be subject to a 4:1 offset ratio requiring an offset area of approximately 23ha. An assessment of HEV waters on the preferred Offset Area 1 stated that Brown Creek, Wabum Creek and the Watson River were suitable to acquit the offset liability. The EIS stated that the water quality of these HEV waters would likely improve due to management actions to protect watercourse vegetation from fire and reduce feral pig numbers. The EIS stated that the MSES HEV watercourse offset would be co-located with the MNES listed threatened species offsets.

The total significant impact area for protected wildlife habitat for the palm cockatoo (8,725.5ha), red goshawk (9,306ha), and masked owl (northern) (9,306ha) would be offset as MNES listed threatened species under the EPBC Act. The *Environmental Offsets Act 2014* effectively restricts the state from imposing an offset condition if the same, or substantially the same, impact has been assessed under the EPBC Act. Therefore, significant impacts to this MSES prescribed environmental matter would be noted in the relevant disturbance limits conditioned for an EA. The significant impacts would lead to offset conditions authorised for any subsequent EPBC Act approval. An assessment of suitable habitat for these species on the preferred Offset Area 1 determined that there was 38,000ha of offset area available for the palm cockatoo, 47,000ha of offset area available for the red goshawk, and 28,000ha of offset area available for the masked owl (northern). Proposed management actions include implementing a suitable fire management regime to reduce the incidence of high intensity fires along with feral animal and weed control programs.

The total significant impact area to be offset for a waterway providing for fish passage (due to the loss and modification of a 10km reach of Tapplebang Creek from the proposed dam and two road crossings on Coconut Creek) is 5.76ha and would be offset at the ratio of 1:1. The EIS stated that the offset would likely be acquitted via a financial settlement offset recognised under the Queensland EO Policy. A preliminary calculation of the offset liability using the financial settlement offset calculator provides a total cost estimate of $360,000.

An Offset Management Strategy for the project details two proposed offset sites, offset outcomes, quantifies significant residual impacts for MSES on the impact area, and the proposed conservation gains for offsets in the offset areas. The preliminary assessment of habitat quality on the offset areas was primarily a desktop assessment. The proponent has committed to the completion of obtaining RE benchmark data and associated habitat quality scoring for an Offset Area Management Plan to be submitted to DCCEEW for assessment post completion of the EIS process.

Further assessment of the Offset Management Strategy is provided in section 6.20.5 of this assessment report.

I note the EIS assessment of significant residual impacts to prescribed environmental matters and agree with the EIS conclusion that offsets are required to provide a conservation outcome for four matters. For the impacts to protected wildlife habitat, see recommended EPBC Act offset conditions in section 7.5 and Appendix D of this report. I recommend that the conditions H8 to H14 proposed in Schedule H Land and Biodiversity in Appendix A of this assessment report be applied to the draft EA.

6.10 Coastal environment

The project is proposed within the coastal zone and therefore must be managed in accordance with the Coastal Management Plan under the *Coastal Protection and Management Act 1995.*

The EIS included a detailed marine assessment that involved multi-season marine ecology surveys and a wildlife lighting impact assessment. The marine study area comprised the full extent of the proposed CLF infrastructure zone and a coastal area extending approximately 3km to the north and south of the CLF (from Norman Creek to False Pera Head), as well as the transhipment routes and areas.

The shoreline in the marine study area comprised sandy beaches, estuaries and dunes, and a rocky headland at False Pera Head. Eleven large coral reefs were mapped in the marine study area, occurring from south of Norman Creek to False Pera Head. Within this ring of reefs there were also several minor features, including some boulder fields. The largest gap between the inshore reefs is the intended transit path for the TSV, with the narrowest section being approximately 800m wide. No seagrass was observed in the study area. Offshore marine habitats comprised unconsolidated soft sandy sediments. The LOJ and part of the transhipment route would be located within Queensland waters, whilst the transhipment areas and remaining transhipment route would be in the Commonwealth Marine Area.

The marine assessment adequately characterised the coastal processes and dynamics of the study area, water and sediment quality, marine macroinvertebrates, fish and fisheries resources, birds, megafauna and conservation significant species. Numerous MNES and MSES were recorded or assessed as having a high or moderate potential to occur. These included marine turtles, migratory birds, the Estuarine Crocodile, Dugong (*Dugong dugon*) and various species of dolphin, ray and sawfish. In addition, the Commonwealth Marine Area is an MNES. For further information on marine ecology refer to section 6.9.3 of this assessment report. For further information on MNES refer to 6.20 of this assessment report.

The EIS considered potential impacts from constructing the CLF and associated works, expected operational impacts from the CLF, transhipping and potential impacts that would arise from any unplanned release of contaminants or introduction of marine pests. The EIS stated that the

potential impacts are not predicted to be significant, largely because the project has been sited and designed to avoid and minimise potential impacts.

Key conclusions from the EIS relating to the coastal environment include:

- No significant potential impacts from direct habitat loss are predicted, given that the LOJ would be in an area where there are no significant marine habitats, and the project has been designed to ensure that no dredging or bed levelling would be required.
- Vessel wash from the TSV has been modelled to not increase total suspended sediments beyond levels that would potentially impact minimum light requirements for coral growth.
- No significant potential impacts from anchor drag in the transhipment areas are predicted. The anchorage areas have been selected because they have a sandy substrate containing sparse to no epifauna cover and no marine plants, reefs or reef features.
- Several measures were proposed to reduce the potential for the project to introduce marine pests. The TSV would operate as a dry bilge vessel, with no to limited requirement for ballast water. The OGVs would comply with standard mitigation measures specifically designed to reduce the potential for the translocation of introduced marine pests. Additionally, regular monitoring of marine pests would be undertaken as part of the project.
- No significant potential impacts from marine pollution and debris were predicted, given that the design of the jetty loading facilities and TSV incorporates industry best practice measures to minimise the risk of bauxite spillage. Measures would also be adopted to prevent accidental spills.
- Vessel strike of slow moving marine species was not expected to be a regular occurrence. This is because of the relatively small number of vessel movements, most vessel movements would be in deep waters that are not primary habitats for most surface-dwelling marine fauna species, and the speed limit on the TSV.
- With the incorporation of appropriate mitigation measures, lighting from the project was not predicted to have a significant potential impact on marine turtles, seabirds and shorebirds. An Artificial Light Management Plan would be adopted for the project, and this plan includes numerous measures to reduce the potential impacts of project light.
- The proponent committed to an ongoing program of monitoring and adaptive management to ensure the effectiveness of the proposed lighting mitigation measures.
- No significant potential acoustic impacts to marine fauna such as turtles, dolphins and shorebirds were predicted from LOJ piling construction and operations, construction and operation of the CLF, and operation of the TSV and OGVs.

The EIS considered potential impacts on fisheries resources. Relevant state and national guidelines were considered, and it was concluded that no significant impacts were predicted on marine fisheries resources.

The EIS described a range of measures to avoid and mitigate potential impacts on the coastal environment, including implementation of a marine pest monitoring program, a reef benthic cover monitoring program and an artificial light monitoring program. These monitoring programs would be implemented during construction, updated and managed over the life of the project.

I support the commitments related to the marine environment stated in Chapter 22 (Environmental Management and Commitments) of the EIS. As noted in section 6.9.3 of this assessment report, I recommend that the conditions proposed in Schedule J Marine in Appendix A of this assessment report be applied to the draft EA. Additional conditions for coastal MSES

and MNES are discussed in sections 6.20, 7.5 and Appendix D of this assessment report.

6.11 Air quality

EIS Chapter 13 (Air Quality) and Appendix U (Air Quality and Greenhouse Gas Report) adequately described the existing air environment for the project and the surrounding airshed.

The EIS identified sources of relevant air emissions from the proposed project, apart from burning of cleared vegetation. Other than this omission, the EIS largely identified and presented sufficient information and assessment for point and diffuse sources. This included satisfactory emissions inventories and descriptions of COC for air emission sources, except for waste gases produced by the proposed incinerator. Insufficient information was presented regarding the specific contaminants and pollution control systems that would be required to manage incinerator waste gases. As the conclusions of this assessment report do not support the use of an incinerator as discussed in section 6.13.6.1, the proposed incinerator air quality emissions have not been considered in detail in this assessment report.

Sources of contaminants identified in the EIS included:

- stripping and stockpiling of topsoil and subsoil
- excavation of bauxite ore by heavy machinery and handling or loading the ore
- hauling of bauxite ore onsite or the product bauxite to the CLF, primarily due to wheel generated dust on unsealed roads
- dumping of bauxite ore and product into crushers or directly into trucks or ships
- combusting diesel in generators for electricity provision at the Mine Site and CLF
- conveying and ship loading of bauxite
- stockpiles, pit and tailings surface losses of dust via wind erosion
- rehabilitation activities including replacement of topsoil and subsoil.

The EIS identified the relevant EVs and air quality objectives from Schedule 1 of the EP Regulation.

Potential impacts to sensitive receptors from dust emissions was emphasised as the main air quality related concern for the project.

The EIS used appropriate predictive modelling to assess contaminant dispersal and dust deposition from the project in accordance with the final TOR. Air quality modelling for dust was reported in the EIS for year 20 of operations (the estimated worst-case year for project dust emission sources) assuming the use of the proposed mitigation measures for the project. Air quality modelling of combustion emissions from generators and the proposed incinerator was also presented. Overall, the modelling was adequate for assessing potential impacts on human health and wellbeing and the health and biodiversity of ecosystems in the surrounding area. The potential impacts were assessed in accordance with relevant guidelines, Environmental Protection (Air) Policy 2019, EP Regulation, and the *National Environmental Protection (Ambient Air Quality) Measure*.

Also as required by the TOR, the EIS adequately considered the sensitivity and assimilative capacity of the receiving environment and the cumulative impacts of neighbouring mines. The air quality modelling showed that the relevant air quality objectives would be met at all nominated sensitive receptors including the Amban Outstation, Aurukun township and Amrun Mine Village, for the project in isolation and cumulatively with ambient background levels. Worst case cumulative dust impacts modelled together to include Amrun Mine emissions

predicted an exceedance of the 24-hour average particulate matter with a diameter of 10 micrometres or less (PM_{10}) at Amban Outstation, noting, that all other presented modelled indicators met relevant air quality objectives. In response to this modelling prediction, the proponent has appropriately committed to consult with RTA Weipa in relation to the potential cumulative dust impacts.

I note that the Sandy Creek swimming hole (a mapped swimming hole from Chapter 4 (Project Description), Figure 4.2 of the EIS) is excluded from the nominated sensitive places incorporated into the air dispersion modelling outputs and impact assessment conclusions. DETSI's *EIS information guideline - Air* requires consideration of the EVs of the receiving air environment at *any* nearby sensitive places. I consider that this location should have been incorporated in the impact assessment. However, complaints-based monitoring is considered suitable for Sandy Creek.

The proposed measures to mitigate predicted air quality impacts were targeted to managing potential impacts from dust particulates. The mitigation measures included:

- sealing the 23km product haul road to the CLF
- regular application of water to sealed and unsealed haul roads (and Waterfall Shortcut Track during construction phases)
- regular watering during bauxite handling activities and beneficiation processing
- progressive and timely vegetation establishment on rehabilitated areas
- regular watering of the CLF stockpiles
- covering the conveyor used to load the TSV
- adding engineering controls to the TSV discharge boom and chute
- utilisation of a fully enclosed cargo space design on the TSV
- maintenance of habitat buffer zones along the creeks in all the project areas to reduce dust impacts to waterways and preferred fauna habitats.

The EIS committed to undertaking the following monitoring and reporting measures:

- complaint or request-based reactive monitoring, investigations and reporting
- dust monitoring at Amban outstation but only during the construction period and for the first two years of operation of the project
- reporting obligations to Traditional Owners.

The EIS identified and presented sufficient information and assessment to develop proposed conditions for air quality matters.

I do not consider that the EIS provided sufficient information to authorise or condition the incineration of general waste. Refer to section 6.13.6 of this assessment report for further information on my consideration of the proposed incineration of waste.

In addition to the monitoring and reporting measures listed in the EIS, I consider that continuous air quality monitoring for dust would be necessary for this project and not only for the first two years of construction, as proposed in the EIS. I recommend that this monitoring and compliance checking be required throughout the project's construction, operation and rehabilitation phases. An automated monitoring station should be established to enable real-time monitoring of meteorological conditions, PM_{10}, particulate matter with a diameter less than 2.5 micrometres ($PM_{2.5}$), and total suspended particles.

I recommend that the automated monitoring station be located at Amban Outstation. I recommend continuous monitoring because reactive monitoring, as currently proposed, is

unlikely to accurately monitor potential exceedances in real time and would not provide representative evidence of compliance or non-compliance at the time/s relevant to potential future complaint(s).

The EIS modelling presented two possible scenarios of worst-case cumulative exceedances for PM_{10} (albeit stated as highly unlikely due to the conservative and cumulative modelling approach applied). I consider that a dedicated continuous monitoring program would be necessary to provide the proponent with the opportunity to demonstrate when they are not the source of any possible exceedance or the cause of any environmental nuisance or harm. This would also be likely to provide reassurance to the Traditional Owners and public that cumulative dust impacts across the airshed are responsibly and responsively managed.

To ensure these mitigation measures are enforceable, I recommend that the conditions proposed in Schedule B Air in Appendix A of this assessment report be applied to the draft EA.

Chapter 22 (Environmental Management and Commitments) of the EIS omitted air quality conditions specific to the point source releases to air from eleven proposed diesel generators at the Mine Site and CLF. Therefore, I consider *once-off* monitoring conditions are justified to ensure that oxides of nitrogen are monitored during the commissioning of each generator as proposed in Table B1 of Schedule B Air in Appendix A of this assessment report.

6.11.1 Greenhouse gas emissions

EIS Appendix U (Air Quality and Greenhouse Gas Report) generally addressed the TOR's GHG emissions requirements. The EIS presented relevant Scope 1 and Scope 2 GHG emissions estimates and broadly assessed alternative methods to avoid or minimise these emissions. The EIS appropriately identified its broad obligations under the National Greenhouse and Energy Reporting Scheme. A requirement for ongoing assessment, reporting and adaptive management to enhance abatement of GHG emissions over the life of the project was also identified by the EIS.

International, federal and state governments have enacted GHG emissions targets and supporting management strategies to limit global warming below 2°C and preferably 1.5°C above pre-industrial levels. The main sources of GHG emissions associated with the project would be land clearing and diesel usage, with diesel powered generators providing the sole power source for this project. Mitigations identified in the EIS for future consideration relate to diesel use efficiency, land clearing minimisation and ongoing re-evaluation of emissions reduction opportunities. The EIS identified that solar power would be considered upon decommissioning of the FCA in year four of operations to optimise use of an already impacted, cleared area. I support consideration of this initiative.

The regulation of GHG emissions is evolving quickly. To meet GHG emissions reduction expectations during project implementation, the proponent would need to consider the latest applicable regulatory requirements. Notably the reforms to the Commonwealth Safeguard Mechanism enacted on July 1, 2023, under the *National Greenhouse and Energy Reporting Act 2007* (NGER Act) and the 2024 Guideline–*Greenhouse gas emissions* (GHG guideline) ((ESR/2024/6819) (DESI 2024)), were published after the finalisation of the project's TOR in 2020. While these new expectations did not need to be addressed by the EIS, I consider them to be relevant to project implementation.

DETSI's GHG guideline is applicable to new (or amended) environmental authorities. The requirements of the version of the GHG guideline current at the time of application for an EA

would need to be addressed by the proponent. The GHG guideline clarifies expectations of the EP Act as it relates to GHG emissions information requirements, impact assessment and emissions reduction. As the EIS identified emissions to be greater than 25,000t of carbon dioxide equivalent (t CO2-e) annually, the GHG guideline requires development and implementation of a GHG abatement plan in accordance with the guideline.

As diesel powered generators would be used for power supply to the project and no off-site power generation was proposed, no Scope 2 emissions were identified for the project.

Consistent with the TOR requirements relevant for this assessment report, the EIS did not include estimation of scope 3 emissions produced. It should be noted that implementation of the EA would require an estimated inventory of Scope 3 emissions consistent with Table 3 of the GHG guideline. Scope 3 emissions assessment would need to include estimates from the significant generation of GHG emissions produced from the Bayer processing of bauxite into alumina and further smelting into aluminium.

The NGER Act's Safeguard Mechanism currently applies to facilities that exceed 100,000t CO2-e emissions annually. The Safeguard Mechanism sets industry specific GHG emissions reduction limits that decline annually to meet Australian emissions targets. The EIS emissions inventory identified that the project does not exceed this emission regulatory trigger until project year 16. However, the preliminary nature of the emissions assessment presented means this trigger date may change. Of relevance is that emissions from land clearing, a significant emission source from the project, are currently excluded from the Safeguard Mechanism threshold calculation. Should recommendations presented by the Climate Change Authority (CCA 2023) be enacted, land clearing emissions would need to be accounted for, moving forward from the 2027-28 financial year.

Regardless of when the project might trigger the NGER Act's Safeguard Mechanism annual threshold, I reiterate that a detailed emissions reduction program as part of the GHG abatement plan must be developed in accordance with the current GHG guideline as part of the EA application. I consider that there remains significant potential for emissions reduction within the project for the GHG abatement plan to capitalise on. When compared to the default emissions intensity of 4.01kg CO2-e per tonne of bauxite for Australian bauxite mining, as defined in the *National Greenhouse and Energy Reporting (Safeguard Mechanism) Rule 2015,* the average emissions intensity for this project, excluding land clearing, is presented as more than double this rate at 10.1kg CO2-e per tonne of bauxite.

To ensure the GHG emissions regulatory requirements are met and the GHG emissions mitigation measures are enforceable, I recommend that conditions B14 to B20 proposed in Schedule B Air in Appendix A of this assessment report be applied to the EA.

6.12 Noise and vibration

The EIS adequately identified all potential sources of noise and vibration from the project. As required by the TOR, this included low-frequency noise, cumulative noise, and underwater noise. The noise assessment presented in EIS Chapter 14 (Noise) and Appendix V (Noise Report) concluded that all noise impacts at the identified sensitive receptors are predicted to comply with the proposed noise criteria. The noise assessment was prepared in consideration of the Environmental Protection (Noise) Policy 2019 (EPP (Noise)) and the model conditions contained in the *Model mining conditions* (ESR/2016/1936) (DESI 2024). I note that the proposed mining activities did not propose blasting, therefore impacts resulting from airblast overpressure were

not assessed.

The noise modelling reported in the EIS was adequate for assessing potential noise and vibration impacts. Environmental noise levels expected to be produced by the project were calculated using RTA Technology Pty Ltd Environmental Noise Model software (ENM software). ENM software combines terrain and noise source information with other input parameters such as weather conditions to predict noise levels. Noise levels of operational equipment were determined from measurements taken at other operating mines. The project noise model took into account design features adopted for the purpose of ensuring compliance with noise criteria (e.g. use of noise-controlled generators at the CLF). Project years 3, 10 and 22 were modelled, given that these years include open cut mining near all significant Mine Site boundaries and collectively represent the worst-case acoustic situation in all directions from the project.

The EIS adequately identified one sensitive receptor (Amban Outstation) relevant to the project. Background and ambient noise levels were determined at two monitoring locations; M1 located 35m north of the main outstation building and M2 located 570m south of the main outstation building. Noise levels at M1 were more affected by human activity than those at M2, as such, noise levels at M2 were considered to be more representative of typical background noise levels and were used to determine noise criteria. The median LA90, 15 min background noise level at M2 was 30dBA or less at all times of day.

Noise criteria for the project were proposed in the EIS and were developed using procedures described in the model mining conditions based on a background noise level of 30dBA.

The EIS also considered cumulative noise impacts at Amban Outstation from the project and the Amrun Mine. Cumulative impacts were estimated based on noise contour figures from the Amrun EIS and the predicted noise levels from the project and were predicted to comply with the EPP (Noise) objectives.

Underwater noise impacts (including vibration) were predicted to occur as a result of construction activities (piling), shipping activities (TSG/OGV movements) and operation of the CLF. The EIS and marine assessment concluded that underwater noise and vibration from the project would not result in significant impacts nor make any significant contribution to cumulative impacts in the region on the marine environment.

I am satisfied that the noise and vibration management measures proposed in the EIS were adequate to mitigate the project noise impacts to comply with the proposed noise criteria. The EIS found that extensive noise mitigation was not required for the project due to the lack of sensitive receptors. To ensure compliance at the identified sensitive receptor the following mitigation measures were proposed at the CLF (these have already been accounted for in the noise assessment):

- use of noise-controlled (i.e. containerised) generators with an upper sound power level of 109dBA
- ensuring that the sound power level from the TSV loading conveyor does not exceed 87dBA per metre or 107dBA per 100m
- additional noise monitoring at Amban Outstation during the construction period and for the first two years of operation of the project to monitor any potential impacts at that location.

To ensure these mitigation measures are enforceable, I recommend that condition J12 proposed in Schedule J Marine and the conditions proposed in Schedule D Noise in Appendix A of this assessment report be applied to the draft EA.

6.13 Waste

EIS Chapter 4 (Project Description) and Chapter 20 (Non-mining waste) generally identified key legislation and how the waste management hierarchy *avoid, reduce, reuse, recycle, recover, treat, dispose* is applicable to wastes generated by the project.

However, I consider that further justification is required to satisfy the *Waste Reduction and Recycling Act 2011* (Qld) (WRR Act) waste and resource management hierarchy for the proposed burning of cleared vegetation (see section 6.13.6.2 of this assessment report) and for the proposed use of an incinerator (see section 6.13.6.1 of this assessment report). For this reason, recommended conditions to enable these activities have not been proposed in Appendix A.

The EIS identified that the project would keep an inventory of waste types, quantities and disposal methods in accordance with WRR Act and EP Regulation. The EIS also committed to submitting annual National Pollution Inventory reports for wastes generated. A waste management system would be implemented with a continual improvement process in place to identify new opportunities for waste minimisation and to address new waste streams.

The EIS identified primary non-mining waste streams including general wastes, green waste, sewage, scrap metal, miscellaneous hydrocarbons waste, batteries and tyres. Table 20-1 of Chapter 20 (Non-mining Waste) of the EIS estimated non-mining waste quantities and identified management strategies and suitable disposal options. Table 20-1 of the EIS Chapter 20 (Non-mining Waste) identified and grouped waste types in accordance with EP Regulation Schedule 9. Total waste volumes estimated to be produced for the project were:

- non-regulated wastes: <323,901t (prior to proposed incineration; see section 6.13.6 of this assessment report)
- regulated waste (category 1): none
- regulated waste (category 2): <78,678t.

Sewage effluent (wastewater from onsite toilets, washing facilities, and canteen) has also been included as a regulated waste (category 2) with an estimated production of 72 kilolitre per day (kL/day) for the life of mine (see section 6.13.4 of this assessment report).

As expanded upon in the following subsections, the EIS generally described adequate methods for the disposal of wastes and proposes mitigation measures that are likely to avoid or minimise impacts from waste disposal. However, I consider that insufficient justification to warrant the burning of cleared vegetation (see section 6.13.6.2 of this assessment report) and the incineration of some general wastes (see section 6.13.6.1 of this assessment report) was provided in the EIS.

To ensure the proper management of wastes, I recommend that proposed conditions in Schedule C Waste in Appendix A of this assessment report be applied to the draft EA.

6.13.1 Waste rock

The Aurukun bauxite ore body is relatively shallow and typically present at less than 1-2m below ground level. Stripped topsoil and subsoils are planned to be utilised immediately or stockpiled for later use for progressive rehabilitation activities. As a result, there would be no waste overburden generated.

The proposed management of soils is further addressed in sections 6.6 and 6.7 of this assessment report.

6.13.2 Rejects

A total of approximately 95Mt of fines rejects would be produced over the life of the project. Fines would be emplaced in the FCA for the first three years of operations. Subsequently, the fines rejects are planned to be emplaced in-pit.

I consider that the fines geochemistry and leachate was adequately assessed as part of the EIS and the results are presented in EIS Chapter 5 (Mine Rehabilitation and Closure), with further detail in the EIS Geochemistry Report (Appendix C). The fines are predicted to be geochemically stable and non-acid forming and therefore no specific management measures are reportedly required to address the fines geochemistry. The fines are stated to generate runoff and seepage that is slightly acidic to pH neutral and generally low saline, with low concentrations of heavy metals and metalloids. The proponent presented evidence in the EIS via kinetic leachate laboratory experiments that acid formation potential is expected to remain minimal over time in response to weathering processes.

The proposed management of reject material geochemistry is further addressed in section 6.7.1.1.4 of this assessment report.

6.13.3 Mine affected water

The proposed management of mine affected water is addressed in section 6.7 of this assessment report.

6.13.4 Wastewater and treated effluent

The EIS adequately addressed the expected production of sewage and grey water. Onsite toilets, washing facilities, kitchens, laundries, etc. are expected to generate up to 60kL/day at the accommodation village and 12kL/day at the MIA facilities. Wastewater would be processed onsite at two proposed wastewater treatment plant (WWTP) to achieve Class A treated effluent which would be stored in above ground storage tanks for reuse for dust suppression or added to the MIA PWP for use through the beneficiation plant and other industrial water demands. The water quality criteria for the discharge of treated effluent to land has been proposed in Chapter 22 (Environmental Management and Commitments) of the EIS. Suitable release limits in accordance with the Queensland's Public Health Regulation 2018 E-coli limits of 10 colony forming units per 100 millilitre have been proposed for dust suppression. Water quality of treated effluent is further discussed in section 6.7.1.1.4. Waste sewage sludge would be collected in geotextile bags, dried and then disposed of off-site by a licenced waste contractor.

The TSV and OGC contain onboard sewage treatment plants. Treated effluent would be discharged at sea, in accordance with the relevant legislation dependant on location of operation either in Queensland' coastal waters or the Australian territorial sea.

6.13.5 Plant and equipment waste

Mining operations would produce a variety of wastes from the maintenance of plant and equipment, including vehicles. Some of those wastes (such as tyres, batteries, and used oil) are regulated wastes listed in Schedule 9 of the EP Regulation. The EIS proposed a waste management system that would identify waste types, track regulated wastes, and use licensed waste transport contractors for offsite disposal of regulated wastes at appropriately licensed facilities. I consider the proposed waste management system is adequate.

6.13.6 General waste

The EIS adequately demonstrates that the Aurukun Shire Council landfill or as a backup, the Springmount Waste Management Facility at Mareeba, has the capacity to accept general waste for the life of the mine. The waste proposed to be disposed of annually to the Aurukun Shire Council landfill includes:

- residual ash from incineration of general waste (food scraps, putrescibles, general waste plastics, and damaged timber and clean pallets) (135t)
- general waste (plastics) (15t)
- protective personal equipment (<1t)
- air filters (<1t)
- treated timber (2t)
- sludge/residues from potable water treatment (1t)
- abrasive blasting media and waste material (<2t)
- sewage sludge/residues (10t)
- contaminated soil (after bioremediation) (10t).

The EIS identified that agreement with Aurukun Shire Council regarding the use of this landfill is required and notes potential for the project to provide in-kind support for the management of this waste facility. Disposal of sludge/residues from the potable water treatment (20kg/week) to land was also proposed in the EIS. However, insufficient justification on the contamination and concentration potential of this waste has been provided to support disposal of it where leaching may occur. Therefore, this disposal method has not been supported in the proposed conditions.

6.13.6.1 Waste incineration

Noting that the Aurukun Shire Council landfill operates under an EA limited to 2,000t of waste per annum, and the closest regional waste facility is at Mareeba greater than 750km away, the remote location provides challenges for off-site waste disposal. An incinerator has been proposed for non-hazardous and non-recyclable general wastes to reduce waste to 3% of their original weight. Additionally, segregation of putrescible camp generated wastes is proposed to occur prior to incineration to allow retention of this ash for use in rehabilitation.

Insufficient information has been provided in the EIS to authorise waste incineration for the project. The waste and resource management hierarchy of the WRR Act, in descending order of preference requires the project mange wastes to *avoid, reduce, reuse, recycle, recover, treat, dispose.* The Energy from Waste Policy (DES and Office of Resource Recovery 2021) expands on waste recovery policy discussing considerations for the assessment of extraction of refuse derived fuel and energy. Extraction of refuse derived fuel and energy would need to be assessed given its preference over the proposed treatment/disposal of waste through incineration. Waste air emissions including GHGs generated from the operation of the proposed incinerator would also need to be taken into account when assessing the suitability of incineration as an appropriate treatment/disposal method. Alternative treatment/disposal options such as backloading waste in empty transport trucks and or barges to more appropriate waste facilities would need to be investigated and assessed.

I recommend that EA condition C2 proposed in Schedule C Waste in Appendix A of this assessment report does not allow waste incineration, unless sufficient justification is presented to satisfy the WRR Act waste and resource management hierarchy. Additionally, as identified in section 6.11 of this assessment report, insufficient information has been presented in the EIS

regarding the specific contaminants and pollution control systems that would be required to manage incineration waste gases.

6.13.6.2 Cleared vegetation

Further consideration of the WRR Act waste and resource management hierarchy is required to demonstrate appropriate disposal of 292,000t of predicted green waste over the life of the mine. EIS Chapter 20 (Non-mining Waste) identified specific trees of cultural or commercial significance would be made available to Traditional Owners with remaining green waste to be mulched or burnt. Additionally, relevant mitigations identified elsewhere in the EIS have been noted providing preferable waste mitigation measures, such as:

- salvage of micro-habitat features (e.g. selected tree hollows, limbs, trunks)
- generation of mulch for rehabilitation

I consider that the reuse of cleared vegetation has not been sufficiently assessed and quantified to demonstrate that the waste and resource management hierarchy expectations have been met to warrant the disposal of vegetation through burning. While alternative waste management strategies have been identified, they are not committed to in the EIS.

I recommend that condition H3 proposed in Schedule H Land and Biodiversity in Appendix A of this assessment report be applied to the draft EA. This condition would provide for consultation with Traditional Owners with the intent of identifying any resources of value prior to clearing. This is further addressed in section 6.17 of this assessment report.

6.14 Hazards and safety

EIS Chapter 21 (Hazard and Safety) and Appendix Y (Hazard and Safety Report) adequately addressed the TOR regarding hazards and safety. Issues addressed in the EIS included:

- identification of potential hazards, particularly those that might impact on human health and safety
- hazard analysis and risk assessment in accordance with relevant standards and guidelines
- hazards and risks associated with climate change
- extreme weather and flooding, including events with at least a 1% AEP
- natural disasters, such as bush fires
- seismic events
- factors that might promote the breeding of pest animals and disease vectors
- storage, transportation and use of hazardous materials, including explosives.

The preliminary risk assessment included in the EIS adequately identified and assessed 28 unique risks. After mitigation controls were applied, 15 medium residual risks and 13 low residual risks were identified. The medium risks are primarily associated with natural hazards and health and safety.

The EIS considered the impacts of potential natural hazards, particularly cyclone, flooding, heatwave and bush fire. The EIS stated that natural hazards and risks would be managed in accordance with an Emergency Response Plan, relevant Australian Standards and advice from local and regional emergency service providers.

The EIS also considered the impact of climate change on natural hazards with the greatest potential impacts associated with increased annual average rainfall; temperatures and evaporation; extreme rainfall events; and flooding and intensity of extreme events including

cyclones and storms.

The EIS proposed adequate measures to address hazards and safety, including:

- reducing the risk of land contamination from project activities through design and construction of the facilities and post-mining rehabilitation
- storing of waste hydrocarbons and chemicals in separate sealed and bunded areas to prevent soil contamination
- handling of waste hydrocarbons and chemicals in accordance with standard operating procedures to minimise potential for spillage and leakage
- locating containers which store hazardous chemicals and dangerous goods outside areas with a 'likelihood of flooding'
- training of key staff in spills prevention and clean up
- provision of oil spill clean-up kits at strategic locations as part of site emergency planning
- controlling fine bauxite material using engineering controls, such as the use of water sprays
- developing a detailed standard for emergency preparedness and response
- addressing the requirements of the *Water Supply (Safety and Reliability) Act 2008* in relation to dam safety and failure impact assessment for Tapplebang Dam
- developing an Emergency Response Plan in consultation with relevant government agencies. This would include reference to disaster management techniques and prevention and preparedness measures.

Upon completion of further risk assessment and consultation, I recommend that hazards and safety risk management strategies and mitigations are integrated into relevant management plans.

6.15 Cultural heritage

6.15.1 Aboriginal cultural heritage

The EIS has adequately addressed the TOR with respect to Aboriginal cultural heritage. In EIS Chapter 22 (Environment Management and Commitments), the proponent commits to addressing the management of Aboriginal cultural heritage in accordance with the *Aboriginal Cultural Heritage Act 2003* (ACH Act). In their response to submissions, the proponent confirmed that cultural heritage would be managed through a Cultural Heritage Management Plan (CHMP) which would be finalised prior to mining lease(s) being granted for the project. Further information on the development of the CHMP was not included in the EIS and other public documentation due to its sensitivity. As discussed in section 6.16.1 and 6.17.1 of this assessment report, the Partnership Agreement will form the basis for all Traditional Owner agreements including the CHMP.

Noting that the CHMP has not been finalised at this stage, I recommend that condition A22 proposed in Schedule A in Appendix A of this assessment report be applied to the draft EA.

The relevant Aboriginal party for the project under the ACH Act is the NAK, representing the Native Title Holders (Traditional Owners). An Aboriginal cultural heritage assessment was undertaken including the following, as presented in EIS Chapter 18 (Cultural Heritage):

- formal and informal consultation (including on Country consultation) with representatives of the directly affected Traditional Owner families
- identification of geographic areas of potential cultural significance within the project site

- on-ground surveys of the areas of potential cultural significance with the participation of nominated Traditional Owner representatives, to document the cultural values and significance of the project site
- archaeological surveys to confirm the archaeological values of the project site
- post-survey verification of information with the relevant Traditional Owner families.

EIS Chapter 3 (Consultation) described the different consultation sessions that were undertaken with Traditional Owners on the proposed mine infrastructure and the scope of the cultural heritage assessment. The EIS stated that the survey strategy for this assessment was discussed and agreed with Traditional Owners and that representatives of the directly affected Traditional Owner families attended some of the field trips and surveys. The final draft of the cultural heritage assessment report was presented to Traditional Owners for review and feedback in 2022. Furthermore, the finalised assessment report would be provided to the relevant Aboriginal parties for endorsement in accordance with the requirements of the ACH Act. The process undertaken also included discussion with Traditional Owners regarding management measures.

The cultural heritage assessment identified culturally significant areas at Coconut Creek, sites downstream of the proposed Tapplebang Dam, and the area of coast between Norman Creek in the north and False Pera Head in the south. Archaeological surveys identified scarred trees and a few isolated stone artefacts on the bauxite plateau. The highest concentration of Aboriginal archaeological material (scarred trees and stone artefacts) within the project site was found at Tapplebang Creek.

EIS Chapter 3 (Consultation) provided an overview of the key issues and concerns raised by Traditional Owners in relation to the disturbance of sites such as creeks and story places that are considered to have special significance to the cultural identity of the directly affected Traditional Owners. The EIS outlines that these concerns would be addressed through an ongoing Agreement making process that involves the directly affected Traditional Owners and NAK. To manage cultural heritage, EIS Chapter 18 (Cultural Heritage) stated that feedback from Traditional Owners has helped to inform elements of mine design to avoid or mitigate potential impacts. Further management would be in accordance with the requirements of the ACH Act via the CHMP.

During the public notification of the EIS, multiple submissions were received from NAK and individual Traditional Owners, demonstrating their interest and involvement in the EIS process. Submissions on the EIS raised concerns about the lack of commitment to developing cultural buffers with Traditional Owner approval and endorsement. In their response to submissions, the proponent explains that buffer zones for culturally significant items and places would be included in the CHMP. Therefore, Traditional Owner agreement to cultural buffers would be achieved through the CHMP process.

Another submission on the EIS requested further details on the process for developing the CHMP. This submission was interested in how non-Indigenous cultural heritage would be managed, noting that much of the non-Indigenous heritage identified across the project area is connected to previous bauxite exploration. The submitter expressed that many Traditional Owners were involved in these activities, and for this reason, the heritage is still valued today. The proponent response stated that although the findings of the assessment of non-Indigenous heritage propose no specific management measures given the low significance of the places, it is recognised that some of these places have a shared history with the Aurukun community. The

proponent has indicated that they welcome further feedback from Traditional Owners in order to incorporate any desired management measures for non-Indigenous heritage places into the CHMP.

6.15.2 Non-Indigenous cultural heritage

A search of the Queensland Heritage Register (QHR) found no listing of any heritage places within the project site.

Field surveys undertaken for the EIS identified 16 non-Indigenous cultural heritage places, all relating to bauxite exploration activities undertaken from the 1950s onwards. The identified places include: a timber bridge; corduroy crossings; survey monuments; bulk sample pits; an exploration camp; the Amban airstrip complex; and other miscellaneous materials and features such as rubbish dumps and vehicle tracks. All places were assessed as having low cultural heritage significance and are below the threshold for inclusion on the QHR.

While no places of non-Indigenous cultural heritage significance were identified, there is still the potential for unidentified sub-surface deposits to exist across the area. If any places or items of potential historical or archaeological significance are uncovered within the project site, the EIS proposes that the following procedures should be undertaken to comply with the requirements of the *Queensland Heritage Act 1992*:

- work would cease and a buffer protection zone would be established
- an archaeologist or suitably qualified person would assess the heritage find
- based on the findings of the assessment, appropriate management recommendations would be developed for the heritage find. Traditional Owners would be consulted to determine any interests
- the prescribed management recommendations would be carried out by the appropriate personnel and Traditional Owners would be consulted to determine any interests
- on the completion of the prescribed management works, earth disturbance works would recommence.

I consider that the proposed approaches and proponent commitments adequately address potential impacts to non-Indigenous cultural heritage matters for the project.

6.16 Social

The EIS included a social impact assessment (SIA) for the project that was consistent with the requirements of the SSRC Act and the Coordinator-General's SIA guideline (DSDILGP 2018). The SIA was developed in consultation with the Office of the Coordinator-General, Department of State Development, Infrastructure and Planning.

The Coordinator-General has undertaken an evaluation of the social impacts of the project, which is available at: Social impact assessments for resource projects | State Development and Infrastructure.

As part of the evaluation, the Coordinator-General decided to state conditions under section 11 of the SSRC Act. Further, the Coordinator-General decided, under section 12 of the SSRC Act, to nominate the project as a large resource project for which the 100 per cent fly-in, fly-out (FIFO) prohibition and anti-discrimination provisions of the SSRC Act apply to the project's construction workforce. These decisions have been considered in the Coordinator-General's evaluation of the project.

The SIA has adequately addressed the impacts, and provided mitigation measures, to address the five key matters as defined by the SIA guideline:

- community and stakeholder engagement
- workforce management
- housing and accommodation
- local business and industry procurement
- health and community wellbeing.

6.16.1 Key matters

The project is located on Aboriginal land approximately 23km north of the township of Aurukun. Most of the workforce are expected to travel to the mine site via the Aurukun airport and stay in an accommodation village provided on site. The project workforce is expected to have 210-250 workers during construction and approximately 350 to 406 workers during operations. The focus of the SIA was on Aurukun where the main impacts are likely to occur.

Weipa is the largest nearby regional community to the project with established bauxite mining. Given the phasing down of Rio Tinto's East Weipa Mine and Andoom there may be increased workforce capacity in Weipa. Rio Tinto currently operates the Amrun Mine that adjoins the project and has some interaction with the Aurukun community and the Traditional Owners. However, the SIA notes that there is currently no bauxite mining in the Aurukun Shire Council LGA and the community has limited exposure to bauxite mining. Historically, there have been a series of proposed bauxite mines with Aurukun that have not progressed.

The project is located on Aboriginal freehold land with Native Title rights held by the Traditional Owners. There are significant cultural and social impacts with the project that are being managed through a Partnership Agreement with Traditional Owners and the development of the SIA. These relate to the deep spiritual attachment Traditional Owners have with the land and the functional challenges faced by the Aurukun community. The Aurukun community is home to approximately 1,418 people, of which more than 90% identify as Aboriginal. Aurukun is highly remote and inaccessible during the wet season. Whilst the community is characterised by strong cultural connections, the Aurukun community has a history of instability and social disadvantage (including limited employment opportunities). The SIA includes a program to benefit Aurukun and improve employment outcomes.

The proponent is seeking the consent of the Traditional Owners of the project site, through a Partnership Agreement. The Ngan Aak-Kunch Aboriginal Corporation (NAK) is the nominated prescribed body corporate in respect Native Title Rights. The Partnership Agreement will form the basis for other regulatory agreements, including an Indigenous Land Use Agreement under the *Native Title Act 1993*, a Compensation Agreement under the MR Act, and a CHMP under the *ACH Act*. The Partnership Agreement will be the primary mechanism to mitigate social impacts on Traditional Owners cultural identity and support the aspirations of the Traditional Owners. The Partnership Agreement has not been finalised and an updated Social Impact Management Plan (SIMP) will be required to be submitted to the Coordinator-General to outline the terms of the Agreement, with the level of detail as deemed publicly appropriate by the Traditional Owners.

The SIA has adequately outlined the community consultation and engagement undertaken to inform the impact assessment. The consultation tools were presented in a culturally appropriate manner and included on Country activities and community event participation.

Community consultation was scaled back in 2023 to manage ongoing EIS revisions and will therefore need to be renewed following a decision regarding the project. In submissions the Aurukun Shire Council, NAK and the directly affected Traditional Owners have all requested a consultative role in the ongoing development of the project. Along with the NAK and Traditional Owner role in the Partnership Agreement, the proponent has also outlined a role for an Aurukun Community Reference Group and Government Reference Agency Group to consult on the project. Further details regarding these reference groups will be required in their updated SIMP and reporting on implementation.

The SIA has identified the intended workforce profile, which assumes 10% employment during construction and 15% during operations for people from Aurukun. The SIA describes the existing barriers and challenges to employment that exist within the Aurukun community, and the proponent proposes a local workforce development plan to support local workers from Aurukun. This plan will involve accessing the relevant training and skills to gain employment on the project. A submission from the NAK questioned the local employment assumptions given the barriers to employment in Aurukun. The proponent has focused on employment outcomes and outlined strategies that include implementing a local recruitment hierarchy, work readiness programs, identified transition roles for local workers, part-time role split project and community-based position in Aurukun and local rosters. A final SIMP will be required to be submitted to the Coordinator-General for the local development workforce plan including Aboriginal and Torres Strait Islander employment targets. This approach to training and employment will need to be developed in consultation with Aurukun Shire Council, NAK and Traditional Owners.

The workforce will be visible in Aurukun with the project site being accessed through the Aurukun airport. I note the proponent has measures in place to manage this interaction and limit the impacts on Aurukun (i.e. road impacts). Aurukun is a closed community, and the SIA includes management measures that address possible non-resident workforce impacts. Aurukun is a 'dry' community, and the non-resident workers will be monitored to ensure alcohol and illicit substances are not being brought into the community. As the accommodation village is in Aurukun Shire Council it is proposed to be a 'dry' camp. There are also initiatives that support cultural awareness training for the workforce.

The SIA has adequately identified a proposed accommodation village for the construction and operational workforce for the project. Due to highly limited housing availability and cultural sensitivities, with Aurukun housing comprising of social housing and State Government leased housing, it is not possible or appropriate to have new local residents reside permanently in Aurukun. The SIA proposes to house all non-resident workers onsite in a temporary Construction Village, followed by a permanent Accommodation Village for operations. Aurukun workers would have the option to reside in the accommodation camp or at home in Aurukun. The SIA consultation highlighted limited housing as a key issue for Aurukun residents with overcrowding and lack of privacy. Whilst the proponent is not responsible for solving housing problems in Aurukun, they have committed to working through the issues in consultative forums. A well-rested and stable workforce in suitable housing would support greater project employment for Aurukun workers.

The SIA considers that workers from Weipa would likely already be based Weipa, and that significant numbers of new residents would not relocate to Weipa; and therefore, not significantly impact housing supply. Whilst it is beneficial that existing bauxite mine workers (for those mines that are phasing down) would secure employment on the project there may be

workers that choose to relocate to Weipa for work and lifestyle. The Coordinator-General will require the impacts on Weipa housing to be monitored by the proponent and be reported in their Social Impact Management Reports (SIMRs).

The SIA has adequately identified strategies to enable local business and industry involvement, including opportunities for Indigenous owned business involvement through all stages of the project. The proponent has committed to a Local Business and Industry Procurement plan that outlines the approaches to supporting local business involvement. The SIA identified during consultation that establishment of new Traditional Owner and Aurukun community member owned businesses that could support the project were highly desired. The revised SIMP will therefore need to outline in detail the support available for the foundation of new local businesses.

The SIA has adequately identified the impacts and opportunities for community health and wellbeing, including changes to cultural identity, impacts on social services and infrastructure, changes to social cohesion and opportunities from the proponent's community investment fund. Preservation of cultural identity was identified as a key matter during consultation and the proponent has committed to enhancing cultural identity opportunities through the terms of the Partnership Agreement, additional environmental monitoring and involvement of Traditional Owners in caring for Country and planning of project activities.

The Coordinator-General is satisfied the potential social impacts of the project can be adequately managed and minimised and has conditioned the proponent that all proposed management measures and proponent commitments are captured in the SIMP and implemented accordingly. If the stated outcomes are not achieved, the SIMP is to be amended to appropriately mitigate impacts. The Coordinator-General requires that conditions 1 to 8 in Appendix C are applied to the project to address social impacts.

6.17 Traditional Owner matters

6.17.1 Partnership Agreement

As noted above, I understand that the proponent is seeking the consent of the directly affected Traditional Owners for the development of the project through a Partnership Agreement involving the directly affected Traditional Owners and NAK.

The Agreement would address a range of initiatives designed to enhance the socio-economic benefits of the project and minimise adverse impacts on the Traditional Owners and the Aurukun community. It would also incorporate a framework for cultural heritage management through a CHMP.

I consider Traditional Owner participation to be of key importance for the project. I highlight other notable measures related to Traditional Owner involvement in the following sections.

6.17.2 Notification

As part of their submission, the Traditional Owners requested that the proponent commit to a process of providing immediate notification (to the Traditional Owners) for all environmental incidents. They requested this include details of the incident, investigation outcomes and proposed action to address any impacts to Country. They noted that this process should mirror the similar process for reporting these incidents to the Regulator. In response, the EIS acknowledged the importance of timely provision of information in respect of any incident that

results in the release of contaminants not authorised by the project's EA.

EIS Appendix AB (Response to Submissions) describes a process for notification through the Partnership Committee in the proposed terms of the Partnership Agreement which includes, in the event of a material breach of the EA, convening a meeting of the Partnership Committee to discuss the circumstances of the breach and any proposed remedial action.

Chapter 22 (Environmental Management and Commitments) of the EIS included conditions to include Traditional Owners and downstream landholders in EA notification requirements. I support this intention. However, I have addressed the matter by updating the proposed definition of 'affected persons' in Schedule K Definitions of the draft EA in Appendix A of this assessment report to include a more appropriate suite of persons. Consultation was sought from the DETSI Cape York Peninsula Tenure Resolution Program to ensure correct terminology was used. I recommend that the proposed definition be:

- '**Affected person/s** has the meaning in section 38 of the EP Act. For the purposes of this EA, affected person/s also includes but is not limited to the following:
- Aurukun Shire Council
  (a) Ngan Aak-Kunch Aboriginal Corporation Registered Native Title Body Corporate (RNTBC) Directors and Contact Person and
  (b) Adjacent downstream landholders.
  Note: Ngan Aak-Kunch Aboriginal Corporation RNTBC *are the owners of Lot 211 SP241404 (inclusive of the Mine Site) in accordance with section 39 of the Aboriginal Land Act 1991 (Qld) and is the prescribed body corporate for the native title holders being the Wik and Wik Way peoples.*
- **Affected person** in relation to a dam includes someone whose drinking water can potentially be impacted as a result of discharges from a dam or their life or property can be put at risk due to dwellings or workplaces being in the path of a dam break flood.

6.17.3 Outstations

The EIS adequately assessed potential impacts on Amban Outstation. The project is not expected to impact Waterfall Outstation, given its distance from the project site.

The project is not expected to exceed relevant air quality and noise criteria at Amban Outstation (see sections 6.11 and 6.12 of this assessment report). While visual impacts on the outstation are not anticipated, there may be visual impacts on the beach in front of the outstation (see section 6.5.5 of this assessment report). Additionally, the project could alter the 'sense of place' at the outstation, as it is situated in a very remote location.

The EIS stated that extensive consultation with Traditional Owners has been carried out regarding potential impacts on Amban Outstation as part of the Agreement making process, noting that the project cannot commence until this process has been concluded. The consultation included multiple site visits by the proponent and the preparation of materials to communicate the potential impacts, ensuring that Traditional Owners can make an informed decision about the project.

6.17.4 Access

There are several access tracks that traverse the project site, providing Traditional Owners with access to the coast, Amban Outstation, Waterfall and other areas of Country. Amban Road (an unsealed landowner/community road) traverses the Mine Site and provides access for

Traditional Owners to traditional Country, including Amban Outstation, along the west coast. The Waterfall Shortcut Track traverses the southern tip of the project site and is used by Traditional Owners during the dry season to access Waterfall. There are numerous mining exploration tracks across the project site that facilitate access for Traditional Owners to adjoining areas.

The EIS stated that these tracks, or their realignments, would continue to provide access throughout the life of mine and after mining operations conclude. While the project would not restrict access to Country beyond the project site, the EIS notes there would be access limitations within parts of the project site, particularly in operational areas, during the life of mine.

The proponent has committed to several measures, which the EIS stated are currently being refined and further developed as part of the Agreement making process with Tradition Owners. These include minimising the area of land within the project site that Traditional Owners are excluded from accessing due to active mining operations and associated safety reasons. In addition, the EIS stated that opportunities are being investigated to improve access to Country for the Traditional Owners (e.g. improving road access to traditional country, providing support to Traditional Owners to enable access to a range of transport options, and providing Traditional Owners with support for outstation improvements and maintenance).

I support the commitments made in the EIS to ensure ongoing access to Country.

6.17.5 Beneficial reuse

EIS Chapter 22 (Environmental Management and Commitments) committed to consultation with Traditional Owners prior to clearing activities during operations to identify 'resources of value' within the area proposed to be cleared, so that they can be harvested for use where safe and reasonably practical to do so. 'Resources of value' include any resource located within the project's clearing footprint that may be of use to the Native Title Holder, including but not limited to, timber resources, seeds, medicinal plants, sugar bag, scar trees and/or hollows.

I support this commitment and recommend it extends to any vegetation clearing from the commencement of construction, not just during operations. To ensure this mitigation measure is enforceable, I recommend that condition H3 proposed in Schedule H of Appendix A of this assessment report be applied to the draft EA. This condition would provide for consultation with Traditional Owners with the intent of identifying any resources of value.

I note that consultation was sought from the DETSI Cape York Peninsula Tenure Resolution Program to ensure correct terminology was used in the proposed condition.

6.17.6 Rehabilitation

EIS Chapter 22 (Environmental Management and Commitments) committed to maintain the engagement of Traditional Owners and seek their active participation in the planning and implementation of rehabilitation and closure activities and ensuring Traditional Owners would have a role in any review or changes to the proposed PRC plan, including any final land uses. The EIS further committed to support of Traditional Owner land and sea management initiatives, caring for Country programs and Traditional Owners' participation in activities aimed at protecting the environment and cultural heritage. I support these commitments for Traditional Owner engagement in relation to rehabilitation planning and management implementation.

6.18 Economic

The Economic Impact Assessment in Appendix T of the EIS, adequately identified and assessed the potential adverse and beneficial economic impacts of the project on the local and regional areas and the State in accordance with the Department of State Development, Infrastructure and Planning *Economic impact assessment guideline* (DSDI 2021).

As required by the TOR, the EIS adequately estimated the economic impacts and opportunities of the project using both regional impact analysis (RIA) and cost-benefit analysis (CBA) with consideration of the construction, operation and decommissioning stages of the project.

The RIA utilised input-output analysis to undertake an economic activity analysis for each phase of the project in terms of direct and indirect effects. The predicted economic impacts of the project's construction and operation phases for the western Cape local economy and Cairns regional economy are summarised in Table 5.

Table 5 Predicted local and regional economic impacts

Project stage	Area	Gross regional output (direct and indirect regional output or business turnover)	Value-added (direct and indirect)	Income (direct and indirect household income)	Employment (direct and indirect jobs)
Construction (year 2)	western Cape local economy	$140 million	$56 million	$34 million	336
	Cairns regional economy	$10 million	$6 million	$2 million	40
Operations	western Cape local economy	$400 million	$364 million	$18 million	390
	Cairns regional economy	$80 million	$41 million	$16 million	221

The EIS identified that the decommissioning phase of the project would also contribute to the local and regional economies. However, this was considered minor relative to the construction and operation phases and was not modelled in the assessment. The peak decommissioning workforce would be 170 full time equivalent (FTE) workers in project year 23 decreasing to 16 FTE workers by project year 25. The monitoring and maintenance workforce would consist of up to eight FTE workers annually.

The CBA compared the present value of the project's total benefits to its total costs. Generally, I consider that the CBA adequately quantified the main residual environmental, cultural, and social impacts of the project after mitigation and offsets. Greenhouse gas emissions were valued at $0.14 million for Australia and $0.03 million for Queensland and the opportunity cost of land was valued at approximately $554,825 (based on full value of the land required for the project). I note that the cost of securing water for the project was unquantified in the CBA.

Similarly, costs related to visual impacts at Amban outstation, and mitigation and management of Aboriginal cultural heritage were not quantified, as they are unknown.

The CBA stated that mitigation costs for impacts to transport, ecology (offsets) and water (fishway and infrastructure to facilitate environmental releases) were accounted for in the capital and operating costs of the project. I note that no detail was provided on the specific value attributed to each impact. The EIS found no material impacts for noise, air quality, marine activity or historic heritage that warranted inclusion in the CBA.

I note the proponent is not proposing a 100% FIFO workforce. To maximise employment opportunities for local people, the EIS stated that the proponent would implement a number of specific strategies. These included a recruitment strategy to give priority to local Indigenous people; implementation of a Local Workforce Development Plan to facilitate local workforce participation; and a Local Business and Industry Procurement Plan that provides access for local businesses to project opportunities and support local economic diversification and growth.

The EIS stated that project-related investment in western Cape York would support improved infrastructure and service delivery in the local economy. I note that the CBA concluded that the project is estimated to have a net social benefit to Australia of at least $747 million and, hence, is desirable and justified from an economic efficiency perspective. The estimated net production benefit of the project to Queensland is $482 million present value, comprising $415 million in royalties and $67 million in company tax. Overall, the EIS concluded that the revenue, expenditure and employment associated with the construction, operation and decommissioning of the project would stimulate economic activity for the western Cape, Cairns and Queensland economies.

6.19 Transport

EIS Chapter 17 (Transport) and Appendix W (Traffic Impact Assessment) adequately described the total transport task for the project, including supplies, products, and workforce inputs and outputs. The EIS largely provided information to allow an independent assessment of how existing transport infrastructure would be affected by the proposed modes of transport at the local and regional level (e.g. local roads and state-controlled roads).

The EIS also adequately assessed the choices for modes of transport that would ensure efficiency and minimise impacts on the community. Air, sea and road transport modes are applicable to this project.

6.19.1 Roads

Product bauxite would be transported from the Mine Site to the CLF via the Product Bauxite Transport Corridor (Figure 2). This corridor traverses RTA Weipa's mining lease 7024, with rights to access being granted under the Comalco Act. Public roads would be utilised to supply Mine Site construction/demobilisation and operational supplies and materials. Notably this includes 2,504 triple road train movements to supply quarry materials from the Archer River Quarry to primarily supply material for the Tapplebang Dam.

Potentially impacted public roads identified in the EIS include:

- state-controlled network: Peninsula Development Road, Mulligan Highway, and Kennedy Highway

- local government road: Aurukun Road which spans both the Aurukun Shire Council and Cook Shire Council
- other local government roads within Aurukun township.

6.19.1.1 State-controlled roads

The Traffic Impact Assessment, Appendix W of the EIS, assessed the impacts to the state-controlled roads. The Pavement Impact Assessment within the Traffic Impact Assessment identified contributions of $792,722.93 during construction and $9,228.34 per annum during mine operations, for impacts to the Peninsula Development Road.

I note that the proponent is required to consult with Department of Transport and Main Roads (TMR) to ensure pre-construction updates are communicated and permits for wet season road use and movement of large indivisible plant and equipment are obtained. I support this and recommend this occurs at least 6 months prior to construction as identified by TMR's submission.

6.19.1.2 Local government-controlled roads

As part of the assessment of project impacts on local government roads, the EIS committed to the proponent providing a short auxiliary left turn lane and a short channelised right turn lane on Aurukun Road at the proposed Mine Access Road/Aurukun Road intersection. The EIS states that this road intersection would be designed in accordance with the requirements of the TMR's Road Planning and Design Manual (2013) for approval by Aurukun Shire Council. Appropriate intersection lighting would be provided to assist drivers with identification and negotiation of the intersection.

I consider that the assessment of impacts to local government road networks and associated mitigation measures including pavement impact contributions have not been adequately addressed in the EIS. Despite the Pavement Impact Assessment within the Traffic Impact Assessment, Appendix W, identifying that the project may have a significant impact on the condition of the Aurukun Road, impacts to the local government roads were not assessed further. The EIS stated that these matters were out of scope and instead committed to consult separately with Councils. In response to submissions, the proponent provided further commitments to consult with Councils to develop agreed protocols for road maintenance to inform a Road Use Management Plan. DETSI sought further clarification on the proposed methods for quantifying impacts to local roads. The proponent's response advised that protocols with the affected Councils would define standards for assessing impacts, maintenance requirements and timeframes, contributions/compensatory methodology and timing of contributions. This response also identified that protocols would be developed at least 6 months prior to substantial construction commencing and would align with the Notifiable Road Use Agreement Protocol (TMR 2019a).

I recommend that the proponent undertake a complete Traffic Impact Assessment on local government roads including a Pavement Impact Assessment. The proponent should use the *Guide to Traffic Impact Assessment* (TMR 2019b) as identified by the Notifiable Road Use Agreement Protocol. This assessment would identify the monetary value of impacts on affected local roads to inform consultation with Aurukun Shire Council and Cook Shire Council. I consider it important that contact with affected Councils is made early to ensure consultation and assessment timeframes are sufficient for agreement to be reached prior to construction.

6.19.2 Sea

Product bauxite would be loaded onto TSVs at the CLF for transfer to anchored ocean-going vessels 18km off the coast, prior to distribution to ports in Asia. TSVs would cruise at 10 knots, and slower in shallow waters and in waters around the CLF making 612 return movements annually. The EIS advised that discussions with TMR have identified that TMR propose to declare a port for the CLF and nominate a port authority to provide regulatory oversight over activities under section 71 of the *Transport Operations (Marine Safety) Act 1994*. The proponent expects port limits to extend 1 nautical mile to sea from the high-water mark and 500m from either side of the LOJ to be designated for the safety of all marine users. The exclusion of other vessels would be required during the approach and mooring of the vessel.

The EIS proposes navigation aids, an oil spill response plan and confirms the proponent would consult with the Regional Harbour Master to develop and submit the specified management plans as outlined in the *Maritime Safety Queensland guidelines for major development proposals* (MSQ 2019) prior to commencing construction.

Fuel and some supplies would be transported via the existing barge service that supplies Aurukun township. The EIS notes that the barge operator has confirmed with the proponent that the project's requirements could be met as part of the existing delivery service. The EIS stated discussions with the Regional Harbour Master identified that a Pilotage Area may be declared because of the substantial increase in fuel being shipped. This designation would aid safe vessel movement and pollution prevention by enabling the regional harbour master to direct navigation of the barge in a specified way.

6.19.3 Air

The project is expected to require up to two flights into Aurukun airport per day. The EIS advised consultation with both Aurukun Shire Council and existing providers of commercial passenger services to Aurukun township has confirmed that the existing airport has sufficient capacity available to accommodate the project's air transport requirements without any alteration to existing air transport facilities or upgrades to the airport.

6.20 Matters of national environmental significance

This section of the EIS assessment report assesses the following requirements:

- a description of the environment
- matters of national environmental significance (MNES) controlling provisions
- feasible alternatives for the project
- summary of the relevant impacts
- measures to avoid, mitigate or manage impacts
- environmental offsets
- recommended conditions of approval (listed in Appendix D).

In accordance with the accredited assessment (under the EP Act), this section addresses the matters protected under the EPBC Act and prescribed in section 9 of the EP Regulation. The accredited assessment enables the EIS to meet the impact assessment requirements of both the EP Act and EPBC Act.

This information has been prepared for the Australian Government Minister for the Environment and Water to help the Minister make an informed decision about the identified

and potential impacts on MNES from the project, whether the project should proceed, and if so, relevant conditions of approval.

6.20.1 Description of the environment

The project site is located in the western Cape York bioregion of Queensland, approximately 35km south of Weipa and 23km north of Aurukun on Traditional Owner lands.

The project site is primarily within the Ward River sub-catchment of the Watson Basin. Coconut Creek and Tapplebang Creek and their respective catchments are located within the site and the watercourses run from the north-east draining to the south-west where they join approximately 2.5km beyond the project site to form the Ward River. The Ward River then discharges into Archer Bay in the Gulf of Carpentaria. A minor tributary of the Norman Creek is located in the north-west corner of the project site and flows west.

The groundwater regime comprises a shallow lateritic aquifer including a bauxite layer on, or close to the surface, and a weathered Bulimba Formation where the water table is located. The water table fluctuates 10m over an annual period due to recharge from wet season rainfall.

The project site covers an area of approximately 23,100ha and is located on a gently undulating bauxite plateau consisting predominantly of tropical savannah eucalypt woodlands, with narrow riparian vegetation corridors associated with the watercourses. The relatively intact and extensive remnant vegetation on the project site and surrounding region provide habitat for a range of threatened and non-threatened species. Habitat condition was described by the EIS as being moderate to good, recognising the influence of an intense and frequent late dry season fire burning regime, and damage from feral pigs in watercourses.

The bauxite product from the proposed action would be transported along a 23km haul road approximately 15km west to the coastal zone in the Gulf of Carpentaria. A jetty would be constructed from a low headland on a lateritic plateau across a sandy beach and 450m across the littoral beach zone and then loaded and transported 18km offshore to the transhipment area within the Commonwealth marine area.

The total clearing footprint for the project area is 6,897ha of remnant vegetation and 18ha of non-remnant vegetation. Only minor areas of the project site have been previously cleared associated with access roads, an abandoned airstrip and exploratory mining works. The existing disturbed areas total 94ha.

The project site is within a larger undeveloped western Cape lowland forest community. The project site's northern and western boundary is bordered by RTA's Amrun Project with current bauxite mining operations and the Port of Amrun located approximately 15km to the north-west. RTA's mining approval is for future operations to progress generally toward the boundary of the Aurukun project. Approximately 29,658ha of *Eucalyptus tetrodonta* (*E. tetrodonta*) woodland habitat is approved to be cleared for the Amrun Project. Cattle grazing operations are located to the south and east of the project site.

Traditional Owners use the site for collecting resources used for painting, weaving, carving and medicine. The project site and the wider Aurukun regional area are severely impacted by frequent fires largely resulting from traditional owner burning practices or unplanned bushfire events. 90% of the terrestrial ecology study area (that includes a 500m buffer around the mining areas and bauxite transport corridor, and a downstream area of the Coconut Creek, Tapplebang Creek and upper reach of the Ward River) has been burnt in 14 of the past 20 years.

The site is largely unaffected by pest plants. Feral pigs have caused habitat destruction to creeks and wetlands and have been observed to forage on marine turtle nests located west of the CLF. Feral cats are considered abundant based on camera trap results.

6.20.2 MNES controlling provisions

The project is comprised of one controlled action – to construct and operate an open-cut bauxite mine, CLF and LOJ in western Cape York, approximately 23km north of Aurukun, Queensland (EPBC Act referral 2020/8624). The referral was varied on 17 December 2022 to realign the product haul road to the south of the original alignment, make minor changes to the original layout of the CLF, and reduce the footprint of the project site from 27,000ha to 23,000ha.

The relevant controlling provisions for the project are:

- sections 18 and 18A (Listed threatened species and communities)
- sections 20 and 20A (Listed migratory species)
- sections 23 and 24A (The Commonwealth marine area).

The project has the potential to significantly impact the following EVs that are covered by the controlling provisions:

- palm cockatoo, *Probosciger aterrimus macgillivrayi*
- red goshawk, *Erythrotriorchis radiatus*
- black-footed tree-rat, *Mesembriomys gouldii rattoides*
- masked owl (northern), *Tyto novaehollandiae kimberli*.

6.20.3 Summary of feasible alternatives

This section provides a summary of feasible alternatives to the project identified in the assessment process (section 6.3.1 of this assessment report for further detail on alternatives). The likely impacts on MNES of the alternatives are outlined in sufficient detail to demonstrate why the preferred alternative was chosen.

The EIS stated that there is no feasible alternative to the general location of the project, and in particular the open-cut pits, which are dictated by the location of the target resource – the relatively shallow bauxite ore seam overlying the weathered Bulimba Formation.

The Water Supply Option Assessment Framework considered the environmental (MSES and MNES) constraints of six water supply options. Three in-stream water storages and one off-stream water storage (OWS) were considered by the EIS to be technically feasible, but all options presented potentially significant impacts to MNES listed threatened species and listed migratory species. An environmental screening process then identified both the Tapplebang Dam option and the OWS as having the least potential impact on prescribed environmental matters.

The preferred alternative for the design and operation of the project was the Tapplebang Dam option, that was considered by the EIS to provide the best technical, engineering and economic solution. Environmental concerns of this option were raised by DETSI and DCCEEW and included the large scale of the dam leading to inundation of a 10km reach of Tapplebang Creek, the clearing of 270ha of threatened species habitat and associated indirect impacts, and the transformation of a natural creek to a lacustrine system.

The EIS responded to these points highlighting the expected rapid establishment of functional

aquatic ecosystem and habitat based on monitoring of the Arraw Dam and Ely Dam (reservoirs that were all established for bauxite mining projects), and Botchet Lagoon, a natural bauxite lake system of the region in western Cape York.

The EIS noted that the OWS option would require a higher habitat clearing area of 460ha than the Tapplebang Dam option. It would also require the construction of a weir comprising 4.5km of embankment walls on Coconut Creek. This in turn would significantly alter the habitat of the creek due to inundation of a 3km to 4km extent of the creek reach. It was unclear whether this was an acceptable option to Traditional Owners.

Water supply from the GAB was investigated but determined by the EIS not to be feasible due to a range of issues. This included that the salinity, heat and mineralisation of groundwater was unsuitable for the beneficiation process. The issues are discussed further in section 6.7.2 of this assessment report.

In relation to the establishment of a separate port, the EIS stated that the ability of the project to use the existing port facility at the Port of Amrun within the adjacent RTA Weipa mining lease was constrained by consent, security of access and financial viability. The location of the CLF was based on avoiding sensitive marine features such as reefs and culturally sensitive locations. The location of the transhipment area was located to avoid sensitive marine features on the seafloor.

6.20.4 Summary of the project's relevant impacts

The construction, operation, and decommissioning of the project would have the potential to cause the following significant impacts on MNES:

6.20.4.1 Listed threatened species and ecological communities

6.20.4.1.1 **Palm cockatoo**, *Probosciger aterrimus macgillivrayi* – Vulnerable

Existing environment

Surveys in 2018, 2019 and 2022 detected the presence of palm cockatoo, *Probosciger aterrimus macgillivrayi* on the project site within riparian vegetation in the vicinity of Coconut Creek and Tapplebang Creek, and offsite at the confluence of the creeks where it becomes the Ward River. 17 direct observations and calls of palm cockatoos were made, and pairs were regularly observed in flight. Desktop surveys identified palm cockatoo records from 10 locations in the adjacent Amrun Mine within 2.5km of the project site.

A habitat assessment was presented in the EIS that categorised four habitat types across the 26,143ha terrestrial ecology study area. The highest value breeding and foraging/roosting habitat was modelled to occur in a zone up to 250m from the riparian vegetation associated with Coconut Creek and Tapplebang Creek. The next zone from 250m to 1,500m was considered to provide potential breeding and foraging habitat. The zone beyond that (from 1,500m to the project boundary) was considered to contain limited foraging habitat. The fourth category was considered to provide dispersal habitat across the entire terrestrial ecology study area.

In response to DETSI comments seeking targeted palm cockatoo surveys, the proponent commissioned palm cockatoo surveys on the project site to assess signs of active or recent habitat use (both breeding and feeding) in 2022 (Plate 1 and Plate 2). The survey methodology largely used the methods from *Field methods to identify Palm Cockatoo nest hollows* (Zdenek et al.

2022). The methods of Zdenek et al. 2022 describe a systematic, grid-based transect methodology that maximises the likelihood of identifying potential, used, and confirmed Palm Cockatoo nest hollows and notes that this methodology has been implemented on western Cape York Peninsula since 2015. I note that the field surveys used to determine palm cockatoo habitat use in the project site did not install the camera traps on nearby trees for viewing suspected nesting hollows as recommended in Zdenek et al. 2022. The EIS states that evidence of breeding was searched for during tree hollow surveys which included the presence of snipped waste sticks at the base of hollows, adult nesting behaviour or presence of fledglings, as per the systematic survey step recommended in Zdenek et al 2022. However, it is unclear whether these searches were conducted at all hollows. Surveys for palm cockatoo hollows were undertaken in August and September 2022.

The surveys commissioned by the proponent targeted potential breeding and feeding habitat adjacent to Coconut Creek and Tapplebang Creek. Systematic traverses of 545km over 54 survey days covered a total area of 5,040ha, which equated to 35% of the modelled potential breeding habitat in the project site.

The field surveys recorded no evidence of active or recently used nesting hollows in the breeding area zones adjacent to Coconut Creek and Tapplebang Creek. This contrasts with field surveys undertaken in western Cape York Peninsula over the period 2015 to 2020 that on average recorded one used hollow every 162ha traversed, and one confirmed nest hollow every 2,890ha of potential habitat traversed (Zdenek et al. 2022). It is noted that camera trap surveys were not conducted as recommended in the survey techniques of Zdenek et al. 2022.

518 potential hollows were identified in the project site. Evidence of breeding was searched for in relation to the hollows as described above. Only one used hollow was identified on the adjacent mining lease 7024 near the CLF and Product Bauxite Transport Corridor on the edge of the project site.

Species expert Dr. Stephen Murphy noted that breeding activity was likely to occur in this area. He expressed concern that the quoted totals for potential and used hollows should be considered minimum values, as some "potential hollows" were used by palm cockatoos. Dr. Murphy suggested that surveys should have included inspections of potential hollows with a pole-mounted camera to confirm palm cockatoo nesting. He also mentioned that some hollow openings are not visible from the ground, indicating that the actual number of potential hollows could be significantly larger than reported.

The riparian feeding habitat assessment identified evidence of feeding by palm cockatoos on 29 Nonda plum, *Parinari nonda* feed trees from 23 feed plots along Tapplebang Creek, Coconut Creek and the upper Ward River.

Eleven incidental sightings of palm cockatoos were recorded during the breeding and feeding habitat survey period between August and December 2022.

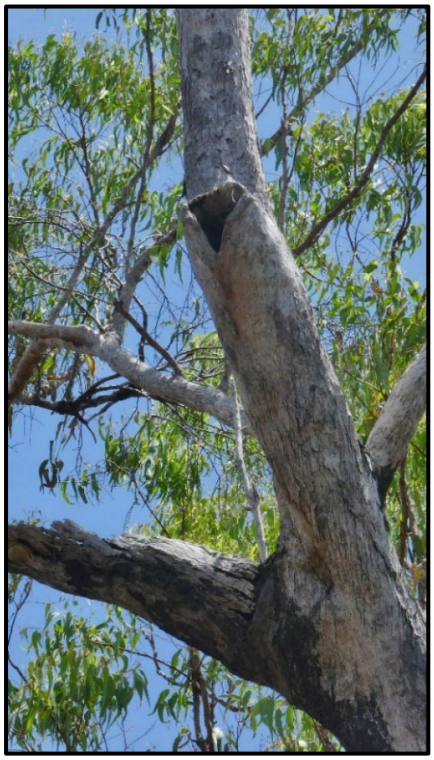

Plate 1. Potential nest hollow of a palm cockatoo *(Probosciger aterrimus macgillivrayi)* on the project site ©DETSI 2022

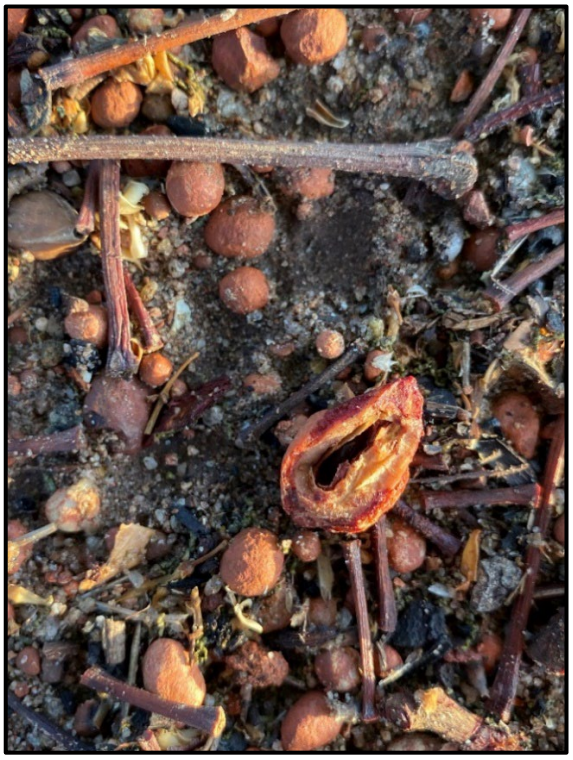

Plate 2. Fresh nonda plum feeding evidence of palm cockatoo *(Probosciger aterrimus macgillivrayi)* on the project site ©DETSI 2022

The EIS concluded that 2022 was not a breeding year for palm cockatoos. Palm cockatoo research has established that this species has a slow life history, breeding infrequently, laying a single egg with a high proportion of nest failure and only successfully breeding on average every 2.2 years (Murphy et al. 2003). I consider that as the species only successfully breeds biennially, a single-season survey limits the ability to draw a conclusion on active breeding habitat and can lead to a false absence conclusion. DETSI provided additional comments to the proponent recommending surveys employing the same methods for the August to December 2023 breeding season to establish whether that year would be a breeding season. The proponent responded that it is committed to further surveys. However, it did not provide any evidence that it had undertaken an equivalent survey effort for the 2023 or 2024 breeding seasons.

The conservation status of the palm cockatoo was upgraded to endangered from vulnerable under the NC Act in November 2021. The upgraded status reflects new Population Viability Analysis models that suggest a >50% meta-population decline over three generations (Keighley et al. 2021). This is related to the palm cockatoo's unusually low reproductive success, the small population size (<2,500 individuals), lack of connectivity for recruitment between three sub-populations, nest hollow competition, nest egg and fledgling predation, and changed fire regimes. The palm cockatoo was listed as vulnerable under the EPBC Act in 2015 but is currently under a listing assessment (due 30 October 2025) that will consider whether it should be uplisted.

Impact assessment

The total calculated significant impact to the palm cockatoo as a result of the project is a loss of 8,725.5ha of habitat. There is no proposed retention of old-growth nest trees in the impact area. This comprises:

- 6,897.2ha of habitat comprised of remnant vegetation proposed to be cleared for mining and project infrastructure
- 1,646.7ha of riparian breeding and foraging habitat to be cleared or significantly impacted by fragmentation with development of Tapplebang Dam
- 181.8ha of habitat that would become isolated between linear infrastructure and active mining areas.

The EIS states that the palm cockatoo habitat impacted includes approximately:

- 4,767ha potential breeding and foraging habitat for the species (<1,500m from watercourses),
- 3,957ha limited use foraging and breeding habitat (>1,500m from watercourses), and
- 6,897ha of dispersal habitat (the entire project disturbance footprint).

The significant impact assessment in the EIS concluded that the loss of nesting, roosting and foraging habitat may give rise to a significant impact on the species. The EIS states that it is considered that the proposed action is likely to lead to a long-term decrease in the size of an important population of the palm cockatoo, to disrupt the breeding cycle of an important population of the species and to interfere substantially with the recovery of the species. The EIS states that critical habitat for the palm cockatoo has not been defined within the relevant EPBC Act Plans, nor is there any habitat listed on the Register of Critical Habitat for the species. Therefore, the EIS concludes that critical habitat is not proposed to be impacted as a result of the proposed action. An offset is proposed to compensate for the significant impact.

Indirect impacts associated with mining activities such as noise and vibration, lighting, vehicle strike and dust were considered by the EIS to be minimal and temporary.

In addition, the EIS states that the project would contribute to a wider cumulative impact on palm cockatoo habitat of 36,555ha which includes the approved clearing total of 29,658ha for the adjacent Amrun Mine.

Mitigation measures

Proposed avoidance and mitigation measures include largely co-locating project infrastructure within an MIA to reduce direct disturbance and providing minimum buffer distances to Coconut Creek and Tapplebang Creek and a Norman Creek tributary. Sequential clearing practices aim to allow dispersal opportunities for displaced palm cockatoos. Pre-clearance surveys would be undertaken by suitably qualified and experienced persons within palm cockatoo roosting habitat to identify breeding hollows, and within 1,500m of that habitat. Any nesting or breeding locations, including additional hollow trees being actively used in the breeding cycle, would be protected by a 200m buffer until the nest or breeding place is abandoned or the fledgling/ juvenile has left the nest. The nesting tree/s and the 200m buffer would then be cleared and lost from the breeding pair's nesting habitat.

DCCEEW requested in submission comments that further mitigation actions be undertaken to reduce disturbance such as increased buffer distances. The resulting 500m wide buffer along the northern side of Coconut Creek (intersected by two road crossings) would largely retain the

integrity of the riparian corridor, reduce the risk of edge effects, and provide connectivity to the Ward River and to seasonally fruiting coastal feed trees. There will be two areas that would only have a 50m buffer zone adjacent to the Tapplebang South mining area (southern pits) and the boundary of Tapplebang Dam. 10 km of riparian vegetation along Tapplebang creek will remain directly impacted.

Fire management measures are proposed for the highest value breeding and foraging/roosting habitat adjacent to Coconut Creek and Tapplebang Creek in order to reduce the risk of the current high intensity fire regimes. A proposed Bushfire Management Plan aims to expand the existing band of riparian vegetation and associated nest trees by protecting it from fire and to implement early-mid dry season cool mosaic burns in other woodland regions of the project site where there is no infrastructure.

Rehabilitation measures for the palm cockatoo include the restoration of mined areas with the species' preferred nest tree *E. tetrodonta*. However, the EIS recognised that the rehabilitated landform would be unlikely to fully replicate the habitat values that occur within the pre-mining environment. The EIS also states that the time it takes for these trees to form suitable hollows are considerable – anywhere between 58 and 201 years. However, research indicates far lower growth rates in mature forests as compared to regrowth forests such as those post-mining. Further, hollow formation is unlikely to occur in *E. tetrodonta* trees until 170-350 years for large hollows, and 220-500 years for very large hollows (Woinarski and Westaway 2008).

The EIS stated that the proposed progressive rehabilitation of mined areas was likely to benefit the palm cockatoo by providing foraging resources that preferentially regenerated Nonda Plum, *Parinari nonda*, (the species' dominant food source), and to establish *E. tetrodonta* (the species' favoured nesting tree) as the dominant framework species. The EIS has stated that if nesting trees are available near to rehabilitation sites, then palm cockatoos would recolonise those sites for foraging of Nonda Plum. The EIS has stated that the PMLU milestone for native vegetation to support significant fauna is assumed to be achieved in 20 years after planting.

However, research indicates bauxite mining rehabilitation in Cape York has not led to the re-establishment of palm cockatoos at five sites aged between 17-23 years (Gould 2011). This is likely related to the lack of required resources for palm cockatoos such as tree hollows, that are generally absent from rehabilitation sites and only found in mature forests. Furthermore, palm cockatoo pairs exhibit nest site fidelity and long-term territorial behaviour so there may be reduced opportunities for individual pairs to re-establish breeding sites once their breeding and foraging habitat is cleared.

Offset assessment

Offsets are proposed for 8,725.5ha of significant impact to the palm cockatoo.

The location of the Offset area 1 includes riparian habitat of the Watson River adjacent to the impact area that had high palm cockatoo activity observed. The riparian vegetation associated with Brown Creek, Wabum Creek and the Watson River that traverse the offset area likely provide important breeding and foraging habitat for the species. Offset area 1 has an Aboriginal freehold title. Large areas of Offset area 1 are in a mineral development area (MDL 2001) with a licence held by the proponent. The proponent can apply for the area to be converted to a mining lease. Approximately 29,932ha of the offset area is within a Restricted Area (RA 315) under the MR Act by the Queensland Government to enable future mining applications to be made.

The location of Offset area 2 borders the eastern boundary of Offset area 1 and includes the upper reaches of some of the same watercourses such as the Watson River. Offset area 2 is a cattle property outside of MDL 2001 and RA 315. The EIS stated that *E. tetrodonta* and *Corymbia* woodlands were mapped on the property and that palm cockatoo feeding evidence along the Watson River was observed. Areas of Offset area 2 are utilised to generate carbon credits primarily managed through savannah burning.

The Offset Management Strategy for the palm cockatoo focuses on changing the existing fire regime of the site to protect breeding and foraging habitat (especially from late dry season high intensity fires). Other management actions include implementing feral animal and weed management programs, and stronger management of land use such as grazing and vehicle access controls.

Proposed management actions for the offset area include the implementation of the following:

- a fire management regime to reduce the frequency and intensity of bushfires
- a feral animal management program to reduce the populations of feral pigs that will lead to increased populations of small and medium sized native mammals
- a weed management program to improve habitat quality and reduce the risk of weed fuel loads contributing to bushfire intensity
- a species monitoring program to improve the understanding of the species active nest sites, species population, nesting and dispersal behaviour over the life of the offset and
- management of land use that would require restricted access; restricted or no cattle grazing; and avoidance of sensitive ecological values such as riparian areas from vehicle use.

Conclusion

I am largely satisfied that the EIS has adequately considered the potential direct and indirect impacts that the project would have on the palm cockatoo. The project is unable to avoid significant impacts to the palm cockatoo due to the nature of the shallow strip-mining of the bauxite resource, and the location of mine infrastructure such as Tapplebang dam that would be within the highest value breeding and foraging/roosting habitat for the species in the project site extending along a 10km reach of the Tapplebang Creek. I remain concerned about the lack of clarity in regards to the species' use of the breeding habitat onsite and consequently the impact on the viability of the population.

The impacts are considerable in extent with the loss of 8,725.5ha of breeding, foraging and dispersal habitat. The impacts are of high magnitude resulting in the complete loss of habitat in development areas with no proposed retention of old-growth nest trees. The impacts are also of significant duration with both direct and indirect impacts over a two-year construction period and a 22-year operational mine life. Further, as noted in the EIS, rehabilitation is unlikely to restore the vegetation back to its existing pre-mining state. Therefore, I consider that the impact to the palm cockatoo habitat in the impact area is likely to be permanent. I have taken into account the considerable time estimated by researchers of approximately 170-350 years for large hollows, and 220-500 years for very large hollows to form (Woinarski and Westaway 2008).

The proponent has proposed a number of mitigation measures such as riparian buffers of 500m, and up to 1km or wider for Coconut Creek, and 200m at Norman Creek, that are designed to reduce disturbance and to maintain connectivity along the watercourses. The EIS contends that the maintenance of habitat trees connected to riparian vegetation within this buffer area would potentially allow breeding to continue. The riparian buffer areas would also

maintain connectivity to the broader landscape such as seasonal movements to fruiting coastal trees. However, there will be no riparian buffer to 10km of Tapplebang Creek due to inundation from the construction of the Tapplebang Dam. The extent of area covered by a 50m and 200m buffer at Tapplebang Dam, to be cleared a year before the end of the life of mine, remains unclear. The proponent has also committed to providing 200m exclusion zones around active nest trees located in clearing zones until the nest is abandoned or the fledgling leaves the nest.

I consider that any nest trees identified in the project site should be protected and suitably buffered for the year of breeding until it is no longer occupied and remains unused by palm cockatoos for two subsequent breeding seasons, i.e. a minimum of three years from detection of use of breeding activity. This level of protection aligns with the Conservation Advice for the palm cockatoo that identifies land clearing as a threat to the species as it reduces feeding habitat and hollow availability (TSSC 2015). The Conservation Advice identifies a primary conservation action is to ensure that impacts from mining activities do not further reduce the amount of available breeding and foraging habitat.

The EIS has proposed an offset for the loss of palm cockatoo habitat to comply with the EPBC Act Environmental Offsets Policy 2012. The policy requires suitable offsets to deliver an overall conservation outcome that improves or maintains the viability of the listed threatened species. The EIS stated that the preferred offset option (Offset area 1) is located on the adjacent property to the south of the site, part of which is within the proponent's exploration permit for minerals mining tenement that is reserved for future bauxite mining. The major proposed management action to provide a conservation outcome is fire management. This aligns with a primary conservation action to implement active and appropriate fire management regimes to optimise the creation and longevity of large tree hollows (TSSC 2015). Currently, too frequent and too intense fires contribute notably to the loss of palm cockatoo nest trees on Cape York.

I have recommended an offset condition for the significant impact to 8,725.5ha of palm cockatoo habitat to the Australian Minister for the Environment and Water that accounts for both the direct and indirect significant impacts of the action (see Appendix D for recommended conditions for MNES). I consider that the proposed offset areas largely meet offset policy principles and that the three key management measures would likely result in a conservation gain. However, I note concerns from DCCEEW in relation to the proposal to legally secure the offset area 12 months after the commencement of the action, and the lack of evidence of landholder consent. I have recommended offset conditions in relation to these matters to ensure that offset principles are met.

I consider that effective fire management actions combined with proposed feral pig control measures undertaken over the life of the offset are likely to improve the existing habitat condition of the offset site. Monitoring, evaluation, reporting and improvement will be a critical component in determining whether palm cockatoos establish breeding territory and persist on site.

I note the proponent's 27-year project timeline. I consider that the 20-year offset timeframe for undertaking management actions should be extended five years and the maintenance of the offset outcomes to extend for the life of the impact or until such time as the ecological benefits are achieved]. There is uncertainty that the offset area may not be sufficiently resilient in the face of an uncontrolled and frequent fire regime returning to the site once the proponent or offset site manager ceases proposed management measures by year 20.

In response to these concerns, I have recommended a longer timeframe to undertake active

management measures at the offset site. This includes fire control measures to protect tall and dead hollow bearing trees from the risk of hot fires, and to increase the recruitment of future large trees, species diversity and coarse woody debris. The aim of a longer timeframe is to ensure that management measures lead to a conservation gain for the palm cockatoo.

I have recommended a condition that further action is required by the proponent in providing more rigorous fire control measures on both the project site and the offset area, undertaking additional offset area field surveys and associated habitat quality scoring, and providing an offset area management plan (OAMP) for assessment and approval prior to commencement of the project.

I have also recommended a condition that includes habitat clearance mitigation measures, including the retention of important habitat trees within the mined areas, and fire management controls to reduce or exclude fire from the Coconut Creek, Tapplebang Creek, and Norman Creek tributary buffer zones. As the EIS has identified that excessive fires in the region are the main threat to palm cockatoo nests, the fire management controls implemented in the habitat buffer zones and associated monitoring and corrective actions are crucial.

I have also recommended a specific condition related to the protection and monitoring of palm cockatoo nesting trees and associated habitat. I consider that a species monitoring plan would be valuable to establish targets, performance indicators and corrective actions relating to mitigation measures for the palm cockatoo at the project site. I note that in accordance with section 138 of the EPBC Act, in deciding whether to approve for the purposes of sections 18 or 18A the taking of an action, and what conditions to attach to such an approval, the Commonwealth Minister must not act inconsistently with a recovery plan and must have regard to any approved conservation advice for the species.

6.20.4.1.2 **Red goshawk**, *Erythrotriorchis radiatus* – Vulnerable

The red goshawk was uplisted from Vulnerable to Endangered on 31 March 2023 under the EPBC Act. The species is considered as Vulnerable for the purposes of this assessment as per section 158A of the EPBC Act because the section 75 Controlled Action decision for this proposed action was made on 11 June 2020.

Existing environment

The survey timing, methodology and effort for the red goshawk, *Erythrotriorchis radiatus* met regulatory guideline standards. Red goshawks were recorded in surveys and incidentally at four locations in the project site across the survey years 2018-2022, including along Tapplebang Creek. The species was also recorded at two locations downstream on the Ward River. The targeted habitat survey for the palm cockatoo was also used to survey for red goshawk nests and to make incidental observations on breeding habitat for the red goshawk. No red goshawk nests were identified on the project site, but one nest in the local area is located approximately 12km from the project site. Desktop surveys identified existing red goshawk records from the wider region within 10km of the town of Aurukun. Three active nests of red goshawks are located on the adjacent Amrun Project mine site (Rio Tinto 2024). The estimated population size for the species on Cape York in 2001 was 60-70 pairs, in 2020 the continuing decline of this species contributed to its uplisting to Endangered under the EPBC Act.

Plate 3. A recently unoccupied nest of a red goshawk ***(****Erythrotriorchis radiatus)* located near the Aurukun Road, October 2022 ©DETSI 2022

Red goshawk breeding habitat was mapped in a 2.5km buffer area associated with Coconut Creek, Tapplebang Creek and the Norman Creek tributary. The buffer distance is consistent with the latest red goshawk Conservation Advice (DCCEWW 2023). This breeding habitat includes areas with large, tall trees (>14m) with riparian vegetation and tall, dry woodlands in proximity to watercourses. The EIS calculated a total of 21,099ha of breeding/nesting/foraging habitat (i.e. within 2.5km of watercourses) in the terrestrial ecology study area.

A total of 5,114ha of foraging/ dispersal habitat was calculated for woodlands more than 2.5km from watercourses. All remnant habitats in the project site were considered to provide either foraging or dispersal habitat for the red goshawk. Tree hollow transects identified a density of approximately 19 hollows per hectare indicating good hollow availability for the red goshawk's preferred prey species Psittacines i.e. parrots, and kookaburras. The EIS considered that the site has the potential to support the home range of two female and one to two male red goshawks. All breeding and foraging habitat is considered habitat critical to the survival of the species.

Impact assessment

The total calculated significant impact to the red goshawk as a result of the project is 9,306ha. This comprises:

- 6,897ha of breeding/ nesting and foraging habitat located within 2.5km of watercourses (including from 10km of vegetation clearing along the Tapplebang dam)
- 1,896ha would be indirectly impacted due to isolation of habitat patches and therefore loss of habitat function with the construction of the Tapplebang Dam. The EIS states that the width of the dam is a barrier to North-South connectivity and would result in "isolation" of habitats and
- 512.7ha of preferred breeding and foraging habitat would become isolated between linear infrastructure and active mining areas.

The offset strategy considers the residual significant impact to red goshawk habitat impacted by the Action is:

- 7, 686.3ha of preferred breeding/nesting and foraging habitat, and
- 1, 619.4ha of additional foraging habitat.

The significant impact assessment concluded that the project is likely to result in a significant impact to the red goshawk. The EIS stated that the proposed clearing impacts have the potential to reduce the size of the local red goshawk population in the broader area. The EIS stated that all habitats in the project site were considered to be habitat critical to the survival of the species.

The EIS has proposed offsets for the residual significant impact to red goshawk associated with the project.

Indirect impacts associated with mining activities such as noise and vibration, lighting, vehicle strike and dust were considered by the EIS to be minimal, temporary and limited to edge effects.

DCCEEW provided comment that proposed buffers to watercourses are unlikely to protect breeding and foraging for the red goshawk in the riparian habitat due to the species being particularly sensitive to disturbance.

Mitigation measures

Proposed avoidance and mitigation measures include largely co-locating project infrastructure within an MIA setback from Coconut Creek to reduce direct disturbance and providing minimum buffer distances of 500m to Coconut Creek and upper Tapplebang Creek and 200m at the Norman Creek tributary.

The EIS proposed a 500m wide buffer along the length of Coconut Creek that would retain the important breeding and foraging habitat not only for the red goshawk but for its prey species. The connectivity of the creek corridor to the Ward River would also retain and provide dispersal opportunities for these species.

The EIS states that pre-clearance habitat inspections would require suitably qualified ecologists to survey within the preferred roosting and breeding habitat of the red goshawk that incorporates the 2.5km buffer from watercourses for nesting red goshawks.

The EIS has stated that exclusion zones of 200m would be established around any identified active nest trees for the red goshawk until either the nest is abandoned, or the fledgling/ juvenile has left the nest. However, I consider this is an insufficient buffer distance. I have recommended a 400m buffer distance that aligns with the Red Goshawk Recovery Plan 2012 and recent EPBC approval conditions for the red goshawk. Further, consistent with the Red Goshawk Recovery Plan 2012 and with regard to the Red Goshawk Conservation Advice 2023, I consider that there should be no more than 25% of forest cleared within 4km of a Red Goshawk nest.

Fire control measures are proposed in the buffer zone around the creeks and woodland ecotone. The aim is to protect the riparian vegetation community from fire thereby promoting recruitment and retention of habitat trees. Expanding the width of this community should provide increased prey habitat for the red goshawk. Fire management is also proposed in other areas of the project site.

The EIS states that the proposed progressive rehabilitation of disturbed sites means that the active disturbance footprint would be smaller than the total clearing impacts for the red goshawk and staggered over a 22-year construction and operational timeframe. Rehabilitation objectives aim to retore favourable habitat for medium to large birds which are the main prey items of red goshawks.

Offset assessment

Offsets are proposed for 9,306ha of residual significant impact to the red goshawk.

The location of the Offset area 1 includes riparian habitat adjacent to the impact area.

The riparian vegetation associated with Brown Creek, Wabum Creek and the Watson River that traverse the offset area likely provide important breeding and foraging habitat for the species.

The control of frequent fire is an important management tool for the offset area for all four threatened species subject to offsets. I note that frequent fires can result in simplified, open woodlands lacking structural diversity with a scorched ground layer.

The risk of uncontrolled fire is proposed to be managed via a suitable fire management regime with the objective to reduce the risk of late season, high intensity fires, and to implement mosaic burning practices of different time intervals and intensities. This includes leaving unburnt refuge areas for the red goshawk and its prey species.

Other proposed management actions for the offset area include the implementation of the following:

- a feral animal management program to reduce the populations of feral pigs and feral cats that will lead to increased populations of small and medium sized birds and mammals
- a weed management program to improve habitat quality and reduce the risk of weed fuel loads contributing to bushfire intensity
- a species monitoring program to improve the understanding of the species response to changes in the bushfire regime, to confirm the presence of active roost sites, to demonstrate an increase in the populations of small and medium sized native mammals (and the relationship between changed fire regimes)
- management of land use that would require restricted access; restricted or no cattle grazing; and avoidance of sensitive ecological values such as riparian areas from vehicle use.

Conclusion

I am largely satisfied that the EIS has adequately considered the potential direct and indirect impacts for the red goshawk on the project site, and has identified significant loss of breeding, foraging and dispersal habitat for the species.

The proponent has proposed a number of mitigation measures such as riparian buffers of 500m, and up to 1km or wider for Coconut Creek, that are designed to reduce disturbance and to maintain connectivity along the watercourses. The riparian buffer areas should also maintain connectivity to the Ward River and the broader landscape. However, there will be no riparian buffer to 10km of Tapplebang Creek due to the construction of the Tapplebang Dam. The proponent has also committed to providing 200m exclusion zones around active nest trees located in clearing zones until the nest is abandoned or the fledgling leaves the nest.

However, the red goshawk is particularly sensitive to disturbance, and I consider that any active

nest trees identified in the project site should be protected and suitably buffered until breeding activities are confirmed to have ended. This level of protection aligns with the *Conservation Advice for Erythrotriorchis radiatus (red goshawk)* (DCCEEW 2023) that identifies that habitat loss is the biggest threat to the species and the broad-scale clearing of tall forests for bauxite mining in western Cape York Peninsula as a developing threatening process. The Conservation Advice states that a conservation and management priority is to prevent further clearing of primary breeding and foraging habitat of the species. I note that based on the home range requirements of the red goshawk that the EIS estimates the project site has the potential to support a maximum of two breeding pairs.

The EIS has proposed an offset for the loss of red goshawk habitat to comply with the EPBC Offsets Policy 2012. The policy requires suitable offsets to deliver an overall conservation outcome that improves or maintains the viability of the listed threatened species. The EIS stated that the preferred offset option, Offset area 1, is located on the adjacent property to the south of the site, part of which is within the proponent's exploration permit for minerals mining tenement. The major proposed management action to provide a conservation outcome is to implement a suitable fire management regime. This aligns with a conservation and management priority in the Conservation Advice to implement fire management regimes that maintain habitat structure in areas supporting breeding populations.

I have recommended an offset condition for the significant impact to 9,306ha of red goshawk habitat to the Australian Minister for Environment and Water that accounts for both the direct and indirect significant impacts of the action. I consider that effective fire management actions combined with proposed feral pig control measures undertaken over the life of the offset are likely to improve the existing habitat condition of the offset site. Monitoring, evaluation, reporting and improvement will be a critical component in determining whether red goshawk establish breeding territory and persist on the offset site.

I note the proponent's 27-year life-of-mine timeline. I consider that the standard 20-year offset timeframe for undertaking management actions should be extended to lower the risk of ecological benefit not being achieved. The offset habitat quality and outcomes must be maintained for the duration of the impact. There is uncertainty that the offset area may not be sufficiently resilient in the face of an uncontrolled and frequent fire regime returning to the site once the proponent or offset site manager ceases proposed management measures by year 20.

A longer timeframe is recommended to undertake active management measures including fire control measures to protect tall trees from the risk of hot fires, and to increase the recruitment of future large trees, coarse woody debris and prey species diversity for the red goshawk. The aim of a longer timeframe is to ensure that management measures lead to a conservation gain for the red goshawk.

In response to these concerns, I have recommended a condition that further action is required by the proponent in providing more rigorous fire control measures on both the project site and the offset area, undertaking additional offset area field surveys and associated habitat quality scoring, and providing an OAMP for assessment and approval prior to commencement of the project.

As the EIS has identified that excessive fires in the region are the main threat to red goshawk habitat, the fire management controls implemented in the habitat buffer zones and associated monitoring and corrective actions are crucial. I have recommended a condition for the project site that includes habitat clearance mitigation measures, including the retention of important

habitat trees within the mined areas, and fire management controls to reduce or exclude fire from the Coconut Creek, Tapplebang Creek and Norman Creek tributary buffer zones.

I have also recommended a specific condition related to the protection and monitoring of red goshawk nesting trees and associated habitat. I consider that a species monitoring plan would be valuable to establish targets, performance indicators and corrective actions relating to mitigation measures for the red goshawk.

6.20.4.1.3 **Black-footed tree-rat (north Queensland),** *Mesembriomys gouldii rattoides* – Vulnerable

Existing environment

Broadly suitable habitat types for the black-footed tree-rat, *Mesembriomys gouldii rattoides* were considered to be present throughout the project site (as described in the *Mesembriomys gouldii rattoides* black-footed tree-rat (north Queensland) Conservation Advice 2015 (TSSC 2015). Tree hollow transects identified a density of approximately 19 hollows per hectare indicating good hollow availability.

No specific survey method is prescribed for the species, so the ecologists used survey methods for a sympatric species, the golden-backed tree-rat, *Mesembriomys macrurus*. Surveys detected the presence of the black-footed tree-rat in the project area in 2018 (within the riparian vegetation of Tapplebang Creek) and 2019 (within the dominant savannah woodland). The EIS stated that black-footed tree-rat breeding, foraging and dispersal habitat was likely to occur throughout the project site.

Impact assessment

A total of 6,897ha of black-footed tree-rat breeding and foraging habitat is proposed to be cleared.

The significant impact assessment concluded that the loss of habitat has potential to significantly impact the north Queensland subspecies of the black-footed tree-rat. An offset is proposed to compensate for the significant impact.

Mitigation measures

Proposed avoidance and mitigation measures include the afore-mentioned habitat buffer zones from watercourses, and 200m from identified breeding/nesting locations. Generic measures seen to benefit all threatened species include vegetation clearance protocols, the use of fauna spotter/catchers when hollow-bearing trees are cleared, and feral animal control management (in consultation with Traditional Owners) focussed on the control of feral pigs.

Offset assessment

Offsets are proposed for 6,897ha of significant impact to the black-footed tree-rat.

The offset includes similar riparian habitat and is located adjacent to the impact area. The riparian vegetation associated with the creeks that traverse the offset area provide important breeding and foraging habitat for the species.

The risk of uncontrolled fire is proposed to be managed via a suitable fire management regime with the objective to reduce the risk of late season, high intensity fires, and to implement mosaic burning practices of different time intervals and intensities. Protection of large patches of old-growth habitat centred on watercourses from fire is essential. Patchy, early dry season

prescribed burns are considered critical for the survival of this species (Kerle and Fleming 2024).

Other proposed management actions for the offset area include the implementation of the following:

- a feral animal management program to reduce the populations of feral pigs and feral cats
- a weed management program to improve habitat quality and reduce the risk of weed fuel loads contributing to bushfire intensity
- a species monitoring program to improve the understanding of the species habitat use, the species response to changes in the bushfire regime and, whether the species population increases over the life of the offset
- management of land use that would require restricted access; restricted or no cattle grazing; and avoidance of sensitive ecological values such as riparian areas from vehicle use.

Conclusion

I am satisfied that the EIS has adequately considered the potential impacts that the project could have on the black-footed tree-rat. I have recommended an offset condition for the significant impact to 6,897ha of black-footed tree-rat habitat to the Australian Minister for the Environment and Water that accounts for the significant impacts of the action.

I note that the species is threatened by inappropriate fire regimes and consider that fire management controls are important in the habitat buffer zones. Frequent, intense and/ or extensive fires are known to alter vegetation community structure resulting in the loss of tree hollows and food resources. Inappropriate fire regimes can lead to a simplified, more open woodland system that benefits predators such as feral cats.

In response to these concerns, I have recommended a condition that further action is required by the proponent in providing more rigorous fire control measures on the project site to reduce or exclude fire from the Coconut Creek, Tapplebang Creek, and Norman Creek tributary buffer zones. These measures are likely to benefit the black-footed tree-rat through increasing the availability of foraging resources and protecting existing hollows and riparian vegetation communities.

I have recommended a condition for an MNES management plan that includes specific conditions related to the clearing of black-footed tree-rat habitat, to the Australian Minister for the Environment and Water. This includes that known trees with hollows suitable for breeding are avoided and retained.

6.20.4.1.4 **Masked owl (northern),** *Tyto novaehollandiae kimberli* – Vulnerable

Existing environment

Seasonal surveys across the period of 2018 to 2022 did not detect the northern subspecies of the masked owl, *Tyto novaehollandiae kimberli* within the ecology study area. Suitable habitat for the masked owl exists in the entirety of the project area with roosting and breeding/nesting habitat identified along watercourses and the rest of the project area classified as breeding/nesting, foraging/hunting and dispersal habitat (some minor cleared areas excluded). A targeted survey for masked owls using a call detection program at 41 recording stations was undertaken between August and December 2022. This occurred along preferred roosting habitat of Coconut Creek and Tapplebang Creek but did not record any masked owl calls. A

habitat quality score of 5/10 for the project site was provided based on the Queensland guide to determining terrestrial habitat quality v1.3. Only qualitative descriptions for the site's condition, context and species stocking rate were provided. The MNES report did not provide a description of the methodology or sufficient justification and evidence to calculate the habitat quality score for the impact site and hence is considered to have low reliability.

Impact assessment

The EIS stated that the masked owl has a moderate likelihood of occurrence for the study area based on potentially suitable habitat and a nearby record. The significant impact assessment stated the masked owl was likely to be an important population and concluded that the mining project would result in a significant impact to the masked owl of 9,306ha. This comprises:

- 47.8ha of preferred roosting habitat (included in the 7,686 ha below)
- 7,686ha of breeding/ nesting and foraging and dispersal habitat. Of this total, 5,229ha is proposed to be directly impacted from project clearing activities, and 2,409ha would be indirectly impacted due to loss of habitat function and isolation with the construction of the Tapplebang Dam
- 1,619ha of lower quality breeding, foraging and dispersal habitat would be cleared
- Indirect impacts considered in the assessment include fragmentation and edge effects, noise and vibration, vehicle strike, lighting, dust, erosion and sedimentation, weeds and feral animals.

An offset is proposed to compensate for the significant impact.

Mitigation measures

Proposed avoidance and mitigation measures include the afore-mentioned riparian habitat buffer zones (see mitigation measures section for the Palm cockatoo above) and generic measures seen to be of benefit to all threatened species such as clearing limits and controls, rehabilitation, land management, dust minimisation and suppression strategies, speed limits, and the preparation of a sediment and erosion control management plan and permanent lighting restrictions. This also includes the use of fauna spotter/catchers, a bushfire management plan to promote lower intensity burns, and pest control measures for feral pigs and feral cats. A specific mitigation measure targeting masked owls is the planned use of autonomous acoustic recording devices for pre-clearance habitat inspections. No mitigation measures are currently proposed for the loss of hollows, specifically for this species.

Offset assessment

Offsets are proposed for 9,306ha of significant impact to the masked owl.

The potential offset sites are adjacent to the impact area. The riparian vegetation associated with the creeks that traverse the offset area provide important breeding and foraging habitat for the species.

The control of frequent fire is an important management tool for the offset area for all four threatened species subject to offsets. Frequent fires can result in simplified, open woodlands lacking structural diversity with a scorched ground layer. This in turn acts to suppress populations of small terrestrial mammals that are the main prey of masked owls. The exclusion of fire from Swamp Box fringing forest in the Coconut Creek, Tapplebang Creek and Norman Creek tributary buffer zones is an important goal to protect the roosting/ refugial habitat of the masked owl.

A suitable fire management regime is proposed as the main management action with the objective to protect existing hollows from bushfires, increase BioCondition attributes, reduce the risk of late season high intensity fires, and to implement mosaic burning practices of different time intervals and intensities to provide refuge for various fauna species.

Other proposed management actions for the offset area include the implementation of the following:

- a feral animal management program to reduce the populations of feral pigs and feral cats that will lead to increased populations of small and medium sized native mammals
- a weed management program to improve habitat quality and reduce the risk of weed fuel loads contributing to bushfire intensity
- a species monitoring program to improve the understanding of the species response to changes in the bushfire regime, to confirm the presence of active roost sites, to demonstrate an increase in the populations of small and medium sized native mammals (and the relationship between changed fire regimes)
- management of land use that would require restricted access, restricted or no cattle grazing, and avoidance of sensitive ecological values such as riparian areas from vehicle use.

Conclusion

I am satisfied that the EIS has adequately considered the potential impacts that the project could have on the masked owl. Mitigation measures include the retention of high habitat amenity riparian vegetation along Tapplebang Creek and Coconut Creek. These watercourses have connectivity to substantial foraging habitat retained in the project area and adjacent to the site.

I have recommended an offset condition for the significant impact to 9,306ha of masked owl habitat and specific conditions related to the clearing of masked owl habitat to the Australian Minister for the Environment and Water.

In consideration of the length of time it takes for suitable hollows to form, mitigation measures for the loss of existing suitable hollows for this species should be investigated and considered prior to commencement of the action.

6.20.4.1.5 **Largetooth sawfish,** *Pristis pristis* – Vulnerable, Migratory

Existing environment

The largetooth sawfish, *Pristis pristis*, is listed as vulnerable and migratory under the EPBC Act. A likelihood of occurrence assessment determined that this was the only species of sawfish that had a moderate likelihood of occurring in the freshwater reaches of the Ward River downstream of Coconut Creek and Tapplebang Creek. Juvenile largetooth sawfish can occur in the upper reaches of freshwater rivers and isolated waterholes. The young (pups) are born at river mouths and estuaries and then migrate upriver to spend their first years of life (DCCEEW, 2014).

The species was not recorded in surveys or incidentally in the freshwater aquatic environments. However third-party evidence of largetooth sawfish presence in the Ward estuary was presented in the EIS. DETSI, in submission comments requested that eDNA sampling be undertaken in the February to April wet season to target sawfish species. The proponent initially had undertaken eDNA sampling in June 2023 (following the wet season) along Coconut Creek,

Tapplebang Creek and the upper reach of the Ward River. The proponent responded to DETSI's request and undertook sampling in early April 2024 in high flow/ flood conditions. Not all sampling sites could be safely accessed due to the flood conditions. No sawfish species were detected by the eDNA sampling indicating that no sawfish species had been in the aquatic system for at least two days prior to sampling. It is noted that the small sample size limits the detection rate for rare aquatic species such as the sawfish.

In response to submission comments from DETSI and DCCEEW, the proponent undertook a remnant waterhole survey of the downstream reaches of Coconut Creek and Tapplebang Creek in October 2024 to determine if sawfish habitat was present. Additionally, eDNA samples were taken in the larger waterholes but sawfish were not detected. The survey concluded that the waterholes were substantially smaller than those known to provide habitat for sawfish on the Fitzroy River in Western Australia. The EIS stated that the waterholes were highly unlikely to provide dry season refugial habitat for sawfish as the pools are not persistent and are too shallow to provide nursery habitat for juvenile largetooth sawfish. The Upper Ward River, from approximately survey site WR3 and including off-channel wetlands, has characteristics that may provide habitat for juvenile largetooth sawfish.

The marine environments associated with the barging and transhipping of the bauxite product were considered by the EIS to provide only transit and low-density foraging habitat for the largetooth sawfish and therefore assessed as having a moderate likelihood of occurrence.

Impact assessment

The project proposes to dam Tapplebang Creek and capture 10GL/year of water at the beginning of the wet season, releasing up to 5.1ML/d into the downstream system until the dam has filled. There is uncertainty about how potential changes to the hydrological regime of Tapplebang Creek arising from dam filling would impact the largetooth sawfish and riparian vegetation. The IESC provided advice to DETSI on 14 November 2023 stating that there was insufficient discussion provided in the EIS on the variability of stream flows and how the effect of reduced flows at the beginning of the wet season (up to two months) and altered flows at the start of the dry season could potentially impact aquatic ecosystems and their biota downstream of the project area.

Changes in flow volumes and delays in flows could impact seasonal habitat availability and habitat quality in freshwater reaches of Tapplebang Creek and Ward River. Freshwater flushing of upstream remnant pools and tidal waters in the lower reaches of the Ward River, including into the wetlands that could support breeding habitats for threatened species such as the largetooth sawfish may also be affected. These systems rely heavily on freshwater flow pulses to ensure there is no build-up of saline water. For example, seasonal freshwater flushes remove accumulated saline water from the wetlands that may be used as breeding habitat for the largetooth sawfish that potentially pup within the wetlands and lagoons during the wet season.

Altering the natural flow of water from Tapplebang Creek could change the timing of reproduction and level of recruitment for the large-toothed sawfish. Research indicates that wet season freshwater flows act as a cue for sawfish pupping (Peverell 2005), and that recruitment success of freshwater sawfish is significantly correlated to high wet season volumes (Lear et al. 2019).

DETSI and DCCEEW requested additional information on the modelled reductions in flow volumes and an assessment of the impact on the downstream environment. The proponent responded in an amended EIS that Tapplebang Dam's impact on the flow regime, tidal extent

and salinity profile of the Ward River is likely to be negligible. The EIS stated that the project would reduce the mean annual flow of Tapplebang Creek by 12% and the Ward River by 5% at the confluence with Tapplebang Creek. The impact to early wet season flows is greater. It stated that there would be no increase in the dry period days downstream of the dam due to the 5.1ML/day environmental flow rules proposed for the project that were used from Schedule 7 of the Water Plan (Cape York). Further, the EIS stated that there would be no impact on water quality or downstream aquatic habitats such as waterholes in the downstream reach of Tapplebang Creek and the Ward River.

However, the IESC stated that the proposed environmental releases of only 5.1ML/d compared to potential average flows in January of approximately 500ML/d, had not been justified. The IESC identified that other environmental flow release scenarios may better preserve ecologically important flow components leading to greatly reduced environmental impacts while having little adverse effect on water security for the project. The IESC recommended the proponent assess a range of environmental flow release scenarios in order to reduce impacts to aquatic biota and riparian vegetation downstream of the dam. DCCEEW, in review comments, stated that the environmental flow objectives from the Water Plan (Cape York) are not directly applicable to MNES and have not been demonstrated to provide adequate protection to the largetooth sawfish. DCCEEW stated that flows between 5-100ML/d and possibly up to 1,000ML/d occurring early in the wet season and possibly late in the wet season, appear particularly important for the largetooth sawfish.

DCCEEW recommended that the proponent provide alternative dam filling scenarios that better mimic the natural flow regime. This was requested to include modelling of multiple alternative scenarios for dam filling, such as: the use of proportional take for filling, that permit a percentage of the total natural flow to be taken to fill the dam; consideration of scenarios that better protect the early wet season flow, and contextualisation of these scenarios with analysis of the risk of not filling the dam under each scenario based on the climate record.

The EIS stated that construction activities in the coastal zone such as piling for the CLF infrastructure had a low risk of impact for the largetooth sawfish. This was due to the acoustic impacts only exceeding peak levels if an elasmobranch was within 13m of the piling activity. The mouth of the Norman Creek, located approximately 2.3km north of the CLF, was considered by the EIS to be the most likely area that could sustain an important population of the species. This location was considered to be sufficiently distant from piling activities to not result in an adverse impact to the species.

The EIS concluded that there would be no significant impacts to the largetooth sawfish from the result of project activities.

Mitigation measures

For the marine environment, the EIS proposed a soft start procedure for piling that allows for fish within a 680m zone of behavioural impact to move away from the source of the sound. The EIS undertook an underwater noise modelling assessment based on information from the site-specific studies completed for the neighbouring Amrun Mine's Chith Export Facility. The EIS concluded that the temporary reduction in hearing sensitivity would likely only occur if an elasmobranch was within 13m of the sound source.

Other management measures for sawfish in the marine environment would be the maintenance of a 100m exclusion zone around the piling activity (section 6.20.4.1.6), and the management and disposal of debris such as plastics from entering the marine environment.

For the freshwater and downstream environment from the project site, the EIS has proposed a sawfish monitoring plan for the Ward River catchment in response to DCCEEW submission comments. One of the objectives of this plan is to determine the water quality and/ or flow triggers for sawfish extent and movement within the catchment. No resulting mitigation or management measures were discussed in the proposed plan despite an aim of the plan to identify further mitigation measures that may limit any potential risks to the sawfish population from the project's activities.

Conclusion

I note that there are two potential records of largetooth sawfish within the Ward River estuary, and that the EIS ecological assessment considered that there was a low likelihood of occurrence of the species occurring in the project site and the upper reaches of the Ward River.

I agree with the EIS conclusion that the project is unlikely to significantly impact the largetooth sawfish. However, I have noted the concerns from the IESC and DCCEEW and have recommended condition 7, Appendix D for the largetooth sawfish to the Australian Minister for the Environment and Water. This includes that the proponent investigates the use of variable environmental releases, such as having a higher release in the early wet season to maintain reproductive cues for downstream sawfish, and to implement a Sawfish Monitoring Plan that must include Trigger Action Response Plan measures to detect impacts on sawfish and appropriate corrective actions should triggers be exceeded.

6.20.4.1.6 **Olive ridley turtle**, *Lepidochelys olivacea* – Endangered, Migratory and Marine

Existing environment

The olive ridley turtle, *Lepidochelys olivacea*, is listed as endangered, migratory and marine under the EPBC Act.

No targeted field surveys for the olive ridley turtle were conducted for the EIS. The EIS relied on megafauna monitoring undertaken in the region by RTA Weipa over the 2015-2020 period. The monitoring program included offshore vessel transects and nesting beach surveys that covered the entire marine study area. Olive ridley turtles were confirmed as present in the marine study area, and nesting was observed in the coastal beach habitat of the marine study area, and on the beach directly in front of the proposed CLF footprint in 2018.

Olive Ridley breeding occurs year-round, with the majority of nesting occurring from April to November and key nesting periods from June to August. Hatchlings are expected to emerge from the nests approximately two months after oviposition. The entirety of the beach within the marine study area (from False Pera Head in the south, to Norman Creek in the north) was considered by the EIS to provide nesting habitat critical to the survival of the olive ridley turtle. Low numbers of nests were recorded over the period 2016–2019 and high predation rates were recorded. Despite low occupancy, the EIS recognised that the beaches of the western Cape are a significant area for olive ridley turtle nesting.

The nesting population of the olive ridley turtle in the western Cape York Peninsula is considered a genetically distinct stock for the species, with the highest density of nesting occurring within Pormpuraaw and Aurukun lands (Limpus, C.J.; Shimada, T. 2024).

The reef habitats close to the CLF were found to support dense macroalgal and invertebrate communities and are therefore considered by the EIS to provide high value foraging habitat.

Other marine habitats include low-density foraging habitat and transit habitat.

Impact assessment

Construction of the CLF and piling

A total of 42.2m^2 of marine habitat is proposed to be significantly impacted due to the construction of the CLF. The CLF, located adjacent to the coast, is approximately 15km west of the mine site and includes a 450m long, 3.5m wide and up to 12m high LOJ. Product bauxite is proposed to be loaded onto TSVs from the LOJ. TSVs are capable of carrying 10,250t of bauxite and are proposed to be 34m wide, 150m long, and include a 5.5m draft. The TSV would transport the product bauxite approximately 18km (10 nautical miles) offshore along a route that varies between 7.5m and 19.5m water depth. One TSV would operate 24hrs per day, making two trips per day and operating for 320 days per year. Approximately 15km of the route would be within the Commonwealth Marine Area.

Underwater acoustic impacts from construction are primarily related to noise from piling in the construction period. The piling works required to support the proposed LOJ includes the establishment of approximately 84 steel piles (44 for the jetty and 8 per berthing dolphin) of 80cm in diameter. The piling works are modelled to have an acoustic impact with the potential for injury to marine turtles within 30m (according to the EIS is 207dB re µPa^2) of the activity, and to have an impact on marine turtle behaviour within 50m (according to the EIS is 175dB re µPa^2). No impacts are predicted to olive ridley turtles foraging on reefs that are more than 900m from the piling works.

Lighting

According to *National Light Pollution Guidelines for Wildlife* (DCCEEW 2023), many species of turtles are attracted to light in the ultraviolet range <300 nm. No significant impacts are predicted by the EIS on the nesting behaviour of olive ridley turtles from artificial lighting from the CLF. Viewshed analysis indicates there would be no direct visibility of onshore lights from the nesting habitat adjacent to the CLF. However, offshore lights would have direct visibility at 86% of the beach nesting habitat area.

The lighting impacts from the jetty on emerging turtle hatchlings poses a higher risk to the species. Light pollution can disrupt ocean-finding behaviour in turtle hatchlings and could increase mortality (Shimada et al. 2023). The EIS stated that the jetty lights would act to attract hatchlings to the sea. During slower tidal current velocity, hatchlings are likely to be attracted to the jetty lights instead of offshore dispersal and potentially be subject to aggregations of predatory fish occurring under jetty structures.

Collision impact

The EIS considers that the risk of TSV collisions with turtle hatchlings are considered low due to the highly unlikely frequency of occurrence and low consequences of interaction.

Propellor wash

The department requested additional information on impacts associated with propellor wash plumes on the high value foraging habitat and potential light disturbance to nesting turtles. The proponent responded that inshore boulder habitats were not high value feeding habitat or breeding habitat for the olive ridley turtle.

Predation

Very high predation rates of marine turtle nests by feral pigs, dingoes and goannas have been recorded along the western Cape beaches from surveys undertaken between 2013 – 2019. The EIS stated that feral pig control measures have been undertaken by RTA as part of the Feral Pig Management Offset Strategy along the coastline. Monitoring reports from RTA indicate the management measures have largely been successful in reducing pig numbers and predation rates on turtle nests.

Mitigation measures

Piling

Underwater acoustic impacts from construction are primarily related to noise from piling in the construction period. A 100m exclusion zone which also ensures that species are not exposed to sound exposure levels greater than or equal to 175dB re μPa^2 for marine fauna is proposed to be achieved by having an observer signalling to stop pile driving activities if marine fauna breach the exclusion zone. Pile driving would use soft-start procedures that are designed to encourage marine fauna to move away from the area of piling activities due to a ramp-up in sound levels. Pile driving would only occur during a four-to-five-month period for a maximum of 30 minutes per day during daylight hours. This would avoid acoustic impacts to turtles that nest at night.

Vessel Wash

Potential sediment smothering of coral reef habitats and boulder habitats from vessel wash is proposed to be monitored via a Marine Water and Coral Monitoring program. Berthing plumes would be monitored as would coral cover at potential impact sites.

Lighting

To minimise impacts on nesting behaviour, lighting design control measures would be undertaken in accordance with the *National Light Pollution Guidelines for Wildlife* (DCCEEW 2023), noting that these guidelines state that that many species of turtles are attracted to light in the ultraviolet range (<380nm). Lighting control measures detailed in an Artificial Light Management Plan aim to reduce the CLF light output and resulting sky glow to as low as possible, and to ensure that onshore lighting is not directly visible in sensitive habitats. Measures include using only the minimum number and intensity of lights needed, and to avoid lighting outside the target area; the use of amber LED emitters for offshore lights and those onshore lights above 10m height; the use of non-reflective, dark coloured surfaces to reduce the impacts of sky glow; and controls that reduce the lighting of buildings and vehicles in the CLF.

The proponent also stated arena trials for emerging turtle hatchlings would be undertaken if the artificial light monitoring program identified onshore light impacts from the CLF. Additional measures such as changing the orientation and direction of light fittings, reviewing operational hours, and changing the wavelength of light would be adopted if the arena trial confirms the impact.

To minimise impact on nesting behaviour; and where compliant with technical and safety requirements, the jetty should be designed to prevent gaps in the floor which would otherwise result in light shining directly onto the ocean below the jetty.

Feral animal management

Feral animal management activities are proposed to be implemented by the proponent but no management plan for feral pig control on turtle nests has been committed to.

To ensure the proposed and recommended mitigation measures are meeting the objective of minimising significant impact to this species, I recommend a monitoring program to be implemented with appropriate surveying and data reporting. This monitoring program must be hosted on a public-facing website hosted by the approval holder, using the principles of Before-After, Control-Impact (BACI).

Conclusion

I note that the combined marine and nesting habitats meet the definition of habitat critical to the survival of the species. I also note that beaches within the study area represent critical nesting habitat for the Australian olive ridley turtles (western Cape York genetic stock).

The wildlife lighting impact assessment adequately described potential impacts to the olive ridley turtle and proposed mitigation and monitoring measures. I support the implementation of an artificial light monitoring program (incorporating monitoring, reporting and adaptive management measures) detailed in the Artificial Light Management Plan. I have recommended a condition to the Australian Minister for the Environment and Water that proposes corrective actions for "problem lights" such as changing the wavelength of light for the specific species interacting; additional shielding; undertaking activities requiring illumination of problem lights during daylight hours only; and avoidance of nocturnal activities requiring lights during peak breeding/nesting season.

I support the proposed mitigation measures relating to construction noise impacts and lighting control measures. However, I consider that the proponent has not adequately addressed the risk of impacts from feral animal predation on the nests of marine turtles. I note an EPBC Act approval condition for the South of Embley Bauxite Mine and Port Development to implement a Feral Pig Management Offset Strategy (RTA Weipa, 2016). The aim of the Offset Strategy is to reduce the annual level of feral pig predation on the nests of the six marine turtle species known to occur in the region. The Offset Strategy extends along the coastline to include the beaches within the study area surrounding the CLF. However, compliance reports indicate the relevant Amban zone is a lower priority for control measures.

I consider specific measures should be undertaken to protect marine turtle nesting habitat (within the CLF study area bounded by Norman Creek in the north and False Pera Head in the south), potentially undertake nest relocation, and to target and monitor the eradication of locally active feral pigs depredating nests.

I agree with the EIS conclusion that the project is unlikely to significantly impact the species if appropriate avoidance, management and mitigation strategies are applied. However, I have recommended a condition that includes specific conditions related to the monitoring and management of olive ridley turtle nesting habitat adjacent to the CLF, to the Australian Minister for the Environment and Water.

6.20.4.1.7 **Green turtle**, *Chelonia mydas* – Vulnerable, Migratory and Marine

Existing environment

The green turtle, *Chelonia mydas*, is listed as vulnerable, migratory and marine under the EPBC Act.

No targeted field surveys for the green turtle were conducted for the EIS. The EIS relied on megafauna monitoring undertaken in the region by RTA Weipa over the 2015-2020 period. Studies conducted for RTA have confirmed the presence of green turtles within the marine study area and eight green turtle sightings were made during the current project's surveys. High value foraging habitat was identified to be the reefs close to the CLF, and nesting habitat is known to occur on beaches within the marine study area. Peak nesting occurs between November and January, with hatching occurring between January and April. Green turtles are known to feed on seagrass and algae associated with seagrass meadows.

Impact assessment

A total of 42.2m^2 of marine habitat consisting of soft sediments and boulders is proposed to be cleared due to the construction of the CLF (as described at the Olive Ridley Turtle section above). The clearing of 42.2 m^2 is approximately 900m away from the high value foraging habitat which was identified to be the reefs close to the CLF. However, the EIS did not consider the clearing of marine habitat to be a significant impact to the green turtle as it does not comprise important feeding habitat.

Acoustic impacts from piling activities predicted potential injury to green turtles within 30m (according to the EIS is 207dB re μPa^2) of the piling and behavioural changes within 50m (according to the EIS is 175dB re μPa^2). However, the majority of foraging habitat was stated to be more than 900m from piling impacts which is not expected to reach either injury or behavioural threshold for the marine turtles.

The EIS recognised that artificial lighting from the CLF would likely impact green turtle nesting without appropriate mitigation strategies.

Vessel strike was recognised as a risk for the slow-moving, surface breathing green turtles.

The EIS stated that beaches in the study area are used by flatback, Olive Ridley, green, and hawksbill turtles for nesting and that nests are frequently destroyed by feral pig and fox predators.

Mitigation measures

The use of soft starts for pile driving, maintaining a 100m exclusion zone, and limiting piling activities to daylight hours would be adopted. Speed limits for vessels will be implemented to reduce the risk of collision. Lighting design control measures would be undertaken in accordance with the *National light pollution guidelines for wildlife* (DCCEEW 2023) as detailed in the Artificial Light Management Plan.

Conclusion

I agree with the EIS conclusion that the project is unlikely to significantly impact the species. However, I have recommended a condition to the Australian Minister for the Environment and Water that includes specific conditions related to mitigation measures and monitoring of marine turtle nesting habitat adjacent to the CLF.

6.20.4.1.8 **Hawksbill turtle**, *Eretmochelys imbricata* – Vulnerable, Migratory and Marine

Existing environment

The hawksbill turtle, *Eretmochelys imbricata*, is listed as vulnerable, migratory and marine under the EPBC Act.

No targeted field surveys for the hawksbill turtle were conducted for the EIS. The EIS relied on megafauna monitoring undertaken in the region by RTA Weipa over the 2015-2020 period. Studies conducted for RTA Weipa have confirmed the presence of hawksbill turtles within the marine study area and one hawksbill turtle sighting was made during the current project's surveys. High value foraging habitat was identified to be the reefs close to the CLF, and nesting habitat is known to occur on beaches within the marine study area. Nesting occurs year-round with a peak in December to February. Hawksbill turtles feed on sponges, seagrass and soft corals associated with the reef.

Impact assessment

A total of 42.2m^2 of marine habitat consisting of soft sediments and boulders is proposed to be cleared due to the construction of the CLF (as described at the Olive Ridley Turtle section above). The clearing of 42.2m^2 is approximately 900m away from the high value foraging habitat which was identified to be the reefs close to the CLF. However, the EIS did not consider the clearing of 42.2m^2 of marine habitat to be a significant impact to the hawksbill turtle as it does not comprise important feeding habitat.

Acoustic impacts from piling activities predicted potential injury to hawksbill turtles within 30m of the piling (according to the EIS is 207dB re μPa^2) and behavioural changes within 50m (according to the EIS is 175dB re μPa^2). However, the majority of foraging habitat was stated to be more than 900m from piling impacts which is not expected to reach either injury or behavioural threshold for the marine turtles.

The EIS recognised that artificial lighting from the CLF would likely impact hawksbill turtle nesting without appropriate mitigation strategies. Vessel strike was recognised as a risk for the slow-moving, surface breathing hawksbill turtles.

The EIS stated that beaches in the study area are used by flatback, Olive Ridley, green, and hawksbill turtles for nesting and that nests are frequently destroyed by feral pig and fox predators.

Mitigation measures

The use of soft starts for pile driving, maintaining a 100m exclusion zone, and limiting piling activities to daylight hours would be adopted. Speed limits for vessels will be implemented to reduce the risk of collision. Lighting design control measures would be undertaken in accordance with the *National Light Pollution Guidelines for Wildlife* (DCCEEW 2023) and as detailed in the Artificial Light Management Plan.

Feral animal management activities are proposed to be implemented by the proponent but no management plan for feral pig control on turtle nests has been committed to.

To ensure the proposed and recommended mitigation measures are meeting the objective of minimising significant impact to this species, I recommend a monitoring program to be implemented with appropriate surveying and data reporting. This monitoring program must be hosted on a public-facing website hosted by the approval holder, using the principles of BACI.

Conclusion

I agree with the EIS conclusion that the project is unlikely to significantly impact the species. However, I have recommended a condition to the Australian Minister for the Environment and Water that includes specific conditions related to mitigation measures and monitoring of marine turtle nesting habitat adjacent to the CLF.

6.20.4.1.9 **Loggerhead turtle**, *Caretta caretta* – Endangered, Migratory and Marine

Existing environment

The loggerhead turtle, *Caretta caretta*, is listed as endangered, migratory and marine under the EPBC Act.

No targeted field surveys for the loggerhead turtle were conducted for the EIS. The EIS relied on megafauna monitoring undertaken in the region by RTA Weipa over the 2015-2020 period. Studies conducted for RTA Weipa have confirmed the presence of loggerhead turtles within the marine study area. However, no incidental sightings were made during the current project's surveys. High value foraging habitat was identified to be the reefs close to the CLF. The EIS stated that no nesting habitat is known or likely to occur on beaches within the marine study area. Loggerhead turtle nesting begins from late October, reaching a peak in late December and nesting finishes in late February or early March. Hatchlings emerge from late December until April.

Impact assessment

A total of 42.2m^2 of marine habitat consisting of soft sediments and boulders is proposed to be cleared due to the construction of the CLF (as described at the Olive Ridley Turtle section above). The clearing of 42.2m^2 is approximately 900m away from the high value foraging habitat which was identified to be the reefs close to the CLF. However, the EIS did not consider the clearing of marine habitat to be a significant impact to the loggerhead turtle as it does not comprise important feeding habitat.

Acoustic impacts from piling activities predicted potential injury to loggerhead turtles within 30m of the piling (according to the EIS is 207dB re μPa^2) and behavioural changes within 50m (according to the EIS is 175dB re μPa^2). However, the majority of foraging habitat was stated to be more than 900m from piling impacts which is not expected to reach either injury or behavioural threshold for marine turtles.

The EIS recognised that artificial lighting from the CLF would likely impact loggerhead turtle nesting without appropriate mitigation strategies.

Vessel strike was recognised as a risk for the slow-moving, surface breathing loggerhead turtles.

Mitigation measures

The use of soft starts for pile driving, maintaining a 100m exclusion zone, and limiting piling activities to daylight hours would be adopted. Speed limits for vessels will be implemented to reduce the risk of collision. Lighting design control measures would be undertaken in accordance with the light pollution guideline, noting that loggerhead turtles are particularly attracted to light at 580nm. Lighting control measures are to be detailed in the Artificial Light Management Plan. To ensure the proposed and recommended mitigation measures are meeting the objective of minimising significant impact to this species, I recommend a monitoring program to be implemented with appropriate surveying and data reporting. This monitoring program must be hosted on a public-facing website hosted by the approval holder, using the principles of BACI.

Conclusion

I agree with the EIS conclusion that the project is unlikely to significantly impact the species.

However, I have recommended a condition to the Australian Minister for the Environment and Water for that includes specific conditions related to mitigation measures and monitoring of marine turtle nesting habitat adjacent to the CLF.

6.20.4.1.10 **Flatback turtle**, *Natator depressus* – Vulnerable, Migratory and Marine

Existing environment

The flatback turtle, *Natator depressus*, is listed as vulnerable, migratory and marine under the EPBC Act.

No targeted field surveys for the flatback turtle were conducted for the EIS. The EIS relied on megafauna monitoring undertaken in the region by RTA Weipa over the 2015-2020 period. Studies conducted for RTA Weipa have confirmed the presence of flatback turtles within the marine study area. However, no incidental sightings were made during the current project's surveys. High value foraging habitat was identified to be the reefs close to the CLF and nesting habitat is known to occur on beaches within the marine study area.

The nesting season for Flatback Turtle usually occurs between November and January. The *Marine bioregional plan for the North Marine Region* identifies three biologically important areas in the Gulf of Carpentaria (DSEWPC 2012b). The EIS identifies the inter-nesting zone for the flatback turtle extending close to the shoreline for the length of the marine study area beaches. The beach adjacent to the CLF is therefore regarded as habitat critical to the survival of the flatback turtles (Arafura Sea genetic stock).

Impact assessment

A total of 42.2m^2 of marine habitat consisting of soft sediments and boulders is proposed to be cleared due to the construction of the CLF. However, the EIS did not consider this to be a significant impact to the flatback turtle as it does not comprise important feeding habitat.

Acoustic impacts from piling activities predicted potential injury to flatback turtles within 30m of the piling (according to the EIS is 207dB re µPa^2) and behavioural changes within 50m (according to the EIS is 175dB re µPa^2). However, the majority of foraging habitat was stated to be more than 900m from piling impacts and is not expected to reach either injury or behavioural threshold for marine turtles.

The EIS recognised that artificial lighting from the CLF would likely impact flatback turtle nesting without appropriate mitigation strategies.

Vessel strike was recognised as a risk for the slow-moving, surface breathing flatback turtles.

The EIS stated that beaches in the study area are used by flatback, Olive Ridley, green, and hawksbill turtles for nesting and that nests are frequently destroyed by feral pig and fox predators.

Mitigation measures

The use of soft starts for pile driving, maintaining a 100m exclusion zone, and limiting piling activities to daylight hours would be adopted. Speed limits for vessels will be implemented to reduce the risk of collision. Lighting design control measures would be undertaken in accordance with the light pollution guideline and as detailed in the Artificial Light Management Plan.

Feral animal management activities are proposed to be implemented by the proponent but no

management plan for feral pig control on turtle nests has been committed to.

To ensure the proposed and recommended mitigation measures are meeting the objective of minimising significant impact to this species, I recommend a monitoring program to be implemented with appropriate surveying and data reporting including on a suitable publicly facing website hosted by the approval holder, using the principles of BACI.

Conclusion

I note that the combined marine and nesting habitats meet the definition of habitat critical to the survival of the species. I also note that beaches within the study area represent important nesting habitat for the flatback turtles (Arafura Sea genetic stock). While I support the proposed mitigation measures relating to construction impacts and lighting control measures, I consider that the proponent has not adequately addressed the risk of impacts from feral animal predation on nests adjacent to the CLF. Specific measures should be undertaken to protect marine turtle nesting habitat (within the CLF study area bounded by Norman Creek in the north and False Pera Head in the south), to potentially undertake nest relocation, and to target and monitor the eradication of locally active feral pigs depredating nests.

I agree with the EIS conclusion that the project is unlikely to significantly impact the species. However, I have recommended a condition to the Australian Minister for the Environment and Water that includes specific conditions related to mitigation measures and monitoring of flatback turtle nesting habitat adjacent to the CLF.

6.20.4.2 Listed migratory species

6.20.4.2.1 Existing environment and impact assessment

The EIS stated that 17 species of migratory fauna species listed under the EPBC Act have been identified in desktop surveys within 50km of the project site. Terrestrial seasonal surveys were undertaken across the period 2018 to 2021 and were consistent with Australian Government guidance. Marine megafauna surveys were not conducted and relied on the findings of the EIS surveys undertaken for the adjacent Amrun Mine. The EIS stated that key shorebird and seabird habitat in the study area were Puuk-Aww (1.3 km north of CLF) and False Pera Head.

The **white-throated needletail**, *Hirundapus caudacutus*, is listed as vulnerable and migratory under the EPBC Act. It is a migratory species that is widespread in eastern Australia and almost exclusively aerial. The species has been recorded in the region, at the adjacent Amrun project, and 1km to the south-east of the terrestrial ecology study area. The species is a transient migrant, but the EIS recognised that the entire study area would be within the species' feeding/foraging range. The EIS considered that the low number of records indicated the population is unlikely to be considered an important population. The EIS stated that the project clearing of 6,885ha of overfly habitat is unlikely to significantly impact the species as it is almost exclusively aerial, and it did not propose an offset for the species.

The **fork-tailed swift**, *Apus pacificus*, is listed as migratory and marine under the EPBC Act. Similar to the white-throated needletail, the species is almost exclusively aerial and likely to overfly all habitats on the project site. The species was recorded 3km north of the project. The EIS stated that the species is unlikely to use the site for roosting and therefore the habitats are unlikely to be important habitats.

Important habitat was identified for the **spectacled monarch**, *Symposiachrus trivirgatus*, the **black-faced monarch**, *Monarcha trivirgatus*, the **satin Flycatcher**, *Myiagra cyanoleuca*, the

oriental cuckoo, *Cocculus optatus*, and the **rufous fantail**, *Rhipidura rufifrons*. Important habitat was comprised of the narrow swamp box fringing forest along Coconut Creek and Tapplebang Creek. This habitat was considered to provide seasonally moist conditions, a denser understory, and a greater structural diversity than the adjacent savannah woodlands. Approximately 317ha of this habitat type occur in the project site and 47.8ha would be cleared but the assessment concluded that these species are unlikely to be significantly impacted.

Important habitat subject to clearing for the **eastern osprey**, *Pandion cristatus*, was calculated by the EIS to be 43.8ha within 1km of the coast. This impact was below the impact area thresholds noted in the *Draft referral guideline for 14 birds listed as migratory species under the EPBC Act* (DCCEEW, 2015). The **glossy ibis**, *Plegadis falcinellus*, was not recorded on site but was identified approximately 3.5km downstream in wetland habitat. The EIS stated there was a moderate likelihood of the species occurring on site in the paperbark woodland RE 3.3.50g.

The EIS stated that the largest aggregations of shorebirds were observed at the rock platforms Puuk- Aww Reef and False Pera Head, and sand flats at the mouth of Norman Creek. Two species of migratory shorebirds were observed in field surveys, the **whimbrel**, *Numenius phaeopus*, and the **common sandpiper**, *Actitis hypoleucos*.

The **eastern curlew**, *Numenius madagascariensis*, is a listed critically endangered, migratory and marine species of shorebird. Three surveys were conducted over the 2018-2019 wet season within expected habitat but over a relatively small area. The eastern curlew was not recorded from the surveys or incidentally. However, the species has been recorded in the region and is considered by the EIS to have a moderate likelihood of occurrence.

The **lesser sand plover**, *Charadrius mongolus*, is a listed endangered, migratory and marine species of shorebird that was not observed in surveys but is considered to have a moderate likelihood of occurrence.

The **marsh sandpiper**, *Tringa stagnatilis*, was stated to have a high likelihood of occurrence and four other species of migratory shorebirds were considered to have a moderate likelihood of occurrence.

Three seabird species listed as marine and migratory under the EPBC Act were considered by the EIS to have ecologically significant populations in the study area: the **lesser frigatebird**, *Fregata ariel*, **brown booby**, *Sula leucogaster*, and **greater crested tern**, *Thalasseus bergii*. All three of these species were stated to move between the study area and other habitats in the Gulf of Carpentaria. The EIS stated that the project is not expected to significantly modify, destroy or isolate foraging habitat for these species.

The **estuarine crocodile**, *Crocodylus porosus*, is a listed migratory and marine species that occurs in Coconut Creek, the lower reaches of Tapplebang Creek, and the Ward River. It was observed in surveys on all these watercourses. The significant impact assessment concluded that the project would not significantly impact water quality or aquatic habitats. The EIS noted that the creation of Tapplebang Dam may positively impact the species due to the permanent supply of water. However, the IESC stated that the dam may impact the food supply, movement and habitat use of the species.

The EIS considered four species of sawfish have potential to be impacted by the project, however, the EIS concluded that they were not likely to be significantly impacted by the project. The **dwarf sawfish**, *Pristis clavata*, and the **green sawfish**, *Pristis zijsron*, are listed as vulnerable and migratory under the EPBC Act. The **narrow sawfish**, *Anoxypristis cuspidata*, is listed as

migratory under the EPBC Act. The EIS surveyed for sawfish species via observations and from eDNA sampling at the CLF and the mouth of the Norman Creek. No observations were made and no eDNA samples returned positive results for the sawfish species. The EIS considered the only likely habitat for these species would be at the mouth of the Norman Creek.

The **largetooth sawfish**, *Pristis pristis*, is listed as vulnerable and migratory under the EPBC Act. The assessment of this species is described in section 6.20.4.1.5 listed threatened species and ecological communities.

Australian snubfin dolphin, *Orcaella heinsohni*, and **Indo-Pacific Humpback dolphin**, *Sousa chinensis*, have both been recently listed as vulnerable and migratory under the EPBC Act. Both species have been regularly recorded in Amrun inshore dolphin surveys from 2014 – 2019. Likely habitat for both species was stated to be the nearshore coastal areas, particularly the mouth of the Norman Creek. However, the EIS did not consider the marine study area to contain unique or important habitat types and concluded that the site was not likely to support an ecologically significant proportion of these species.

The five species of **marine turtle** are also listed threatened species, see section's 6.20.4.1.6 - 6.20.4.1.10.

6.20.4.2.2 Impact assessment

The EIS did not identify any significant impacts from the CLF infrastructure, including jetty and loading structures on the MNES that are listed migratory species. The design and implementation of a 450m long jetty and the use of shallow draft TSVs preclude the requirement for dredging and lower the risk of turbidity impacts to sensitive habitats. The CLF would be constructed within subtidal soft sediment and would result in the permanent loss of 42.2m^2 of marine habitat within the pile footprints. In addition, there would be no clearing of *Casuarina* along the coastal area for the CLF construction.

The proposed increase in vessel movements can pose risks to marine fauna from vessel strike, especially to those that are slow-moving, such as dugongs, crocodiles, turtles and whales. The EIS stated that the likelihood of vessel strike is unlikely given the small number of vessel movements with speed limited to 8 knots inside the ring of reefs within 1.6km of the CLF. I note that the *National Strategy for Reducing Vessel Strike on Cetaceans and other Marine Mega-fauna* (DCCEEW 2017) recommends a speed of approximately 2 knots to prevent collision with marine fauna.

Marine water quality was identified as being at risk of turbidity plumes from berthing vessels. Predicted plumes were modelled and baseline data generated. The peak TSS concentrations are modelled to be small relative to median background conditions and within existing background variability. Impacts on boulder and coral habitats were considered unlikely to be significant. The EIS stated that TSS concentrations regularly exceed model thresholds during much of the wet season. No impacts to coral reefs from light reduction from turbidity were predicted.

The indirect impacts of the CLF include noise from machinery and conveyors, light, and vehicle movements. These disturbance impacts were considered to extend no more than 100m north and south of the CLF in relation to migratory shorebirds. The EIS stated that the average terrestrial acoustic impacts from construction and operation of CLF and road trains will have noises below 50dBA at the closest habitat. Piling was considered to produce the maximum acoustic impacts on migratory shorebirds such as the eastern curlew. The timeframe for the piling works during April to October recognised only limited impacts in the shoulder months of

April and October to early arriving and late departing shorebirds.

The EIS stated that the prevention of upward light spills and avoidance of red lights by the project will reduce the likelihood of migrating birds becoming disoriented and the implementation of a bird interaction procedure will reduce the likelihood of negative impacts to individuals in the unlikely event of a bird grounding. The EIS stated that although the artificial lighting may alter the abundance and distribution of seabirds and shorebirds, they are localised and minor impacts. Furthermore, with mitigation applied, potential impacts are expected to be limited to localised changes in foraging behaviours of a small number of individuals where the jetty crosses the shoreline. Lighting impacts from the proposed CLF and jetty were considered by the EIS to pose a potential impact to nesting marine turtles and emerging turtle hatchlings from beach nests. Viewshed analysis indicates there would be no direct visibility of onshore lights from the nesting habitat adjacent to the CLF, mainly due to the shielding effect of the beach cliff. However, offshore lights would have direct visibility at 86% of the beach nesting habitat area.

The lighting impacts from the jetty on emerging turtle hatchlings has a higher risk than onshore lighting impacts. Light pollution can disrupt ocean-finding behaviour in turtle hatchlings and could increase mortality (Shimada et al. 2023). The EIS stated that the jetty lights would act to attract hatchlings to the sea. During slower tidal current velocity, hatchlings are likely to be attracted to the jetty lights instead of offshore dispersal and potentially be subject to aggregations of predatory fish occurring under jetty structures.

Artificial lighting impacts on seabirds and migratory shorebirds was considered by the EIS to pose a risk, if unmitigated, to the behaviour of these species by potentially attracting birds to the location and influencing their foraging behaviour.

Underwater acoustic impacts from construction are primarily related to noise from piling in the construction period. The underwater noise modelling undertaken for the Amrun EIS project in 2013 was adopted. Modelling results showed that a temporary threshold shift (a reduction in hearing sensitivity) could result in injury to a range of taxa if they were within a certain radius of the noise source. The highest potential for this occurrence was from transiting species such marine turtles. A zone of behavioural impact from piling activities predicted potential injury to marine turtles within 30m of the piling (207dB re μPa^2) and behavioural changes within 50m (175dB re μPa^2). However, the majority of foraging habitat was stated to be more than 900m from piling impacts. The behavioural zone for dolphins and dugongs at 235m (160dB re μPa^2) was considered to present minimal risk as a 100m exclusion zone combined with a noise threshold of 175dB re μPa^2 would be enforced along with the use of soft starts.

Underwater noise from shipping is related to the movement of TSVs and OGVs but acoustic impacts were considered by the EIS not to result in significant behavioural responses.

6.20.4.2.3 Mitigation measures

Mitigation measures include adopting the use of soft starts for pile driving, maintaining a 100m exclusion zone, and limiting piling activities to less than 30 minutes per day and in daylight hours.

Speed limits for vessels will be implemented to reduce the risk of collision.

The proposed control measures to reduce the risk of artificial light impacts on wildlife include limiting the height of mobile light sources to prevent light on roosting and nesting beaches; ensuring only essential lighting would be used; eliminating light spills; shielding any directly

visible light at the nesting habitat; the use of red (~625-750 nm) and green (~500-565 nm) lights should only be used when required by navigation law and avoiding skyglow to the greatest extent possible. Lighting design control measures would be undertaken in accordance with the light pollution guideline and as detailed in the Artificial Light Management Plan. The implementation of an artificial light monitoring program (incorporating monitoring, reporting and adaptive management measures) as detailed in the Artificial Light Management Plan is also supported.

A proposed Marine Water and Coral Monitoring Program would undertake baseline and operational water quality monitoring at the CLF, Puuk Aww reef, Norman Creek, False Pera Head and Thud Point (monthly for 18 months and then quarterly). Berthing plumes would be monitored as would coral cover at potential impact sites.

6.20.4.2.4 Conclusion

I agree with the EIS significant impact conclusions that the project is unlikely to result in a significant impact for any of the migratory species if implemented in accordance with the proposed and recommended avoidance, management and mitigation measures. I also agree that a residual significant impact that would require an offset condition is unlikely.

The EIS did not consider that important habitat for migratory shorebirds and seabirds exists within the CLF site. Preferred habitat was stated to be at the three aggregation sites at Puuk-Aww (a rock platform 1.3km north), the mouth of the Norman Creek (2.3km north) and the rock platform at False Pera Head (2.5km south).

I note that, unmitigated, the lighting impacts from the proposed CLF and jetty likely pose a potential impact to nesting marine turtles and emerging turtle hatchlings from beach nests. I have provided assessments of the five marine turtle species within section 6.20.4.1.1 (Listed threatened species and ecological communities) of this assessment report.

I support the proposed mitigation measures to reduce any potential disturbance to terrestrial migratory shorebird and seabird species, and for a range of the identified marine migratory species. However, I have included some additional recommended mitigation measures for migratory marine turtles, the dugong, two species of nearshore dolphin and the largetooth sawfish as conditions to the Australian Minister for the Environment and Water.

6.20.4.3 Commonwealth Marine Area

6.20.4.3.1 Existing environment

The Commonwealth Marine Area is located approximately 6km (3 nautical miles) west of the western Cape shoreline and extends across the Gulf of Carpentaria. Part of the transhipment route and the Transhipment Area are located in the Commonwealth Marine Area. This section of the Assessment Report assesses only that area. Note that the LOJ from the CLF and part of the transhipment route are located within Queensland waters.

The Commonwealth Marine Area is within the *Marine bioregional plan for the North Marine Region* (DSEWPC 2012b). The EIS marine study area comprises the full extent of the proposed CLF infrastructure zone and a coastal area extending approximately 3km to the north and south of the CLF (from Norman Creek to False Pera Head), as well as the transhipment routes and three transhipment areas located approximately 18km offshore.

Surveys conducted for the EIS stated that offshore marine habitats are comprised of unconsolidated soft sandy sediments. No reefs or marine plants are within the three proposed

transhipment areas.

The Marine Bioregional Plan recognises important habitat for marine species occurring within the region. This includes breeding, feeding and nursery sites for marine species that includes dugong, snubfin dolphin, marine turtles, estuarine crocodile, sawfish, pipefish, seahorses and sea snakes.

6.20.4.3.2 Impact assessment

The project proposes the construction and operation of a CLF located adjacent to the coast and approximately 15km west of the Mine Site. The product bauxite would be loaded onto a TSV from a 450m long LOJ. The TSV is 34m wide, 150m long, with a 5.5m draft and capable of carrying 10,250t of bauxite. The TSV would transport the product bauxite approximately 18km (10 nautical miles) offshore along a route that varies between 7.5m and 19.5m water depth. One TSV would operate 24hrs per day, making two trips per day and operating for 320 days per year. Approximately 15km of the route would be within the Commonwealth Marine Area.

The bauxite would be loaded from the TSV onto OGV without the need for tugboats. Two OGVs would typically be anchored in a transhipment area with one being loaded and one waiting. No infrastructure would be constructed in the three transhipment areas. The transhipment areas are depicted as circular shapes with a radius of approximately 926m and area of 246ha each. Anchor damage from OGVs is predicted within a 200-250m disturbance footprint in relation to anchor drag and chain rotation. The impacts of predicted scouring would be on a sandy substrate with limited epifauna. The nearest reefs are 590m from the Outer Transhipment Area 1 and 1,325m from the Outer Transhipment Area 2.

The OGVs would ship the product bauxite to export markets. There would be 51 OGV return movements per year. The risk of vessel strikes from large vessels with low drafts and large powerful propellors was stated to pose most risk to slow moving megafauna close to the surface.

The underwater acoustic noise from TSV and OGVs has the potential to elevate ambient noise levels. The EIS stated that this will not have a significant impact as most marine fauna communicate at frequencies outside that generated by large vessels.

The EIS identifies that the project has the potential to have unplanned spills of bauxite during the loading and the transportation of bauxite materials. Although bauxite itself is not toxic to marine biota, the spill can result in smothering of benthic flora and fauna and altering the substrate conditions. Any spills are expected to be highly localised but potentially long term in nature.

The project also presents risks of accidental spills and leaks of hydrocarbons. The toxic oil fraction contains aromatic hydrocarbon that is less dense and volatile. This fraction may impact the surface water aquatic biota more than those in the water column. The spilled substances have the potential to cause toxicity effects on fish and invertebrates and an increase in algal growth.

The EIS stated that adverse water quality impacts were not expected to impact the Northern Prawn Fishery. The proposed location of the offshore transhipment area is within an area mapped by Northern Prawn Fishery as a zone of “low relative fishing intensity”. Water quality would be monitored by a marine water quality monitoring program.

The project also has the potential to introduce marine pests from ballast water or biofouling of

the vessel hull.

6.20.4.3.3 Mitigation measures

The transhipment areas were selected as they consist of a sandy substrate containing sparse to no epifauna cover.

In relation to the risk of vessel strike it was stated that most vessel movements would be in deep waters and that the highest risk zone close to shore would be subject to a slower vessel speed limit of 8 knots. It should be noted that the *National Strategy for Reducing Vessel Strike on Cetaceans and other Marine Mega-fauna* recommends a speed of approximately 2 knots as adequate in preventing collision with marine fauna (DCCEEW 2017).

The proponent has included mitigation measures to prevent accidental spills by having double hull protection, emergency spill response procedures and reducing the frequency of fuelling events.

Design features of the TSV including the use of covered cargo holds are expected to minimise product loss to the marine environment. The TSVs would have double hull protection for diesel cargo spaces to reduce the risk of fuel spills. The vessels would operate with procedures in place for hazardous materials handling and emergency spill response.

Several measures are proposed to reduce the potential for the project to introduce marine pests. The TSV would operate as a dry bilge vessel, with limited to no requirement for ballast water. Antifouling would be used on TSVs with regular marine pest inspection.

The OGVs would comply with standard mitigation measures specifically designed to reduce the potential for the translocation of introduced marine pests. Ballast water exchanges would occur outside of 12NM from shore in water greater than 50m deep. Additionally, regular monitoring of marine pests would be undertaken as part of the project.

Further water quality monitoring is recommended to better understand the baseline levels especially for the parameters which exceeded the guideline values. The proposed marine water quality and coral monitoring program is supported.

The EIS described including implementation of a marine pest monitoring program, a reef benthic cover monitoring program and an artificial light monitoring program. These monitoring programs would be implemented during the construction stage, updated and managed over the life of the project.

6.20.4.3.4 Conclusion

I agree with the EIS significant impact conclusions that the project is unlikely to result in a significant impact to the Commonwealth Marine Area if implemented in accordance with proposed and recommended avoidance, management and mitigation measures, as represented in the conditions of approval.

I support the proposed mitigation measures to reduce the risk of product spills and vessel fuel spills and the implementation of an appropriate marine pest monitoring program.

To ensure shipping impacts are minimised, I have recommended a condition to the Australian Minister for the Environment and Water that the proponent complies with a Marine Management Plan that includes specific management measures for marine and migratory species.

6.20.5 Environmental offsets

6.20.5.1 Offset Management Strategy

The Offset Management Strategy (OMS) quantifies significant impacts for MNES and MSES on the project site (referred to as the impact area), and the proposed conservation gains for offsets on two proposed offset sites. It also addresses the relevant Australian Government and state environmental offsets frameworks and how offset outcomes would comply with the respective offset policies. I note the Commonwealth has previously raised concerns about the proposed OMS not being in line with the principles of the EPBC Offsets policy and is awaiting a response from the proponent in relation to these concerns.

The OMS has determined the significant impacts to the four MNES described in section 6.20.4 on the impact area. The OMS states that habitat quality surveys were undertaken in 2023 and late 2024, as well as preliminary field surveys on one of the two proposed offset areas.

The OMS has not provided the complete methodology and sufficient justification and supporting evidence used to inform the inputs of the Offsets Assessment Guide for all species. Importantly, there is insufficient information for DCCEEW to agree with the habitat quality scores at both the impact and offset sites, as the scores provided are based on limited data and qualitative descriptions for the site context and species stocking rate components. Further, evidence for the site context and species stocking rate components have not been provided. This reduces DCCEEW's confidence in the scores and the inputs in the Offsets Assessment Guide, such as the habitat quality at impact site, start habitat quality at the offset sites, the projected habitat quality gains proposed and the 80% confidence level that the offset sites would be delivered within the specified timeframe. Hence DCCEEW is unable to agree that the proposed offsets would be suitable with the current information, as there is reduced confidence that the proposed offsets would be of a suitable size and scale to deliver a conservation gain to adequately compensate for the impacted matters and deliver an overall conservation outcome which improves the viability of the protected matter.

In addition to limited evidence to support the habitat quality scoring for relevant MNES on the impact site, the OMS has provided limited habitat quality survey data for the respective locations within the offset areas intended to offset individual MNES. Habitat quality scores on the offset sites are largely based on desktop assessments. The proponent has committed to undertaking habitat quality scoring and targeted surveys in the dry season of 2025 for the four listed threatened species requiring offsets, subject to offset site survey constraints.

The OMS proposes a range of management actions that are aimed to provide habitat quality improvements for the prescribed matters over the life of the offset. The Australian Minister for the Environment and Water has raised concerns with the proponent regarding the proposed management actions and the current land management actions (notably fire management for carbon offsets at Offset site two). In addition, DCCEEW has noted that the appropriate fire management practices differ amongst the four threatened species for which the offsets apply. DCCEEW is requesting the proponent to provide confirmation from the landowner that they understand the commitments associated with the management of their land for an offset.

I have recommended an offset condition to the Australian Minister for the Environment and Water for the proponent to submit an updated OMS to incorporate detailed habitat quality scoring from field assessments of the preferred offset area.

6.20.5.2 Offset area

Two land-based offset area options are proposed by the EIS, only one of which is proposed to be progressed. Land-based offsets are proposed that seek to acquit 90% of the total offset requirement. Both proposed offset properties are located within the same Weipa plateau subregion as the project site. The status of the proposed offsets is summarised below:

6.20.5.2.1 Offset area 1

Offset area 1 is a land-based offset area of approximately 47,500ha adjacent to the southern boundary of the mining lease.

The EIS states that Offset area 1 has large portions of approximately 22,931 ha within MDL 2001 (the mineral development licence held by the proponent for this project) and approximately 29,932 ha is within Restricted Area 315 (RA315). The MDL provides the proponent an ability to apply for the area to be converted to a mining lease and mined. RA315 is an area designated under the Mineral Resources Regulation by the Queensland Government for the protection of the Aurukun bauxite resource, and to enable future mining applications to be made. The EIS further states that both the MDL and RA315 increase the likelihood of future clearing and development to occur on these parcels of land. The risk of loss would be higher across the MDL and RA315 designations compared to other lands in Cape York which are not.

The EIS states that Offset area 1 has been subject to widespread environmental damage by pigs and cattle. Some limited habitat quality scoring assessments and field surveys to determine vegetation communities have occurred on the offset area.

6.20.5.2.2 Offset area 2

Offset area 2 is located adjacent to and on the eastern boundary of Offset area 1 and is approximately 54,000ha. The EIS states that the primary land use on this property is cattle grazing, with a homestead located in the southern section of the property. The current owner of the property (Corporate Carbon) also utilises areas of the property to generate carbon credits, primarily through savanna fire management.

The EIS states that further detailed assessment would be required to confirm if the current fire regime is optimised for the specific threatened species being offset, and considering the current regime is primarily focused on early season burns for carbon credits. Perry (2016) found that shifting fire regimes from late to early dry season fires for carbon abatement may not completely equate with terrestrial vertebrate biodiversity outcomes on Cape York, with a more nuanced, species-specific monitoring approach being required to optimise biodiversity benefits than a fire frequency-based regime to minimise emissions.

6.20.5.2.3 Offset areas 1 and 2 information

The offset areas are proposed to acquit the impacts on both MNES and MSES associated with the two-year construction phase and 22-year operational phase. The EIS states that Offset area 1 is the preferred option and has the potential to acquit 38,000ha of offsets for the identified impacts.

The EIS stated that the offset areas were chosen due to their location close to the area of impact, the potential to provide suitable habitat for the four listed threatened species, and the capacity to achieve a conservation outcome by reducing and managing threatening processes. The offset areas are intended to maintain functional ecosystems across the landscape associated with the Watson River catchment.

The two proposed offset areas generally meet offset principles as they are situated close to the area of impact and contain the habitat attributes of the impacted MNES. However, the initial habitat quality assessments undertaken for the impact and offset sites were incomplete in the original EIS. DETSI recommended in its submission that the proponent undertake habitat quality assessments on the proposed offset areas to inform site condition, site context and species stocking rate scores informed by the *Offsets assessment guide* (DCCEEW 2012) using the *Guide to determining terrestrial habitat quality* (DES 2020). The proponent responded to these comments and provided updated habitat quality assessments in December 2024. The proponent has committed to further site analysis and field surveys to be undertaken starting in the dry season of 2025.

The offset areas are owned by third parties and the proponent has not legally secured the properties. Ongoing negotiations with the NAK (the landowner of Offset area 1) are still required regarding land management, legal security and compensation.

DCCEEW has provided review comments requesting the proponent to demonstrate that offset landholders are aware of and consent to offsets on their properties, including proposed management measures. In relation to Offset area 2, DCCEEW notes the property has been actively using Savanna fire management methods to generate carbon credits under the Australian Carbon Credit Unit Scheme. There are concerns that the fire management measures proposed to benefit the offset matters would not meet the additionality principle of the EPBC Environmental Offset Policy 2012.

The final offset area is proposed to be secured via a declaration of an area of high nature conservation value under the *Vegetation Management Act 1999* (Qld).

6.20.5.3 Offset area management plan

The purpose of an OAMP is to provide specific information to demonstrate how an offset area would compensate for the significant impacts to MNES, in accordance with the principles of the EPBC Environmental Offset Policy 2012 and the requirements of the Offsets Assessment Guide (DCCEEW 2012). It must address TOR requirements to provide information demonstrating how offsets would compensate for significant residual impacts on the relevant MNES. However, an OAMP was not provided for assessment. The OMS stated that an OAMP would be provided post the EPBC Act approval but prior to project commencement. I have recommended an offset condition to the Australian Minister for the Environment and Water that requests a draft OAMP be provided for assessment and approval prior to the commencement of the action. It is noted that in accordance with the EPBC Offsets Policy, the Australian Minister for the Environment and Water is likely to condition for legal securement of the offset to be obtained prior to commencement of the action and for the duration of the impact of the project.

7 Recommended conditions and actions

Section 59(d) of the EP Act requires this assessment report to recommend conditions on which any approval required for the project may be given where possible.

Key approvals and declarations that would be required for the project are summarised in section 3.1 of this assessment report. The project requires the following key approvals relevant to the EIS assessment that are issued by the Queensland Government:

- EA under the EP Act

- PRC plan and PRCP schedule under the EP Act
- Water licence under the Water Act
- Social impact assessment under the SSRC Act

As a declared controlled action, the project also requires an approval from the Australian Government under the EPBC Act.

The following sections of this assessment report discusses and makes recommendations on the conditions relevant to these approvals.

7.1 Environmental authority

Recommended draft EA conditions are provided as Appendix A—Recommended conditions for the environmental authority of this assessment report and have been drafted based on the information presented in the EIS, including the proponent's proposed EA in Chapter 22 (Environmental Management and Conditions) of the EIS. Submissions made pursuant to section 54 of the EP Act about the submitted EIS have also been considered in the drafting of conditions.

Following completion of the EIS process, I recommend that those outstanding matters identified throughout this assessment report that relate to, or would otherwise be dealt with through the EA, are addressed to meet the statutory application requirements for the administering authority to make a properly made determination under section 127 of the EP Act. This requires an EA application and proposed PRC plan comply with sections 125-127 of the EP Act. In deciding the application, the administering authority must comply with any relevant regulatory requirement and have regard to the application and the standard criteria.

I recommend the proponent liaise with DETSI prior to formal submission of a site-specific application for an EA. This can be done by lodging an Application for pre-lodgement services for an EA.

While an EA may permit the taking of overland flow water, and in some cases the interference with the flow of water by impoundment (section 97 of the Water Act) this is only applicable where an application for EA has assessed the relevant impacts, and conditions are included about the take or interference of water. Recommendations in this assessment report and associated draft EA conditions do not include conditions authorising the take or interference of water in a way that would be sufficient to address the proposed impacts. Instead, the project will utilise the established water licencing framework under the Water Act and the proponent has been working with DLGWV in this regard (see section 7.3).

7.2 PRCP schedule

A proposed PRC plan, comprising a rehabilitation planning part and a PRCP schedule was provided in Appendix E of the EIS. I consider the proposed PRC plan generally followed the information requirements in DETSI's statutory PRC plans guideline at a high level. However, insufficient details, information gaps and outstanding matters have prevented a complete assessment of rehabilitation in this EIS. These matters are described in detail in section 6.6 of this assessment report.

Following completion of the EIS process, I recommend these matters are addressed in a revised proposed PRC plan which meets the statutory PRC plans guideline and information

requirements listed in sections 126B-126D of the EP Act. The revised PRC plan must be formally lodged to DETSI in the approved form Submission of a progressive rehabilitation and closure plan (ESR/2019/4957) along with the site-specific EA application (see section 7.1).

Despite the limitations discussed in section 6.6 of this assessment report, I have provided a draft proposed PRCP schedule in Appendix B of this assessment report. While incomplete, I considered it may assist the proponent's when revising the draft PRC plan prior to formal lodgement. DETSI will review the revised proposed PRCP schedule following formal lodgement of a draft PRC plan. If approved, DETSI will issue the PRCP schedule and any conditions it considers appropriate. If DETSI refuses to approve a draft PRCP schedule for a proposed PRC plan, the EA must also be refused.

As with the EA application, I recommend that the proponent liaise with DETSI prior to formal submission of a revised proposed PRC plan. This can be done by lodging an Application for pre-lodgement services for an EA.

7.3 Water entitlement

Prior to the taking of water, the project would need to obtain a water entitlement under the Water Act to access unallocated water from the Strategic Reserve under the Water Plan (Cape York) and/or Water Plan (GABORA). DLGWV is the administering authority.

In January 2025, DLGWV advised that the EIS did not adequately address the matters relating to water supply options and impacts raised during the EIS process. Specifically, DLGWV advised that the EIS did not:

- Demonstrate that an alternative water supply—specifically, groundwater from the Water Plan (GABORA)—could be considered as an alternate water supply and used in conjunction with a surface water supply from the proposed Tapplebang Dam. This analysis is important to determine whether reliance on surface water from the Strategic Reserve under the Water Plan (Cape York) could be reduced.
- Demonstrate that the proposed annual surface water take and operation of the proposed Tapplebang Dam resulted in no impact to RTA Weipa's downstream existing water rights under the Comalco Act and the Water Act.
- Provide evidence of consultation with RTA Weipa demonstrating that RTA Weipa the impacts to their downstream water rights under the Comalco Act and the Water Act.

If the proponent identifies a suitable water supply option under the Water Plan (GABORA), the proponent would also need to demonstrate no impact —and where this was not achievable, demonstrate consultation and agreement from RTA Weipa (or other ground water users) regarding any impacts. DLGWV noted that this information would be needed to support any future request for the release of unallocated water and granting of a water entitlement under the Water Plan (Cape York) and/or Water Plan (GABORA).

7.3.1 Alternative water supply

During the early stages of project development, the proponent engaged with DLGWV regarding the availability of water under the Water Plan (GABORA). In April 2020, DLGWV advised that a maximum of 150ML/year could be extracted based on the relevant ecological threshold calculator prescribed by the GABORA Water Plan. This volume represented approximately 1.5% of the project's anticipated annual water demand. The DLGWV advised the proponent that there

is an alternative methodology which may result in a greater volume of water that may be made available for this project. The use of GAB water was discounted by the proponent as a viable source for operational water supply and excluded from further consideration in project planning. Consequently, the Initial Advice Statement (IAS) submitted to DETSI in June 2020 identified the proposed Tapplebang Dam as the preferred water supply option. The project's TOR was developed based on this IAS.

In July 2023, the proponent submitted the EIS. In its submission on the EIS, DLGWV raised concerns that the proponent did not consider the GAB as a potential water supply option that could potentially be used in conjunction with a surface water supply option. DLGWV again advised there was an alternative assessment methodology that might identify a greater volume of GAB water potentially available for the project.

In July 2024, the proponent submitted a revised EIS and formal response to submissions, including a response to DLGWV's advice. Upon review, DLGWV advised that the response remained inadequate and requested a more detailed analysis of the potential availability of groundwater under the Water Plan (GABORA). This information was considered necessary to demonstrate that an alternative water supply option had been investigated, as required under section 24(1)(d) of the Water Management Protocol for the Water Plan (Cape York).

In January 2025, the proponent submitted a revised EIS and revised response to submissions, including DLGWV's submission. I am satisfied that section 3.1 (Alternative Water Supply) in Appendix AC of the EIS adequately addressed DLGWV's submissions requesting consideration of GAB water as an alternative water supply option for the project for the purpose of the EIS process.

I note DLGWV's January 2025 advice, further information would need to be provided by the proponent to support any future request for the release and granting of a water entitlement under the Water Plan (Cape York) and/or Water Plan (GABORA). However, I consider that these matters can be more appropriately progressed outside of the EIS process, through the water entitlement application process administered by DLGWV. To that end, I recommend that the proponent continue engagement with DLGWV to resolve outstanding matters in relation to water supply options for the project.

7.3.2 Surface water

Under the Comalco Act, RTA Weipa holds significant water rights to support its operations in the western bauxite fields of Cape York, including rights to extract up to 40,000 acre-feet (approximately 49.339GL per annum) of water from various unnamed rivers in the area. It holds water licences for 34.67GL/year—32 GL from Arraw Dam on Norman Creek and 2.67GL from the Ward River—leaving a residual entitlement of 14.669GL/year. The Comalco Act further prescribes that the State must not diminish RTA Weipa's right to take water in, or within the vicinity of, the western bauxite fields. While this residual right is protected under the Comalco Act, it is my understanding that it does not constitute, nor override a water entitlement under the Water Act.

I am satisfied that section 3.1 (Surface Water Model) in Appendix AC of the EIS adequately demonstrated that the annual water demands, design and operation of the proposed Tapplebang Dam have identified downstream impacts on existing entitlement holders and rights held by RTA Weipa under the Comalco Act. I have formed the view that the information provided in the EIS is adequate for the purposes of the EIS process.

Any further clarification or assessment required by DLGWV can be more appropriately addressed through the subsequent water licensing process, which operates separately from the EIS framework. To that end, I recommend that the proponent continue engagement with DLGWV to resolve any outstanding matters pertaining to the water rights prescribed by the Comalco Act.

The proponent has acknowledged that resolution of these issues can occur during the water licensing process, separately from the EIS framework and has expressed a commitment to working collaboratively with DLGWV and RTA Weipa.

7.4 Social impact assessment

Conditions stated by the Coordinator-General under section 11(2) of the SSRC Act to address social impacts are provided in Appendix C—Coordinator-General's stated conditions under the *Strong and Sustainable Resource Communities Act 2017* . In accordance with section 11(3)(a) of the SSRC Act, these conditions are enforceable conditions under the *State Development and Public Works Organisation Act 1971*.

7.5 Australian Government approval

In accordance with the accredited assessment process, section 6.20 of this assessment report has assessed the matters protected under the EPBC Act and prescribed in section 9 of the EP Regulation. This information has been prepared to support the Australian Government Minister for the Environment and Water to make an informed decision about the identified and potential impacts on MNES from the project, when deciding whether to grant an approval under the EPBC Act.

To ensure the mitigation measures and offsets summarised in sections 6.20.4 and 6.20.5 of this assessment report are enforceable, I have recommended conditions addressing the MNES controlling provisions of listed threatened species and ecological communities; listed migratory species and the Commonwealth Marine Area in Appendix D—Recommended conditions for the Australian Government's approval of this assessment report.

I note that DCCEEW have requested additional information from the proponent to address outstanding matters relating to the finalisation of offsets. They have also requested that the proponent consider further modelling scenarios for the operation of Tapplebang Dam to better understand the potential downstream impacts on sawfish habitat in the Ward River. I recommend that the proponent liaise directly with DCCEEW to address any outstanding matters and develop conditions for approval, if required.

8 Suitability of the project

Section 59(c) of the EP Act requires I make a recommendation in this assessment report on the suitability of the project to proceed. I have completed this assessment in accordance with relevant legislation and regulatory requirements, including the Aurukun Bauxite Project final TOR, the submitted EIS, all submissions on the submitted EIS and the standard criteria under the EP Act. Validity of this assessment is under the provision that the proponent progresses the project and honours commitments as stated in the EIS.

The proponent has engaged with DETSI to address the TOR and deliver the EIS. The detailed information provided in this EIS process on the project and its potential impacts on the identified EVs, have been assessed by representatives of the Australian, State and local governments, industry, interest groups and members of the public through an open, public review process.

In section 6 of this assessment report I discuss the findings of the EIS, summarise the relevant impacts and outline those environmental protection commitments made by the proponent that are recommended as conditions. I have also included further recommended management measures and environmental protection conditions.

Key outstanding matters have been identified by the relevant regulatory agencies in relation to approvals listed in Table 6.

Table 6 Outstanding matters

Approval required	Responsible agency	Key Outstanding matters
EA and PRC plan	DETSI	Refine the draft EA and draft progressive rehabilitation and closure plan and schedule prior to application for approval under the EP Act
Water license under the Water Act	DLGWV	Address DLGWV concerns related to assessment of an alternative water supply option and the potential impact on rights held by RTA Weipa under the Comalco Act.
Approval under the EPBC Act	DCCEEW	Address DCCEEW information request relating to the finalisation of offsets and further modelling scenarios for the operation of Tapplebang Dam.

However, it is my view that the provision of the outstanding information to the appropriate agencies, and the subsequent assessment of these matters, can proceed through the respective legislative approval processes following the completion of the EIS process.

I consider that the project as proposed in the EIS is suitable to proceed, subject to the:

- recommendations in this assessment report being fully implemented by imposing conditions on the necessary approvals
- resolution of outstanding matters on key approvals, and
- the proponent progressing the project and honouring commitments as stated in the EIS.

9 Completion of the EIS process

In accordance with section 60(1) of the EP Act, the giving of this EIS assessment report to the proponent completes the EIS process for the Aurukun Bauxite Project.

This EIS assessment report is given to the proponent by the delegate of the chief executive.

Christopher Loveday	30 April 2025
Signature	**Date**

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10 References

ANZG (2018) *Australian and New Zealand guidelines for fresh and marine water quality*, Australian and New Zealand Governments and Australian state and territory governments, Canberra, Australian Capital Territory, www.waterquality.gov.au/anz-guidelines, accessed 6 June 2024.

CCA (2023) *2023 Review of the National Greenhouse and Energy Reporting Legislation*, Climate Change Authority, Commonwealth of Australia, https://www.climatechangeauthority.gov.au/nger-act-reviews, accessed 11 November 2024.

Commonwealth of Australia (2017) 'EPBC Act Policy Statement 3.21 - Industry guidelines for avoiding, assessing and mitigating impacts on EPBC Act listed migratory shorebird species', https://www.dcceew.gov.au/sites/default/files/documents/bio4190517-shorebirds-guidelines.pdf.

DAWE (2020) *Australian Ballast Water Management Requirements*, Department of Agriculture, Water and the Environment, Australia Government, Canberra, https://www.agriculture.gov.au/biosecurity-trade/aircraft-vessels-military/vessels/marine-pest-biosecurity/ballast/australian-ballast-water-management-requirements, accessed 23 October 2024.

DCCEEW (2012) *Offsets assessment guide*, https://www.dcceew.gov.au/environment/epbc/approvals/offsets/guidance/offsets-assessment-guide, accessed 18 June 2024.

—— (2015) 'Conservation Advice Mesembriomys gouldii rattoides Black-footed tree-rat (north Queensland)', *Threatened Species Scientific Committee, Department of the Environment, Canberra*.

—— (2017) 'National Strategy for Reducing Vessel Strike on Cetaceans and other Marine Mega-fauna', https://www.dcceew.gov.au/sites/default/files/documents/vessel-strike-strategy.pdf.

—— (2023) *National light pollution guidelines for wildlife*, Commonwealth of Australia, https://www.dcceew.gov.au/environment/biodiversity/publications/national-light-pollution-guidelines-wildlife.

—— (2024) *Environmental management plan guidelines*, Department of Climate Change, Energy, the Environment and Water, Australian Government, Canberra ACT 2601, https://www.dcceew.gov.au/environment/epbc/publications/environmental-management-plan-guidelines, accessed 24 April 2025.

DCCEWW (2023) 'Conservation Advice for Erythrotriorchis radiatus (red goshawk)', *Commonwealth of Australia, Canberra*, https://environment.gov.au/biodiversity/threatened/species/pubs/942-conservation-advice-31032023.pdf.

DEHP (2014) *Significant residual impact guideline—Queensland Environmental Offsets Policy*, Department of Environment and Heritage Protection, Queensland Government, Brisbane, Queensland, https://www.qld.gov.au/environment/management/environmental/offsets/resources, accessed 19 June 2024.

Department of the Environment (2015) 'Referral guideline for 14 birds listed as migratory species under the EPBC Act',

https://www.dcceew.gov.au/environment/biodiversity/threatened/publications/epbc-act-referral-guidelines-migratory-birds.

DES (2020) *Guide to determining terrestrial habitat quality*, Department of Environment and Science, Queensland Government, Brisbane, https://environment.des.qld.gov.au/__data/assets/pdf_file/0017/102833/habitat-quality-assessment-guide-v1-3.pdf, accessed 6 November 2024.

—— (2023) *Progressive rehabilitation and closure plans (PRC plans) guideline*, ESR/2019/4964, Department of Environment and Science, Queensland Government, https://www.business.qld.gov.au/running-business/environment/licences-permits/rehabilitation/progressive-rehabilitation-closure-plans, accessed 15 February 2024.

—— (2025) *Flora survey guidelines - Protected plants*, NCS/2016/2534, Department of Environment and Science, Queensland Government, Brisbane, https://www.des.qld.gov.au/policies?a=272936:policy_registry/gl-wl-pp-flora-survey.pdf, accessed 17 April 2025.

DES and Office of Resource Recovery (2021) *Energy from Waste Policy Queensland*, Queensland Government, Queensland, https://www.qld.gov.au/__data/assets/pdf_file/0020/118433/energy-from-waste-policy.pdf, accessed 25 March 2025.

DESI (2024) *Wastewater releases to Queensland waters*, ESR/2015/1654, Department of Environment and Science, Queensland Government, Brisbane, Queensland, https://www.des.qld.gov.au/policies?a=272936:policy_registry/pr-gl-wastewater-to-waters.pdf, accessed 19 June 2024.

—— (2024) *Model mining conditions*, ESR/2016/1936, Department of Environment, Science and Innovation, Queensland Government, Brisbane, https://www.des.qld.gov.au/policies?a=272936:policy_registry/rs-gl-model-mining-conditions.pdf, accessed 6 October 2024.

—— (2024) *Guideline—Greenhouse Gas Emissions*, ESR/2024/6819, Department of Environment, Science and Innovation, Queensland Government, Brisbane, https://www.desi.qld.gov.au/policies?a=272936:policy_registry/era-gl-greenhouse-gas-emissions.pdf, accessed 6 June 2024.

DNRM (2001) *Queensland Australian River Assessment System (AusRivAS): Sampling and processing manual*, Department of Natural Resources and Mines, Queensland Government, Brisbane, https://ausrivas.ewater.org.au/index.php/resources2/category/16-manuals?download=22:qld-sampling-and-processing-manual-063mb, accessed 6 November 2024.

DSDI (2021) *Economic impact assessment*, Department of State Development and Infrastructure, Queensland Government, Brisbane, https://www.statedevelopment.qld.gov.au/coordinator-general/assessments-and-approvals/economic-impact-assessment, accessed 6 June 2024.

DSDILGP (2018) *Social impact assessment guideline*, Department of State Development, Infrastructure, Local Government and Planning, Brisbane, https://www.statedevelopment.qld.gov.au/__data/assets/pdf_file/0017/17405/social-impact-assessment-guideline.pdf, accessed 6 June 2024.

DSEWPC (2012a) *Threat abatement plan to reduce the impacts on northern Australia's biodiversity by the five listed grasses*, Department of Sustainability, Environment, Water, Population and Communities, Commonwealth of Australia, Canberra ACT,

https://www.dcceew.gov.au/environment/biodiversity/threatened/publications/threat-abatement-plan-reduce-impacts-northern-australias-biodiversity-five-listed-grasses, accessed 27 November 2024.

—— (2012b) *Marine bioregional plan for the North Marine Region*, Department of Sustainability, Environment, Water, Populations and Communities, Australian Government, Canberra, ACT, https://www.dcceew.gov.au/environment/marine/marine-bioregional-plans/north, accessed 17 June 2024.

DSITI and DNRM (2015) *Guidelines for agricultural land evaluation in Queensland*, 2nd edn, Department of Science, Information Technology and Innovation and Department of Natural Resources and Mines, Queensland Government, Brisbane.

Gould SF (2011) 'Does post-mining rehabilitation restore habitat equivalent to that removed by mining? A case study from the monsoonal tropics of northern Australia', *Wildlife Research*, 38(6):482–490, doi:10.1071/WR11019.

Hazel J, Lawler I, Marsh H and Robson S (2007) 'Vessel speed increases collision risk for the green turtle Chelonia mydas', *Endangered Species Research*, 3:105–113, doi:10.3354/esr003105.

IAI (2022) *Sustainable Bauxite Mining Guidelines*, International Aluminium Institute, https://aluminium.org.au/resources/sustainable-bauxite-mining-guidelines/, accessed 8 April 2025.

Keighley MV, Haslett S, Zdenek CN and Heinsohn R (2021) 'Slow breeding rates and low population connectivity indicate Australian palm cockatoos are in severe decline', *Biological Conservation*, 253:108865, doi:10.1016/j.biocon.2020.108865.

Kerle JA and Fleming MR (2024) 'The golden-backed tree-rat (Mesembriomys macrurus) (Peters 1876): reproduction, growth, development and behaviour in captivity', *Australian Mammalogy*, 46(3), doi:10.1071/AM24007.

Lear KO, Gleiss AC, Whitty JM, Fazeldean T, Albert JR, Green N, Ebner BC, Thorburn DC, Beatty SJ and Morgan DL (2019) 'Recruitment of a critically endangered sawfish into a riverine nursery depends on natural flow regimes', *Scientific Reports*, 9(1):17071, doi:10.1038/s41598-019-53511-9.

Limpus, C.J.; Shimada, T. (2024) 'A review of the biology and conservation of the Olive Ridley turtle, Lepidochelys olivacea (Eschscholtz) in Queensland'.

MSQ (2019) *Maritime Safety Queensland guidelines for major development proposals*, Maritime Safety Queensland, Department of Transport and Main Roads, Queensland Government, Brisbane, https://www.msq.qld.gov.au/Waterways/Tidal-works-and-major-development-proposals, accessed 6 June 2024.

Murphy S, Legge S and Heinsohn R (2003) 'The breeding biology of palm cockatoos (Probosciger aterrimus): A case of a slow life history', *Journal of Zoology*, 261:327–339, doi:10.1017/S0952836903004175.

Neldner V, Wilson B, Dillewaard H, Ryan T, Bulter D, McDonald W, Richter D, Addicott E and Appleman C (2024) *Methodology for surveying and mapping regional ecosystems and vegetation communities in Queensland*, Queensland Herbarium, Department of Environment, Science and Innovation, Queensland Government, Brisbane, https://www.qld.gov.au/__data/assets/pdf_file/0033/459186/methodology-mapping-surveying-

v7.pdf, accessed 6 November 2024.

Peverell SC (2005) 'Distribution of sawfishes (Pristidae) in the Queensland Gulf of Carpentaria, Australia, with notes on sawfish ecology', *Environmental Biology of Fishes*, 73(4):391–402, doi:10.1007/s10641-005-1599-8.

Queensland Fire and Emergency Services (2019) *Bushfire Resilient Communities*, Queensland Government.

Rio Tinto (2024) *Amrun Project (EPBC 2010/5642)- Annual Compliance Report 2024*, https://www.riotinto.com/en/search#main-search_e=0&main-search_q=2024%20Amrun%20EPBC%20Annual%20Compliance%20Report&presentation-search_o=Date%2CDescending.

Shimada T, Limpus CJ, FitzSimmons N, Ferguson J and Limpus D (2023) 'Sky glow disrupts the orientation of Australian flatback turtles Natator depressus on nesting beaches', *Regional Environmental Change*, 23(20), doi:https://doi.org/10.1007/s10113-022-02014-x.

TMR (2019a) *Notifiable Road Use Agreement Protocol*, Department of Transport and Main Roads, Queensland Government, https://www.publications.qld.gov.au/dataset/reports/resource/66dd812a-3ff5-462a-b9c4-869169b94311, accessed 24 July 2024.

—— (2019b) *Guide to Traffic Impact Assessment*, Department of Transport and Main Roads, Queensland Government, Brisbane, Queensland, https://www.tmr.qld.gov.au/business-industry/Technical-standards-publications/Guide-to-Traffic-Impact-Assessment, accessed 6 June 2024.

TSSC (2015) 'Conservation Advice Probosciger aterrimus macgillivrayi (palm cockatoo (Australian))', *Threatened species scientific committee, Depaartment of Environment, Canberra*, https://environment.gov.au/biodiversity/threatened/species/pubs/67033-conservation-advice-31102015.pdf.

Woinarski JCZ and Westaway J (2008) 'Hollow formation in the Eucalyptus miniata – E. tetrodonta open forests and savanna woodlands of tropical northern Australia'.

Zdenek CN, Cacho CV, Searle JB, Nevard HD and Dibben LR (2022) 'Field methods to identify Palm Cockatoo nest hollows', *Australian field ornithology*, 39:113–124.

Appendix A—Recommended conditions for the environmental authority

The following draft conditions incorporate the following schedules:

Schedule A	General
Schedule B	Air
Schedule C	Waste
Schedule D	Noise
Schedule E	Groundwater
Schedule F	Surface water
Schedule G	Sewage treatment
Schedule H	Land and biodiversity
Schedule I	Structures
Schedule J	Marine
Schedule K	Definitions
Schedule L	Figures

Other permits required

This permit only provides an approval under the EP Act. In order to lawfully operate you may also require permits/approvals from your local government authority, other business units within DETSI, other State Government agencies or the Commonwealth Environment Department (for significant impacts on matters of national environmental significance or development in Commonwealth waters).

Schedule A—General

A1 This environmental authority authorises the activities listed in Table A1 – Authorised activities and locations to the extent that they are carried out in accordance with:

a. the activity's corresponding:
   i. maximum disturbance area; and
   ii. location.
b. Figure 1 – Authorised activities and locations.

Table A1 – Authorised activities and locations

Activity	Feature		Tenure	Max. area of disturbance (ha)	Location (MGA2020, Zone 54)	
					Easting	Northing
Mining Area	Coconut		Mining lease (MLTBA[1])	2480.13	582805.657	8561396.642
	Tapplebang North			1087	590759.945	8560529.978
	Tapplebang South			1620	585995.476	8553422.303
Regulated Dam	Fines Containment Area (FCA)			229.17	585362.227	8561086.967
Water Supply Dam	Tapplebang Dam			410.9	585417.890	8550126.944
	Tapplebang Dam Fish Way			TBA[1]	TBA[1]	TBA[1]
	Tapplebang Dam Pumps			TBA[1]	TBA[1]	TBA[1]
Mine Infrastructure (MIA)	Mine Administration Area (MAA)			TBA[1]	597640.205	8559282.757
	Sediment Pond (Sed_MAA_1)			TBA[1]	597297.041	8559193.881
	MAA - Sewage			TBA[1]	597567.707	8559018.854
	MAA Water Treatment			TBA[1]	597587.384	8559155.076
	Mine Infrastructure Area			TBA[1]	584650.000	8561530.000
	MIA - Process Water Pond (PWP)			TBA[1]	584518.009	8561171.210
	MIA - Sediment Ponds	Sed_MIA_1		TBA[1]	584426.201	8561067.314
		Sed_MIA_2		TBA[1]	584741.666	8561074.454
		Sed_MIA_3		TBA[1]	584793.830	8560937.766
	MIA ROM			TBA[1]	TBA[1]	TBA[1]

		MIA - Beneficiation Plant		TBA[1]	584613.783	8561334.583
		MIA - Warehouse		TBA[1]	584663.757	8561566.629
		MIA - Workshop		TBA[1]	584616.719	8561615.736
		MIA - Power Generation		TBA[1]	584588.738	8561465.621
		Soil Stockpiles		456.45	586402.210	8562944.530
					585795.400	8562371.510
					584893.120	8561697.250
					585877.260	8560992.250
					584175.800	8561092.400
					584399.030	8560888.370
					584130.810	8560670.510
					584409.410	8560540.830
					584219.060	8560238.240
					584399.540	8558806.580
					584127.340	8558764.470
					582720.060	8558190.010
					583250.640	8557783.560
					582461.850	8557352.360
					582674.080	8557221.590
					583360.290	8557228.660
					591433.290	8562145.370
					591519.850	8560443.920
		Mine Access Road		TBA[1]	595090.754	8561756.472
		Coconut Creek Crossing			TBA[1]	TBA[1]
		Tapplebang Creek Crossing			TBA[1]	TBA[1]
		Tapplebang Access Road			584532.928	8561756.472
		Mining Haul Road			587086.213	8558400.340
		Product Haul Road	Transportation Mining Lease (TML TBA[1])	TBA[1]	583425.461	8555554.174

	Coastal Loading Facility	**CLF**	Specific Purpose Mining Lease (SPML TBA[1])	TBA[1]	567617.426	8555343.453
		Load out Jetty		TBA[1]	567064.120	8555165.200
		CLF Power Generation		TBA[1]	567444.577	8555229.845
		Product Stockpiles		TBA[1]	567515.495	8555433.083
					567515.426	8555283.101
		CLF workshop		TBA[1]	567548.136	8555229.845
		CLF Sediment Ponds **Sed_CLF_1**		TBA[1]	567534.334	8555070.357
		Sed_CLF_2			567632.665	8555089.859
		Sed_CLF_3			567503.867	8555718.775
		Sed_CLF_4			567703.867	8550126.944

1. *To be advised upon submission of environmental authority (EA) application.*

A2	All reasonably practicable measures must be taken to prevent or minimise environmental harm caused, or likely to be caused, by the activities.
A3	Unless specifically authorised by a condition of this environmental authority, this environmental authority does not authorise a relevant act which is: a. an act that causes serious or material environmental harm or an environmental nuisance; or b. an act that contravenes a noise standard; or c. a deposit of a contaminant, or release of stormwater run-off, mentioned in section 440ZG of the *Environmental Protection Act 1994*.
A4	**Plant and equipment** An appropriately qualified person must install, operate, calibrate, and maintain the plant and equipment required to carry out the activity (including monitoring devices) in a proper and effective manner.
A5	Records of installation, calibration and maintenance carried out under condition A4 must be kept.
A6	**Record keeping** Unless otherwise specified by a condition of this environmental authority, records must be: a. kept for the period outlined in Table A2 – Record keeping requirements; and b. provided to the administering authority in the format requested, within: i. ten (10) business days; or ii. an alternative timeframe agreed between the administering authority and the holder of this environmental authority. **Table A2 – Record keeping requirements**

Description of records	**Retention requirement**

	Monitoring results	Retain for 15 years
	All other records	Retain for 5 years
A7	**Chemical storage** Chemicals and fuels in containers of greater than 15 litres must be stored within a secondary containment system.	
A8	**Monitoring and sampling** All monitoring and sampling required by the conditions of this environmental authority must be carried out, interpreted, and recorded by an appropriately qualified person.	
A9	Unless otherwise authorised in writing by the administering authority, all laboratory analyses required under this environmental authority must be carried out by a laboratory that has National Association of Testing Authorities (NATA) accreditation for such analyses. The only exception to this condition is for *in situ* monitoring of dissolved oxygen, temperature, pH, electronic conductivity, turbidity and total chlorine.	
A10	**Environmental risk management procedures** Written procedures must be developed and implemented by an appropriately qualified person that ensure: a. all potential risks to the environment from the carrying out of the activity are identified and assessed, including: i. during routine operations; and ii. outside routine operations (e.g., maintenance, start up and shut down); and iii. during preparation, rehabilitation, and closure; and iv. in an emergency (e.g., fire, flood or other natural disaster); and b. for each potential risk identified, any necessary measures to prevent or minimise the potential for environmental harm are implemented; and c. staff understand their obligations under this environmental authority and the *Environmental Protection Act 1994*; and d. environmental risk management procedures are continually reviewed and improved, based on a reasonable risk-management approach.	
A11	**Contravention of conditions** Unless specifically authorised by a condition of this environmental authority, details of any contravention of (or reasonably expected to be not in accordance with) a condition of this environmental authority must: a. be reported to the administering authority and affected person/s within twenty-four (24) hours of becoming aware of the contravention; and b. include the nature and circumstances of the contravention and any immediate actions taken.	
A12	As soon as reasonably practicable but no later than twenty (20) business days of a report made under condition A11 (or a longer period agreed to in writing by the administering authority), an investigation must be undertaken to determine: a. the potential circumstances and actions that may have contributed to the contravention; and	

	b. reasonable and practicable measures that will be implemented to address the cause of the contravention to prevent future contraventions of this nature.
A13	As soon as reasonably practicable but no later than twenty (20) business days of investigating a contravention under condition A12 (or a longer period agreed to in writing by the administering authority), the reasonable and practicable measures identified in the investigation must be implemented.
A14	The outcome of the investigation carried out under condition A12 and the reasonable and practicable measures implemented under condition A13 must be recorded.
A15	**Complaints** The following details must be recorded for all complaints received: a. date and time the complaint was received; and b. if authorised by the person making the complaint, their name and contact details; and c. nature and details of the complaint.
A16	As soon as reasonably practicable but no later than five (5) business days of receiving a complaint (or a longer period agreed to in writing by the administering authority), an investigation must be undertaken to determine: a. the potential circumstances and actions on site that may have contributed to the basis of the complaint; and b. reasonable and practicable measures that will be implemented to address the complaint.
A17	As soon as reasonably practicable but no later than five (5) business days of investigating a complaint under condition A16 (or a longer period agreed to in writing by the administering authority), the reasonable and practicable measures identified in the investigation must be implemented.
A18	The outcome of the investigation carried out under condition A16 and the reasonable and practicable measures implemented under condition A17 must be recorded.
A19	The holder of this environmental authority must, when requested by the administering authority, undertake relevant specified monitoring within a reasonable timeframe nominated or agreed to by the administering authority to investigate any complaint of environmental harm. The results of the investigation (including an analysis and interpretation of the monitoring results) and abatement measures, where implemented, must be provided to the administering authority within ten (10) business days of completion of the investigation, or no later than ten (10) business days after the end of the timeframe nominated by the administering authority to undertake the investigation.
A20	**Third-party reporting** The holder of this environmental authority must: a. within one (1) year of the commencement of this environmental authority, obtain from an appropriately qualified person a report on compliance with the conditions of this environmental authority; and b. obtain further such reports at regular intervals, not exceeding three-yearly intervals, from the completion of the report referred to above; and c. provide each report to the administering authority within ninety (90) days of its completion.

A21	Where a condition of this environmental authority requires compliance with a standard, policy or guideline published externally to this environmental authority and the standard is amended or changed subsequent to the issue of this environmental authority, the holder of this environmental authority must: a. comply with the amended or changed standard, policy or guideline within two years of the amendment or change being made, unless a different period is specified in the amended standard or relevant legislation, or where the amendment or change relates specifically to regulated structures referred to in this environmental authority, the time specified in that condition; and b. until compliance with the amended or changed standard, policy or guideline is achieved, continue to remain in compliance with the corresponding provision that was current immediately prior to the relevant amendment or change.
A22	Activities which include excavation, construction or other activity that may cause harm to Aboriginal cultural heritage are not authorised to commence without the development and approval of a cultural heritage management plan for the project, pursuant to section 87 of the *Cultural Heritage Act 2003*.
Schedule B - Air	
B1	Unless authorised by this environmental authority, the release of contaminants to air must not cause environmental harm or an exceedance of the limits in Table B2 – Ambient air quality limits at a sensitive or commercial place.
B2	The holder of this environmental authority must develop, document and implement an air quality monitoring program that can ensure compliance with the conditions of this environmental authority, within 6 months of the effective date of this environmental authority and prior to commencement of the activity.
B3	**Point source releases to air** Point source emissions released to the atmosphere must only be released from release point/s specified in Table B1 – Point source air release limits and must be monitored at the frequencies and for the contaminants specified in Table B1 – Point source air release limits.
B4	Air emissions and meteorological conditions must be monitored in accordance with Table B2 – Ambient air quality limits.

Table B1 – Point source air release limits

Release Point	Source Description	Minimum Release Height[2] (m)	Minimum Efflux Velocity (m/s)	Contaminant	Maximum release limit (g/s)	Monitoring frequency[3]
Coastal Loading Facility (CLF)	2 generators	5.5	30	Oxides of Nitrogen (or NO_X as NO_2 equivalent)	10.4	Once off monitoring – All stacks must be monitored for the contaminant/s within three months of commissioning of the release points; and
Mine Infrastructure Area (MIA)	6 generators	5.5	30		31.3	
Tapplebang Dam Pumps	TBA[1]	5.5	30		5.2	

	Mine Administration Area (MAA)	2 generators	5.5	30		10.4	Monitoring as required by conditions A15-A19 of this environmental authority.
	Fines Containment Area (FCA)	1 generator	5.5	30		1.8	

1. TBA with EA application.
2. The release of contaminants from the point source in accordance with Table B1 – Point source air release limits must be directed vertically upwards without any impedance or hindrance.
3. Monitoring provision for the release points listed in Table B1 – Point source air release limits must comply with the Australian Standard AS 4323.1 - 1995 'Stationary source emissions Method 1: Selection of sampling positions'.

B5 The only type of fuel to be burnt in power generators is diesel.

B6 **Dust and particulate matter monitoring**

Emissions of contaminants to air must comply with the release limits in Table B2 – Ambient air quality limits.

Table B2 —Ambient air quality limits

Monitoring location	Air Quality Indicator	Monitoring Frequency	Air Quality Limit	Nuisance Limit	Monitoring Method
Amban Outstation	Total Solid Particles (TSP) and PM_{10}	Once every six (6) days	TSP annual average limit as 90 µg/m^3 PM_{10} 24-hour limit as 50 µg/m^3 $PM_{2.5}$ 24-hour limit as 20 µg/m^3	TSP 24-hour average limit as 100 µg/m^3 PM_{10} 1-hour limit as 80 µg/m^3	High Volume Air Sampler (HVAS) AS/NZS 3580.9.15
	PM_{10} and $PM_{2.5}$	Continuous			Beta Attenuation Monitor (BAM) AS/NZS 3580.9.11
	Weather station[1] measuring wind speed and direction, temperature, precipitation and humidity.	Continuous			Australia/New Zealand Standards: AS/NZS 3580.14:2014, Methods for sampling and analysis of ambient air Meteorological monitoring for ambient air quality monitoring applications.

1. 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.

B7 If monitoring indicated the potential for exceedance of the relevant limits in Table B2 – Ambient air quality limits, then the holder of this environmental authority

	must immediately implement dust abatement measures to avoid exceeding the relevant limits.
B8	Measures for the control of airborne emissions from the ship loading and ship unloading of product bauxite must be documented; and installed, maintained and operated in a manner that prevents the release of contaminants to the environment. Measures must include, but not be limited to: a. ensuring that the moisture content of the product bauxite is maintained as high as practicable[1] at the point of ship loading or ship unloading; and b. implementation of operational practices to minimise any potential reduction in material moisture content; and c. minimising the exposure of product bauxite to the effects of wind; and d. dust suppression systems[2]. 1. *Consideration for Transportable moisture limit (TML) maritime safety requirements when determining practicable.* 2. *An appropriately qualified person must design, install, test and commission all dust control and dust suppression systems specific to the product bauxite and the specific method of handling. The design must take into consideration the dustiness, the Dust Extinction Moisture (DEM) level, and the dust/moisture relationship for product bauxite as determined by the relevant Australian and International Standards.*
B9	The holder of this environmental authority must ensure all vehicles and vessels used for transporting material, do so with the appropriate load preparation to minimise the spillage and/or loss of material and/or windblown dust during transport.
B10	If there is a visible release of dust emissions to the atmosphere from the ship loading or unloading activity or storage activity, the holder of this environmental authority must: a. immediately review and where necessary adjust operation controls; and b. if visible release of dust emissions continues or are repetitive, then: i. cease all relevant activities; and ii. review applicable measures for the control of airborne emissions; and iii. prior to recommencement, implement any reasonable identified improvements to the measures for the control of airborne emissions.
B11	The holder of this environmental authority must undertake monitoring of dust deposition: a. at the monitoring locations specified in Table B3 – Dust Deposition Monitoring Locations; and b. at the monitoring frequency specified in Table B3 – Dust Deposition Monitoring Locations; and c. in accordance with the method in the most recent version of the relevant Australian Standard *AS/NZS 3580.10.1 Methods for sampling and analysis of ambient air Determination of particulate matter – Deposited matter – Gravimetric method*.

Table B3 – Dust Deposition Monitoring Locations

Monitoring Location[1]	Location[1] (GDA 94 MGA Zone 54)		Monitoring frequency
	Easting	Northing	
Amban Outstation[2]	TBA[1]	TBA[1]	Monthly
TBA[1]	TBA[1]	TBA[1]	

1. TBA with EA application.
2. Monitoring location to be located between sensitive receptor and predominant emission source/s.

B12 The limits of the parameter specified in Table B4 – Dust deposition limits must not be exceeded at any of the monitoring locations specified in Table B3 – Dust Deposition Monitoring Locations.

Table B4 – Dust deposition limits

Parameter	Monitoring location	Limit type	Limit[2]	Averaging period
Dust deposition	Amban Outstation	Maximum	120 mg/m^2/day	30 days
	CLF			
	TBA[1]			

1. TBA with EA application.
2. Air quality objectives health and wellbeing *Environmental Protection (Air) Policy 2019.*

B13 Air quality monitoring, including for dust and point source emissions from the activity, must be undertaken:

a. during a release and at the authorised release points, frequency and for the contaminants specified; and

b. when emissions are expected to be representative of actual operating conditions for the sample period; and

c. in accordance with:

i. the latest edition of the administering authority's Air Quality Sampling Manual; or

ii. if monitoring requirements are not described in the department's Air Quality Sampling Manual, monitoring protocols must be in accordance with a method as approved by New South Wales EPA, or United States EPA.

B14 **Greenhouse gas abatement plan**

Prior to the commencement of mining activities, a greenhouse gas (GHG) abatement plan must be developed and implemented for all stages of the mining activity.

B15	The GHG abatement plan must address the content requirements of Appendix A of the most recent version of the guideline – *Greenhouse gas emissions (ESR/2024/6819)*, including: a. project details; and b. emissions projections and commencing abatement measures; and *Note: emissions projects must incorporate the projections identified in Table 13-14 Summary of Annual Greenhouse Gas Emission Rates (tCO_{2-e}/year) of the Aurukun Bauxite Project Environmental Impact Statement (January 2025) for diesel consumption and land (vegetation) clearing; commencing abatement measures must include mitigation measures proposed to be adopted under section 13.3.5 of the Aurukun Bauxite Project Environmental Impact Statement (January 2025).* c. GHG emissions reference point and justification for the reference point/s proposed; and d. emission reduction targets for Scope 1 GHG emissions; and e. GHG emission reduction program for Scope 1 GHG emissions, including but not limited to how ongoing mitigation measures identified in section 13.3.5 of the Aurukun Bauxite Project Environmental Impact Statement (January 2025) will be implemented and when; and f. regular review of advancing technologies and opportunities to further reduce emissions and energy efficiency; and *Note: regular review of advancing technologies must include a regular schedule to review power sources and investigate opportunities for lower carbon sources of power;* and g. monitoring and auditing; and h. reporting on the progress towards the GHG emission reduction targets outlined in the GHG abatement plan.
B16	The GHG emission reduction program in the GHG abatement plan: a. must be updated to incorporate implemented emission reduction measures and energy efficiency measures; and b. must be updated to account for non-conformances identified by auditing under condition B18 and other operational changes not accounted for in the GHG abatement plan that lead to a net or gross increase in GHG emissions; and c. the GHG Emission Reduction Program in the GHG abatement plan may be updated to incorporate opportunities to further reduce emissions and improve energy efficiency.
B17	Updates to the GHG abatement plan must comply with the most recent version of the guideline - *Greenhouse Gas Emissions* (ESR/2024/6819).
B18	An appropriately qualified person must undertake an annual audit by <<insert date>> to determine whether the GHG abatement plan has been implemented and complied with during the previous 12 months.
B19	A statement of compliance must be prepared about the work undertaken to develop, implement and comply with the GHG abatement plan. The statement of compliance must: a. be prepared by an appropriately qualified person; and b. be submitted to the administering authority within 10 business days of the audit under condition AB18 being completed; and

	c. consider the following compliance criteria: i. whether the GHG abatement plan complies with the most recent version of the guideline - *Greenhouse Gas Emissions* (ESR/2024/6819); and ii. whether the emission reduction targets in the GHG abatement plan have been met; and iii. whether the emission reduction measures in the GHG Emission Reduction Program have been implemented; and iv. whether the GHG abatement plan has been reviewed in accordance with review provisions in the GHG abatement plan; and v. whether GHG emissions have been monitored in accordance with the monitoring program in the GHG abatement plan; and vi. whether public reporting on progress toward the emission reduction targets has been carried out in accordance with the reporting program in the GHG abatement plan; and d. state whether the work complies with the above compliance criteria; and e. be supported by the methodology, assumptions and input data used to determine GHG emissions.
B20	Within twenty (20) business days of the audit being completed under condition B19 the following information must be published on the environmental authority holder's website: a. the statement of compliance required under condition B19; and b. the most recent version of the GHG abatement plan.
Schedule C—Waste	
C1	Unless otherwise permitted by the conditions of this environmental authority, all waste must be lawfully reused, recycled or removed to a facility that can lawfully accept the waste.
C2	Waste must not be burnt.
C3	The holder of this environmental authority must develop, document and implement a Waste Management Program, which includes: a. a description of the activity that may generate waste; and b. waste management control strategies including: i. recording of the types and amounts of wastes generated by the activity; and ii. segregation of the wastes; and iii. storage of the wastes; and iv. transport of the wastes; and v. disposal of waste; and vi. monitoring and reporting matters concerning the waste; and c. the hazard characteristics of the wastes generated, including disposal procedures for regulated wastes; and

<table>
<tr><td></td><td>
d. a program for reusing, recycling or disposing of all wastes; and
e. 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 management hierarchy (i.e. avoidance, reuse, recycling, energy recovery, disposal); and
f. how the waste will be stored, handled and transferred in a proper and effective manner; and
g. 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; and
h. procedures for dealing with accidents, spills, and other incidents that may impact on waste management; and
i. details of any accredited management system employed, or planned to be employed, to deal with the waste; and
j. how often the performance of the waste management practices will be assessed; and
k. indicators or other criteria on which the performance of the waste management practices will be assessed; and
l. staff training and induction to the waste management program.
</td></tr>
<tr><td>C4</td><td>The Waste Management Program required under condition C3 must be regularly reviewed and updated at intervals of no greater than five (5) years.</td></tr>
<tr><td>C5</td><td>
Mining Waste Management
Waste must only be disposed of in accordance with Table C1 – Mining Waste and as illustrated in Schedule L – Figure 1 – Authorised activities and locations.
Table C1 – Mining Waste
<table>
<tr><th>Waste type</th><th>Authorised Disposal Location</th><th>Handling requirements/ limiting conditions</th></tr>
<tr><td>Waste bauxite</td><td rowspan="2">Fines Containment Area (FCA);
Mined out pit areas:
• Coconut
• Tapplebang North
• Tapplebang South</td><td rowspan="2">A containment used for the storage of tailings (fines) 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.</td></tr>
<tr><td>Tailings (fines)</td></tr>
</table>
</td></tr>
<tr><td>C6</td><td>
Tailings must be managed in accordance with a Mine Waste Management Plan, which includes:
a. a description of the mine wastes to be generated; and
b. containment of tailings in accordance with the approved design plan(s); and
c. strategies for mine waste management; and
d. the control of fugitive emissions to air; and
</td></tr>
</table>

e. a program of progressive sampling and characterisation to identify acid producing potential and metal concentrations of tailings; and

f. management of tailings in order to minimise the potential for environmental harm.

Schedule D—Noise

D1 Noise from the activity must not include substantial low frequency noise components and must not exceed the levels identified in Table D1 – Noise limits at any sensitive place.

Table D1 – Noise limits

Noise level measured in dB(A)	**Monday to Sunday (including Public Holidays)**		
	7am–6pm	**6pm–10pm**	**10pm–7am**
$L_{Aeq\ adj,\ 15min}$	35	35	30
$L_{A1,adj,\ 15min}$	40	40	35

D2 All monitoring of noise emissions from the activity must be undertaken when the activity is in operation.

D3 The following must be recorded when undertaking monitoring of noise emissions from the activity:

a. all equipment in operation at the time of the noise measurement; and

b. the mode of operation at the time of the noise measurement.

Note: results and monitoring reports are records that must be kept in accordance with condition A6.

D4 Noise measurements must be taken using a class 1 sound level meter as classified under AS IEC 61672.

D5 All monitoring of noise emissions from the activity must be undertaken in accordance with the latest edition of the Noise measurement manual (available on the Queensland government website), the relevant Australian Standard and the *Environmental Protection Regulation 2019* (Chapter 5, Part 4).

Schedule E—Groundwater

E1 Contaminants from the activity must not be released to groundwater.

E2 **Groundwater Monitoring Bores**

The construction, maintenance, operation and decommissioning of each groundwater monitoring bore must be undertaken by an appropriately qualified person in a manner that:

a. prevents contaminants entering the groundwater; and

b. ensures representative groundwater samples from the target hydrogeological unit; and

c. maintains the hydrogeological environment within the hydrogeological unit.

E3 A bore report must be kept for each monitoring bore which includes:

a. a unique identification reference number and geographic coordinate location; and
b. construction information including but not limited to the depth of bore, depth and length of casing, depth and length of screening and bore sealing details; and
c. stratigraphy and target hydrogeological unit of the bore; and
d. depth at which groundwater was intercepted and the final standing water level (SWL) after bore development.

E4 **Monitoring and reporting**

All determinations of groundwater quality and biological monitoring must be:

a. performed by an appropriately qualified person; and
b. carried out in accordance with the requirements of the latest edition of the *Monitoring and sampling manual* (available on the Queensland government website) unless otherwise approved by the administering authority.

E5 **Groundwater monitoring**

Groundwater quality and standing water level (SWL) must be monitored:

a. at the locations specified in Table E1 – Groundwater monitoring locations and frequency, as illustrated in Figure 2 – Groundwater Monitoring Bore Locations; and
b. at the frequencies specified in Table E1 – Groundwater monitoring locations and frequency; and
c. for the relevant quality characteristics listed in Table E2 – Groundwater quality limits.

Table E1 – Groundwater monitoring locations and frequency

Monitoring Bore	Hydrogeological Unit	Location (decimal degrees*, GDA2020 – Zone 54)		Surface RL[1] (mAHD)	Screened Interval RL (mbgl)	Monitoring Frequency	
		Latitude	Longitude			Water level	Water quality
Interpretation Bores							
C_MB6A	Bulimba Fm	593215.892	8561965.495	83.15	TBA[2]	TBA[2]	TBA[2]
C-MB6B	Weathered Bulimba Fm/Bauxite	593215.892	8561965.495	TBA[2]	TBA[2]		TBA[2]
C_MB10A	Bulimba Fm	591964.892	8566219.495	71.80	TBA[2]		TBA[2]
C-MB10B	Bauxite	591964.892	8566219.495	TBA[2]	TBA[2]		TBA[2]
Compliance Bores							

C_MB1A	Weathered Bulimba Fm	588025.891	8557979.495	56.25	TBA[2]	TBA[2]	TBA[2]
C-MB1B	Bauxite	588025.891	8557979.495	TBA[2]	TBA[2]		TBA[2]
C_MB2A	Bulimba Fm/ weathered Bulimba Fm	587262.891	8553153.495	35.00	TBA[2]		TBA[2]
C-MB2B	Weathered Bulimba Fm	587262.891	8553153.495	TBA[2]	TBA[2]		TBA[2]
C_MB3A	Weathered Bulimba Fm	587325.891	8559473.495	43.00	TBA[2]		TBA[2]
C-MB3B	Bauxite	587325.891	8559473.495	TBA[2]	TBA[2]		TBA[2]
C_MB4A	Weathered Bulimba Fm	585981.892	8562417.495	49.60	TBA[2]		TBA[2]
C-MB4B	Bauxite	585981.892	8562417.495	TBA[2]	TBA[2]		TBA[2]
C_MB5A	Bulimba Fm	589488.892	8560910.495	70.10	TBA[2]		TBA[2]
C-MB5B	Weathered Bulimba Fm	589488.892	8560910.495	TBA[2]	TBA[2]		TBA[2]
C_MB7A	Weathered Bulimba Fm	585299.892	8565367.495	67.35	TBA[2]		TBA[2]
C-MB8B	Weathered Bulimba Fm	585299.892	8565367.495	TBA[2]	TBA[2]		TBA[2]
C_MB8A	Bulimba Fm	584927.891	8555781.495	38.50	TBA[2]	TBA[2]	TBA[2]
C-MB8B	Weathered Bulimba Fm	584927.891	8555781.495	TBA[2]	TBA[2]		TBA[2]
C_MB9A	Bulimba Fm/ weathered Bulimba Fm	584927.891	8555781.495	34.95	TBA[2]		TBA[2]
C-MB9B	Weathered Bulimba Fm	584927.891	8555781.495	TBA[2]	TBA[2]		TBA[2]
C-MB11A	Bulimba Fm/ weathered Bulimba Fm	TBA[2]	TBA[2]	TBA[2]	TBA[2]		TBA[2]
C-MB11B	Bauxite	TBA[2]	TBA[2]	TBA[2]	TBA[2]		TBA[2]
p-MB12	TBA[2]	TBA[2]	TBA[2]	TBA[2]	TBA[2]		TBA[2]
p-MB13	TBA[2]	TBA[2]	TBA[2]	TBA[2]	TBA[2]		TBA[2]
p-MB14	TBA[2]	TBA[2]	TBA[2]	TBA[2]	TBA[2]		TBA[2]
p-MB15	TBA[2]	TBA[2]	TBA[2]	TBA[2]	TBA[2]		TBA[2]
p-MB16	TBA[2]	TBA[2]	TBA[2]	TBA[2]	TBA[2]		TBA[2]
p-MB17	TBA[2]	TBA[2]	TBA[2]	TBA[2]	TBA[2]		TBA[2]

p-MB18	TBA[2]	TBA[2]	TBA[2]	TBA[2]	TBA[2]		TBA[2]
p-MB19	TBA[2]	TBA[2]	TBA[2]	TBA[2]	TBA[2]		TBA[2]
p-MB20	TBA[2]	TBA[2]	TBA[2]	TBA[2]	TBA[2]		TBA[2]
p-MB21	TBA[2]	TBA[2]	TBA[2]	TBA[2]	TBA[2]		TBA[2]
p-MB22	TBA[2]	TBA[2]	TBA[2]	TBA[2]	TBA[2]		TBA[2]
p-MB23	TBA[2]	TBA[2]	TBA[2]	TBA[2]	TBA[2]		TBA[2]
p-MB24	TBA[2]	TBA[2]	TBA[2]	TBA[2]	TBA[2]		TBA[2]
p-MB25	TBA[2]	TBA[2]	TBA[2]	TBA[2]	TBA[2]		TBA[2]
p-MB26	TBA[2]	TBA[2]	TBA[2]	TBA[2]	TBA[2]		TBA[2]
p-MB27	TBA[2]	TBA[2]	TBA[2]	TBA[2]	TBA[2]		TBA[2]
p-MB28	TBA[2]	TBA[2]	TBA[2]	TBA[2]	TBA[2]		TBA[2]

* Decimal degrees to be provided to a minimum of 6 decimal places.

1. Surface RL in metres Australian Height Datum (mAHD) measured to the nearest centimetre.

2. TBA with EA application.

E6 **Groundwater Quality**

Groundwater samples obtained from compliance bores specified in Table E1 – Groundwater monitoring locations and frequency must not exceed Limit A specified in Table E2 – Groundwater quality limits on any five (5) consecutive sampling occasions.

E7 Groundwater samples obtained from monitoring bores specified in Table E1 – Groundwater monitoring locations and frequency must not exceed Limit B specified in Table E2– Groundwater quality limits on any three (3) consecutive sampling occasions.

Table E2 – Groundwater quality limits

Quality Characteristic[1, 2] (mg/L unless stated)	**Limit type**	**Monitoring bores**		
		Bore	**Limit A**	**Limit B**
pH (*in situ*) (units)	Range	All bores	5.0-6.0	5.0-6.5
EC (*in situ*) (µS/cm)	Maximum	All other bores	54	66
		C_MB3A	299	378
		C_MB9A	100	109
Sulphate as SO_4	Maximum	All other bores	3.25	4.08

		C_MB3A	35.08	43.80
Aluminium (dissolved, 0.45µm fraction)	Maximum	All other bores	0.08	0.165
		C_MB7A	-	0.0008
Copper (dissolved)	Maximum	C_MB1A, C_MB2A, C_MB3A, C_MB7A, C_MB8A and C_MB9A	-	0.001
		C_MB10A	0.012	0.015
		C_MB4A	0.015	0.047
		C_MB5A	TBA[3]	TBA[3]
		C_MB6A	0.010	0.033
Iron (total)	Maximum	C_MB1A	1.90	3.29
		C_MB2A	4.71	9.21
		C_MB3A	3.76	8.12
		C_MB4A	3.02	5.60
		C_MB5A	TBA[3]	TBA[3]
		C_MB6A	2.62	5.00
		C_MB7A	0.21	0.72
		C_MB8A	6.11	7.53
		C_MB9A	3.92	20.45
Bioavailable iron (weak-acid extract)[5]	Maximum	All bores	TBA[3]	TBA[3]
Manganese (dissolved)	Maximum	All other bores	0.014	0.028
		C_MB9A	0.049	0.072
TPH C6-C9 (µg/L)	Maximum	All bores	-	20
Petroleum hydrocarbons C10-C36 Fraction (sum) (µg/L)			126	360

	Aluminium (dissolved, 0.1µm fraction)	Maximum	All bores	TBA[4]	TBA[4]
	Iron (dissolved)			TBA[4]	TBA[4]
	Total aluminium			TBA[4]	TBA[4]
	Total copper			TBA[4]	TBA[4]
	Total manganese			TBA[4]	TBA[4]
	Major ions			For interpretation purposes	

1. *All metals and metalloids must be measured as 'dissolved' (from analysis of a field filtered sample).*
2. *pH values based on in-situ measurements; remaining characteristics analysed in accordance with Condition E4.*
3. *TBA – Limits to be proposed by the EA holder, based on 2 years of data collection.*
4. *Analytes to be confirmed as potential contaminants of concern upon submission of environmental authority (EA) application.*
5. *Based on updated draft ANZG (2025, accepted draft), the default guideline value for total iron can be compared with the bioavailable iron analysed using a weak-acid extraction method.*

E8 **Groundwater Standing Water Level**

Groundwater SWL when measured at the compliance bores specified in Table E1 – Groundwater monitoring locations and frequency must not exceed the level trigger thresholds specified in Table E3 – Groundwater standing water level trigger threshold.

Table E3 – Groundwater standing water level trigger threshold

Monitoring Bore	Hydrogeological Unit	Level (upper threshold[2])	Level (lower threshold[3])
C_MB1A	TBA[4]	Baseline[1] + 1.43m	Baseline[1] - 0.97m
C_MB2A	TBA[4]	Baseline[1] + 2.26m	Baseline[1] - 0.78m
C_MB3A	TBA[4]	TBA[4]	Baseline - 0.48m
C_MB4A	TBA[4]	Baseline[1] + 6.04m	Baseline[1] - 0.77m
C_MB5A	TBA[4]	Baseline[1] + 5.93m	Baseline[1] - 1.60m
C_MB6A	TBA[4]	TBA[4]	Baseline - 0.18m
C_MB7A	TBA[4]	Baseline[1] + 5.55m	Baseline[1] - 1.06m
C_MB8A	TBA[4]	Baseline[1] + 0.42m	Baseline[1] - 1.06m
C_MB9A	TBA[4]	Baseline[1] + 4.98m	Baseline[1] - 1.53m
C_MB10A	TBA[4]	TBA[4]	Baseline[1] - 0.00m

p_MB13	TBA[4]	TBA[4]	TBA[4]
p_MB14	TBA[4]	TBA[4]	TBA[4]
p_MB15	TBA[4]	TBA[4]	TBA[4]
p_MB18	TBA[4]	TBA[4]	TBA[4]
p_MB19	TBA[4]	TBA[4]	TBA[4]
p_MB20	TBA[4]	TBA[4]	TBA[4]
p_MB23	TBA[4]	TBA[4]	TBA[4]
p_MB28	TBA[4]	TBA[4]	TBA[4]

1. 'Baseline' means baseline groundwater elevation (in mAHD). Baseline to be provided upon EA application.
2. Upper threshold equivalent to baseline groundwater elevation plus predicted groundwater mounding at bore location.
3. Lower threshold equivalent to baseline groundwater elevation minus predicted groundwater drawdown at bore location.
4. TBA with EA application.

Note: All values in the above table must be reviewed and assessed at the time of EA application.

E9 If the level trigger thresholds of groundwater measured at water level compliance bores specified in Table E1 - Groundwater monitoring locations and frequency exceeds any of the corresponding Level Trigger Thresholds specified in Table E3 - Groundwater standing water level trigger threshold, the holder of this environmental authority must:

a. notify the administering authority as relevant via WaTERS within 24 hours of becoming aware; and
b. complete an investigation into the cause of the exceedance within ten (10) business days; and
c. if the investigation carried out under part (b) determines that the mining activities are a potential cause or contributor to the exceedance,
i. notify the administering authority as relevant via WaTERS within twenty-four (24) hours of making the determination; and
ii. take immediate action to ensure compliance with condition E8 of this environmental authority and notify the administering authority of when action has been completed.

E10 **Groundwater Monitoring and Management Program**

On or before <INSERT DATE>, a Groundwater Monitoring and Management Program (GMMP) must be developed, implemented and maintained.

E11 The GMMP required by condition E10 must:

a. provide a hydrogeological conceptual groundwater model; and
b. identify all potential sources of contamination to groundwater from the activities; and
c. identify all environmental values that may be impacted; and

	d. detail groundwater levels in all identified hydrogeological units present across and adjacent to the site to confirm existing groundwater flow paths; and e. ensure all potential groundwater impacts due to the activities authorised under this environmental authority are identified, monitored and mitigated; and f. ensure adequate groundwater monitoring and data analysis is undertaken to achieve the following objectives: i. detect any impacts to groundwater quality due to the activities authorised under this environmental authority; and ii. detect any changes to groundwater level due to the activities authorised under this environmental authority; and iii. determine compliance with condition E6; and iv. determine trends in groundwater quality; and v. determine any interaction or impact from groundwater on surface water; and g. document groundwater management and monitoring methodologies undertaken for the duration of all the activities authorised under this environmental authority; and h. provide an appropriate quality assurance and quality control program; and i. include a review process to identify improvements to the program that includes addressing any comments provided by the administering authority.
E12	The GMMP must be reviewed on an annual basis by an appropriately qualified person to determine if it continues to meet the requirements stated in condition E11.
E13	**Groundwater Model** The groundwater model must be reviewed and updated by an appropriately qualified person every five (5) years.
E14	The groundwater model review required by condition E13 must: a. include all hydrogeological units potentially impacted by the activities authorised under this environmental authority; and b. be undertaken in accordance with the most recent version of the 'Australian Groundwater Modelling Guidelines'; and c. be validated and recalibrated with all recent monitoring data; and d. be documented and recorded.
E15	If the outcomes of the updated groundwater model required by condition E14 differ from the predictions and associated impacts from the current groundwater model, the holder of this environmental authority must also submit a report to the administering authority within twenty-eight (28) days of completion of the review under condition E14 that details the impacts to environmental values that will, or are likely to, occur as a result of the updates to the groundwater model.
E16	**Annual Groundwater Monitoring Report** Within one year after commencing mining activities an Annual Groundwater Monitoring Report (AGMR) must be completed each year.
E17	The AGMR required by condition E16 must include: a. a review of all the groundwater quality and SWL data of all groundwater bores listed within Table E1 – Groundwater monitoring locations and frequency; and b. an assessment of groundwater quality and SWL trends for all data from all groundwater bores listed in Table E1 – Groundwater monitoring locations and

frequency; and

c. details of any review undertaken of the groundwater model; and

d. an assessment of any impacts on groundwater quality and level due to the mining activities; and

e. comparison with receiving environment surface water quality monitoring results to determine any interaction or impact from groundwater on surface water.

E18 **Groundwater Dependent Ecosystems (GDEs)**

Other than as authorised under this environmental authority, the activities authorised under this environmental authority must not cause environmental harm to any groundwater dependant ecosystems, including those specifically referenced in Table E4 – Identified Groundwater Dependent Ecosystems, and as illustrated in Figure 3 – Groundwater Dependent Ecosystems Locations.

Table E4 – Identified Groundwater Dependent Ecosystems

GDE	Type	Location (decimal degrees, GDA2020)	
		Latitude	Longitude
GDE 1 – RE 3.5.36b (Darwin Stringybark woodland to tall woodland on highly weathered geology)	Terrestrial GDEs with medium likelihood of accessing groundwater.	TBA[1]	TBA[1]
GDE 2 – REs 3.3.9a/3.3.9b and 3.3.20b (Riparian vegetation communities)		TBA[1]	TBA[1]
GDE 3 – TBA[1]		TBA[1]	TBA[1]

1. TBA upon EA application

E19 A Groundwater Dependent Ecosystem Management and Monitoring Plan (GDEMMP) must be developed, implemented and maintained to ensure compliance with condition E18**.** The GDEMMP must include all groundwater dependent ecosystems which could reasonably be considered to be impacted by the mining activity.

Schedule F— Surface water

F1 Contaminants must not be released to any waters unless otherwise permitted by a condition of this environmental authority.

F2 Water monitoring and sampling must be carried out in accordance with the requirements of the latest edition of the *Monitoring and sampling manual* (available on the Queensland government website) unless otherwise approved by the administering authority.

F3 The following information must be recorded for all surface water, sediment, and biological monitoring:

a. the date on which the sample or in-situ record was taken; and

b. the time at which the sample or in-situ record was taken; and

c. the location co-ordinates and description of the monitoring point at which the sample was taken; and

d. the flow rate in the receiving environment at the time of sampling; and the results of all monitoring; and

e. details of any exceedances of the conditions of this environmental authority.

F4 The information recorded under condition F3 must be submitted to the administering authority annually in the specified electronic format.

F5 **Contaminant release**

The release of contaminated water to waters must only occur from the release points specified in Table F1 – Contaminated water release points and depicted in Schedule L, Figure 4 – Contaminated water release points of this environmental authority.

Table F1 - Contaminated water release points

Release Point (RP)	Latitude (decimal degree, GDA 2020)	Longitude (decimal degree, GDA 2020)	Water source and location	Monitoring Point	Receiving waters
Process water					
FCA	585156.694	8559598.022	Fines Containment Area	FCA Spillway	Coconut Creek
Extraction areas					
CC1	584066.623	8557902.092	Bauxite Mining and/or Fines Deposition Areas (Coconut)	At release point	Coconut Creek
CC2	585286.326	8562681.739	Bauxite Mining and/or Fines Deposition Areas (Coconut)	At release point	Coconut Creek
CC3	587765.548	8559678.783	Bauxite Mining Area (Tapplebang)	At release point	Coconut Creek
CC5	583406.283	8555357.113	Bauxite Mining and/or Fines Deposition Areas (Coconut)	At release point	Coconut Creek
NC1	TBA[1]	TBA[1]	Bauxite Mining and/or Fines Deposition Areas (Coconut)	At release point	TBA[1]
NC2	TBA[1]	TBA[1]	Bauxite Mining Area (Coconut)	At release point	TBA[1]
TC1	593653.990	8558703.046	Bauxite Mining Area (Tapplebang)	At release point	Tapplebang Creek
TC2	587682.836	8553867.300	Bauxite Mining Area (Tapplebang)	At release point	Tapplebang Creek

	TC3	585879.549	8550830.269	Bauxite Mining Area (Tapplebang)	At release point	Tapplebang Creek
	Sediment basins					
	MAA and Accommodation Village					
	Sed_MAA_1	TBA[1]	TBA[1]	TBA[1]	TBA[1]	TBA[1]
	MIA					
	Sed_MIA_1	TBA[1]	TBA[1]	TBA[1]	TBA[1]	TBA[1]
	Sed_MIA_2	TBA[1]	TBA[1]	TBA[1]	TBA[1]	TBA[1]
	Sed_MIA_3	TBA[1]	TBA[1]	TBA[1]	TBA[1]	TBA[1]
	Sed_ROM	TBA[1]	TBA[1]	TBA[1]	TBA[1]	TBA[1]
	Coastal Loading Facility					
	Sed_CLF_1	TBA[1]	TBA[1]	TBA[1]	TBA[1]	TBA[1]
	Sed_CLF_2	TBA[1]	TBA[1]	TBA[1]	TBA[1]	TBA[1]
	Sed_CLF_3	TBA[1]	TBA[1]	TBA[1]	TBA[1]	TBA[1]
	Sed_CLF_4	TBA[1]	TBA[1]	TBA[1]	TBA[1]	TBA[1]

1. TBA on submission of EA application

F6 The release of contaminated water to waters from the release points must be monitored at the locations specified in **Table F1 - contaminated water release points** for each quality characteristics and at the frequency specified in **Table F2 - Contaminated water release limits**.

Note: The administering authority will take into consideration any extenuating circumstances prior to determining an appropriate enforcement response, in the event condition F7 is contravened due to a temporary lack of safe or practical access. The administering authority expects the holder of this environmental authority to take all reasonable and practicable measures to maintain safe and practical access to designated monitoring locations.

F7 The release of contaminated water to waters in accordance with condition F5 must not exceed the release limits stated in Table F2 - Contaminated water release limits when measured at the monitoring points specified in Table F1 - Contaminated water release points for each quality characteristic.

F8 **Table F2 - Contaminated water release limits**

Quality characteristic	Release limits[1]	Monitoring frequency
Electrical conductivity (µS/cm)	19.5	Continuous (or daily in-situ measurement during release)
pH (pH Unit)	5.2 – 5.7	Daily during release (the first

	Turbidity (NTU)	5.0[2]	sample must be taken within two hours of commencement of release)
	Total suspended solids (mg/L)	5.0	
	Sulfate (mg/L)	0.3	
	Dissolved Oxygen (mg/L)	3.7 – 6.7	
	Dissolved aluminium (0.45µm fraction, mg/L)	0.030	
	Dissolved aluminium (0.1µm fraction, mg/L) **	0.01	
	Total iron (mg/L)	0.31	
	Dissolved manganese (mg/L)	0.003	
	Dissolved selenium (mg/L)	0.005[2]	
	Total Nitrogen (mg/L)	0.30	
	Total Phosphorous (mg/L)	0.02	
	Ammonia (mg/L)	0.06	
	Nitrate (mg/L)	0.01	
	Chlorine (mg/L)	TBA[3]	
	Total recoverable hydrocarbons (C6-C9) (µg/L)	20	
	Total recoverable hydrocarbons (C10-C36) (µg/L)	100	

1. Release Limits correspond to the 80th percentile of receiving environment data collected between 2019-2024 (or 20th-80th percentile for pH and DO) unless otherwise stated.
2. Default DGV applied, i.e. 99% species protection ANZG (2018)
3. TBA with EA application.

F9 **Contaminated water release events**

The holder must ensure a stream flow gauging station/s is installed, operated and maintained to determine and record stream flows at the locations and flow recording frequency specified in **Table F3 – Receiving water stream flow**.

Table F3 – Receiving water stream flow

Receiving waters/ stream	Gauging station	Latitude (decimal degree, GDA	Longitude (decimal degree, GDA	Receiving water flow recording frequency

		2020)	**2020)**	
	Tapplebang Creek	WL1	585287.960	8550068.257	Continuous (minimum daily)
	Coconut Creek	WL2	583221.047	8555204.477	
	Norman Creek	TBA[1]	TBA[1]	TBA[1]	

1. TBA with EA application.

F10	The release of contaminated water to waters in accordance with condition F5 must only take place during periods of natural flow.
F11	The daily quantity of contaminated water released from each release point must be measured and recorded at the monitoring points in Table F1 - Contaminated water release points.
F12	Releases to waters must be undertaken so as not to cause scouring and erosion of the bed and banks of the receiving waters or cause a material build-up of sediment in such waters.
F13	**Notification of release event** The holder of this environmental authority must notify the administering authority via WaTERS and affected person/s as soon as practicable and no later than 24 hours after commencing to release contaminated water to the receiving environment. A notification must be submitted for each release point and include the following information: a. release commencement date/time; and b. expected release cessation date/time; and c. release point; and d. release volume (estimated); and e. release flow rate; and f. release quality including electrical conductivity and pH; and g. receiving water/s including the natural flow rate and electrical conductivity; and h. any details (including available data) regarding likely impacts on the receiving water/s.
F14	The holder of this environmental authority must notify the administering authority via WaTERS, and affected person/s as soon as practicable (nominally within twenty-four (24) hours after cessation of a release event) of the cessation of a release notified under condition F13 and provide the following information: a. release cessation date/time; and b. natural flow volume in receiving water; and c. volume of water released; and d. details regarding the compliance of the release with the conditions of Schedule F – Water, of this environmental authority (i.e. contamination limits, natural

	flow, discharge volume); and e. all *in-situ* water quality monitoring results; and f. any other matters pertinent to the water release event. *Note: Successive or intermittent releases occurring within twenty-four (24) hours of the cessation of any individual release can be considered part of a single release event and do not require individual notification for the purpose of compliance with conditions F13 and F14, provided the relevant details of the release are included within the notification provided in accordance with conditions F13 and F14.*
F15	The holder of this environmental authority must within twenty-eight (28) days after cessation of a release event notified under condition F13 provide a report and supporting raw data to the administering authority via WaTERS, which must include the following information: a. all continuous and in-situ water quality monitoring results (including laboratory analyses); and b. any further matters pertinent to the water release event.
F16	**Release limit exceedance** If the release limits defined in Table F2 - Contaminant water release limits are exceeded, the holder of this environmental authority must notify the administering authority via WaTERS and affected person/s within twenty-four (24) hours of receiving the results.
F17	The holder of this environmental authority must, within twenty-eight (28) days of a release that exceeds the conditions of this authority, provide a report to the administering authority and affected person/s detailing: a. the reason for the release; and b. the location of the release; and c. all water quality monitoring results (including all laboratory analyses) for the relevant release point and the monitoring point/s; and d. any general observations; and e. all calculations; and f. any other matters pertinent to the water release event.
F18	**Receiving environment monitoring and contaminant trigger levels** The quality of the receiving waters must be monitored at the locations specified in Table F4 - Receiving water upstream background sites and downstream monitoring points and depicted in Schedule L, Figure 5 – Receiving water upstream background sites and downstream monitoring points, for each quality characteristic and at the monitoring frequency stated in Table F5 - Receiving waters contaminant trigger levels. **Table F4 - Receiving water upstream background sites and downstream monitoring points**

Monitoring points	Receiving waters location description	Latitude (decimal degree,	Longitude (decimal degree,

		GDA2020)	**GDA2020)**
Upstream control monitoring points			
Coconut Creek Upstream (CCUS)	Monitoring point upstream of operational activities on Coconut Creek	TBA[1]	TBA[1]
Tapplebang Creek Upstream (TCUS)	Monitoring point upstream of operational activities on Tapplebang Creek	595220.923	8559942.756
Norman Creek Upstream (NCUS)	Monitoring point upstream of operational activities on Norman Creek	583771.923	8564558.458
Downstream compliance monitoring points[2]			
Coconut Creek Downstream (CCDS)	Monitoring point downstream of operational activities on Coconut Creek	583218.917	8555207.343
Tapplebang Creek Downstream (TCDS)	Monitoring point downstream of operational activities on Tapplebang Creek	585196.549	8550076.681
Norman Creek Downstream (NCDS)	Monitoring point downstream of operational activities on Norman Creek	TBA[1]	TBA[1]

1. TBA with EA application.
2. Compliance points must be located on tenure.

F19

If a water quality characteristic measured at a downstream compliance monitoring site specified in Table F4 - Receiving water upstream background sites and downstream monitoring points exceeds any trigger levels specified in Table F5 - Receiving waters contaminant trigger levels, the holder of this environmental authority must compare this result to the applicable control site and:

a. If the quality measured at a downstream compliance monitoring point is equal to or less than the quality measured at the applicable upstream control monitoring point, no further action is required; or

b. If the quality measured at a downstream compliance monitoring point is greater than the quality measured at the applicable upstream control monitoring point, complete an investigation into the cause of the deterioration in water quality and the potential for environmental harm and submit a written report to the administering authority within twenty-eight (28) days outlining:

i. details of the investigation carried out including any assumptions and limitations of the investigation; and

ii. findings of the investigation including an explanation of the cause identified; and

iii. recommendations of the investigation; and

iv. actions taken to comply with the conditions of the environmental authority and to prevent environmental harm.

Table F5 - Receiving waters contaminant trigger levels

Quality characteristic	Trigger level[1]	Monitoring frequency
pH (in-situ)	5.2 – 5.7	Monthly (Daily during release)
Electrical conductivity (in-situ, µS/cm)	19.5	Monthly (Continuous or daily in-situ measurement during release)
Total suspended solids (mg/L)	5.0[4]	Monthly (Weekly during release)
Sulphate (mg/L)	0.3[7]	
Sodium (mg/L)	3.0	
Dissolved aluminum (0.45µm fraction, mg/L)	0.030[5]	
Dissolved aluminum (0.1µm fraction, mg/L)[3]	0.01[5]	
Total iron (mg/L)	0.31[5]	
Bioavailable iron (weak-acid extract)[2]	TBD	
Dissolved manganese (mg/L)	0.003 [5]	
Dissolved selenium (mg/L)[3]	0.005[6]	
Total Nitrogen (mg/L)	0.30	
Total Phosphorous (mg/L)	0.02	
Ammonia (mg/L)	0.06	
Nitrate (mg/L)	0.01	
Chlorine (mg/L)[2]	TBA[8]	
Total recoverable hydrocarbons (C6-C9) (µg/L)	20[7]	
Total recoverable hydrocarbons (C10-C36) (µg/L)	100[7]	
Oil or grease	No visible film	
Dissolved organic carbon (DOC)	For interpretation purposes	
Dissolved silicon (mg/L)		
Major ions (Calcium, chloride, potassium, magnesium, bicarbonate, carbonate)		

	Temperature (°C)		

1. Trigger levels correspond to the 80th percentile of data collected between 2019-2024 (or 20th-80th percentile for pH). All trigger levels should be revised to exclude the post-cyclonic period from 2019 to mid-2021 as soon as sufficient data is available.
2. Parameters not analysed to date in the receiving waters. For the weak-acid extract methodology, refer to ANZG guidance.
3. LOR requires adjusting to 0.001 mg/L at a minimum (if possible for dissolved (0.1 µm) aluminium, the LOR should be 0.0005 mg/L to meet the DGV of 0.0008 mg/L)
4. *In-situ* turbidity could be used as an indicator of TSS, however insufficient in-situ turbidity data is available (< 5 sampling dates) to investigate the relationship between TSS and in-situ turbidity and to derive a reliable in-situ turbidity trigger at this time.
5. Conservative triggers based on data collected during drier months (May to September) due to high variability of the dataset during higher flow conditions. The drier months were selected as a substitute for dry flow condition (due to higher flow conditions being more variable and more elevated). These triggers should be refined in the future to suit all conditions during which releases are expected to occur.
6. Default DGV applied, i.e. 99% species protection ANZG (2018).
7. Corresponds to the LOR to date. It is recommended that the LOR is adjusted to 0.01mg/L for sulphate.
8. TBA upon EA application.

F20	**Receiving Environment Monitoring Program** On or before <INSERT DATE>, a Receiving Environment Monitoring Program (REMP) Design Document must be: a. prepared in accordance with condition F6: and b. submitted to the administering authority. For the purposes of the REMP design document, the receiving environment refers to the waters of the Ward River, Coconut Creek, Tapplebang Creek, Norman Creek (and their catchments and tributaries) and connected or surrounding waterways downstream of the release. *Note: The REMP should encompass any sensitive receiving waters or environmental values downstream of the authorised mining activity that will potentially be affected by the mining activity.*
F21	Any comments made by the administering authority on the REMP Design Document must be addressed to the reasonable satisfaction and within a timeframe specified by the administering authority.
F22	On or before <INSERT DATE>, a REMP that has been prepared in accordance with the REMP Design Documents must be implemented. For the purposes of the REMP, the receiving environment refers to the waters of the Ward River, Coconut Creek, Tapplebang Creek, Norman Creek (and their catchments and tributaries) and connected or surrounding waterways downstream of the release.
F23	The REMP must at a minimum: a. address and comply with the most recent version of the administering authority's guideline – *Receiving environment monitoring program guideline*

	(ESR/2016/2399); and b. identify, describe and monitor any adverse impacts to surface water environmental values, quality, and flows; and c. assess the long-term condition or state of surface waters, sediment, and aquatic ecosystem health; and d. include at a minimum the locations listed in: i. Table F4 – Receiving water upstream background sites and downstream monitoring points; or ii. Table F1 – Contaminated water release points and Table F4 – Receiving water upstream background sites and downstream monitoring points; and e. identify and describe all environmental values of the receiving environment; and f. assess the receiving environment monitoring results against water quality objectives in Table F5 - Receiving waters contaminant trigger levels; and g. include an assessment of the potential impacts of the activity and propose appropriate mitigation measures; and h. assess the status of and any change to aquatic ecosystem health including aquatic flora and fauna within and immediately surrounding the project area; and i. assess the status of and any change to riparian vegetation health within and immediately surrounding the project area; and j. apply procedures and/or guidelines from ANZG 2020 and other relevant standards and guideline documents; and k. describe sampling and analysis methods and quality assurance and control; and l. incorporate stream flow and hydrological information in the interpretations of water quality and biological data.
F24	A REMP Annual Report must be prepared annually by 1 August.
F25	The REMP Annual Report required by condition F24 must: a. be prepared by an appropriately qualified person; and b. outline the findings of the REMP, including but not limited to: i. an assessment of long-term upstream water quality; and ii. an assessment of the long-term condition or state of surface waters, sediment and aquatic ecosystem health; and iii. an assessment of changes to flow performance indicators under the Water Plan (Cape York) 2019; and iv. recommendations for further investigation or actions; and v. recommendations for changes or improvements to the monitoring program; and vi. recommended impact mitigation and management actions for implementation under the Water Management Plan; and vii. all monitoring results; and viii. a description of all conclusions formed.
F26	**Water Storage monitoring**

The quality of water in water storages in Table F6 – Water storage monitoring must be monitored:

a. at the location in Table F6 – Water storage monitoring; and
b. at the monitoring frequency in Table F6 – Water storage monitoring; and
c. for all quality characteristics specified in Table F2 - Contaminated water release limits; and
d. include the volume of the water storage in ML at the time of monitoring.

Table F6 – Water storage monitoring

Water Storage	**Monitoring point**	**Location**		**Monitoring frequency**
		Latitude (decimal degree, GDA2020)	**Longitude (decimal degree, GDA2020)**	
Tapplebang Dam	Dam spillway	TBA[1]	TBA[1]	Quarterly (Weekly during release from TC1 to TC3)
Fines Containment Area	FCA Spillway	TBA[1]	TBA[1]	Quarterly
Process Water Pond	Spillway	TBA[1]	TBA[1]	Quarterly

1. TBA upon EA application

F27 If results of any water storage monitoring from condition F26 exceed a trigger value for livestock drinking water quality in ANZG 2020, then all necessary actions must be taken to prevent access to the waters by wildlife and livestock.

F28 **Water Management Plan**

On or before <INSERT DATE>, a Water Management Plan must be developed and implemented for all stages of the activity.

F29 The Water Management Plan must:

a. provide for effective water management of actual and potential environmental impacts resulting from the activity; and
b. include:

i. a study of the source of contaminants; and
ii. a water balance model for the site; and
iii. a water management system for the site, which includes stormwater management; and
iv. contingency procedures for incidents and emergencies; and
v. a program for monitoring and review of the effectiveness of the Water Management Plan.

F30 The Water Management Plan must be reviewed by *<INSERT DATE for each calendar year>.* The review must be documented and:

	a. include a statement that the Water Management Plan has been reviewed by an appropriately qualified person; and b. assess the plan against the requirements under condition F12; and c. include recommended actions to ensure actual and potential environmental impacts are effectively mitigated and managed; and d. provide details and timelines of the actions to be taken; and identify any amendments to be made to the Water Management Plan.
F31	A copy of the Water Management Plan must be kept up to date following each annual review.
F32	**Stormwater management** Stormwater must be managed to: a. prevent stormwater from being contaminated by the activity; or b. direct stormwater that is contaminated by the activity to stormwater treatment and retention measures.
F33	Stormwater treatment and retention measures must have capacity to retain stormwater runoff from disturbance areas generated by a rainfall event up to and including a 24-hour rainfall event with an Annual Exceedance Probability (AEP) of 10%.
F34	Stormwater may only be released to waters in accordance with the conditions of this environmental authority, where: a. beneficial reuse of contained stormwater runoff on site is not viable; and b. the release is necessary to maintain stormwater retention capacity required by condition F33; and c. the release is in accordance with condition F5.
F35	A specific Tapplebang Dam habitat restoration and management plan to maximise habitat values and minimise impacts on fauna and flora accessing the dam must be developed and implemented for the life of the dam.
F36	The Tapplebang Dam habitat restoration and management plan must include design, construction and operating targets that: a. identify key habitat features and materials to retain or install for optimal ecosystem function; and b. avoid isolated backwater formation within the inundated area; and c. minimise fringing vegetation loss along the inundated area and minimise vegetation clearing at the dam wall and fishway through clear demarcation of allowable disturbance footprints; and d. provide timeframes, methodologies and resources for the establishment of a viable aquatic and shoreline riparian community including active revegetation and physical structures; and e. maximise access to existing vegetation propagule and seed sources; and f. prioritise revegetation at fishway entry and exit points; and g. retain a minimum depth of 2m beyond the shoreline at minimum operating level; and h. monitor dam water quality upstream, within and downstream of the dam in Tapplebang Creek and the upper Ward River; and

	i. monitor aquatic habitat and ecosystem outcomes; and j. require an annual report evaluating the monitoring results, identifying any deviations form predicted outcomes in the EIS and detailing any necessary amendments to the plan.
F37	The Tapplebang Dam habitat restoration and management plan must be provided to the administering authority prior to any construction or clearance works associated with the dam.
F38	**Aquatic Pest Management Plan** On or before <INSERT DATE>, an Aquatic Pest Management Plan must be developed and submitted to the administering authority.
F39	The Aquatic Pest Management Plan must be implemented for all stages of the activity and the life of the dam.
F40	The Aquatic Pest Management Plan must include: a. a monitoring program for identifying incursions of non-endemic and non-native aquatic fauna and flora into waters within, upstream, downstream and offshore of the project site; and b. measures to minimise the risk of pest transfer into the Ward catchment and adjacent waters as a result of the project activities; and c. education and training for personnel, visitors and landholders to minimise the risk of pest transfer as a result of the project activities; and d. action planning and resourcing in the event of an aquatic pest incursion; and e. annual reporting on the outcomes of the Aquatic Pest Management Plan for the project.
F41	**Erosion and Sediment Control Plan** On or before <INSERT DATE>, an Erosion and Sediment Control Plan (ESCP) must be developed by an appropriately qualified person and implemented for all stages of the activity.
F42	The ESCP must demonstrate how erosion and sediment control measures detailed in the plan adequately minimise the release of sediment to receiving waters and must include at least the following: a. an assessment of the size and characteristics of all catchment areas; and b. an assessment of relevant properties of soils and waste materials; and c. identification of receiving waters environmental values, water quality objectives and management intent; and d. specification of minimum design criteria for erosion and sediment control structures to achieve the management intent of receiving waters; and e. locations and descriptions of all erosion and sediment control measures; and f. an audit schedule to ensure erosion and sediment control measures are maintained.
F43	The ESCP must be reviewed by *<INSERT DATE for each calendar year>.* The review must be documented and must: a. include a statement that the Erosion and Sediment Control Plan has been reviewed by an appropriately qualified person; and

	b. assess the plan against the requirements of condition F42; and c. include recommended actions to ensure actual and potential environmental impacts are effectively managed; and d. provide details and timelines of the actions to be taken; and e. identify any amendments made to the Erosion and Sediment Control Plan.
F44	A copy of the ESCP must be kept up to date following each annual review.
F45	**Temporary waterway barriers** The holder of this environmental authority must remove the temporary waterway barrier/s within Tapplebang Dam (Water Supply Dam) and Tapplebang Creek and Coconut Creek by no later than 30 November of the year it is constructed, and: a. if there is more than one temporary waterway barrier in the location, the most downstream waterway barrier must be removed first; and b. all temporary waterway barrier material must be removed from within the waterway and disposed of to a facility that can lawfully accept the waste.
Schedule G – Sewage treatment	
G1	Contaminants generated by sewage treatment activities must not be released to waters, unless otherwise approved by the conditions of this environmental authority.
G2	Treated sewage effluent (which may be blended with process water from the PWP) may be used for dust suppression in accordance with the conditions of this approval: a. may only be released to land for the purposes of dust suppression; and/or b. may only pumped to the Process Water Pond (PWP) for reuse in the Beneficiation Plant.
G3	Treated sewage effluent that is released to land for the purposes of dust suppression or for reuse in the Beneficiation Plant during operations must: a. be monitored at the location identified in Table G1 – STP Monitoring Locations; and b. not exceed the contaminant limits stated in Table G2 – Treated sewage effluent release limits.

Table G1 – STP Monitoring locations

Monitoring Location	Location (GDA 94 MGA Zone 54)	
	Easting	Northing
Accommodation Village Sewage Treatment Plant (STP) pre-irrigation storage	TBA[1]	TBA[1]
Mine Infrastructure Area (MIA) STP pre-irrigation storage	TBA[1]	TBA[1]

1. TBA upon application of site-specific environmental authority application.

Table G2 – Treated sewage effluent release limits

<table>
<tr><td></td><td>
<table>
<tr><th>Contaminant</th><th>Unit</th><th>Release limit</th><th>Limit type</th><th>Monitoring frequency</th></tr>
<tr><td>5 day Biochemical oxygen demand (BOD)[1]</td><td>mg/L</td><td>20</td><td rowspan="8">Maximum</td><td rowspan="5">Monthly</td></tr>
<tr><td>Total suspended solids</td><td>mg/L</td><td>30</td></tr>
<tr><td>Nitrogen</td><td>mg/L</td><td>30</td></tr>
<tr><td>Phosphorus</td><td>mg/L</td><td>15</td></tr>
<tr><td>E-coli</td><td>Organisms/100ml</td><td>10</td></tr>
<tr><td>Free Residual Chlorine (FRC)</td><td>mg/L</td><td>2</td><td rowspan="3">Weekly</td></tr>
<tr><td>Total Chlorine Residual (TCR)[1]</td><td>mg/L</td><td>2</td></tr>
<tr><td>Electrical conductivity</td><td>µS/cm</td><td>200</td></tr>
<tr><td>pH</td><td>pH units</td><td>6.0-9.0</td><td>Range</td><td>Monthly</td></tr>
</table>
1. May be measured on site using a basic test kit.
</td></tr>
<tr><td>G4</td><td>Treated sewage effluent may be used for dust suppression provided the following criteria are met:
a. the amount applied does not exceed the amount required to effectively suppress dust; and
b. the application:
i. does not cause on-site ponding or runoff; and
ii. is directly applied to the area being dust suppressed; and
iii. does not cause spray drift; and
iv. does not harm vegetation surrounding the area being dust suppressed; and
v. does not cause visible salting.</td></tr>
<tr><td>G5</td><td>Treated sewage effluent must not be used for dust suppression at a place, or in a way, so that the contaminant could reasonably be expected to wash, drain, or otherwise move into waters, a roadside gutter or stormwater drainage.</td></tr>
<tr><td>G6</td><td>Dewatering and/or storing of any sludge generated by the activity must be undertaken in an area which provides an impervious barrier to land and waters.</td></tr>
<tr><td>G7</td><td>When circumstances prevent the beneficial reuse of treated sewage effluent such as during or following rain events, waters must be directed to a wet weather storage or alternative measures must be taken to store/lawfully dispose of effluent.</td></tr>
<tr><td colspan="2">Schedule H—Land and Biodiversity</td></tr>
<tr><td>H1</td><td>Contaminants that will or may cause environmental harm must not be directly or indirectly released to land, except as permitted under this environmental authority.</td></tr>
</table>

H2	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.
H3	**Vegetation Clearing** Prior to commencement of any vegetation clearing: a. consultation with the Native title party in accordance with native title rights, the *Aboriginal Cultural Heritage Act 1993 (Qld)* and Cultural Heritage Management Plan must be undertaken with the intent of identifying any resources of value; and b. a vegetation clearing plan must be developed by an appropriately qualified person and implemented for all stages of the activity; and c. a pre-clearance survey must be undertaken by an appropriately qualified person to minimise impacts to flora and fauna species and fauna habitat.
H4	The vegetation clearing plan required by condition H3(b), must address, but not be limited to the following: a. avoid, minimise and/or mitigate (in order of preference) any impacts on areas of sensitive vegetation or other areas of ecological value; and b. reuse, including but not limited to the beneficial reuse of logs, hollows and tree stumps as shelter for fauna in rehabilitated areas; and c. recycle, including but not limited to mulching of vegetation and storage so that it is stockpiled in a manner that facilitates salvage in accordance with waste management hierarchy and the principles of the *Waste Reduction and Recycling Act 2011* and subordinate legislation, and does not impede vehicle, stock or wildlife movements; and d. minimise the risk of injury, harm, or entrapment to wildlife and stock; and e. minimise disturbance to land that may otherwise result in land degradation; and f. minimise disturbance to watercourses and/or drainage features; and g. ensure that for land that is to be significantly disturbed by the activity, the topsoil layer is removed and handled in a manner that will minimise degradation of its biological, chemical and physical properties to enable its use in rehabilitation activities; and h. prior to carrying out any disturbance activities, make all relevant staff, contractors or agents carrying out those activities, aware of the location of sensitive vegetation or other areas of ecological value and the relevant requirements of this environmental authority; and i. if significant disturbance to land is unavoidable, clear vegetation in a way which minimises fragmentation; and j. include any other alternative management options implemented in a way that causes the least amount of environmental harm.
H5	Notwithstanding condition H8, the removal of, or tampering with an animal breeding place/s, is not authorised without an approved species management program (SMP). *Note: Activities that disturb an animal breeding place/s may require an approved species management program (SMP) pursuant to section 335(4) of the Nature Conservation (Animals) Regulation 2020.*
H6	An appropriately qualified spotter-catcher must be present to identify and relocate significant flora and fauna species and minimise impacts to fauna habitat during any vegetation clearing.

	Note: This environmental authority does not authorise the taking of protected animals.
H7	**Topsoil management** The holder of this environmental authority must ensure that: a. topsoil is removed and stockpiled prior to carrying out any activity; and b. measures are implemented to ensure that the mixing and erosion of topsoil and subsoil stockpiles is prevented; and c. a topsoil inventory is maintained.
H8	**Prescribed environmental matters - matters of State environmental significance** Impacts to matters of State environmental significance (MSES) as a result of carrying out the activity must only occur within the locations and to the maximum extents stated in Table H1 – Authorised impacts to MSES and as illustrated in Schedule L, Figure 6 – Significant residual impacts to prescribed environmental matters.

Table H1 – Authorised impacts to MSES

Matters of State environmental significance	Species/RE ID	Location of prescribed environmental matter[1]	Significant residual impact	Offset Required	Maximum extent of impact
Regulated vegetation[3,4]					
Regional ecosystems (not within an urban area) within the defined distance from the defining banks of a relevant watercourse or relevant drainage feature	3.3.20b[3] Long-fruited Bloodwood (*Corymbia novoguinensis*) Swamp Box +/- Paperbark (*Melaleuca* spp.) woodland on alluvium.	ML TBA[6]	Yes	Yes	1.45ha
	3.3.9a[3] Swamp Box (*Lophostemon suaveolens*) fringing forest.				39.85ha
	3.3.9b[3] *Penda (Xanthostemon crenulatus*) Swamp mahogany *(Lophostemon suaveolens*) *Asteromyrtus brassii woodland* to open forest +/- Red beech (Dillenia alata) +/-				7.03ha

	Paperbark (Melaleuca saligna).				
	3.5.36b[3] Darwin Stringybark (*Eucalyptus tetrodonta*) +/- Cape Melville Bloodwood (*Corymbia nesophila*) woodland to tall woodland on tertiary plateaux.				63.55ha
Wetlands and watercourses[3]					
Wetland or watercourse in High Ecological Value waters (HEV waters)	Tapplebang Creek	ML TBA[6]	Yes	Yes	5.76ha
Protected wildlife habitat					
Habitat for an animal that is critically endangered wildlife, endangered wildlife or vulnerable wildlife or a special least concern animal.	Southern palm cockatoo (*Probosciger aterrimus macgillivrayi*)[5]	ML TBA[6]	Yes	Yes	8,725.5ha
	Red goshawk (*Erythrotriorchis radiatus*)[5]				9,305.7ha
	Masked owl (northern) (*Tyto novaehollandiae Kimberli*)[5]				9,305.7ha
Waterway providing for fish passage[3]					
Any part of a waterway (not in an urban area) providing for passage of fish.	Tapplebang Creek	Waterways on ML TBA[6]	Yes	Yes	5.76ha

1. *Coordinates provided in Appendix A; Detailed Coordinates – Significant residual impacts to prescribed environmental matters*
2. *Stream Order 1 and 3 combined.*
3. *Matter of State environmental significance (MSES) under the Queensland Environmental Offset Policy (ESR/2015/1658), dated 5 July 2024.*
4. *The significant residual impact criteria for clearing of vegetation in a regional ecosystem that is within the defined distance of a watercourse is defined in Table 1 of the Queensland Environmental Offsets Policy Significant Residual Impact Guideline.*
5. *Matter of National environmental significance (MNES) under the EPBC Act Environmental Offsets Policy (October 2012) and MSES under the Queensland Environmental Offset Policy (ESR/2015/1658), dated 5 July 2024.*
6. *To be advised upon submission of environmental authority (EA) application.*

H9	The impacts authorised in Condition H8 may be carried out in stages.
H10	All impacts to MSES must be determined, documented, and mapped by an appropriately qualified person.
H11	Records of impacts to MSES in condition H10 must be kept for the life of the environmental authority and include: a. the location, size and extent of impact; and b. details about the condition of the MSES (e.g., dominant vegetation and remnant status); and c. a determination of whether the impact is a significant residual impact based on the criteria in the *Queensland Environmental Offsets Policy – Significant Residual Impact Guideline, 2014*.
H12	**Environmental Offsets** An environmental offset must be made in accordance with the *Environmental Offsets Act 2014* and Queensland Environmental Offsets Policy (EPP/2015/1658) Version 1.16, dated 05/07/2024, for the maximum extent of impact to each prescribed environmental matter requiring an offset as listed in Table H1 – Authorised residual impacts to prescribed environmental matters. *Note: Deemed conditions provided in section 16 of the Environmental Offsets Act 2014 also apply to this authority. Any contravention of a deemed condition will be dealt with under the Environmental Protection Act 1994.*
H13	The environmental offset required by condition H12 can be delivered for each stage of impact.
H14	**Spatial records** Spatial records sufficient to demonstrate compliance with conditions H8 to H13 must be kept for the life of the environmental authority.
H15	**Fish passage/ Fish way** The holder of this environmental authority must provide upstream and downstream fish passage across the following waterway barriers: a. Tapplebang Dam (Water Supply Dam); and b. Tapplebang Creek crossing; and c. Coconut Creek crossings.
H16	The holder of this environmental authority must maintain the fish passages referred to in condition H15, in accordance with the approved plans, and the requirements of any conditions included in this environmental authority.
H17	The Tapplebang Dam on Tapplebang Creek, listed in Table A1 – Authorised activities and locations and Figure 1 – Authorised activities and locations must: a. incorporate a fish way, as defined by the *Fisheries Act 1994;* and b. incorporate design elements to minimise impacts on fish moving downstream; and c. be designed by, and constructed under the supervision of, an appropriately qualified person.
H18	The construction of Tapplebang Dam and other waterway barrier works permitted by the conditions of this environmental authority, must:

	a. maintain fish movement and connectivity throughout waterways and within and between fish habitats; and b. maintain the health and productivity of fisheries resources and fish habitat; and c. maintain the community's use of the area and access to fisheries resources; and d. provide adequate fish passage, including a fish way, if necessary; and e. avoid impacts or, where the matters of national and/or state environmental significance cannot be reasonably avoided, impacts are reasonably minimised and mitigated; and f. not result in a significant residual impact on a matter of national and/or state environmental significance unless the significant residual impact is acceptable, and an offset is provided.
H19	During the design of the Tapplebang Dam, Tapplebang Dam Fish Way, stream crossings and the development of the Fish Way Management Plan and Monitoring Program required by condition H20, the holder of this environmental authority must: a. assemble a fish way design team that includes an appropriately qualified person; and b. consult with the administering authority; and c. seek advice from the Queensland Department of Primary Industries (or its successor); and d. give due consideration to any comments made by the administering authority and/or the Queensland Department of Primary Industries (or its successor).
H20	A Fish Passage Management Plan and Monitoring Program must: a. be developed by an appropriately qualified person for the purpose of confirming the fish passage performance of the Tapplebang Dam, fish way and stream crossings. The program must, at a minimum, include the requirements included in *Appendix C: Preliminary Draft Fishway Management Plan and Monitoring Program* of *Appendix N – Tapplebang Dam Fishway Conceptual Design Report*, included in the Environmental Impact Statement (EIS) submitted to the Department of the Environment, Science, Tourism and Innovation on 16 January 2025; and b. involve the provision of inspection and monitoring reports to the administering authority and the Queensland Department of Primary Industries (or its successor) in accordance with the recommendations of the appropriately qualified person referred to in condition H20(a); and c. include an alert and action component, which will enable changes to be made to any deficiencies promptly and by no later than prior to the commencement of the following wet season; and d. be regularly reviewed and updated by an appropriately qualified person at intervals of no greater than five (5) years.
H21	Notwithstanding conditions I1 to I3 of this environmental authority, the construction of the Tapplebang Dam, Tapplebang Dam Fish Way and stream crossings must be physically overseen by an appropriately qualified person, and: a. a report must be prepared by the appropriately qualified person, confirming: i. how the construction was physically overseen; and ii. that the 'as constructed' dam, fish way and stream crossings complies with the design plans; and

	iii. that the 'as constructed' dam, fish way/and stream crossings will provide fish passage. b. the report must be submitted to the administering authority and the Queensland Department of Primary Industries (or its successor) twenty (20) business days of receipt of the report. The report must state the environmental authority number and this condition number under which the report is being given.
H22	In the event of fish stranding or entrapment: a. fish salvage must be undertaken generally in accordance with the Department of Primary Industries' factsheet 'Guidelines for fish salvage'; and b. submit written notice to the administering authority and the Queensland Department of Primary Industries (or its successor) as soon as reasonably practicable but no later than ten (10) business days at any time/s fish salvage* is undertaken. **at any time fish mortality is observed.*
H23	**Environmental Flows** The holder of this environmental authority must provide for the release of water from the Tapplebang Dam to the Tapplebang Creek, with the intent of simulating the natural flow in the Tapplebang Creek.
H24	The release of water from the Tapplebang Dam to the Tapplebang Creek, required by condition H23, must be sourced from surface-level quality waters only.
H25	When inflow/s (including groundwater supply base flows) to the Tapplebang Dam from Tapplebang Creek are less than or equal to 5.1 ML/d, the release of waters specified in condition H23 must maintain a volume of water that is, at least, the same as the inflow/s.
Schedule I—Structures	
I1	**Assessment of consequence category** The consequence category of any structure must be assessed by a suitably qualified and experienced person in accordance with the Manual for assessing consequence categories and hydraulic performance of structures (ESR/2016/1933) at the following times: a. prior to the design and construction of the structure; and/or b. prior to any change in its purpose or the nature of its stored contents.
I2	A consequence assessment report and certification must be prepared for each structure assessed and the report may include a consequence assessment for more than one structure.
I3	Certification must be provided by the suitably qualified and experienced person who undertook the assessment, in the form set out in the Manual for assessing consequence categories and hydraulic performance of structures (ESR/2016/1933.
I4	**Design and construction of a regulated structure** All regulated structures must be designed by, and constructed under the supervision of, a suitably qualified and experienced person in accordance with the requirements of the Manual for assessing consequence categories and hydraulic performance of structures (ESR/2016/19338).
I5	Construction of a regulated structure is prohibited unless: a. the holder has submitted a consequence category assessment report and certification to the administering authority; and

	b. certification for the design, design plan and the associated operating procedures has been certified by a suitably qualified and experienced person in compliance with the relevant condition of this authority.
I6	Certification must be provided by the suitably qualified and experienced person who oversees the preparation of the design plan in the form set out in the Manual for assessing consequence categories and hydraulic performance of structures (ESR/2016/1933),and must be recorded in the Register of Regulated Structures.
I7	Regulated structures must: a. be designed and constructed in compliance with the Manual for assessing consequence categories and hydraulic performance of structures (ESR/2016/1933); and b. be designed and constructed with due consideration given to ensuring that the design integrity would not be compromised on account of: i. floodwaters from entering the regulated dam from any watercourse or drainage line; and ii. wall failure due to erosion by floodwaters arising from any watercourse or drainage line.
I8	Certification by the suitably qualified and experienced person who supervises the construction must be submitted to the administering authority on the completion of construction of the regulated structure, and state that: a. the 'as constructed' drawings and specifications meet the original intent of the design plan for that regulated structure; and b. construction of the regulated structure is in accordance with the design plan.
I9	**Notification of affected persons** All affected persons must be provided with a copy of the emergency action plan in place for each regulated structure: a. prior to the operation of the new regulated structure; and b. if the emergency action plan is amended, within five (5) business days of it being amended.
I10	**Operation of a regulated structure** Operation of a regulated structure, is prohibited unless the holder has submitted to the administering authority in respect of regulated structure, all of the following: a. one paper copy and one electronic copy of the design plan and certification of the 'design plan' in accordance with condition I5 and b. a set of 'as constructed' drawings and specifications; and c. certification of the 'as constructed drawings and specifications' in accordance with condition I8; and d. where the regulated structure is to be managed as part of an integrated containment system for the purpose of sharing the DSA volume across the system, a copy of the certified system design plan; and e. the requirements of this authority relating to the construction of the regulated structure have been met; and f. the holder has entered the details required under this authority, into a Register of Regulated Structures; and g. there is a current operational plan for the regulated structure.

I11	Operation of any regulated structure, is prohibited unless: a. the details of the structure are listed in Table II1: Hydraulic Performance of Regulated Structures; and b. there is a current operational plan for the regulated structure.
I12	Each regulated structure must be maintained and operated, for the duration of its operational life until decommissioned and rehabilitated, in compliance with the current operational plan and, if applicable, the current design plan and associated certified 'as constructed' drawings.
I13	**Mandatory Reporting Level** Conditions I13 to I16 inclusive only apply to Regulated Structures which have not been certified as low consequence category for 'failure to contain – overtopping'.
I14	The Mandatory Reporting Level (the MRL) must be marked on a regulated dam in such a way that during routine inspections of that dam, it is clearly observable.
I15	The holder must, as soon as practicable but within forty-eight (48) hours of becoming aware, notify the administering authority when the level of the contents of a regulated dam reaches the MRL.
I16	The holder must, immediately on becoming aware that the MRL has been reached, act to prevent the occurrence of any unauthorised discharge from the regulated dam.
I17	The holder must record any changes to the MRL in the Register of Regulated Structures.
I18	**Design storage allowance** The holder must assess the performance of each regulated dam or linked containment system over the preceding November to May period based on actual observations of the available storage in each regulated dam or linked containment system taken prior to 1 July of each year.
I19	By 1 November of each year, storage capacity must be available in each regulated dam (or network of linked containment systems with a shared DSA volume), to meet the Design Storage Allowance (DSA) volume for the dam/s as listed in Table I1 - Hydraulic Performance of Regulated Structures.
I20	The holder must, as soon as practicable but within forty-eight (48) hours of becoming aware that the regulated dam (or network of linked containment systems) will not have the available storage to meet the DSA volume on 1 November of any year, notify the administering authority.
I21	The holder must, immediately on becoming aware that a regulated dam (or network of linked containment systems) will not have the available storage to meet the DSA volume on 1 November of any year, act to prevent the occurrence of any unauthorised discharge from the regulated dam or linked containment systems.
I22	**Annual inspection report** Each regulated structure must be inspected each calendar year by a suitably qualified and experienced person.
I23	At each annual inspection, the condition and adequacy of all components of the regulated structure must be assessed and a suitably qualified and experienced person must prepare an annual inspection report containing details of the assessment and include a recommendations section, with any recommended actions to ensure the integrity of the regulated structure or a positive statement that no recommendations are required.
I24	The suitably qualified and experienced person who prepared the annual inspection report must certify the report in accordance with the *Manual for assessing consequence categories and hydraulic performance of structures* (ESR/2016/193310).

<table>
<tr><td>I25</td><td>The holder must within twenty (20) business days of receipt of the annual inspection report, provide to the administering authority:
a. The recommendations section of the annual inspection report; and
b. If applicable, any actions being taken in response to those recommendations; and
c. If, following receipt of the recommendations and (if applicable) recommended actions, the administering authority requests a copy of the annual inspection report from the holder, provide this to the administering authority within ten (10) business days of receipt of the request.</td></tr>
<tr><td>I26</td><td>Transfer arrangements
The holder must provide a copy of any reports, documentation and certifications prepared under this authority, including but not limited to any Register of Regulated Structures, consequence assessment, design plan and other supporting documentation, to a new holder on transfer of this authority.</td></tr>
<tr><td>I27</td><td>Decommissioning
The holder of this environmental authority must submit a decommissioning plan to the administering authority prior to decommissioning any regulated structure that has been certified by a suitably qualified and experienced person.</td></tr>
<tr><td>I28</td><td>Hydraulic Performance of Regulated Structures
The holder of this environmental authority must comply with the hydraulic performance criteria specified in Table I1: Hydraulic Performance Criteria.
Table I1 – Regulated structures hydraulic performance criteria
<table>
<tr><th rowspan="2">Regulated structure</th><th rowspan="2">Consequence category</th><th colspan="3">Hydraulic performance criteria</th></tr>
<tr><th>Spillway Capacity</th><th>Design Storage Allowance (DSA)[1]</th><th>Mandatory Reporting Level (MRL)</th></tr>
<tr><td>Fines Containment Area (FCA)</td><td>Significant</td><td>1:1,000 AEP</td><td>TBA[2]</td><td>TBA[2]</td></tr>
<tr><td>TBA[2]</td><td>TBA[2]</td><td>TBA[2]</td><td>TBA[2]</td><td>TBA[2]</td></tr>
</table>
1. Must be achieved on 1 November of each year.
2. TBA upon application of site-specific environmental authority application.</td></tr>
<tr><td>I29</td><td>Each regulated structure listed in Table I1: Hydraulic Performance Criteria must:
a. meet the applicable hydraulic performance criteria listed in Table I1: Hydraulic Performance Criteria for that structure; and
b. have the Design Storage Allowance and Mandatory Reporting Level calculated in accordance with the Manual for assessing consequence categories and hydraulic performance of structures (ESR/2016/1933).</td></tr>
<tr><td>I30</td><td>The hydraulic performance criteria specified in this environmental authority are the minimum mandatory performance requirements, regulated structures must be managed in a manner that ensures compliance with all conditions of this environmental authority.</td></tr>
<tr><td colspan="2">Schedule J—Marine</td></tr>
</table>

J1	**Marine Works** Dredging is not authorised under this environmental authority.
J2	The holder of this environmental authority must not commence construction of any marine works unless the holder has submitted to the administering authority design drawings certified by a Registered Professional Engineer of Queensland.
J3	The design for the Load-out Jetty must provide a minimum of 40 percent (40%) light penetration on all relevant decking surfaces and include measures to address product loss to the environment in the design.
J4	The holder of this environmental authority must construct and maintain the marine works in accordance with the certified design drawings referred to in condition J2.
J5	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 marine works certifying that: a. the marine works (including any other associated works) have been constructed in accordance with the drawings referred to in condition J2 and b. the coastal works: i. are structurally adequate for the anticipated use; and ii. comply with all relevant codes including the administering authority's operational policy. *Note: This approval does not constitute a ruling on the structural safety of the coastal works. It is the responsibility of the holder of this environmental authority to ensure adequacy of the design, construction and ongoing maintenance of the works.*
J6	Marine works must be managed in accordance with a Marine Works Environmental Management Plan, which includes but is not limited to: a. identification of environmental issues and potential impacts to the marine environment, including but not limited to: i. maintenance schedules; and ii. stormwater management; and iii. erosion and sediment control measures; and iv. water, waste, noise, air and land disturbance; and b. the actual and potential release of all contaminants; and c. the potential impact of these sources and contaminants; and d. what actions will be taken to minimise the impacts on the receiving environment, including but not limited to: i. maintenance schedules which include consideration of marine turtle nesting and shorebird roosting and migrations; and ii. stormwater management; and iii. erosion and sediment control measures; and iv. water, waste, noise, air and land disturbance and controls; and

	e. monitoring of contaminant releases including contaminant release locations and conducting environmental impact assessments, if relevant; and f. contingency plans including the practices and procedures to be employed to restore the environment or to mitigate impacts on the receiving environment; and g. including emergency and notification procedures for emergency events, incidents to minimise the risk of environmental harm arising from emergency events; and h. organisational structure and responsibility; and i. effective communication; and j. staff training; and k. periodic review of environmental performance and continual improvement.
J7	This environmental authority does not authorise marine plant removal, destruction or damage and impacts associated with the construction of the Coastal Loading Facility and Load-out Jetty.
J8	All rock, stone, gravel, sand or other fill material used in construction of the Load-out Jetty must be: a. suitable for the purpose having regard to the location of the land and the proposed use of the land; and b. free from contaminants that may cause environmental harm.
J9	An Integrated Marine Monitoring Program (IMMP) must be developed by an appropriately qualified person and implemented by the environmental authority holder. The IMMP must include the monitoring and management of the following: a. marine water and sediment quality; and b. vessel wake waves and propeller wash; and c. marine benthic monitoring; and d. marine introduced pests.
J10	**Temporary works** The holder of this environmental authority must remove any debris, material or temporary marine works that fall, are placed or are developed on tidal lands or in tidal waters during the construction of the works.
J11	The holder of this authority must construct and maintain a defined pathway/track for the temporary jetty access to minimise disturbance to the adjacent beach, marine plants and fauna.
J12	**Pile driving and construction** Pile driving and construction activities at the Coastal Loading Facility and Load-out Jetty must be carried out in a manner that minimises adverse impacts on the surrounding environment and must include the following: a. all reasonable and practicable measures required to minimise the impact of construction activities on marine fauna and migratory shorebirds; and

	b. pile driving and construction of the Load-out Jetty must only take place during daylight hours; and c. soft-start approach to disperse of any marine fauna in the vicinity of proposed works; and d. only one (1) pile per day at the Load-out Jetty, at no more than 30 minutes of driving time per pile is authorised; and e. monitoring by an observer prior to commencing and during normal pile driving activities; and f. if turtles, dugongs or cetaceans are observed within a 100m exclusion zone around the marine works, normal pile driving operations must not commence or, if commenced, must cease and must not commence or resume until the observed fauna leave the exclusion zone and/or have not been sighted for a minimum continuous period of fifteen (15) minutes.
J13	An appropriately qualified spotter-catcher/s must be present during pile driving and construction activities at the Coastal Loading Facility and Load-out Jetty to identify and minimise impacts to marine fauna and migratory shorebirds. *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.*
J14	Daily monitoring for impacted turtles and marine species must be undertaken at the location of pile driving and construction activities at the shoreline down-current from the construction site.
J15	The holder of this environmental authority must notify the administering authority within twenty-four (24) hours of becoming aware of injury or mortality to any marine species and/or migratory shorebirds of conservation significance.
J16	**Marine transport** For all vessels within the first 1.6km of the transhipment route, the adjacent estuaries, inside the ring of reefs and around the Coastal Loading Facility and Load-out Jetty, to reduce the risk of vessel strike; the holder of this environmental authority must implement the following restrictions: a. a slow-speed zone (2 knots); and b. vessel movement controls associated with the construction and operational phases of the project which comply with marine mammal management measures stipulated in the Nature Conservation (Animals) Regulation 2020; and c. implement the no approach zone and caution zone limits for whales, dugongs and dolphins, including not operating a vessel at a speed of more than two (2) knots, as per the *National Strategy for Reducing Vessel Strike on Cetaceans and other Marine Mega-fauna*.
J17	Once the transhipment vessel, or other 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 Coastal Loading Facility and Load-out Jetty.
J18	Only two (2) transhipment vessel transfers per day are authorised.
J19	**Light impacts** An Artificial Light Management Plan (ALMP) detailing the application of best practice lighting design principles (including other recent peer reviewed literature) and mitigation measures to eliminate or minimise project related lighting impacts to marine turtles, seabirds, and migratory shorebird species must be developed by an appropriately qualified person and implemented.

J20	Lighting that is not considered best practice lighting design, as specified in the most recent version of the National Light Pollution Guidelines for Wildlife must not be used at the Coastal Loading Facility (CLF), Load-out Jetty or the seaborne access location associated with the transhipping activity.
J21	Lights must be positioned away from nocturnal foraging and roost habitat for migratory seabirds and sea turtle nesting beaches, unless otherwise required for the safe operation of vehicle and plant.
J22	**Monitoring** Daily monitoring for impacted turtles by artificial light sources must be undertaken by an appropriately qualified person at, and adjacent to the shoreline and for a length of 500m either side of the Load-out Jetty and the Coastal Loading Facility (CLF).
J23	If monitoring required by condition J22 indicates that turtles are impacted through change in directional movement and/or behaviour as a result of a direct light source, an investigation must be carried out by an appropriately qualified person and relevant preventative actions implemented.
J24	In the event of a complaint about light emissions from the 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.
J25	**Operation of the coastal loading facility** The holder of this environmental authority must develop and implement an operating procedure for the Coastal Loading Facility and Load-out Jetty, including how materials are handled and transported, which must include, but not be limited to: a. the completion of periodic inspections of the mining lease where mining activities are carried out including all structures, plant, equipment and trafficked surfaces to identify and remove or stabilise exposed bulk materials that may be mobilised by wind, water or equipment movement and have the potential to impact sensitive receptors; and b. an ongoing cleaning and maintenance schedule to minimise any potential release of bulk materials and to ensure there is no accumulation of bulk materials over time in areas where it may be mobilised and have the potential to impact sensitive receptors; and c. placement of any removed materials in a designated storage area; and d. periodic review of the management and operation of bulk materials storage and handling activities including identification of options for continuous improvement; and e. a hazardous and non-hazardous materials handling procedure, including emergency spill response procedure that will apply to the use of all hazardous and non-hazardous materials in the vicinity of the Coastal Loading Facility (CLF).
J26	**Materials handling and management** Transfer of materials to ships at the Coastal Loading Facility must be carried out in a manner that minimises the likelihood of any release of product bauxite or bulk materials to the atmosphere or waters.
J27	Storage and handling of product bauxite must be carried out in a manner which minimises the release of dust and particulate matter, prevents or minimises the contamination of land, stormwater, coastal and marine environments.

J28	**Acid sulfate soils** Treatment and management of acid sulfate soils must comply with the latest edition of the *Queensland Acid Sulfate Soil Technical Manual, Soil Management Guidelines*.
J29	Spoil, including that from construction of the Load-out Jetty must not be disposed of on tidal lands or within waterways and must be managed to prevent acid soil development.
J30	Certification from an appropriately qualified person on acid sulfate soil must be sought, confirming that the affected soil has been neutralised or contained in accordance with the latest edition of the most recent version of the Queensland acid sulfate soil technical manual.

Schedule K—Definitions

Where a word or phrase in this document is defined in this schedule or within the document, it has its corresponding meaning. Where a word or phrase in this document is not defined in this schedule, it has the meaning given to it in (in order of priority):

- the *Environmental Protection Act 1994* (EP Act), its regulations or its environmental protection policies;
- the *Acts Interpretation Act 1954*;
- the Macquarie Dictionary (taking account of the context in which the word or phrase is used in this document).

For example, environmental value, environmental harm, environmental nuisance, material environmental harm, serious environmental harm and relevant act are defined in the EP Act and groundwater is defined in the Environmental Protection Regulation 2019.

Defined words or phrases in the singular include the plural and vice versa.

Activity means the environmentally relevant activities to which the environmental authority relates.

Adverse impacts on marine animals includes:

• masking social communications used to find mates or identify predators;

• temporary and permanent hearing loss or impairment;

• displacement from preferred habitat;

• disruption of feeding, breeding, nursing, and communication;

• strandings;

• death and serious injury from haemorrhaging and tissue trauma.

Affected person/s has the meaning in section 38 of *Environmental Protection Act 1994.* For the purposes of this environmental authority, affected person/s also includes but is not limited to the following:

(a) Aurukun Shire Council; and

(b) Ngan Aak-Kunch Aboriginal Corporation Registered Native Title Body Corporate (RNTBC) Directors and Contact Person; and

(c) Adjacent downstream landholders.

Note: Ngan Aak-Kunch Aboriginal Corporation RNTBC *are the owners of Lot 211 SP241404 (inclusive of the Mine Site) in accordance with section 39 of the Aboriginal Land Act 1991 (Qld) and is the prescribed body corporate for the native title holders being the Wik and Wik Way peoples.*

Affected person in relation to a dam includes someone whose drinking water can potentially be impacted as a result of discharges from a dam or their life or property can be put at risk due to dwellings or workplaces being in the path of a dam break flood.

Ambient in relation to air quality means the immediate and extended surroundings of the activity or receiving environment.

Animal breeding place has the meaning in Schedule 7 of the Nature Conservation (Animals) Regulation 2020.

Annual exceedance probability or AEP is the probability that at least one event in excess of a particular magnitude will occur in any given year.

Annual inspection report means an assessment prepared by a suitably qualified and experienced person containing details of the assessment against the most recent consequence assessment report and design plan (or system design plan);

(a) against recommendations contained in previous annual inspections reports;

(b) against recognised dam safety deficiency indicators;

(c) for changes in circumstances potentially leading to a change in consequence category;

(d) for conformance with the conditions of this authority;

(e) for conformance with the 'as constructed' drawings;

(f) for the adequacy of the available storage in each regulated dam, based on an actual observation or observations taken after 31 May each year but prior to 1 November of that year, of accumulated sediment, state of the containment barrier and the level of liquids in the dam (or network of linked containment systems);

(g) for evidence of conformance with the current operational plan.

ANZG 2020 means ANZG 2020; Australian and New Zealand Guidelines for Fresh and Marine Water Quality. This is available at https://www.waterquality.gov.au/anz-guidelines.

Appropriately qualified person (AQP) 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 relating to the subject matter using the relevant protocols, standards, methods or literature.

Approved species management program has the meaning in Part 6, section 335(4) of the Nature Conservation (Animals) Regulation 2020.

Assessed or assessment by a suitably qualified and experienced person in relation to a consequence 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 of the assessment:

(a) exactly what has been assessed and the precise nature of that determination;

(b) the relevant legislative, regulatory and technical criteria on which the assessment has been based;

(c) 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

(d) the reasoning on which the assessment has been based using the relevant data and facts, and the relevant criteria.

Associated works in relation to a dam, means:

(a) operations of any kind and all things constructed, erected or installed for that dam; and

(b) any land used for those operations.

Background, with reference to the water schedule, means the average of samples taken prior to the commencement of mining from the same waterway that the current sample has been taken.

Certified, with respect to:

a) watercourse diversions, means assessed and approved by a suitably qualified and experienced person.

b) 'as constructed' drawings and specifications, the certification must be by the suitably qualified person who supervised the construction of the watercourse diversion, or re-establishment of the watercourse.

Certification means assessment and approval must be undertaken by a suitably qualified and experienced person in relation to any assessment or documentation required by this Manual, including design plans, 'as constructed' drawings and specifications, construction, operation or an annual report regarding regulated structures, undertaken in accordance with the Board of Professional Engineers of Queensland Policy Certification by RPEQs (ID: 1.4 (2A)).

Certifying, certify or certified have a corresponding meaning as 'certification'.

Chemical means:

a) an agricultural chemical product or veterinary chemical product within the meaning of the Agricultural and Veterinary Chemicals Code Act 1994 (Commonwealth), or

b) a dangerous good under the Australian Code for the Transport of Dangerous Goods by Road and Rail approved by the Australian Transport Council, or

c) a lead hazardous substance within the meaning of the Workplace Health and Safety Regulation 1997, or

d) a drug or poison in the Standard for the Uniform Scheduling of Drugs and Poisons prepared by the Australian Health Ministers' Advisory Council and published by the Commonwealth, or

e) any substance used as, or intended for use as:

i) a pesticide, insecticide, fungicide, herbicide, rodenticide, nematocide, miticide, fumigant or related product, or

ii) a surface-active agent, including, for example, soap or related detergent, or

iii) a paint solvent, pigment, dye, printing ink, industrial polish, adhesive, sealant, food additive, bleach, sanitiser, disinfectant, or biocide, or

iv) a fertiliser for agricultural, horticultural or garden use, or

v) a substance used for, or intended for use for mineral processing or treatment of metal, pulp and paper, textile, timber, water or wastewater, or

vi) manufacture of plastic or synthetic rubber.

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 the purpose of preparing a design plan.

Construction or **constructed,** in relation to:

- a regulated structure, includes building a new regulated structure and lifting or otherwise modifying an existing regulated structure, but does not include investigations and testing necessary for the purpose of preparing a design plan.
- in relation to watercourse diversions, is the process of building, or modifying an existing diversion, but does not include investigations and testing necessary for the purpose of preparing a design plan.

Commercial place means a workplace used as an office or for business or commercial purposes, which is not part of the activity and does not include employees' accommodation or public roads.

Compliance bore refers to a groundwater monitoring bore which is the subject of

compliance requirements for groundwater quality and/or level.

Consequence in relation to a structure as defined, means the potential for environmental harm resulting from the collapse or failure of the structure to perform its primary purpose of containing, diverting or controlling flowable substances.

Consequence 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 Manual for assessing consequence categories and hydraulic performance of structures (ESR/2016/1933).

Dam means a land-based structure or a void that contains, diverts or controls flowable substances, and includes any substances that are thereby contained, diverted or controlled by that land-based structure or void and associated works.

Dam crest volume means the volume of material (liquids and/or solids) that could be within the walls of a dam at any time when the upper level of that material is at the crest level of that dam. That is, the instantaneous maximum volume within the walls, without regard to flows entering or leaving (for example, via spillway).

Design plan is a document setting out how all identified consequence scenarios are addressed in the planned design and operation of a regulated structure.

Design storage allowance or DSA means an available volume, estimated in accordance with the Manual for assessing consequence categories and hydraulic performance of structures (ESR/2016/1933) published by the administering authority, must be provided in a dam as at 1 November each year in order to prevent a discharge from that dam to an annual exceedance probability (AEP) specified in that Manual.

Designer for the purposes of a regulated dam, means the certifier of the design plan for the regulated dam.

Disturbance (or **disturbed**) of land includes:

a) compacting, removing, covering, exposing or stockpiling of earth;
b) removal or destruction of vegetation or topsoil or both to an extent where the land has been made susceptible to erosion;
c) carrying out mining within a watercourse, waterway, wetland or lake;
d) the submersion of areas by tailings or hazardous contaminant storage and dam/structure walls;
e) temporary infrastructure, including any infrastructure (roads, tracks, bridges, culverts, dam/structures, bores, buildings, fixed machinery, hardstand areas, airstrips, helipads etc) which is to be removed after the activity has ceased;
f) releasing of contaminants into the soil, or underlying geological strata.

However, the following areas are not included when calculating areas of 'disturbance':

a) areas off lease (e.g. roads or tracks which provide access to the mining lease);
b) areas previously disturbed which have achieved the rehabilitation outcomes;
c) by agreement with the administering authority, areas previously disturbed which have not achieved the rehabilitation objective(s) due to circumstances beyond the control of the mine operator (such as climatic conditions);
d) areas under permanent infrastructure. Permanent infrastructure includes any infrastructure (roads, tracks, bridges, culverts, dam/structures, bores, buildings, fixed machinery, hardstand areas, airstrips, helipads etc) which is to be left by agreement

with the landowner;

e) disturbance that pre-existed the grant of the tenure.

Effluent means treated wastewater released from sewage treatment plants.

Emergency action plan means documentation forming part of the operational plan held by the holder or a nominated responsible officer, that identifies emergency conditions that sets out procedures and actions that will be followed and taken by the dam owner and operating personnel in the event of an emergency. The actions are to minimise the risk and consequences of failure, and ensure timely warning to affected persons and the implementation of protection measures. The plan must require dam owners to annually review and update contact information where required.

Environmental offset has the meaning in section 7 of the *Environmental Offsets Act 2014*.

Fish passage means fish access to, or movement within, a waterway.

Fish way has the meaning in Schedule 1 of the *Fisheries Act 1994*.

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.

Holder, for a mining tenement, means a holder of the tenement under the *Mineral Resources Act 1989*, and the holder of the associated environmental authority under the *Environmental Protection Act 1994*.

Hydraulic performance means the capacity of a regulated dam to contain or safely pass flowable substances based on the design criteria specified for the relevant consequence category in the Manual for assessing consequence categories and hydraulic performance of structures (ESR/2016/1933).

Hydrogeological unit is any soil or rock unit or zone that by virtue of its hydraulic properties has a distinct influence on the storage or movement of groundwater.

Infrastructure means water storage dams, levees, roads and tracks, buildings and other structures built for the purpose of the activity.

Interpretation bore means a monitoring bore located outside of any potential influence or impact by the activity, that is used for comparative and interpretative purposes and represents natural background quality and levels similar to the hydrogeological units of the compliance bores.

Land means land excluding waters and the atmosphere, that is, the term has a different meaning from the term as defined in the *Environmental Protection Act 1994.* For the purposes of the *Acts Interpretation Act 1954,* it is expressly noted that the term 'land' in this environmental authority relates to physical land and not to interests in land.

Levee means an embankment that only provides 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.

Licensed place means the mining activities carried out at the mining tenements detailed in <INSERT Table reference> of this environmental authority.

Low consequence dam means any dam that is not a high or significant consequence

category as assessed using the Manual for assessing consequence categories and hydraulic performance of structures (ESR/2016/1933).

m means metres.

Mandatory reporting level or MRL means a warning and reporting level determined in accordance with the criteria in the Manual for assessing consequence categories and hydraulic performance of structures (ESR/2016/1933) published by the administering authority.

Manual means the Manual for assessing consequence categories and hydraulic performance of structures (ESR/2016/1933) published by the administering authority, as amended from time to time.

Maximum extent of impact means the total, cumulative, residual extent and duration of impact to a prescribed environmental matter that will occur over a project's life after all reasonable avoidance and reasonable on-site mitigation measures have been, or will be, undertaken.

Minimise is to reduce to the smallest possible amount or degree.

Modification or modifying (see definition of 'construction')

Monitoring bore means a groundwater bore that provides access to groundwater for measuring its quality and level; and allows groundwater samples to be withdrawn for laboratory analysis.

NATA means National Association of Testing Authorities, Australia.

Native title party is defined under section 34 of the *Aboriginal Cultural Heritage Act 2003*.

Natural flow means the flow of water through waters caused by nature.

Operational plan includes:

(a) normal operating procedures and rules (including clear documentation and definition of process inputs in the DSA);

(b) contingency and emergency action plans including operating procedures designed to avoid and/or minimise environmental impacts including threats to human life resulting from any overtopping or loss of structural integrity of the regulated structure.

Register of Regulated Structures includes:

(a) Date of entry in the register;

(b) Name of the structure, its purpose and intended/actual contents;

(c) The consequence category of the dam as assessed using the Manual for assessing consequence categories and hydraulic performance of structures (ESR/2016/1933);

(d) Dates, names, and reference for the design plan plus dates, names, and reference numbers of all document(s) lodged as part of a design plan for the dam;

(e) Name and qualifications of the suitably qualified and experienced person who certified the design plan and 'as constructed' drawings;

(f) For the regulated dam, other than in relation to any levees –

i. The dimensions (metres) and surface area (hectares) of the dam measured at the footprint of the dam;

ii. Coordinates (latitude and longitude in GDA2020) within five metres at any point from the outside of the dam including its storage area

iii. Dam crest volume (megalitres);

iv. Spillway crest level (metres AHD).

v. Maximum operating level (metres AHD);

vi. Storage rating table of stored volume versus level (metres AHD);

vii. Design storage allowance (megalitres) and associated level of the dam (metres AHD);

viii. Mandatory reporting level (metres AHD);

(g) The design plan title and reference relevant to the dam;

(h) The date construction was certified as compliant with the design plan;

(i) The name and details of the suitably qualified and experienced person who certified that the constructed dam was compliant with the design plan;

(j) Details of the composition and construction of any liner;

(k) The system for the detection of any leakage through the floor and sides of the dam;

(l) Dates when the regulated dam underwent an annual inspection for structural and operational adequacy, and to ascertain the available storage volume for 1 November of any year;

(m) Dates when recommendations and actions arising from the annual inspection were provided to the administering authority;

(n) Dam water quality as obtained from any monitoring required under this authority as at 1 November of each year.

Point source emissions means emissions to air from a stationary source that are exhausted into a vent (excluding roof vents) or stack and are emitted through a single point source into the atmosphere. The term excludes fugitive emissions, emissions from ventilation shafts and steam vents and transportable point sources such as pumps and generators.

Prescribed environmental matters has the meaning in section 10 of the Environmental Offsets Act 2014, limited to the matters of State environmental significant listed in schedule 2 of the *Environmental Offsets Regulation 2014*.

Protected area means – a protected area under the Nature Conservation Act 1992, or

a) a marine park under the *Marine Parks Act 1992*, or

b) a World Heritage Area.

Receiving environment in relation to an activity that causes or may cause environmental harm, means the part of the environment to which the harm is, or may be, caused. The receiving environment includes (but is not limited to):

a) a watercourse

b) groundwater

c) an area of land that is not specified in Schedule A – Table A1 (Authorised Activities) of this environmental authority.

The term does not include land that is specified in Schedule A – Table A1 (Authorised Activities) of this environmental authority.

Receiving waters means the waters into which this environmental authority authorises releases of contaminated water.

Regulated structure means any structure in the significant or high consequence category as assessed using the Manual for assessing consequence categories and hydraulic performance

of structures (ESR/2016/1933) published by the administering authority. A regulated structure does not include:

• a fabricated or manufactured tank or container, designed and constructed to an Australian Standard that deals with strength and structural integrity of that tank or container;

• a sump or earthen pit used to store residual drilling material and drilling fluid only for the duration of drilling and well completion activities;

• a flare pit.

Release event means a surface water discharge from contaminated water storages or contaminated areas on the licensed place.

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.

RL means reduced level, relative to mean sea level as distinct from depths to water.

Residual drilling material means waste drilling materials including muds and cuttings or cement returns from well holes and which have been left behind after the drilling fluids are pumped out.

Resources of value means any resource located within the project's clearing footprint that may be of use to the Native Title Holder, including but not limited to, timber resources, seeds, medicinal plants, sugar bag, scar trees and/or hollows.

Self-sustaining means not requiring on-going intervention and maintenance to maintain functional riverine processes and characteristics.

Sensitive place includes the following and includes a place within the curtilage of such a place reasonably used by persons at that place:

a) a dwelling, residential allotment, mobile home or caravan park, residential marina or other residential premises; or

b) a motel, hotel or hostel; or

c) a kindergarten, school, university or other educational institution; or

d) a medical centre or hospital; or

e) a protected area under the *Nature Conservation Act 1992*, the *Marine Parks Act 2004* or a World Heritage Area; or

f) a public park or garden; or

g) for noise, a place defined as a sensitive receptor for the purposes of the Environmental Protection (Noise) Policy 2019.

Significant residual impact has the meaning in section 8 *Environmental Offsets Act 2014*.

Spillway means a weir, channel, conduit, tunnel, gate or other structure designed to permit discharges form the dam, normally under flood conditions or in anticipation of flood conditions.

Strategic environmental areas has the meaning in section 11(1) of the *Regional Planning Interest Act 2014*.

Structure means dam or levee.

Substantial low frequency noise means a noise emission that has an unbalanced frequency spectrum shown in a one-third octave band measurements, with a predominant component within the frequency range 10 to 200 Hz. It includes any noise emission likely to cause an

overall sound pressure level at a noise sensitive place exceeding 55 dB(Z).

Suitably qualified and experienced person in relation to regulated structures means a person who is a Registered Professional Engineer of Queensland (RPEQ) under the provisions of the *Professional Engineers Act 2002*, and has demonstrated competency and relevant experience:

• for regulated dams, an RPEQ who is a civil engineer with the required qualifications in dam safety and dam design

• for regulated levees, an RPEQ who is a civil engineer with the required qualifications in the design of flood protection embankments.

Note: It is permissible that a suitably qualified and experienced person obtain subsidiary certification from an RPEQ who has demonstrated competence and relevant experience in either geomechanics, hydraulic design or engineering hydrology.

System design plan means a plan that manages an integrated containment system that shares the required DSA and/or ESS volume across the integrated containment system.

Temporary watercourse diversion is as defined in Definitions, within the Guideline: Works that interfere with water in a watercourse for a resource activity— watercourse diversions authorised under the Water Act 2000 (OSW/2019/4599 Version 2.00 05/02/2019) or subsequent versions.

The Act means the *Environmental Protection Act 1994*.

µS/cm means micro siemens per centimetre.

Void means any constructed, open excavation in the ground.

Water is defined under Schedule 4 of the *Water Act 2000*.

Watercourse has the meaning in Schedule 4 of the *Environmental Protection Act 1994* and means:

1) a river, creek or stream in which water flows permanently or intermittently—

(a) in a natural channel, whether artificially improved or not; or

(b) in an artificial channel that has changed the course of the watercourse.

2) Watercourse includes the bed and banks and any other element of a river, creek or stream confining or containing water.

Waters includes all or any part of a creek, river, stream, lake, lagoon, swamp, wetland, unconfined surface water, unconfined water in natural or artificial watercourses, bed, and bank of any waters, non-tidal or tidal waters (including sea), stormwater channel, stormwater drain, roadside gutter, stormwater run-off, water confined in natural or artificial structures and underground water (or groundwater).

WaTERS Water Tracking and Electronic Reporting System or subsequent updated system, used to submit monitoring data and notify the Queensland Government. It is available at www.waters.des.qld.gov.au or by contacting psd.help@qld.gov.au.

Watercourse has the same meaning given in the *Water Act 2000*.

Water quality means the chemical, physical and biological condition of water.

Water Quality objective (WQO) - A numerical concentration limit or narrative statement that has been established to support and protect the designated uses of water at a specified site. It is based on scientific criteria or water quality guidelines but may be modified by other inputs such as social, cultural or economic constraints. WQOs are specified in the EPP Water

and Wetland Biodiversity (Part 4, Section 11).

Wet season means the time of year, covering one or more months, when most of the average annual rainfall in a region occurs. For the purposes of DSA determination this time of year is deemed to extend from 1 November in one year to 31 May in the following year inclusive.

Schedule L—Figures

Figure 1 – Authorised activities and locations

Source: EIS – Project Description (Figure 4-2 Aurukun Bauxite Project Revised Conceptual Layout)

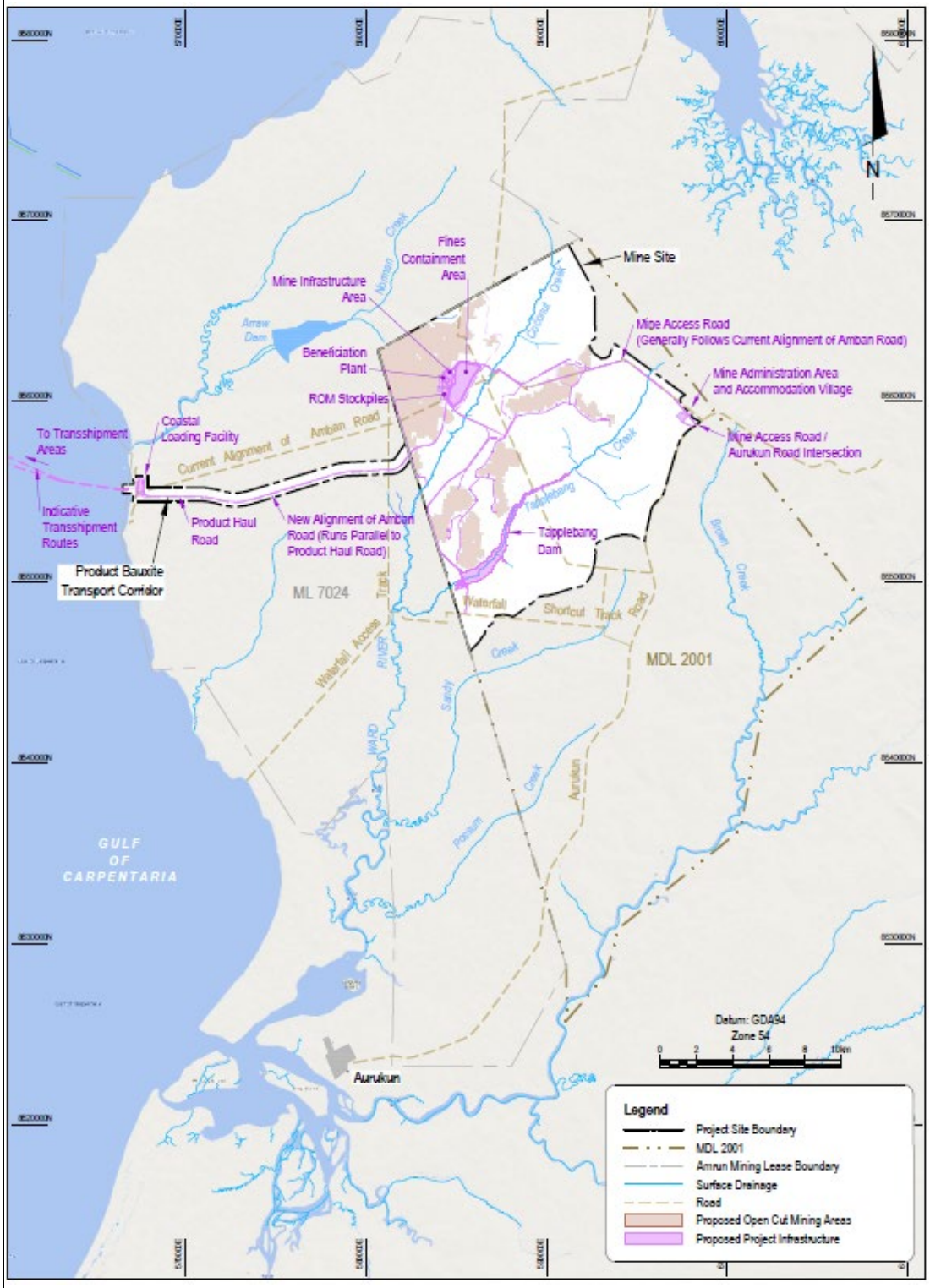

Figure 2 – Groundwater Monitoring Bore Locations

To be updated upon submission of environmental authority (EA) application.

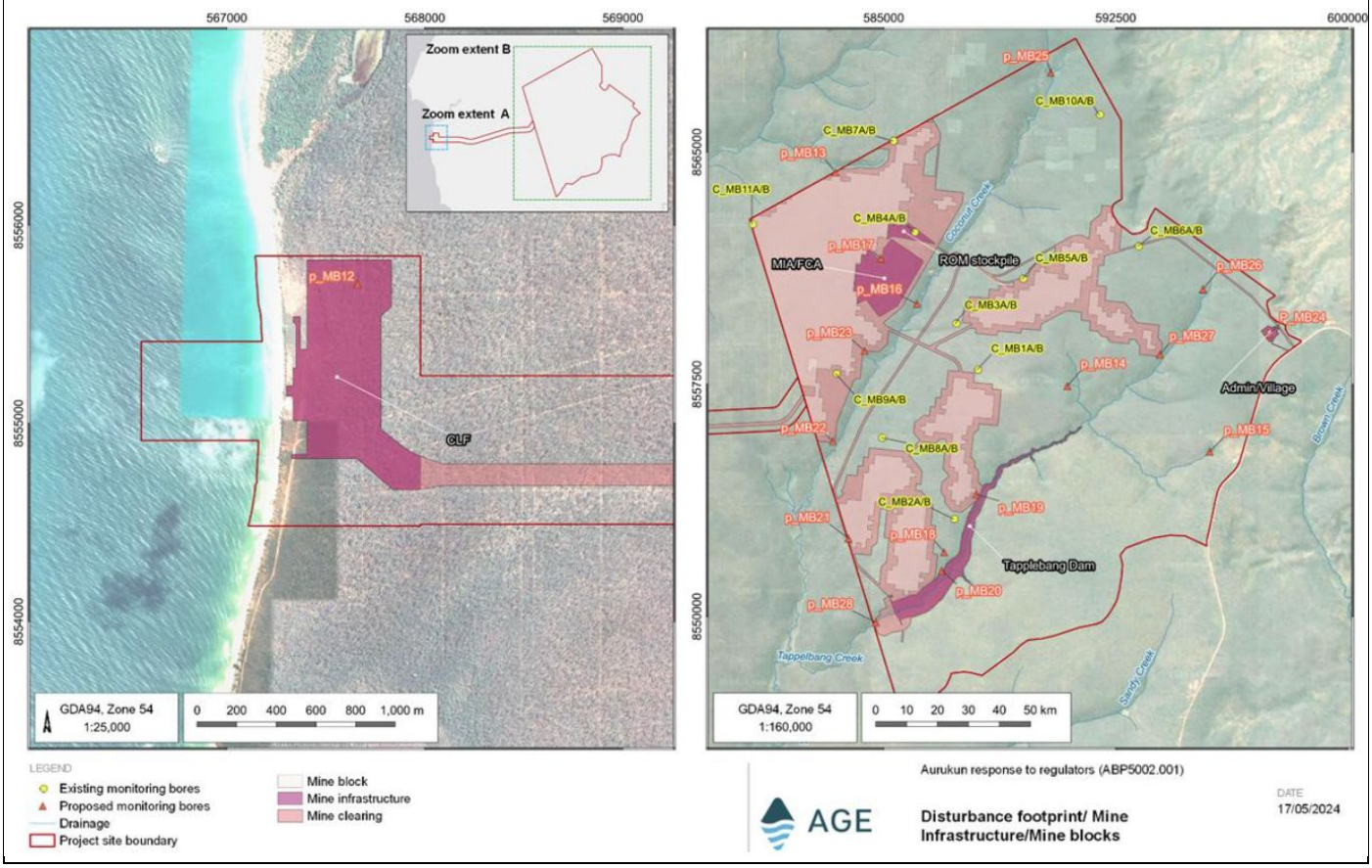

Figure 3 – Groundwater Dependent Ecosystems Locations

To be updated upon submission of environmental authority (EA) application.

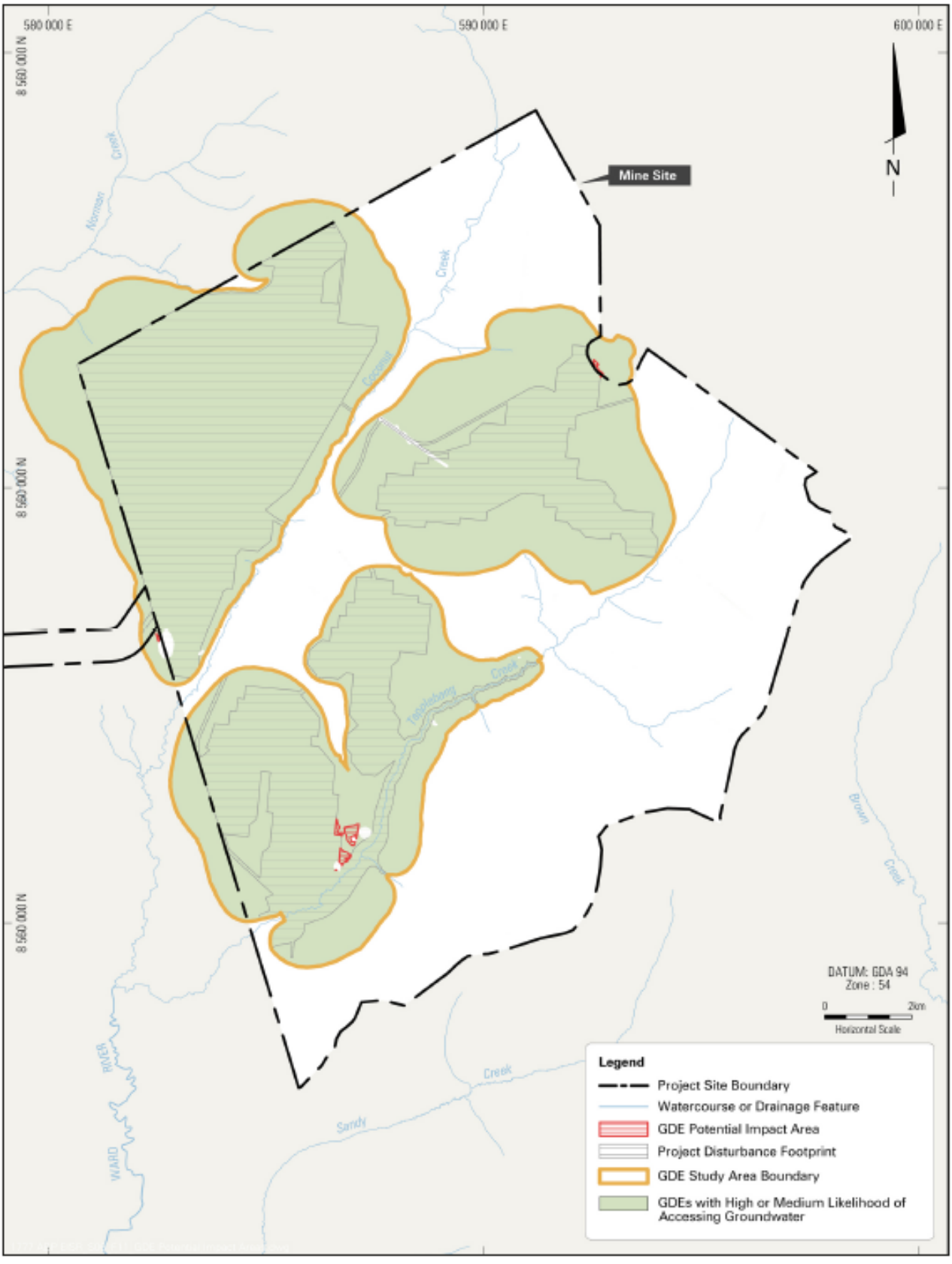

Figure 4 – Contaminated water release points

To be updated upon submission of environmental authority (EA) application.

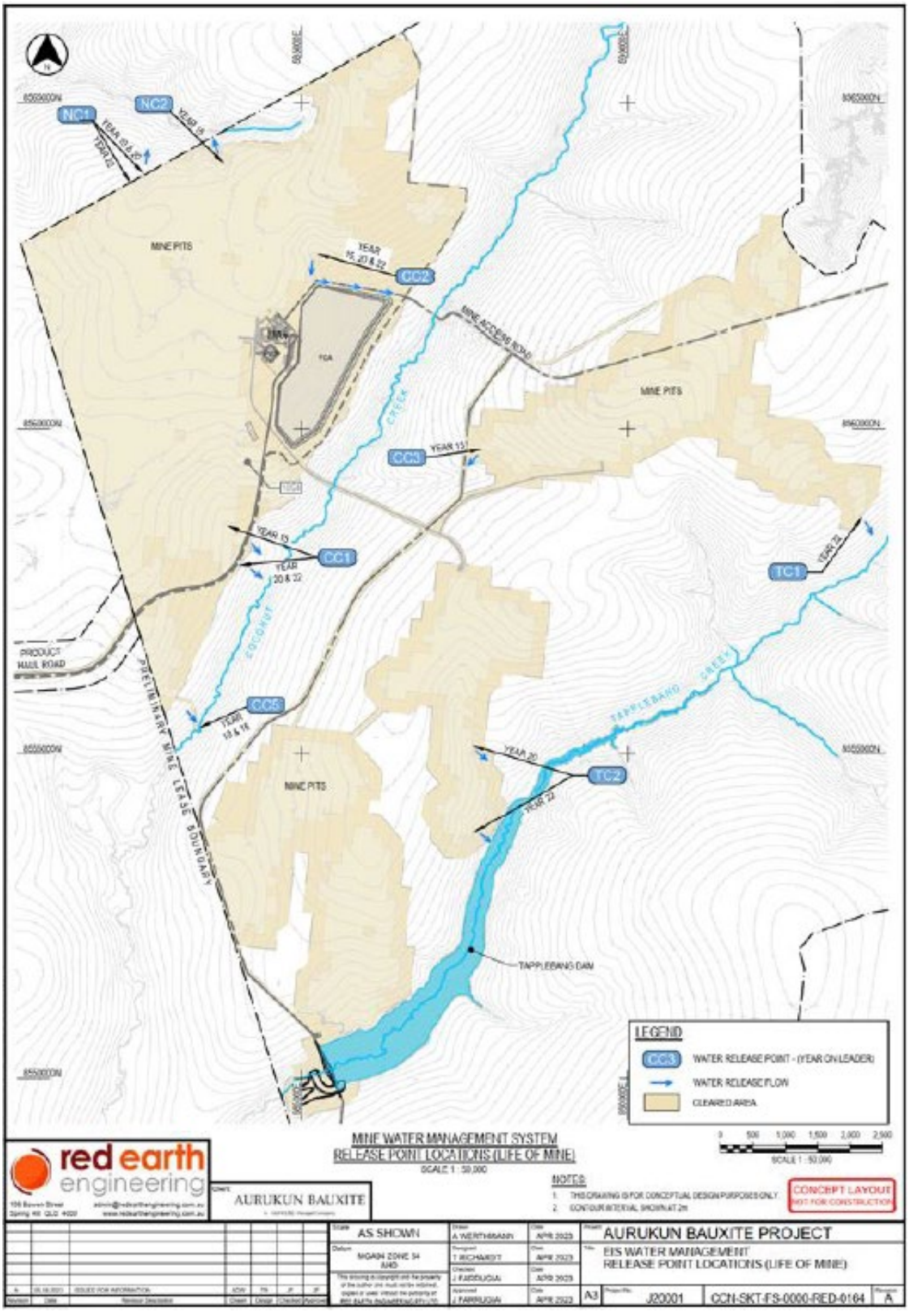

Figure 5 – Receiving water upstream background sites and downstream monitoring points

To be updated upon submission of environmental authority (EA) application.

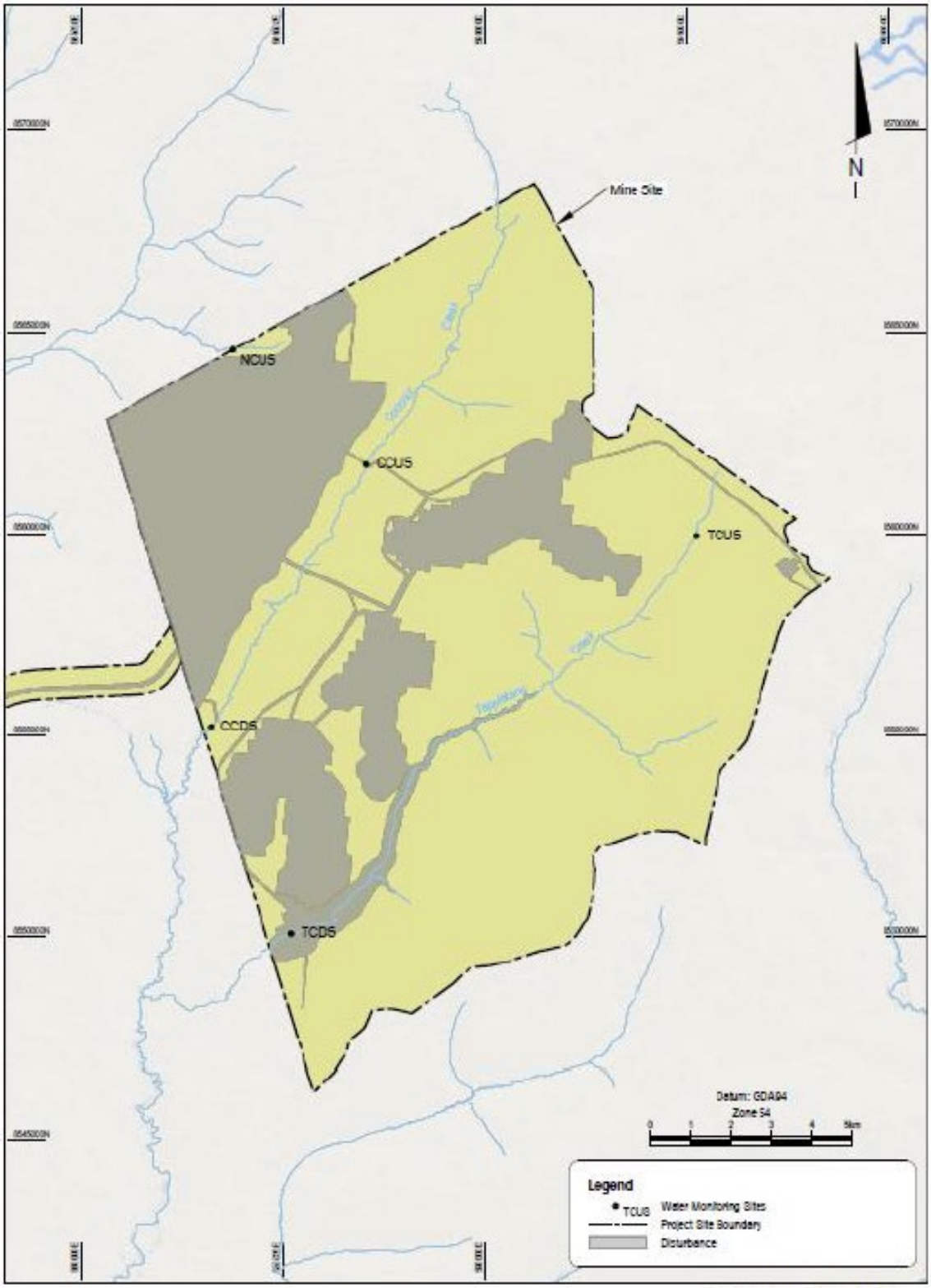

Figure 6 – Significant residual impacts to prescribed environmental matters

To be included upon submission of environmental authority (EA) application.

Appendices

Appendix A

Detailed Coordinates – Significant residual impacts to prescribed environmental matters

Regulated vegetation						Wetlands and watercourses		Protected wildlife habitat						Waterways providing for fish passage	
RE 3.3.20b		RE 3.3.9a		RE 3.3.9b		Tapplebang Creek		Southern palm cockatoo (*Probosciger aterrimus macgillivrayi*)		Red goshawk (*Erythrotriorchis radiatus*)		Masked owl (*Tyto novaehollandiae Kimberli*)		Tapplebang Creek	
Easting (GDA94 MGA54)	Northing (GDA94 MGA54)	Easting (GDA94 MGA54)	Northing (GDA94 MGA54)	Easting (GDA94 MGA54)	Northing (GDA94 MGA54)	Easting (GDA94 MGA54)	Northing (GDA94 MGA54)	Easting (GDA94 MGA54)	Northing (GDA94 MGA54)	Easting (GDA94 MGA54)	Northing (GDA94 MGA54)	Easting (GDA94 MGA54)	Northing (GDA94 MGA54)	Easting (GDA94 MGA54)	Northing (GDA94 MGA54)
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1. *To be advised upon submission of environmental authority (EA) application.*

END OF ENVIRONMENTAL AUTHORITY

Appendix B—Draft Progressive Rehabilitation Closure Plan schedule and conditions

The Draft PRCP schedule incorporates the following sections:

- Section A - Conditions of PRCP schedule
- Section B - Final site design and reference maps
- Section C - Post mining land uses
- Section D - Definitions

Section A - Conditions of PRCP schedule

Pursuant to section 206A of the *Environmental Protection Act 1994* (EP Act):

- it is a condition of this PRCP schedule that, in carrying out a relevant activity under the schedule, the holder must comply with a requirement stated in the environmental authority relevant to carrying out the activity; and
- it is a condition of this PRCP schedule that the holder must comply with the following matters stated in the schedule:

  (a) each rehabilitation milestone; and

  (b) when each rehabilitation milestone is to be achieved.

General conditions

PRCP1 All mining disturbance authorised under <insert EA number> must have an associated rehabilitation area provided in this PRCP schedule.

PRCP2 The holder must for each rehabilitation area, achieve the corresponding rehabilitation criterion (milestone reference):

(a) for the cumulative area available specified in this schedule; and

(b) by the milestone completion date specified in this schedule.

PRCP3 Where land becomes 'available for rehabilitation' earlier than the date nominated in this schedule, the holder must:

(a) notify the administering authority in writing within 30 days of the land becoming 'available for rehabilitation'. The written notification must include precise details of the relevant land area and the date when that land became 'available for rehabilitation'; and

(b) unless otherwise agreed to by the administrating authority in writing, within 90 days of the land becoming 'available for rehabilitation', apply to the administering authority to amend this schedule in a way that maximises the

progressive rehabilitation of the land to a stable condition, including bring forward achievement of relevant milestones and criteria.

Note: reference to 'earlier than the date nominated in the schedule' means a date that is greater than 1 year prior to the date nominated in the schedule.

PRCP4 Where an area achieves a rehabilitation milestone, the holder must continue to achieve the milestone criteria until a surrender for the area is approved.

PRCP5 Following commencing land disturbance under <Insert version VX>, the holder must maintain a risk register that identifies the risks to not achieving:

(a) a stable condition for post-mining land uses; and

(b) how the risks are being managed or minimised.

PRCP6 The risk register must be reviewed annually and include consideration of the outcomes of PRCP monitoring data.

PRCP7 The holder must carry out monitoring in accordance with:

(a) the monitoring and maintenance program described in the rehabilitation planning part for the activity <Insert version VX>; and

(b) any requirement under this schedule; and

(c) as necessary to demonstrate achievement of each rehabilitation milestone criteria.

Where there is any inconsistency between this schedule and the rehabilitation planning part the schedule criteria prevail to the extent of the inconsistency.

PRCP8 The holder must make and keep up to date records on:

(a) achievement and maintenance of each rehabilitation milestone criteria of this schedule; and

(b) rehabilitation activities and the results of those activities (including but not limited to, actions taken, date, location, methods, data collected, Quality Assurance/Quality Control, photos, waste tracking and disposal records, appropriately qualified person (AQP) details and assumptions); and

(c) maintenance of rehabilitation and the results of maintenance activities; and

(d) monitoring of rehabilitation and the results of monitoring; and

(e) details and results of rehabilitation trials; and

(f) designs, drawings, specifications and any similar documents developed in accordance with good professional practice in relation to rehabilitation milestones or milestone criteria; and

(g) all documents in relation to the requirements of this schedule, including reports (e.g. site investigation report), statements (e.g. site suitability statement), certifications, assessments, investigations, inspections, audits or any similar documents developed in relation to rehabilitation milestones or milestone criteria; and

(h) landholder agreements; and

(i) details of community consultation in the community consultation register relating to rehabilitation and closure activities.

PRCP9 Records made under PRCP8 must be kept until the relevant environmental authority has been surrendered or cancelled.

PRCP10 Records made under PRCP8 must be provided to the administering authority in the specified format within 10 business days of a written request.

PRCP11 All AQP designs, specifications, certifications, assessments and any similar documents must:

(a) include documented consideration of any relevant guideline or publication material, including material published by the administering authority; and

(b) detail the boundary conditions (of any model); and

(c) detail any assumptions made, limitations and areas of uncertainty; and

(d) must contain sufficient detail to allow for independent peer review and substantiation.

PRCP12 Disturbance due to exploration and minor ancillary activities in areas not planned to be mined and not within a Rehabilitation Area in this Schedule must be rehabilitated in accordance with the provisions detailed in the '*Eligibility criteria and standard conditions for exploration and mineral development projects*' or its successor, with the exception that land must be rehabilitated to a stable condition which includes achieving the relevant post mining land use for the disturbance location as detailed in Section B - Final site design and reference maps.

PRCP13 The holder must, at least one (1) year prior to operations commencing under <Insert version VX>, provide to the administering authority an AQP prepared and peer reviewed, landform closure design report, which includes detailed engineering designs and a durability assessment.

PRCP14 The landform closure design report required by PRCP13 must include all the information requirements for landform design under the latest version of the '*Guideline Progressive rehabilitation and closure plans (PRC plans) (ESR/2019/496)*'.

PRCP15 The landform closure design report required by PRCP13 must at a minimum include:

(a) design aims and objectives of final landform, including the cover system and batters; and

(b) the intended design life of the component parts of each relevant structure including the cover, plateau, batters, access points, water management, and associated monitoring network; and

(c) quality assurance and quality control required during construction; and

(d) how the cover system achieves a performance outcome equivalent to or better than the design provided in the PRC plan dated <Insert version VX>; and

(e) how the cover system performance will be demonstrated; and

(f) how the landform achieves acceptable geotechnical and erosional stability; and

(g) how the landform achieves an acceptable water quality outcome; and

(h) how redundancy of the monitoring network has been identified and built into the final design; and

(i) how the design, including the component parts supports the achievement of the nominated post mine land use (PMLU); and

(j) how the design is consistent with the durability assessment; and

(k) the critical design elements and associated assessment that support the achievement of a stable condition, and

(l) where any assumed or inferred material properties have been used in the design or its assessment (inclusive of modelling), detailed discussion justifying why actual/measured properties were not used, how uncertainties regarding material properties may affect performance, and how those uncertainties are managed.

PRCP16 The durability assessment required in PRCP13 must include:

(a) specified nominated design life of the component parts of the structures including the cover, plateau, batters, access points and water management features; and

(b) the systematic identification and analysis of potential failure modes for the component parts of the structures (including the cover, plateau, batters, access points and water management features); and

(c) an explanation of how each failure mode has been considered in the design and designed out, to the extent practicable; and

(d) where a failure mode could not be designed out, the control measures that are required and their residual risks, How the design has been developed to allow for the future practical repair of the component parts of the structure, should any of the potential failure modes be realised either during or after the nominated design life; and

(e) details of the minimum monitoring required to detect each potential failure mode, including the type of monitoring, location/s, frequency and performance indicators, to demonstrate ongoing stability and performance in support of achieving a stable condition. This must include measurable time-based criteria to detect the development of potential failure modes.

PRCP17 The documents required under PRCP13 must be independently peer reviewed. Both the AQP and independent peer reviewer must provide a certification, that the landform closure design report is fit for purpose, prepared in accordance with good professional practice and if constructed as per the landform closure design report the rehabilitated landform will achieve a stable condition in a post-closure context.

PRCP18 Monitoring must be conducted equivalent to or better than the monitoring type and frequency as specified in the durability assessment required in PRCP16.

PRCP19 The currency of the landform closure design report, including the durability assessment must be maintained, and the report updated as often as necessary, to ensure that the structures will achieve a stable condition that can be sustained. Where the report has been updated, the certifications provided under PRCP14 must also be provided in relation to the updates.

PRCP20 A dam decommissioning study/report of the Tapplebang Dam must be prepared by an AQP and submitted to the administering authority at least three (3) years prior to planned decommissioning of the Tapplebang Dam.

PRCP21 The dam decommissioning study/report for the Tapplebang Dam must include:

(a) the characterisation of quality and quantity of sediment contained within the bed of the Tapplebang Dam based on field collected data; and

(b) a description of management measures to be implemented to minimise risks associated with dam removal and an evaluation of residual risks to the environment as a result of removal of the Tapplebang Dam; and

(c) the final landform design, including watercourse and riparian areas; and

(d) how the landform achieves acceptable geotechnical and erosional stability; and

(e) how the landform achieves an acceptable water quality outcome; and

(f) how the final landform design, including the component parts supports the PMLU; and

(g) community consultation of the final landform and PMLU; and

(h) independent technical review of the decommissioning study/report; and

(i) sign off from the AQP and Independent technical reviewer to certify that once implemented the final landform will achieve a stable condition.

PRCP22 The monitoring bores listed in Appendix 5 must be installed prior to commencing land disturbance under <Insert version VX> following approval of the PRCP.

PRCP23 The groundwater model must be recalibrated and predictions rerun at the end of mining activities and at least every five (5) years from the date of approval of the PRCP.

END OF CONDITIONS

Section B – Final site design and reference maps

Figure 1 – Final Site Design (Mine Site)[1]

To be updated upon submission of PRCP application

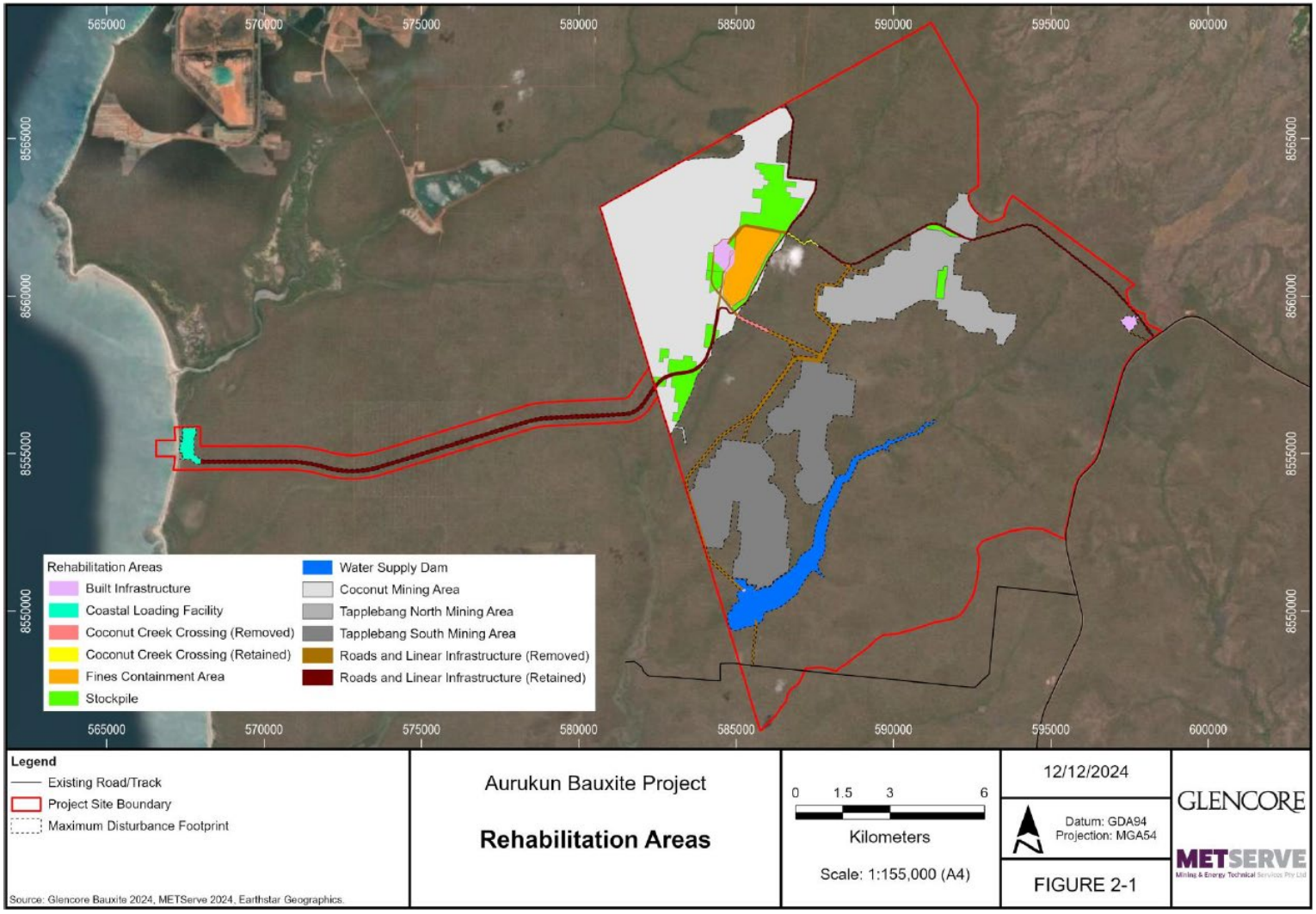


Figure 2 – Final Site Design (Product Bauxite Transport Corridor and Costal Loading Facility)[1]

TBA upon submission of PRCP application

Figure 3 – Reference map (Mine Site)[1]

TBA upon submission of PRCP application

Figure 4 – Reference map (Product Bauxite Transport Corridor and Coastal Loading Facility)[1]

TBA upon submission of PRCP application

Section C – Post mining land uses

(RA1) Rehabilitation area 1

Post-mining land uses (PMLU)					
Rehabilitation area	RA1				
Relevant activities	Tapplebang Dam				
Total rehabilitation area size (ha)	410.9				
Commencement of first milestone: RM1	1/01/2051				
PMLU	Native ecosystems				
Date area is available	1/01/2051	10/12/2052	10/12/2053	10/12/2054	10/12/2074
Cumulative area available (ha)	410.9	410.9	410.9	410.9	410.9
Milestone completed by	10/12/2052	10/12/2053	10/12/2054	10/12/2074	10/12/2075
Milestone Reference	**Cumulative area achieved (ha)**				
RM1	410.9				
RM3		410.9			
RM4			410.9		
RM7				410.9	
RM8					410.9

(RA2) Rehabilitation area 2

Post-mining land uses (PMLU)													
Rehabilitation area	RA2												
Relevant activities	Tapplebang North Mining Area												
Total rehabilitation area size (ha)	1,086.70												
Commencement of first milestone: RM5	31/07/2043												
PMLU	Native vegetation												
Date area is available	31/07/2043	10/12/2043	10/12/2044	10/12/2049	10/12/2050	10/12/2051	10/12/2052	10/12/2055	10/12/2056	10/12/2057	10/12/2064	10/12/2070	10/12/2071
Cumulative area available (ha)	16	16	18	53	1,086.70	1,086.70	1,086.70	1,086.70	1,086.70	1,086.70	1,086.70	1,086.70	1,086.70
Milestone completed by	10/12/2043	10/12/2044	10/12/2049	10/12/2050	10/12/2051	10/12/2052	10/12/2055	10/12/2056	10/12/2057	10/12/2064	10/12/2070	10/12/2071	10/12/2072
Milestone Reference	**Cumulative area achieved (ha)**												
RM3	16		18	53	1,086.70								
RM4		16		18	53	1,086.70							
RM5			16				18	53	1,086.70				
RM6			16				18	53	1,086.70				
RM7										16	18	53	1,086.70
RM8										16	18	53	1,086.70

(RA3) Rehabilitation area 3

Post-mining land uses (PMLU)													
Rehabilitation area	RA3												
Relevant activities	Tapplebang South Mining Area												
Total rehabilitation area size (ha)	1,619.90												
Commencement of first milestone: RM3	31/07/2040												
PMLU	Native ecosystem												
Date area is available	31/07/2040	10/12/2040	10/12/2041	10/12/2042	10/12/2044	10/12/2045	10/12/2046	10/12/2047	10/12/2048	10/12/2049	10/12/2050	10/12/2051	10/12/2052
Cumulative area available (ha)	33	89	89	124	159	219	372	479	627	793	1,619.9	1,619.90	1,619.90
Milestone completed by	10/12/2040	10/12/2041	10/12/2042	10/12/2044	10/12/2045	10/12/2046	10/12/2047	10/12/2048	10/12/2049	10/12/2050	10/12/2051	10/12/2052	10/12/2053
Milestone Reference	**Cumulative area achieved (ha)**												
RM3	33	89		124	159	219	372	479	627	793	1,619.90		
RM4		33	89		124	159	219	372	479	627	793	1,619.90	
RM5						33	89			124	159	219	372
RM6						33	89			124	159	219	372

Post-mining land uses (PMLU)															
Rehabilitation area	RA3 - Continued														
Relevant activities	Tapplebang South Mining Area														
Total rehabilitation area size (ha)	1,619.90														
Commencement of first milestone: RM3	31/07/2040														
PMLU	Native vegetation														
Date area is available	10/12/2053	10/12/2054	10/12/2055	10/12/2056	10/12/2057	10/12/2061	10/12/2062	10/12/2065	10/12/2066	10/12/2067	10/12/2068	10/12/2069	10/12/2070	10/12/2071	10/12/2072
Cumulative area available (ha)	1,619.90	1,619.90	1,619.90	1,619.90	1,619.90	1,619.90	1,619.90	1,619.90	1,619.90	1,619.90	1,619.90	1,619.90	1,619.90	1,619.90	1,619.90
Milestone completed by	10/12/2054	10/12/2055	10/12/2056	10/12/2057	10/12/2061	10/12/2062	10/12/2065	10/12/2066	10/12/2067	10/12/2068	10/12/2069	10/12/2070	10/12/2071	10/12/2072	10/12/2073
Milestone Reference	**Cumulative area achieved (ha)**														
RM5	479	627	793	1,619.90											
RM6		479	627	793	1,619.90										
RM7					33	89	124	159	219	372	479	627	793	1,619.90	
RM8						33	89	124	159	219	372	479	627	793	1,619.90

(RA4) Rehabilitation area 4

Post-mining land uses (PMLU)														
Rehabilitation area	RA4													
Relevant activities	Coconut Mining Area													
Total rehabilitation area size (ha)	2,480.10													
Commencement of first milestone: RM3	31/07/2036													
PMLU	Native ecosystem													
Date area is available	31/07/2036	10/12/2036	10/12/2037	10/12/2038	10/12/2039	10/12/2040	10/12/2041	10/12/2042	10/12/2043	10/12/2044	10/12/2045	10/12/2046	10/12/2047	10/12/2048
Cumulative area available (ha)	50	154	237	333	437	444	629	954	1,075	1,264	1,506	1,542	1,573	1,573
Milestone completed by	10/12/2036	10/12/2037	10/12/2038	10/12/2039	10/12/2040	10/12/2041	10/12/2042	10/12/2043	10/12/2044	10/12/2045	10/12/2046	10/12/2047	10/12/2048	10/12/2049
Milestone Reference	**Cumulative area achieved (ha)**													
RM3	50	154	237	333	437	444	629	954	1,075	1,264	1,506	1,542	1,573	
RM4		50	154	237	333	437	444	629	954	1,075	1,264	1,506	1,542	
RM5							50	154	237	333	437	444	629	
RM6								50	154	237	333	437	444	629

Post-mining land uses (PMLU)														
Rehabilitation area	RA4 - Continued													
Relevant activities	Coconut Mining Area													
Total rehabilitation area size (ha)	2,480.10													
Commencement of first milestone: RM3	31/07/2036													
PMLU	Native ecosystem													
Date area is available	10/12/2049	10/12/2050	10/12/2051	10/12/2052	10/12/2053	10/12/2054	10/12/2055	10/12/2056	10/12/2057	10/12/2058	10/12/2059	10/12/2060	10/12/2061	10/12/2062
Cumulative area available (ha)	1,573	1,720	2,480.10	2,480.10	2,480.10	2,480.10	2,480.10	2,480.10	2,480.10	2,480.10	2,480.10	2,480.10	2,480.10	2,480.10
Milestone completed by	10/12/2040	10/12/2051	10/12/2052	10/12/2053	10/12/2054	10/12/2055	10/12/2056	10/12/2057	10/12/2058	10/12/2059	10/12/2060	10/12/2061	10/12/2062	10/12/2063
Milestone Reference	**Cumulative area achieved (ha)**													
RM3		1,720	2,480.10											
RM4	1,573		1,720	2,480.10										
RM5	954	1,075	1,264	1,506	1,542	1,573		1,720	2,480.10					
RM6		954	1,075	1,264	1,506	1,542	1,573		1,720	2,480.10				
RM7									50	154	237	333	437	
RM8										50	154	237	333	437

Post-mining land uses (PMLU)											
Rehabilitation area	RA4 - Continued										
Relevant activities	Coconut Mining Area										
Total rehabilitation area size (ha)	2,480.10										
Commencement of first milestone: RM5	31/07/2036										
PMLU	Native ecosystem										
Date area is available	10/12/2063	10/12/2064	10/12/2065	10/12/2066	10/12/2067	10/12/2068	20/12/2070	10/12/2071	10/12/2072	10/12/2073	10/12/2074
Cumulative area available (ha)	2,480.10	2,480.10	2,480.10	2,480.10	2,480.10	2,480.10	2,480.10	2,480.10	2,480.10	2,480.10	2,480.10
Milestone completed by	10/12/2064	10/12/2065	10/12/2066	10/12/2067	10/12/2068	20/12/2069	10/12/2071	10/12/2072	10/12/2073	10/12/2074	10/12/2075
Milestone Reference	**Cumulative area achieved (ha)**										
RM7	444	629	954	1,075	1,264	1,506	1,542	1,573	1,720	2,480.10	
RM8		444	629	954	1,075	1,264	1,506	1,542	1,573	1,720	2,480.10

(RA5) Rehabilitation area 5

Post-mining land uses (PMLU)							
Rehabilitation area	RA5						
Relevant activities	Fines containment area						
Total rehabilitation area size (ha)	229.1						
Commencement of first milestone: RM2	31/07/2032						
PMLU	Native ecosystem						
Date area is available	31/07/2032	10/12/2032	10/12/2033	10/12/2034	10/12/2038	10/12/2040	10/12/2052
Cumulative area available (ha)	229.1	229.1	229.1	229.1	229.1	229.1	229.1
Milestone completed by	10/12/2032	10/12/2033	10/12/2034	10/12/2038	10/12/2040	10/12/2052	10/12/2053
Milestone Reference		**Cumulative area achieved (ha)**					
RM2	229.1						
RM3		229.1					
RM4			229.1				
RM5				229.1			
RM6					229.1		
RM7						229.1	
RM8							229.1

(RA6) Rehabilitation area 6

Post-mining land uses (PMLU)								
Rehabilitation area	RA6							
Relevant activities	Coastal Loading Facility							
Total rehabilitation area size (ha)	46.7							
Commencement of first milestone: RM1	31/07/2051							
PMLU	Native ecosystem							
Date area is available	31/07/2051	10/12/2051	10/12/2053	10/12/2054	10/12/2055	10/12/2060	10/12/2062	10/12/2064
Cumulative area available (ha)	46.7	46.7	46.7	46.7	46.7	46.7	46.7	46.7
Milestone completed by	10/12/2051	10/12/2053	10/12/2054	10/12/2055	10/12/2060	10/12/2062	10/12/2064	10/12/2075
Milestone Reference	**Cumulative area achieved (ha)**							
RM1	46.7							
RM2		46.7						
RM3			46.7					
RM4				46.7				
RM5					46.7			
RM6						46.7		
RM7							46.7	

RM8								46.7

(RA7) Rehabilitation area 7

Post-mining land uses (PMLU)						
Rehabilitation area	RA7					
Relevant activities	Soil stockpiles					
Total rehabilitation area size (ha)	456.4					
Commencement of first milestone: RM3	31/07/2054					
PMLU	Native ecosystem					
Date area is available	31/07/2054	10/12/2054	10/12/2055	10/12/2060	10/12/2065	10/12/2070
Cumulative area available (ha)	456.4	456.4	456.4	456.4	456.4	456.4
Milestone completed by	10/12/2054	10/12/2055	10/12/2060	10/12/2065	10/12/2070	10/12/2075
Milestone Reference	**Cumulative area achieved (ha)**					
RM3	456.4					
RM4		456.4				
RM5			456.4			
RM6				456.4		
RM7					456.4	
RM8						456.4

(RA8) Rehabilitation area 8

Post-mining land uses (PMLU)								
Rehabilitation area	RA8							
Relevant activities	Roads and linear infrastructure to be removed							
Total rehabilitation area size (ha)	503.6							
Commencement of first milestone: RM1	31/07/2051							
PMLU	Native ecosystem							
Date area is available	31/07/2051	10/12/2051	10/12/2053	10/12/2054	10/12/2055	10/12/2060	10/12/2062	10/12/2070
Cumulative area available (ha)	503.6	503.6	503.6	503.6	503.6	503.6	503.6	503.6
Milestone completed by	10/12/2051	10/12/2053	10/12/2054	10/12/2055	10/12/2060	10/12/2062	10/12/2070	10/12/2075
Milestone Reference	**Cumulative area achieved (ha)**							
RM1	503.6							
RM2		503.6						
RM3			503.6					
RM4				503.6				
RM5					503.6			
RM6						503.6		
RM7							503.6	

RM8								503.6

(RA9) Rehabilitation area 9

Post-mining land uses (PMLU)														
Rehabilitation area	RA9													
Relevant activities	Built infrastructure (accommodation, offices, workshops, beneficiation plant, incinerator, power and water supply infrastructure, fuel storage, process water pond)													
Total rehabilitation area size (ha)	64.2													
Commencement of first milestone: RM1	1/01/2051													
PMLU	Native ecosystem													
Date area is available	1/01/2051	10/12/2051	10/12/2053	10/12/2054	10/12/2055	10/12/2056	10/12/2057	10/12/2060	10/12/2061	10/12/2062	10/12/2063	10/12/2075	10/12/2076	10/12/2077
Cumulative area available (ha)	44	64.2	64.2	64.2	64.2	64.2	64.2	64.2	64.2	64.2	64.2	64.2	64.2	64.2
Milestone completed by	10/12/2051	10/12/2053	10/12/2054	10/12/2055	10/12/2056	10/12/2057	10/12/2060	10/12/2061	10/12/2062	10/12/2063	10/12/2075	10/12/2076	10/12/2077	10/12/2078
Milestone Reference	**Cumulative area achieved (ha)**													
RM1	44	64.2												
RM2		44		64.2										
RM3			44		64.2									
RM4				44		64.2								
RM5							44		64.2					
RM6								44		64.2				

RM7											44		64.2	
RM8												44		64.2

(RA10) Rehabilitation area 10

Post-mining land uses (PMLU)							
Rehabilitation area	RA10						
Relevant activities	Coconut Creek crossing						
Total rehabilitation area size (ha)	15.9						
Commencement of first milestone: RM1	31/07/2051						
PMLU	Native ecosystem						
Date area is available	31/07/2051	10/12/2051	10/12/2052	10/12/2053	10/12/2058	10/12/2059	10/12/2060
Cumulative area available (ha)	15.9	15.9	15.9	15.9	15.9	15.9	15.9
Milestone completed by	10/12/2051	10/12/2052	10/12/2053	10/12/2058	10/12/2059	10/12/2060	10/12/2073
Milestone Reference	**Cumulative area achieved (ha)**						
RM1	15.9						
RM3		15.9					
RM4			15.9				
RM5				15.9			
RM6					15.9		
RM7						15.9	
RM8							15.9

Rehabilitation area milestones

Milestone reference	Rehabilitation milestone	Milestone criteria
RM1	Infrastructure decommissioning and removal	1.1 All services disconnected, terminated and removed. 1.2 All buildings and associated infrastructure dismantled and removed offsite. 1.3 All hardstand, concrete areas and roads (bitumen, aggregate, gravel etc) removed. 1.4 All fencing that is not part of PMLU requirements removed. 1.5 All pipelines drained and removed. 1.6 All waste, not authorised under the environmental authority <insert EA number>., removed. 1.7 All surface water drainage infrastructure removed. 1.8 All drillholes, bores, sediment ponds and sumps decommissioned. 1.9 All machinery and equipment removed from site. 1.10 All dams dewatered and desilted. 1.11 Tapplebang Dam decommissioned, including removal of the dam wall. 1.12 Watercourse crossings and culverts removed. 1.13 Below ground Infrastructure and services deeper than 0.5m below the final landform surface can be retained provided that the following has occurred: a) all below-ground pipelines have been drained, filled with inert material and capped; and b) the location of all retained below-ground infrastructure is mapped; and c) the intended PMLU is not compromised; and d) there is no ongoing risk of environmental harm. 1.14 An AQP has certified the achievement of RM1.1 to 1.13.
RM2	Identification, remediation and removal of contaminated land	2.1 A contaminated land investigation document (CLID) prepared by a suitably qualified person (SQP) is completed in accordance with the *EP Act*, including a site investigation report, and, where required, a Validation Report and/or a draft Site Management Plan. 2.2 All contaminated water and sediment has been removed from dams. 2.3 Contaminated and hazardous material either remediated in-situ or removed/transported to an approved landfill for disposal and waste tracking information recorded and submitted. 2.4 Contaminated land assessment indicates that no contamination unsuitable for the PMLU remains or is occurring. 2.5 Land is removed from the Contaminated Land Register and Environmental Management Register, unless otherwise agreed to in writing with the administrating authority.

RM3	Landform development and surface preparation	3.1 An assessment of the health and suitability of all topsoil and subsoil (growth media) to be used in rehabilitation activities has been undertaken to confirm the soil materials are suitable for target vegetation establishment in the relevant rehabilitation area. 3.2 Soil testing of the growth media confirms: a) Electrical Conductivity (saturated extract) <4 dS/m; and b) Soil pH <8.5 and >5.5; and c) Exchangeable Sodium Percentage (ESP%) <6%; and d) Organic carbon >1%. 3.3 An AQP has reviewed all growth media analyses and determined if ameliorants and/or fertiliser is required to achieve soil suitability criteria. 3.4 Re-testing of any treated soil materials used as growth media is completed and AQP confirms soil suitability criteria (as per RM3.2) are achieved. 3.5 All major earthworks (including reshaping, pushing/trimming) are completed in accordance with the final landform engineer design specifications. 3.6 The subsoil surface is ripped to relieve any compaction prior to applying topsoil. 3.7 All landforms are shaped to be water shedding. 3.8 The surface and groundwater monitoring network are installed at locations listed in Appendix 5 and monitoring is underway (one year of sampling undertaken). 3.9 An Independent AQP certifies achievement of RM3.1 to 3.8.
		Fines Containment Area (RA5) 3.10 The landform has been constructed in accordance with the final landform engineering design. 3.11 No slope exceeds 12%. 3.12 The landform has been constructed to achieve the design criteria for geotechnical stability with a Factor of Safety ≥1.5 (static drained and/or undrained with potential loss of containment). 3.13 Any areas of the final landform which display instability due to surface flow velocities have been re-engineered with remedial works such as rock armouring. 3.14 Subsoil has been applied and spread at an average depth of 0.35m and a minimum depth of 0.3m at any one location. 3.15 Topsoil meeting suitability criteria in RM3.2 has been applied and spread at an average depth of 0.25m and a minimum depth of 0.2m at any one location. 3.16 An Independent AQP certifies achievement of RM3.10 to 3.15.
		Tapplebang Dam (RA1)

		3.17 Dam wall and associated waste is removed, unless otherwise agreed to by the administering authority. 3.18 The natural watercourse bed and banks disturbed by the construction of the Tapplebang Dam are returned to the pre-disturbance condition as per the decommissioning study/report. 3.19 Topsoil meeting suitability criteria in RM3.2 has been applied and spread within the disturbance footprint, as per the decommissioning study/report, to an average depth of 0.25m and a minimum depth of 0.2m at any one location. 3.20 An Independent AQP certifies achievement of RM3.17 to RM3.19.
		Mining Areas (RA2, RA3, RA4) 3.21 No slope exceeds 12%. 3.22 Prior to placement of subsoil, the floor of the mined area will be deep ripped for compaction relief. 3.23 Subsoil has been applied and spread at an average depth of 0.35m and a minimum depth of 0.3m at any one location. 3.24 Prior to topsoil application the area will be ripped for compaction relief if necessary. 3.25 Topsoil meeting suitability criteria in RM3.2 has been applied and spread at an average depth of 0.25m and a minimum depth of 0.2m at any one location. 3.26 the rehabilitation area has been deep ripped along contour of slopes. 3.27 An Independent AQP certifies achievement of RM3.21 to 3.26.
		Other Rehabilitation Areas (RA6, RA7, RA8, RA9 and RA10) 3.28 Topsoil has been applied and spread to disturbed areas at an average depth of 0.25m and a minimum depth of 0.2m at any one location. 3.29 The rehabilitation area has been deep ripped along contour of slopes. 3.30 An Independent AQP certifies achievement of RM3.28 and RM3.29.
RM4	Revegetation	4.1 The topsoil surface has been scarified along contour of slopes prior to commencement of any revegetation activities. 4.2 Application of seed mix as described in Appendix 1 – Species List and Seed Application Rate and at the locations identified in Appendix 1, Figure 1 – Location of vegetation communities. 4.3 Planting of appropriate species as described in Appendix 2 – Species List to plant as container stock at a density specified, unless adjusted by an AQP based on results of rehabilitation trials, site conditions or rehabilitation monitoring. 4.4 Non-native seed must not be used for the revegetation (except when sterile cover crops are used). 4.5 An Independent AQP certifies achievement of RM4.1 to 4.4.

RM5	Achievement of sufficient ground cover to limit erosion.	5.1 Monitoring of rehabilitation areas has been undertaken using the Line-Point Intercept method along one, 50m line transect per 25ha rehabilitated. 5.2 Vegetative groundcover is ≥70%. 5.3 No evidence of erosion classified as 'Moderate' or 'Severe' in accordance with the Table 1 – Erosion classification framework. 5.4 Drainage follows appropriate drainage paths. 5.5 An Independent AQP certifies achievement of RM5.1 to 5.4.
RM6	Removal of erosion and sediment control systems	6.1 Erosion and sediment control systems installed in the rehabilitated areas have been removed and/or free draining. 6.2 An Independent AQP certifies achievement of RM6.1.
RM7	Establishment of target vegetation type and achievement of surface requirements	7.1 Any erosion present will not compromise the achievement of a PMLU to a stable condition. 7.2 All other erosion requiring intervention has been remediated and does not impact achieving the PMLU. 7.3 Surface water runoff is non-polluting to receiving waters and complies with Table 2 – Surface water quality limits. 7.4 The growth media (topsoil and subsoil) physical, chemical and biological properties does not limit vegetation cover performance or restrict the potential effective depth of rooting. 7.5 An Independent AQP certifies achievement of RM7.1 to 7.4.
		Vegetation 7.6 Baseline condition assessment of at least 20 unmined and otherwise relatively undisturbed, analogue reference sites per relevant vegetation unit has been undertaken. 7.7 Rehabilitation monitoring sites have been established within rehabilitation areas at a density of at least three (3) sites per vegetation unit. 7.8 Monitoring has been undertaken in the late wet season (generally February - May) at a frequency suitable to inform assessment of the achievement of this milestone (e.g. every three (3) years for nine (9) years after completion of RM6 for that area and at least every five (5) years thereafter). 7.9 In rehabilitated areas where the water table remains deeper than 1m below ground level in the wet season: a) The species with the greatest total basal area per hectare at each relevant monitoring site is *Eucalyptus tetrodonta.* b) Development trajectories of *Eucalyptus tetrodonta* at each relevant monitoring site demonstrate current or future capacity for hollow formation by either:

		i) Recording steadily increasing size, as measured by the diameter at breast height (dbh) of the largest five trees within the 10m x 50m belt transect at that monitoring site; or ii) Observation of at least one hollow within the 10m x 50m belt transect at that monitoring site.
		7.10 The 'framework species' applicable to each monitoring site (as identified in Appendix 1 and Appendix 2) either: a) Comprise more than 50% of the total basal area of woody vegetation at that monitoring site; or b) Demonstrate a developmental trajectory to achieve dominance based on a sigmoidal curve that, when fitted to a sequence of five or more monitoring events at that site, displays an expected plateau above 50% (of total basal area of woody vegetation at that site). 7.11 The habitat density and complexity of rehabilitated areas is considered to be within the natural range observed in unmined, analogue reference sites (per RM7.6 as evidenced by: a) The species richness of trees (> 5 m tall), within a 100m x 50 m quadrat at each rehabilitation monitoring site, equals or exceeds the 10th percentile observed among the unmined analogue reference sites for the relevant vegetation unit; and b) The species richness of shrubs (1-5 m tall), within a 10m x 50 m belt transect at each rehabilitation monitoring site, equals or exceeds the 10th percentile observed among the unmined analogue reference sites for the relevant vegetation unit; and c) The foliage projective cover of trees and shrubs along a 50m line transect at each rehabilitation monitoring site, equals or exceeds the 10th percentile observed among the unmined analogue reference sites for the relevant vegetation unit; and d) The percentage groundcover of perennial grasses along a 50m line transect at each rehabilitation monitoring site, equals or exceeds the 10th percentile observed among the unmined analogue reference sites for the relevant vegetation unit. 7.12 Rehabilitated areas will provide foraging habitat for Palm Cockatoos as evidenced by: a) The combined stem density of *Parinari nonda, Terminalia spp., Pandanus spiralis, Grevillea glauca, Persoonia falcata and Canarium australianum* (food plants for the Palm Cockatoo) at each rehabilitation monitoring site equals or exceeds the 10th percentile observed among the unmined analogue reference sites for the relevant vegetation unit; and b) All six species of food plants (*Parinari nonda, Terminalia spp., Pandanus spiralis, Grevillea glauca, Persoonia falcata* and *Canarium australianum*) are found to be present in at least 10% of the 100m x 50m quadrats established in rehabilitation areas.

		7.13 Rehabilitated areas will support plant species that are culturally significant to the native title party as evidenced by: a) The combined stem density of culturally significant woody plant species (Appendix 3) within a 10m x 50m belt transect at each rehabilitation monitoring site equals or exceeds the 10th percentile observed among the unmined analogue reference sites for the relevant vegetation unit; and b) The percentage groundcover of culturally significant herbaceous plant species (Appendix 3) along a 50m line transect at each rehabilitation monitoring site, equals or exceeds the 10th percentile observed among the unmined analogue reference sites for the relevant vegetation unit. 7.14 Rehabilitated area will not be an important source of weeds in the local landscape as evidenced by: a) The combined cover of all non-native plant species within a 10m x 50m belt transect at each rehabilitation monitoring site is less than 5%; and b) The percentage groundcover of Grader Grass (*Themeda quadrivalvis*) along a 50m line transect at each rehabilitation monitoring site is less than 0.1%; and c) All other priority weeds (defined as "high priority" species listed within the Cook Shire Biosecurity Plan, "regional priority weeds" within the Cape York Peninsula Regional Biosecurity Plan and/or any priority weeds identified in Aurukun Shire Council's Weed and Pest Management Plan) are absent. 7.15 An Independent AQP certifies achievement of RM7.6 to 7.14.
RM8	Achievement of a stable PMLU	8.1 Hazard and safety assessment completed by an AQP demonstrates hazards are consistent with the type and severity of hazards typical of the adjacent equivalent land use. 8.2 Any rills present are in a stabilised state. 8.3 Final landform survey confirms no built structures or waste remain. 8.4 Landform is geotechnically stable and achieved a factor of safety ≥ 1.5. 8.5 An Independent AQP certifies achievement of RM8.1 to 8.4.
		Vegetation 8.6 All species of trees (>5m tall) and shrubs (1m-5m tall) within a 10m x 50m belt transect display evidence of newly sprouted seedlings or sucker and/or have multiple generations represented within the tree and shrub layer. 8.7 Vegetative groundcover is ≥70%. 8.8 The combined cover of all non-native plant species within a 10m x 50m belt transect at each rehabilitation monitoring site is less than 5% and has remained stable or reduced since the preceding record of monitoring at that sited.

		8.9 The percentage groundcover of Grader Grass (*Themeda quadrivalvis*) along a 50m line transect at each rehabilitation monitoring site is less than 0.1% and has remained stable or reduced since the preceding record of monitoring at that site. 8.10 All other priority weeds (defined as "high priority" species listed within the Cook Shire Biosecurity Plan, "regional priority weeds" within the Cape York Peninsula Regional Biosecurity Plan and/or any priority weeds identified in Aurukun Shire Council's Weed and Pest Management Plan) are absent. 8.11 A BioCondition assessment is completed by an AQP using the methodology outlined in the latest version of the Queensland Herbarium's 'BioCondition Assessment Manual'. 8.12 The BioCondition assessment completed under 8.11 complies with the PRCP Benchmark of 41/60, as per Appendix 4 – PRCP Benchmarks for Rehabilitation Areas. 8.13 Recording of fire scars in rehabilitation areas has been undertaken on an annual basis since the completion of rehabilitation milestone RM4 - Revegetation. 8.14 Rehabilitation Areas with a PMLU of native ecosystem have experienced at least one fire. 8.15 An Independent AQP certifies achievement of RM8.6 to 8.14.
		Water Quality 8.16 Surface water runoff is non-polluting to receiving waters and complies with Table 2 – Surface water quality limits. 8.17 Surface water quality monitoring has been undertaken at monitoring locations as described in Table 3 at least on a monthly basis during flow (subject to safe access to monitoring points). 8.18 The results of the monitoring in RM8.17 for the quality characteristics described in Table 2 - Surface water quality limits at downstream locations, must not exceed the limits in Table 2 - Surface water quality limits, for a minimum of five (5) consecutive years. 8.19 If the surface water quality exceeds the limits in Table 2 - Surface water quality limits, the applicable upstream site must be compared to the downstream site

		result; and quality result measured at a downstream site must be equal to or less than the quality result measured at the applicable upstream site[1]. 8.20 Groundwater monitoring has been undertaken at the groundwater monitoring locations described in Table 4 – Groundwater monitoring bores on at least a quarterly basis (subject to safe access to monitoring locations) for at least five (5) consecutive years, for all quality characteristics listed in Table 5 – Groundwater quality limits. 8.21 Groundwater quality must not exceed the limits stated in Table 5 – Groundwater quality limits for that quality characteristic in three consecutive rounds of monitoring. 8.22 Groundwater levels recorded are between the upper and lower thresholds described in Table 6 - Groundwater Level Thresholds. 8.23 An Independent AQP certifies achievement of RM 8.16 to 8.22.
		Fauna 8.24 Terrestrial fauna surveys have been undertaken, in the early dry season (May - July) and at least every five (5) years, at least at twenty (20) unmined, analogue reference sites. 8.25 Rehabilitation areas terrestrial fauna surveys comprise: a) Small mammal surveys utilising at least fifty (50) Type A Elliot traps installed over four consecutive nights across each 1ha (100m x 100m) survey site; and b) Bird surveys, undertaken by specialist ecologists with high competence in regional bird call identification, to record bird species utilising the survey site with a search effort of at least 15 minutes per site, twice per day over four consecutive days. 8.26 Terrestrial fauna survey sites demonstrate that rehabilitation areas: a) Are able to provide foraging habitat for the Red Goshawk as evidenced by: i) The mean number of birds recorded at the survey site(s) within the rehabilitated area equals or exceeds the 10th percentile recorded at the same time at the unmined analogue reference sites; and

[1] For pH, the quality result measured at the downstream location must be within the prescribed range. However, where pH at the downstream location is greater-than (>) the highest limit in the range, the pH at the applicable upstream location must be greater-than or equal-to (≥) the downstream location. Conversely, where pH at the downstream location is less than (<) the lowest limit in the range, the upstream pH at the applicable upstream location must be less-than or equal-to (≤) the downstream location.

		ii) Comparing the mean number birds per survey within the families C*olumbidae, Psittacidae, Cacatuidae, Artamidae* and *Alcedinidae* recorded at the survey site(s) within the rehabilitated area equals or exceeds the 10th percentile recorded at the same time at the unmined analogue reference sites. b) Are able to provide foraging habitat for the Masked Owl as evidenced by the mean number of mammals captured at the survey site(s) within the rehabilitated area equals or exceeds the 10th percentile captured at the same time at the unmined analogue reference sites. 8.27 An Independent AQP certifies achievement of RM 8.24 to 8.26.
		Tapplebang Dam (RA1) 8.28 Natural features (including geomorphic and vegetation) present within the watercourse. 8.29 The hydraulic characteristics of the watercourses is maintained. 8.30 Sediment transport and water quality regimes within the watercourse are self-sustaining, while minimising any impacts to upstream and downstream water quality, geomorphology, or vegetation. 8.31 The watercourse is geotechnically and erosionally stable. 8.32 Aquatic macroinvertebrate surveys have been undertaken in the post-wet season (April-June), in accordance with procedures prescribed by the Queensland AusRivAS sampling manual (DNRM, 2001), at: a) Five sites on Coconut Creek; and b) Five sites upstream of the removed Tapplebang Dam embankment wall on Tapplebang Creek; and c) Five sites downstream of the removed Tapplebang Dam embankment wall on Tapplebang Creek. 8.33 Results of macroinvertebrate monitoring demonstrate that: a) The taxonomic richness (being the total number of different macroinvertebrate taxa collected at each site); and b) The PET taxa richness (being the total number of families collected at each site that belong to the environmentally sensitive insect orders, *Plecoptera* (stoneflies), *Ephemeroptera* (mayflies) and *Trichoptera* (caddisflies), of the *sites* upstream and downstream of the Tapplebang Dam embankment wall on Tapplebang Creek equal or exceed the 10th percentile of such indices calculated for sites on Coconut Creek. 8.34 Monitoring of the conditions of riparian vegetation undertaken, in the late wet season (February-May) in accordance with the Tropical Rapid Appraisal of Riparian Condition (TRARC) methodology described by Dixon et al. (2006), at: a) Three sites within RA1 (at least 1.5km apart); and b) Twenty analogue reference sites (on Coconut Creek or upstream of RA1).

		8.35 The results of riparian vegetation monitoring demonstrate that the BioCondition of riparian vegetation at all monitoring sites is equal or exceed the 10th percentile of the BioCondition of riparian vegetation measured at the analogue reference sites at the same time. 8.36 An Independent AQP certifies achievement of RM 8.28 to 8.35.

Appendix 1 – Species List and Seed Application Rate

Vegetation Units

A = "Standard" = areas where the water table remains deeper than 1m below ground level in the wet season (based on data collected or models prepared by an AQP)

B = "Seasonally Waterlogged" = areas where the groundwater expresses at the surface, or rises to within 1m of the ground level during the wet season (based on data collected or models prepared by an AQP)

C = "Riparian" = the banks of Coconut Creek and Tapplebang Creek.

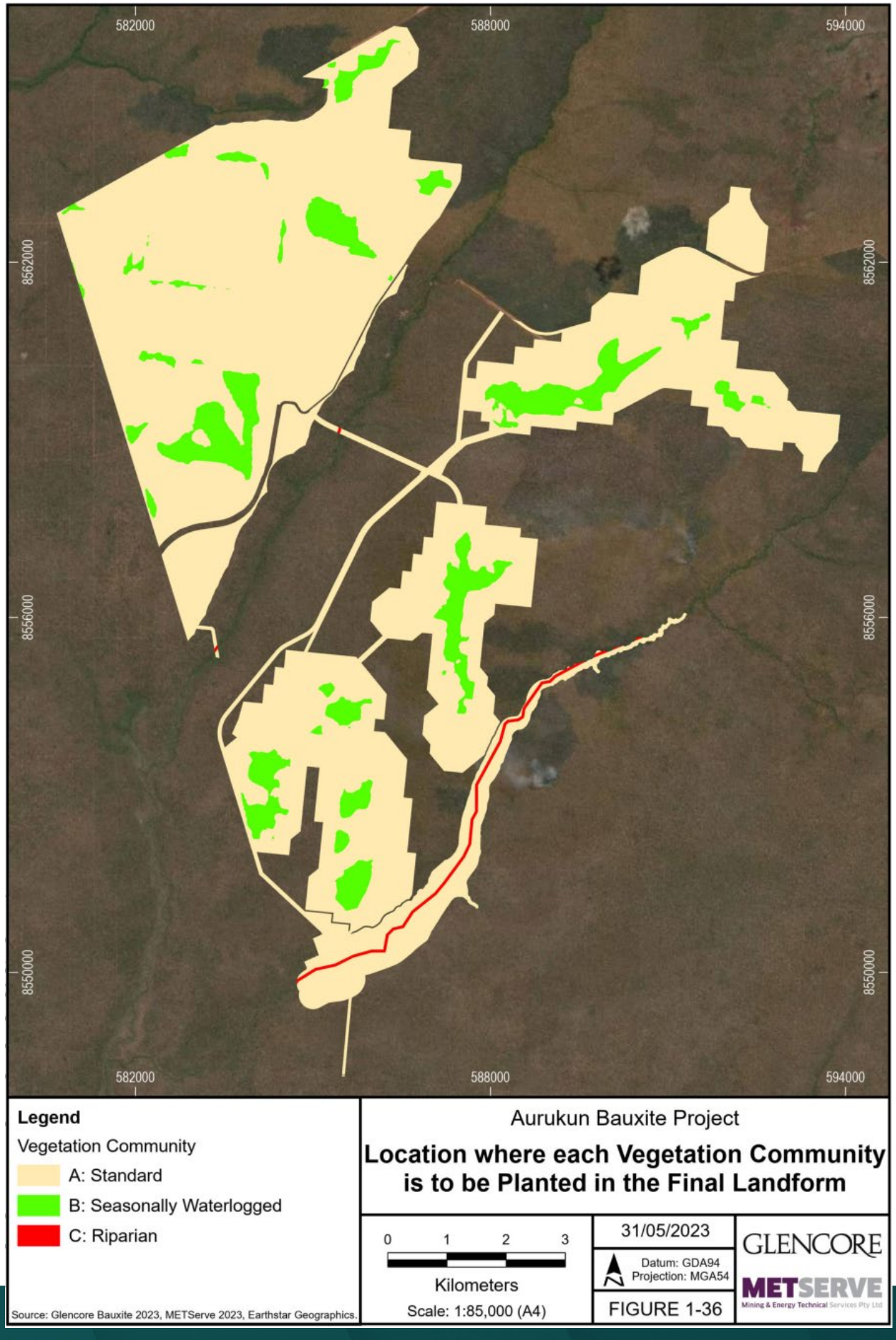
Species name	Culturally significant	Wik Mungkan Name (where available)	Application Rate (g/ha)[1]			Framework Species[2]		
			A	B	C	A	B	C
Acacia rothii	Yes	wiinth (syn. yuk wiinth)	150	150				
Alphitonia excelsa	Yes	nga' (syn. yuk nga')		30				
Alstonia actinophylla	Yes		30		30			
Antidesma ghaesembilla	Yes	yuk yoorp	30					
Asteromyrtus symphyocarpa				20	20			
Banksia dentata	Yes	punthiy (syn. yuk punthiy)		20				
Brachychiton garrawayae			60					
Breynia oblongifolia			30		30			
Corymbia clarksoniana				50	50			
Corymbia nesophila	Yes	put	240			Yes		
Corymbia novoguinensis				290	250		Yes	Yes
Corymbia stockeri	Yes	minchak (syn. yuk minchak)	120			Yes		
Croton arnhemicus				20				
Erythrophleum chlorostachys	Yes	yuk yongk	50		50	Yes		Yes
Eucalyptus brassiana				120	100		Yes	Yes
Eucalyptus tetrodonta	Yes	ponth (syn. yuk ponth)	450		400	Yes		

Species name	Culturally significant	Wik Mungkan Name (where available)	Application Rate (g/ha)[1]			Framework Species[2]		
			A	B	C	A	B	C
Ficus opposita	Yes	yuk kom	30					
Fimbristylis aestivalis					200			
Flueggea virosa			30					
Glochidion apodognium			50					
Glochidion benthamiana					50			
Grevillea glauca	Yes	yuk oot	50	50				
Grevillea parallela			50					
Leptospermum madidum					40			
Livistona muelleri	Yes	yuk koyngkan	400	350	400			
Lophostemon suaveolens				350	300		Yes	Yes
Melaleuca cajuputi	Yes	kich ontan		70				
Melaleuca leucadendra	Yes	kich thuumpiy		65	100			Yes
Melaleuca nervosa	Yes	kich yelnang		40				
Melaleuca quinquenervia				70				
Melaleuca saligna				70			Yes	
Melaleuca viridiflora	Yes	kich kont		100			Yes	
Parinari nonda	Yes	yuk po'al	200	200	200		Yes	Yes
Petalostigma banksii				5				
Xanthostemon crenulatus					50			Yes
Xylomelum scottianum			30					
Silk Sorghum			5,000	5,000	5,000			

1 The actual seed mixes used in any one year are subject to seed availability.

2 Framework species relevant to rehabilitation completion criteria and which characterise the pre-existing regional ecosystem present on site.

Figure 1 – Location of vegetation communities



Appendix 2 – Species List to plant as container stock and density

Vegetation Units

A = "Standard" = areas where the water table remains deeper than 1m below ground level in the wet season (based on data collected or models prepared by an AQP)

B = "Seasonally Waterlogged" = areas where the groundwater expresses at the surface, or rises to within 1 m of the ground level during the wet season (based on data collected or models prepared by an AQP)

C = "Riparian" = the banks of Coconut Creek and Tapplebang Creek

Species name	Culturally significant	Wik Mungkan Name (where available)	To plant as container stock			Density	Framework Species[1]		
			A	B	C		A	B	C
Banksia dentata	Yes	punthiy (syn. yuk punthiy)		Yes	Yes	TBA[2]			
Buchanania arborescens					Yes	TBA[2]			
Calophyllum sil					Yes	TBA[2]			
Calycopeplus casuarinoides				Yes		TBA[2]			
Canarium australianum	Yes	yuk nguchaman	Yes		Yes	TBA[2]			
Carallia brachiata					Yes	TBA[2]			
Chrysopogon oliganthus, C. elongatus					Yes	TBA[2]			
Clerodendrum floribundum	Yes		Yes			TBA[2]			
Coelospermum reticulatus			Yes			TBA[2]			
Cryptocarya brassii					Yes	TBA[2]			
Cyperus spp. (*C. aquatilis, C. polystachyos, C. haspan*)					Yes	TBA[2]			
Dapsilanthus elatior				Yes	Yes	TBA[2]			

Species name	Culturally significant	Wik Mungkan Name (where available)	To plant as container stock			Density	Framework Species[1]		
			A	B	C		A	B	C
Deplanchea tetraphylla					Yes	TBA[2]			
Dillenia alata					Yes	TBA[2]			
Diospyros calycantha					Yes	TBA[2]			
Diospyros hebecarpa					Yes	TBA[2]			
Elaeocarpus arnhemicus					Yes	TBA[2]			
Endiandra glauca					Yes	TBA[2]			
Garcinia warrenii					Yes	TBA[2]			
Gmelina dalrymplea na	Yes	yuk niich			Yes	TBA[2]			
Hydriastele wendlandia na					Yes	TBA[2]			
Mallotus polyadenos					Yes	TBA[2]			
Pandanus spiralis	Yes		Yes		Yes	TBA[2]			
Persoonia falcata			Yes			TBA[2]			
Planchonell a pohlmanian a	Yes		Yes			TBA[2]			
Planchonia careya	Yes		Yes			TBA[2]			
Sersalisia unmackian a			Yes			TBA[2]			
Siphonodon pendulus	Yes		Yes			TBA[2]			
Syzygium angophoroi des					Yes	TBA[2]			Yes
Syzygium suborbicula re	Yes		Yes	Yes		TBA[2]			

1 Framework species relevant to rehabilitation completion criteria and which characterise the pre-existing regional ecosystem present on site.

2 TBA upon submission of PRCP

Appendix 3 – Plant Species of Cultural Significance

Species name	Wik Mungkan Name (where available)	Growth form
Abrus precatorius	kuuy puukuw	Herbaceous
Acacia crassicarpa and Acacia auriculiformis	mo' (syn. yuk mo')	Woody
Acacia rothii	wiinth (syn. yuk wiinth)	Woody
Alphitonia excelsa	nga' (syn. yuk nga')	Woody
Alstonia actinophylla	-	Woody
Antidesma ghaesembilla	yuk yoorp	Woody
Aristolochia pubera	waant	Herbaceous
Banksia dentata	punthiy (syn. yuk punthiy)	Woody
Barringtonia acutangula	thanch	Woody
Bombax ceiba	uungkath	Woody
Canarium australianum	yuk nguchaman	Woody
Cassytha spp.	yuk moomam	Herbaceous
Cayratia trifolia	angk	Herbaceous
Clerodendron floribundum	-	Woody
Cochlospermum gillivraei	wenchapathan	Woody
Coelospermum reticulatum	yuk wayk	Woody
Corymbia nesophila	put	Woody
Corymbia stockeri	minchak (syn. yuk minchak)	Woody
Dioscorea transversa	ka'am (syn. may ka'am)	Herbaceous
Erythrina vespertilio	yuk yuunch	Woody
Erythrophleum chlorostachys	yuk yongk	Woody
Eucalyptus tetrodonta	ponth (syn. yuk ponth)	Woody
Eugenia reinwardtiana	yuk iith	Woody
Exocarpos latifolius	may pam-pam	Woody
Ficus opposita	yuk kom	Woody
Flagellaria indica	koonth (syn. yuk koonth)	Herbaceous
Gmelina dalrympleana	yuk niich	Woody
Grevillea glauca	yuk oot	Woody
Grewia retusifolia	mantamp (syn. may mantamp)	Woody
Haemodorum coccineum	pa'amp (syn. wak pa'amp)	Herbaceous
Hibiscus tiliaceus	yuk okanch	Woody
Ipomoea brassii	yiil (syn. may yiil)	Herbaceous
Livistona muelleri	yuk koyngkan	Woody
Melaleuca acacioides	kich pooy	Woody
Melaleuca cajuputi	kich ontan	Woody
Melaleuca leucadendra	kich thuumpiy	Woody
Melaleuca nervosa	kich yelnang	Woody
Melaleuca viridiflora	kich kont	Woody
Morinda reticulata	yuk wayk	Herbaceous

Species name	Wik Mungkan Name (where available)	Growth form
Pandanus spiralis	yuk kunchan	Woody
Parinari nonda	yuk po'al	Woody
Perotis rara	poonch (syn. wak poonch)	Herbaceous
Planchonella pohlmaniana	-	Woody
Planchonia careya	yuk waath	Woody
Siphonodon pendulus	yuk po'al	Woody
Sterculia quadrifida	yuk mippiy	Woody
Syzygium forte	yuk po'am	Woody
Syzygium suborbiculare	yuk cheengk	Woody
Tacca leontopetaloides	wu'amp	Herbaceous
Terminalia muelleri	yuk thankan	Woody
Thespesia populnea	yuk thiimpin	Woody
Vigna vexillata	lot (syn. may lot)	Herbaceous
Wrightia pubescens	paap (syn. yuk paap)	Woody

Appendix 4 – PRCP Benchmarks for Rehabilitation Areas

BioCondition benchmark data is provided below, as referenced by criterion (b), for the respective regional ecosystems (REs). The table below includes a set of attributes that are applicable to mine site rehabilitation monitoring. Milestone criteria are based on REs (3.5.36b, 3.3.9a, 3.3.20b) and should be a % of the *overall* BioCondition score (out of 60). The revised PRCP benchmark includes a subset of the BioCondition assessable attributes as some attributes (i.e. large trees) are naturally absent in a grassland ecosystem or are not likely to be attainable in the timeframe between revegetation and achievement of the PMLU.

Relevant PMLU	**Weighting**	**Indicative benchmark for RM10**	**Native Ecosystem**					
BioCondition Assessable Attributes			**3.5.36b**	**Score**	**3.3.9a**	**Score**	**3.3.20b**	**Score**
Recruitment (% of trees)	5	≥ 25% of benchmark height	100	3	TBA[1]	TBA[1]	TBA[1]	TBA[1]
Non-native plant cover (%)	5	≥ 20% of dominant canopy species	0	5	TBA[1]	TBA[1]	TBA[1]	TBA[1]
Tree (native) species richness	5	≥50% and ≤200% relative to benchmark	6	3	TBA[1]	TBA[1]	TBA[1]	TBA[1]
Shrub (native) species richness	5	≥50% and ≤200% relative to benchmark	12	3	TBA[1]	TBA[1]	TBA[1]	TBA[1]
Grass (native) species richness	5	≥ 25-90% of benchmark	6	3	TBA[1]	TBA[1]	TBA[1]	TBA[1]
Forb/other (native) species richness	5	≥ 25-90% of benchmark	14	3	TBA[1]	TBA[1]	TBA[1]	TBA[1]
Tree canopy height (m)	5	≥ 25-90% of benchmark	26	3	TBA[1]	TBA[1]	TBA[1]	TBA[1]

Relevant PMLU	Weighting	Indicative benchmark for RM10	Native Ecosystem					
BioCondition Assessable Attributes			**3.5.36 b**	**Score**	**3.3.9 a**	**Score**	**3.3.20 b**	**Score**
Tree canopy cover (%)	5	≥25-90% of benchmark	33	5	TBA[1]	TBA[1]	TBA[1]	TBA[1]
Shrub canopy cover (%)	10	<10% of vegetation cover	2	5	TBA[1]	TBA[1]	TBA[1]	TBA[1]
Native perennial grass cover (%)	5	≥90% of benchmark	31	3	TBA[1]	TBA[1]	TBA[1]	TBA[1]
Litter and other vegetation cover (%)	5	≥ 50% of benchmark	54	5	TBA[1]	TBA[1]	TBA[1]	TBA[1]
Max score	60		284	41	TBA[1]	TBA[1]	TBA[1]	TBA[1]

1. TBA upon submission of PRCP

Source: BioCondition benchmarks

Table 1 – Erosion classification framework

Erosion classification	Minor	Moderate	Severe
Sheet erosion	Shallow soil deposits downslope	Partial exposure of roots; moderate soil deposits downslope.	Loss of surface horizon; subsoil exposure; root exposure; substantial soil deposits downslope.
Rill/gully erosion	<15 rills/transect* and <0.3m deep	15-30 rills per transect* and <0.3m deep	>30 rills per transect* and/or any >0.3m deep.
Tunnel erosion	Absent	Absent	Present
Mass movement	Absent	Absent	Present

Source: NCST (2009) *Australian Soil and Land Survey Field Handbook, 3rd edition*. The National Committee on Soil and Terrain. CSIRO Publishing, Collingwood, Australia.

*Transect 100 m across the contour (Source: Tongway, D. J. and Hindley, N. L. 2005. Landscape Function Analysis: Procedures for Monitoring and Assessing Landscapes. CSIRO Publishing, Canberra, Australia.

Table 2 – Surface water quality limits

Quality Characteristics	Units	Limit[2]	Source
pH (in situ)	pH units	5-7	Baseline data
Electrical Conductivity (in-situ)	µS/cm	19.5	Site-specific
Turbidity (in situ)	NTU	10.5	Site-specific
Sulfate	mg/L	22	Site-specific
Dissolved Aluminium (<0.45µm)	µg/L	95	Site-specific
Dissolved Aluminium (<0.1µm)	µg/L	60	Site-specific
Total Aluminium	µg/L	270	Site-specific
Dissolved Copper	µg/L	1.4	ANZG 2018
Dissolved Iron	µg/L	400	Site-specific
Dissolved Manganese	µg/L	23	Site-specific
Ammonia as N	mg/L	0.2	Site-specific
Nitrate	mg/L	0.5	Site-specific
Total Nitrogen as N incl. TKN, Nox	mg/L	0.9	Site-specific
Total Phosphorus	mg/L	0.05	Site-specific
Total recoverable hydrocarbons (C6-C9)	µg/L	20	Site-specific
Total recoverable hydrocarbons (C10-C36)	µg/L	100	Site-specific
Major ions (Calcium, chloride, potassium, magnesium, sodium, bicarbonate, carbonate)	mg/L	Interpretation	

1 Derived from the pooled results from Coconut Creek, Tapplebang Creek and the Ward River as set out in the Baseline Surface Water Monitoring Report in Appendix H of the EIS.

2 Limits for EC and turbidity based on 80th percentile and other limits based on 95th percentile of data

provided.

Table 3 – Surface waters monitoring locations

Monitoring Locations	Receiving waters location description	Latitude (decimal degree, GDA94)	Longitude (decimal degree, GDA94)
Upstream monitoring locations			
CCUS	Upstream monitoring point for Coconut Creek	-13.00918	141.80281
TCUS	Upstream monitoring point for Tapplebang Creek	-13.02493	141.87814
NCUS	Upstream monitoring point for Norman Creek	-12.98353	141.77244
Downstream monitoring locations			
CCDS	Downstream monitoring point for Coconut Creek	-13.06810	141.76760
TCDS	Downstream monitoring point for Tapplebang Creek	-13.11444	141.78599
NCDS	Downstream monitoring point for Norman Creek	TBA[1]	TBA[1]
WRUS	Monitoring point for Ward River (downstream of project site)	-13.13035	141.75181

1. TBA upon submission of PRCP

Figure 3 – Surface water monitoring locations[1]

TBA upon submission of PRCP

Table 4 – Groundwater monitoring bores

Monitoring Bore	Hydrogeological Unit	Latitude (decimal degree, GDA94)	Longitude (decimal degree, GDA94)
MB1A	Weathered Bulimba Fm	-13.0429	141.8118
MB1B	Bauxite	-13.043	141.8118
MB2A	Bulimba Fm/ weathered Bulimba Fm	-13.0866	141.8049
MB2B	Weathered Bulimba Fm	-13.0866	141.8049
MB3A	Weathered Bulimba Fm	-13.0294	141.8053
MB3B	Bauxite	-13.0294	141.8053
MB4A	Weathered Bulimba Fm	-13.0029	141.7928
MB4B	Bauxite	-13.0028	141.7928
MB5A	Bulimba Fm	-13.0164	141.8251

Monitoring Bore	Hydrogeological Unit	Latitude (decimal degree, GDA94)	Longitude (decimal degree, GDA94)
MB5B	Weathered Bulimba Fm	-13.0164	141.8252
MB6A	Bulimba Fm	-13.0067	141.8596
MB6B	Weathered Bulimba Fm/Bauxite	-13.0067	141.8595
MB7A	Weathered Bulimba Fm	-12.9762	141.7865
MB7B	Weathered Bulimba Fm/Bauxite	-12.9762	141.7865
MB8A	Bulimba Fm	-13.0629	141.7833
MB8B	Weathered Bulimba Fm	-13.0629	141.7833
MB9A	Bulimba Fm/ weathered Bulimba Fm	-13.0442	141.7697
MB9B	Weathered Bulimba Fm	-13.0443	141.7697
MB10A	Bulimba Fm	-12.9683	141.848
MB10B	Bauxite	-12.9683	141.8479
MB11A	Bulimba Fm/ weathered Bulimba Fm	-13.0007	141.7446
MB11B	Bauxite	-13.0006	141.7446
p-MB12	TBA[1]	TBA[1]	TBA[1]
p-MB13	TBA[1]	TBA[1]	TBA[1]
p-MB14	TBA[1]	TBA[1]	TBA[1]
p-MB15	TBA[1]	TBA[1]	TBA[1]
p-MB16	TBA[1]	TBA[1]	TBA[1]
p-MB17	TBA[1]	TBA[1]	TBA[1]
p-MB18	TBA[1]	TBA[1]	TBA[1]
p-MB19	TBA[1]	TBA[1]	TBA[1]
p-MB20	TBA[1]	TBA[1]	TBA[1]
p-MB21	TBA[1]	TBA[1]	TBA[1]
p-MB22	TBA[1]	TBA[1]	TBA[1]
p-MB23	TBA[1]	TBA[1]	TBA[1]
p-MB24	TBA[1]	TBA[1]	TBA[1]
p-MB25	TBA[1]	TBA[1]	TBA[1]
p-MB26	TBA[1]	TBA[1]	TBA[1]
p-MB27	TBA[1]	TBA[1]	TBA[1]
p-MB28	TBA[1]	TBA[1]	TBA[1]

1. TBA upon EA/PRCP application.

Table 5 – Groundwater Quality limits

Quality Characteristics[2,3]	Units		Limit[1]	Source
pH	pH units	All bores	5-7	Baseline data
Electrical conductivity	µs/cm	All bores, except MB3A	96	Site-specific
Electrical conductivity	µs/cm	MB3A	400	Site-specific
Sulfate	mg/L	All bores	30	Site-specific
Dissolved Aluminium (<0.45µm)	µg/L	All bores	165	Site-specific
Dissolved Copper	µg/L	All bores	40	Site-specific
Dissolved Iron	µg/L	All bores	780	Site-specific
Dissolved Manganese	µg/L	All bores	44	Site-specific
Petroleum Hydrocarbons C10-C36 Fraction (sum)	µg/L	All bores	360	Site-specific
Major ions (Calcium, chloride, potassium, magnesium, sodium, bicarbonate, carbonate)	mg/L	All bores	Interpretation	

1 Derived from the site-specific baseline groundwater quality results as set out in the Groundwater Report in Appendix F of the EIS.

2 All metals and metalloids must be measured as 'dissolved' (from analysis of a field filtered sample) and total (unfiltered).

3 Limits for metals and metalloids apply to dissolved results.

Table 6 – Groundwater level thresholds

Monitoring Location	Level (upper threshold[2])	Level (lower threshold[3])
C-MB1A	Baseline[1] + 1.43 m	Baseline[1] - 0.97 m
C-MB2A	Baseline[1] + 2.26 m	Baseline[1] - 0.78 m
C-MB4A	Baseline[1] + 6.04 m	Baseline[1] - 0.77 m
C-MB5A	Baseline[1] + 5.93 m	Baseline[1] - 1.60 m
C-MB7A	Baseline[1] + 5.55 m	Baseline[1] - 1.06 m
C-MB8A	Baseline[1] + 0.42 m	Baseline[1] - 1.06 m
C-MB9A	Baseline[1] + 4.98 m	Baseline[1] - 1.53 m

1 'Baseline' means baseline groundwater elevation (in mAHD). Baseline to be provided upon PRCP application.

2 Upper threshold equivalent to baseline groundwater elevation plus predicted groundwater mounding at bore location.

3 Lower threshold equivalent to baseline groundwater elevation minus predicted groundwater

drawdown at bore location.

Figure 4 – Groundwater monitoring locations[1,2]

1. TBA upon EA/PRCP application, including the monitoring locations, watercourses and final landform.
2. Figure to be updated to include bores relevant to closure only.

Section D - Definitions

Appropriately qualified person (AQP)	means a person who has professional qualifications, training, skills and 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.
Activity (EP Regulation)	includes that part, if any, of an activity relating to the following— (a) preparing a place for the activity before carrying out the activity; and (b) rehabilitating a place after it has been used for carrying out the activity.
BioCondition	refers to the *BioCondition Assessment Manual* (Eyre, T.J., Kelly, A.L, Neldner, V.J., Wilson, B.A., Ferguson, D.J., Laidlaw, M.J. and Franks, A.J. (2015)) and *BioCondition: A Condition Assessment Framework for Terrestrial Biodiversity in Queensland. Assessment Manual. Version 2.2* (Queensland Herbarium, Department of Science, Information Technology, Innovation and Arts, Brisbane).
Growth media	is defined as all soil and soil-like material that will support the final vegetation cover. This includes the topsoil and subsoil where these materials are applied independently. Where the topsoil is incorporated into the underlying subsoil/spoil, topsoil refers to the depth of incorporation and the remaining depth is regarded as subsoil. The total depth of growth media is nominally considered to be the effective plant root zone
Gully	is defined as a moderate to large channel carved into a ground-based material (soil, growth media, spoil) by the action of running water. Greater than 0.3 m deep and 0.3 m wide
Independent AQP	is an AQP who is a third party, being independent of the PRCP schedule holder, and has not previously provided advice on the matter the subject of the review.
Independently peer reviewed	means a peer reviewer who is a third-party to the PRCP schedule holder and the AQP whose report is being reviewed and substantiated. The peer reviewer shall also be an AQP and documentation provided must contain sufficient detail to allow for independent technical review and substantiation and provide and justify site-specific landform performance (SMART) criteria.
Native title party	is defined under section 34 of the *Aboriginal Cultural Heritage Act 2003*. *Note: Ngan Aak-Kunch* Aboriginal Corporation RNTBC *are the owners of Lot 211 SP241404 (inclusive of the Mine Site) in accordance with section 39 of the Aboriginal Land Act 1991 (Qld) and are the Native Title Holder on behalf of Wik Peoples.*
Rehabilitation activity	means any activity that the holder is required to carry out in relation to this PRCP schedule.
Stable	in relation to land, means landform dimensions are or will be stable within tolerable limits now and in the foreseeable future. Stability includes consideration of environmental context, geotechnical stability, settlement and consolidation allowances, bearing capacity (trafficability), erosion resistance and geochemical stability with respect to seepage, leachate and related

	contaminant generation.
Stabilised (including stabilised state)	means one or both of the following conditions apply: no evidence of sediment movement; sides and/or floors of erosion form are revegetated (Australian Soil and Land Survey Field Handbook Fourth Edition).
Stable condition	see section 111A of the *Environmental Protection Act 1994*.
Vegetative groundcover	is the living and attached plant material that comprise the ground cover components (shrubs, grasses, forbs). It does not include trees, organic litter, or coarse woody debris.

END OF PRCP SCHEDULE

Appendix C—Coordinator-General's stated conditions under the *Strong and Sustainable Resource Communities Act 2017*

This appendix includes conditions stated by the Coordinator-General under section 11(2) of the *Strong and Sustainable Resource Communities Act 2017* (SSRC Act). In accordance with section 11(3)(a) of the SSRC Act, these conditions are enforceable conditions under the *State Development and Public Works Organisation Act 1971*. The entity with jurisdiction for the conditions in this appendix is the Coordinator-General.

Condition 1. General conditions

(a) The proponent must advise the Coordinator-General in writing that construction of the project has commenced within 5 business days of construction commencing.

(b) The proponent must advise the Coordinator-General in writing that the operation of the project has commenced within 5 business days of operations commencing.

Condition 2. Social Impact Management Plan

(a) The proponent must develop and implement a detailed Social Impact Management Plan (SIMP) to manage the potential social impacts of the project identified in the social impact assessment (SIA) through ongoing community and stakeholder engagement.

(b) The proponent must submit the detailed SIMP to the Coordinator-General for approval at least 3 months prior to the commencement of construction.

(c) The SIMP must be prepared in consultation with the Aurukun Shire Council and the Ngan Aak-Kunch Aboriginal Corporation, and provided to Traditional Owners for review prior to submission to the Coordinator-General.

(d) The SIMP must outline the status of the Partnership Agreement at the time of submission and provide any publicly appropriate information approved by the Traditional Owners about key commitments of the Partnership Agreement.

(e) The SIMP must include an updated social baseline and indicators for Nearby Regional Communities.

(f) The SIMP must include the following plans:

  (i) Community and Stakeholder Engagement Plan in accordance with Condition 3

  (ii) Workforce Management Plan in accordance with Condition 4

  (iii) Housing and Accommodation Plan in accordance with Condition 5

  (iv) Local Business and Industry Procurement Plan in accordance with Condition 6 and

  (v) Health and Community Wellbeing Plan in accordance with Condition 7.

(g) A SIMP for the closure of the mine must be prepared and submitted to the Coordinator-General for approval at least 24 months prior to the conclusion of operations.

(h) The SIMP for closure must be prepared in consultation with Aurukun Shire Council, the Ngan Aak-Kunch Aboriginal Corporation and Traditional Owners and include the details of any legacy infrastructure agreements.

(i) The proponent must publish the SIMP on their website within one month of the Coordinator-General's approval of the plan. The proponent must notify the Coordinator-General within 5 business days of the SIMP being made publicly available on the proponent's website.

Condition 3. Community and Stakeholder Engagement Plan

(a) The proponent must engage with all relevant stakeholders to ensure they are informed about the project and that identified potential social impact issues are effectively managed and monitored.

(b) The proponent must prepare a Community and Stakeholder Engagement Plan that is to be submitted as part of the SIMP to the Coordinator-General for approval, in accordance with Condition 2.

(c) The Community and Stakeholder Engagement Plan must address the construction and total operation phases of the project, and include:

  (i) objectives and key performance indicators

  (ii) an analysis of key stakeholders and stakeholder issues

  (iii) action plans for ongoing engagement including details of proposed communication tools, timeframes for activities and roles and responsibilities for engagement

  (iv) the status of the formal communication structures nominated in the Community and Stakeholder Engagement Plan outlined in the Social Impact Management Plan (Appendix S) of the EIS, including the timing of engagement and key matters for discussion or resolution. This includes the Government Reference Agency Group, Aurukun Bauxite Partnership Committee, Emergency Management Committee and Aurukun Community Reference Group.

  (v) processes for incorporating stakeholder feedback into the further development of project-specific management measures

  (vi) details of any stakeholder agreements to be negotiated, including agreements with state and local government agencies

  (vii) a complaints management process and

  (viii) monitoring and reporting protocols.

(d) The Community and Stakeholder Engagement Plan must:

  (i) be consistent with the Community and Stakeholder Engagement Plan outlined in Section 4 of the Social Impact Management Plan (Appendix S) of the EIS (HB, 2022) and

  (ii) incorporate the management measures listed in Appendix S and proponent's commitments in Chapter 22 – Environmental Management and Commitments of the EIS (Glencore, 2025).

(e) The Community and Stakeholder Engagement Plan must provide details for:

  (i) providing advanced notice to directly affected landholders, Traditional Owners and residents of Aurukun of project works that may potentially impact on the amenity and activities of the land, Amban Outstation and traditional country.

  (ii) consulting with the Aurukun Shire Council, local service providers and relevant state agencies about potential impacts from the project on primary healthcare, childcare, road safety and measures to manage potential impacts.

Condition 4. Workforce Management Plan

(a) The proponent must prioritise recruitment of workers who are Wik and Wik Waya Traditional Owners, residents of Aurukun and culturally accepted by Traditional Owners, and residents of the nearby regional communities.

(b) The proponent must support the health and wellbeing of the project workforce.

(c) The proponent must prepare a Workforce Management Plan that is to be submitted as part of the SIMP to the Coordinator-General for approval, in accordance with Condition 2.

(d) The Workforce Management Plan must address the construction and operational phases of the project, and include:

- (i) objectives and key performance indicators
- (ii) updated summary workforce profile, including the estimated proportions of local workforce participants, regional workers and FIFO workers, and targets for Aboriginal and Torres Strait Islander employment.
- (iii) roster arrangements for local, regional and FIFO workers
- (iv) measures that implement the recruitment strategy described in the social impact management plan for the Aurukun Bauxite project
- (v) details of the Local Workforce Development Plan, including:
  - (1) detailed outline of the local workforce development programs, including the Community Capability Program, Work Readiness Program, Youth Engagement Program, Operational Readiness Program and Mentoring Program
  - (2) plan for enhancing work readiness for inmates at Lotus Glen Correctional Centre as agreed with Queensland Corrective Services
  - (3) establishment of transitional roles for local workforce participants
- (vi) measures to enhance potential employment opportunities for local communities including Indigenous people and mitigate potential negative social impacts
- (vii) proposed training and development initiatives to improve local and regional skills, including initiatives for those traditionally underrepresented
- (viii) programs to support the physical and mental health and wellbeing of workers
- (ix) the level of on-site health services to be provided for workers
- (x) details of any workforce code of conduct that governs worker interactions with local communities and
- (xi) monitoring and reporting protocols.

(e) The Workforce Management Plan must:

- (i) be consistent with the Workforce Management Plan outlined in Section 5 of the Social Impact Management Plan (Appendix S) of the EIS (HB, 2022) and
- (i) incorporate the management measures listed in Appendix S and proponent's commitments in Chapter 22 – Environmental Management and Commitments of the EIS (Glencore, 2025).

Condition 5. Housing and Accommodation Plan

(a) The proponent must limit or mitigate negative social impacts of the project to housing and accommodation affordability and availability in local and regional communities.

(b) The proponent must prepare a Housing and Accommodation Plan that is to be submitted as part of the SIMP to the Coordinator-General for approval, in accordance with Condition 2.

(c) The Housing and Accommodation Plan must be developed in consultation with Aurukun Shire Council and describe consultation undertaken with Aurukun Shire Council to monitor conditions of housing in Aurukun and the impact on the wellbeing of local workforce participants.

(d) The Housing and Accommodation Plan must address the construction and operational phases of the project, and include:

  (i) objectives and key performance indicators

  (ii) measures to enhance potential benefits for project workers and the community

  (iii) measures to mitigate potential negative social impacts

  (iv) policies regarding housing and accommodation support to be provided to project workers and their families who wish to move to Weipa and

  (v) monitoring and reporting protocols.

(e) The Housing and Accommodation Plan must:

  (i) be consistent with the Housing and Accommodation Plan outlined in Section 8 of the Social Impact Management Plan (Appendix S) of the EIS (HB, 2022) and

  (ii) incorporate the management measures listed in Appendix S and proponent's commitments in Chapter 22 – Environmental Management and Commitments of the EIS (Glencore, 2025).

(f) The Housing and Accommodation Plan must provide:

  (i) an updated assessment of Weipa housing availability and demand, housing tenure, dwelling stock, sales and rental volumes, and prices

  (ii) the likely impacts of the project on short-term accommodation

  (iii) the arrangements for housing the project's workforce, including the capacity of the temporary Construction Village and Accommodation Village

  (iv) analysis of the on-shift accommodation preferences for the local workforce participants and details of the arrangements to cater to their preferences

Condition 6. Local Business and Industry Procurement Plan

(a) The proponent must ensure that opportunities for local businesses to provide goods and services for the project are maximised during the construction and operational phases.

(b) The proponent must prepare a Local Business and Industry Procurement Plan that is to be submitted as part of the SIMP to the Coordinator-General for approval, in accordance with Condition 2.

(c) The Local Business and Industry Procurement Plan must address the construction and operational phases of the project, and include:

  (i) objectives and key performance indicators

(ii) updated list of potential local business supply opportunities, identifying any Aboriginal and Torres Strait Islander owned businesses

(iii) procurement strategies, initiatives and targets for local and regional suppliers, including Aboriginal and Torres Strait Islander owned businesses, and actions to facilitate participation

(iv) proposed policies and programs to build local and regional capacity and capability and reduce barriers to entry, including establishment of new local businesses

(v) processes that embed the local business and industry procurement strategies into the contracting model for the project

(vi) measures to mitigate any potential negative social impacts on local industries

(vii) details of any established industry guidelines or codes of practice which the proponent has committed to compliance and

(viii) monitoring and reporting protocols.

(d) The Local Business and Industry Procurement Plan must:

(i) be consistent with the Local Business and Industry Procurement Plan outlined in Section 6 of the Social Impact Management Plan (Appendix S) of the EIS (HB, 2022) and

(ii) incorporate the management measures listed in Appendix T and proponent's commitments in Chapter 22 – Environmental Management and Commitments of the EIS (Glencore, 2025).

Condition 7. Health and Community Well-being Plan

(a) The proponent must limit or mitigate negative social impacts of the project and capitalise on opportunities to improve the health and well-being of local and regional communities.

(b) The proponent must limit or mitigate adverse impacts of the project on the level of service (social services, facilities and infrastructure) currently provided to local communities.

(c) The proponent must prepare a Health and Community Well-being Plan that is to be submitted as part of the social impact management plan to the Coordinator-General for approval, in accordance with Condition 2.

(d) The Health and Community Well-being Plan must address the construction and operational phases of the project, and include:

(i) objectives and key performance indicators

(ii) measures to ensure that Wik and Wik Waya cultural identity is supported

(iii) measures reduce impacts to the amenity of Amban Outstation

(iv) measures to ensure that the level of service provided to the local community by existing social services, facilities and infrastructure is not reduced

(v) measures to mitigate potential health and well-being impacts on Aurukun and enhance potential benefits

(vi) emergency response arrangements and management measures agreed with emergency service providers, for incidents associated with the project, both on and off the project site

(vii) details of any community development programs to be implemented, and the outcomes to be achieved and

(viii) monitoring and reporting protocol.

(e) The Health and Community Well-being Plan must:

(i) be consistent with the Health and Community Well-being Plan outlined in Section 7 of the Social Impact Management Plan (Appendix S) of the EIS (HB, 2022) and

(ii) incorporate the management measures listed in Appendix S and proponent's commitments in Chapter 22 – Environmental Management and Commitments of the EIS (Glencore, 2025).

(f) The Health and Community Well-being Plan must provide details for the following matters:

(i) measures developed in consultation with the Aurukun Shire Council, Queensland Health and other service providers to limit potential adverse impacts of the project on the level of healthcare service and childcare services provided to the local community

(ii) measures developed in consultation with Queensland Police Service (QPS) to monitor and manage drug and alcohol consumption and additional QPS services required for project activities

(iii) measures developed in consultation with Aurukun Shire Council to limit potential adverse impacts on council owned infrastructure and

(iv) measures developed in consultation with Traditional Owners to facilitate continued access to traditional country, including any agreements for access to Tapplebang Creek.

Condition 8. Reporting on the implementation and effectiveness of social impact management measures

(a) The proponent must prepare an annual Social Impact Management Report (SIMR) for each year of construction, the first 5 years of operation and every third year thereafter for the life of the project.

(b) The annual SIMR must be submitted to the Coordinator-General for approval within 30 business days after the end of the relevant 12-month period from the commencement of construction of the project.

(c) The annual SIMR must be presented to Aurukun Shire Council, the Ngan Aak-Kunch Aboriginal Corporation and Traditional Owners for review prior to submission to the Coordinator-General.

(d) The annual SIMR must include any updates on the status of the Partnership Agreement and provide any publicly appropriate information approved by the Traditional Owners about key commitments of the Partnership Agreement.

(e) Using the monitoring protocol described in the SIMP, the SIMR must detail:

(i) an assessment of the social impacts of the project against the potential social impacts identified in the social impact assessment, including the consideration of other proposed developments in regional communities

(ii) the progress and effectiveness of the social impact management measures identified in the social impact management plan

(iii) where monitoring indicates measures have not been effective, describe how those social impact management measures have been modified

(iv) ongoing assessment of social indicators for Aurukun (in relation to the social baseline prior to the project)

(v) the actions taken to implement closure commitments made by the proponent.

(f) The SIMR must present the total workforce profile including:

(i) total number of workers employed

(ii) proportion of local workforce participants, regional workforce participants, Aboriginal and Torres Strait Islander workers and FIFO workers from outside of the western Cape

(iii) usual place of residence of the workforce.

(g) Each SIMR must be publicly available on the proponent's website within 30 business days of the Coordinator-General's approval of the relevant report. The proponent must notify the Coordinator-General within 5 business days of the SIMR being published on proponent's website.

Definitions

‘commencement of construction’ is defined as the commencement as the commencement of the activities as described in Section 4.12 of Chapter 4 – Project Description of the EIS.

‘commencement of operation’ is mining and processing of bauxite.

‘Traditional Owners’ are the Wik and Wik Waya People that hold Native Title rights over the mine site.

‘FIFO worker’ is a worker who does not live in the nearby regional communities.

‘local communities’ is the Aurukun township.

‘nearby regional communities’ are Aurukun, Weipa, Napranum and Mapoon.

‘local worker’ is a worker who lives in one of the local communities.

‘local workforce participant’ is a Wik and Wik Waya Traditional Owner or a resident of Aurukun that is culturally accepted by the Traditional Owners.

‘regional workforce participant’ is an indigenous or non-indigenous worker from Weipa, Napranum or Mapoon.

‘the project’ the Aurukun Bauxite project.

Appendix D—Recommended conditions for the Australian Government's approval

To ensure the mitigation measures and offsets summarised in sections 6.20.4 and 6.20.5 are enforceable, the proposed conditions for the MNES controlling provisions of listed threatened species and ecological communities; listed migratory species and the Commonwealth Marine Area, are recommended for the Australian Government's approval under the *Environment Protection and Biodiversity Conservation Act 1999*.

Condition 1. Maximum clearance limits

The outcome sought by this condition is to ensure the proponent does not impact on more than the defined maximum disturbance limits for habitat for listed threatened species and ecological communities specified in **Table 7** for each stage of the action.

a) The proponent must not clear outside of the project area
b) During each stage of the action, the proponent must not clear more than the areas (in hectares) of habitat for each listed threatened species and community as specified in the following Table 7.

Table 7 Maximum disturbance limits to habitat for Listed threatened species

Listed threatened species	EPBC Act status	Total impact (ha)
palm cockatoo, *Probosciger aterrimus macgillivrayi*	Vulnerable	8,725.5
red goshawk, *Erythrotriorchis radiatus*	Vulnerable	9,306
black-footed tree-rat, *Mesembriomys gouldii rattoides*	Vulnerable	6,897
masked owl, *Tyto novaehollandiae kimberli*	Vulnerable	9,306

Condition 2. Matters of National Environmental Significance (MNES) Management Plan

The outcome sought by this condition is to ensure that prior to the commencement of the action on the project site, the proponent has a MNES Management Plan in place which includes specific species/ ecological community management measures for the listed threatened and migratory species shown below:

- Palm cockatoo (*Probosciger aterrimus macgillivrayi*) - Vulnerable,
- Red goshawk (*Erythrotriorchis radiatus*) - Vulnerable
- Black-footed tree-rat (north Queensland) (*Mesembriomys gouldii rattoides*) - Vulnerable
- Masked owl (northern) (*Tyto novaehollandiae kimberli*) - Vulnerable
- Largetooth sawfish, (*Pristis pristis)* – Vulnerable, Migratory
- Olive ridley turtle, (*Lepidochelys olivacea)* – Endangered, Marine and Migratory
- Green turtle, (*Chelonia mydas)* - Vulnerable, Marine and Migratory
- Hawksbill turtle, *Eretmochelys imbricata*- Vulnerable, Marine and Migratory
- Loggerhead turtle, (*Caretta caretta)* - Endangered, Marine and Migratory
- Flatback turtle, (*Natator depressus)* - Vulnerable, Marine and Migratory

a) The proponent must submit a MNES Management Plan for the written approval of the Australian Minister for the Environment and Water prior to commencement of the action.
b) The proponent must not commence the action until the Australian Minister for the Environment and Water has approved the MNES Management Plan.
c) The approved MNES Management Plan must be implemented from commencement of the action until the end of the approval and all MNES management and rehabilitation activities have been completed as

per the conditions of approval.

d) The MNES Management Plan must:
(i) be prepared by a suitably qualified ecologist in accordance with the Australian Government department's *Environmental Management Plan Guidelines* and the *National Light Pollution Guidelines for Wildlife* (DCCEEW 2023).

(ii) be prepared in consultation with Traditional Owners in accordance with the process under the Partnership Agreement and the associated Working Group.

(iii) include: measures that will be implemented to avoid, mitigate, and manage impacts to EPBC Act listed threatened species and their habitat during construction, operation, and decommissioning of the action, within, adjacent and downstream of the project site.

(iv) detail how proposed management measures align with EPBC Act requirements including relevant approved conservation advice and consistency with the measures contained in relevant recovery plans and threat abatement plans.

Condition 3. Palm cockatoo

To avoid and mitigate harm as a result of the Action on the **palm cockatoo**, (*Probosciger aterrimus macgillivrayi*), the approval holder must implement the following mitigation measures:

a) conduct pre-clearance surveys of all potential hollows within the project footprint prior to clearance to identify occupied hollows. Surveys must:
    i. be conducted by a suitably qualified ecologist within the breeding season of the palm cockatoo.
    ii. include transect searches and camera trap surveys for nesting birds within mapped breeding habitat, and within 1,500m of breeding habitat in the breeding season of the palm cockatoo.
    iii. survey methods must comply with *Field methods to identify Palm Cockatoo nest hollows* (Zdenek et al. 2022).
    iv. survey methods must include inspection of all potential hollow trees subject to impact for palm cockatoo use. Hollows must be inspected with either:
        a. a pole-mounted camera to determine whether nest platform sticks are present or
        b. camera traps installed at breast height on nearby trees with a view of the potential hollow.
    v. if survey methods confirm nesting, then a minimum 400m exclusion zone is to be flagged with tape and maintained around the nest hollow tree and additional display hollow trees being actively used in the breeding cycle.
    vi. confirmed nesting and display habitat trees must be retained, including within proposed mining or infrastructure areas for the year of breeding and two subsequent breeding seasons, i.e. three years.
    vii. any nest trees that are retained must be marked on site and depicted in on-site drawings.
    viii. a minimum exclusion area of 400m must apply around retained nesting trees.
    ix. active nests must be subject to a suitable ongoing monitoring program.
    x. nest trees that are not further used within the three-year period should be marked as abandoned hollows that can then be assessed for clearing.
b) to prevent potential impacts to the palm cockatoo, at the time of clearance the Approval Holder must ensure:
    i. no occupied nest trees are removed or damaged.
    ii. all occupied nest trees and surrounding habitat up to 400m from the nest tree are retained
    iii. an appropriately qualified spotter-catcher must be present to identify palm cockatoos and minimise impacts to fauna habitat during any vegetation clearing.
    iv. undertake sequential clearing practices in the direction of retained habitat, allowing

dispersal opportunities for displaced palm cockatoos.

c) to mitigate impacts to palm cockatoo the Approval Holder must prevent degradation of uncleared areas of the project site through implementation of:
    i. appropriate fire control measures (including targeted aerial incendiary operations parallel to Aurukun Road, mosaic burning only every 2-3 years, and exclusion of fire from riparian areas) from prior to commencement of construction activities through to the end of the approval to protect the Coconut Creek, Tapplebang Creek and Norman Creek buffer zones.
    ii. a feral animal management program to reduce feral pig and feral cat populations to improve habitat quality.
d) to monitor the palm cockatoos on the project site, the Approval Holder must implement a species monitoring program that:
    i. includes all information on the palm cockatoo presence and use of the project site as identified in the EIS.
    ii. identifies and protects active nest sites of the palm cockatoo on the project site.
    iii. monitors the number of palm cockatoo breeding pairs and records their breeding activities including the number of juveniles fledged.
    iv. improves the understanding of the species habitat use for breeding, foraging and dispersal.
    v. improves the understanding of the species responses to bushfire management regimes that aim to retain and recruit suitable breeding hollows.

Condition 4. Red goshawk

To avoid and mitigate harm as a result of the Action on the **red goshawk**, (*Erythrotriorchis radiatus*), the Approval Holder must incorporate the following measures to mitigate potential impacts to the red goshawk, as a minimum:

a) a suitably qualified ecologist is to implement transect searches and camera trap surveys for nesting birds within preferred breeding habitat i.e. 2.5km proximity from watercourses, in the breeding season, i.e. May to October of the red goshawk.
b) if nesting is confirmed, a minimum 400m exclusion zone is to be flagged with tape and maintained around the nest site.
c) confirmed nesting habitat trees must be retained within proposed mining or infrastructure areas.
    i. retained habitat trees must be marked on site and depicted in on-site drawings.
    ii. a minimum exclusion area of 400m must apply around retained habitat trees.
    iii. a minimum area of 25% of red goshawk habitat must be retained within four square kilometres of a red goshawk nest.
    iv. active nests must be subject to a suitable ongoing monitoring program.
    v. nest trees that are not further used within a three-year period should be marked as abandoned that can then be assessed for clearing.
d) an appropriately qualified spotter-catcher must be present to identify red goshawks and minimise impacts to fauna habitat during any vegetation clearing. Areas of potential habitat must be flushed immediately prior to any clearing works.
e) undertake sequential clearing practices in the direction of retained habitat, allowing dispersal opportunities for displaced red goshawks.
f) appropriate fire control measures (including targeted aerial incendiary operations parallel to Aurukun Road, mosaic burning only every 2-3 years, and exclusion of fire from riparian areas) must be proposed in the Bushfire Management Plan prior to commencement of construction activities to protect the Coconut Creek, Tapplebang Creek and Norman Creek buffer zones.
g) implement a feral animal management program to reduce feral pig and feral cat populations to improve habitat quality.
h) implement a species monitoring program to:
    i. identify and protect active nest sites of the red goshawk on the project site.

ii. aim to maintain or increase the number of red goshawk breeding pairs.
iii. improve the understanding of the species habitat use for breeding, foraging and dispersal.
iv. improve the understanding of the species responses to bushfire management regimes that aim to:
    i. retain and recruit suitable nest habitat trees, and
    ii. improve the habitat resources for the species prey of small and medium-sized birds.

Condition 5. Black-footed tree-rat (north Queensland)

To avoid and mitigate harm as a result of the Action on the **black-footed tree-rat (north Queensland)**, (*Mesembriomys gouldii rattoides)*, the Approval Holder must incorporate the following measures to mitigate potential impacts to the species, as a minimum:

a) pre-clearance surveys must be undertaken by a suitably qualified ecologist to map and mark the location of habitat trees within the clearing area and completed one to three weeks prior to commencement of vegetation clearing.
b) if nesting is confirmed, a minimum 200m exclusion zone is to be flagged with tape and maintained around the nest site until the breeding cycle is complete or the nest is abandoned.
c) confirmed nesting habitat trees must be retained within proposed mining or infrastructure areas.
    i. retained habitat trees must be marked on site and depicted in on-site drawings
    ii. a minimum exclusion area of 200m must apply around retained habitat trees
    iii. active nests must be subject to a suitable ongoing monitoring program
d) an appropriately qualified spotter-catcher must be present to identify black-footed tree-rats and minimise impacts to fauna habitat during any vegetation clearing. Areas of potential habitat must be flushed immediately prior to any clearing works.
e) clearing within black-footed tree-rat habitat must be undertaken sequentially, in daylight hours and outside of peak breeding season as a priority and in accordance with vegetation clearing mitigation measures.
f) appropriate fire control measures (including targeted aerial incendiary operations parallel to Aurukun Road, mosaic burning only every 2-3 years, and exclusion of fire from riparian areas) must be proposed in the Bushfire Management Plan prior to commencement of construction activities to protect and maximise the structural diversity of the ground habitat in the Coconut Creek, Tapplebang Creek and Norman Creek tributary buffer zones.
g) Undertake feral pig and feral cat control measures such as baiting and shooting, in the post-fire period as an effective way to dampen feral cat and pig impacts, and to support the recovery of the black-footed tree-rat and other small mammal species.
    i. monitor and report on the outcomes of feral pig and feral cat control programs.
    ii. consider the likely interactions of fire with cats (their density, activity and impacts) and report on post-fire survey findings.

Condition 6. Masked owl (northern)

To avoid and mitigate harm as a result of the Action on the **masked owl (northern)**, (*Tyto novaehollandiae kimberli*), the Approval Holder must incorporate the following measures to mitigate potential impacts to the species, as a minimum:

a) pre-clearance surveys must be undertaken by a suitably qualified ecologist to map and mark the location of habitat trees within the clearing area and completed one to three weeks prior to commencement of vegetation clearing.
b) this would include the use of dusk stag watching, call-playback, spotlighting and autonomous acoustic recording devices to target masked owls (northern).
c) if nesting is confirmed, a minimum 200m exclusion zone is to be maintained around the nest site until

the breeding cycle is complete or the nest is abandoned.

d) any active masked owl (northern) nesting site is to be monitored until the nesting cycle has been completed.
e) the nest tree and buffer zone cannot be cleared or disturbed until the end of the breeding season (i.e. May to October) or until fledglings no longer use the nest for habitat.
f) an appropriately qualified spotter-catcher must be present to identify masked owls (northern) and minimise impacts to fauna habitat during any vegetation clearing. Areas of potential habitat must be flushed immediately prior to any clearing works.
g) undertake sequential clearing practices in the direction of retained habitat, allowing dispersal opportunities for displaced masked owls (northern).
h) removal of hollow-bearing habitat trees must be consistent with best practice management measures and supervised by a suitably qualified person or spotter-catcher.
i) appropriate fire control measures (including targeted aerial incendiary operations parallel to Aurukun Road, mosaic burning only every 2-3 years, and exclusion of fire from riparian areas) must be proposed in the Bushfire Management Plan prior to commencement of construction activities to protect the Coconut Creek, Tapplebang Creek and Norman Creek buffer zones.

Condition 7. Largetooth sawfish

To avoid and mitigate harm as a result of the Action on the **largetooth sawfish**, (*Pristis pristis*), the Approval Holder must incorporate the following measures, to mitigate potential impacts to the species, as a minimum:

a. pile driving must include soft start procedures and incorporate behavioural exclusion zones. Pile driving must not occur during the construction period from 1 November to 31 March. Pile driving must be restricted to a maximum of one pile per day during daylight hours.
b. complete a study, undertaken by suitably qualified experts in hydrology and sawfish ecology, based on modelling and historical rainfall record, examining a range of alternative dam filling scenarios:
    i. the study, at a minimum, will examine three dam filling scenarios, where the minimum environmental release of 5.1ML/d from Tapplebang Dam is maintained and up to 25%, 50% or 75% of inflows to Tapplebang dam are captured in the dam with the remaining flows released to Tapplebang Creek below the dam.
    ii. the study must include an analysis of the effect on daily downstream flows in Tapplebang Creek and Ward River to monitoring location WR4 in the context of average rainfall conditions, a low-rainfall wet season and a late onset wet season.
    iii. analysis of how the various dam filling scenarios will affect water security for the project must be provided.
    iv. analysis of additional dam filling scenarios defined by the Approval Holder can also be included.
c. the study must be provided to the department prior to commencement of the action for approval of a specific dam filling scenario.
d. filling of Tapplebang Dam must not commence until the Approval Holder receives written approval from the Minister for a specific dam filling scenario.
e. the Approval Holder may request to alter the approved dam filling scenario if suitable evidence is provided to demonstrate that largetooth sawfish do not inhabit the Tapplebang Creek or Ward River upstream of WR4.
f. implement measures detailed in the proposed Sawfish Monitoring Plan to manage potential impacts to sawfish species including the largetooth sawfish in the Ward River catchment from project activities.
    i. the monitoring regime must include Trigger Action Response Plan measures to detect impacts on sawfish and appropriate corrective actions should triggers be exceeded.

ii. suitable adaptive management measures must be proposed for sawfish if detected in the upper freshwater reaches of the Ward River, or Coconut Creek and/ or Tapplebang Creek.

Condition 8. Marine

To avoid and mitigate harm as a result of the Action on the **olive ridley turtle**, (*Lepidochelys olivacea*), **green turtle**, (*Chelonia mydas*), **hawksbill turtle**, (*Eretmochelys imbricata*), **loggerhead turtle**, (*Caretta caretta*), **flatback turtle**, (*Natator depressus*), **dugong**, (*Dugong dugon*), **Australian snubfin dolphin**, (*Orcaella heinsohni*), and **Indo-Pacific Humpback dolphin**, (*Sousa chinensis*), the Approval Holder must incorporate the following measures to mitigate potential impacts to the species, as a minimum:

a) undertake activities in accordance with a Marine Water Quality Management Plan, Marine Water and Coral Monitoring Program and Marine Management Plan that must be completed prior to the commencement of construction activities. These management plans must cover all facets of the construction and operation of all marine related precincts for the Aurukun Bauxite Project, including but not limited to, the CLF, shipping activities, anchoring, and underwater noise. These management plans must be provided for the Minister's approval and must effectively define, avoid, manage and mitigate against impacts to the MNES listed in Condition 8.
b) include a Trigger Action Response Plan in the Marine Water and Coral Monitoring program.
    i. this must establish triggers for action when there is evidence of a reduction in coral or boulder cover at monitored coral and boulder habitat locations as a result of vessel wash mobilising bed sediments.
    ii. assess and report on the success of adaptive management responses.
c) pile driving mitigation measures for the CLF must include soft start procedures and incorporate behavioural exclusion zones of 100m. These exclusion zones must be implemented to ensure the above listed species are not exposed to sound exposure levels greater than or equal to 175dB re qμ Pa^2. Pile driving must not occur during the construction period from 1 November to 31 March. Pile driving must be restricted to a maximum of one pile per day during daylight hours.
d) pile driving operations must cease if the above listed species are observed within the exclusion zone. Action to cease all pile driving operations within the exclusion zone must be taken within two minutes of the observation, or as soon as possible if it is unsafe to cease pile driving operations within two minutes. Every 30 days during periods of pile driving operations, the Approval Holder must report the number of incidents where pile driving operations did not cease within two minutes.
e) specify and commit to procedures to manage, monitor and report on any avoidance behaviour of marine turtles, dugong, Australian snubfin dolphin and Indo-Pacific Humpback dolphin due to pile driving impacts.
f) to mitigate impacts to marine turtles, dugong and cetaceans from pile driving the Approval Holder must not undertake pile driving during the peak marine turtle nesting periods of 1 November to 31 March and 1 June to 31 August.
    i. establish a program capable of accurately monitoring turtle, dugong, Australian snubfin dolphin and Indo-Pacific Humpback dolphin presence before and after the pile driving construction period.
    ii. the program must establish baseline population demographic information for all recorded marine turtle species found in the coral and boulder habitat and beach nesting locations. Performance criteria must be established for marine turtles, dugong, Australian snubfin dolphin and Indo-Pacific Humpback dolphin to demonstrate there will be no adverse effect on the ecological values of these species

from marine impacts as a result of piling activities.

iii. use a survey methodology appropriate to the biology, behaviour (foraging/ inter-nesting), habitat type (e.g. depth/ substrate), and seasonality of habitat use for the individual marine turtle species, dugong and cetaceans.

iv. establish corrective actions for where trigger values have been reached and/or exceeded in relation to observed avoidance behaviour by marine turtles, dugong and cetaceans.

v. establish and commit to timing for notifying the Australian Minister for the Environment and Water when an environmental offset in accordance with the principles of the *EPBC Act Environmental Offsets Policy 2012* may be required.

g) to mitigate impacts to the above listed species from the CLF load-out jetty and the transport of product bauxite the approval holder must:

i. mitigate vessel noise at the CLF load-out jetty by avoiding engine idling when vessels are not in use.

ii. mitigate the impacts of artificial lighting from the CLF by undertaking management measures detailed in the Artificial Light Management Plan.

iii. implement an artificial light monitoring program (incorporating monitoring, reporting and adaptive management measures) detailed in the Artificial Light Management Plan.

iv. propose and implement corrective actions for "problem lights". Corrective actions include but are not limited to avoiding the wavelengths of light that the above listed turtle species are known to be attracted to; providing additional shielding; undertaking activities requiring illumination of problem lights during daylight hours only; altering the orientation of light fittings to ensure that there will be no light visible from the beach or the marine turtle nesting habitat; avoidance of nocturnal activities requiring lights during peak breeding/nesting season.

h) implement a slow speed two (6) knot zone over the first 1.6km of the transhipment route from the CLF to reduce the risk of vessel strike.

i. vessel movement controls associated with the construction and operational phases of the project must comply with marine mammal management measures stipulated in the Nature Conservation (Animals) Regulation 2020.

ii. adhere to the *no approach zone* and *caution zone* limits for whales, dugongs and dolphins as prescribed in the Nature Conservation (Animals) Regulation 2020. Ensure vessels do not operate at a speed of more than two (6) knots.

iii. in the event of a marine mammal being killed by vessel strike, the Approval Holder must notify the department within ten (10) business days.

i) specify procedures to monitor and report on the potential extent and severity of nest predation to the five species of marine turtles within the study area associated with the CLF. This must include commitment to, and implementation of, measures outlined in an approved Feral Animal Management Plan.

j) implement specific measures within the study area associated with the CLF to protect marine turtle nesting habitat, potentially undertake nest relocation, and targeted monitoring and eradication of locally active feral pigs depredating nests.

k) any marine turtle nest relocation must occur in accordance with the approved Species Management Program and/or Damage Mitigation Permit obtained under the Queensland *Nature Conservation (Animals) Regulation 2020*.

Condition 9. Offsets

The outcome sought by this condition is to provide an approved Offset Area Management Plan that is consistent with the *EPBC Act Environmental Offsets Policy 2012* and the approved Offset Management Strategy.

The purpose of the following conditions is to compensate for the significant residual impacts to the palm cockatoo, red goshawk, black-footed tree-rat (north Queensland), and masked owl (northern).

a) Submit an updated Offset management strategy to incorporate field assessments of the preferred offset area, including:
    i. assessments of ground-truthed REs.
    ii. data from Biocondition surveys including the establishment of reference sites for RE benchmarks on both the impact site and offset site.
    iii. targeted fauna surveys.
    iv. habitat assessments of nest trees for palm cockatoo (using *Field methods to identify Palm Cockatoo nest hollows*, (Zdenek et al. 2022)), red goshawk, masked owl (northern), and black-footed tree-rat (north Queensland).
    v. MNES habitat mapping for the listed threatened species: palm cockatoo, red goshawk, masked owl (northern), and black-footed tree-rat (north Queensland).
    vi. providing the area and potential quality of each habitat type (consistent with Table 4.1 of Appendix Q, Offset Management Strategy) in the offset area for each of the four significantly impacted species.
    vii. updated habitat quality scoring, including methodology, evidence and data for attributes under site condition, site context, and species stocking rate, to inform and revise the EPBC Act Offsets Assessment Guide calculations for each of the four significantly impacted species. Justify habitat quality gains and risk of loss calculations with evidence.
b) The proponent must submit the updated Offset management strategy for the written approval of the Australian Minister for the Environment and Water prior to commencement of the action.
c) To compensate for the significant impacts of the action, the proponent must submit an OAMP, for the approval of the Australian Minister for the Environment and Water prior to commencing the action, proposing environmental offsets for impacts to palm cockatoo habitat, red goshawk habitat, masked owl (northern) habitat, and black-footed tree-rat (north Queensland) habitat.
d) The OAMP must meet the requirements of the *EPBC Act Environmental Offsets Policy 2012* and the *Environmental Management Plan Guidelines* to the satisfaction of the Australian Minister for the Environment and Water.
e) The OAMP must be consistent with the Offset Management Strategy.
f) The OAMP must:
    i. be prepared by a suitably qualified ecologist
    ii. include the details [details to be advised], and
    iii. be attached to the mechanism used to legally secure each offset area specified in the approved OAMP.
g) The proponent must obtain the environmental offset area(s) specified in the approved OAMP prior to the commencement of the action and submit the application to legally secure each of the environmental offset area(s) specified in the approved OAMP prior to commencement of the action. Each of the environmental offset area(s) specified in the approved OAMP must be legally secured before commencement.
h) The proponent must notify and provide evidence to DETSI in writing within five (5) business days of each environmental offset area being obtained; and again within five (5) business days of the submission to legally secure each environmental offset area(s); and again, within five (5) business days of each environmental offset area being legally secured.
i) Management actions within an OAMP must incorporate fire management methods to reduce the risk of fire destroying nesting hollow trees for the palm cockatoo, red goshawk, masked owl (northern) and black-footed tree-rat (north Queensland). This must include but not be limited to the creation of 3m radius firebreaks around used, confirmed and some potential nesting trees as recommended by the Field methods (Zdenek et al. 2022).

j) Environmental offsets for the palm cockatoo must include artificial nest boxes erected in the offset site(s) for use by existing or displaced palm cockatoos. Artificial nest boxes – such as 'Cockatubes' – must be monitored for use by palm cockatoos for the duration of the Action.

k) To ensure that the offsets required for red goshawk habitat, palm cockatoo habitat, masked owl (northern) habitat, black-footed tree-rat (north Queensland) habitat provide a conservation gain in accordance with the *EPBC Act Environmental Offsets Policy 2012*, the proponent must:
    i. achieve the completion criteria specified in the approved OAMP within 20 years of the commencement of the Action, and
    ii. once the completion criteria specified in the approved OAMP have been achieved, maintain or improve the condition of the above types of habitat in the offset areas specified in the approved OAMP for the remaining duration of the approval.

l) The proponent must, within 40 business days of the 20th anniversary of the commencement of the Action:
    i. submit to DCCEEW a report detailing the areas and condition of red goshawk habitat, masked owl (northern) habitat, black-footed tree-rat habitat (north Queensland) and palm cockatoo habitat recorded in the year prior to the 20th anniversary of the commencement of the Action in each offset area specified in the approved OAMP, and
    ii. notify DCEEW in writing of any completion criteria at any offset area specified in the approved OAMP that has not been achieved and the likely reasons that this/these completion criteria have not been met.

m) The proponent must ensure that the offset area remains secured at least until the expiry date of the approval.

Condition 10. Marine Management Plan

The outcome sought by this condition is to ensure that prior to the commencement of the action, the proponent has a Marine Management Plan in place which includes specific management measures for marine and migratory species. The Marine Management Plan must be prepared in accordance with the *Environmental management plan guidelines* (DCCEEW 2024).

The Marine Management Plan must detail measures to avoid, mitigate and manage impacts to dugong (*Dugong dugong*), listed sawfish and river shark species, listed marine turtle species and listed cetacean species and the environment of the Commonwealth Marine Area, including:

a. artificial light related impacts from barging and shipping activities, and anchored/moored vessels.
b. barging and shipping activities, including management of bauxite dust and contamination spills
c. vessel strike, including restricting vessel speed limits to six (6) knots; and adhering to the *no approach zone* and *caution zone* limits for whales, dugongs and dolphins as prescribed in the Nature Conservation (Animals) Regulation 2020.
d. underwater noise including pile driving activities, and barging and shipping activities.
e. the risk of introduced marine pest species over the life of the project, including ballast water management.
f. a monitoring program to determine the success of mitigation and management measures to ensure adaptive management for the duration of the EPBC Act approval.
g. details of how proposed management measures take into account relevant approved conservation advices, and are consistent with the measures contained in relevant recovery plans and threat abatement plans, and
h. details of the timeframe for reviews of the approved Marine Management Plan; including to ensure that the Marine Management Plan is informed by the findings of the Marine Water Quality Management Plan, Marine Water and Coral Monitoring Program.

Appendix E—*Human Rights Act 2019* impact assessment

Introduction

The Aurukun Bauxite Project is a proposed bauxite mine located approximately 600km northwest of Cairns and 23km northeast of the town of Aurukun on Western Cape York. The mine is expected to produce up to 15 million tonnes (Mt) per annum of run-of-mine (ROM) bauxite ore, yielding up to eight million dry tonnes per annum of product bauxite.

Bauxite ore would be extracted using open-cut mining methods, processed in an on-site beneficiation plant, and transported by road train to a Coastal Loading Facility (CLF) approximately 15km west of the mine site on the western edge of Cape York. From the CLF, the bauxite would be transhipped to ocean-going vessels moored in the Gulf of Carpentaria.

The project proponent is the Aurukun Bauxite Project Joint Venture, an unincorporated joint venture between Glencore Bauxite Resources Pty Ltd, a wholly owned subsidiary of Glencore plc (Glencore), and MDP Bauxite Pty Ltd, a wholly owned subsidiary of Mitsubishi Corporation (Mitsubishi).

As the decision-maker, I have considered the Environmental Impact Statement (EIS) for the project, which describes the project in detail and assesses its potential environmental, economic, and social impacts—both positive and negative. The EIS also outlines monitoring, management, and mitigation measures to avoid or minimize adverse impacts and examines feasible alternatives to the project. The EIS process provided opportunities for state government agencies and the public to review and submit comments on the project.

After a thorough assessment of the EIS, I have determined that the project is suitable to proceed, subject to strict conditions and required actions to be undertaken by the proponent.

This human rights assessment demonstrates how human rights considerations have been integrated into my decision-making process. In accordance with the *Human Rights Act 2019* (HR Act), I have considered human rights, ensuring that my decision is compatible with the rights of individuals in Queensland. It is important to note that human rights protections under the HR Act apply only to individuals and not to corporations. Therefore, this assessment focuses exclusively on how my decision may affect the human rights of individuals. I am satisfied that my decision meets the requirements of the HR Act and upholds my obligations as the decision-maker

Legislative basis

Section 58(1) of the HR Act makes it unlawful for a public entity, in its decision making, to fail to give proper consideration to a human right relevant to a decision or action (section 58(1)(b) of the HR Act). It is also unlawful for a decision to be made in a way that is not compatible with human rights (section 58(1)(a) of the HR Act).

The HR Act relevantly applies to public service employees, including a decision maker for an Environmental Impact Statement assessment report (EIS assessment report) under the *Environmental Protection Act 1994* (EP Act). When deciding if the project is suitable to proceed, I am required to:

- give proper consideration to human rights relevant to my decision; and
- make decisions that are compatible with human rights.

A decision will be compatible with human rights if it does not limit a human right or limits a human right only to the extent that is reasonable and demonstrably justifiable in accordance with section 13 of the HR Act (section 8 of the HR Act).

In order to decide whether a limit on a human right is reasonable and demonstrably justified, it is necessary consider:

(a) the nature of the right
(b) the nature and purpose of the limitation
(c) whether the limitation helps to achieve the purpose
(d) whether there is any less restrictive way of achieving the purpose
(e) on balance, whether the importance of achieving the purpose outweighs the importance of preserving the right (section 13(2)).

I have undertaken this consideration as set out below.

Assessment details

Assessing officer: Chris Loveday

Decision/action

This human rights assessment relates to the giving notice of the decision under section 56A(5) of the EP Act and the subsequent requirement under section 57 of the EP Act to give an EIS assessment report for the Aurukun Bauxite Project EIS, proposed by the Aurukun Bauxite Project Joint Venture (the proponent).

The chief executive must give the proponent a report (an EIS assessment report) about the submitted EIS within 30 business days after

(a) if, at the end of the submission period, the chief executive has accepted any submissions—the day the notice mentioned in subsection (1) was given; or

(b) otherwise—the end of the submission period.

Related to the requirement under section 57:

The EP Act requires that under section 58 in preparing an EIS assessment report, the chief executive must consider the following:

(a) the final terms of reference for the EIS;

(b) the submitted EIS;

(c) all properly made submissions and any other submissions accepted by the chief executive;

(d) the standard criteria;

(e) another matter prescribed under a regulation.

Additionally, section 59 of the EP Act lists the required content of an assessment report required by section 57, an EIS assessment report must:

(a) address the adequacy of the EIS in addressing the final terms of reference; and

(b) address the adequacy of any environmental management plan for the project; and

(c) make recommendations about the suitability of the project; and

(d) recommend any conditions on which any approval required for the project may be given; and

(e) contain another matter prescribed under a regulation.

Human rights engaged

The following Human Rights were identified as potentially engaged by the decision:

1. Section 15(2) - Recognition and equality before the law - Every person has the right to enjoy the person's human rights without discrimination.
2. Section 24(2) - Property rights - A person must not be arbitrarily deprived of the person's property.
3. Section 26(2) - Protection of families and children - Every child has the right, without discrimination, to the protection that is needed by the child, and is in the child's best interests, because of being a child.
4. Section 28 - Cultural rights—Aboriginal peoples and Torres Strait Islander peoples –
    1) Aboriginal peoples and Torres Strait Islander peoples hold distinct cultural rights.
    2) Aboriginal peoples and Torres Strait Islander peoples must not be denied the right, with other members of their community—
        a) to enjoy, maintain, control, protect and develop their identity and cultural heritage, including their traditional knowledge, distinctive spiritual practices, observances, beliefs and teachings; and
        b) to enjoy, maintain, control, protect, develop and use their language, including traditional cultural expressions; and
        c) to enjoy, maintain, control, protect and develop their kinship ties; and
        d) to maintain and strengthen their distinctive spiritual, material and economic relationship with the land, territories, waters, coastal seas and other resources with which they have a connection under Aboriginal tradition or Island custom; and
        e) to conserve and protect the environment and productive capacity of their land, territories, waters, coastal seas and other resources.
    3) Aboriginal peoples and Torres Strait Islander peoples have the right not to be subjected to forced assimilation or destruction of their culture.

I have not listed all 23 human rights protected under the HR Act above, instead I have only listed those rights I believe to be engaged by a decision about the suitability of the project.

As part of the EIS process, I visited the site of the proposed Aurukun Bauxite Project and the town of Aurukun. During this trip I engaged with members of the local community to determine which (if any) of the above rights were engaged. I also used this opportunity to improve my understanding of the distinct cultural rights held by the Traditional Owners of where the proposed project would be located.

In addition, I have relied on the EIS process and on the public notification process undertaken as part of the EIS process to fulfill any additional requirements (where appropriate) to consult with potentially affected individuals, whose human rights may be engaged by the decision.

Limitations

I consider that the following rights are potentially limited by my decision to allow the project to proceed and to issue the EIS report.

(a) Section 15(2) - Recognition and equality before the law

(b) Section 24(2) - Property rights

(c) Section 26(2) - Protection of families and children

(d) Section 28 - Cultural rights—Aboriginal peoples and Torres Strait Islander peoples

As the above rights may be subject to limitation by the Aurukun Bauxite project, I must consider whether the limitations are reasonable and demonstrably justifiable in accordance with section 13 of the HR Act.

The decision to allow the Aurukun Bauxite project to proceed is authorised under the EP Act, therefore it is 'under law' (section 13(1) of the HR Act)

Climate Change

Climate Change may limit various rights, including the rights to life, children and families, and cultural rights of Aboriginal peoples and Torres Strait Islander peoples in sections 16, 26, and 28 of the HR Act.

The operation of open cut bauxite mining as part of the Aurukun Bauxite Project has the potential to contribute to climate change though the generation of greenhouse gas emissions. Therefore, I have carefully considered the relationship between climate change and human rights in my assessment. In evaluating the project's contribution to climate change and any potential limitations on the human rights listed, I have taken a conservative approach. I have determined that the project has the potential to affect people, property, and the environment in Queensland due to greenhouse gas emissions (primarily CO2) released into the atmosphere, mainly from fuel combustion for on-site power generation and heavy machinery operation. However, whilst I acknowledge this potential impact, I also recognise that the project's CO2 emissions would be relatively small at both the Queensland and Australian levels and negligible from a global perspective. As a result, I have not analysed climate change impacts in the same level of detail as other, more direct project impacts. However, for the purposes of this assessment report, I acknowledge that the project's contribution to climate change may, to some extent, limit each of the human rights identified.

I consider a fair balance has been struck between allowing the Aurukun Bauxite Project to proceed and protecting the relevant rights that may be impacted by climate change. The mine will bring important benefits to the region, including economic and social benefits that will be wide reaching and will likely improve the overall quality of infrastructure and services in and around Aurukun.

I have also included in the report recommendations that may assist in mitigating or reducing the contribution of the project to climate change. Further, as I noted above, the project's CO2 emissions would be relatively small at both the Queensland and Australian levels and negligible from a global perspective. Lastly, it is important to note that my decision to recommend that the project to proceed is not the sole approval required for its operations to commence. Further human rights consideration will be necessary when making the decision to issue an Environmental Authority for the project.

Section 15(2) – Recognition and equality before the law – Every person has the right to enjoy the person's human rights without discrimination.

(a) nature of the right

Recognition and equality before the law in section 15 of the Human Rights Act recognises that everyone has the right to enjoy their human rights equally and without discrimination. It is about human dignity. Discrimination is defined in the HR Act to include direct discrimination or indirect discrimination, within the meaning of the Anti-Discrimination Act 1991 based on an attribute in section 7 of that Act. The relevant attributes for the decision are age and race. In relation to indirect discrimination, I have considered whether my decision imposes a burden or denies a benefit in a way that has the effect of reinforcing, perpetuating, or exacerbating disadvantage, including historical or systemic disadvantage.

(b) the nature and purpose of the limitation

I have formed the view that the Aurukun Bauxite Project has the potential to limit the rights in section 15(2), being recognition and equality before the law, particularly regarding the fair and non-discriminatory treatment of Traditional Owners and Indigenous community members. Given that the project is proposed to be located on land traditionally owned and occupied by Wik and Wik Waya people, there is a risk that their rights and interests could be disproportionately affected compared to non-Indigenous people.

As the decision-maker, I have considered whether the project has the potential to discriminate against individuals or groups, particularly Aboriginal people, in ways that could limit their ability to enjoy their human rights on an equal basis with others. Where I consider that potential exists, to mitigate potential impacts, I have made recommendations about the following matters:

Meaningful Consultation: The proponent should engage in ongoing, culturally appropriate consultation with Traditional Owners to ensure their views and concerns are properly considered in decision-making

processes for the project, including the proposed partnership agreement with Traditional Owners to capture elements of cultural heritage management and native title.

Cultural Heritage Protection: Conditions have been recommended to protect significant cultural heritage sites and ensure Traditional Owners have a role in managing and preserving their cultural heritage.

Employment and Economic Inclusion: The proponent is required to implement employment and training programs that provide opportunities for local Indigenous people, ensuring they benefit from economic opportunities created by the project.

(c) whether the limitation helps to achieve the purpose

The limitation on the right is directly connected to the decision that the project is suitable to proceed.

(d) whether there is any less restrictive way of achieving the purpose

I do not consider there is any less restrictive way of achieving the purpose of allowing the project to proceed. As noted above, I have made recommendations in the EIS report about measures to reduce potential impacts on human rights where appropriate.

(e) on balance, whether the importance of achieving the purpose outweighs the importance of preserving the right

I consider that a fair balance has been struck between the potential limitations on the right for a person to enjoy their human rights equally and without discrimination under section 15(2) of the HR Act and the importance of allowing the project to proceed. The project will provide significant economic and social benefits, including the creation of employment opportunities, enhancement of regional infrastructure, and long-term economic development for the broader community, including Indigenous populations. Therefore, I consider the limitation is reasonable and justified.

Section 24(2) - Property rights - A person must not be arbitrarily deprived of the person's property

(a) nature of the rights

The project as proposed involves activities that would generate direct impacts on property within and adjacent to the project area. These impacts include (but are not limited to) dust nuisance, noise nuisance, land (vegetation) clearing, other land disturbance, surface water and groundwater impacts (including impoundment and use of surface water on site) and property access restrictions. The amenity impacts may result in physical or mental effects on people residing close to the mine.

(b) the nature and purpose of the limitation

The decision to allow the Aurukun project to proceed, and provide the EIS assessment report, are being undertaken in accordance with the requirements of the EP Act after appropriate consideration of the

following relevant factors:

1. the final terms of reference for the EIS;
2. the submitted EIS;
3. all properly made submissions and any other submissions accepted by the chief executive;
4. the standard criteria;

I have formed the view that the Aurukun Bauxite Project has the potential to limit the rights in section 24(2), being property rights, because of the project's direct impacts on properties within the proposed mining area, and adjacent properties that may also be affected.

(c) whether the limitation helps to achieve the purpose

The limitation on the rights to property and privacy is directly related to the approval for the project to proceed.

(d) whether there is any less restrictive way of achieving the purpose

As the decision-maker, I have considered the potential for the project to impact property rights and have ensured that the EIS recommends conditions to be placed on the draft EA requiring the proponent to avoid, mitigate and monitor the various impacts to properties including direct impacts from land disturbance, nuisance

matters such as dust and noise, groundwater drawdown and surface water impacts. I consider it appropriate that conditions be placed on the draft EA for these matters along with conditions requiring rehabilitation activities on-site to ensure landholders' property rights are protected to the extent possible and land is restored to a suitable post-mining land use. In my opinion, there is no less restrictive way of achieving the purpose of allowing the project to proceed.

(e) on balance, whether the importance of achieving the purpose outweighs the importance of preserving the right

Based on the above considerations, it is my opinion that a fair balance has been struck between the potential limitation of the human rights in section 24(2) and the importance of allowing the project to proceed. There are significant impacts on property, including the property rights of the Traditional Owners and Indigenous community members (due to the potential impacts on land and resources of cultural and traditional significance). However, there are also significant economic and social benefits the project is expected to deliver, including regional job creation, economic development, and improved community infrastructure. Importantly, the proponent has demonstrated a clear commitment to avoiding and minimising impacts on land and cultural values through careful project design, route selection, and operational controls. In addition, the proponent has committed to progressive rehabilitation of disturbed areas and ongoing consultation with affected communities, ensuring that impacts are not only minimised during the life of the project, but that land is restored to a condition that supports future use and cultural continuity.

Section 26(2) - Protection of families and children - Every child has the right, without discrimination, to the protection that is needed by the child, and is in the child's best interests, because of being a child.

(a) the nature of the right

The protection of children and families in section 26 of the HR Act is concerned with the protection of children and families by the State. The right to protection of children recognises that children have the same rights as adults, but with additional protections because they are children.

The project as proposed involves activities that may generate direct and indirect impacts on children within and adjacent to the project area. These impacts include (but are not limited to) increased noise and air pollution, impacts to land and water, and changes to local community infrastructure that may affect children's access to essential services such as water and sewerage and may increase pressure on essential community services such as waste collection and sanitation. The project may also impact on Aboriginal and Torres Strait Islander children through the inter-generational effects of climate change (discussed above).

(b) the nature and purpose of the limitation

The decision to allow the Aurukun project to proceed, and provide the EIS assessment report, are being undertaken in accordance with the requirements of the EP Act after appropriate consideration of relevant matters, this is a proper purpose. I have formed the view that the Aurukun Bauxite Project has the potential to limit the rights in section 26(2), being the rights of children, due to the project's direct and indirect effects on the environment and community services. Children are particularly vulnerable to environmental hazards, and exposure to increased pollution, land disturbances, or disruptions to essential services may disproportionately affect their well-being and development. In addition, children in Aurukun may be further affected due to reduced standards of living when compared with other children living in rural communities across Queensland.

(c) whether the limitation helps to achieve the purpose

The limitation on the rights of the child is directly related to the approval for the project to proceed.

(d) whether there is any less restrictive way of achieving the purpose

As the decision-maker, I have considered the potential for the project to impact the rights of children and have ensured that the EIS recommends conditions to be placed on the draft EA requiring the proponent to avoid, mitigate, and monitor the various impacts that could affect children. These conditions include measures to avoid, mitigate and monitor impacts to environmental values in the area surrounding the proposed project site, particularly those that may result in detrimental impacts off site.

Additionally, I consider it appropriate that the EIS recommends conditions be placed on the draft EA and any commitments made by the proponent as part of the EIS process, along with any recommendations around social

and economic benefits to the local community and traditional owners be implemented by the proponent. In my opinion, there is no less restrictive way of achieving the purpose of allowing the project to proceed.

(e) on balance, whether the importance of achieving the purpose outweighs the importance of preserving the right

I consider a fair balance has been struck between the protection of the rights of children and the importance of the project proceeding. While there may be indirect impacts on children within the local Indigenous community, particularly through changes to the environment, land use, and cultural practices, I consider this potential limitation is justified given the significant economic and social benefits the project is expected to deliver. These include increased employment and training opportunities for local families, improved access to infrastructure and services, and long-term community investment, all of which can contribute positively to the wellbeing and prospects of children.

Section 28 - Cultural rights—Aboriginal peoples and Torres Strait Islander peoples –

(1) Aboriginal peoples and Torres Strait Islander peoples hold distinct cultural rights.

(2) Aboriginal peoples and Torres Strait Islander peoples must not be denied the right, with other members of their community—

(a) to enjoy, maintain, control, protect and develop their identity and cultural heritage, including their traditional knowledge, distinctive spiritual practices, observances, beliefs and teachings; and

(b) to enjoy, maintain, control, protect, develop and use their language, including traditional cultural expressions; and

(c) to enjoy, maintain, control, protect and develop their kinship ties; and

(d) to maintain and strengthen their distinctive spiritual, material and economic relationship with the land, territories, waters, coastal seas and other resources with which they have a connection under Aboriginal tradition or Island custom; and

(e) to conserve and protect the environment and productive capacity of their land, territories, waters, coastal seas and other resources.

(3) Aboriginal peoples and Torres Strait Islander peoples have the right not to be subjected to forced assimilation or destruction of their culture.

(a) nature of the right

Section 28 of the HR Act recognises that Aboriginal peoples and Torres Strait Islander peoples have a rich and diverse culture. There are many hundreds of distinct Aboriginal groups and Torres Strait Islander groups in Australia, each with geographical boundaries and an intimate association with those areas. Many of these groups have their own languages, customs, laws, and cultural practices. Section 28 explicitly protects the right to live life as an Aboriginal person or Torres Strait Islander person who is free to practise their culture and gives rights to individuals as part of a cultural group. The proposed project involves activities that would have direct impacts on land and waters within and adjacent to the project area. These impacts may affect intangible cultural heritage values, physical cultural artefacts, and the rights of traditional owners to access, use, and maintain their connection to country.

(b) nature and purpose of the limitation

The decision to allow the Aurukun project to proceed, and provide the EIS assessment report, are being undertaken in accordance with the requirements of the EP Act after appropriate consideration of the relevant matters. This is a proper purpose.

In assessing the Aurukun Bauxite Project, I have determined that it has the potential to limit the rights in section 28, being the cultural rights of Aboriginal and Torres Strait Islander peoples. These rights include the ability to enjoy, maintain, control, protect, and develop cultural heritage, traditional knowledge, and distinctive spiritual practices, observances, beliefs, and teachings.

The project is proposed to be located on land traditionally owned and occupied by the Wik and Wik Waya people, with the Upu-Mren Family Group and the Paiden Family Group identifying as the Traditional Owners.

Recognising their profound and enduring connection to country, I have given significant weight to this relationship in my assessment.

Throughout the EIS process and my time on-site in Aurukun, I developed an understanding of the spiritual, cultural, and practical connection that traditional owners maintain with the land and waters. Consultations and submissions provided firsthand insights into how this relationship shapes their aspirations for the Aurukun community and their concerns about the project's potential impacts. This understanding has been central to my decision-making.

Concerns raised by traditional owners encompass both tangible and intangible cultural impacts, which are summarised below:

Tangible Impacts

- Destruction or Damage to Cultural Heritage – Culturally significant areas have been identified at Coconut Creek, along Tapplebang Creek (downstream of the proposed Tapplebang Dam) and along the coastline between Norman Creek in the north and False Pera Head in the south. Surveys have also recorded scar trees and isolated stone artefacts on the bauxite plateau, with the highest concentration found along Tapplebang Creek.
- Displacement from Traditional Lands – Mining activities may cause significant land disturbance, potentially restricting traditional owners' access—intermittently or permanently—to areas historically used for cultural practices, ceremonies, and resource gathering.
- Loss of Flora and Fauna – traditional owners rely on the local environment for medicine, food, and ceremonial purposes, making the loss of specific plants and animals a major concern.
- Water-Related Impacts – Coconut Creek, Tapplebang Creek, and the coastal areas (including the inner and outer reefs near the proposed Coastal Loading Facility) hold deep spiritual and cultural significance.
- Economic and Social Disruptions – While the project is expected to bring economic benefits to Aurukun and surrounding areas, potential negative effects include an increased cost of living, unequal distribution of financial benefits and employment opportunities, and disruptions to established social structures.

Intangible Impacts

- Loss of Connection to Country – Traditional owners have expressed concerns that the loss of access to impacted lands due to mining would sever their spiritual connection, which in turn may result in strong feelings of shame and disempowerment.
- Loss of Cultural Identity – Mining activities could disrupt cultural practices passed down for generations, weakening the cultural identity of traditional owners and their ability to transmit knowledge to future generations.
- Emotional and Psychological Distress – Traditional owners, particularly Elders, have noted that the long history of mining in the region has caused significant emotional distress. The disturbance of sacred sites and ancestral lands has the potential to cause further deep emotional and psychological harm.

(c) <u>whether the limitation helps to achieve the purpose</u>

The potential limitation on the cultural rights of Aboriginal peoples is directly related to the approval for the project to proceed.

(d) w<u>hether there is any less restrictive way of achieving the purpose</u>

In my opinion, there is no less restrictive way of achieving the purpose of allowing the project to proceed. However, there are several safeguards built into the approval process to minimise the potential cultural impacts, including

- Comprehensive mitigation measures would be required to manage cultural heritage impacts through the *Aboriginal Cultural Heritage Act 2003* (ACH Act).

- A Cultural Heritage Management Plan (CHMP) would be developed and implemented in accordance with the ACH Act, ensuring that impacts on cultural heritage are identified, minimised, and managed in collaboration with traditional owners. The CHMP should include:
    - Formal and informal consultations, including on-country consultations, with representatives of the directly affected traditional owner families.
    - Identification of areas of potential cultural significance within the project site.
    - On-ground surveys of culturally significant areas, conducted with nominated traditional owner representatives, to document the cultural values of the site.
    - Archaeological surveys to assess the presence of significant cultural artefacts.
    - Post-survey verification of findings with the relevant traditional owner families.
- I have recommended conditions for the draft environmental authority to ensure that:
    - The commitments made by the proponent in response to traditional owner consultation and submissions during the EIS process are implemented.
    - Social and economic benefits for the local community and traditional owners are realised.

The final decision maker for the environmental authority may choose to apply these recommended conditions as part of their decision.

(e) on balance, whether the importance of achieving the purpose outweighs the importance of preserving the right

I consider a fair balance has been struck between the protection of the cultural rights of Aboriginal people and the importance of the project proceeding. On one side, the Aurukun Bauxite Project may potentially limit the cultural rights protected under section 28 of the HR Act due to its direct and indirect impacts on land, waters, cultural heritage, traditional knowledge, and spiritual practices. On the other side, the project has significant economic and social benefits for the Aurukun community, including employment, business opportunities, and infrastructure development that aim to support the long-term wellbeing and self-determination of local Indigenous communities. The proponent has taken steps to avoid and minimise cultural impacts through ongoing engagement with Traditional Owners. In addition, the measures outlined in the CHMP, alongside the conditions imposed on the draft EA, would ensure that cultural heritage is appropriately managed, and that traditional owners remain actively involved in decision-making processes concerning their Country

Record of consultation

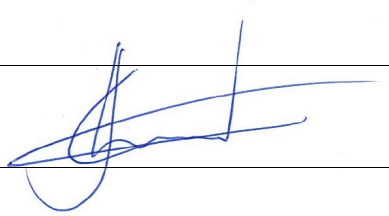
As part of the EIS process, I have consulted with potentially affected traditional owners in the Aurukun community. I have done this directly by travelling to Aurukun and indirectly by making subsequent contact with traditional owners and their representatives in relation to their formal submissions to the EIS process, for which I approved several extensions of time to ensure they were able to seek advice and comments from all relevant parties.

On 9 October 2023, I travelled to Cape York to visit the site of the proposed Aurukun Bauxite Project. During this visit I met with traditional owners of the land associated with the proposed project, along with other traditional owners from the region to talk about the consultation process undertaken by the proponent as part of the EIS, and the ongoing presence in the Aurukun community.

Outcome

Human rights **are limited** and the decision/action is compatible with the HR Act.

In my opinion, the decision to allow the project to continue is compatible with human rights under the HR Act because it limits human rights only to the extent that is reasonable and demonstrably justifiable in a free and democratic society based on human dignity, equality, and freedom.

	30 April 2025
Signature	**Date**

Christopher Loveday
Department of the Environment, Tourism, Science and Innovation
Delegate of the chief executive
Environmental Protection Act 1994

Appendix F—Acronyms and abbreviations

ACH Act	*Aboriginal Cultural Heritage Act 2003* (Qld)
AEP	Annual exceedance probability
AHD	Australian Height Datum
ARI	Average recurrence interval
BACI	Before-After, Control-Impact
CBA	Cost-benefit analysis
CHMP	Cultural heritage management plan
CLF	Coastal Loading Facility
Comalco Act	*Commonwealth Aluminium Corporation Pty Limited Agreement Act 1957* (Qld)
COC	Contaminants of concern
Cwlth	Commonwealth
DCCEEW	Department of Climate Change, Energy, the Environment and Water
dBA	A-weighted decibels
DES	former Department of Environment and Science (now DETSI)
DESI	former Department of Environment, Science and Innovation (now DETSI)
DETSI	Department of the Environment, Tourism, Science and Innovation (former DES / DESI)
DLGWV	Department of Local Government, Water and Volunteers
DNRMMRRD	Department of Natural Resources and Mines, Manufacturing and Regional and Rural Development
DPI	Department of Primary Industries
DRDMW	former Department of Regional Development, Manufacturing and Water
DSDILGP	former Department of State Development, Infrastructure, Local Government and Planning
EA	Environmental authority
eDNA	Environmental DNA
EIS	Environmental impact statement
ENM software	RTA Technology Pty Ltd Environmental Noise Model software
EO Act	*Environmental Offsets Act 2014* (Qld)
EP Act	*Environmental Protection Act 1994* (Qld)
EP Regulation	Environmental Protection Regulation 2019 (Qld)
EPP (Noise)	Environmental Protection (Noise) Policy 2019 (Qld)
EPP (Water and Wetland Biodiversity)	Environmental Protection (Water and Wetland Biodiversity) Policy 2019 (Qld)
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cwlth)
ERA	Environmentally relevant activities
ESCP	Erosion and sediment control plan
EVs	Environmental values
FCA	Fines Containment Area
FIFO	Fly-in, fly-out
FMP	Fines management plan

FTE	Full time equivalent
GAB	Great Artesian Basin
GDE	Groundwater dependant ecosystem
GHG	Greenhouse gas
GL	Gigalitre
GMMP	Groundwater Monitoring and Management Plan
ha	Hectares
HES	High ecological significance
HEV	High ecological value
HR Act	*Human Rights Act 2019* (Qld)
IAS	Initial advice statement
IESC	Independent Expert Scientific Committee on Unconventional Gas Development and Large Coal Mining Development
kg	Kilogram
km	Kilometres
kL	Kilolitre
LFC tool	Landscape Fragmentation and Connectivity Tool
LGA	Local government area
LOJ	Load-out Jetty
m	Metres
MDL	Mineral development license
MIA	Mine Infrastructure Area
ML	Megalitre
ml	millilitre
MNES	Matters of national environmental significance
MR Act	*Mineral Resources Act 1989*
MSES	Matters of state environmental significance
MSQ	Maritime Safety Queensland
Mt	Million tonnes
Mtpa	Million tonnes per annum
MW	Megawatt
NAK	Ngan Aak Kunch Aboriginal Corporation
NC Act	*Nature Conservation Act 1992* (Qld)
NGER Act	*National Greenhouse and Energy Reporting Act 2007* (Cwlth)
NM	Nautical miles
OAMP	Offset area management plan
OGV	Ocean Going Vessels
OMS	Offset Management Strategy
OWS	Off-stream water storage
Planning Act	*Planning Act 2016* (Qld)
PM_{10}	Particulate matter with a diameter of 10 micrometres or less
PMLU	Post Mining Land Use
PRC plan	Progressive rehabilitation and closure plan

PRCP schedule	Progressive rehabilitation and closure plan schedule
PWP	Process Water Pond
QHR	Queensland Heritage Register
Qld	Queensland
REMP	Receiving environment monitoring program
RE	Regional ecosystem
RIA	Regional impact analysis
ROM	Run of mine
RTA Weipa	RTA Weipa Pty Ltd
SIA	Social impact assessment
SIMP	Social impact management plan
SIMRs	Social Impact Management Reports
SRI	Significant residual impact
SSRC Act	*Strong and Sustainable Resource Communities Act 2017* (Qld)
SSTV	Site-specific trigger values
t	Tonnes
the project	Aurukun Bauxite Project
the proponent	Aurukun Bauxite Project Joint Venture
TMR	Department of Transport and Main Roads
TOR	Terms of reference
TSV	Transhipment Vessel
Water Act	*Water Act 2000* (Qld)
Water Plan (Cape York)	Water Plan (Cape York) 2019
Water Plan (GABORA)	Water Plan (Great Artesian Basin and Other Regional Aquifers) 2017 (Qld)
Working Group	Aurukun Bauxite Project Working Group, comprised of Kuchek Karp Nyiian Ak Aak Ngamparam Ak
WRR Act	*Waste Reduction and Recycling Act 2011* (Qld)

The Department of the Environment, Tourism, Science and Innovation acknowledges Aboriginal and Torres Strait Islander peoples as the Traditional Owners and custodians of the land.

We recognise their connection to land, sea and community, and pay our respects to Elders past and present.

Queensland Government